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To cite this article: Michael Schröder (2014) Financial effects of corporate social responsibility: a literature review, *Journal of Sustainable Finance & Investment*, 4:4, 337-350, DOI: [10.1080/20430795.2014.971096](https://doi.org/10.1080/20430795.2014.971096)

To link to this article: <http://dx.doi.org/10.1080/20430795.2014.971096>



Published online: 05 Nov 2014.



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Financial effects of corporate social responsibility: a literature review

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(Received 20 June 2014; accepted 16 July 2014)

This literature overview focuses on the latest results of academic research on the performance of socially responsible investments and the links between corporate social responsibility (CSR) and financing costs of companies. It covers not only the results for stocks (which are in the focus of research so far) but also the effects of CSR on bonds, loans, and default risk as well as “green” real estate.

The combined results on these different asset classes and financing instruments lead to a comprehensive up-to-date picture on the relationships between CSR activities of companies and their financing costs. It is shown that the costs for equity and debt capital are linked to CSR ratings with the consequence that companies with “good” CSR ratings exhibit on average lower financing costs. Thus, an (un-)ethical behavior of companies as defined by CSR ratings seems to be significantly related to the costs companies are facing.

Keywords: corporate finance; corporate responsibility; SRIs

JEL Classification: G3; G12; M14

1. Introduction

Over the last 10–15 years, the market for socially responsible investments (SRIs) has grown considerably in Europe and the USA. Interest of private and institutional investors is expressed by figures for market volume. In 2011 the investment volume of SRIs in the USA was around USD 3.3 trillion,¹ roughly 10% of investments under professional management (USSIF 2012). In Europe, the share of SRIs in professionally managed investments was about 17% with a market volume of ca. EUR 2.5 trillion² (Eurosif 2012).

Research on SRIs has also intensified, paralleling market development. Comparing SRI funds with conventional funds began in the early 1970s. Many new analyses based on a variety of econometric models and methods have been carried out and published, especially in the 1990s and since 2000, mainly to quantify differences in performance.

Up until today, also some survey articles have been published, summarizing the state of the research at the respective point in time. Orlitzky, Schmidt, and Rynes (2003), Renneboog, ter Horst, and Zhang (2008a) and Margolis, Elfenbein, and Walsh (2009) stand out among the most recent ones.³ Chegut, Schenk, and Scholtens (2011) give an overview on the state of the methodology in econometric performance analysis with respect to SRIs.

Our literature overview focuses on the latest results of academic research on the performance of SRIs and the links between corporate social responsibility (CSR)⁴ and financing costs of

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companies. It complements the existing surveys by considering not only stocks (which are in the focus of research so far) but also the effects of CSR on bonds, loans, and default risk. Investments in “green” real estate are covered as well. The analyses on stocks also cover portfolios of so-called “*sin*” stocks, that is, the “opponents” of SRIs, which give insights into the empirical effects of changes in the investment behavior and relative stock valuation.

The combined results on the different asset classes and financing instruments lead to a comprehensive up-to-date picture on the relationships between CSR activities of companies and their financing costs. It is shown that the costs for equity and for debt capital are linked to CSR ratings with the consequence that companies with “good” CSR ratings exhibit on average lower financing costs. Thus, an (un-)ethical behavior of companies as defined by CSR ratings seems to be significantly related to the costs companies are facing.

Our literature overview is structured as follows. Section 2 presents the latest research findings on SRI funds and SRI equity indexes.

Section 3 follows with an analysis on so-called long–short portfolios. These portfolios are composed of long positions in stocks with a good CSR rating and short positions in companies with a bad rating. This portfolio construction is similar to that of a hedge fund which would be exclusively based on information on CSR ratings.

The so-called “sin” stocks are considered in Section 4. “Sin” stocks are stocks that are *not* included in the SRIs universe but have been excluded from it by means of negative screening. “Sin” stocks typically include gambling, alcohol, tobacco, pornography, nuclear energy, and weapons production.

Sections 5 and 6 focus on areas that have not been in the spotlight of research on CSR so far. Section 5 analyzes how CSR ratings are connected to the cost of debt capital and credit default risk of companies. Section 6 addresses investments in real estate, particularly risk and return of “green” real estate. And section 7 concludes and gives an outlook to open research topics.

2. Performance of SRI funds and SRI equity indexes

The first studies on the performance of SRIs were carried out relatively early in the initial stages of this investment class. One of the most important early studies is Moskowitz (1972). The main finding of most performance studies until present is that SRIs do not exhibit significantly different (risk-adjusted) value development from conventional investments.

This result is surprising, given that theoretical approaches based on portfolio theory find that a limit to the investment universe, as would be a restriction to SRIs, should be detrimental to performance. Since the expected result may not be found due to potentially distorted estimations, many performance studies try to improve the econometric methods. Nevertheless these improved methodologies are only able to confirm the result that performance differences are insignificant in statistical terms and negligible in economic terms.

Older studies (Luther, Matatko, and Corner 1992) apply a simple market model in their analyses, which uses (excess) returns of an adequate market portfolio as the only explaining factor for (excess) returns⁵ of SRI funds. More advanced investigations include several additional factors. The now accepted standard models are the 3-factor model of Fama and French (1993) and the 4-factor model of Carhart (1997).⁶

Statman (2006) finds that the most important SRI indexes for US stocks do not exhibit a statistically significant outperformance. Nevertheless the indexes exhibit clear differences to the S&P 500 index: the average CSR score is higher and the tracking error seems to be relatively strong. A comprehensive analysis of 29 international SRI stock indexes was carried out by Schröder (2007). He uses multi-factor models similar to the Fama-French 3-factor model and systems of equations in order to quantify the performance of SRI indexes. Specific benchmark indexes are used, half of

which are denominated official benchmarks by the SRI index issuers. The results show that the (risk-adjusted) performance of SRI indexes does not differ significantly from that of the benchmark portfolios. However, SRI indexes exhibit a significantly higher *risk*.

The study by Bauer, Koedijk, and Otten (2005) uses multi-factor models in combination with a matching approach to test the performance of SRI funds in the UK, Germany, and the USA. The authors use the factors of Carhart's (1997) 4-factor model. The main findings are: First, the performance differences to the benchmarks are not significant. Second, some SRI funds exhibit different investment styles than conventional funds. In particular, German and the UK SRI funds invest more strongly in companies with low market capitalization, while the US SRI funds appear to favor relatively large companies in comparison with the selected conventional funds. Renneboog, ter Horst, and Zhang (2008b) analyze the performance of 440 SRI funds worldwide, taking into account 17 countries in North America, Europe, and Asia. Using the Carhart 4-factor model to compare the performance of the SRI funds with conventional funds yields almost no significant differences. However, returns of SRI funds in France, Ireland, Sweden, and Japan do differ from those of conventional investment funds.

Derwall and Koedijk (2009) is the only study addressing the performance of *SRI bond funds*. The authors include 15 bond funds and 9 mixed funds in their analysis. Bond funds focus on US bonds; mixed funds also invest in US stocks. In order to carry out the performance analysis, a control group of five conventional funds is formed for each SRI fund by means of matching. The matching criteria used are fund age, fund size, and investment policy. The performance of SRI funds, control group, and the difference of the portfolios is studied using factor models.⁷ The performance of SRI bond funds does not differ significantly from that of conventional funds, but there is an outperformance of mixed SRI funds which is significant at the 10% level.

Derwall & Koedijk interpret their results as that sustainability considerations in bond funds do not decrease performance for the investor. This is also the overall conclusion reached by the existing studies on the performance of funds and indexes of SRIs.

The reason for most of these studies not finding a significant outperformance could be due to the only moderate pronunciation of CSR aspects. One important result of the following section is that selecting only the best or worst rated companies (e.g. the 10% companies with the best or worst CSR ratings) will result in a clear and relatively high outperformance. In contrast, most SRI mutual funds and indexes exhibit only a small difference in company weightings relative to conventional funds or indexes.

3. Performance of long–short portfolios

A range of new studies analyze the performance of so-called *long–short portfolios* based on CSR ratings. These portfolios have the methodical advantage of targeting and identifying performance differences between companies with good and bad CSR ratings. The long portfolio comprises stocks with a high SRI rating while the short portfolio consists of stocks with a low SRI rating. Amount X is invested in the long portfolio; the same amount is sold short in the short portfolio. Therefore, the long–short portfolio does not exhibit any capital investment. If CSR ratings do not contain information on the future stock price, the performance of the long–short portfolio should not be significantly different from 0. The econometric analyses of long–short portfolios aim at identifying a positive or negative performance,⁸ which would show that CSR ratings are significantly correlated to stock performance. This approach also makes it possible to check whether high and low SRI ratings contribute differently to performance. Econometric estimations are usually carried out using multi-factor models.

There are two studies based on long–short portfolios which carry out broad SRI performance analyses for the US stock market. Derwall et al. (2005) use CSR ratings from Innovest.⁹ The

long–short portfolio and the two individual portfolios constructed based on these ratings are analyzed using a multi-factor model analogously to Bauer, Koedijk, and Otten (2005). The results indicate a significant outperformance of the difference portfolio of about 5% per year. As regards the two individual portfolios, the portfolio consisting of companies with a “good” rating exhibits a significantly positive outperformance, while the portfolio with the “bad” companies has a negative, yet insignificant performance.

Kempf and Osthoff (2007) use CSR ratings for US companies from Kinder, Lydenberg, Domini (KLD)¹⁰ and conduct a study similar to that of Derwall et al. (2005). They also find a significant, high outperformance for the difference portfolio of “good” and “bad” companies. The highest outperformance of 8.7% p.a. is yielded when applying a best-in-class screening,¹¹ including only the best and worst 5% of companies in the portfolio. Outperformance clearly decreases when more companies are included, such as the best and worst 25%. This is a crucial finding of the analysis: the higher the average CSR rating of the long portfolio, the larger the outperformance seems to become.

Furthermore, the best results are achieved when applying all six rating categories (Community, Diversity, Employee Relationships, Environment, Human Rights, and Product) as a positive filter. An analysis based on individual CSR rating categories only finds a significant outperformance for Community, Diversity, and Employee Relationships, but the combination of all six criteria exceeds these individual results. As in Derwall et al. (2005), significant results are only found for companies rated as “good”, but not for companies rated as “bad”.

The analysis by Edmans (2011) reaffirms the findings of the four previous studies on the effect of job satisfaction on stock performance.¹² Job satisfaction is one of the social criteria used in most CSR ratings. Edmans measures job satisfaction by looking at which companies are on the list of the “100 Best Companies to Work for in America”. The results, spanning the period of 1984 until 2009, show that the economic value of job satisfaction is not fully reflected in the stock price, that is, the effect of job satisfaction on the success of companies is systematically underestimated. Investments in a portfolio composed of the listed “100 Best Companies” generated an outperformance of around 2–3.5% per year, depending on the method of portfolio construction. This is a clear implication that the social CSR criteria can have a positive effect on the performance of stock portfolios. The systematic underestimation of the effect of job satisfaction through the stock market found by Edmans could be an explanation for the outperformance of SRIs when using long–short portfolios.

The very significant and high outperformance found for SRIs for the USA using the methodology of long–short portfolios seems to contradict performance estimations for funds and indexes which *do not* find an outperformance in most cases.¹³ One cause of this difference could be that performance improves when using only the extreme (positive and negative) CSR ratings for portfolio formation, as shown by Derwall et al. and Kempf & Osthoff.

The majority of existing SRI stock indexes and funds, however, not only include the few companies with a very good CSR rating but also a high number of companies with a mediocre, but still good rating. Therefore, the results could be watered down. Analyses by Kempf & Osthoff using the top 50% of CSR ratings point to this issue. In these cases, the authors no longer find a significant outperformance which is in stark contrast to the very high outperformance found when including only the few top-rated companies.

4. Performance of “Sin” stocks

The performance analysis of so-called “sin” stocks can shed more light on the relationships between sustainability and stock performance. “Sin” stocks are those stocks resulting from a negative screening of a given investment universe. SRI funds using a negative screening

exclude those companies that generate a large part of their business in the industries gambling, alcohol, pornography, tobacco, nuclear energy, and/or weapons production.

While investors' interest in SRIs has increased considerably over the last decade, "sin" stocks have been increasingly underweighted by institutional investors (Hong and Kacperczyk 2009). Both the greater weight on SRI stocks and the lower weight on their opposite may have had an impact on the performance of the respective group of stocks and the equity costs of companies.

Hong and Kacperczyk (2009) focus on US "sin" stocks in the areas of alcohol, tobacco, and gambling. For the period from 1926 until 2004 the authors show that long-short portfolios investing in "sin" stocks and selling short conventional stocks have an outperformance of 4.7% p.a. According to Hong & Kacperczyk, this high additional return is a risk premium for court fees and penalty payments which may be imposed on these stocks in the future.¹⁴ El Ghoul et al. (2011) find evidence for higher equity costs for the two "sin" areas of tobacco and nuclear energy.

Additionally, according to the findings of Hong & Kacperczyk "sin" stocks are underrepresented in institutional investors' portfolios and not covered by company analysts as intensively as comparable stocks in other industries. The market price for these stocks relative to their book value is thus below average and this underpricing results from a systematically lower demand by investors.¹⁵ Due to the relatively low market price and the ensuing higher equity costs, the "sin" companies exhibit a lower financing share of equity and a higher share of outside debt capital.

Fabozzi, Ma, and Oliphant (2008) come to a similar conclusion for "sin" stocks from 21 countries, which they analyzed over the period from 1970 until 2007. They consider a broader "sin" stock universe including alcohol, pornography, gambling, tobacco, weapons production, and genetic engineering. In 16 of the countries observed, "sin" stocks achieve a higher yearly performance than the chosen benchmark index. Some of the additional annual returns are very high, for example, 27.95% for the USA, 26.25% for Italy, and 25.65% for Sweden. There is no country for which the additional return is significantly negative. Among the six selection criteria of the "sin" stock universe, outperformance ranges from a maximum of 49.15% per year for gambling to a minimum of 1.4% per year for pornography. But as this study makes use of a market model to estimate outperformance instead of the commonly used Fama-French model or the Carhart model these results might be biased upwards.

The study of Derwall, Koedijk, and ter Horst (2011) complements the two previously presented analyses. The authors find significant excess returns for both a "sin" portfolio and an SRI portfolio. The estimates are made for the period spanning from 1992 to 2008. The two portfolios are constructed based on KLD ratings. The "sin" stocks comprise the areas alcohol, gambling, tobacco, weapons production, and nuclear energy, again a different composition than in Hong and Kacperczyk (2009) or Fabozzi, Ma, and Oliphant (2008). The SRIs portfolio is formed based only on the company ratings with regard to job satisfaction. Similar results are found by Statman and Glushkov (2009). They use the entire range of KLD SRI criteria (not only job satisfaction). Both the SRI stocks chosen using positive filtering and the "sin" stocks significantly outperform their respective benchmarks.

To summarize the results for stocks corporations of this and the previous section the following empirical results have been found: both the stocks of companies with a particularly high CSR rating and those active in "sin" sectors exhibit a significant outperformance. The historic outperformance of the former is interpreted as a systematic underestimation of the positive influence of SRI-related company characteristics by the stock market. In contrast, the observed outperformance of the "sin" stocks is explained as being a risk premium with regard to expected future costs. In addition, for "sin" stocks an underpricing has been found whereas for SRI stocks an overpricing seems to exist. This means that, on average, "sin" companies pay a relatively high price

for equity whereas companies with a high CSR rating are able to benefit from a lower-than-average price of equity.

5. CSR ratings, credit costs, and default risk

The analyses of the previous section almost exclusively address stocks and particularly the relationships between CSR ratings and stock performance. Some studies were able to show that equity financing costs are lower for companies with a high CSR rating than for comparable conventional companies (Galema, Plantinga, and Scholtens 2008; El Ghouli et al. 2011), while equity costs are higher for “sin” stocks (Fabozzi, Ma, and Oliphant 2008; Hong and Kacperczyk 2009; El Ghouli et al., 2011).

The results for equity and stocks suggest that similar relations could hold true for the relative costs of debt capital. Some studies directly address the links between CSR ratings and *borrowing costs* in order to analyze the influence of CSR ratings on outside capital financing. When evaluating loan inquiries, banks focus particularly on a company’s ability to pay off a loan. This is why differences in the relative borrowing costs between companies should indicate the underlying differences in default risk. According to the supporters of sustainable company management, companies with a higher CSR rating should exhibit a better long-term financial performance and a lower susceptibility to extreme risk. Thus, these companies should have to face lower borrowing costs. But the opposite hypothesis might also be true: higher costs and lower profitability, which are caused by a company’s sustainability efforts, could increase relative borrowing costs.

Goss and Roberts (2011) conduct a study on *borrowing costs* for 650 US companies between 1991 and 2006. Their assessment of companies’ CSR is based on KLD information. Their results show that companies with a below-average CSR rating have to pay slightly higher borrowing costs (5–11 basis points higher). When comparing companies of the best and worst CSR classes, a difference of 23 basis points can be found, which is due to higher average loan costs that have to be paid by companies with the worst CSR ratings. Although these results are statistically significant, the effect is of rather little economic importance for most companies.

Similar to Goss & Roberts, Oikonomou, Brooks, and Pavelin (2014) analyze the link between CSR and the costs of debt capital for US companies using KLD ratings. As opposed to Goss and Roberts, the authors do not look at the costs of loans but those of *corporate bonds*. They show that a higher CSR rating reduces the yield difference between corporate bonds and government bonds. This is mainly due to the CSR rating criteria “Support for local communities”, “Greater product safety and quality”, and “Prevention of conflicts with employees”. A company’s pronounced efforts to protect minorities, however, appear to increase return differences.

Kim, Surroca, and Tribó (2013) expand the geographic coverage of the analysis of Goss & Roberts by investigating the costs of debt financing for a sample of 175 companies in 15 different countries. The period analyzed is 2003 until 2006 for which data from 4554 syndicated company loans are used. The information on social responsibility is taken from the former SiRi PRO database.¹⁶ The aim of the analysis was to find out whether the loan spread, that is, the difference between the yield of the loan and the Libor, is significantly related to the CSR ratings of the borrowing company. The study finds that the loan spread decreases with an improvement of the borrowers’ CSR rating. This reduction is more pronounced when the lending bank also has an above-average CSR rating.

Cheng, Ioannou, and Serafeim (2014) analyze whether different CSR ratings can lead to differences in *access to capital* for US companies. CSR ratings are extracted from the Asset4 database of Thomson Reuters. The results of the study show that companies with a higher CSR rating are less affected by capital restrictions.¹⁷ The main cause according to Cheng et al. is that a

stronger commitment to CSR goes hand in hand with the building up of mutual trust and a company policy geared to the longer term, which reduces agency costs¹⁸ and therefore the required risk premia. In addition, companies more committed to CSR appear to have a more transparent information policy. The study by Cheng, Ioannou, and Serafeim (2014) is the only study with a very broad international scope. It includes data from 49 countries from 2002 until 2009.

Some further studies address special aspects of the (possible) influence of CSR on the costs for debt capital. The studies by Sharfman and Fernando (2008) and Bauer and Hann (2010) focus on those elements of CSR ratings concerning *environmental criteria* and their influence on costs of debt capital of US companies.¹⁹ Sharfman & Fernando show that companies with a relatively sound *environmental risk management* benefit from lower financing costs. They also appear to have better access to outside capital, which is expressed by a relatively high leverage. Bauer and Hann are able to evidence that companies with a relatively high KLD environmental rating incur lower costs for financing with corporate bonds and have a higher credit rating. Nandy and Lodh (2012) are also looking at the influence of environmental criteria on the conditions of loans for US companies. Companies with higher KLD environmental scores seem to benefit from lower costs of loans. As all three studies use a sound econometric methodology (e.g. use of appropriate conditional variables) the negative relationship between environmental activities of companies and their costs for debt capital seems to be well established.

Bauer, Derwall, and Hann (2009) focus on the connection between (good) *employee relations* and the costs of financing with corporate bonds in the USA. Employee relations are constructed in the same way as in the study by Goss and Roberts, that is, using KLD data. The first dependent variable is the difference between the yield difference on the issuing day between the corporate bond and government bonds. Further dependent variables are the bond rating as well as the long-term rating of the issuing company. The analysis covers the years 1995–2006 and includes 568 companies as well as 2265 corporate bonds. The main finding of the study is that companies with better employee relations face lower financing costs (regarding corporate bonds), higher credit ratings, and lower firm-specific risk.

Verwijmeren and Derwall (2010) also consider *employee relations* as a CSR variable and use KLD data to construct this variable – the same as the two previously described studies. Their analysis spans the period from 2001 to 2005 and includes around 7500 US companies. The starting hypothesis of the study is that companies committed to good employee relations also face a lower *bankruptcy risk* because they follow less risky strategies. The empirical results of the econometric estimates show that companies with good employee relations have a lower level of indebtedness, that is, a lower ratio of outside capital to equity. They also have better credit ratings. Both factors are closely correlated with a lower risk of bankruptcy.

The findings of the studies described in this section indicate a significant relationship between CSR, the borrowing costs, and default risk. The greater the CSR (in particular with regard to environmental criteria as well as employee relationships), the lower the default risk (of loans and corporate bonds) and the lower the costs for debt capital. Nevertheless, the results of these studies have to be interpreted with some caution: Most of the investigations only concern US companies and the validity of the findings for non-US companies is by no means certain.

6. “Green” real estate

Energy efficiency of buildings is fundamental for energy consumption and energy efficiency in any given economy. In some countries, such as Germany, the building of very energy-efficient buildings and improving energy efficiency in existing real estate are subsidized by the

government, for instance through cheaper loans. Many studies have addressed the correlation between energy efficiency (measured, e.g. by particular energy efficiency labels) and the returns for commercial real estate in the USA. Only a handful of other countries have been the subject of similar analyses, such as the UK and the Netherlands.

Eichholtz, Kok, and Quigley (2010) analyze whether investments in energy efficiency of buildings also make good economic sense when they are not subsidized. The authors use a data set of 10,000 units of *commercial real estate* in all US states. They try to find whether, and if so in how far, a building's energy efficiency is rewarded with higher *rental income* and a *higher market price* for the building. Eichholtz et al. motivate their starting hypothesis of a positive influence of energy efficiency on rent and market price with (1) conserving resources when operating the building, (2) greater productivity of employees working in the building due to the improved indoor climate, (3) a boost of reputation for companies known to rent and use "green" real estate, (4) a potentially greater longevity of buildings and lower market price volatility due to a more sustainable method of construction.

The study follows a matching approach: highly energy-efficient buildings are compared to buildings of average energy efficiency in their vicinity which are otherwise similar. The study analyzes not only actual energy efficiency but also special quality labels for energy efficiency which were given out to some of the buildings.

The empirical study comes to the conclusion that rent per square meter is about 3% higher for buildings with a seal of quality, the so-called effective rent²⁰ is even about 7% higher and sales prices 16% higher than prices of comparable commercial real estate without such seal. The study furthermore shows that lowering energy consumption by 10% leads to a property value increase of 1%, regardless of the presence of a seal. Fuerst and McAllister (2011a) obtain similar results for US commercial real estate.

Reichardt et al. (2012) confirm the findings of the other studies, which are based on cross-section data, with a *panel analysis* for US commercial real estate. The US results on the effect of energy efficiency labels on rental income and market price of commercial real estate therefore seem to be robust. Reichardt et al. (2012) also point out that rent premia paid for energy efficiency demonstrate a distinct variability over time.

For the *Netherlands*, Brounen and Kok (2011) find that better energy efficiency significantly increases houses' market price. For the *UK*, Fuerst and McAllister (2011b), however, do not find any effect of energy efficiency on rent and market price.

The study by Eichholtz, Kok, and Yonder (2012) analyzes the effect of green quality labels in the USA on the economic key figures of *real estate portfolios* from 2000 until 2011. Their research focuses on real estate investment trusts (REITs). REITs are listed companies whose task is managing a real estate portfolio. In a first step, Eichholtz et al. calculate the share of "green" real estate in the portfolio of various REITs. In a second step, they analyze the influence of the share of "green" real estate on the economic key figures. They find that a greater share of real estate with "green" labels raises both return on assets and return on equity. In a third step, Eichholtz et al. analyze the development of REITs stock prices. A higher share of companies with an energy efficiency label in the portfolio does not lead to an outperformance, but it does lower the sensitivity of REITs stock prices to fluctuations in the overall stock market. This means that the so-called "beta" risk of REITs decreases when they hold a greater proportion of "green" real estate. This might be traced back to a lower susceptibility of REITs to changes in energy prices and environmental law.

The results of the studies show that in the USA, increasing energy efficiency is significantly positively correlated with profitability of commercial real estate, either directly through higher rent and market value, or indirectly through REITs' profit. It is currently unclear whether and in how far these results can be transferred to other countries.

7. Conclusions and outlook

The presentation of the results of studies on stock, bonds, borrowing costs, and real estate allows for a clear conclusion: Greater CSR positively affects stock price performance and the profitability of commercial real estate and it reduces outside capital costs and companies' default risk. However, the question of causality is still a weak point of the studies. On the basis of the empirical findings it cannot be unambiguously stated that, for example, more and better activities in CSR will *cause* lower financing costs of companies. Nevertheless, most of the recent studies are aware of the problem of identifying causal effects (instead of measuring only correlations) and are therefore using comprehensive sets of control variables and advanced estimation approaches (e.g. matching treatment and control groups).

There are some other weaknesses in the existing studies. Most of the empirical investigations have been done for the USA and the validity of the findings for other countries is not obvious. Despite the remarkably high statistical and even sometimes economic significance which have been found for the relationship between CSR on the one side and performance and financing conditions on the other side it has to be borne in mind that the number of studies is relatively small compared to classic topics of finance. Therefore, the results are not as robust as those in other areas of finance.

The coverage of asset classes in empirical research on CSR is also quite unbalanced. Although there is a broad range of asset classes that are at least theoretically relevant in research on SRIs, most studies focus on stocks. The analyses presented here on bonds, borrowing costs, default risk, and real estate have led to interesting and clear results. Nevertheless, when it comes to SRIs, these asset classes have been studied far less intensively than stocks. Some assets, particularly "alternative investments", have not been considered at all in research and only little in practice. Among these are venture capital, private equity, commodities, hedge funds, and investments in infrastructure.

Furthermore, reliable data are only available for very restricted time periods and therefore do not allow for long-term predictions, although this would be of interest for CSR.

There is also a lack of comparability amongst some studies as CSR ratings from different rating companies are used. And in general the rating criteria and rating processes differ amongst these rating agencies.

In future studies a focus should therefore be on international studies with a broad range of different countries using a consistent international data set on CSR ratings. In addition, and most importantly, the question of causality between CSR and financing costs should be investigated carefully.

Notes

1. Counting asset management strategies "that apply various environmental, social and governance (ESG) criteria" USSIF (2012, 11)
2. To receive a number that is similarly defined as the US market statistics only those asset management strategies are added that are using different positive or negative screenings. According to Eurosif (2012) these are the categories "Best-in-class and other positive screens" and "Norms-based screening".
3. Orlitzky, Schmidt, and Rynes (2003) and Margolis, Elfenbein, and Walsh (2009) also cover the relationships between corporate social performance and accounting-based measures of company success.
4. CSR is usually defined as "good corporate governance, sound environmental standards, and good management towards stakeholder relations" (Renneboog, ter Horst, and Zhang 2008a). This definition of CSR (in different varieties) is also the basis for many SRI ratings.
5. Excess returns are defined as the change rate to the previous period minus risk-free interest.
6. The Fama-French model includes, in addition to the market factor, a small cap factor and a valuation factor. The small cap factor quantifies the difference returns of stocks with a small and a large market capitalization, the valuation factor measures the difference returns between companies with a high and a low book-to-market ratio. The Carhart model adds a fourth factor which captures the influence of stock price momentum on the returns. These factor models are used in recent studies on the performance of SRI stocks and bonds.

7. The factors of the baseline model are the (excess) returns of a broad bond index, the return spread between an index including bonds with a high default risk and a government bond index, the return spread between an index for mortgage interests and a government bond index. Another factor is the returns of a broad US stock market index, since the mixed funds also contain a greater share of stocks.
8. Several control factors are used in these estimations, such as the three Fama-French model factors, to exclude other explanation as far as possible.
9. Innovest Strategic Value Advisors was a specialized financial information services and investment advisory firm headquartered in New York. It now belongs to Morgan Stanley Capital International (MSCI).
10. KLD Research & Analytics used to be one of the oldest independent SRI rating agencies and SRI index managers. Today, KLD Research & Analytics belongs to MSCI.
11. In the best-in-class approach, the sectoral structure of the SRI index is similar to that of a conventional benchmark index. Within a certain sector, the value of the SRI rating defines the weight of individual companies. However, the methods can vary from index to index. It is also possible to exclude companies or entire sectors completely according to certain negative criteria.
12. Edmans (2011) applies only a long portfolio and not a long–short difference portfolio. But as in Derwall et al. (2005) and Kempf and Osthoff (2007) the outperformance almost completely driven by the long portfolio the approach of Edmans (2011) is comparable to that of the other two studies.
13. See, for example, Schröder (2007).
14. For instance due to hidden waste disposals, a careless use of natural resources or the harmfulness of products.
15. In contrast to the high book-to-market ratio estimated for “sin” stocks Galema, Plantinga, and Scholtens (2008) find relatively low book-to-market ratios SRI stocks which indicates an overpricing for this group of stocks. The great interest of investors has raised the average price of these stocks in the US more than that of comparable conventional stocks. Equity costs for companies with a high SRI rating have therefore decreased in comparison with the average company.
16. SiRi is the abbreviation for Sustainable Investment Research International Company. The company existed until 2008. The database comprised 11 international SRI research institutions in Europe, North America, and Australia.
17. Restrictions on access to capital are measured by an index developed in Kaplan and Zingales (1997).
18. Agency costs comprise the costs for monitoring the adherence to an agreement.
19. Sharfman & Fernando also look at the link with equity costs.
20. Effective rent is calculated including actual tenancy rates.

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Appendix Overview of studies published since 2005.

Study	SRI asset classes	Countries/ Regions	Time period	Main findings
<i>Performance of SRI funds and SRI indexes</i>				
Bauer, Koedijk, and Otten (2005)	Stock funds	USA, UK, and Germany	1990–2001	No significant performance differences. SRI investment styles partly differ from those of conventional funds
Derwall and Koedijk (2009)	Bond funds, mixed funds (stocks and bonds)	USA	1987–2003	SRI bond funds: no performance differences, mixed SRI funds: slightly significant outperformance
Galema, Plantinga, and Scholtens (2008)	SRI stocks	USA	1991–2006	Overpricing of SRI stocks (i.e. market value is relatively high compared to book value)
Renneboog, ter Horst, and Zhang (2008b)	SRI stock funds	International (17 countries)	1991–2003	Almost no significant differences in performance. In part underperformance of SRI funds (France, Ireland, Japan, and Sweden)
Schröder (2007)	SRI stock indexes	World, Europe	Launch date of the index until December 2003	Almost no significant differences in performance to conventional indexes; in some cases higher risk
<i>Performance of long–short portfolios</i>				
Derwall et al. (2005)	SRI stocks, SRI ratings by Innovest	USA	1995–2003	Highly significant outperformance of the long portfolio and the long–short portfolio
Edmans (2011)	SRI stocks	USA	1984–2009	Portfolio of the “100 Best Companies to Work for in America” yields highly significant outperformance
Kempf and Osthoff (2007)	SRI stocks, SRI ratings by KLD	USA	1991–2003	Highly significant outperformance of the long portfolio and the long–short portfolio
<i>Performance of “Sin” stocks</i>				
Derwall, Koedijk, and ter Horst (2011)	SRI stocks, sin stocks	USA	1992–2008	Outperformance of SRI and sin stocks. SRIs criterion: job satisfaction
El Ghouli et al. (2011)	SRI stocks, sin stocks	USA	1992–2007	Higher SRIs rating reduces price of equity, in some sin areas (tobacco, nuclear energy) price of equity is higher
Fabozzi, Ma, and Oliphant (2008)	Sin stocks	International (21 countries)	1970–2007	Outperformance of sin stocks
Hong and Kacperczyk (2009)	Sin stocks	USA	1926–2006	Outperformance of sin stocks (tobacco, alcohol, and gambling)

(Continued)

Appendix Continued.

Study	SRI asset classes	Countries/ Regions	Time period	Main findings
Statman and Glushkov (2009)	Sin stocks	USA	1991–2006	Outperformance of SRI and sin stocks
<i>SRI ratings, credit costs and default risk</i>				
Bauer, Derwall, and Hann (2009)	Corporate bonds	USA	1995–2006	Better employee relations correlate with lower financing costs, higher credit ratings, and lower company-specific default risk
Bauer and Hann (2010)	Corporate bonds	USA	1995–2006	Higher environmental rating correlates with lower financing costs and higher credit rating
Cheng, Ioannou, and Serafeim (2014)	Access to outside capital	International (49 countries)	2002–2009	CSR efforts reduce required risk premia and capital restrictions
Goss and Roberts (2011)	Borrowing costs	USA	1991–2006	Below-average SRIs rating correlates with slightly higher borrowing costs
Kim, Surroca, and Tribó (2013)	Borrowing costs	International (15 countries)	2003–2006	Better CSR rating correlates with lower loan costs. Stronger result if the CSR rating of the lender is also high
Nandy and Lodh (2012)	Borrowing costs	USA	1991–2006	Better environmental rating is correlated with lower loan costs
Oikonomou, Brooks, and Pavelin (2014)	Corporate bonds	USA	1991–2008	Better SRIs rating correlates with lower bond spread to government bonds
Sharfman and Fernando (2008)	Outside capital (equity, debt)	USA	2001/2002	Sound environmental risk management reduces financing costs, improves access to outside capital, and increases leverage
Vermijmeren and Derwall (2010)	Default risk	USA	2001–2005	Better employee relations correlate with lower leverage and better credit rating
<i>“Green” real estate</i>				
Brounen and Kok (2011)	Real estate	The Netherlands	2009	Higher energy efficiency increases market price
Eichholtz, Kok, and Quigley (2010)	Commercial real estate	USA	(2004–2007), 2006, 2009	Energy efficiency labels increase rental income and market price. Less energy consumption increases property value
Eichholtz, Kok, and Yonder (2012)	REITs	USA	2000–2011	Energy efficiency labels do not lead to outperformance but reduces bankruptcy risk of REITs

(Continued)

Appendix Continued.

Study	SRI asset classes	Countries/ Regions	Time period	Main findings
Fuerst and McAllister (2011a)	Commercial real estate	USA	1999–2008	Energy efficiency labels increase rental income and market price
Fuerst and McAllister (2011b)	Commercial real estate	UK	2010	No correlation between energy efficiency and rent or market price
Reichardt et al. (2012)	Commercial real estate	USA	2000–2010	Energy efficiency labels increase rental income and market price. Relative increases in rent are time variant