

Strategy matters, does EU ETS?

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Abstract

For most nations, increased carbon dioxide (CO₂) emissions are the only way to reach economic development. At the same time awareness about future costs for handling climate change related problems show how the market has failed to reflect this cost on produced and consumed goods. To counter this externality problem the European Union introduced in year 2005 a system for trading allowances to emit CO₂, the EU ETS (European Union Emissions Trading Scheme). More than 10'000 installations from energy, metal, mineral, pulp, paper and board industries are included thus covering about half of EUs CO₂ emissions.

The EU ETS has been criticized for being ineffective and not leading to enough emission reductions. At the same time the climate change issue is assumed to be on many corporate agendas, but do we know if that is the case? In year 2006 we saw the much famous Stern Review, in year 2007 Al Gore and IPCC were appointed laureates for the Nobel price, but did EU ETS play a part in putting the climate change issue under the eyes of corporate leaders?

This study presents a content analysis of more than 1100 shareholder letters from 131 of the largest European corporations during year 2000 to 2009. The main target is to analyze to what extent (if or if not) climate change is on the corporate agenda. Does CEOs and corporate chairmen discuss climate related topics?

The result show that for the trading sector (but not other sectors) the climate change issue appeared in year 2005. This is comparable to other sectors such as finance and insurance, where the issue appeared one year later in 2006. However the result also show that the recent financial crises as such, swept away the climate change issue for industry heavily - but not as much in the trading sector as in other sectors. In total this mean: money matters if we expect industry to care about climate change. Concerning climate change action; political interfering in CEOs daily life is effective when a cost component is involved.

Introduction

The overall aim of this paper is to analyze how the climate change issue has developed within the largest European public corporations. The main purpose is to outline differences between how the climate change issue has been adopted on the strategic agenda between different industries. A particular notion is taken towards industries and corporations included within the European Union Emission Trading Scheme (EU ETS). To answer this, the content analysis method is applied on over 1100 letters to shareholders from the largest European corporations during the period of year 2000 to 2010.

During the last decades the climate change issue has been predicted to evolve on the corporate strategic agenda (Sachs, 2009; Porter & Reinhart, 2007; Stern 2009). Climate change poses many uncertainties and risks: reputational, physical and economical to name a few. Corporations gain a competitive advantage if better at mitigating climate related risks than their competitors (Lash & Wellington, 2007).

Expectations on future higher prices as environmental costs are included in market transactions have existed for several decades (Allen & Christensen, 1990; Grubb & Hope, 1992; Stern, 2006; Sachs, 2009; Rive 2009). In a

short term perspective there is uncertainty regarding how and when individual corporations will be affected (Busch & Hoffman, 2007; Blyth et al., 2009). In the oil industry climate change was first openly acknowledged by BP in 1997, but response has shown to vary within the industry. Much depending on location, internal organization, economic and market position (Kolk & Levy, 2001). It exist a need to obtain more insight to the actual positioning across industries and how they have responded to climate change issues (Kolk & Pinske, 2004; IPCC 2007).

This paper investigates how the climate change issue has been assimilated within corporations and industries from Europe. Certain interest has been given to corporations affected by the EU ETS compared to other sectors. Thus this study answers the question:

How has the climate change issue developed on the strategic agenda of the largest European corporations?

In year 2006 the movie an inconvenient truth and the Stern Review was released. In year 2007 IPCC Fourth Assessment Report followed. The Nobel Peace Prize of year 2007 was awarded jointly to Intergovernmental Panel on Climate Change (IPCC) and Al Gore "for their efforts to build up and disseminate greater knowledge about man-made climate change and to lay the foundations for the measures that are needed to counteract such change" (nobelprize.org, 2011). As described later the strategic importance of the climate change issue rose in 2006 and 2007 amongst European corporations, but what was the case before this time?

Background

Climate change, externalities, market failure and political intervention

There is today more or less consensus that Greenhouse Emissions (GE) -externalities- will most likely continue to accelerate climate change. For European as well as the global industry the climate change discourses we have witnessed during the past few decades cannot be business as usual. If the level of emissions increases at the continued rate, we can expect atmospheric carbon dioxide concentrations to threaten climate stability. To reach safe levels a rapid reduction in emissions is needed. For most nations though, increased carbon dioxide (CO₂) emissions are the only way to reach economic development. This as it exists elasticity between energy demand and economic development and most energy resources are derived from fossil sources. At the same time awareness about future costs for handling climate change related problems is increasing. (IPCC 2007; Stern 2006; IEA, 2010)

Externalities are positive or negative spillovers of the production or consumption of goods not transmitted through the price. With greenhouse emissions the private marginal net product is different from the social marginal net product. This as the cost for society to manage the externality of climate change is not reflected in market prices. Thus the market fails to produce optimal national dividend and welfare. Something called market failure (Bator, 1958). In an environmental context this is often based on the presence of externality effects, often the case when it exist no ownership of a resource (Stern, 2003). Climate change is the biggest example of market failure in history (Stern, 2006).

Many potential policy instruments exist to correct for market failures and be applied in a climate change context. Either through providing direct incentives for abatement through command and control, or through economic instruments designed to correct the market price for emitting GHGs. One important target while designing a climate/CO₂ – policy is to achieve targeted abatement at the lowest possible cost for society. (Broberg et al., 2008)

Arthur Cecil Pigou presented in the beginning of last century a theoretical framework for how policies for countering market failures should be managed. Mainly by the introduction of a subsidies or tax depending on if a market failure entailed excessive or insufficient production or consumption. The goal of such policy is to reduce the difference between social and private marginal net product to optimize national dividend and welfare. Thus

including all negative and positive effects of the marginal increment, independent of which volume or how a resource is used. (Pigou, 1920)

In the 1960s, Nobel Prize laureate Ronald Coase introduced an alternative standpoint on how to manage market failures and the presences of externalities. The right to perform a task harmful to others might be seen as a factor of production. If production or consumption is decreased there will be an alternative cost involved. When choosing between possible options the total effect of these must be taken into account, which Pigous system did not if further analyzed. If the changes in production or consumption could be agreed on through market mechanisms the most efficient distribution of resources would be obtained. (Coase, 1960)

The optimal level of emission reduction is a difficult and controversial question (Sterner, 2003). Political factors are often influencing policy formation more than economic considerations (Hepburn 2006). Even though it at first might seem illogical, maximum abatement is not automatically the preferable choice. Resources (economical and other) are finite. Total abatement under one cause take more resources from other areas (environmental areas, education, healthcare etc) than what is saved from the reductions. Thus inefficient policy leads to national dividend and welfare falling short of potential (Sterner, 2003).

European policies for lowering CO₂ emissions

During the late 1980s and 1990s energy prices where low and thus less incentive for decreasing the elasticity between energy and economic development. At the same time beliefs was in market liberalism and that governments only should intervene to correct market failures. The rest the market would fix by itself. (Nilsson et al 2009)

CO₂ tax

A European hybrid energy/CO₂ tax was proposed during year 1992 (EU COM (92) 126 1992), but was never introduced as resistance was large from industry and some member states. Especially UK worked against it. Even though the proposal was failure and a union wide tax never was implemented, some countries introduced one by themselves. Finland was first in year 1990 followed by Sweden and Norway in year 1991 and then Denmark in year 1992. The Netherlands had though already in 1988 introduced a tax on hydrocarbon based fuels that was extended to CO₂ in year 1990 and energy in year 1996. The design of the tax among the Nordic countries made consumers take the burden as most large emitters where exempt because of international competition. (Chesney & Tachini, 2008)

European Union Emission Trading Scheme

In 2005 the European Union introduced a system for trading allowances to emit CO₂, the European Union Emissions Trading Scheme (EU ETS). More than 10'000 installations from energy, metal, mineral, pulp, paper and board industries are included thus covering about half of EUs CO₂ emissions. The system has been designed to be implemented over several phases. (Chesney & Tachini, 2008)



Figure 1. *Historic EU ETS allowance prices.*

The EU ETS allowance market has shown extreme volatility. Historic prices from Blue Next are shown in Figure 1. During year 2006 the price ranged from about € 7 up to € 30 per ton emitted CO₂. When new regulatory information was introduced regarding the phases in year 2006 prices fell by 70 % during one month (Nordhaus, 2007). Lax caps could not ensure a carbon price at all which was seen during the collapse and no incentives for abatement existed under such scenario (Alberola et al 2008). During the first phase of ETS free allocation also made competitiveness effects less imminent. A strengthening of the scheme would have continued limited effects according to simulations by Wobst et al. (2007). Uncertain and unclear effects of policy make less incentive for corporations to invest in R&D and low carbon alternatives (Katsoulacos et al., 2001; Hepburn, 2006; Baker et al., 2008).

After the introduction of Phase 2 in year 2008 prices has ranged between € 9 to € 29 per ton and seems to be oscillating around € 15 during the end of year 2010. In Sweden and many other member states a CO₂ tax today works alongside the EU ETS for the non trading sector to provide abatement incentives (Broberg et al., 2008).

Corporate view on climate policy

PricewaterhouseCoopers has conducted a study covering interviews with over 700 corporate executives on their view on climate change and climate policy: The volatility of the carbon price and the bureaucracy surrounding European Union Emission Trading Scheme (EU ETS) have led many European executives to conclude that a carbon tax would be easier to administrate and provide more stable criteria for strategic decisions. Especially as the development of new technologies is costly and needs large capital expenditures. When overlooking long-term investment strategies corporate leaders must forecast likely carbon policies and their outcomes five to ten years in the future. (PWC, 2010)

Letters to shareholders as a way to corporate strategy

It exist several sources for information about a corporation's activity. The annual report is one such source and contains both qualitative and quantitative data. As the form of an annual report is given by laws, regulations and norms the content is quite standardized (Yuthas et al., 2002). Even though there are many returning themes within annual reports, some space is devoted to discussion of various topics affecting the business (Thomas, 1997; Santema & Jeroen, 2001). The letters to shareholders included in the annual reports are statements directly from corporate chairmen and executives (Bowman, 1984; Petersen & Martin, 1996). Thus, these letters are important

tools when communicating issues of strategic importance (Courtis, 1982). Letters to shareholders mirror corporate strategic change and attention, and are if followed over time useful for analyzing corporate strategy (Yaday et al., 2007; Santema & Jeroen, 2001).

Within letters to shareholders most of the space is devoted to annually returning topics or standard matters (Bettman & Weitz, 1983). These include discussing dividend, thanking employees and shareholders, as well as discussing finances. Therefore a marginal space devoted for the topic of climate change and other topics affecting the business is to be expected.

Surprisingly few studies of the climate change issue in relation to letters to shareholders have been performed. One exception is Monteiro and Aibar-Guzman (2010) who with the help of content analysis on annual reports concluded that the Portuguese interest in climate change issues were rather low during year 2002 to 2004.

Research Methodology

The research process followed three major steps. First 131 of the largest European corporations were chosen to mirror the industrial landscape including Eastern and Central Europe. Secondly a pilot tests were adopted according to the Weber Protocol (Weber, 1990) to calibrate and create consistency within the research group. Thirdly during the codification and analyzes process any uncertainties regarding categorization were settled within the research group. The data was processed with the help of the statistical tool “Analyze-it version 2.22 Excel 12+”. Fourthly a common interpretation was reached.

Sampling

A selection of 131 publically listed corporations were selected for this study. From the period of year 2000-2010 1147 letters to shareholders were extracted from the annual report of these corporations. The basis for selection were mainly the “Fortune 500” list of year 2009 with additional corporations from “Deloitte Central Europe’s top 500” to include Eastern and Central Europe in the analysis. Both these lists use total revenue to define size. By this a representation of the largest and most influential corporations in Europe could be covered. The effect of these corporations businesses is not only direct, but also transmitted through their value chain. A detailed list of all observed corporations is given in Appendix I.

During analysis the corporations from sectors participating in allowance trading within the EU ETS (trading corporations) were compared to corporations from the finance and insurance industries, as well as the overall European average.

Content analysis methodology

The content analysis method (CAM) were used for analyzing the shareholder letters. The steps described by Roberts (1989) and Weber (1990) were utilized: Collection of data, coding and statistical processing, and finally interpretation of results. The climate change issue is built up by several open concepts used in different contexts such as “climate”, which might refer to the financial rather than metrological climate. This makes the use of an automatic tool impossible to utilize as the context is not considered (Deumes, 2008). Thus a manual “human scored schema” was used (Short & Palmer, 2008). The CAM procedure was further based on weighting the number of words discussing climate change issues towards the total length of the shareholder letter. Thus the present study shares similarities with Bowman (1989), Kohout & Segars (1992) and Abraham & Cox (2007). Weighting is necessary when analyzing letters to shareholders as they vary in length, from half a page to over 15 pages.

Like every research process, CAM has particular limitations. Validity in the process was persuaded in several ways. As manual reading and coding was utilized, regular checks within the research group to calibrate the coding

procedure were performed. Also a random selection of 10% was recoded to check for biased results. The recoded data were found to be unbiased during this procedure.

It might be expected that corporations with a separate CSR-report might save space in the annual report for other matters. This possibility was investigated and correlation could be established. Rather those with separate CSR reporting wrote more on climate change topics in their shareholder letters included in the annual report, than those without separate CSR reporting. In other words the presence of a separate CSR-report did not bias the results.

Results

The values of all the European observations regarding the climate change issue within letters to shareholders are shown in the dot plot in Figure 2 together with 95% percentiles and a connected means line illustrating the average position. Number of observations n , mean values and a 95% confidence interval is also expressed in table 1. 1147 observations of the space devoted for the climate change issue within shareholders letters is the ground for the following mathematical statistical analysis. Year 2000 holds the least amount of observations with 82 observations and year 2005 and year 2007 the most with 125. It is also shown that in average within a 95% confidence interval year 2001, 2003 and the period of year 2005 and onwards is positively distinct from 0.

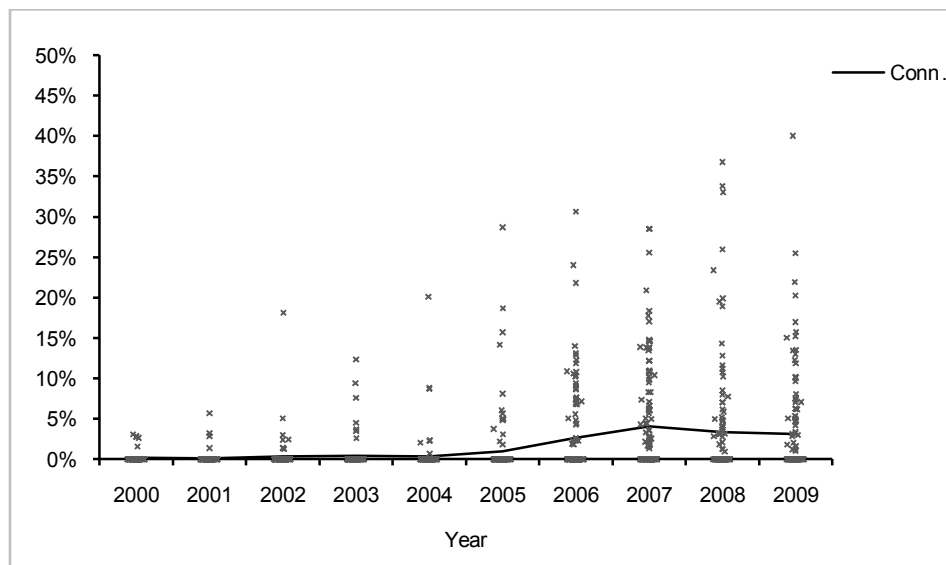


Figure 2. Dot plot and average space devoted for climate change issues within shareholder letters.

Year	n	Mean	95% CI		SE	SD
2000	82	0.16%	0.02%	to 0.30%	0.070%	0.633%
2001	93	0.14%	-0.01%	to 0.29%	0.077%	0.743%
2002	106	0.33%	-0.03%	to 0.69%	0.182%	1.872%
2003	112	0.39%	0.06%	to 0.72%	0.164%	1.737%
2004	120	0.37%	-0.02%	to 0.76%	0.197%	2.160%
2005	125	0.98%	0.32%	to 1.64%	0.335%	3.744%
2006	123	2.67%	1.73%	to 3.61%	0.475%	5.270%
2007	125	4.10%	2.96%	to 5.24%	0.574%	6.413%
2008	119	3.34%	2.04%	to 4.65%	0.658%	7.175%
2009	122	3.10%	1.99%	to 4.22%	0.564%	6.235%

Table 1. Data on average space devoted for climate change issues

Of all 1147 observations 123 were from corporations included within sectors affected by emission trading within the EU ETS. The development of the space devoted for the climate change issue divided between corporations

within the EU ETS, overall European average and at last finance and insurance, is illustrated in Figure 3. The corresponding data is expressed in Table 2.

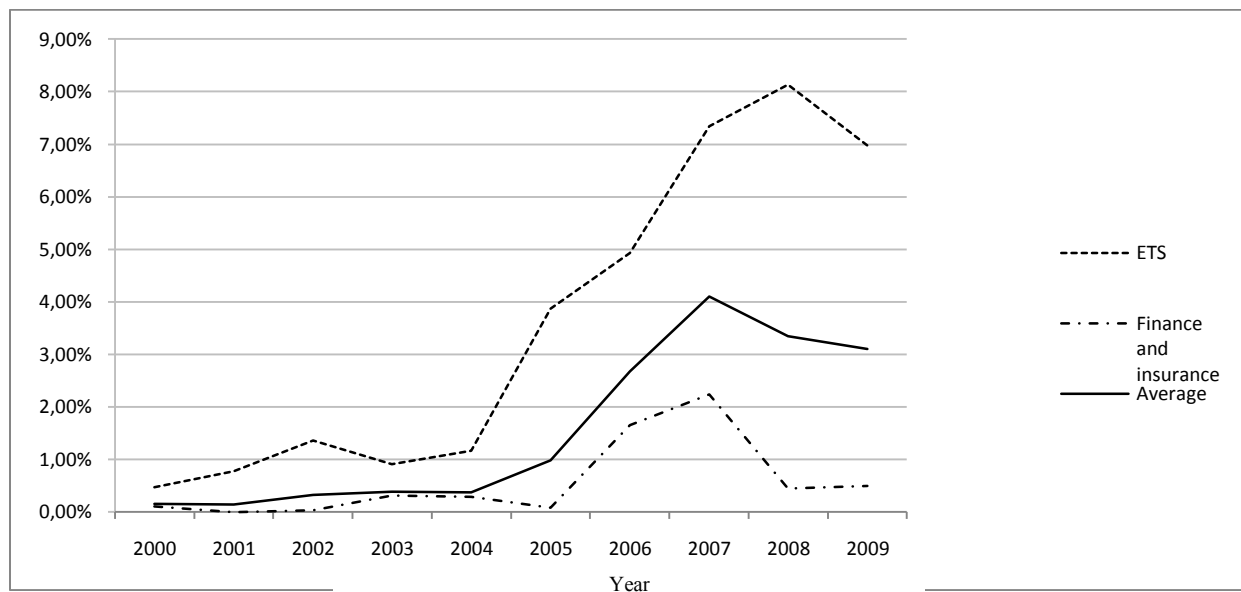


Figure 3. Space devoted for climate change issues within letters to shareholders.

Year	ETS	Finance and Insurance	Average
2000	0.47%	0.10%	0.16%
2001	0.77%	0.00%	0.14%
2002	1.36%	0.04%	0.33%
2003	0.91%	0.32%	0.39%
2004	1.17%	0.29%	0.37%
2005	3.87%	0.08%	0.98%
2006	4.93%	1.65%	2.67%
2007	7.34%	2.24%	4.10%
2008	8.13%	0.44%	3.34%
2009	6.98%	0.50%	3.10%

Table 2. Space devoted for climate change issues within letters to shareholders

Amongst the trading corporations the space devoted for climate change issues has been larger than the European average during the whole period. Before year 2005 the issue took up between 0.77% and 1.36%. In year 2005 allowance trading within the EU ETS was started. The same year the space devoted for climate change issues increased to 3.87%. For the average European firm the space devoted for climate change issues was before year 2005 in the range of 0.14% to 0.39%. The rise in year 2005 of the European average is mainly due to the development within the trading industries. For the specific industries of energy, vehicle, finance and insurance the increase could not be found until year 2006 (see Appendix II, Figure 4). For finance and insurance corporations the space devoted for climate change issues was in average 0.08% in year 2005. In year 2006 the space increased to 1.65%.

Until year 2007 the average space for climate change issues within European corporations continued to increase and reached 4.10%. As the financial crisis hit in the middle of year 2007 the climate change issue was pushed aside in year 2008 to 3.34% and further in year 2009 to 3.10%. For the trading corporations the space for climate change issues increased in year 2008 to 8.13% from 7.34% in year 2007. In year 2009 the space decreased to 6.98%. For finance and insurance the peak was in year 2007 at 2.24%, year 2008 this was decreased to 0.44% and in year 2009 a small increase towards 0.50%.

Linear regression analysis through the least square method revealed the statistical relationships. The letters to shareholder from the trading corporations are expected to devote 1.9 times more space for climate change issues than the European average (see appendix III). Or within a 95% confidence interval, 1.5 to 2.3 times more. For the corporations belonging to finance and insurance industries the expected return is 0.4 times the European average, or within a 95% confidence interval 0.1 to 0.6 times (see appendix IV).

Interpretation of results

This study confirms Monteiro and Aibar-Guzman (2010) result that the interest in climate change issues were moderate between in year 2002 to 2004. The big growth of interest occurred in year 2005, much caused by developments within corporations affected by EU ETS. This is the same year as trading within the EU ETS was started thus indicating its importance. Other industries followed in year 2006. Amongst these were finance and insurance corporations included. The statistically expected return is that the climate change issue is half as important within these corporations as within the European average.

After year 2008 the space devoted for climate change issues within shareholder letters and thereby its strategic priority was pushed aside by the financial crisis. This counts for both the European average as well as corporations belonging to the finance and insurance industries. For corporations affected by EU ETS (trading corporations) the climate change issue increased in importance during year 2008 and declined first in year 2009. The expected return is that the trading corporations should devote almost twice the space for climate change issues than the European average, thus illustrating the greater strategic importance of issue.

It should be noted that the space discussing climate change and other issues is not a reflection of actual corporate action. Thus it does not tell if a corporation is climate friendly, “green”, good or bad, or any other interpretation. The result indicates the strategic focus of corporations and thus it could be the reason of answering public opinion as well as a summary of actions taken. The causes for an climate issues to be of corporate strategic interest should be focus of future research.

The results regarding the trading corporations have no direct correlation to development of the EU ETS price expect its starting date. In other words during the lower prices after the peak in year 2006 the climate change issue continued to increase. This illustrates that events such as the Stern Review, Al Gore and IPCC (might be others) has been important for the development of the climate change issue on the strategic agenda. Still the importance of the climate change issue started within the trading sector one year ahead of those.

As a result one might expect climate change issues of increasing in importance for other sectors as they are included in a trading scheme or affected by a CO₂ fee or tax. This might be the case of for example the European aviation industry in a near future. The effect of instruments for correcting market failures is not only decreased production or consumption; it also moves the underlying issue onto the strategic agenda of corporations. This implies that in a future where similar approaches are under consideration towards for example the phosphorus depletion problem; this development is to be expected.

Conclusions

This study has shown that the importance of the climate change issue was rather low during the first half of last decade. In year 2005 the trading corporations within EU ETS were affected more thus moving the issues towards the strategic agenda. Other European corporations followed the year after. During and after the financial recession the climate change issue decreased towards levels seen before year 2006 within finance and insurance.

The introduction of a price on CO₂-emissions increased the importance of climate change issues within affected corporations. Later though developments continued in a pace not correlating to allowance prices why other factors such as the Stern Review, Al Gore and IPCC played an important part.

From a theoretical perspective this study shows that not only financial matters are of concern for strategic thinking, but they do play a role. It also broadens the understanding of how climate change issues have been adopted during the last decades. These results implies even though it is not the only cause for strategic concern, the introduction of a price on CO₂-emissions did matter. So did the financial crisis in pushing climate change issues aside.

The introduction of policy to correct a market failure does not only lowers production or consumption. It has also the effect of increasing an issues strategic importance, moving it onto the strategic agenda. This should be considered by policy makers and corporate executives interested in future developments.

Acknowledgements

I hereby want to direct a special thank you towards the other members of the original research group responsible for conducting the first study: PhD. Henrik Blomgren and Mr. Peder Johansson. Without their original work the empirical processing and analysis would not have been performed. I would also like to direct a thank you towards the Swedish Energy Agency and Shell for providing initial funding of the study.

Appendix I

List of observed corporations

Name	Industry	Country
A.P. Møller-Mærsk Group	Shipping	Denmark
ABB	Technology	Switzerland
Aegon	Insurance	Netherlands
Agrofert Holding	Chemistry	Czech
Agrokor	Food/Beverage	Croatia
Air France-KLM Group	Aviation	France
Allianz	Insurance	Germany
ArcelorMittal	Metals'	Luxemburg
Assicurazioni Generali	Insurance	Italy
Aviva	Insurance	UK
AXA	Insurance	France
Banco Bilbao Vizcaya Argentaria	Finance	Spain
Bank of Ireland Group	Finance	Ireland
Barclays	Finance	UK
BASF	Chemistry	Germany
Bayer	Chemistry	Germany
BMW	Vehicle	Germany
BNP Paribas	Finance	France
Bouygues	Construction/IT	France
BP	Petroleum	UK
BT	IT	UK
Carrefour	Food/Beverage/Pharmaceuticals	France
Centrica	Energy	UK
CEZ	Energy	Czech
Cie Nationale à Portefeuille	Finance	Belgium
CNP Assurances	Insurance	France
Commerzbank	Finance	Germany
Crédit Agricole	Finance	France
Credit Suisse	Finance	Switzerland
CRH	Construction Materials	Ireland
Daimler	Vehicle	Germany
Danske Bank Group	Finance	Denmark
Delhaize Group	Food/Beverage	Belgium
Deutsche Bahn	Rail road/Logistics	Germany
Deutsche Post	Logistics	Germany
Deutsche Telekom	IT	Germany
Deutsche Bank	Finance	Germany
Dexia Group	Finance	Belgium
DZ Bank	Finance	Germany
E.ON	Energy	Germany
EADS	Space/Defense	Netherlands
Électricité de France	Energy	France
Enel	Energy	Italy
ENI	Petroleum	Italy
Erste Bank	Finance	Austria
Fiat	Vehicle	Italy
Foncière Euris	Real-estate	France
Fortis	Finance	Belgium/Netherlands
France Télécom	IT	France
Franz Haniel	Pharmaceuticals/Metal	Germany
Galp Energia	Petroleum	Portugal
Gaz de France	Energy	France
GDF SUEZ	Energy	France
GlaxoSmithKline	Pharmaceuticals	UK
Groupe Auchan	Food/Beverage	France
Groupe Caisse d'Épargne	Finance	France
HBOS	Finance	UK
HSBC Holdings	Finance	UK

INA Group	Energy	Croatia
Inbev	Food/Beverage	Belgium
ING Group	Finance	Netherlands
Intesa Sanpaolo	Finance	Italy
J. Sainsbury	Food/Beverage	UK
KBC Group	Finance	Belgium
KFW Bankengruppe	Finance	Germany
KGHM	Metals	Poland
L.M Ericsson	Technology	Sweden
La Poste	Logistics	France
Landesbank Baden-Württemberg	Finance	Germany
Legal & General Group	Insurance	UK
Lloyds Banking Group	Finance	UK
Lloyds TSB Group	Finance	UK
Lufthansa Group	Aviation	Germany
Metro Group	Food/Beverage	Germany
MOL	Energy	Hungary
Munich Re Group	Insurance	Germany
Nestlé	Food/Beverage	Switzerland
Nokia	Electronics	Finland
Nordea Bank	Finance	Sweden
Norsk Hydro	Metals/Petroleum	Norway
Novartis	Pharmaceuticals	Switzerland
Old Mutual	Insurance	UK
OMV Group	Petroleum	Austria
Petrom	Petroleum	Romania
Peugeot	Vehicle	France
PGNiG	Energy	Poland
PKN Orlen group	Energy	Poland
Prudential	Insurance	UK
Rabobank	Finance	Netherlands
Renault	Vehicle	France
Repsol YPF	Petroleum	Spain
Robert Bosch	Technology	Germany
Roche Group	Pharmaceuticals	Switzerland
Royal Ahold	Food/Beverage	Netherlands
Royal Bank of Scotland	Finance	UK
Royal Dutch Shell	Petroleum	Netherlands
Royal Philips Electronics	Electronics	Netherlands
RWE	Energy	Germany
Saint-Gobain	Construction Materials	France
Sanofi-Aventis	Pharmaceuticals	France
Santander Central Hispano Group	Finance	Spain
Scottish & Southern Energy	Energy	UK
Siemens	Electronics	Germany
Skandinaviska Enskilda Banken	Finance	Sweden
Skanska	Construction	Sweden
Skoda Auto	Vehicle	Czech
Slovnaft	Petroleum	Slovakia
SNCF	Railway	France
Société Générale	Finance	France
Statoil Hydro	Petroleum	Norway
Stora Enso	Forest	Finland
Suez	Energy	France
Swiss Reinsurance	Insurance	Switzerland
Telecom Italia	IT	Italy
Telefónica	IT	Spain
Telekomunikacja Polska	IT	Poland
Tesco	Food/Beverage	UK
ThyssenKrupp	Metals	Germany
Total	Petroleum	France
UBS	Finance	Switzerland
UniCredit Group	Finance	Italy
Unilever	Food/Beverage	UK/Netherlands

Unipetrol
Vattenfall
Veolia Environnement
Vinci
Vodafone
Volkswagen
Wolseley
Volvo
Zurich Financial Services

Petroleum
Energy
Environmental Infrastructure
Construction
IT
Vehicle
Construction
Vehicle
Insurance

Czech
Sweden
France
France
UK
Germany
UK
Sweden
Switzerland

Appendix II

The results from this study shows that during the period of year 2000-2004 a few CEO's and Chairman's have discussed climate change issues in the letters to shareholders. These were mainly representatives of energy corporations, except year 2003 when the topic also was discussed by representatives of the vehicle and insurance industries. Still the majority did not, why climate change issues had a marginal position.

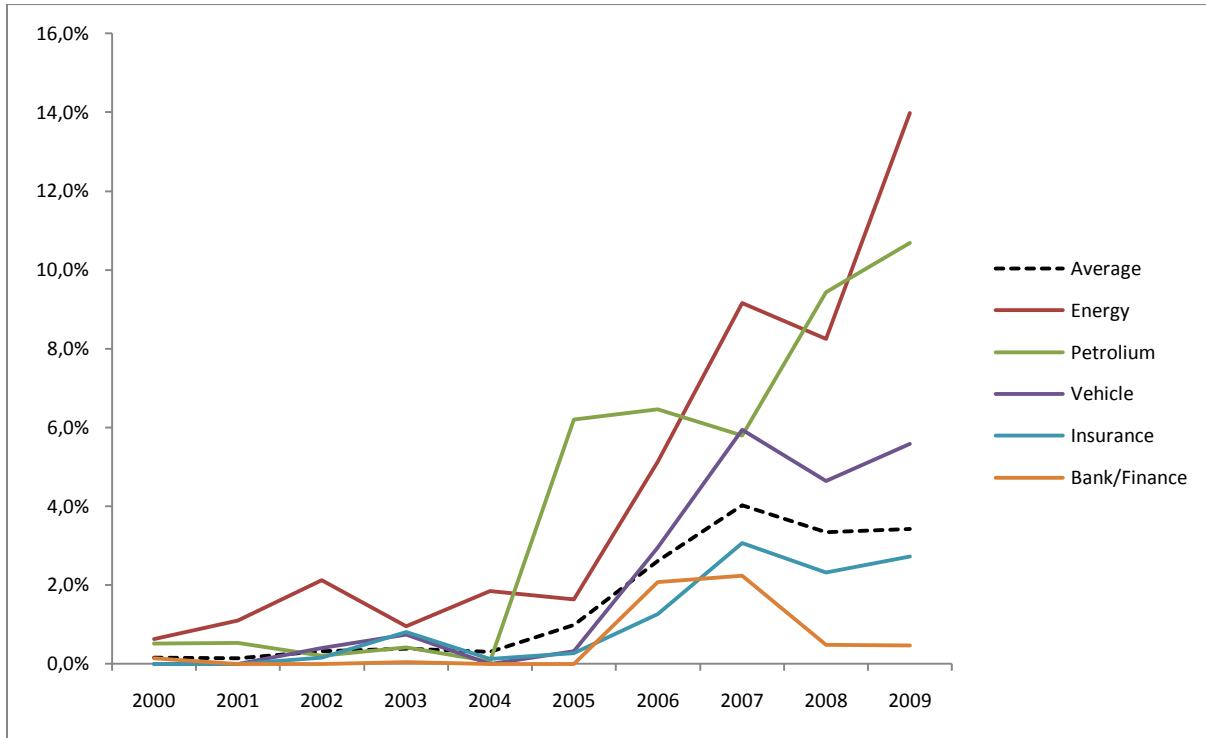


Figure 4. *Interest in climate change issues expressed by different industries in letters to shareholders.*

In year 2005 especially the petroleum industry gained interest in climate change issues with most other industries following in year 2006. After year 2007 there was in average and for most industries a decline in interest due to the economic recession and especially the bank and finance industry lost interest. In year 2009 the greatest interest in climate change issues were displayed by the energy sector followed by petroleum and vehicle manufacturers. The results explained in this section are illustrated by Figure 3 which shows the industrial differences.

Appendix III



v2.22

Test **Regression - Linear**

ETS v Average
Performed by Fabian Levihn

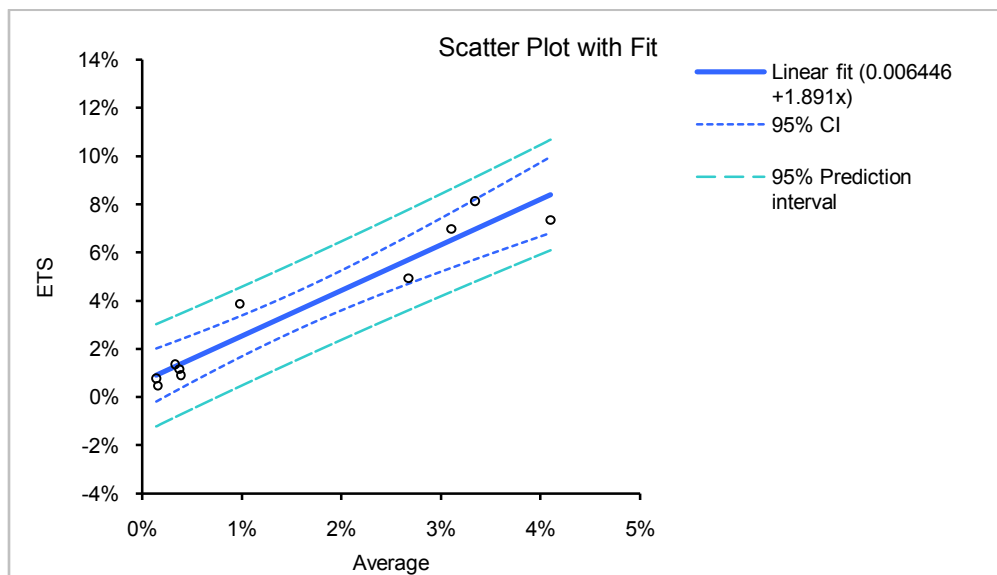
Date 17 januari 2011

n 10
R² 0.93
Adjusted R² 0.92
SE 0.842%

Term	Coefficient	95% CI	SE	t statistic	DF	p
Intercept	0.006446	-0.002480 to 0.015371	0.0038706	1.67	8	0.1344
Slope	1.891	1.475 to 2.306	0.1801	10.50	8	<0.0001

$$\text{ETS} = 0.006446 + 1.891 \text{Average}$$

Source of variation	Sum squares	DF	Mean square	F statistic	p
Model	0.781%	1	0.781%	110.17	<0.0001
Residual	0.057%	8	0.007%		
Total	0.838%	9			



Appendix IV



v2.22

Test **Regression - Linear**

Performed by Finance and insurance v. Average
Fabian Leivinn

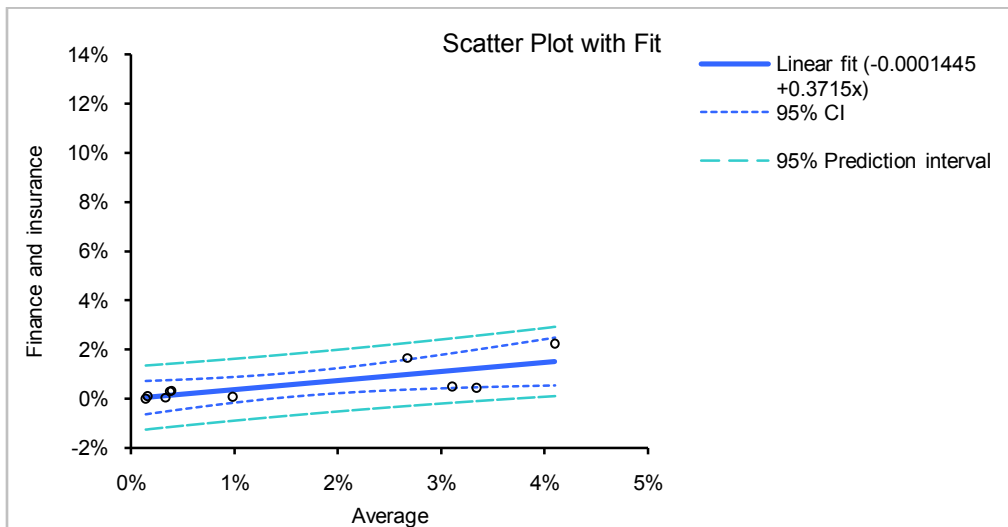
Date 17 januari 2011

n | 10
R² | 0.58
Adjusted R² | 0.53
SE | 0.519%

Term	Coefficient	95% CI	SE	t statistic	DF	p
Intercept	-0.0001445	-0.0056435 to 0.0053544	0.00238481	-0.06	8	0.9532
Slope	0.3715	0.1156 to 0.6274	0.11097	3.35	8	0.0101

Finance and insurance = -0.0001445 + 0.3715Average

Source of variation	Sum squares	DF	Mean square	F statistic	p
Model	0.030%	1	0.030%	11.21	0.0101
Residual	0.022%	8	0.003%		
Total	0.052%	9			



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