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The effect of bad news on reputation and shareprice: An empirical survey

Term paper in the field of Social Sciences

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Table of contents:

0. Introduction

An Australian oil company shoves aside a rock monument with 30.000 year old aboriginal art on it to build a natural gas plant (Waelterli, 2007). This is hard to believe, but it happened. We can question the ethical beliefs of the operators, but it is unlikely that they change. But we can also ask, if this decision is good in terms of business. Is dirty business more efficient than ethically sound business? Or is it maybe the other way around? This is part of the archaic question about good and evil, which will not be answered in this paper. But it contributes its share to the quest, relating ethical conduct and financial performance.

For this investigation, two measures are needed: One measure of economic success, and one of ethical conduct. The shareprice is widely recognised to represent the overall value of a company and is also readily available. The measure of ethical conduct is less clear and by far more difficult to obtain. In this paper, a commercial index is used that builds on the news exposure of companies. The leading question is: Is there an effect of bad news concerning ethical conduct on the shareprice.

This effect can be positive or negative, of course. Usually, companies behave immoral only, if there is a special gain in profits connected to it. Hence it may well be that in the aftermath of bad news, the numbers go up. On the other hand, there is reputation that usually suffers from bad news. A loss in reputation can result in a monetary loss, but it is difficult to quantify and probably lagged in its effect. If companies act efficiently, they have considered this possible loss and weighed out against the profit. Due to the fact that reputation is an intangible asset and very hard to assess, chances are that these possible losses have not been considered. Framed in terms of risk management, the question is: Is there a systematic underestimation of reputational risk?

This question can be discussed on the company level and the portfolio level. The latter has been more fruitful, as timeseries of an individual shareprice are quite noisy and difficult to explain. The aim of this survey is to fish for evidence, if there is an effect that shows empirically and give indications on what could be the cause.

The paper is structured as follows: In the first section there is an overview of previous research relating corporate social responsibility and financial performance. The second section motivates the hypothesis, adressing reputation and the impact of news. The third and fourth section describe the data and methodology of the analysis in detail. The fifth section displays the results and section six concludes with interpretation and hints

for further research. The appendix includes a bonus chapter, describing first attempts for this project that have not been followed through but should not be forgotten altogether.

1. Previous studies

The question, how corporate social responsibility (CSR) influences the market value of a company is old and much debated. There are two competing schools, the cost-concerned and the value creation school. The cost-concerned school, whose most prominent representative is Milton Friedman, claims that there is a trade-off between CSR performance and financial performance and CSR activities would have been implemented already, if they were profitable (Friedman, 1962). The value creation school argues that CSR activities are a competitive advantage, spurring innovation, if they are conducted in the right manner (Porter and van der Linde, 1995).

There have been numerous studies, trying to show and quantify this relationship and to end this dispute. So far, there has not been a clear result. Several studies before 2000 have found evidence for the value creation hypothesis, most of them using the Fortune Corporate Reputation index and applying muliple timeseries regression models. The use of multisector samples and the range of lag times are the most critical points in surveys of this kind (de la Fuente Sabate and de Quevedo Puente, 2003). Lag times ranging from days to years have been proposed. It has been questioned, what kind of reputation the Fortune index measures. With respect to CSR research it seems inappropriate now, as its „usefulness is limited to measuring the extent to which a firm is perceived as striving for financial goals“ (Fryxell, 1994).

Another methodology is the superposition of windows from shareprice timeseries, selected on the basis of news events. It was recently indicated that the act of joining climate leaders, clearly a CSR activity, caused an immediate sharp drop in shareprices of the companies that did so (Thorburn, 2008). Another modern approach is to look at portfolios that incorporate CSR measures into their trading strategy (Stenström and Thorrel, 2007 as well as Kempf and Osthoff, 2007), which is also applied in this survey.

Results in CSR research will always greatly depend on the measure that has been used for CSR performance. It is unfortunate that many papers fail to specify, what exact measure of CSR performance has been used and how it was computed. This makes comparison among studies obsolete. There is an approach to measurement called norm-based (Stenström and Thorrel, 2007). All companies that violate some sort of norm, an

international treaty like the UN Global Compact for example, are said to have bad CSR performance. The advantage is that CSR is clearly defined. Another measuring approach builds upon reputation for CSR performance. In that case the nature of reputation and its measuring instrument has to be defined.

2. Reputation and the role of news

This chapter describes the line of thoughts, that make me believe that there could be an effect of bad news concerning CSR on the shareprice. In order to do that, the concept of reputation needs to be introduced and linked to news and shareprices. Reputation is an intangible asset. Following Eccles, Newquist & Schatz it can be defined as the belief that a company will fufill my expectations. As a consequence of different expectations that stakeholders have towards a company, reputation will also be different among them. An easy example is a company that pays very high salaries. Reputation among employees will be good, but among investors it will be bad. The overall reputation and its value, that makes up a part of the company's market value, is a function of these different reputations (Eccles, Newquist & Schatz). The goal is to maximize this function. CSR activities are directed towards employees, clients and the community and they serve their needs and expectations. Therefore, reputation within these groups will be positively influenced. Among investors, reputation may fall or rise, depending on if they believe that these additional costs will pay off. If we assume that the costs are immediate and potential investment benefits take some time and involve the risk of failing, it is fair to suppose that the investor's reputation will first fall, and later increase.

With reputation, though, I introduce another variable that has no agreed definition and cannot be measured in a standard way. I eventually use a news-based proxy, so here is the rationale of what reputation has to do with news. Reputation has not much to do with objective reality, reputation is perception (Eccles, Newquist & Schatz). We perceive most of the world via media and this is true for the financial world as well: „Finance is about how the continuous stream of news gets incorporated into prices. But not all news have the same impact.“ (Sornette, Malevergne, Muzy).

My idea is that a large sample of intelligently selected news should allow to detect its characteristic effect in economic datastreams. I assume that the news that make up the Reputational Risk Index from ECOFACT have the common characteristic effect that they hurt reputation among those that expect CSR activities from a company, most prominently

clients and employees. I further assume that this loss in reputation will result in a lagged loss of company value.
This provides the foundation for my hypothesis: High RRI values will result in lagged, low returns.

3. Data Specification

The investment universe for this study were the constituents of the MSCI World as of April 2008. The analysis was based on weekly closing prices of these securities. As a proxy for ethical performance, the Reputational Risk Index RRI from ECOFACT AG was used. Both of these commercial datasets were kindly provided by the respective companies for research purposes.
The MSCI World from April 2008 comprises 2876 securities. For the experiment, all those were used, that had no gaps in weekly prices during the observed period, resulting in 2446 securities.
The RRI is based on the global flow of news. The internet is searched automatically for any news that contain criticism towards any company. These news are screened by a team of analysts, to judge if the criticism is in the scope of a list of 26 defined environmental and social issues, e. g. child labour or local pollution. If this is the case, the news are rated on how severely they might weigh on the company's reputation, following specific guidelines. This results in entries in a database, relating a date, a company and measures of severity. From these discrete entries, a continouos timeseries of index values between 0 and 100 is computed. In the calculation, several news shortly following each other have a cumulative effect, if there is a period without news, the index value decreases. Identical news from different sources are not taken into account. So in short, the RRI is a measure of how often and how strongly a company has been criticized at a given time.
This RRI exists for 4212 companies. The data is not homogenous, because ECOFACT expanded, and nowadays a lot more news are entered as in the beginning of 2006 (see Appendix 1). This needs to be kept in mind. Another problem is, that the RRI of many companies is identical, which can be the case when companies are criticized together. I decided to use a subset of all those companies, that were at least 5 times entered into the database, to limit this problem. Hence the Matrix of RRI timeseries that was finally used, comprised 364 companies.

4. Methods

The aim of this computational experiment is to test a trading strategy that sells securities with a high RRI. To make the effect of this strategy more visible, I play the devil's advocate and do exactly the opposite: The strategy is to buy all companies with a high RRI. What is precisely tested is, if there is a difference in returns between a benchmark portfolio and a portfolio that consists only of companies that scored the maximum RRI in their sector. This is basically the same as to exclude specific companies from a benchmark portfolio and compare the remainders to the benchmark, but the difference is much clearer. When the initial portfolio is large and there is only a small fraction excluded, the difference will always be very small, even if the performance of the excluded companies is extraordinary. Considered as a small sub-portfolio, however, extraordinary performance of the selection can clearly be seen. A large initial portfolio, that serves in this context as an investment universe, allows for a worldwide scope, which is necessary to match the worldwide scope of the RRI.

Three portfolios are compared to each other: The MSCI World portfolio, the Max RRI portfolio and a simulated benchmark portfolios. The simulation was conducted to make sure that the difference in returns is not due to the difference in size. 10 securities were 200 times randomly selected out of the MSCI World portfolio. The mean return on these 200 simulated portfolios is, as expected, very close to the return on the MSCI world portfolio. Additionally, the set of simulated portfolios yields quantiles, that allow to diagnose, if the RRI portfolio performed significantly different from a randomly selected one.

The period of observation was from 2006-01-01 to 2008-04-01. The length of the screening interval was chosen as a variable between 11 and 52 weeks. Logarithmic returns were calculated at the end of each interval, measuring the performance of the portfolio for the duration of that interval.

The screening criterion was the maximum RRI. This maximum was computed per screening interval and sector, yielding the top-criticized company in a given interval in its sector. The ten sectors were defined according to the 10 main sectors of the NYSE sector classification. These resulting 10 companies formed the Max RRI portfolio, that was bought and held as an equal weighted portfolio for the following interval. Starting with the second interval, two returns per interval were compared: Return on the Max RRI portfolio

and mean return on the simulated benchmark portfolios, showing 5% and 95 % quantiles.

5. Results

The analysis resulted in 41 plots, covering an interval length from 11 to 52 weeks. As a selection, plots for interval lenghts of 12, 24, 32 and 40 weeks are shown in exhibits 1 through 4. Depending on how many intervals fit into the observation period, they display 1 to 8 comparisons between the returns on the Max RRI portfolio and the simulated benchmark portfolio. In total, there are 126 evaluated intervals.

There are 8 intervals, where the Max RRI portfolio significantly underperforms the benchmark and there are 5 intervals, where it significantly outperforms. In most intervals, performance is within the 5% and 95% quantile of the simulated benchmark portfolios. The results are quite sensitive to the interval length, but there are patterns that remain over a certain range of interval length. The results are also clearly dependant on the overall market development.

When comparing the results from different interval lengths, it needs to be kept in mind that not only the position of portfolios in the timeline of a changing market is altered, but also can the Max RRI portfolio have other constituents, due to a different screening interval.

Let's first have a look at the incidents, where performance of the Max RRI portfolio is significantly different. Significant means here, that the return on the max RRI portfolio is outside the 5% and 95% quantiles, therefore the null that the difference is a random result can be rejected on the 10% level. By that measure, the intervals can be nicely divided in two groups. Significant outperformance of the Max RRI portfolio is found in intervals of length 11, 13, 15, 18 and 22 weeks. Significant underperformance is found in intervals of length 11, 20, 24, 27, 28, 32, 33 and 35 weeks. That means in intervals longer than 22 weeks, there are only significant differences due to underperformance of the max RRI portfolio. Another characteristic is that the Max RRI portfolio significantly outperforms the benchmark only in times when the overall market performance is negative. The five intervals, when this is the case, all include October to December of 2007, when the market was suffering from the subprime crisis. But there are also two intervals of 27 and 28 weeks length, that include this critical period and where the max RRI portfolio significantly underperforms.

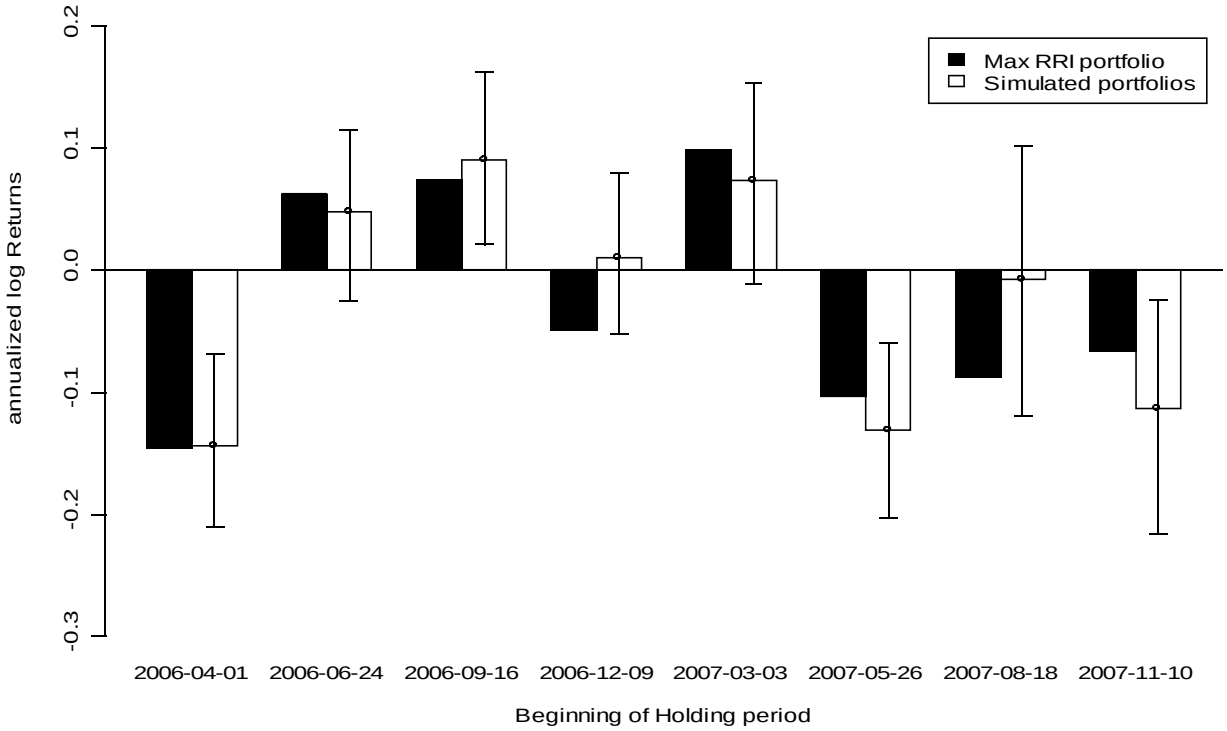

Exhibit 1: Returns on the Max RRI portfolio with an interval length of 12 weeks compared to the means of return on 200 simulated portfolios of equal size including 5% and 95% quantiles.

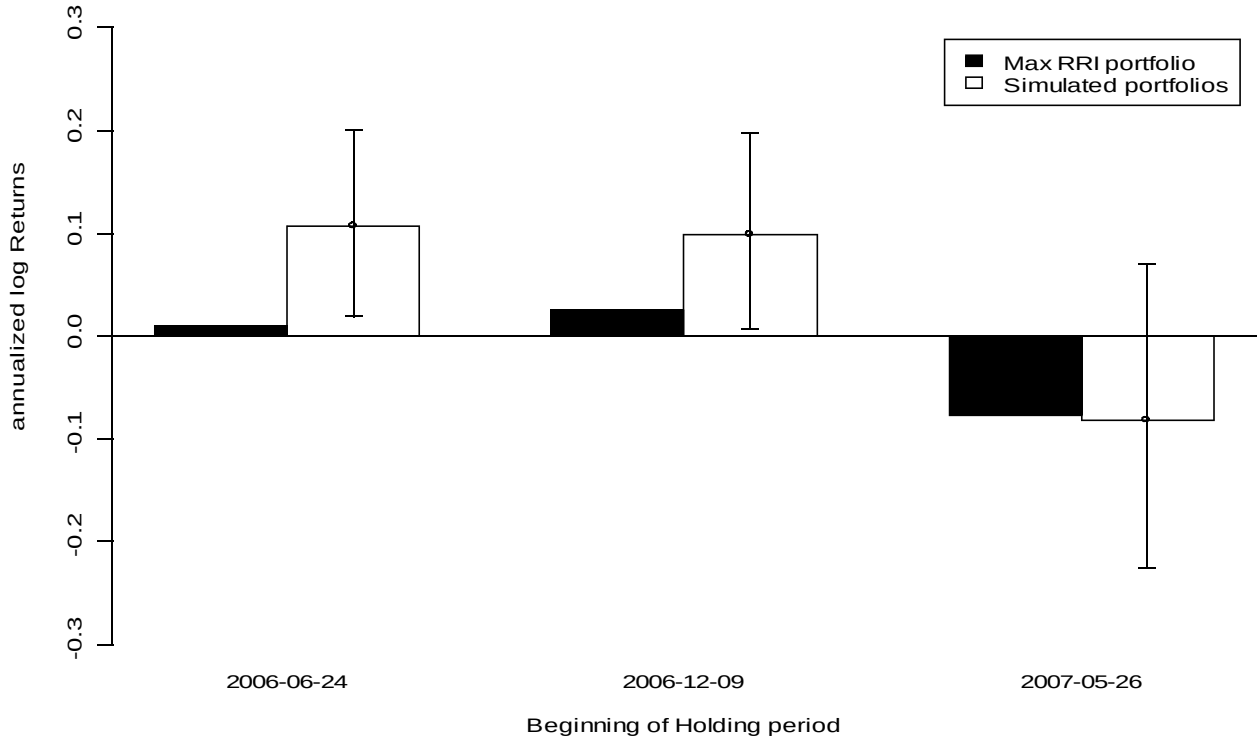

Exhibit 2: Returns on the Max RRI portfolio with an interval length of 24 weeks compared to the means of return on 200 simulated portfolios of equal size including 5% and 95% quantiles.

Exhibit 3: Returns on the Max RRI portfolio with an interval length of 32 weeks compared to the means of return on 200 simulated portfolios of equal size including 5% and 95% quantiles.

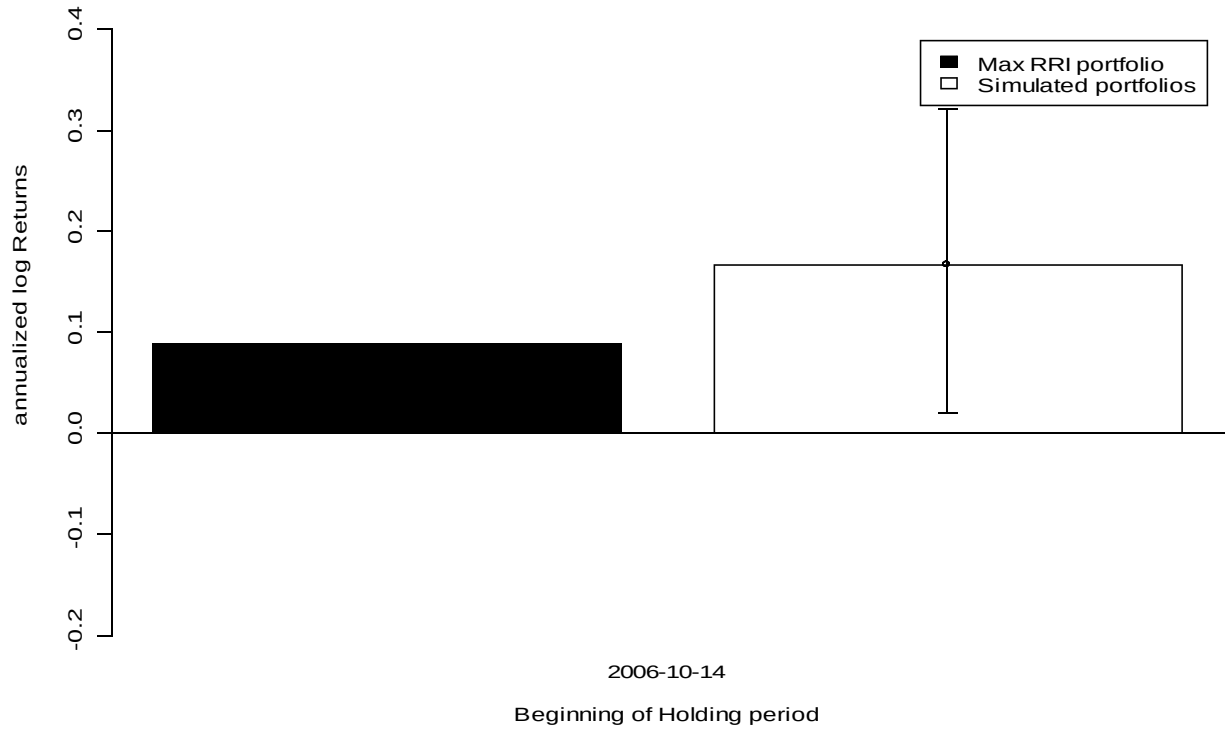

Exhibit 4: Returns on the Max RRI portfolio with an interval length of 40 weeks compared to the means of return on 200 simulated portfolios of equal size including 5% and 95% quantiles.

This picture is supported, when simply the presigns of differences are considered. Generally, the short intervals produce results, where under- and overperformance is mixed, as seen in Exhibit 1. Intervals longer than 24 weeks consistently show underperformance of the max RRI portfolio until August of 2007, when the subprime crisis started. Intervals that stretch over that date yield both under and overperformance, as can be seen on the right hand side of Exhibits 2 and 3. Intervals over 39 weeks long all show a larger return on the benchmark than on the Max RRI portfolio, as long as they do not include the subprime crisis. They all look similar to Exhibit 4, which is partially due to the fact that one week difference is less meaningful, when the interval is long. Interval lengths from 35 to 30 weeks show the pattern of exhibit 3 with lower return on the max RRI portfolio in the first interval, and higher return in the second interval, compared to the benchmark. In the group of all intervals longer than 24 weeks, the benchmark clearly dominates the Max RRI portfolio, yielding higher returns in 33 out of 46 occasions. In the shorter intervals there are only 36 out of 60 intervals with higher returns on the benchmark.

6. Discussion

The results suggest that in the long run, an RRI maximum is followed by losses. Significant differences and presign test both indicate that for periods longer than 20 weeks, a max RRI portfolio underperforms the market. The high sensitivity to the interval length, though, does not allow to pinpoint this effect. Looking at exhibit 2, one would definitely want to sell max RRI companies. But it was worthwhile to look at other interval lengths, because things are less clear for 23 or 25 weeks. But nevertheless, the range of results gives evidence for a lagged, negative effect of the RRI on returns.

This is in line with the assumption that it is not shareholder reputation that is hurt. Clients and employees are most concerned by the kind of news that go into the RRI. Bad reputation among them takes some time until it shows up in the numbers. Employees may decide to leave and, what may be worse, attractiveness to new employees could be lower, resulting in higher employment costs. Clients may have run away, which would diminuish revenues.

The observation that a max RRI portfolio can as well under- or overperfom in times of general loss, indicates that in times of crisis, other factors become important. It is well possible that investors, as well as all other stakeholders narrow their needs when things get rough. CSR would then be a thing for the sunny days, when everything else is running

smooth.

The subprime crisis was a period of considerable panic and is likely to have had a large impact on results. It is fate that the rather short observation period contains this dominating event. On the other hand, dependance on overall market development is an interesting result that may stay valid for the next time the market is stable. When considering that it is generally doubtful, if ex-post analyses survive regime shifts of the market, this conditional approach is much less naive.

To proof the predicting power of the RRI, one would have to work on the robustness of the results. One could apply a trading strategy that screens every week for RRI maxima with a constant lag and restructures the portfolio. This would yield multiple results of equal dimensions that can be exploited statistically. The most promising lag would be around 30 weeks. Additionally, one could introduce a condition on the sign of the market development, or concentrate on observation periods with stable bull markets.

Further research questions would be to conduct case studies to see, if the proposed reasons for the drop in shareprices can actually be found in the balance, looking at sales numbers and and employment costs. It will also be absolutely worthwhile to repeat this survey at a later time, when there is more data available.

7. Bonus chapter: Fishing for evidence

The goal of this thesis was to find a relationship between the RRI and the shareprice. Several approaches preceded the one presented in this paper. They were all abandoned, because I felt the applied methods did not measure the things I wanted to find out. Looking back on it, I think that there have been some interesting insights along the way that are worth to be mentioned here. In this appendix I briefly describe earlier approaches and results in order to prevent others from repeating it, or giving them a chance to do it in a smarter way.

The first attempts were all carried out with a small sample of the RRI for 10 companies. At the beginning I simply looked at the timeseries of RRI and shareprice, trying to find some sort of pattern, but there was nothing to see.

Following that, I tried a multiple timeseries regression of the RRI on returns. As additional explaining variables I used the three factors from Eugene Fama and Kenneth French's three factor CAPM model. I wanted to find out, if this model could be improved by adding the RRI as a fourth factor, possibly with some lag. The problem that halted me, was that the average R-squared of the three factor model was barely above 0.1, so that it did not make sense to improve this model with the RRI, because an R-squared of 0.2 would still be nothing. The only candidates with an acceptable model performance of R-squared over 0.5 were two Swiss banks. But this result could be attributed to the subprime crisis, as the RRI was good to explain the extreme drops in prices during fall 2007. That was nice for the model, but I am convinced it is a spurious correlation. High RRI values were not the cause and no predictor of the subprime crisis.

With crosscorrelations between returns and RRI I tried to find a useful lag time for the RRI timeseries, but there was no lag that worked consistently for several timeseries of the RRI. A result along the way was that the RRI is a non-stationary timeseries, which would be the foundation to do correlations. A Phillips-Perron test for the ten RRI series clearly showed that they have a unit root.

Worrying that I had done something wrong in my calculation for the CAPM model, I tried to reproduce a result from a manuscript, where a new two-factor capital asset pricing model is compared to the established three-factor model by Fama and French (Malevergne and Sornette 2007). The reproduction comprised the calculation of alphas and betas for ten industry portfolio timeseries that are available on the website of Kenneth R. French. The

original table from the referred manuscript and the reproduced table are shown in appendix 2 and 3. Doing this I understood that the CAPM only works for diversified portfolios, explaining the non-diversifiable risk, and that this model would never explain the prices of an individual asset properly.

The next approach was to forget about the timeseries nature of the RRI and to focus more on the effect of discrete news events. I selected news that were rated as having a very high reach throughout the media and looked at windows of the returns around this date. By superposition of these windows, I hoped to recognize some common pattern. This was clearly not the case as can be seen in appendix 4. I failed at the time to draw the useful conclusion that there is apparently no immediate impact from top RRI news on the shareprice. This analysis may actually be worthwhile to be repeated with a larger sample. One could argue that, in line with the results of the presented study, the effect of the RRI is not an immediate one, because it is not the kind of news that would upset shareholders. It is also a nice complement to the study of Karin S. Thorburn, showing that there is immediate investor reaction when positive CSR news are released.

The last approach, to incorporate the RRI into a trading strategy, has been presented in this paper. The road to it was wound, but I have learned a lot about doing research and it does not bother me to know that the road will always be like that.

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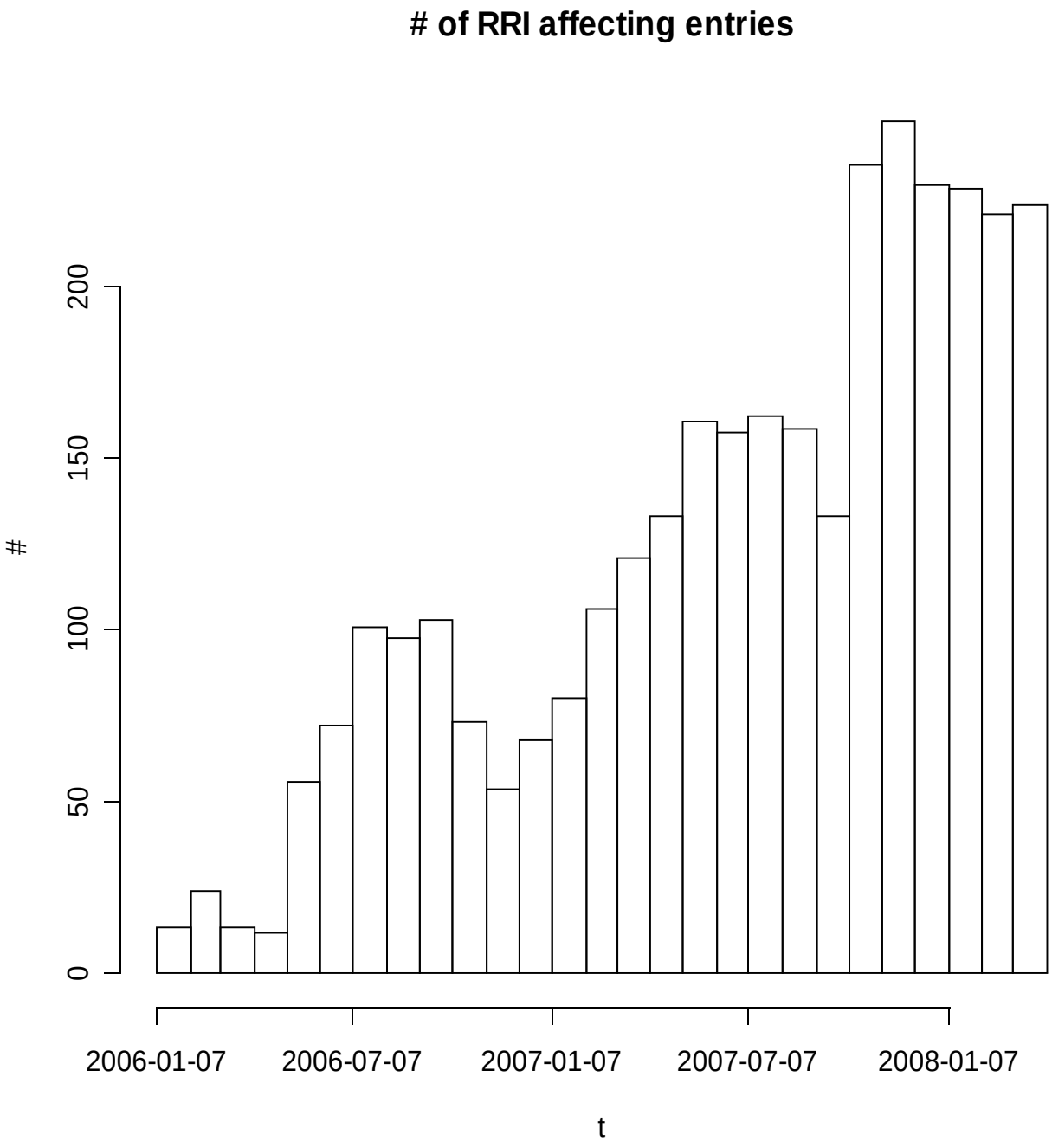
Appendix



Appendix 1: Histogram of RRI affecting entries in the RRI database for the 364 companies that have been entered at least 5 times.

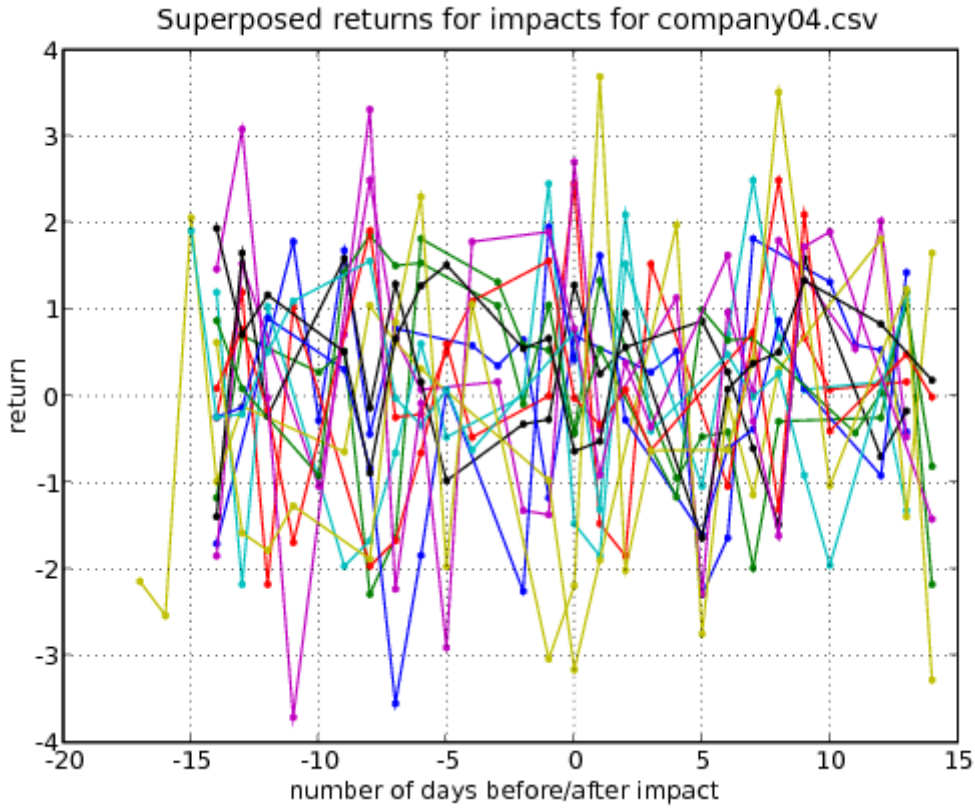
Table 7
Multi-factor time series regressions for monthly excess returns on 10 equally-weighted industry portfolios (R^2): Jan. 1927 - Dec. 2005, 948 months

R^2 of the linear regression of the excess returns of ten equally-weighed industry portfolios regressed on the (excess return) on the market portfolio (Rm), on the market portfolio and the factor ICC (ICC), on the market portfolio and the size factor (SMB), on the market portfolio and the book to market factor (HML), on the market portfolio and the two Fama & French factors (HML + SMB), on the market portfolio, the factor ICC and the size factor (ICC + SMB), on the market portfolio, the factor ICC and the book to market factor (ICC + HML) and, finally on the four factors (market, ICC, SMB and HML). Figures in boldface represent the maximum value of the R^2 within the group of regression with two factors (columns ICC, SMB and HML) and with three factors (columns HML + SMB, ICC + SMB and ICC + HML).

	Rm	ICC	SMB	HML	HML + SMB	ICC + SMB	ICC + HML	All four factors
Consumer Non Durables	75.9% (70.9%,80.5%)	**94.1%** (92.4%,95.5%)	88.4% (85.2%,91.2%)	79.7% (74.9%,83.9%)	91.8% (89.5%,93.9%)	94.1% (92.5%,95.5%)	**94.3%** (92.7%,95.6%)	94.3% (92.7%,95.7%)
Consumer Durables	74.4% (69.2%,79.2%)	**92.3%** (90.2%,94.2%)	87.9% (84.8%,91.1%)	76.9% (72.2%,81.9%)	90.2% (87.6%,92.6%)	**92.4%** (90.3%,94.3%)	92.3% (90.2%,94.2%)	92.4% (90.4%,94.3%)
Manufacturing	82.2% (78.3%,86.0%)	**96.7%** (95.7%,97.6%)	92.0% (89.9%,93.9%)	85.9% (82.5%,88.9%)	95.4% (93.9%,96.6%)	96.8% (95.7%,97.6%)	**97.0%** (96.1%,97.8%)	97.1% (96.2%,97.9%)
Energy	58.3% (51.7%,64.5%)	**67.8%** (61.9%,73.7%)	63.7% (57.6%,69.9%)	63.4% (58.6%,68.5%)	68.5% (63.0%,74.1%)	68.1% (62.3%,74.0%)	**69.3%** (64.0%,74.7%)	69.3% (64.0%,74.8%)
Business Equipment	74.5% (68.7%,79.9%)	**87.4%** (85.0%,89.8%)	86.2% (82.5%,89.4%)	74.8% (69.3%,80.1%)	86.6% (83.2%,89.6%)	88.0% (85.9%,90.4%)	**91.6%** (90.1%,93.0%)	91.8% (90.4%,93.2%)
Telecom	62.7% (55.4%,69.2%)	**68.2%** (64.0%,72.8%)	68.1% (61.4%,74.0%)	63.9% (56.5%,70.5%)	69.4% (63.4%,75.1%)	68.6% (64.2%,74.2%)	**72.6%** (69.0%,77.0%)	73.0% (69.5%,77.3%)
Shops	71.8% (66.7%,77.0%)	**90.1%** (86.2%,93.1%)	86.7% (82.8%,90.5%)	72.8% (67.7%,78.2%)	87.6% (83.6%,91.2%)	90.3% (86.6%,93.4%)	**90.4%** (87.1%,93.3%)	90.5% (87.1%,93.4%)
Health	65.1% (58.2%,71.3%)	74.5% (69.5%,79.0%)	**75.9%** (72.0%,79.7%)	66.4% (60.0%,72.5%)	77.4% (73.7%,81.0%)	76.2% (72.8%,79.9%)	**80.5%** (77.3%,83.7%)	80.5% (77.4%,83.8%)
Utilities	58.3% (51.0%,65.3%)	60.8% (52.8%,68.8%)	58.9% (51.6%,66.8%)	**65.9%** (58.2%,72.8%)	**66.5%** (58.3%,74.0%)	61.7% (53.8%,69.5%)	66.3% (58.3%,73.6%)	66.5% (58.5%,74.1%)
Others	71.9% (66.1%,77.2%)	**92.8%** (90.5%,94.8%)	83.6% (79.3%,87.5%)	81.6% (77.5%,85.3%)	92.7% (90.1%,94.9%)	93.4% (91.1%,95.3%)	**95.2%** (93.4%,96.6%)	95.2% (93.5%,96.6%)
Average	69.5% (65.0%,73.9%)	**82.4%** (79.9%,85.1%)	79.1% (76.0%,82.3%)	73.1% (69.0%,77.1%)	82.6% (79.9%,85.4%)	82.9% (80.5%,85.6%)	**84.9%** (82.9%,87.2%)	85.0% (83.0%,87.3%)

Appendix 3: Reproduction of table showing R-squareds of linear regressions of excess returns on ten industry portfolios for different factor models.

	Portfolio	Mkt.RF r.squared	+SMB r.squared	+HML r.squared	all 3 factors r.squared
1	NoDur	75.80%	88.30%	79.50%	91.70%
2	Durbl	74.40%	87.80%	77.00%	90.20%
3	Manuf	82.10%	91.90%	85.80%	95.30%
4	Enrgy	58.10%	63.50%	63.10%	68.20%
5	HiTec	74.30%	86.00%	74.70%	86.50%
6	Telcm	62.40%	68.00%	63.70%	69.40%
7	Shops	71.70%	86.60%	72.70%	87.40%
8	Hlth	65.20%	75.90%	66.60%	77.40%
9	Utils	58.30%	59.00%	66.00%	66.60%
10	Other	71.70%	83.40%	81.40%	92.60%
11	MEAN	69.40%	79.00%	73.10%	82.50%



Appendix 4: Superposition of windows of daily returns, centered at the time t=0 when a news with highly rated reach was released.