# The Impact of Corporate Social Responsibility Rating Announcement on Stock Prices: An Event Study on European Markets

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## Abstract

The announcement of Corporate Social Responsibility (CSR) ratings offers a good opportunity to assess the impact of CSR on financial markets. Using an event study methodology, we analyze the influence of Vigeo CSR rating announcements from 2004 to 2009 on short term European stock returns. The results show a positive significant effect of the announcement on the stock returns over two days prior and two days following. Thus, CSR provides an additional information (in respect to financial one) taken into account by markets, modifying investors beliefs and firms' valuation. We investigate the relation between the content of the announcement and the Abnormal Return (AR). The overall impact is positive. A limited number of CSR components explain the reaction that depends of the sign of the score (strength vs concern). Moreover, some components have a positive influence (Human rights), others have a negative (Environment, Human resources) or a mixed one (Community involvement). Our study shows that CSR really matters for financial markets and that the reaction is driven by disaggregated measures for corporate governance and varies according to the aggregation level for others topics.

*Keywords:* Corporate social responsibility rating, Corporate social performance, Financial performance, Event study
EFM classification: 150, 330, 350

## 1. Introduction

The development of Socially Responsible Investment (SRI) and more generally the consideration by shareholders of non financial performance puts CSR into the light. Investors care increasingly about ethical, social, environmental, and corporate governance decisions and performances. Environmental, Social and Governance (ESG) criteria are today inescapable. In Europe, according to Eurosif at the end of 2009 the SRI assets under management was €5 trillion[2] representing 10% of total assets under management in Europe. This development generates a growing interest for CSR rating so as to satisfy the investors' demand (mainly socially responsible ones), for an additional information to take and support their decisions. Beyond the sole consideration of sustainability, risk and returns are supposed to depend of extra-financial information.

Over the last two decades CSR ratings agencies have competed on the basis of differentiation of ratings' methodologies. Rating agencies assess firms on their Corporate Social Performance (CSP) and for some of them, as Vigeo, on their management performance from a CSR point of view. Recently, the sector concentration is increasing in the United States where RiskMetrics Group acquired in 2009 Innovest Strategic Value Advisors and KLD Research & Analytics and in Europe where Vigeo became in the last years the European leader of extra-financial analysis. This evolution confirms the interest of financial world for such rating and should yield some standardization of the methodologies. So, it would be interesting to know if these ratings imply a market reaction and a modification of investors' behavior. The aim of the paper is to answer the question: *Do CSR ratings have an impact on stock prices?*

Studies about CSR rating agencies are growing up in recent years. Some papers based on CSR ratings document a link between CSR and financial performance[3]. For example, on US market Derwall et al. (2005) use rating from Innovest, Galema et al. (2008) from KLD and on European markets Dupré et al. (2006) employ rating from Vigeo. However, a few studies on global impact of rating sharply contrast with a surge of rating activity.

Rather that searching for an impact of the broad rating, sev-

[2]Allocated between €3.8 trillion for broad SRI and €1.2 trillion for core SRI. "European SRI 2010": www.eurosif.org/research/eurosif-sri-study/2010. As the Social Investment Forum (SIF) in the US, the European Sustainable Investment Forum (Eurosif) is a network and think-tank whose mission is to develop sustainability through European Financial Markets. Definitions of core and broad SRI are detailed on website.

[3]In a related study, Scalet and Kelly (2009) evidence little impact from the CSR rating on the CSR firms' behavior.

eral studies focus on one component the CSR rating: The corporate governance. On the US using the rating of the three premier agencies from 2003 to July 2006 Ertugrul and Hegde (2009) state a poor predictive power of corporate governance summary score. Nevertheless, they document a higher information content for 8 sub-ratings on key dimensions. On European markets from 1999 to 2003 Renders et al. (2010) find a significant positive relationship between corporate governance ratings and performance. This result occurs after controlling for econometric concerns obscuring the relation like selection bias and endogeneity.

No study, to our knowledge, deals with the announcement impact of CSR ratings on financial markets and investors behavior. The closest paper to our scope (Ducassy and Jeannicot, 2008) measure the impact of announcement of social reporting ranking on share prices on the French market during the period 2005-2007. They find a market reaction, but stronger for the modifications than for the rankings themselves. Lastly, two recent researches on US are also close to our topic. Krüger (2009) study market reaction to public news about social responsibility. He particularly examines the effect of the news announcement and the concordance between the market reaction and the KLD rating. Mǎnescu (2010) offers a long term study of stock returns in relation with CSP. She examines the different effects of sustainability attributes and explain them either by mispricing or by the non-sustainability risk level of firms.

In this paper we offer an exploratory study of European stock markets reaction to announcement of CSR ratings. This is an innovative and relevant way to study CSR effects on financial performance for three reasons. First, we are dealing with the still open question of the pricing (or not) of CSR by the market, but unlike the existing literature on the incorporation of CSR in the share prices (for a survey, see Renneboog et al., 2008b) we focus on CSR rating announcement. Second, aiming to understand CSR rating effects, the analysis of their announcement offers a good opportunity to assess the overall impact of CSR on financial markets. Third, focusing on European markets, we use ratings disclosed by Vigeo, which are published through the year, while others agencies (e.g. KLD) rate whole firms annually. Every month Vigeo rates a few sectors. This periodicity enables us to use an event study methodology to measure AR associated with rating announcements.

Relying on the efficiency hypothesis, there are two ways to analyze the CSR announcement effect.
On one hand, in efficient markets any new information is incorporated in prices. So, we should expect no effect. Nevertheless, several reasons can explain a market reaction. Since the ratings (sold mainly to institutional investors) are not fully public it could reduce efficiency. Moreover, rating are based not only on public information but also on non-public information collected by rating agencies. Thus, rating can bring new information to the market. At last, rating agencies can have a superior ability to extract information from these mainly qualitative measures and to provide a relevant assessment of the risk including immaterial. Investors can use such additional information to take and support (justify) their decisions, to reduce their risks. . .
On the other hand, in efficient markets there is no difference

between firms' risk adjusted returns. AR provided by the announcement can be explained either by an mispricing or by the emergence of a new risk. A stock is mispriced (Derwall et al., 2005) if it valued using a current model (for example Fama French factors models) missing a relevant risk factor such as the CSR[4]. Although CSR can also induce the appearance of new risk factor adding non-sustainability risk (Mǎnescu, 2010). We could also consider a sustainability risk, link to a strong CSR activity (too much in the mind of investors).

This paper contributes to the literature dealing with two main questions.

- *Does the CSR rating announcement produce any effect on the stock prices (AR), and how to interpret it?*

We measure the AR associated to Vigeo CSR rating announcements on the European market from 2004 to 2009. This enables us to analyze a large sample including 1588 events and 581 firms. We choose an event study methodology in the aim to measure the financial performance through the market reaction. This methodology is used in different studies on CSR impact on financial performance, for example on corporate news diffusion (Hall and Rieck, 1998), environmental awards (Klassen and McLaughlin, 1996) and recently on mergers and acquisitions announcements (Aktas et al., 2010). Based on previous elements, on the development of SRI and on the increasing interest of investors in CSR, we expect a significant effect of the announcement of CSR ratings on the stock market.

- *How to quantify and analyze the effect of the informational content of the announcement?*

We use a two steps regression methodology to analyze the relationship between AR and CSR scores. Following Ertugrul and Hegde (2009) and Mǎnescu (2010) we expect no market reaction to aggregated scores. Then we study how the market reacts (what is the investors' interpretation) to the rating by components, taking in account the different aggregation levels and their signs. This last point offers the opportunity to compare with concern and strength of KLD rating.

Our study offers four main results.

- First, we show that CSR rating announcement have a significant impact on stock prices. We suggest different interpretation, particularly that CSR rating gives additional information to the market, modifying investors believes and decisions. Our study reinforces the interest of approach in terms of CSR risk (or ESG risk). For, each CSR component there is a risk of weak CSR (non-sustainability risk), but also a risk of too much CSR (sustainability risk). This also reinforces the need to incorporate CSR into valuation model.

- Second, we find that there is no reaction to aggregated rating scores. Aggregated score incorporates too many elements leading to ambiguity. This result is in line with Vigeo views since they do not provide aggregated scores.

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[4](Galema et al., 2008) show that there is non trivial relationship between CSR and financial risk factors.

- Third, we document that the market reaction is multivariate, depending on the field, on the aggregation level and of the sign of the components' score. Reactions to components are complex and must be analyzed with caution. A detailed analysis of market reactions allows us to suggest that the reaction can be interpreted mainly in terms of value (excess or shortage) for some components and in terms of risk for others. These reactions are expected to evolve, according to the investor's demand for CSR, to the learning of pricing CSR elements taking into account both the sustainability and the non-sustainability risk.

- Last, we show that market views environment and human resources mainly as a cost, human rights as benefit, community involvement as mixed. Corporate governance is significant but at a disaggregated level.

The remainder of the paper is organized as follows. Section 2 develops background and hypotheses. Section 3 details our data and the methodology used. Section 4 gives our results. Lastly, section 5 provides our conclusions.

## 2. Background and Hypotheses

A large literature exits on the relationship between CSR, CSP and financial performance, but very few on CSR rating effects on markets.

The CSP, as defined by Wood (1991), is a larger concept than CSR. It "*includes organizational processes of environmental assessment, stakeholder management, and issues management, but also, and perhaps most important, various measures of its external manifestations and societal effects, such as social impacts*" (Orlitzky, 2008).

Many papers deal with the links between CSP and financial performance. Allouche and Laroche (2006) survey the main hypotheses and theoretical models. Some authors like McWilliams and Siegel (2001) argue for no relationship, but most consider that one exists. Some models establish a positive link. The CSP increases the financial performance because of the satisfaction of goals of stakeholders (Freeman, 1984) and the improvement of public image and reputation of the firm (Waddock and Graves, 1997). Other models state a negative link. The costs expand due to the CSR of the firm (Friedman, 1962, 1970) reduces the firms competitiveness and its financial performance. Finally, models based on Preston and O'Bannon (1997) suppose a synergy, positive or negative. On one hand, a virtuous circle is considered by Waddock and Graves (1997). A high level of CSP leads to a better financial performance which authorized new CSR actions. On the other hand, a poor CSP reduces financial performance and thus CSR expenditures.

Empirical studies give results much debated. They are difficult to compare directly because of limits concerning concepts, methodologies and data used (Allouche and Laroche, 2006). Based on a meta-analysis of literature Orlitzky et al. (2003) supports a positive link between CSR and financial performance. CSR *"helps improve managerial knowledge and skills and enhance corporate reputation"* (Orlitzky, 2008). Different benefits are obtained, mainly: Increased efficiency, increased sales revenues, reduction of business risk and particularly the shareholder risk. Results are dependent on measures of performances, as shown by the synthesis of Margolis and Walsh (2003). CSR seems to be more related to accounting measures of financial performance than capital markets measures. Allouche and Laroche (2006) point out that reputation indexes are correlated with financial market measures more than accounting ones. But, the relationship between CSR and financial performance is not completely determined due to the action of many moderators, such as characteristics of firms, industry and economic situation. Moreover, CSR interact with financial risk factors, for instance with Fama & French factors, as demonstrated by Galema et al. (2008). Further, some authors underline ambiguity of the links. So, even where positive relation can be shown, more research is needed to better understand the links and interactions between CSR and financial performance. The existence of a non-linear relationship between CSR and financial performance is an interesting perspective opened by Bowman and Haire (1975).

The literature focusing on the impact of CSR on capital market performance and shareholder wealth reveals contrasted results. Studies on specific aspects, as announcement of corporate donation or producing environmentally friendly products show a positive link (Hall and Rieck, 1998). But is CSR globally incorporated in share prices or in other words are investors paying for CSR remains a question? A first answer is given by Dupré et al. (2006). Using an aggregated measure based on Vigeo components ratings of European firms from 1999 to 2004, they found that ethical firms have a lower medium term return than non-ethical firms. Thus, investors pay for CSR. They suggest that this result is explained more by a financial sacrifice accepted by investors to hold ethical stocks than a risk premium requirement of purely financial rational investors facing social risk. Based on the literature, the increasing interest of investors in CSR and the development of SRI we state our first hypothesis:

**Hypothesis 1.** *The announcement of CSR ratings induces a significant reaction of the stock market.*

As shown by Renneboog et al. (2008b) in their review of empirical literature, the pricing of CSR by financial markets its still an open question. Galema et al. (2008) suggest that the difficulty in bringing to the fore the impact of CSR on returns could be explained by the use of aggregated measures of CSR. Such aggregation of different components could lead to confounded effects, due to opposite reactions. This confounding effect argument is documented in many empirical studies (Mănescu, 2010), but remain to explore. Indeed Galema et al. (2008) found a little evidence of this explanation in their empirical study. Scholtens and Zhou (2008) highlight the antinomic impacts on expected returns of environmentally friendly products (positive) and employee relations (negative). Yet, they also find a little empirical evidence of their study of US portfolios returns. Bird et al. (2007) suggest that share values are not only influenced by CSR components, but also by the whole CSR activities, in a way varying over time. Nevertheless focusing on corporate governance rating Ertugrul and Hegde (2009) find

a poor predictive power of summary score, compare to sub-scores. This leads to our second hypothesis:

**Hypothesis 2.** *The market does not react to aggregated CSR score.*

Most studies distinguishing components document an heterogeneous reaction depending on CSR component. The main finding summarized by Renneboog et al. (2008b): "*Good corporate governance, sound environmental standards and, to a lesser extent, care of stakeholder relations*" are associated with higher shareholder value. But, environmental performance does not systematically increases the share price, as event studies on announcement of corporate environmental news tends to show it[5]. Derwall et al. (2005) formulate, to explain best returns of portfolios invested in high environment scores, the hypothesis of undervaluation of environmental information by the market. Such hypothesis could also be considered about corporate governance information. For stakeholder relations the results are various. Hillman and Keim (2001) distinguish two aspects with opposite implications on financial performance. They show that "stakeholder management" dealing with direct stakeholders of the firm (employees, customers, suppliers and communities) has a positive impact on shareholder values. Reverse, "social issue participation" corresponding to relationship with non-direct stakeholder and usual excluding factors in SRI (nuclear energy, military, "sin" industries (alcohol, tobacco, and gambling), human rights violations..) has often a negative impact on firm value.

The reaction is depending on CSR informational content of rating and on score level (or concern/ strength). The ability of scores elements to summarize the past or to predict the future is important. For example on environment Chatterji et al. (2009) find that KLD concern ratings offer a good representation of the past performance, but that in contrast strengths are bad predictors of pollution levels and compliance violations. In the same way Krüger (2009) find negative AR associated to news about negative social responsibility, but no systematic reaction to positive news. Bad news and by extension scores are easiest to interpret than good ones.

The market reaction depends of the (main) interpretation of the score of CSR components whether the score is considered as a benefit (reputation, increase of cash-flows and risk reduction) or as a cost (future expenses, increase of risk about corporate responsibility...). A low rating of a component can be viewed as the consequence of a cost cutting strategy (beneficial) but a high rating could be interpreted as a profitable investment (also beneficial); thus both low and high score could have a positive influence. From such line of reasoning it is straightforward to understand that strength and concern could induce any kind of market reaction (positive or negative). These arguments and evidences allow us to formulate our third hypothesis:

**Hypothesis 3.** *The market reaction varies according to three dimensions of the CSR rating announcement:*

a) *The field rated.*
b) *The score aggregation level (fields, subfields or items)*[6].
c) *At last, the sign of the component' score, whether it is positive (an investment, a strength) or negative (a divestment, a concern)*[7].

As offset by the literature, investors are mainly reacting to some components. These ones could be considered at a moment as more relevant than others (for example on environment or corporate governance), but also more informative. Ertugrul and Hegde (2009) show that component sub-ratings focusing on some key dimensions (8) of corporate governance structure provide the information to predict firm performance. We try to verify if this important result is transferable to all CSR topics. The fact that investors take into account a limited number of information to form their decisions, specially in a context of short term context trading decision could also support this assumption. Our last hypothesis is:

**Hypothesis 4.** *A reduced number of detailed components (subfields, items) of CSR ratings is taken into account by investors.*

## 3. Data and Methodology

We first present our data in subsection 3.1 then we turn to the methodology in subsection 3.2.

### 3.1. Data

Our initial sample comprises all regular ratings (Equitics - stocks belonging to the STOXX Europe 600) broadcast by Vigeo from 2004 until end 2009: 778 firms and 1945 announcements (events). Stock data are extracted from Datastream[8]. We mainly use the shares and index prices, shares' dividends and from Worldscope the market value and the book to market. First, we review the content of Vigeo ratings in subsection 3.1.1, then we present our event sample in subsection 3.1.2.

### 3.1.1. Vigeo Ratings

Vigeo, the European leading supplier of extra-financial analysis, measures companies' performance in the area of Sustainable Development & Social Responsibility. The rating is based on internationally recognized CSR standards. Six *fields* are covered:

1) Business Behavior (*BB*);
2) Corporate Governance (*CG*);
3) Community Involvement (*CIN*);
4) Environment (*ENV*);
5) Human Resources (*HR*);

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[5]A positive reaction to environmental performance can also be interpreted as relating to anticipated cash-flows taking in account risks and future costs link to environmental regulation or litigation.

[6]For instance, on field *BB* there are 3 subfields, we expect that some of them have a positive impact whereas others have a negative.

[7]For instance, strength *BB+* can be rewarded while at the same time concern *BB−* is also rewarded thus a positive influence whatever the news.

[8]Refer to Ince and Porter (2006) for a comparison between Datastream and CRSP data. Campbell et al. (Available online July 2010) also use and detail Datastream's data.

6) Human Rights (*HRTS*).

The fields are disaggregated in 17 *subfields*, themselves made up of 37 generic criteria (hereafter *items*) detailed in appendix in tables 13 though 15. Thus, the ratings can be viewed as a hierarchical tree:
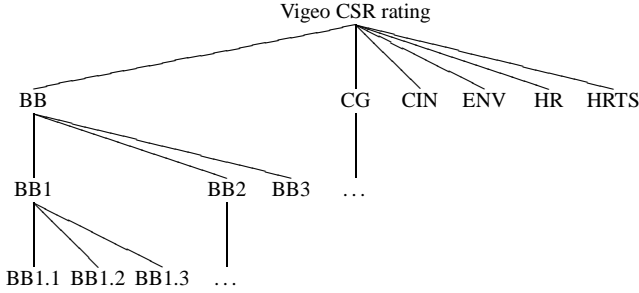


Table 1 provides the correlation between the fields.

Table 1: Correlation among CSR Fields

| Variable | BB | CG | CIN | ENV | HR | HRTS |
|---|---|---|---|---|---|---|
| BB |  | 37 | 53 | 59 | 60 | 61 |
| CG | 37 |  | 37 | 34 | 19 | 31 |
| CIN | 53 | 37 |  | 57 | 49 | 54 |
| ENV | 59 | 34 | 57 |  | 66 | 60 |
| HR | 60 | 19 | 49 | 66 |  | 72 |
| HRTS | 61 | 31 | 54 | 60 | 72 |  |

This table gives, on the studied sample, the correlation between the 6 fields. All correlation are significant at a 1% level.

From table 1, we notice a strong correlation between the fields. All correlations are significant at a 1% level. *CG* is the least correlated field, all other fields have a correlation greater than 53%. *HR* and *HRTS* are the most correlated (72%). Such results suggest a common component among fields, where a firm choose CSR as a management way and apply it, more or less, among all the fields. Table 2 provides the first two principal components among the fields.

Table 2: Factorial Analysis of CSR Fields

|  | $Factor_1$ | $Factor_2$ |
|---|---|---|
| Contribution (%) | 59.39 | 14.61 |
| BB | 0.23 | 0.01 |
| CG | 0.14 | 0.94 |
| CIN | 0.21 | 0.15 |
| ENV | 0.23 | -0.09 |
| HR | 0.23 | -0.42 |
| HRTS | 0.24 | -0.21 |

This table gives, on the studied sample, the first two factors among the 6 fields. First line provides the contribution of the factor and following lines the contribution of each field.

The first component explains 59% of the variation, all fields have similar contribution except *CG* that has a lower contribution. The second factor account for 14%, *CG* has a high contribution, *CIN* a lower whereas *HR* and *HRTS* have a negative one, others fields are negligible. Thus, $Factor_1$ reflects the general investment in CSR whereas $Factor_2$ represents a high

investment in *CG*, a lower on *CIN* whereas *HR* and *HRTS* are clearly neglected.

Each criterion is applied in relation to its sector relevance and is given a consideration representing the relative weight of social responsibility objectives relating to it. The management systems are rated according to three dimensions: The *relevance* of their policies; the *coherence* of implementation and the *effectiveness* of results[9].

Vigeo provides two figures: A score ($\in [0, 100]$) and a rating in five categories ($++, +, =, -, --$) which represents the rank of the firm within its' sector 5% best, 25% following, 40% central, 25% following 5% worst. The score is relative to a sector and a production date since Vigeo continuously improves it's methodology. Thus even for the same firm two scores at two different dates are not directly comparable. With an absolute score, the score itself has no information content beyond the variation. However, with a relative score (to the sector that is to say to others firms), the score has itself an informational content beyond the variation since it enables to locate the firm within its' sector that is impossible with the variation only. Consequently, we expect that the score itself (not only the variation) to be informative.

Table 3 provides the ratings by countries. To give an overall image of the rating for a firm we compute an aggregated measure: *ACSR* the average of fields.

Four countries have an noticeably above the mean CSR: France, United Kingdom, Netherlands and Norway; Germany is close to zero. The worst countries are Austria, Denmark, Ireland and by far Greece[10]. There are change among the fields. Looking at the Fisher test, *CG* is the field with most important variations among the countries. In France, *CG* is quite low whereas *HR* is the highest, UK as an opposite behavior: High *CG* and low *HR*. Translating this into the factors UK has both a high $Factor_1$ and $Factor_2$ whereas France has a high $Factor_1$ and a negative $Factor_2$.

*3.1.2. Event Sample*

Almost every month Vigeo broadcasts the rating on one (or a few) sector. To select the relevant events, we use 6 exclusion criteria: We exclude firms, without data in Datastream, not traded over the whole period, with conflicting Vigeo country and Datastream country, with low valuation (penny stocks $\leqslant 1$ currency unit), we exclude abnormal cases: Iceland and Nokia[11]. At last we exclude events with missing data in the estimation or event window[12]. Table 4 gives the numbers of firms and events excluded by these filters.

From table 4 we notice that these exclusion criteria albeit strict do not exclude too much firms (202) or events (357).

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[9]We try to take into account this decomposition. The three categories are rarely significant and quite unstable. Thus they do not provide, according to us, interesting patterns and we do not report this analysis.

[10]Luxembourg is special since there is a very few events.

[11]Island since the Worldscope coverage is not sufficient and Nokia since it represents a too big part of the Finnish stock market.

[12]Since these shares are highly liquid a day without trading is abnormal and probably reflect a corporate event.

Table 3: CSR Ratings by Countries

| Country | # | ACSR | $F_1$ | $F_2$ | BB | CG | CIN | ENV | HR | HRTS |
|---|---|---|---|---|---|---|---|---|---|---|
| United Kingdom | 442 | 43.42 | 0.23 | 1.10 | 41.68 | 65.02 | 45.22 | 35.93 | 30.10 | 42.55 |
| Norway | 28 | 42.68 | 0.28 | −0.05 | 41.14 | 50.71 | 40.32 | 34.89 | 38.46 | 50.57 |
| Netherlands | 73 | 42.36 | 0.22 | 0.35 | 42.99 | 54.81 | 42.45 | 33.64 | 35.40 | 44.86 |
| France | 269 | 42.10 | 0.27 | −0.72 | 42.18 | 39.90 | 44.49 | 35.06 | 43.37 | 47.61 |
| Germany | 149 | 39.42 | 0.06 | −0.61 | 39.34 | 39.86 | 38.77 | 36.13 | 38.14 | 44.26 |
| Spain | 92 | 37.83 | −0.07 | −0.49 | 40.68 | 40.23 | 37.74 | 29.93 | 36.51 | 41.90 |
| Switzerland | 103 | 36.84 | −0.16 | −0.16 | 39.81 | 43.56 | 34.61 | 33.05 | 30.03 | 39.96 |
| Sweden | 90 | 36.78 | −0.13 | −0.42 | 40.68 | 40.96 | 30.81 | 32.00 | 30.87 | 45.39 |
| Finland | 43 | 36.43 | −0.20 | −0.13 | 36.09 | 47.47 | 26.77 | 31.02 | 36.44 | 40.77 |
| Portugal | 25 | 36.21 | −0.19 | −0.64 | 40.28 | 34.88 | 41.80 | 29.84 | 33.40 | 37.08 |
| Belgium | 43 | 35.47 | −0.25 | −0.63 | 36.72 | 36.30 | 35.58 | 31.77 | 33.51 | 38.95 |
| Italy | 86 | 35.08 | −0.25 | −0.85 | 39.37 | 33.48 | 35.43 | 26.06 | 36.07 | 40.05 |
| Austria | 22 | 31.95 | −0.53 | −0.41 | 30.41 | 39.18 | 29.50 | 21.41 | 30.55 | 40.64 |
| Denmark | 47 | 30.72 | −0.58 | −0.84 | 34.74 | 29.91 | 29.38 | 26.13 | 26.43 | 37.72 |
| Ireland | 36 | 29.56 | −0.77 | 0.39 | 33.83 | 47.72 | 25.25 | 17.31 | 22.31 | 30.94 |
| Greece | 35 | 27.02 | −0.88 | −0.89 | 31.60 | 25.66 | 28.94 | 23.34 | 22.60 | 30.00 |
| Luxembourg | 5 | 26.50 | −0.94 | −0.36 | 34.80 | 32.00 | 29.80 | 14.00 | 17.20 | 31.20 |
| Fisher Test | | 12.18*** | 9.76*** | 138.1*** | 3.68*** | 109.9*** | 10.31*** | 6.26*** | 12.05*** | 7.54*** |

This table provides the results of an Anova on *ACSR* and each field by countries. # is the number of announcements. The first lines give the mean score by countries, and the last one (Fisher Test) gives the overall significance.

Table 4: Filters

| Filter | # Firms | # Event |
|---|---|---|
| **Initial Sample** | 778 | 1945 |
| No data in Datastream | 3 | 6 |
| Not traded over the whole period | 179 | 311 |
| Different Vigeo and Datastream countries | 9 | 21 |
| Penny Stock | 2 | 5 |
| Abnormal cases | 1 | 3 |
| Missing days in estimation or event window | 8 | 11 |
| Σ | 202 | 357 |
| **Final Sample** | 581 | 1588 |

This table provides the numbers of firms and events excluded by the filters we use. Since the filter "missing days" is on an event basis, it can affect a firm without excluding all events (thus the firm remains in the sample). This induces that the final number of firms is not equal to the initial number minus the excluded number.

Moreover, most of the deletion come from the filter "not traded over the whole period". It proves the quality of the data we are working on. The remaining sample contains 581 firms and 1588 events.

Vigeo covers stock belonging to the STOXX Europe 600 thus the final sample closely follow the index composition. Table 16 in appendix details the geographic composition of the sample and the sectors covered. We see that the final sample encompass 17 countries. Mains countries are United-Kingdom, France, Germany. We clearly view a predominance of the financial sector: 332 events (21% of the sample). Following sectors are industrial (305) and consumer services (279). A more detailed analysis reveals the occurrence of sector under negative screening by SRI funds as tobacco, alcohol, weapons or nuclear (belongs to electric & gas utilities). At last, we should notice interactions between countries and sectors.

In accordance with an agenda, Vigeo broadcasts it's ratings through a newsletter and an electronic platform at the end of each month to it's clients (all majors financial institutions). Thus, there are waves of social rating and the number of rated firms depends on the sector. We distinguish the production date (the date when Vigeo releases the rating) and the event date: The first trading day on the production date or the first trading day after when the market is closed on the announcement. Figure 1 details the numbers of rated firm according to the events date.

Figure 1: Number of Announcements per Day
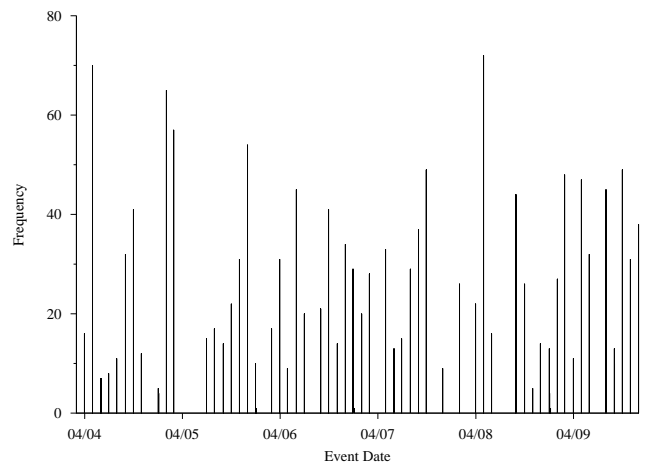


This figure gives the number of announcements on each event date (trading day).

Figure 1 shows that there are great variations of the numbers of firms rated on a given event day. The minimum is $1$[13],

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[13]For a given sector the event date can change among firms if they are quoted in different markets and one of the markets is closed on the production date.

the maximum 72, the average 25 and the standard deviation 18. Moreover, over a few month Vigeo does not broadcast any rating.

## 3.2. Methodology

First, we present the event study methodology in subsection 3.2.1. Then we present the analysis of the effect stock features on ratings in subsection 3.2.2. At last, we detail the analysis of relationships between Cumulative Abnormal Return (CAR) and ratings in subsection 3.2.3.

### 3.2.1. Event Study

Event study is a widely used methodology in finance (for surveys see for instance Khotari and Warner, 2006; Campbell et al., 1997). However, exact choices about main methodological steps remains an empirical question. The estimation windows covers six months: $[-130, -10]$, the event windows is eleven days: $[-5 : 5]$. On these windows we compute the returns taking into account dividends using the following formula: $R_t = \frac{P_t + D_t - P_{t-1}}{P_{t-1}}$ where $P_t$ and $D_t$ are respectively the price and dividend on date $t$.

Event studies can use several different models: Among others the mean model, the market model, the CAPM, the Fama and French (1993) three factors or Carhart (1997) four factors. To compute the factors for the last two models, we follow the procedure detailed by Renneboog et al. (2008a)[14]. To tackle possible error measurement, all models include an intercept. We consider several candidates as benchmark the STOXX Europe 600 (this choice is natural since Vigeo follows this index), the emblematic index of each country (for instance the CAC 40 in France, the FTSE 100 in UK, or the DAX 30 in Germany...), and a self made country capital weighted index based on the shares covered by Worldscope[15]. To choose among these models and benchmarks, we retain the best combination on the estimation window using adjusted R-square. Results clearly favor the Carhart (1997) model since the adjusted R-square is about 36% (on average) whereas it is about 32% with the market model. Consequently, in the remainder, we use the Carhart (1997) model four factor model given in equation (1).

$$R_{i,t} = \alpha + R_f + \beta_i(R_{m,t} - R_f) + \beta_{i,smb} \times SMB_t$$
$$+ \beta_{i,hml} \times HML_t + \beta_{i,mom} \times MOM_t + \varepsilon_{i,t} \quad (1)$$

There is a concern using Fama French Carhart's model in such framework since Galema et al. (2008) evidence that this model includes risk premia that interacts with the CSR. The remainder of the methodology (cf. subsection 3.2.2) deals with this topic.

On the reference windows, we check the AR stationarity with the KPSS test, the normality using the Jarque-Bera test, the

auto-correlation using the Durbin Watson test and the Lagrange multiplier test for arch effect. All tests are made on an event basis and then compared on the sample. On the 1588 reference windows the KPSS reject the stationarity in 3% of the cases. The Jarque Bera's test rejects the normality in about 67% of the cases. With one lag, the Durbin Watson reject the absence of auto-correlation in 21% of the cases (15% with a diagnostic of negative auto-correlation and 6% with a positive one) at last, the Lagrange multiplier highlights the presence of arch effect in 15% of cases.

On the event window we compute the AR following equation (2):

$$AR_{i,t} = R_{i,t} - \left(\widehat{\alpha} + R_f + \widehat{\beta_i}(R_{m,t} - R_f) + \widehat{\beta_{i,smb}} \times SMB_t + \right.$$
$$\left. \widehat{\beta_{i,hml}} \times HML_t + \widehat{\beta_{i,mom}} \times MOM_t \right) \quad (2)$$

In this analysis, there are a few important point to take into account:

- The study encompass several countries with different currencies

- Event date are clustered in time: figure 1 shows that the there are several ratings on the same day, this numbers has great variation from 1 rating to 72. This induces cross-correlation among the firms that affect the test statistics.

- The rating effect can change according to the firm. The event can induce change in variance Harrington and Shrider (2006). Thus tests must be robust to change of the variance.

- The normality of the AR is strongly rejected on the estimation window.

According to Campbell et al. (Available online July 2010), in such a multi-countries (and currencies) event study, a model with local index, no currency conversion (and preferably buy and hold returns) are adequate. Moreover, results favor the Cowan (1992) and Corrado (1989) tests. Numerous studies analyze the tests features (see for instance, among others Cowan (1992), Giaccotto and Sfiridis (1996), Seiler (2000), Hamill et al. (2002), Corrado and Truong (2008)). Major conclusions are the superiority of non-parametric tests (Corrado and Zivney (1992), Cowan (1992)) and tests that account for change in variance (Boehmer et al. (1991))[16].

One drawback of the Corrado and Zivney (1992) is that it is a one day test (not suited for the CAR since to aggregate several AR one need to hypothesis that they are independents!). In this case, we use the adjustment proposed by Kolari and Pynnönen (2009) that standardizes the returns before computation of the test and re-base the number of days to obtain a properly specified test. According to the authors, theses tests are robust to

---

[14]To avoid influence of extreme abnormal values we winsorize individual data prior to computation of the Fama French factors. According to the features we observe, we winsorize returns at a 0.25% level, market capitalization at a 0.5% and market to book value at a 1%. Following these operations we obtain for the $SMB$, $HML$ and $UMD$ values in the range $[-18\%; 19\%]$.

[15]This index is the only one used for Fama and French (1993) and Carhart (1997) models.

[16]They also recommend a equal weighted index however, no such index is available during all the period and in all countries. Computing such index could lead to significant differences.

serial correlation, event induced volatility and cross-correlation due to event day clustering.

However, one strength of the parametric tests is that they able to quantify the phenomenon. Thus we also compute parametric test: The standard Patell (1976) t-test[17] and Boehmer et al. (1991) test that account for induced variance. However, none of this test is robust to cross-correlation. Thus we use the simple adjustment proposed by Kolari and Pynnönen (2005) that takes into account the cross-correlation among the events on a same date[18].

All computation use the Standardized Abnormal Return (SAR) and Standardized Cumulative Abnormal Return (SCAR), the standardization account for the prediction error (see Campbell et al., 1997, for details) and are done using the SAS software. In the remainder we only report parts of the results, whole results are available upon request.

This analysis enables us to check our main hypothesis (hypothesis 1)

*3.2.2. Analysis of CSR Ratings*

Here, without loss of generality we illustrate the methodology using the $ACSR$ variable. The same methodology is used for all elements of the rating ($ACSR$, factors, fields, subfields and items).

One advantage of the event study methodology we use is that it controls for stock features. More specifically, since we use the Fama French Carhart's model, AR are adjusted according to market return, systematic risk, book to market, market value and momentum.

Thus, to assess the impact of CSR on the stock returns we should also control for the influence of these features on the CSR. Following the literature, market value has a positive influence on the CSR (Orlitzky, 2008), even if the link is less clear book to market and beta are also related to CSR behavior (Galema et al., 2008). Moreover, the economics sectors are very different in terms of stock features thus the relationship between the stock features and CSR behavior can vary according to the sector. Consequently, we estimate the following model:

$$
ACSR_{i,t} = \alpha + \sum_{s=0}^{9} DS_s \times (MV_{i,t-1} \times \beta_{MV,S,s}
$$
$$
+ BTMV_{i,t-1} \times \beta_{BTMV,S,s} + BETA_{i,t-1} \times \beta_{BETA,S,s})
$$
$$
+ \epsilon_{i,t} \tag{3}
$$

where $DS_s$ are sector dummies that are equal to 1 if the firm belongs to the sector $s$ (first level of the ICB classification) and 0 otherwise. $MV$ is the firm market value (in ln million €), $BTMV$ is the firm's book to market value and $BETA$ is the CAPM firm's $\beta$. These variables are lagged in event time that is to say $MV_{t-1}$ is the capitalization measured during the estimation window of the previous event. Since there is one lag,

we necessarily loose the first event for all firms. The resulting sample contains 1007 events.

Since the rating belongs to $[0, 100]$, we use truncated regression to estimate equation (3)[19]. This regression enables us to estimate the expected CSR according to the firms' features. What really matters in the announcement is not the announced value, but the surprise (the innovation). In the remainder, we only use the residual ($\epsilon_{i,t}$) from equation (3). A critical question is how to translate the ratings into variables. The proper translation relies on the true (unknown) relationship between AR and the CSR. Moreover, as several studies (Galema et al., 2008; Krüger, 2009) underline a different reaction according to good and bad news (positive or negative; strength or concern), we construct two variables:

$$
ACSR_{i,t}+ = \epsilon_{i,t} \qquad \text{when } \epsilon_{i,t} \qquad >= 0
$$
$$
ACSR_{i,t}- = -\epsilon_{i,t} \qquad \text{when } \epsilon_{i,t} \qquad < 0 \tag{4}
$$

$ACSR+$ corresponds to a good score from a CSR point of view (an investment of the firm into the CSR, a strength) and $ACSR-$ to a bad one (a divestment from CSR activities, a concern). Using this transformation enables a simple interpretation of parameters of AR regressions. Whatever the variable, if we obtained a positive parameter then the market view this activity (either a strength or a concern) as a benefit whereas negative values show a costly interpretation[20].

The parameters interpretation have to be made with caution, due to the sign of variables. Then, on the one hand a positive parameter on $ACSR+$ and a negative parameter on $ACSR-$ means that the market interprets investments of the firm into CSR activities as beneficial for the firm. On the other hand a negative parameter on $ACSR+$ and a positive one on $ACSR-$ evidences that the market considers investments of the firm into these activities as detrimental for the firm.

*3.2.3. Analysis of CAR*

In order to analyze the influence of the CSR on AR we use the model given in equation (5).

$$
CAR_{i,t} = A + B \times VIGEO_{i,t} + C \times X_{i,t} + \varepsilon_{i,t} \tag{5}
$$

where $CAR_{i,t}$ is the cumulative abnormal return of firm $i$ on date $t$, $VIGEO_{i,t}$ is a vector containing the ratings of the firm[21] and the vector $X_{i,t}$ contains several control variables.

We initially consider a set of control variable similar to Galema et al. (2008), after removing non significant variables, we use: $Date \geqslant 07\text{-}2007$ a dummy variable that is equal to 1 if

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[17]Also referenced as $J2$ test in Campbell et al. (1997).

[18]Roughly speaking, this adjustment deflates the test statistic by the value induced by the correlation among observations.

[19]Factors are by construction free from this constrain, they are estimated as usual. For details about the estimation process refer to proc qlim in SAS documentation, option truncated.

[20]At last, one can ask whether the change of rating has an influence. Thus we also compute the change of rating $\Delta ACSR_t = ACSR_t - ACSR_{t-1}$, to avoid loosing too many observations, we consider that when no previous rating is available, $\Delta ACSR_t = 0$. However, these changes of rating do not produce significant results thus we do not include them into the presented results.

[21]The exact content varies among regressions, we study the overall influence (one variable), the fields influence (6 variables), the subfields or the items.

the date is after July 2007[22]; *Abnormal Volume* the percent deviation of the monetized daily trading volume on that day from the reference period[23]; the *Sector Return* the country sector return extracted from Datastream according to the classification of the firm (variable *INDXEG*). This variable enables to control for several features: A sector effect, a country effect and also a historical effect[24].

We also try to include control variables for others phenomena for instance a short term momentum behavior of investors. We thus compute the total return of the share on a window before the event ([−11, −6] or [−16, −6] or [−21, −6]) and include this variable into the regression (one at a time). However, the result is barely significant. Thus, short term momentum is not significant here and we prefer not to include it in the presented models.

Since, the rating is nested it is not possible to include the different levels of the rating (for instance field and subfields) into the same regression due to a collinearity problem. Thus, on a given regression we include content of the CSR rating according to their level: Overall (*ACSR* or factors), fields, subfields or items. All these variables are residuals obtained from equation (3) and split according to their sign (cf. equation 4).

## 4. Results

We first present results on the effect of announcements on returns in subsection 4.1. Second we take into account the effects of stocks features on CSR ratings in subsection 4.2. Then we review the impact of the overall CSR behavior of the firm in subsection 4.3. Following, we then turn to a detailed analysis of the announcement in subsection 4.4. At last we present the robustness check we run in subsection 4.5.

### 4.1. Effect of Announcements on Returns

Figure 2 and 3 provides the SAR and Standardized Cumulative Average Abnormal Returns (SCAAR) over the event windows.

Figure 2 shows that SAAR are significant a 5% level (using a cross-sectional t-test also known as J1) over the window [−2, 2]. The overall reaction is firmly positive. The sequence of SAAR generates SCAAR from −5 in figure 3: They are first slightly negative and thus grow up until 2 to become positive and significant, then they slightly decrease from 3. Table 5 details the statistical tests on these data.

Table 5 highlights that SAAR are significant and positive over the window [−2, 2]. Even accounting for the induced variance, the effect remains positive (Boehmer test). This one is not an artifact of event clustering since the Adjusted Boehmer is also significant. The reaction is particularly concentrated on the

Figure 2: Standardized Average Abnormal Returns (SAAR)
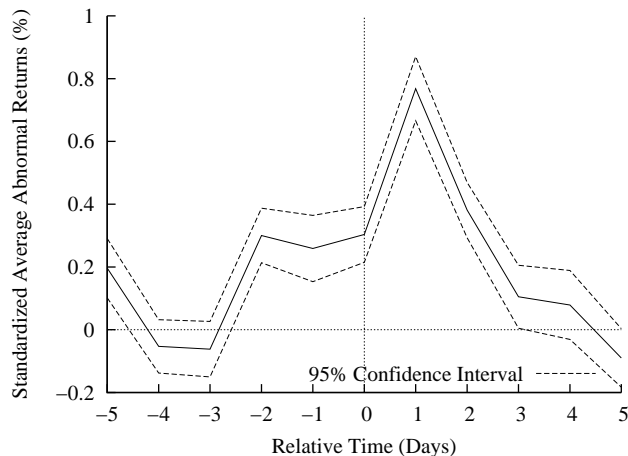


This figure gives the SAAR in the event window. 95% confidence interval is build using a reversed t-test.

Figure 3: Standardized Cumulative Average Abnormal Returns (SCAAR)



This figure gives the SCAAR in the event window. The various SCAAR only change according to the beginning date.

---

[22]This variable comes from a Chow test evidencing the influence of the financial crisis on the stock market.

[23]We first compute on the reference period the average daily trading volume ($\mu_v$) then, on the event day(s) we compute abnormal volume$_{i,t}$ = ($volume_{i,t}$ − $\mu_v$)/$\mu_v$.

[24]Interestingly, we also tried the AR but this variable was not significant. Thus abnormal shares' returns are not influenced by the abnormal sector return.

Table 5: Standardized Abnormal Return (SAR) Tests

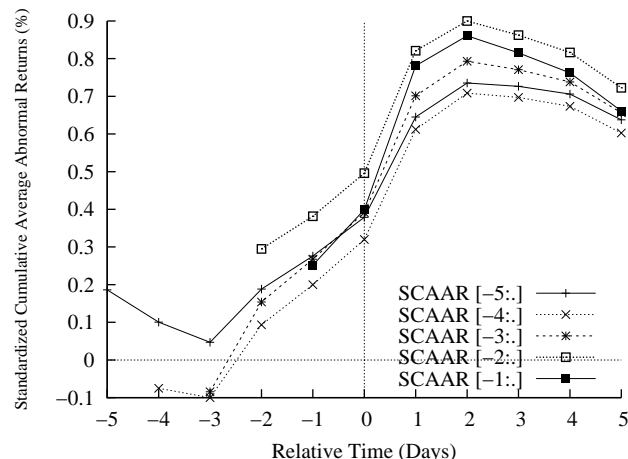| Variable | Average (%) | % Positive | Patell | Boehmer | Adj. Boehmer | Corrado | Corrado-Zivney |
|---|---|---|---|---|---|---|---|
| $SAR_{-5}$ | 0.20 | 54.28 | 7.66*** | 4.08*** | 2.90*** | 1.09 | 1.38 |
| $SAR_{-4}$ | -0.05 | 46.41 | −2.07** | −1.23 | −0.87 | −0.75 | −0.82 |
| $SAR_{-3}$ | -0.06 | 49.62 | −2.41** | −1.37 | −0.98 | −0.44 | 0.11 |
| $SAR_{-2}$ | 0.30 | 61.02 | 11.71*** | 6.78*** | 4.82*** | 2.27** | 3.27*** |
| $SAR_{-1}$ | 0.26 | 58.12 | 10.10*** | 4.81*** | 3.42*** | 2.17** | 2.75*** |
| $SAR_0$ | 0.30 | 55.10 | 11.84*** | 6.69*** | 4.76*** | 1.85* | 2.10** |
| $SAR_1$ | 0.77 | 69.27 | 29.97*** | 14.73*** | 10.48*** | 5.73*** | 6.46*** |
| $SAR_2$ | 0.38 | 58.82 | 14.87*** | 8.47*** | 6.03*** | 2.86*** | 3.16*** |
| $SAR_3$ | 0.11 | 53.72 | 4.10*** | 2.06** | 1.46 | 0.83 | 1.55 |
| $SAR_4$ | 0.08 | 57.56 | 3.08*** | 1.41 | 1.00 | 1.06 | 2.32** |
| $SAR_5$ | -0.09 | 50.31 | −3.50*** | −1.89* | −1.34 | −0.25 | 0.16 |
| $SCAR[-2:-1]$ | 0.38 | 62.34 | 14.95*** | 7.92*** | 5.63*** | 2.82*** | 3.63*** |
| $SCAR[0:2]$ | 0.83 | 69.65 | 32.42*** | 16.75*** | 11.92*** | 6.16*** | 6.49*** |
| $SCAR[-2:2]$ | 0.88 | 70.91 | 34.24*** | 17.33*** | 12.33*** | 5.71*** | 6.30*** |

This table provides the test of the SAAR/SCAAR significance. When a cumulative return is studied, the Corrado and Corrado-Zivney statistics have been adapted to the multi-day framework following Kolari and Pynnönen (2009). The adjusted Boehmer test account for event day clustering following Kolari and Pynnönen (2005). * 10%, ** 5% and *** 1% significance.

days following the announcement. Moreover, SCAAR show a significant anticipation on the two days preceding the announcement. Hence, the announcement of social rating (good or bad) induces a positive reaction of the stock price, showing the strong demand of investors for these information. The anticipated effect of ratings can be explained by information sources of rating agencies. Vigeo uses public information and also data directly obtained from stakeholders and firms. Anticipating ratings on the base of public information, investors could buy or sell stocks before ratings announcement, operating only a few days before the announcement limits their risk. In that consideration a part of information is included in stock prices prior the announcement date. Another explanation could be linked to the data collection from rated companies and stakeholders. Theses exchanges between firms and rating agencies are a potential way for dissemination of information (insider trading).

Table 6 gives the Cumulative Average Abnormal Return (CAAR) distribution. The distribution and tests (t-test, sign-test) shows that, over the window $[-2, 2]$, the CAR are positive and significant albeit dispersed (the minimum is negative). Thus, these evidences confirm the results obtained on SAR, they strongly support hypothesis 1: *The announcement of CSR rating induces a significant reaction of the market.* Moreover, this reaction is firmly positive and partly anticipated.

The rating announcement seems to satisfy expectation of investors looking for information about social responsibility of the firms and especially about the risks attached (sustainability risk or unsustainability risk). Given the development of SRI in the last years this additional information could reinforce the demand for these stocks and explain an increase of transactions. Another interpretation could be the portfolio re-balancing of institutional SR investors, to show appropriate composition to their customers, that is to say have companies with good CSR scores. This explanation is to explore in other research. Since this study clearly shows that the effect is concentrated over the window $[-2, 2]$, in the remainder of the analysis, we only consider this window.

Table 6: Cumulative Abnormal Return (CAR) Distribution

| | $CAR[-2, -1]$ | $CAR[0, 2]$ | $CAR[-2, 2]$ |
|---|---|---|---|
| Mean | 0.90 | 1.91 | 2.81 |
| Standard Deviation | 4.60 | 6.79 | 8.04 |
| T Stat | 7.78*** | 11.20*** | 13.90*** |
| Sign Stat | 196.00*** | 312.00*** | 332.00*** |
| Min | −43.81 | −33.35 | −39.26 |
| Median | 0.80 | 1.96 | 2.72 |
| Max | 25.24 | 54.18 | 75.45 |

This table provides the distribution (mean, standard deviation, minimum, median and maximum) of the AR. Moreover t-stat gives the student statistic and sign stat the sign test statistic with the associated confidence levels: * 10%, ** 5% and *** 1% significance.

### 4.2. Effects of Stocks Features on CSR Ratings

Table 7 provides descriptive statistics of variables included in equation (3) in panel A and in equation (5) in panel B. As one can notice from table 7. Variables in panel B have extreme values. To avoid the influence of these observations in estimation of equation (5) control variables are winsorized at a 1% level.

Table 8 summarizes the results from estimation of equation (3). From table 8, we see that market capitalization is overwhelmingly significant. Whatever the sector or the aspect under review, the greater the firm the greater its' investment in CSR. However, considering the distribution (average, the minimum, maximum and dispersion) we notice variations between the sectors and between the aspects (for instance *ENV* and *CIN* are more influenced by the size of firm). Beta is less significant. It has a positive on *CG* (and consequently on $Factor_2$) and negative but mostly not significant influence on the CSR. Thus firm with high risk may invest in *CG* and improve their rating. Book to market has a changing influence with the same number significantly of positive and negative cases. Firms with high book to market tend to invest in *ENV* and *HR* while they disinvest from *BB* or *CG*.

Looking at the detailed parameters estimates we notice clear differences between sectors about book to market. Indeed in

Table 7: Descriptive Statistics

| Variable | # | $\mu$ | $\sigma$ | Min. | P1 | Median | P99 | Max. |
|---|---|---|---|---|---|---|---|---|
| Panel A: Rating Regression Lag Stock Variables |
| $\beta$ (CAPM) | 1007 | 0.89 | 0.36 | 0.01 | 0.16 | 0.88 | 1.98 | 3.56 |
| Book to Market | 1003 | 0.49 | 0.27 | 0.00 | 0.06 | 0.44 | 1.30 | 1.87 |
| Market Value (ln $10^6$ €) | 1006 | 8.52 | 1.25 | 4.89 | 5.83 | 8.41 | 11.5 | 12.1 |
| Panel B: Abnormal Returns Regression Market Variables |
| Sector Return (%) | 995 | 1.21 | 3.76 | -11 | -5.9 | 1.20 | 6.67 | 35.9 |
| Abnormal Volume (% deviation) | 1007 | 0.18 | 48.7 | -99 | -70 | -9.4 | 159 | 436 |

This table describes variables entering in equation (3) in panel A and equation (5) in panel B.
$\beta$ (CAPM) is the CAPM beta, book to market is the ratio book value ÷ market value, market value is the ln market value in million €.
Sector Return is the country sector return extracted from Datastream, Abnormal Volume is the percent deviation of the volume compared to the estimation window.
Panel B figures refer to the window $[-2, 2]$.

Table 8: Summary of Effects of Stocks Features on CSR Ratings

| Variable | $\mu$ | $\sigma$ | Min. | Median | Max. | # Significant - 5% | |
|---|---|---|---|---|---|---|---|
| | | | | | | > 0 | < 0 |
| ACSR $\rho^2$: 0.33 |
| Btmv - Sector | 0.18 | 9.71 | -14.18 | 0.97 | 16.40 | 2 | 2 |
| Capitalization - Sector | 5.21 | 0.72 | 4.25 | 5.30 | 6.14 | 10 | 0 |
| Beta - Sector | -1.19 | 5.47 | -14.24 | -1.12 | 6.84 | 1 | 1 |
| FACTOR1 $\rho^2$: 0.22 |
| Btmv - Sector | -0.19 | 0.78 | -1.26 | -0.09 | 0.91 | 3 | 2 |
| Capitalization - Sector | 0.35 | 0.07 | 0.22 | 0.38 | 0.43 | 10 | 0 |
| Beta - Sector | -0.22 | 0.47 | -1.00 | -0.35 | 0.75 | 1 | 2 |
| FACTOR2 $\rho^2$: 0.08 |
| Btmv - Sector | -0.66 | 1.01 | -2.98 | -0.43 | 0.72 | 0 | 3 |
| Capitalization - Sector | 0.07 | 0.05 | 0.02 | 0.06 | 0.18 | 3 | 0 |
| Beta - Sector | 0.24 | 0.43 | -0.58 | 0.42 | 0.65 | 2 | 0 |
| BB $\rho^2$: 0.22 |
| Btmv - Sector | -4.34 | 8.85 | -18.24 | -4.01 | 10.66 | 1 | 3 |
| Capitalization - Sector | 4.06 | 0.64 | 3.16 | 3.84 | 5.12 | 10 | 0 |
| Beta - Sector | -1.31 | 5.14 | -8.25 | -2.27 | 7.40 | 0 | 0 |
| CIN $\rho^2$: 0.22 |
| Btmv - Sector | -4.96 | 10.50 | -19.58 | -5.81 | 8.99 | 0 | 0 |
| Capitalization - Sector | 6.91 | 1.05 | 5.49 | 6.81 | 8.63 | 10 | 0 |
| Beta - Sector | 0.54 | 12.27 | -31.35 | 3.39 | 11.39 | 0 | 1 |
| CG $\rho^2$: 0.16 |
| Btmv - Sector | -9.46 | 13.49 | -28.65 | -7.70 | 6.48 | 0 | 3 |
| Capitalization - Sector | 3.32 | 1.23 | 1.79 | 3.35 | 5.70 | 9 | 0 |
| Beta - Sector | 0.88 | 9.56 | -12.37 | 0.65 | 17.44 | 3 | 0 |
| ENV $\rho^2$: 0.31 |
| Btmv - Sector | 10.76 | 10.70 | -9.24 | 11.26 | 27.05 | 4 | 0 |
| Capitalization - Sector | 7.39 | 1.23 | 6.14 | 7.04 | 10.17 | 10 | 0 |
| Beta - Sector | -1.51 | 11.17 | -31.40 | 1.71 | 5.68 | 0 | 1 |
| HR $\rho^2$: 0.28 |
| Btmv - Sector | 6.63 | 17.56 | -23.89 | 8.87 | 31.31 | 4 | 2 |
| Capitalization - Sector | 5.95 | 1.32 | 3.63 | 5.98 | 7.80 | 10 | 0 |
| Beta - Sector | -7.78 | 9.35 | -30.74 | -5.63 | 4.48 | 0 | 2 |
| HRTS $\rho^2$: 0.21 |
| Btmv - Sector | 1.69 | 12.03 | -14.49 | 2.72 | 24.86 | 2 | 1 |
| Capitalization - Sector | 4.73 | 0.76 | 3.58 | 4.78 | 5.74 | 10 | 0 |
| Beta - Sector | -1.41 | 4.37 | -7.89 | -1.12 | 6.46 | 0 | 0 |

This table summarizes the results from estimation of equation (3) on $ACSR$, factors and fields. $\rho^2$ is the squared correlation between observed and predicted values (a rough estimate of the R-square).
First five columns give the mean ($\mu$), the standard deviation ($\sigma$), minimum (*Min.*) median (*Median*) and maximum (*Max.*) of the estimated parameters.
Last two columns count the number (out of the 10 sectors) of parameters significant (likelihood ratio test) at least a a 5% level.
Estimation takes care of the truncation of the rating ($ACSR$ and fields) over the range $[0, 100]$ using proc qlim (SAS).

sectors *consumers goods, consumers services* and *financials* the effect is positive (and significant at a 5%) on *ENV*, *HR*, *HRTS*, *Factor$_1$*. On *ACSR* only *consumers goods, consumers services* are positive and on *BB consumers goods*. On the contrary, in sectors *telecoms* and *utilities* the effect is negative (and significant at a 5%) on *ACSR*, *BB*, *HR*, *Factor$_1$*. On *BB* we also obtain a negative parameter for *industrials*, on *CG* for *industrials, health care* and *utilities* and on *HRTS* for *consumers services*. Consequently, it seems that in sectors with direct public relations (*consumers goods, consumers services* and *financials*) a high book to market induces a investment in CSR while in network infrastructure sectors (*telecoms and utilities*) the higher the book to market the lower the investment in CSR.

### 4.3. Influence of Overall Score

Tables 9 provides the parameters' estimation considering the overall influence of CSR.

From table 9 panel A evidences that there is not a significant impact of aggregated scores (*ACSR*) on stock market. This result is in line with the findings of Ertugrul and Hegde (2009) on corporate governance ratings and reinforce the existing literature on confounding effect. Panel B confirms this result since the dominant *Factor$_1$* reflecting the general investment in CSR has no significant influence.

However, panel B also reveals a positive influence at 5% on the entier window of the second factor. Representing a high investment in *CG* and a low one in *HR* and *HRTS* this factor explain only 14% of the score variation. This result is to rely to the impact of the factor components, among others *CG*.

Moreover, we observe a significant effect of sector returns on market reaction to rating announcements. This effect is linked to the period and to the Vigeo methodology, that is to say to the announcement waves of ratings by sector. The financial crisis also affect the AR. Lastly the abnormal volume has a significant impact but very weak. Effects of these three control variables will be also observed on the next regressions (table 10 through 12).

These findings allow us to validate hypothesis 2 since the aggregated score does not directly influence the AR.

### 4.4. Influence of Components' Score

Table 10 through 12 provide the parameters' estimation of equation (5) considering respectively the influence of fields, of subfields and at last of items[25]. Due to size constraint in subfields and items we only present elements when at least one of the components (strength or concern) is significant at 10% level. *However, we always use in the regression all (filled) subfields and items*[26].

A cross analysis of tables 10 to 12 shows that two fields provide a significant influence whatever the aggregation level[27]. Market views mainly *ENV* as a cost and *HRTS* as a benefit.

Table 9: Influence of *ACSR* and Factors on Abnormal Return (AR)

| Variable | $SCAR[-2,-1]$ | $SCAR[0,2]$ | $SCAR[-2,2]$ |
|---|---|---|---|
| | Panel A: *ACSR* | | |
| Adj. R$^2$ | 0.56 | 0.48 | 0.48 |
| F test | 261.*** | 187.*** | 190.*** |
| ACSR + | −0.000 | 0.029 | 0.031 |
| | 0.93 | 0.46 | 0.48 |
| ACSR − | 0.012 | 0.03 | 0.031 |
| | 0.58 | 0.36 | 0.37 |
| Abnormal Volume (#) | 0.002 | 0.011*** | 0.007 |
| | 0.61 | 0.01 | 0.15 |
| Sector Return | 1.717*** | 1.427*** | 1.557*** |
| | 0.00 | 0.00 | 0.00 |
| Date ⩾ 07-2007 | 0.202** | 0.583*** | 0.567*** |
| | 0.03 | 0.00 | 0.00 |
| | Panel B: Factors | | |
| Adj. R$^2$ | 0.56 | 0.48 | 0.48 |
| F test | 187.*** | 134.*** | 136.*** |
| FACTOR1 + | 0.023 | −0.05 | −0.03 |
| | 0.92 | 0.91 | 0.96 |
| FACTOR1 − | 0.021 | 0.211 | 0.016 |
| | 0.93 | 0.64 | 0.97 |
| FACTOR2 + | 0.236 | 0.606* | 0.773** |
| | 0.21 | 0.06 | 0.03 |
| FACTOR2 − | −0.15 | 0.457 | 0.319 |
| | 0.45 | 0.22 | 0.41 |
| Abnormal Volume (#) | 0.002 | 0.011*** | 0.007 |
| | 0.60 | 0.00 | 0.14 |
| Sector Return | 1.713*** | 1.444*** | 1.558*** |
| | 0.00 | 0.00 | 0.00 |
| Date ⩾ 07-2007 | 0.208** | 0.569*** | 0.567*** |
| | 0.02 | 0.00 | 0.00 |

This table reports the estimation of model (5).
First two lines Adj. R$^2$ and F test provide respectively the regression's adjusted R-square and the Fisher test. Following lines provide the parameters estimate with significance (* 10%, ** 5% and *** 1%) and below the p-value.
Panel A considers only the influence of *ACSR*, the average of the fields.
Panel B decomposes the CSR between the first two factors (refer to table 2 for the meaning)
In each panel, the variable is the residual from equation (3) differentiated according to the sign (cf. equation 4).
Control variables are *Abnormal Volume*: The percent deviation from the reference window; *Sector Return*: The country sector return and *Date*: A dummy variable taking value 1 if the date if after July 2007.
To obtain robust inference, we use MacKinnon and White (1985) HCC 3 estimator.

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[25]We only use items filled in at least 33% of cases. Refer to table 15 for details.

[26]Results remains qualitatively similar when we select only significant variables in the regression.

[27]In comments, we only consider parameters significant at a 1% and 5% level.

Table 10: Influence of Fields on Cumulative Abnormal Return (CAR)

| Variable | $SCAR[-2,-1]$ | $SCAR[0,2]$ | $SCAR[-2,2]$ |
|---|---|---|---|
| Adj. $R^2$ | 0.56 | 0.49 | 0.49 |
| F test | 88.*** | 66.*** | 66.*** |
| BB + | −0.000 | 0.056* | 0.045 |
| | 0.98 | 0.08 | 0.21 |
| BB − | 0.022 | 0.03 | 0.029 |
| | 0.21 | 0.38 | 0.41 |
| CIN + | 0.008 | −0.04** | −0.02 |
| | 0.46 | 0.03 | 0.25 |
| CIN − | 0.002 | −0.06*** | −0.05** |
| | 0.85 | 0.00 | 0.04 |
| CG + | 0.006 | 0.02 | 0.03 |
| | 0.63 | 0.38 | 0.21 |
| CG − | −0.03* | 0.011 | −0.01 |
| | 0.06 | 0.67 | 0.79 |
| ENV + | −0.01 | 0.005 | 0.005 |
| | 0.60 | 0.87 | 0.88 |
| ENV − | 0.017 | 0.09*** | 0.099*** |
| | 0.28 | 0.00 | 0.00 |
| HR + | 0.02 | −0.06** | −0.04 |
| | 0.15 | 0.02 | 0.17 |
| HR − | 0.017 | −0.01 | 0.005 |
| | 0.32 | 0.78 | 0.88 |
| HRTS + | −0.01 | 0.101*** | 0.083** |
| | 0.55 | 0.01 | 0.05 |
| HRTS − | −0.01 | 0.005 | −0 |
| | 0.68 | 0.88 | 0.94 |
| Abnormal Volume (#) | 0.002 | 0.012*** | 0.008 |
| | 0.58 | 0.00 | 0.11 |
| Sector Return | 1.727*** | 1.409*** | 1.545*** |
| | 0.00 | 0.00 | 0.00 |
| Date ⩾ 07-2007 | 0.201** | 0.615*** | 0.592*** |
| | 0.02 | 0.00 | 0.00 |

This table gives the influence of the fields on the CAR.
Report to table 9 for full legend and to table 13 for the meaning of the fields.

Table 11: Influence of Subfields on Cumulative Abnormal Return (CAR)

| Variable | $SCAR[-2,-1]$ | $SCAR[0,2]$ | $SCAR[-2,2]$ |
|---|---|---|---|
| Adj. $R^2$ | 0.57 | 0.49 | 0.49 |
| F test | 36.*** | 28.*** | 28.*** |
| CG1 + | 0.002 | 0.051** | 0.051** |
| | 0.88 | 0.01 | 0.02 |
| CG1 − | −0.02 | 0.022 | −0.00 |
| | 0.16 | 0.32 | 0.99 |
| CG4 + | 0.012 | −0.03** | −0.02 |
| | 0.11 | 0.02 | 0.32 |
| CG4 − | −0.02* | −0.01 | −0.03 |
| | 0.07 | 0.56 | 0.29 |
| CIN2 + | 0.019 | −0.03 | 0.009 |
| | 0.11 | 0.11 | 0.68 |
| CIN2 − | 0.007 | −0.05*** | −0.02 |
| | 0.52 | 0.01 | 0.27 |
| ENV1 + | −0.01 | 0.015 | 0.011 |
| | 0.62 | 0.58 | 0.71 |
| ENV1 − | $1.1E-4$ | 0.072** | 0.06* |
| | 0.99 | 0.01 | 0.06 |
| ENV2 + | $3.0E-5$ | 0.006 | 0.006 |
| | 1.00 | 0.85 | 0.87 |
| ENV2 − | 0.037* | −0.01 | 0.027 |
| | 0.05 | 0.82 | 0.43 |
| ENV3 + | 0.005 | −0.05* | −0.04 |
| | 0.69 | 0.06 | 0.13 |
| ENV3 − | −0.01 | 0.009 | 0.007 |
| | 0.69 | 0.75 | 0.83 |
| HR3 + | −0.01 | −0.06** | −0.06** |
| | 0.47 | 0.01 | 0.02 |
| HR3 − | −0.00 | −0.05 | −0.05 |
| | 0.82 | 0.15 | 0.17 |
| HRTS2 + | 0.007 | 0.107*** | 0.1** |
| | 0.70 | 0.01 | 0.02 |
| HRTS2 − | 0.007 | 0.028 | 0.029 |
| | 0.72 | 0.45 | 0.46 |
| Abnormal Volume (#) | 0.001 | 0.012*** | 0.008* |
| | 0.66 | 0.00 | 0.09 |
| Date ⩾ 07-2007 | 0.204** | 0.609*** | 0.563*** |
| | 0.02 | 0.00 | 0.00 |
| Sector Return | 1.721*** | 1.365*** | 1.58*** |
| | 0.00 | 0.00 | 0.00 |

This table gives the influence of the subfields on the CAR.
Report to table 9 for full legend and to table 14 for the meaning of the subfields.
In this table even if all subfields are included in the regression, we only report subfields of which one of the components is significant at least at a 10% level.

Table 12: Influence of Items on Cumulative Abnormal Return (CAR)

| Variable | $SCAR[-2,-1]$ | $SCAR[0,2]$ | $SCAR[-2,2]$ |
|---|---|---|---|
| Adj. R$^2$ | 0.57 | 0.49 | 0.49 |
| F test | 25.*** | 19.*** | 19.*** |
| BB1−1 + | 0.004 | 0.042* | 0.043 |
| | 0.81 | 0.08 | 0.12 |
| BB1−1 − | −0.01 | 0.032 | 0.004 |
| | 0.66 | 0.26 | 0.87 |
| BB2−4 + | −0.00 | −0.06 | −0.06 |
| | 0.89 | 0.13 | 0.14 |
| BB2−4 − | 0.038** | −0.01 | 0.027 |
| | 0.03 | 0.75 | 0.50 |
| CG1 + | 0.001 | 0.047** | 0.047** |
| | 0.90 | 0.02 | 0.05 |
| CG1 − | −0.02 | 0.032 | 0.008 |
| | 0.20 | 0.18 | 0.74 |
| CG4 + | 0.012 | −0.03* | −0.01 |
| | 0.10 | 0.05 | 0.51 |
| CG4 − | −0.02* | −0.01 | −0.02 |
| | 0.05 | 0.83 | 0.43 |
| ENV2−2 + | 0.005 | −0.03 | −0.02 |
| | 0.70 | 0.39 | 0.54 |
| ENV2−2 − | 0.027** | −0.02 | 0.026 |
| | 0.04 | 0.41 | 0.26 |
| ENV2−5 + | −0.01 | −0.03 | −0.03 |
| | 0.52 | 0.47 | 0.39 |
| ENV2−5 − | −0.00 | −0.03 | −0.05* |
| | 0.80 | 0.34 | 0.08 |
| ENV2−7 + | 0.006 | 0.067** | 0.06* |
| | 0.71 | 0.01 | 0.05 |
| ENV2−7 − | 0.009 | 0.03 | 0.024 |
| | 0.51 | 0.20 | 0.36 |
| ENV3 + | 0.004 | −0.05* | −0.05 |
| | 0.75 | 0.06 | 0.11 |
| ENV3 − | −0.02 | 0.015 | 0.001 |
| | 0.34 | 0.66 | 0.97 |
| HRTS2−4 + | −0.01 | 0.05* | 0.036 |
| | 0.61 | 0.08 | 0.25 |
| HRTS2−4 − | 0.006 | 0.035 | 0.031 |
| | 0.73 | 0.28 | 0.37 |
| Abnormal Volume (#) | 0.002 | 0.011*** | 0.008 |
| | 0.57 | 0.00 | 0.12 |
| Date ⩾ 07-2007 | 0.181** | 0.556*** | 0.542*** |
| | 0.03 | 0.00 | 0.00 |
| Sector Return | 1.747*** | 1.456*** | 1.596*** |
| | 0.00 | 0.00 | 0.00 |

This table gives the influence of the items on the CAR.
Report to table 9 for full legend and to table 15 for the meaning of the items. In this table even if all filled items are included in the regression, we only report items of which one of the components is significant at least at a 10% level.

Some fields are significant only for some aggregation levels. As Ertugrul and Hegde (2009) we find that the market does not react to *CG* on the summary level (field), but only on subfields and items. This point emphasizes the specificity of *CG* field shown in data analysis (see subsection 3.1.1). A confounding effect or the use by investors of specialized *CG* information (for instance broker reports, corporate governance ratings...) can explain the irrelevance of summary information. *BB* is weakly significant and not on subfields. For *CIN* and *HR* a detailed scoring in items is not relevant.

The sign of the component' score, whether it is positive (an investment, a strength) or negative (a divestment, a concern), is a crucial dimension of CSR rating to analyze market reaction. We underline the main results and compare them with the relative literature. We validate some previous results but also find new and contrasted results. Theses differences are related to main features of our research: we focus on short term market reaction; we use scores with positive or negative values and not strength and concern[28].

The market views only one field *HRTS* as beneficial due to the positive influence of good score. This result contrasts with the negative mispricing effect found by Mănescu (2010). Two fields are corresponding to detrimental activities: *ENV* and *HR*. For *ENV* a bad score has a positive influence, suggesting that the market rewards firms with bad environmental practices. A low investment in *ENV* can be view by investors as a way of cost minimization. Only an investment in *ENV*2 − 7 (Management of environment impacts from transportation) is beneficial. Except for this item our results contrast with growing empirical literature showing a positive relation between corporate environmental performance and firm value (Renneboog et al., 2008a) and Scholtens and Zhou (2008). A good score of *HR*, which seems to be perceived mainly as a cost, induces a negative reaction after the announcement. The effect is driven by *HR*3 (Quality of working conditions). Our results confirms the one of Scholtens and Zhou (2008) and Mănescu (2010) on the recent period but differ from those of Galema et al. (2008).

For *CG* and *CIN* the relationship is mixed. A good score on *CG*1 (Independence and efficiency of board of directors) and a bad one on CG4 (Transparency on executive remuneration) induce positive AR. Community involvement (*CIN*) is also interpreted as mixed. The market reacts negatively to bad and good *CIN* scores. Thus, to avoid a negative market reaction, firms have to make investment in *CIN* according to the norm of the sector (neither less nor more). This illustrate the two facets of risk: non-sustainability and sustainability. The beneficial part seems to be driven by *CIN*2 (Responsible societal behavior). So we do not verify the positive effect documented by Mănescu (2010).

We validate hypothesis 3. The results show differences of market reaction to the CSR rating announcement between the fields, within a given topic according to the aggregation level

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[28]We work on numerical scores whereas analysis based on KLD uses counts of positive CSR firms' realizations (strength) and counts of negative CSR firms' realizations (concern). Interested reader can refer to Mănescu (2010) who details the methodological concern using KLD measures.

(fields, subfields or items) and at last according to the sign of the elements' score (strength vs concern).

Only 6 subfields out of 17 are significant at 5%, and very few items. More details induce more noise due to missing information. So a few items (4 out of 37) are relevant. Some of detailed elements give the needed information. Subfields allow to offset the confounding effect for some topic. That is the right level for *CG*. Two subfields are relevant *CG*1 (Board of directors) and *CG*4 (Executive remuneration). On others fields it gives also valuable information. *CIN*2 (Responsible societal behavior) and *HRTS*2 (Respect for human rights in the workplace) are significant. Items give useful information to investors on the most important topics for investors at a time, like environment. Items on non-discrimination and on integration of social factors in supply chain management are also relevant. Our findings are in line with those of Ertugrul and Hegde (2009) and allow to validate hypothesis 4: A reduced number of detailed components of CSR ratings is taken into account by investors.

### 4.5. Robustness Checks

To check for a selection bias, we use the Heckman selection model with:

$$selection = f(Book\,to\,Market, Market\,Capitalization)$$

. This model underlines that the sample we study is more focused on bigger firm than the population of the rated firms. However, in the latter steps (regression 3 and 5) the inverse mills ratio is not significant. Thus, the selection does not influence the results we obtain and we do not include this additional step into the analysis.

To ensure that results of the event study is not driven by the methodological choices we made, we try other lengths of estimation windows for instance $[-260, -10]$ and $[-72, -10] \cup [10, 72]$, we use other indexes (the emblematic index of each country for instance the CAC 40 in France, the FTSE 100 in Great Britain, or the DAX 30 in Germany...) and obtain almost identical results. To check for an influence of the Fama French model we also compute the SAAR using the constant mean model and obtain figure (4). As one can see comparing figure 4 and 2, the AR patterns and significance remain.

Since Vigeo broadcast it's rating on the last business day of the month, the results we obtain heretofore could be due to an end of month or a day of the week effect. To confirm the robustness of our results, we first compute the average volatility (squared return) according to the day of the month (ordinal position of the day within the month $\bar{\sigma}_d$), we then standardize the raw return: $R_{Adj,t} = R_{Raw,t} \div \bar{\sigma}_d$ where $d$ is the ordinal position of day $t$ within the month. We then use the adjusted return to perform the event study. Figure 5 gives the standardized average AR obtained adjusting day of the month (analogous to figure 2 on the raw returns). As one can see, even if there is some modifications (for instance the AR on day 0 is lower), the main results (positive influence of the announcement) remains almost unchanged.

On the regression part, we also run robustness checks. Rather than using the sector's return to control for historical or sector

Figure 4: Standardized Average Abnormal Returns (SAAR) using the Mean Model
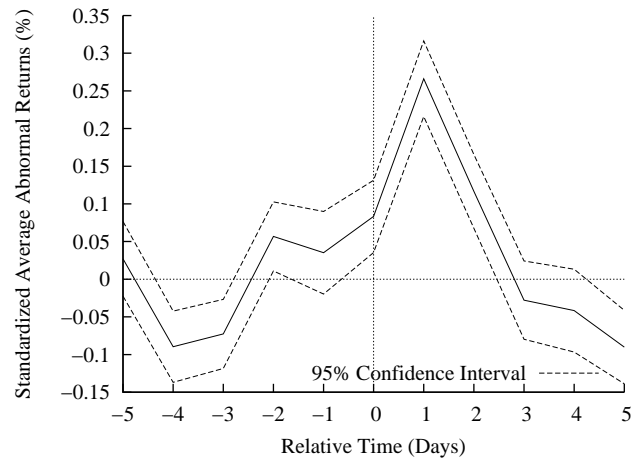


This figure gives the SAAR in the event window using a constant mean model. 95% confidence interval is build using a reversed t-test.

Figure 5: Standardized Average Abnormal Returns (SAAR) Adjusted Day of the Month
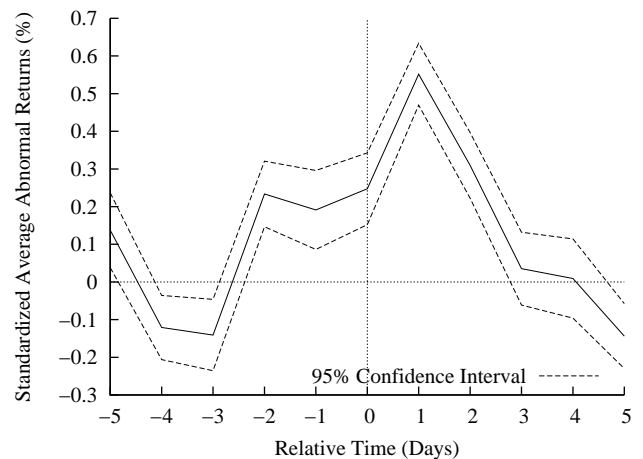


This figure gives the SAAR in the event window. 95% confidence interval is build using a reversed t-test.

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effect, we use a panel regression with a fixed effect (according to the Haussman's test) for the production date. The result, remains quite similar (even slightly better). However, with such approach, the interpretation of the fixed effect is quite difficult thus we prefer to present the linear regression model with the sector return.

The specification we present in table 9 through 12 uses a transformation of the initial score splitting the variable in two components according to the sign of the residual. One can ask whether others transformation lead to the same results. We test alternative specifications, a non parametric transform[29] of the initial score, a dummy transformation (that is to say $ACSR+ = 1$ if the score is positive and 0 and conversely for $ACSR-$) and others splitting scheme according to the rating[30]. We obtain qualitatively similar results however, significance is lower since it does not account for the magnitude of the rating (dummy) or it cut away the impact of the rating "=" which represents 40% of the sample.

At last, we also check for others phenomena by including relevant variables into the regression (3) and (5).
In equation (3) we tried the growth of the sector, the firm financial leverage or the specific risk of the firm. In equation (5) we check whether the results are similar for continental Europe and UK.
These analysis reveal that our results are robust to these phenomena. Since these variables are note significant we exclude them from the estimated models.

## 5. Conclusion

In the aim to emphasize the links between CSR and financial performance, we document in this paper the short term market reaction to CSR ratings. Using an event study, we determine AR associated to CSR rating announcements. We analyze the market reaction to the announcement and also to the informational content of aggregated and decomposed (at different degrees) CSR rating.

First, from a methodological point of view, event study succeed in showing that CSR impacts the market. We find that the announcement of CSR rating induces a positive reaction of the stock market, whatever the rating. This result confirms that the CSR rating information is incorporated in stock prices. It is an additional information, in respect to financial one, taken in account by markets, modifying investors' beliefs and firms' valuation.

Second, we show that market does not react to overall CSR. Investor need a more detailed information to react.

Third, we document that some CSR components, depending on their score signs (strength vs concern), have a positive influence on stock returns (e. g. human rights) whereas others have a negative one (e.g. environment, human resources). Market's reaction is quite discriminating since the reaction can be

univocal but not necessarily. There are elements (e.g. community involvement) where being in the norm is rewarded whereas having a good or a bad score are both penalized.

Fourth, we show that the market reaction is mainly determined by a reduced number of elements and that more detailed scores are often needed to overpass ambiguity of the overall figure or ambiguity of the corporate governance field. Field corporate governance has no influence whereas subfield independence and efficiency of board of directors (transparency on executive remuneration) is valued (penalized).

Our results underlines both the growing role of CSR and the cleverness of the market since the reaction really discriminates among the fields, subfields and items, varies according to the investment in or divestment from the CSR activities.

Our conclusions are of course relative to the sample and period studied. The relationships we evidenced should evolve in the future as the knowledge and importance of CSR is growing. We use CSR ratings considering that they are good proxies of firms' CSR behavior and performance. Such assertion could be questioned. We focus on short term market reaction, according to market efficiency the expectation of long term impact. However, the effects we observed could be influenced by short term (transitory) market dynamics. Future research about the stocks liquidity around the event should enable us to distinguish between a value creation (linked to permanent informational content of the announcement) or to a transitory buy pressure (linked to portfolio re-balancing).

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[29]For details refers to base SAS documentation: proc rank statement, blom option.

[30]For instance, with this transform $ACSR+ = ACSR$ if the rating is either ++ or + and conversely.

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# Appendix

Table 13: Vigeo Fields

| Field | Content |
|---|---|
| *BB* | Business Behavior |
| | Consideration of the rights and interests of clients, integration of social and environmental standards in the selection of suppliers and on the entire supply chain, effective prevention of corruption and respect for competitive practices |
| *CG* | Corporate Governance |
| | Effectiveness and integrity, guarantee of independence and efficiency of the Board of Directors, effectiveness and efficiency of auditing and control mechanisms, in particular the inclusion of social responsibility risks, respect for the rights of shareholders, particularly minority shareholders, transparency and rationale for the remuneration of directors |
| *CIN* | Community Involvement |
| | Effectiveness, managerial commitment to community involvement, contribution to the economic and social development of territories / societies within which the company operates, positive commitment to manage the social impacts linked to products or services and overt contribution and participation in causes of public or general interest |
| *ENV* | Environment |
| | Protection, safeguarding, prevention of damage to the environment, implementation of an adequate management strategy, eco-design, protection of biodiversity and co-ordinated management of environmental impacts on the entire life-cycle of products or services |
| *HR* | Human Resources |
| | Continuous improvement of professional relations, labor relations and working conditions |
| *HRTS* | Human Rights |
| | Respect for freedom of association, the right to collective bargaining, non-discrimination and promotion of equality, elimination of illegal working practices such as child or forced labor, prevention of inhumane or degrading treatment such as sexual harassment, protection of privacy and personal data |

Following the Vigeo website http://www.vigeo.com, this table gives the meaning of the fields.

Table 14: Vigeo Subfields

| Subfield | # | Content |
|---|---|---|
| BB1 | 1250 | Customers |
| BB2 | 1243 | Suppliers and contractors |
| BB3 | 1461 | Business integrity |
| CG1 | 1588 | Board of directors |
| CG2 | 1588 | Audit and internal controls |
| CG3 | 1588 | Shareholders |
| CG4 | 1588 | Executive remuneration |
| CIN1 | 776 | Impact on local communities |
| CIN2 | 1200 | Responsible societal behavior |
| ENV1 | 1588 | Integration of environmental issues into corporate strategy |
| ENV2 | 1585 | Incorporation of environmental issues into the manufacturing and distribution of products |
| ENV3 | 645 | Environmental consideration in the use and disposal of products/services |
| HR1 | 1553 | Continuous improvement of industrial relations |
| HR2 | 1573 | Career development |
| HR3 | 1490 | Quality of working conditions |
| HRTS1 | 790 | Respect for human rights |
| HRTS2 | 1588 | Respect for human rights in the workplace |

This table provides the meaning of the Vigeo subfields and the number of filled subfields within the studied sample (1588 events).

Table 15: Vigeo Items

| Items | # | Content |
|---|---|---|
| BB1.1 | 727 | Product safety |
| BB1.2 | 643 | Information to customers |
| BB1.3 | 557 | Responsible Contractual Agreement |
| BB2.2 | 280 | Sustainable Relationship with suppliers |
| BB2.3 | 1001 | Integration of environmental factors in the supply chain |
| BB2.4 | 825 | Integration of social factors in the supply chain |
| BB3.1 | 1202 | Prevention of corruption |
| BB3.2 | 814 | Prevention of anti-competitive practices |
| CG1.1 | Subfield | Board of directors |
| CG2.1 | Subfield | Audit and Internal Controls |
| CG3.1 | Subfield | Shareholders' Rights |
| CG4.1 | Subfield | Executive Remuneration |
| CIN1.1 | Subfield | Promotion of social and economic development |
| CIN2.1 | 838 | Social impacts of company's products and services |
| CIN2.2 | 520 | Contribution to general interest causes |
| ENV1.1 | 1588 | Environmental strategy and eco-design |
| ENV1.2 | 463 | Pollution prevention and control |
| ENV1.3 | 425 | Development of "Green" products and services |
| ENV1.4 | 511 | Protection of biodiversity |
| ENV2.1 | 530 | Protection of water resources |
| ENV2.2 | 1513 | Minimizing environmental impacts from energy use |
| ENV2.4 | 641 | Management of atmospheric emissions |
| ENV2.5 | 1010 | Waste management |
| ENV2.6 | 175 | Management of environmental nuisances: dust, odor, noise |
| ENV2.7 | 1099 | Management of environmental impacts from transportation |
| ENV3.1 | Subfield | Management of environmental impacts from the use and disposal of products |
| HR1.1 | 1531 | Promotion of labor relations |
| HR1.2 | 269 | Encouraging employee participation |
| HR2.3 | 691 | Responsible management of restructurings |
| HR2.4 | 1219 | Career management and promotion of employability |
| HR3.1 | 188 | Quality of remuneration systems |
| HR3.2 | 1381 | Improvement of health and safety conditions |
| HR3.3 | 420 | Respect and management of working hours |
| HRTS1.1 | Subfield | Respect For Human Rights and prevent of violations |
| HRTS2.1 | 1454 | Respect for freedom of association and the right to collective bargaining |
| HRTS2.4 | 1588 | Non-discrimination |
| HRTS2.5 | 26 | Elimination of child labor and forced labor |

This tables details the items included in the Vigeo ratings and the number of filled items within the studied sample (1588 events).

"Subfield" designates an item that is identical to the corresponding subfield (there only one item within the subfield).

In the analysis, we use only items with enough data (at least 33% or 529 observations). Thus we exclude: BB2.2 CIN2.2 ENV1.2 ENV1.3 ENV1.4 ENV2.1 ENV2.6 HR1.2 HR3.1 HR3.3 HRTS2.5.

Table 16: Sectors and Geographic Coverage

| Sector | Total | Austria | Belgium | Denmark | Finland | France | Germany | Greece | Ireland | Italy | Luxembourg | Netherlands | Norway | Portugal | Spain | Sweden | Switzerland | United Kingdom |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Oil and Gas | 54 | 3 | 0 | 3 | 0 | 8 | 1 | 0 | 0 | 6 | 0 | 4 | 6 | 0 | 6 | 1 | 0 | 16 |
| Basic Materials | 104 | 2 | 6 | 0 | 10 | 12 | 17 | 0 | 0 | 0 | 2 | 8 | 6 | 0 | 3 | 5 | 12 | 21 |
| Industrials | 305 | 5 | 4 | 11 | 10 | 46 | 30 | 4 | 11 | 11 | 0 | 11 | 0 | 7 | 18 | 24 | 27 | 86 |
| Consumer Goods | 210 | 0 | 4 | 8 | 2 | 55 | 33 | 4 | 3 | 11 | 0 | 16 | 4 | 0 | 2 | 9 | 12 | 47 |
| Healthcare | 82 | 0 | 4 | 14 | 1 | 7 | 12 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 2 | 4 | 18 | 15 |
| Consumer Services | 279 | 1 | 8 | 0 | 6 | 66 | 16 | 4 | 7 | 12 | 3 | 12 | 1 | 2 | 9 | 7 | 1 | 124 |
| Telecommunications | 69 | 4 | 4 | 2 | 4 | 4 | 4 | 3 | 0 | 4 | 0 | 4 | 4 | 4 | 4 | 8 | 4 | 12 |
| Utilities | 83 | 2 | 0 | 0 | 3 | 6 | 9 | 4 | 0 | 11 | 0 | 0 | 0 | 4 | 16 | 0 | 0 | 28 |
| Financials | 332 | 5 | 13 | 9 | 5 | 37 | 20 | 16 | 11 | 31 | 0 | 12 | 5 | 8 | 29 | 29 | 25 | 77 |
| Technology | 70 | 0 | 0 | 0 | 2 | 28 | 7 | 0 | 0 | 0 | 0 | 5 | 2 | 0 | 3 | 3 | 4 | 16 |
| $\sum$ | 1588 | 22 | 43 | 47 | 43 | 269 | 149 | 35 | 36 | 86 | 5 | 73 | 28 | 25 | 92 | 90 | 103 | 442 |

This table provides the number of announcements according to the firm's sector (first level of ICB classification) and firm's country. The first column (Total) gives the total number of firms by sector while the last line ($\sum$) sums up firms by countries.