

# Corporate Social Responsibility and Corporate Performance: Where to Begin?

Ron Bird<sup>a</sup>

Lorenzo Casavecchia<sup>a</sup>

Francesco Reggiani<sup>b</sup>

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**Abstract:** Although there have been numerous studies that have addressed the sign of the relationship between corporate social responsibility (CSR) activities within companies and their performance, very little analysis has been undertaken as to the causation between these two variables. Further, the little work that has been done on causation has suffered from poor research design, inappropriate statistical method and inadequacies in data so little weight can be placed on their findings. In this study we attempt to overcome the weaknesses in previous studies and so provide better insights into these issues. We first replicate the previous studies and confirm their findings of a feedback relationship between CSR activities and corporate performance. However when we apply our own method, we find support for the proposition that it is the availability of discretionary resources that is the main motivating force that causes management to fund CSR activities, especially those of a more discretionary nature. Our findings question whether we have yet reached a stage where management has accepted that it is in their interests to voluntarily direct the corporation's resources

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<sup>a</sup> University of Technology, Sydney

<sup>b</sup> Bocconi University, Milan

## Corporate Social Responsibility and Corporate Performance:

### Where to Begin?

#### SECTION 1: INTRODUCTION

As the impact of the corporate sector very broadly defined has become a greater concern, there has been an increasing interest in determining the sign and magnitude of any relationship that might exist between the extent of a company's social responsibility (CSR) activities and its future corporate performance. There is conflicting evidence on this relationship from the in excess of 60 papers that have been published in this area but the weight of the findings would lead one to conclude that overall CSR activities have a positive impact on a company's performance. However the issue of causation in this relationship has received comparatively little attention and it is important that this be resolved so that we are better able to interpret previous research findings and to better understand the motivating factor(s) that causes management to invest in CSR activities.

Our objective in this paper is to provide the definitive study of the causal relationship between CSR activities and corporate performance. In Section 2 of the paper, we provide a summary of the previous studies that have addressed this issue highlighting both their findings and their deficiencies. We go on in Section 3 to describe the approach that we have taken and how it helps to overcome the deficiencies of the previous studies. We report our findings in Section 4, first confirming the findings of the previous studies within their inadequate research environment and then expanding the study to provide improved insights into the order of causation between our two variables of interest. We

conclude in Section 5 with a summary of our findings and some thoughts on possible future extensions for work in this area

## SECTION 2: BACKGROUND

For a period of over 30 years there has been great interest in, and as a consequence numerous studies of, the nature of the relationship between corporate social responsibility (CSR) and corporate performance. Management, politicians, academics are among those interested in identifying who gains the benefits from, and who bears the costs of, CSR activities and indeed the extent to which corporations will spontaneously address important societal issues. While the weight of evidence suggests that there is a positive relationship between CSR activities and corporate performance, the studies have been far from unanimous in this finding. Of the 51 papers surveyed by Griffin and Mahon (1997), a positive relationship between CSR and corporate performance was found to hold in two-thirds of the cases. A more recent survey conducted by Roman, Hayibor and Agle (1999) came up with a similar percentage when considering an expanded and updated set of studies. Orlitzky, Schmidt and Rynes (2003) argued that the “vote counting” methodology used by the previous two sets of authors is flawed and proposed meta-analysis as a preferable way to aggregate the findings across a large number of studies. They applied meta-analysis to the findings from 61 previous studies and also concluded that a positive relationship exists between CSR and corporate performance. Bird, Hall, Momente and Reggiani (2007) also found a positive relationship to exist between an aggregate score for CSR activities and corporate performance but concluded that this finding did not extend to the relationship between each individual CSR activity and corporate performance.

It is useful to separate the individual CSR activities into two groups: one group where the activities contribute to the firm meeting government regulations and/or minimum community standards and another group where the activities take the firm well beyond these minimum standards. While both Frooman (1997) and Johnson (2003) found that firm's that failed to meet the minimum standards were punished in terms of their future performance, there was no evidence to suggest that firms were rewarded for going beyond these minimum standards. Bird et al (2007) found that the market very much punished firms that failed to meet minimum standards in the areas of diversity and the environment while the firms that reaped the greatest market rewards were those that exceeded the minimum standards in their employment-related activities.

The overwhelming concentration in the numerous past studies has been on the direction of the impact of CSR activities on future corporate performance with little attention being paid to the issue of causation: is it performance that determines the level of CSR activities undertaken within a firm or is it the CSR activities that determine the level of performance? The answer to this question is interesting in its own right because of its implications for the way that we interpret the empirical finding which are suggestive of a positive relationship between the level of CSR activities and subsequent corporate performance. The common assumption being CSR activities cause corporate performance which leads to the interpretation that CSR activities more than pay for themselves as reflected by improvements in financial and market performance. However if the causation is in the opposite direction, then this raises the alternative interpretation that well-performing firms are those most likely to devote significant resources to CSR activities. Of course, the causation may prove to operate fairly equally in both directions

suggesting the proverbial “chicken and egg” with both CSR activities and corporate performance impacting on the other with there being no obvious initial source of causation.

Waddock and Graves (1997) and Orlitzky et al (2003) are among a small number of papers that have conducted an empirical test of the direction of the relationship between CSR and corporate performance. Although the two studies utilise completely different methodologies when analysing their data, what is common to each is that they examine the correlation between CSR and corporate performance assuming a lag in both directions. Both sets of authors find evidence to support the existence of what they refer to as a virtuous circle/cycle where each variable impacts somewhat equally on the other.

We would query the reliance that one might place on the findings in each of these studies because of inadequacies both in their data and the methodologies that they employed. The major problem with the Waddock and Graves’ paper is that they only have two years of data to test what is actually a time-series relationship, resulting in their regression being unable to come up with any definitive findings in relation to the causation. The main problem with the paper of Orlitzky *et al.*, is the great diversity in both the CSR and corporate performance measures employed across the 61 studies that they include in their meta-analysis. We would concur with Griffin and Mahon (1997) that this lack of homogeneity brings into question the interpretation that can be placed on their findings.

In the next section we outline the data and the methodology that we have chosen to employ in this study to overcome the problems of previous studies and so provide superior insights into the direction of the relationship between CSR and corporate performance. However besides the data and statistical problems associated with the

previous studies, there is the further question of whether design employed in these studies enabled them to throw light on this issue of causation. In order to address this problem we must first consider the basically common hypotheses developed in each study to explain management's initial motivations for investing in CSR. One hypothesis proposed is termed *slack resources theory* which postulates that the level of resources that management devotes to CSR activities is driven by the accessibility of resources not required for other purposes. This concept is perhaps best articulated in Jensen (1986) who suggested that management faced with holding cash in excess of their needs are likely to invest this free cash in a way that is at variance with maximising the value of the firm (i.e. waste it, at least in economic terms). The other hypotheses proposed is termed *good management theory*, which is really just another articulation of stakeholder theory (Freeman, 1984; Donaldson and Preston, 1995). The proposition here is that good management will invest in a wide range of CSR activities in seeking to satisfy the interests of a broad group of stakeholders as it recognises that this is a precondition for creating the necessary environment to enable the firm to generate strong financial performance. The implication is that good management will choose to invest in CSR activities, because they either choose or are coerced to do so, and that these investments subsequently will translate into superior financial performance.

Both sets of writers interpret their findings of a virtuous cycle/circle to suggest that it is both the availability of slack resources and the application of good management principles that motivates management to devote resources to CSR activities, and this in turn translates into superior future corporate performance and so the cycle/circle continues. We would suggest that neither set of authors have designed their experiments

to actually be able to discriminate between the two proposed explanations. The main problem is the use of accounting performance and/or excess market returns as their measure. For example a growth firm that is enjoying good accounting and market performance might face heavy demands on their available funding to finance further investment and so have no slack resources available for discretionary expenditures (such as CSR activities). As a consequence neither study ever truly considered slack resources theory and it is doubtful whether they provided any evidence to substantiate whether good management theory provides an explanation for the relationship between CSR and corporate performance. We will outline in the next section both the data and statistical techniques that we employed in order to provide better insights into what are the motivating forces for the link between CSR and corporate performance.

### SECTION 3: DATA AND METHOD

#### **Data**

The analysis was conducted over the period from January 1991 to December 2003 and included data on 650 US companies. Data on CSR are from KLD Research & Analytics, Inc., data on stock excess returns and return on equity are from Datastream (Thomson Financial), while the data on free cash flow are collected from Worldscope.

*Our CSR Score* is based upon the annual qualitative data provided by KLD in which they assign a firm either a zero or a one under several criteria rated as either strengths (STR) or concerns (WKN) and aggregated under different headings. We agree with Hillman and Keim (2001) about the necessity to separate the indicators of CSR in two main groups:

stakeholder management and social issue participation. For this reason, we choose to use the KLD criteria constituted by the headings of *community*, *diversity*, *employee relations*, *environment* and *product*<sup>1</sup>, as measures of stakeholder management, because they are strictly related to the stockholder value creation<sup>2</sup>. On the other side, we did not include in our measure of CSR, the social issue participation screens because, according to Hillman and Keim, they are outside the firm strategy, with a doubtful relation with corporate and market performance.

In the KLD dataset, each firm is assigned a one for each criteria that they are deemed to satisfy and zero for those they fail to satisfy. We decided to compute a firm's standardised STR (WKN) score by aggregating its score across all strength (concern) criteria and dividing it by the maximum possible score. For example if a firm is classified as satisfying 16 out of possible 32 strength criteria, then its strength score is 0.5. We then calculated the percentage variation in this standardised score from one year to the next for both strengths and concerns and this becomes the CSR score that we use in our analysis<sup>3</sup>. It is important to note that strengths can be interpreted as relating to activities that go beyond minimum community standards and/or legal requirements while concerns can be interpreted as relating to a level of CSR activity that fall short of meeting minimum community and/or legal requirements.

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<sup>1</sup> The other two qualitative screens of stakeholder management enter the corporate governance and human rights categories, but we decided not to include them in the analysis because of a paucity of data in the KLD database.

<sup>2</sup> We do not analyse in this study any of KLD's social issue scores because, as Hilman and Keim (2001) point out they have a doubtful relationship with financial and market performance.

<sup>3</sup> We did not adjust the scores in the attempt to remove any effect caused by industry characteristics, as suggested by Griffin and Mahon, because our analysis is at time-series rather than cross-sectional level.



*The corporate performance measures* used in previous studies have largely been based on accounting performance. McGuire et al. (1988) were one of the first to use a combination of accounting performance and stock-market-based performance indicators. As they stated, corporate market performance has several advantages over accounting measures in terms of being less sensitive to accounting principles and manipulations and more closely linked with the future (rather than past) economic performance of the company. In order to maximise comparability with previous studies, we decided to use both a market and an accounting measure of performance: excess market return and return on equity. The data for returns was obtained from Datastream Thompson Financial over the period 1991 to 2003. The analysis was conducted as of the end of April each year and so annual market returns are the 12-month geometric returns commencing the end of April each year<sup>4</sup>. The annual excess returns (hereafter, ER) are then the ratio between these annual returns and the returns over the same 12-month period of an equally-weighted portfolio consisting of all of the stocks included in our sample for the 12-month period.

The return on common equity (hereafter, ROE) was calculated for each firm by dividing the net income of the firm by the book value of common equity, obtained from Worldscope as of April each year and was constructed using the most recent released information available at that time.

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<sup>4</sup> The month of April was used to undertake the analysis each year as it represented the best possible compromise between the release of the KLD ratings and the public release of the accounting information.

*Free cash flow* is our measure of the availability of slack resources<sup>5</sup>. Cash flow from operations provides a measure of the resources generated from the operations in the previous period which the firm can either use to fund new investments or pay out to shareholders. From this figure we deduct net financial flows and net capital expenditures in order to obtain a measure of the resources that are available to allocate to activities including those designated as forming part of CSR. As mentioned earlier, neither excess returns (ER) nor return on equity (ROE) provide a reliable measure of the level of slack resources existing within a firm. Our data on free cash flow is collected from Worldscope as at the end of April each year.

### **Descriptive Statistics and Correlation Analysis**

In table I we document the main descriptive statistics on the CSR (both strengths and concerns) and the corporate performance measures. We also report the result of the stationarity test, aiming at investigating the characteristic of the indicators used in our analysis. Considering whether the CSR and CP measure are stationary (in the sense of covariance stationary) has been ignored in previous tests but is crucial because the results (such as regression coefficients) as well as the conclusions drawn on the possible relationship might otherwise be spurious. All the measures we used are found to be stationary at the 99% conventional critical value of the Augmented Dickey-Fuller (hereafter, ADF) tables.

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<sup>5</sup> Seiffert, Morris and Bartkus (2004) make the same point that financial performance is an inadequate measure of the availability of discretionary resources. They use cash flow as their measure of discretionary resources when analysing what motivates management to make cash donations to charitable organisations

## Method

Because our focus is on what causes a firm to invest in socially responsible activities, we decided to perform an instrumental analysis on the connection between stakeholder strategies (social responsiveness) and conditional performance. We sought to overcome the deficiencies of previous studies by building our methodology on a strong conceptual foundation so as to permit us to identify the direction of causation (lead-lag effects) between CSR activities (either *strengths* or *concerns*), corporate performance and corporate free cash flow. We would like to stress that to our knowledge our paper is the first to apply an appropriate method to a suitably long time series of data to be able to meaningfully analyse the nature of causation between CSR and corporate performance.

We employ a Granger-causality test and an impulse-response function with variance decomposition to allow us to determine the sign, frequency, intensity and, particularly, the order of the relationship between the variables. We first seek to replicate the relationships, already analysed in previous studies, between CSR and corporate performance by using a bivariate vector of autoregression (VAR) to examine the relationship between CSR and each of our two performance measures, either excess returns or ROE. However, we should point out that a bivariate approach is not adequate to differentiate between the two hypotheses, slack resources and good management, because of the potential interaction we would omit between free cash flows, return-on-equity or excess returns and CSR (as either STR or WKN). We overcome this inadequacy by introducing free cash flow as our proxy for slack resources and so undertaking a trivariate approach to investigate the relationship this time between the three variables (free cash flows, CSR, and each of the two performance measures, excess returns and ROE).

The vector of autoregression has proven useful for investigating the relationship between stock returns and other financial (Bird and Casavecchia, 2006) or non-financial (Lee, 1992) variables. It can provide interesting findings not only on the *existence* of a lead-lag relation between each of the variables considered in the system but also on the *direction* and *magnitude* of the causality among variables. For this reason, we decided to examine:

- a. The *existence* of a causal relation between free cash flow, CSR and corporate performance. For this purpose we performed for each company a Granger test to determine the frequency of causality between the variables being evaluated, as well as the percentage of any feedback running either way between the variables included;
- b. The *direction* of the reactions of the one or two variables by computing an impulse-response function in order to highlight also the reactivity of one variable (e.g. CSR activity and performance) to a 1-unit positive shock generated in another variable (e.g. free cash flows).
- c. The *magnitude* of causation among variables. This is obtained by decomposing the forecast error variance in order to attribute the appropriate proportion of variation in the residuals to each of the independent variables in the system.

A detailed description of the methodology is documented in the Appendix. Our findings are discussed in the next Section.

## SECTION 4: RESULTS

We conduct two forms of tests:

1. A *bivariate analysis*, where we seek to determine the nature of the causation between CSR activities and corporate performance, as measured by both excess market returns and ROE. As stated earlier, the general consensus is that there is a positive relationship between CSR activities and corporate performance but no study to date has adequately addressed the issue of the causation between these two variables;
2. We then introduce a third variable, free cash flow, and we conduct a *trivariate analysis* in order to gain insights into whether it is *slack resources theory* or *good management theory* that provides the best explanation for why management chooses to invest in CSR activities.

### **Bivariate Tests**

*The Granger causality test* was applied to all the covariance-stationary series and we computed the pair wise percentages of the times when the excess returns, the return on equity and CSR indicators Granger-cause each other, across all the universe of stocks. Panel A in Table II documents the difference in the adjusted- $R^2$  between a univariate VAR (e.g.  $ER_t$  on  $ER_{t-1}$ ) and a bivariate VAR (e.g.  $ER_t$  on both  $ER_{t-1}$  and  $CSR_{t-1}$ ). The inclusion of a CSR indicator (either STR or WKN) always generates an increase of in excess of 20% in the adjusted- $R^2$  of the autoregression where the ER is the dependent variable, but this is much smaller than the increase of in excess of 30% experienced when CSR is the dependent variable and ER is introduced as an independent variable. In the

same table we also report the *p-values* of the causation of the independent variable (e.g. CSR) on the dependent variable in the VAR (e.g. ER). If an independent variable is significant (at least at 90% conventional level) it is said to “Granger cause” the dependent variable. Both the CSR and the ER have a significant effect on each other when taken as the independent variable, with the probability of Granger causation being equal (50/50) when we consider the STR whereas in the case of the WKN, the CSR indicator seems to impact more frequently on ER (60%) than in the opposite case (40%). We repeat the same analysis in Panel B but this time we consider the ROE (rather than the ER) as our measure of corporate performance. In this case the measure of corporate performance (ROE) seems to explain a slightly larger portion of the CSR (as either STR or WKN) than was the case with ER, with an increase in the adjusted-R<sup>2</sup> of 38% (STR) and 35% (WKN). The variable that generates the highest effect (ROE) is also that with the highest probability of significant causation (59% on the STR and 53% on the WKN). However, as with ER as the measure of corporate performance, the one clear finding is that there is a relationship between CSR and corporate performance but no clear indication as to one being the dominant partner in the relationship.

In general, these findings seem to confirm part of the conflicting results obtained in the literature where in some instances corporate performance impacts more significantly on the CSR while in others the reverse is true (see Orlitzky et al.). The advocated reasons for the existence of this conflict in the literature are:

- Use of different corporate performance measures in the analysis, for example financial market rather than accounting measures;

- Use of different single or combined screens of corporate social responsibility in the analysis<sup>6</sup>;
- Failure to consider the contemporaneous relationship existing between the measures of corporate performance (ROE and ER) and the CSR indicators (single or combined).

The results in Table II highlight the importance of considering the large, significant and mutual relation between corporate performance and social responsibility. In addition, we also illustrate the frequency of contemporaneous feedback among the variables (last row of the table). These impacts, which range between 6% (STR) and 9% (WKN) in the case of ER and between 12% (WKN) and 15% (STR) in the case of ROE, emphasise the need to control for any simultaneous relation existing between the criteria considered when conclusions are to be drawn on the mutual sensitivity of CSR and corporate performance.

### **Trivariate Tests**

*The Granger causality test* was also applied to assist us in addressing the question we raised earlier in this paper: What is the motivating force that causes management to invest resources in CSR? As already mentioned, the two explanations commonly put forward are:

- The “*slack resources*” theory, where better financial performance leads the management to the availability of investment opportunity, and so to the allocation of resources to social responsible activities, and

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<sup>6</sup> The authors also plan to replicate the analysis of the paper by using single qualitative screens of CSR rather than their combination. For example, we expect a higher intensity of causation between corporate performance and strengths or concerns related to environment rather than diversity.

- The “*good management*” theory, where an effective stakeholder management leads to a better financial performance through a value-creation process generated by better relationships with communities, governments, suppliers, customers and employees.

It seems quite evident that if we want to test whether one theory dominates the other (in terms of being more appropriate in representing the relation between CSR and corporate financial resources), we need to introduce free-cash flow (FCF) as an additional variable to quantify more accurately the availability of funds for financing CSR activities. This means that we need to expand our bivariate VAR in order to include FCF as a third variable as our measure of corporate slack resources.

Starting with the analysis of the frequency of causation, Table III documents the percentage of instances where there is significant (90%) Granger-causation of the independent on the dependent variable as well as the simultaneous effect existing between FCF, CSR and the corporate performance, represented by either ER (panel A) or ROE (panel B). In panel A, the trivariate VAR indicates that the most frequent causation on CSR is generated by FCF with this being significant 20% of instances with STR and 21% of instances with WKN. This frequency is particularly high when we realise that it does not impound any contemporaneous relationship between FCF and CSR (last chart in panel A). In terms of any impact generated by CSR, the frequency of causation falls in the fairly narrow range of 12.5 to 15% where the dependent variable is either FCF or ER.

When we use ROE, instead of ER, as a measure of corporate performance (panel B) the results are very similar. FCF is still the leading variable in affecting CSR (19% of instances on STR and 29% on WKN), though with a positive frequency of simultaneous



relation (10% with STR and 7% with WKN). The effect of CSR on corporate performance seems slightly stronger with the highest probability of Granger causality on the ROE (running at 19% from STR and 17% from WKN).

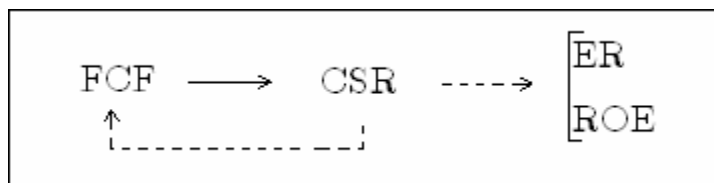
Table III highlights the importance of investigating the causal relationship between corporate social responsibility and corporate performance (ER or ROE) controlling at the same time for FCF. What might best be described as preliminary evidence suggests that FCF does have an impact on the level of CSR activities and that there is a flow on effect of CSR on corporate performance which is slightly stronger in the case of ROE than it is in the case of ER. Furthermore, these results also indicate that for some companies the causation might work in both directions, with the probabilities of causation being inflated by a feedback loop between CSR and financial performance, even though we are not able yet to analyse the nature of others have described as a virtuous circle. Indeed, this will constitute the aim of the next section of our analysis.

The Granger-causality tests may be useful for investigating whether, for example, the corporate performance is affected by, or is able to affect, the level of investment in CSR activities. “On the other hand, one may be sceptical about their utility as a general diagnostic for establishing the direction and magnitude of causation between ...arbitrary series” (Hamilton, 1994, pp. 308). Indeed, a simple test on the null hypothesis that there is no causal relationship may not constitute a good description of the data. A more interesting investigation might be to obtain empirical regularities as a result of an examination of the informative and predictive content of the dynamic interaction among variables as represented by either the *direction* of the response of a variable to the

independent variables used in the system or the *magnitude* of the impact of one variable on the other variables.

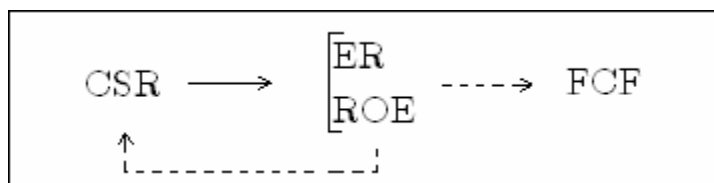
***Impulse-response functions and forecast error variance decomposition*** is computed in each autoregression in order to test both the direction and magnitude of the relationship between CSR and corporate performance. As explained in more detail in the Appendix, we decided to use the Choleski factorisation, because it permits us to test the two hypothesis of *slack resources* and *good management* and quantify the impact and response to shocks without any contemporaneous effect between the variables. Indeed, as already stated, a problem in the analysis of causality between corporate performance and social responsibility in the literature has been the difficulty to isolate the simultaneous interaction between the two factors analysed. Therefore, the recursive information ordering of the Choleski method, allows us to determine the extent of the effect of a variable (e.g. excess returns), which is theoretically and *a priori* defined as being the leading phenomenon, on the variables that follow in the order.

Therefore, if we want to test whether *slack resources* leads the investment in social responsibility, and also quantify the extent of any feedback of CSR on free cash flows and financial performance (as expressed by either ROE or ER), we need to impose an *a priori* theoretical order to test the relevance of the theory under analysis. Our variable ordering would then be:



Further, slack resources theory does not necessarily suggest that such investments will lead to improved performance (Jensen, 1986) so one would not expect an overly strong positive relationship between CSR activities and either ER or ROE.

The alternative explanation for why management devotes resources to CSR activities is *good management* theory. Managers devote resources to improve the social strength or reduce the concerns simply because they are good managers who correctly identify that such investments are necessary in order to realise the full-performance potentials of the firm. Therefore, management does not require any stimulus such as the availability of surplus resources to invest in CSR activities and it would be expected that such activities would translate into superior future market (ER) and profitability (ROE) performance with this virtuous circle possibly affecting FCF in the current or the following fiscal year(s). The Choleski ordering that we use to test the relevance of the good management theory is given below:



Irrespective of the hypotheses we want to test, by choosing a particular recursive ordering of the variables we are implicitly asking a set of questions about forecasting the information conveyed by a criterion beyond that contained (and already discounted) in the criteria preceding in the order. Our expectation is that if a variable is the Granger-

prior event, in the sense that it happens before the others, we should not observe any difference by reverting the order of the variables.

In Figure 1 we illustrate two subplots with the results of the impulse-response function (IRF) and the forecast error variance decomposition (FEVD) analysis. In the first subplot we evaluate the order running from the FCF to the STR and ER whereas in the second subplot we substitute ROE for ER as the other measure of corporate performance. Starting with the impact of FCF on STR, both subplots illustrate a positive response of STR ratings to a 1-unit positive shock (increase) in our measures of corporate performance. These findings indicate that a positive innovation in our “slack” resources indicator generates an improvement in the following period (year) in the level of the strength scores. The magnitude of this impact is quite high (around 35%), confirming the results obtained with the Granger test where, regardless of the ordering, the FCF had the highest frequency of causality on the STR when compared to either ER or ROE.

Continuing with the order of causation, in the first (second) subplot the response of the STR back on the FCF and ER (ROE) is positive in the first year and close to the long run value (i.e. zero) from the second year<sup>7</sup>, documenting some form of feedback from the level of CSR activities and corporate performance. The magnitude is, though, in almost all cases less than a third (around 10%) of the proportion of causation generated by the leading variable (FCF) on the STR itself. These findings are fairly supportive of *slack resources theory* with the availability of FCF leading to an increase in CSR activities which has a low effect on corporate performance, albeit much smaller than the impact that FCF has on CSR activities.

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<sup>7</sup> The fact that all the response functions “smooth” to zero is a consequence of the series being covariance stationary.

In Figure 2 we report our findings as to whether the availability of FCF leads to greater CSR activities as represented this time by WKN. Again the findings are split into two subplots according to the particular measure of financial performance we consider (ER or ROE). The conclusions are the same irrespective of the measure of corporate performance used with FCF again explaining the largest proportion (approximately 40%) of the variance (FEVD) of the response of the WKN<sup>8</sup>, although with a slightly stronger feedback than was the case with STR (around 20% compared with the previous 10%) with a relatively small impact of any change in CSR activities on future performance. In terms of the direction (IRF), the consistency of the results evidenced by the response function is striking: the relationship between FCF and WKN is always negative, supporting the hypothesis that an improvement in the amount of funds available to the managers for discretionary investments (FCF) results in a percentage reduction of the concern ratings (better social posture). In other words, management with access to FCF will use some of these funds to redress any existing situations where their CSR activities are falling short of minimum community and legal standards.

In general, we interpret the findings in figure 1 and 2 to mean that free-cash flows *lead* cross-sectionally to higher expenditures on CSR activities (as measured by either more positive strength scores or less negative concern scores), which subsequently has a positive, albeit smaller, impact in the following year on corporate performance as represented by either ER or ROE. In general, the results confirm the validity of our Choleski ordering, indicating the high plausibility of the slack resources theory.

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<sup>8</sup> There is a slightly stronger feedback from CSR(WKN) to FCF than was previously the case with STR (around 20% compared with the previous 10%)

In Figures 3 and 4, we test the alternative hypothesis by reverting the variable ordering to where CSR now leads both corporate performance and FCF. Starting with Figure 3, we impose the STR as the causally prior event affecting in the upper (lower) subplot the ER (ROE) and the free cash flow. We repeat the same approach for the two subplots of Figure 4, where instead we analyse the corporate concerns (WKN). The analysis of the IRF in both subplots of Figures 3 and 4, illustrates that the direction of the causation is not affected, as we might expect, by the different order of the variables. Indeed, STR (WKN) in Figure 3 (Figure 4) impulses and responds positively (negatively) to a 1-unit shock in the variables that follow in the order (ROE and ER), confirming the validity of the good management hypothesis in terms of the sign of the causation. However, IRF does not provide any indication of the intensity of these responses and so cannot by itself allow us to determine the extent to which *good management theory* is the major motivating factor for management to invest in CSR activities. Indeed, the question is of whether the initial engagement in the corporate posturing behaviour (CSR) might boost financial performance (e.g. improved investor and community relations, higher competitive advantages in attracting better employees, minorities or a wider spectrum of customers, as proposed by Jensen, 2001) without any concern about the availability of free cash flows to fund these CSR activities. The answer to this question lies in the FEVD for both STR and WKN reported in the second row of each subplot of Figure 3 and Figure 4. Commencing with STR (Figure 3), the proportion of the forecast error variance of either the FCF and ER (upper subplots) or the FCF and ROE (lower subplots) is typically less than 20% which is much less than the impact generated by FCF on the CSR (almost 40%). The same conclusion holds in the case of the WKN (Figure 4), with the

one observation worth noting being that the impact of the WKN on the ROE and in particular on the FCF is larger than was the case for STR.

Overall the FEVD analysis provides much stronger evidence to support the *slack resources*, rather than the *good management*, explanation for what motivates management to expend resources on CSR activities. This finding is much stronger when explaining investments in CSR activities that take companies above minimum standards (STR) than is the case for expenditures on CSR activities that move companies towards these standards (WKN), a finding that is particularly noticeable when ROE is used as the corporate performance variable. This raises the question as to why the strength of the causation should vary in the cases of STR and WKN. The answer probably lies in the fact that expenditures on CSR activities that take a company beyond minimum community and legal requirements (STR) is likely to be far more discretionary than expenditure on CSR activities that raises the company closer to these standards. As a consequence, one would expect to see stronger evidence that FCF was the motivating factor for higher STR scores than would be the case for WKN. Further, previous evidence suggests that there will be a stronger association between WKN and corporate performance than is the case between STR and corporate performance. Our findings support this suggestion but surprisingly only in the case where ROE is the performance measure but again this is the performance metric that has been used in most of the previous studies that have examined this issue.

## SECTION 5: SUMMARY

Previous studies have found the relationship between CSR activities and corporate performance to be a virtuous circle with each impacting almost equally on the other and there being no obvious starting point in the relationship. The findings in these studies do not enable us to determine with any great certainty which of *slack resources theory* or *good management theory* bests encapsulates the motivating force that causes management to invest in CSR activities. When replicating these studies we also find it impossible to determine the direction of the relationship between CSR activities and corporate performance which means that we cannot differentiate between the two theories as to which provides the best explanation for what motivates management to invest in CSR.

However, we also point out that we would not expect the previous studies to resolve these issues as they have neither posed the right questions nor employed the appropriate statistical techniques. We introduce a third variable into our analysis, free cash flow, to afford us the opportunity to differentiate between the two theories proposed to explain management behaviour and we also employ appropriate statistical techniques to enable us to measure both the direction and the strength of the relationship between CSR activities and corporate performance. We find that there is a much stronger relationship between FCF and CSR activities than between either of our performance measures and CSR activities. This finding strongly supports the proposition that it is access to funds in excess of a company's immediate needs that is the main motivating force for management to decide to devote increased resources to CSR activities. In other words, it



is *slack resource theory* rather than *good management theory* that provides the best explanation for what causes management to invest in CSR activities.

We have also noted that this finding is stronger when we are considering STR than when we are considering WKN. The result should not be all that surprising as meeting legal and community requirements may not be regarded as discretionary expenditures and so their funding does not solely depend on access to resources surplus to current needs. Further, previous studies have identified expenditure on CSR activities of this type results in improved corporate performance. However when we consider CSR activities that go beyond this minimum requirement, we find that management is only motivated to undertake these activities at those times when it has available funds in excess of its immediate needs. Writers have previously found that such expenditures are not in general well rewarded in terms of future accounting and market performance. For example, Bird et al (2007) found that expenditures on employee related activities were the only one of five areas where the market rewarded activities that went beyond the minimum standards. The conclusion that we draw is that management does not spontaneously invest in CSR activities that take the company beyond minimum standards because there is not a strong link between such investment and future performance.

Overall we have established that the inadequacies in the previous studies that have investigated the causal relationship between CSR activities and corporate activity has lead to their finding that it is a virtuous circle with no obvious starting point. This study demonstrates that these findings are largely the consequence that they fail to consider what is the true starting point in the relationship, free cash flow, and the inclusion of this variable enables us not only to determine the true strength of the relationship between

CSR activities and future performance but also to gain a better insight into what it is that causes management to invest in CSR activities.

It should be emphasised that the interpretation that we can place on our findings is restricted by the fact that our analysis only includes US companies and we have only examined CSR activities in aggregate. Hence we believe that an important extension would be to conduct a similar study using data on companies in other countries and also to disaggregate the CSR scores in order to be able to determine whether our findings could be generalised to individual types of CSR activities.

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**Table I**

The table shows the main descriptive statistics obtained from the indicators of corporate performance (ROE and ER), corporate social responsibility (STR and WKN) and corporate free cash flow (FCF), as well as the results of the Augmented Dickey-Fuller test (ADF) and the critical values corresponding to a 99% significance level.

<b>Descriptive Statistics</b>	FCF	STR	WKN	ER	ROE
Mean	0.118	0.002	0.006	-0.001	0.098
Median	-0.085	0.000	0.000	-0.004	-0.014
Std Dev	2.056	0.071	0.084	0.097	1.299
Min	-3.656	-0.125	-0.136	-0.157	-0.929
Max	2.558	0.113	0.182	0.150	2.685
ADF t_stat	-4.583	-4.922	-4.631	-5.139	-4.286
Crit_Value (99%)	-3.640	-4.200	-4.200	-3.640	-3.640

Table II

### Granger Causality and Frequency of Feedback in the Bivariate VAR

The table shows the results of a Granger test on bivariate vectors of autoregression on the stationary series of the CSR and both excess returns (Panels A) and ROE (Panels B). In Panel A (B), we document the relation between CSR and ER (ROE) in terms of the increase in the adjusted  $R^2$  from the univariate (e.g.  $ER_t$  on  $ER_{t-1}$ ) to bivariate (e.g.  $ER_t$  on both  $ER_{t-1}$  and  $CSR_{t-1}$ ) autoregression. In the same tables we also report the percentages of Granger causality as well as the p-values related to a 90% significance level, computed across all stocks in the US market. At the bottom of the two panels (A and B) we added an additional row documenting the frequency of contemporaneous feedback (virtuous circle) existing between pairs of variables in order to highlight the relevance of controlling for simultaneous impact of the two variables considered on each other.

Panel A					Panel B				
CSR: STR					CSR: STR				
Granger Test	Adjusted- $R^2$		p-value (% of causation)		Granger Test	Adjusted- $R^2$		p-value (% of causation)	
	univariate	bivariate	ER	CSR		univariate	bivariate	ROE	CSR
ER (dep. var.)	21.4%	41.9%	---	0.072 (50%)	ROE (dep. var.)	2.2%	31.0%	---	0.058 (41%)
Csr (dep. var.)	2.9%	34.4%	0.029 (50%)	---	Csr (dep. var.)	7.4%	45.0%	0.059 (59%)	---
CSR: WKN					CSR: WKN				
Granger Test	Adjusted- $R^2$		p-value (% of causation)		Granger Test	Adjusted- $R^2$		p-value (% of causation)	
	univariate	bivariate	ER	CSR		univariate	bivariate	ROE	CSR
ER (dep. var.)	22.0%	44.8%	---	0.050 (60%)	ROE (dep. var.)	8.1%	40.7%	---	0.044 (47%)
Csr (dep. var.)	5.2%	37.8%	0.064 (40%)	---	Csr (dep. var.)	5.5%	40.6%	0.055 (53%)	---
Contemporaneous Feedback Between Variables									
ER-STR	5.6%	ER-WKN	8.6%	ROE-STR	14.8%	ROE-WKN	12.5%		

**Table III****Granger Causality and Frequency of Feedback in the Trivariate VAR**

The table shows the results of a Granger test on the trivariate vectors of autoregression between the stationary series of the CSR (both STR and WKN), corporate performance (ER or ROE) and FCF. In Panel A we document the percentages of causality at a 90% significance level as well as the frequency of feedback computed among FCF, CSR (both STR and WKN) and ER across all stocks in the US market. Panel B documents, instead, the percentages of causality related to a 90% significance level as well as the frequency of feedback computed among FCF, CSR (both STR and WKN) and ROE across all stocks in the US market.

Panel A				Panel B				
Variables		Percentage of Granger-causation			Variables		Percentage of Granger-causation	
Explained		FCF	STR	ER	Explained	FCF	STR	ROE
FCF		---	12%	18%	FCF	---	15%	15%
STR		20%	---	14%	STR	19%	---	15%
ER		22%	12%	---	ROE	18%	19%	---
Variables		Percentage of Granger-causation			Variables		Percentage of Granger-causation	
Explained		FCF	WKN	ER	Explained	FCF	WKN	ROE
FCF		---	13%	22%	FCF	---	13%	13%
WKN		21%	---	13%	WKN	29%	---	14%
ER		14%	16%	---	ROE	13%	17%	---
Simultaneous Effect	Frequency	Simultaneous Effect	Frequency		Simultaneous Effect	Frequency	Simultaneous Effect	Frequency
FCF-STR	0%	FCF-WKN	0%		FCF-STR	10%	FCF-WKN	7%
STR-ER	8%	WKN-ER	7%		STR-ROE	5%	WKN-ROE	5%
FCF-ER	5%	FCF-ER	5%		FCF-ROE	15%	FCF-ROE	8%

Figure I

### Impulse-Response Functions and FEVD for the CSR-Strengths (STR)

The figure shows two subplots. In the first subplot we represent the pattern of both the Impulse-Response Functions (first row) and the Forecast Error Variance Decomposition (second row) obtained with the *Choleski* order FCF-STR-ER and applied to the trivariate VAR. In the second subplot, we repeat the same analysis for this time using ROE as a measure of corporate performance, with the order being FCF-STR-ROE. All the series analysed are covariance stationary series (as indicated by the Augmented Dickey-Fuller test).

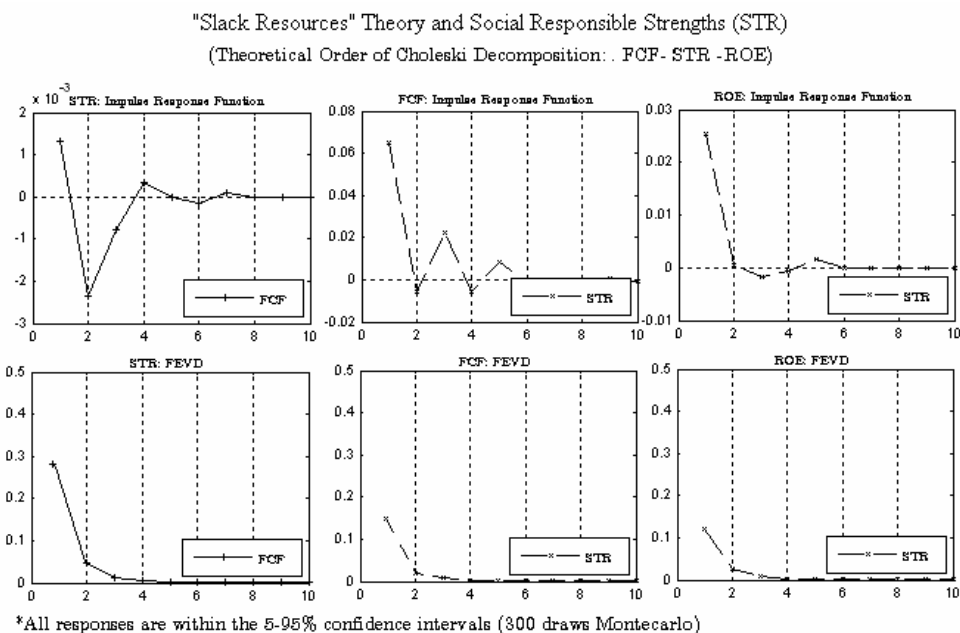
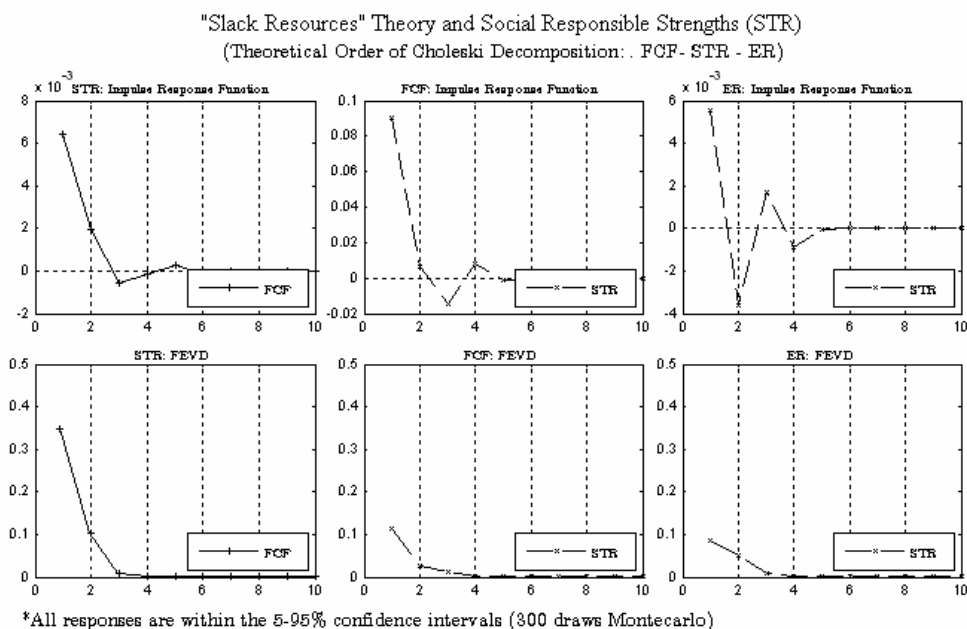


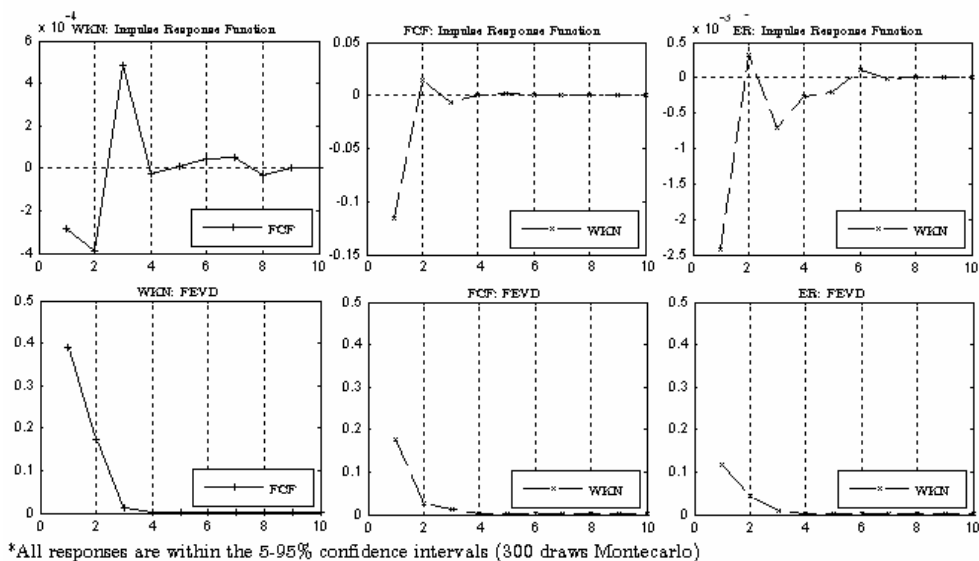


Figure II

### Impulse-Response Functions and FEVD for the CSR-Concerns (WKN)

The figure shows two subplots. In the first subplot we represent the pattern of both the Impulse-Response Functions (first row) and the Forecast Error Variance Decomposition (second row) obtained with the *Choleski* order FCF-STR-ER and applied to the trivariate VAR. In the second subplot, we repeat the same analysis for this time using ROE as a measure of corporate performance, with the order being FCF-STR-ROE. All the series analysed are covariance stationary series (as indicated by the Augmented Dickey-Fuller test).

"Slack Resources" Theory and Social Responsible Concerns (WKN)  
(Theoretical Order of Choleski Decomposition: . FCF- WKN - ER)



"Slack Resources" Theory and Social Responsible Concerns (WKN)  
(Theoretical Order of Choleski Decomposition: . FCF- WKN - ROE)

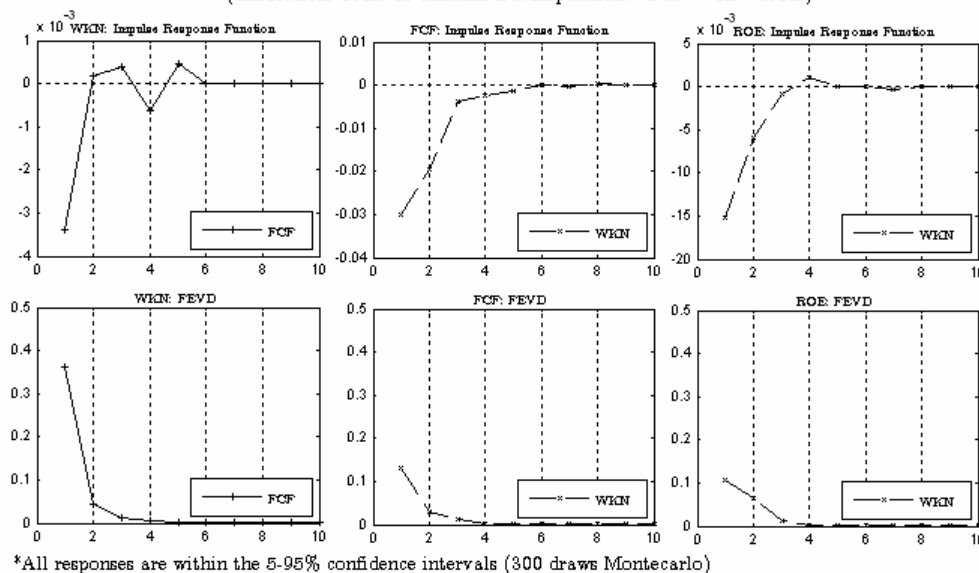
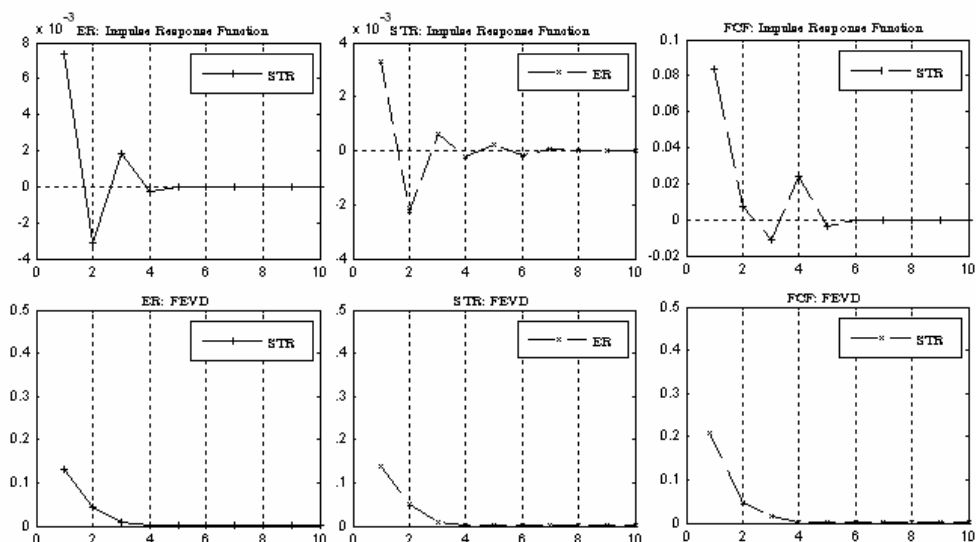


Figure III

### Impulse-Response Functions and FEVD for the CSR-Concern (WKN) Indicators

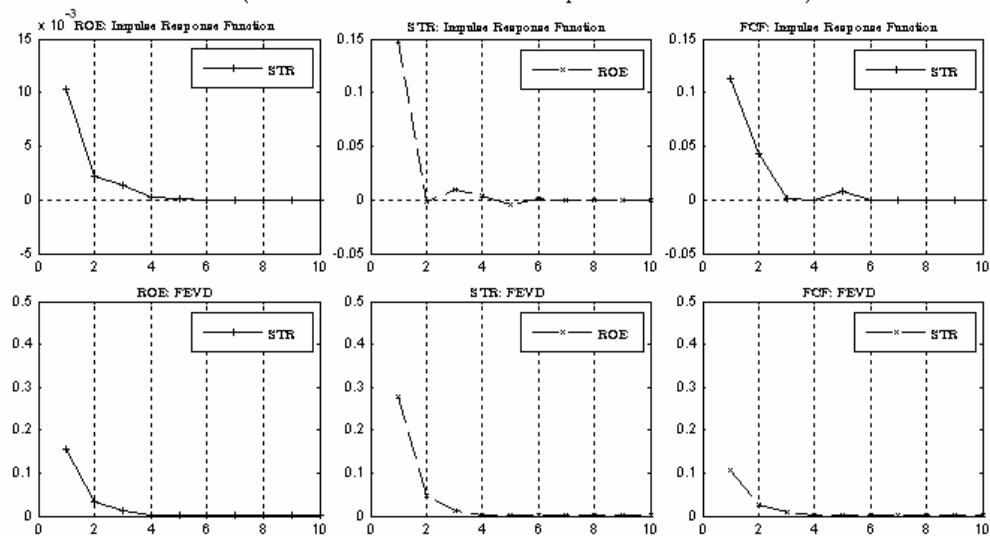
The figure shows the pattern of both the Impulse-Response Functions (first row) and the Forecast Error Variance Decomposition (second row) obtained with the *Choleski* approach and applied to the trivariate VAR in the case of the Concern (WKN) as a measure social investing. In each subplot we illustrate the response of each dependent variable to the three shocks in the independent variables used in the system. The analysis is repeated for all the stationary series in our sample of stocks (as indicated by the Augmented Dickey-Fuller test).

"Good Management" Theory and Corporate Performance  
(Theoretical order of Choleski Decomposition: STR - ER - FCF)



\*All responses are within the 5-95% confidence intervals (300 draws Montecarlo)

"Good Management" Theory and Corporate Performance  
(Theoretical order of Choleski Decomposition: STR - ROE - FCF)



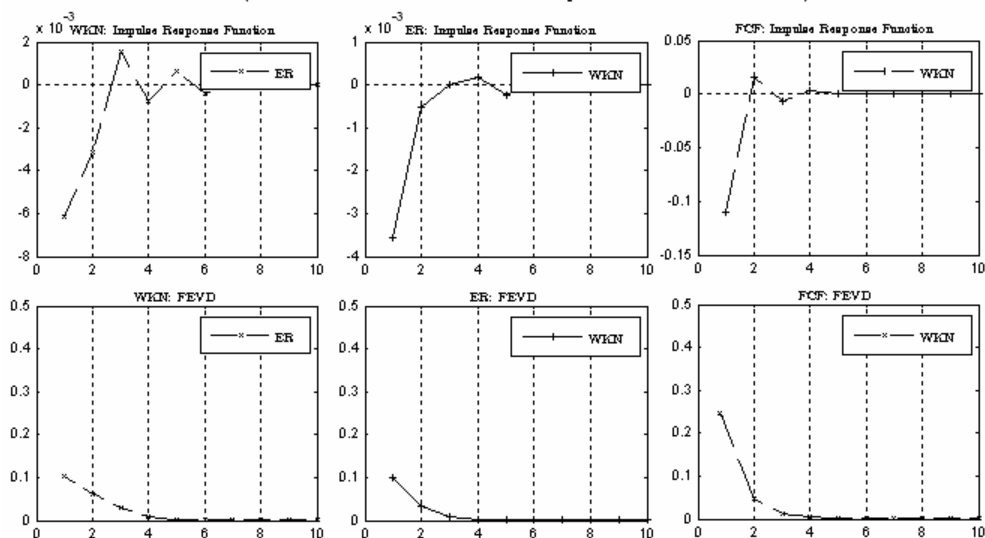
\*All responses are within the 5-95% confidence intervals (300 draws Montecarlo)

Figure IV

### Impulse-Response Functions and FEVD for the CSR-Concern (WKN) Indicators

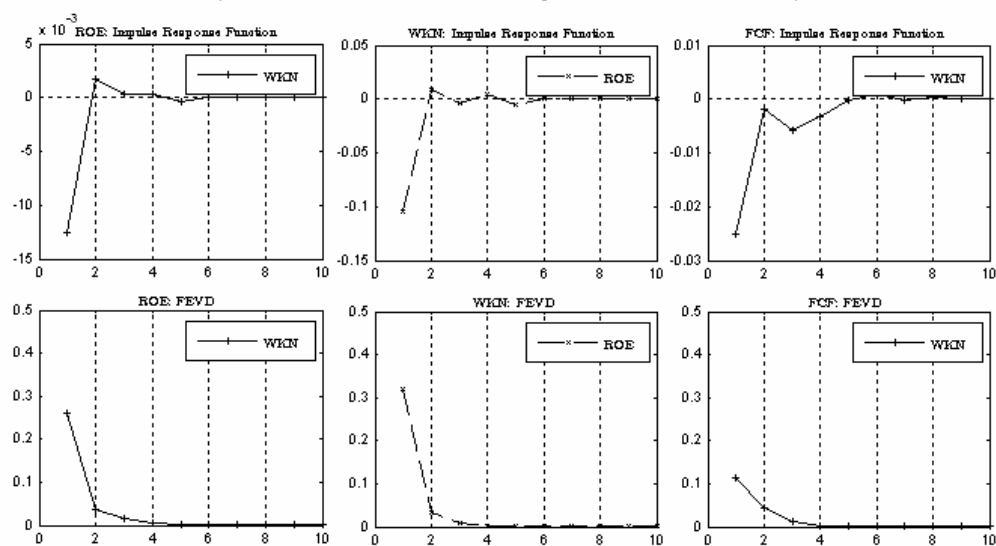
The figure shows the pattern of both the Impulse-Response Functions (first row) and the Forecast Error Variance Decomposition (second row) obtained with the *Choleski* approach and applied to the trivariate VAR in the case of the Concern (WKN) as a measure social investing. In each subplot we illustrate the response of each dependent variable to the three shocks in the independent variables used in the system. The analysis is repeated for all the stationary series in our sample of stocks (as indicated by the Augmented Dickey-Fuller test).

"Good Management" Theory and Corporate Performance  
(Theoretical order of Choleski Decomposition: WKN - ER - FCF)



\*All responses are within the 5-95% confidence intervals (300 draws Montecarlo)

"Good Management" Theory and Corporate Performance  
(Theoretical order of Choleski Decomposition: WKN - ROE - FCF)



\*All responses are within the 5-95% confidence intervals (300 draws Montecarlo)

## APPENDIX

The trivariate VAR used in our analysis consists of regressing an endogenous covariance-stationary variable  $y_{i,t}$  on past realizations of all the independent variables ( $y_{j,t-p}$ , for  $j=1, 2$ , and  $3$ , in our analysis). In this case,  $y_{i,t}$  can be compactly expressed as<sup>9</sup>:

$$\begin{bmatrix} y_{1,t} \\ y_{2,t} \\ y_{3,t} \end{bmatrix} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \end{bmatrix} + \begin{bmatrix} \beta_{11}^1 & \beta_{12}^1 & \beta_{13}^1 \\ \beta_{21}^1 & \beta_{22}^1 & \beta_{23}^1 \\ \beta_{31}^1 & \beta_{32}^1 & \beta_{33}^1 \end{bmatrix} \begin{bmatrix} y_{1,t-1} \\ y_{2,t-1} \\ y_{3,t-1} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1,t} \\ \varepsilon_{2,t} \\ \varepsilon_{3,t} \end{bmatrix} \quad (1)$$

where the coefficient  $\beta_{i,j}^p$  represents the effect of a change in the  $j^{\text{th}}$  variable at time  $t-p$  on the  $i^{\text{th}}$  variable at time  $t$ . Econometric tests of whether a particular observed series  $y_{j,t-p}$  causes (or *Granger-causes*)  $y_{i,t}$  can be based on an OLS estimation of the coefficients  $\beta_{i,j}^p$ . In the case of just one lag ( $p = 1$ ) and  $T$  observations, we conduct an *F-test* of the null hypothesis:

$$H_0 : \beta_{i,j}^1 = 0 \quad \forall i \neq j \quad (2)$$

If the *F*-statistic is greater than the 90% critical value for an  $F(p, T-2p-1)$  distribution, then we reject  $H_0$ , and conclude that  $y_{j,t-p}$  helps in forecasting (or is causally prior to)  $y_{i,t}$ .

This clearly does not imply that the series  $y_{j,t-p}$  *causes*  $y_{i,t}$  to move up or down.

If we want to examine not only whether one variable(s) leads (in the sense of being causally prior to) other(s) variable(s), but also the direction and magnitude of the causality, we need to compute the impulse-response function and decompose the forecast error variance of the dependent variables.

In the case of the IRF, formally we estimate the model:

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<sup>9</sup> The selection of the appropriate lag length for the independent variables in the VAR is based on different criteria. We used the Likelihood Ratio, the Final Prediction Error, the Akaike, Schwartz and Hannan-Quinn Information criteria. In most of the cases, the length returned by the different criteria is 1 lag (year). The results of these tests are available on request from the authors.

$$\frac{\partial \hat{E}(\mathbf{y}_{i,t} | y_{j,t-p}, \mathbf{x}_{t-p-1})}{\partial y_{j,t-p}} = \Phi_p \quad (3)$$

where  $\Phi_p$ , called *impact multiplier*, represents the impact of a shock hitting the  $j^{\text{th}}$  variable of the system at time  $t-p$  on the  $i^{\text{th}}$  variable of the system at time  $t$ , *holding all the other innovations constant in the other periods*. It can be used to visualize the effect of (1-unit) shocks on the time path of the dependent variables investigated. As already mentioned in the paper, by choosing a particular recursive ordering of the variables with the Choleski method, we are implicitly investigating the direction of the leading effect of one variable, the first in the order, on the others (those that appear later in the order). Ordering the variables is crucial, but more crucial is the theoretical dynamics of the group of variables used in our analysis (CSR and CP). Indeed, if the variance-covariance matrix of the shocks is positive definite (and symmetric), our ordering for the three variables implies that the vector of residual ( $e_{i,t}$ ) is related to a set of mutually orthogonal structural shocks ( $\varepsilon_{t-p}$ ) determined with the Choleski factorization, which implies the existence of a lower triangular matrix  $\mathbf{C}$  such that  $y_t$  can be represented as a function of orthogonalized innovations ( $\varepsilon_i$ ).

The result is that the innovation in one equation (e.g.  $y_1$ ) affects -but is not affected contemporaneously by- the other variables (e.g.  $y_2$  and  $y_3$ )<sup>10</sup>. For instance, the Granger causality of  $y_1$  on  $y_2$  and  $y_3$ , can be expressed as follows:

$$\begin{cases} \mathbf{e}_{1,t} = \varepsilon_{1,t} \\ \mathbf{e}_{2,t} = \mathbf{C}_{21}\varepsilon_{1,t} + \varepsilon_{2,t} \\ \mathbf{e}_{3,t} = \mathbf{C}_{31}\varepsilon_{1,t} + \mathbf{C}_{32}\varepsilon_{2,t} + \varepsilon_{3,t} \end{cases} \quad (4)$$

In this particular case,  $y_1$  is said to be “causally-prior” to  $y_2$  and  $y_3$ .

Finally, in addition to the impulse-response function we also document the forecast error variance decomposition (FEVD) obtained by deriving the error in forecasting variable  $y$

<sup>10</sup> In the particular case of a trivariate VAR, it is necessary to impose 3 ( $(n^2-n)/2$ ) restrictions (all the elements above the principal diagonal are set to be zero) on the model in order to identify the system (necessary but not sufficient condition to an exact identification of the structural VAR).

$t$ -steps ahead into the future. As previously demonstrated by Lee (1992), the variance of such forecasting error can also be expressed as:

$$\text{Var}(y_{t+i} - \bar{y}_{t+i}) = \Phi_0 \mathbf{I} \Phi_0' + \Phi_1 \mathbf{I} \Phi_1' + \dots + \Phi_i \mathbf{I} \Phi_i' \quad (5)$$

where  $\mathbf{I}$  is the identity matrix of rank  $m$  (in our case  $m$  equals 3),  $\Phi$  is a nonsingular matrix such that  $\Sigma^{-1} = \Phi' \Phi$ , and  $\Sigma$  is the symmetric positive definite variance matrix of the shocks in the structural VAR.

The previous formula permits to compute the share of the total variance attributable to the variance of each shock, when shocks are orthogonal to each other (as the covariance terms are zero given the orthogonality property of the shocks). In this way, we can assign the variance of each element in the series  $y_i$  to sources in elements of  $\varepsilon_i$ , given that  $\varepsilon_i$  are serially and contemporaneously uncorrelated. It follows that the FEVD can be expressed as:

$$\sum_{i=0}^{s-1} \Phi_{s,ij}^2 \Big/ \sum_{j=1}^m \sum_{i=0}^{s-1} \Phi_{s,ij}^2 \quad (6)$$

In equation (6), the numerator represents the proportion of forecast error variance in the  $t$ -step ahead forecast of the dependent variable  $y_i$  explained by the shock in the independent variable  $y_j$ .