Does Good Environmental Performance reduce Credit Risk?  
Empirical Evidence from Europe's Banking Sector

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Does Good Environmental Performance reduce Credit Risk? – Empirical Evidence from Europe’s Banking Sector

Marcus Fenchel, Roland W. Scholz, and Olaf Weber

September 2003
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Marcus Fenchel, Roland W. Scholz, and Olaf Weber

Abstract

About 15 years ago, banks started to integrate Environmental Risks (ER) in their credit risk valuation procedures in an explicit way. However, it is still unclear if this strategy pays back from a credit management point of view. We present a survey in the European banking sector. We ran the survey in 2002 and it encompasses questionnaires from 50 banks. The inquiry focused on the analysis of the integration of ER in all phases of the credit risk management process. Thus the study goes beyond prior research that focused almost exclusively on the rating phase and ignored the other phases of costing, pricing, monitoring and work out. We compared banks that are proactive in terms of the management of ER with banks that consider ER as an issue of low importance to their business. The results of our study show that making use of the environmental performance of borrowers as an indicator for credit risk is beneficial, as it (i) reduces the workload in the work out phase, caused by bad credits and (ii) accomplishes the cost benefit condition.

Keywords: environmental risk, environmental performance, credit risk
Introduction

“Does it really pay to be green?” is a question more and more people want to have answered. Investors want to know if it is worth to invest in companies that show environmental awareness and responsibility. Managers are keen to know if it is financially worth to improve the corporate environmental performance of their company. And, vice versa, environmentalists want to know if market principles can be applied to protect the environment.

Traditionally, managers believed that investments, which improve the environmental performance of their companies, reduce financial benefits. In the last 20 years this assumption has changed. Some companies successfully followed an environmental business strategy (e.g. the Body Shop; see Jeucken, 2001; Tutsek-Dossi, 1992) and academic surveys identified a positive correlation between environmental and financial performance (Dowell, Hart, & Yeung, 2000; King & Lenox, 2001; Klassen & McLaughlin, 1996). In addition to that, a closer look had been taken on the cause and effect chains between environmental and financial performance (Bansal & Roth, 2000; Reinhardt, 1999; Steger, 2000) as well as on some factors that influence the strength of the correlation (Russo & Fouts, 1997). Today a positive correlation between environmental and financial performance is broadly accepted, even though the strength of the correlation and its genesis are still unclear for most sectors. The increasing importance of environmental performance for business success is brought forward by some concepts that became popular over the last years: the polluter pays principle and greater use of economic instruments in order to realize a better internalization of external cost. The reason behind this development is the changing perception of society concerning environmental and societal issues caused by developments such as globalization.

About 15 years ago, the first commercial banks began to take environmental aspects into consideration. Their attention was first caught by court cases in the United States. Under the U.S. Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA, also known as “Superfund”), liability for cleanup is imposed on owners of contaminated sites. Even though Superfund specifically exempts lenders from being classed as owners, some banks were held liable under CERCLA due to their either operating, owning, or management participation of a contaminating business (Bacow, 1998; Schmidheiny & Zorraquin, 1996). Another ER that lead to credit defaults in the past is linked to real estate collateral. If a lender accepts real estate collateral as loan security without checking that site or building for contamination the calculated value of the security is higher than the market value. So, if a bank wants to realize on the security it might get a far smaller amount as calculated or even nothing at all. But banks have learned from experience and today it is a standard procedure in credit rating to examine if the value of real estate collateral is reduced through contamination (Weber & Sell, 2002). As a consequence it can be often read in literature that most banks consider ER as part of the credit appraisal process (Coulson & Dixon, 1995; United Nations Environment Programme, 1992; United Nations Environment Programme, 1995; Wanless, 1995).
But do banks also consider ER besides the contamination of real estate collateral? According to the United States Environmental Protection Agency most banks are still struggling to integrate overall environmental risks (e.g. from regulatory policy and climate change) into their credit decision-making process and to assess the impact of a borrower’s current environmental performance on its future success (United States Environmental Protection Agency & Office of Cooperative Environmental Management, 1998). The following example reveals the current problems of ER evaluation in banks. A quarter of a billion USD of bonds make Credit Suisse First Boston currently the biggest bond creditor of Asian Pulp and Paper (APP), a huge Indonesian wood processing corporate group. APP’s future looked very promising on first sight, but APP’s share price fell from 7.50 USD in April 1999 to 0.12 USD in April 2001. APP now has 13 billion USD liabilities and its debt was downgraded from Standard & Poors from B+ in February 1997 to D in February 2001, signifying default. One of the key reasons for APP’s former success was the use of cheap wood from the Indonesian virgin forests. Instead of farming wood in a sustainable way APP predominantly cut primeval forest and saved the farming cost. This behavior was not only ecologically doubtful but also economically shortsighted. In the UK NGOs evoke buyers to boycott APP-paper. And after APP’s behavior became known, they are now under great pressure to change their logging practice into a sustainable way, which increases the cost of APP’s production dramatically (Shari, 2001). Credit Suisse is certainly one of the leading banks in Europe in terms of ER management. However, they overlooked a huge environmental credit risk in this case. This example demonstrates that ER can form serious credit risk and that the tools to manage these risks have not reached a satisfying standard yet.

These findings are also confirmed by prior research. In 1995 Salomon Brothers Inc. conducted a survey of “Environmental Policies and Practices of the Financial Services Sector”. The results provide evidence that banks have adopted environmental management practices, particularly environmental loan assessment procedures (United Nations Environment Programme & Salomon, 1995). Other surveys are in line with these results (Environmental Data Resources, 1994; Hill, Fedrigo, & Marshall, 1997; Thompson, 1998). At the same time, two other surveys showed that even if most banks consider ER in some way there is still a great need among banks in Europe for quantification tools to evaluate environmental credit risk (Fenchel, 1997; Vaughan, 1995).

Most prior research projects that examined environmental credit risks were focusing on the security risks from contaminated real estate collateral and on the rating phase of the credit risk management process (Keidel, 1997; Kühne, 1999). The banks’ activities in the other phases of the credit risk management process have not yet been empirically examined. There is almost no empirical evidence that shows if this effort also results in fewer credit defaults. Only Michalik (Michalik, 2001) provided some indication that the integration of environmental indicators improves the performance of the credit management process using discriminant analysis, which can be used to analyze cause-effect relations.
The described situation points out that the following key questions need to be answered:

- Does the integration of ER in the credit risk management process improve the lender’s ability to assess a borrower’s future success and by this reduce the number of credit defaults?
- And, if so, are the benefits greater than the costs for developing and running an evaluation system?

To answer these questions we conducted a survey among 50 banks that responded to a survey from 8 European countries. The focus of our research was on the examination of the complete credit management process.
Background

The process of credit risk management consists of the five phases shown in Figure 1. The objective of the rating is to determine the borrower’s default risk. For that purpose, banks conduct a credit evaluation before they lend money to a customer. Besides the personal credibility check, a creditworthiness evaluation is conducted to determine a loan’s probability of default (DP). The aim of costing is to quantify the expected loss (EL, measured in USD) in lending based on probability of default (DP) and loss given default (LGD, measured in percent). LGD is the expected loss when a borrower goes bankrupt. It depends on the usage of the credit limit, the so-called credit equivalent (CE, measured in percent), and the loss severity (LS, measured in percent), which is the expected loss of the exposure in percent. The latter mainly depends on the value the bank estimates to receive if it calls in security on a loan and subsequently sells it.

In the pricing phase the identified costs are integrated in the credit conditions. By charging every borrower a premium according to his EL the average loss in lending can be compensated. During the loan period the credit is watched concerning changes in credit risk (monitoring). If the expected loss of a borrower becomes higher during lending, the reasons for this need to be analyzed and measures of correction will be taken. Bad credits (= credits that can only be paid back partly or not at all by the borrower) are handled in the work out unit of the bank. The objective in the work out phase is to reduce the losses and, if possible, to get the borrower back on track. Solutions vary from turnaround of a company to insolvency of the customer’s enterprise. In our research we examined how often banks consider ER in the different process phases (see Figure 1).

Figure 1: The Credit Risk Management Process (Manz, 1998)
Method

As mentioned earlier, prior research that examined the role of ER for credit risk evaluation either focused almost exclusively on the rating phase of the credit risk management process or examined security risk from contaminated real estate collateral. Based on this approach it could not be proven if the integration of ER leads to a reduced credit failure rate and less efforts in the work out. Therefore we enlarged the focus of prior research and examined the role environmental performance plays not only in the rating but also in all phases of the credit risk management process (Figure 1).

In order to find answers to the two key questions above, we analyzed the credit risk management process and made use of the “Statement by Banks on the Environment and Sustainable Development”. This statement, also called the UNEP statement, was the first reaction of the banking industry to the challenge of sustainability. In 1992 the United Nations Environmental Programme (UNEP) and some funding banks published the UNEP statement. The UNEP statement commits the signees to integrate environmental criteria into their risk assessment and in some cases to undertake an environmental impact assessment. Today about 200 banks have signed the statement (the statement is available at http://www.unep.ch/eco).

We postulate that banks, which signed the UNEP Statement, tend to be more active with respect to environmental issues than banks that have not signed the statement. Based on this assumption we compared a group of signees with a group of banks that have not committed themselves to the statement. One sample consists of all European banks with commercial lending activities that have signed the UNEP statement. In order to allow for statistical analysis, we only considered banks from countries with a minimum number of 4 signees. The second sample consists of banks that have not signed the statement. It was taken care that the structure of both samples concerning location, number of banks, size of banks, and type of banks is similar and hence comparable. The two samples were examined for differences concerning the credit risk management process described above. We tested the following hypothesis:

“UNEP-banks consider environmental credit risks to a larger extent in the operational phases rating, pricing, costing, and monitoring of the credit risk management process than Non-UNEP-banks.”

If the UNEP-sample considers the environmental performance of borrowers in the rating, costing, pricing, and monitoring more often than Non-UNEP banks, then we could also hypothesize that this would imply a lower work-load in the work-out in the UNEP-sample than in the other banks. Or to express it in other words: Banks that apply environmental performance indicators can expect reduced efforts in the work out.

To examine the hypothesis we conducted a survey among 205 banks from 8 European countries. The data for the survey was gathered between October 2001 and January 2002 with a 16-page questionnaire, which was provided in German for banks from Austria, Switzerland and Germany and in English for banks from the Netherlands, Poland, Spain, Sweden, and the United Kingdom. A pilot test showed that it took about 60 minutes to complete the questionnaire provided the participant is familiar with the subject. The questionnaire was mailed to the banks in October 2001. Banks that have not been responding until the end of November were contacted by phone. The data was analyzed by means of descriptive statistics and parametric and non-parametric statistical tests.
Results

Out of the 205 banks, 50 sent back the completed questionnaire, representing a net response rate of 24.4%. Since the environmental standards and attitudes in the represented countries are considered to be similar, differences between countries are seen to be negligible. Therefore in the analysis all countries are treated as one group called “Europe”. However, it needs to be pointed out that 82% of the responses come from 3 countries (Germany, Switzerland, Poland). We therefore distinguish in Table 1 Germany, Switzerland, Poland and “Further EU States”. Table 1 shows the absolute responses and relative proportions of these countries within the UNEP-sample, the Non-UNEP-sample and in total. A chi-square test of the country specific response rates (Chi-square, df = 3, p = 0.0067) showed that “Further EU States” demonstrated the weakest motivation to participate in the survey whereas banks from Switzerland showed the strongest commitment. This result is most probably due to the fact that the name recognition of the Swiss Federal Institute of Technology within Switzerland is higher than in the other European countries. The response rates from German and Polish banks are as expected.

<table>
<thead>
<tr>
<th>Country</th>
<th>Responses</th>
<th>Responses</th>
<th>Responses</th>
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</thead>
<tbody>
<tr>
<td>Germany</td>
<td>10</td>
<td>40,0 %</td>
<td>15</td>
</tr>
<tr>
<td>Switzerland</td>
<td>3</td>
<td>12,0 %</td>
<td>6</td>
</tr>
<tr>
<td>Poland</td>
<td>6</td>
<td>24,0 %</td>
<td>1</td>
</tr>
<tr>
<td>Further EU States¹</td>
<td>6</td>
<td>24,0 %</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td><strong>25</strong></td>
<td><strong>50</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Absolute Responses and relative Proportion of Countries in the UNEP-Sample, in the Non-UNEP-Sample and in Total (¹Further EU States are: A, E, GB, NL, S)

To test the above hypothesis we asked the banks in which phases of the credit risk management process they consider ER. First we looked at all answers as one sample and received the results shown in Figure 2.

In the rating the banks showed the most activities concerning the integration of ER. 85.7% of the banks (42 banks answered this question) considered ER in the rating. A chi-square test for 2 independent samples showed that ER are considered significantly more often in the rating phase than in the other process phases (Chi-square, df = 4, p < 0.0001). We also asked the banks for the reasons behind their strategy. The reason most often named (16 banks) is a lack of suitable instruments in the phases after the rating. Other reasons were that the other phases were not considered to be relevant nor to be economically sound (10 banks) and the believe that it is impossible to integrate ER in all phases of the credit risk management process (6 banks).
Particularly in the costing phase banks hardly thought about ER. Only 23.8% of the banks tried to integrate ER in the costing. 32 of 43 banks (74%) have never captured credit defaults completely or partly due to ER.

About 43% of all banks answering the corresponding question (18 out of 42) said they integrate ER in the pricing phase. A question on the influence ER could have on pricing at a maximum level revealed great differences among the banks. Twelve of the 28 banks answered that ER can increase the credit price not more than 0.1%. The other end of the spectrum is marked by 7 banks, which stated that ER could increase credit price by more than 1.0%.

Almost 60% of the banks (25 out of 42) stated that they consider ER if it comes to a re-evaluation during the monitoring. The following answers were captured on a 7-stage scale that reached from 1 := “never” to 7 := “always”. The frequency of checks for changes of ER during the credit period is similar for both security risks (M = 3.76; SD = 1.99) and creditworthiness (M = 3.5; SD = 2.13). Specific early warning indicators, e.g. changing energy prices, to identify changes in ER are hardly applied in the monitoring phase (M = 2.07; SD = 1.55).

While in the rating, costing, pricing, and monitoring it is the decision of the bank whether or not it wants to consider environmental aspects, in the work out phase banks are forced to consider environmental aspects by bad credits due to ER (Scholz, Weber, & Michalik, 1995a). Having said that, it is remarkable that 57.1% of the responding banks (24 out of 42) reported to systematically check environmental aspects in the work out.

On the basis of the above results we wanted to find out if banks that consider ER in the credit management process suffer from significantly less credit defaults. For this purpose we divided the credit management process in two sections. On the one side we examined the pre-work out activities concerning ER (rating, costing, pricing and monitoring). On the other side we looked at the effort in the work out phase caused by bad credits. Our intention was to find whether there is a statistical interaction between pre-work out activities and work out activities. Methodologically, we tackled this problem in two different ways.
We split the main unit in two samples, one sample of UNEP-banks and one sample of Non-UNEP-banks. We examined if the activities concerning ER in the process phases are different for these two groups. When postulating higher environmental concern, awareness, and capabilities of the UNEP-banks, we assumed that a more frequent consideration of ER in the pre-work out phases increases the quality of credit risk evaluation and lead to a reduced work out effort.

We wanted to know precisely in which phases of the credit risk management process environmental awareness pays most for the lender? For this purpose we looked at each of the pre-work out phases individually and compared it with the environmental activities in the work out. The strongest correlations can be considered an indicator for the most important pre-work out phases in terms of ER.

**UNEP-banks and Non-UNEP-banks**

To examine if banks that have signed the UNEP Statement (UNEP-banks) manage ER differently from banks that have not signed the UNEP Statement (Non-UNEP-banks) we tested the following hypothesis:

“UNEP-banks consider environmental credit risks to a larger extent in the operational phases rating, pricing, costing, and monitoring of the credit risk management process than Non-UNEP-banks.”

Figure 3 and Table 2 compare the percentage of UNEP-banks and Non-UNEP-banks that consider ER in the different phases of the credit management process.

The results show that ER in rating, costing, pricing and monitoring are considered more often by UNEP-banks than by Non-UNEP-banks. Only in the work out phase the situation is vice versa. A chi-square test for two independent samples regarding all phases shows, that the differences between UNEP-banks and Non-UNEP-banks are significant (Chi-square, df = 4, p < 0.001). Thus the above hypothesis is accepted.
**Does Good Environmental Performance reduce Credit Risk? – Empirical Evidence from Europe’s Banking Sector**

**Table 2**: Environmental Credit Risks in the Credit Management Process – A Comparison of UNEP-Banks and Non-UNEP-Banks

<table>
<thead>
<tr>
<th></th>
<th>Rating</th>
<th>Costing</th>
<th>Pricing</th>
<th>Monitoring</th>
<th>Work out</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNEP-Banks (N=23)</td>
<td>Number 21</td>
<td>8</td>
<td>12</td>
<td>15</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>in %</td>
<td>91.3</td>
<td>34.7</td>
<td>52.1</td>
<td>65.2</td>
</tr>
<tr>
<td>Non-UNEP-Banks (N=19)</td>
<td>Number 15</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>in %</td>
<td>79.0</td>
<td>10.5</td>
<td>36.8</td>
<td>52.6</td>
</tr>
</tbody>
</table>

**Effects due to Enterprise Size**

It can be assumed that large banks are more advanced than small banks concerning the accessibility of instruments applied in evaluation of credits as well as ER management (Scholz, 1990). Therefore the differences between the two samples identified above could be caused by the possibility that the two samples are characterized by samples of banks with different size. There is a possibility that the proportion of large banks in the UNEP-sample is much bigger compared to the Non-UNEP-sample. To exclude this influence, we created three classes of banks with respect to the number of employees. We distinguished banks with less than 250 employees, banks with 250-500 employees, and banks with more than 500 employees (Table 3).

**Table 3**: Enterprise Sizes of the Banks in the UNEP-Sample and in the Non-UNEP-Sample

<table>
<thead>
<tr>
<th>Enterprise size (number of employees)</th>
<th>UNEP-Sample</th>
<th>Non-UNEP-Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Up to 250</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>251–500</td>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>More than 500</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>

We conducted the above analysis of differences between UNEP-banks and Non-UNEP-banks once more, this time focusing exclusively on the banks with more than 500 employees. Figure 4 and Table 4 summarize the results (Chi-square, df = 4; p < 0.0001).
The outcome is very similar to the examination of the complete samples. This means the identified statistical interaction between pre-work out activities and work out activities is not due to differences in enterprise size. Thus the above hypothesis could also be accepted after filtering out size effects.

### Table 4: Environmental Credit Risks in the Credit Management Process – A Comparison of UNEP-Banks and Non-UNEP-Banks (only Banks with more than 500 Employees)

<table>
<thead>
<tr>
<th></th>
<th>Rating</th>
<th>Costing</th>
<th>Pricing</th>
<th>Monitoring</th>
<th>Work out</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>UNEP-Banks</strong></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>(N=18)</td>
<td>Number</td>
<td>15</td>
<td>7</td>
<td>11</td>
<td>12</td>
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<tr>
<td></td>
<td>in %</td>
<td>83.3</td>
<td>38.9</td>
<td>61.1</td>
<td>66.7</td>
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<tr>
<td><strong>Non-UNEP-Banks</strong></td>
<td></td>
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<td></td>
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<tr>
<td>(N=14)</td>
<td>Number</td>
<td>9</td>
<td>1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>in %</td>
<td>64.3</td>
<td>7.1</td>
<td>28.6</td>
<td>50.0</td>
</tr>
</tbody>
</table>

### Group Differences

We also examined the interactions of pre-work out activities and work out activities independent of the UNEP membership. First we looked at each of the pre-work out phases individually. We checked for every pre-work out phase if ER is considered and compared the outcome for each bank with the fact whether or not the same bank considers ER in the work phase. With this approach we could not find any significant interaction with the raised work out activities.

A different approach produced the following outcome. We divided the whole sample of banks into a group called “complete” and a group called “incomplete”. The banks of the first group consider ER in all four pre-work out phases. The banks of the group “incomplete” do not consider ER in one or more pre-work out process phases. Both groups were opposed to their activities in the work out. The cross tab in Table 5 shows the results of this analysis.

### Table 5: Complete and Incomplete Banks in the Work Out

<table>
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<th>Work out</th>
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<tbody>
<tr>
<td></td>
<td>ER not considered</td>
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<td><strong>Complete Banks</strong></td>
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<td><strong>Incomplete Banks</strong></td>
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About 56% of the responding (18 of 32) “complete” banks consider ER in the work out. This is more than the expected 14 banks assuming no interaction between pre-work out and work out activities. 14 of 32 “complete” banks do not consider ER in the work out. This is less than the 18 banks expected on the basis of no interaction. On the other side all 9 “incomplete” banks consider ER in the work out. This is more than the expected 5 banks assuming no interaction between pre-work out and work out activities. Statistical tests show that the differences are significant (Fisher’s Exact Test, df = 1, p = 0.0025, Chi-Square = 9.024).
Discussion

Our data showed that the rating is the phase where the banks considered ER significantly more often than in the other phases of the credit risk management process (Figure 2). The strong emphasis of the rating phase can be explained through the reasons given by the banks: a lack of suitable instruments in the phases after the rating (16 banks), the opinion that the other phases are not relevant concerning ER (10 banks) and the believe that it is impossible to integrate ER in all phases of the credit risk management process (6 banks). These findings mirror the evolution until today, which mainly dealt with the development of new or the enlargement of existing credit rating systems for the integration of ER (Keidel, 1997; Michalik, 2001) In addition to that it can be seen that there is a strong need for instruments to manage ER in the phases after the rating. We assume that the other reasons were given (lack of relevance and impossible integration of ER) due to a lack of experience and know how concerning ER.

Particularly in the costing phase banks hardly thought about ER. 32 of 43 banks (74%) have never captured credit defaults completely or partly due to ER. Hence most banks do not know the relevance of ER in their portfolio. Taking into account the results of another survey with German banks that indicates that environmental risks are essential in ten percent of all defaults of commercial credits (Scholz, Weber, Stünzi, Ohlenroth, & Reuter, 1995b), it can be concluded that most banks suffer from a serious lack of information in their credit risk management.

Besides that the knowledge of the default volume due to ER can be a good argument inside the bank to promote the development of appropriate tools. Very often employees responsible for the management of ER told us that it is very difficult to get support for the development of better measurement tools as long as they cannot back up their business plans with hard data. In addition to that banks leave an opportunity out to identify the causes of environmental credit defaults, which would give a good indication of the applicable ER indicators.

The question we asked on the influence ER could have on pricing at a maximum level revealed great differences among the banks. Twelve banks answered that ER can increase the credit price not more than 0.1%. On the other end of the spectrum 7 banks stated that ER can increase credit price by more than 1.0%, which increases the cost of capital for companies in a serious dimension. We interpret these results twofold. Either the banks that price ER very low simply did not have any bad experience with ER in the past. This could be due to the sectors covered by the banks (e.g. focused on service companies with very low ER). However, taking into account that most banks diversify their loans over several sectors to lower the overall risk of their credit portfolio, it is more likely that the low pricing of ER goes back to the fact that these banks did not realize that they had credit defaults due to ER. Our interpretation indicates that these banks underprize ER and therefore are at risk to attract bad borrowers with high ER (adverse selection effect) (Ritter, Silber, & Udell, 2000). On the other side we do not believe that the banks that price ER by more than 1.0% overprize ER and therefore loose good borrowers. Since banks want to stay competitive, it can be assumed that they think carefully before they increase the prices of their loans. Therefore we believe that the banks that price ER by more
than 1.0% have rational reasons to do that. It is very likely that they experienced credit defaults
due to ER in the past and therefore are able to calculate the prices for ER.

More than half of the responding banks (24 out of 42) reported to systematically check
environmental aspects in the work out. Taking into consideration that banks analyze the rea-
sons for bad credit in the work out, we presume that these banks have gathered salient experi-
ences in the past concerning ER as a reason for bad credits (Scholz et al., 1995a).

We can thus conclude that in the rating phase ER is considered significantly more often
than in costing, pricing, and monitoring. More than half of the banks do not integrate ER in
these phases and thus are not in the position to control this type of risk exposure of their cred-
its.

The fact that ER in the work out phase are considered more often from Non-UNEP-banks
than from UNEP-banks is considered a strong indicator that the increased efforts of the UNEP-
banks in the pre-work out phases are reflected in less work out effort due to a smaller number
of bad credits. This means the management of environmental credit risk reduces the number of
bad credits to be handled in the work out.

Assuming no interaction between pre-work out and work out activities we found three
interesting results: more “complete” banks consider ER in the work out, less “complete” banks
than expected do not consider ER in the work out, and more “incomplete” banks than expected
consider ER in the work out. Statistical tests show that the differences are significant (Fisher’s
Exact Test, df = 1, p = 0.0025, Chi-Square = 9.024). How can these results be explained? First we
look at the “incomplete” banks. We presume that “incomplete” banks are forced to consider ER
in the work out due to problem loans caused by ER. Because these banks miss to manage ER in
one or more of the pre-work out phases, they overlook, do not calculate, misprice or do not
monitor the default risk due to ER. This result confirms our hypothesis.

Then we looked at the “complete” banks. We interpret the results twofold. On the one
side the fact that less of the “complete” banks than expected consider ER in the work out is not
surprising. This result can be attributed to the management of ER in all pre-work out phases. It
confirms the hypothesis. The same argumentation can be followed for the finding that more of
the “complete” banks than expected do not consider ER in the work out. However, the fact that
14 of the “complete” banks consider ER in the work out despite their strong pre-work out activi-
ties does not go along with our hypothesis. It could be assumed that these banks do not have
any advantages from considering ER in all pre-work out phases. We interpret this result differ-
ently. We rather think that these banks manage ER with the most systematic approach of all
banks participating in the survey. These banks consider ER systematically in all process phases
including work out. They know from experience that ER are relevant and apply their expertise
actively in the work out if it is appropriate. They most probably have fewer problem credits than
most of the “incomplete” banks but in case they suffer from a bad credit due to ER they are
ready to apply their expertise in a systematic way. So, we assume that these banks are the
leaders in managing credit risk caused by ER.
An additional question is whether the cost caused through the consideration of ER are lower than the created benefits (Question 2). Even though we cannot provide empirical evidence for this, we can show that a small reduction in the number of bad credits improves the overall performance of the credit business enormously. A bad credit causes direct and indirect costs (Bowerman, 1992). For our purpose it is adequate to focus on direct costs, even though the total cost of a bad credit are even higher. Direct costs arise from credit losses in the form of unpaid loan redemptions and interest payments (Lautenschlager, 2000). The relevance of a credit loss can be appraised by estimating the volume of new credits necessary to compensate for the direct cost. We assume a net operating margin of 1.4%. To compensate for a credit loss of 10,000 USD a bank needs to generate new credit volume of \( \frac{10,000}{0.014} = 714,285 \) USD. These dimensions make clear that even small reductions in the credit default rate justify serious investments in the pre-work out phases. An example for a serious credit default due to environmental risk represents the case of the Fleet Factors bank in 1990, where Fleet Factors had to pay 800,000 USD for the clean up of the borrower’s site, because it participated in the management of the borrower’s company (Robb & Sotto, 1993). On the background of this situation it is very likely that the cost caused by the development, maintenance and running of management systems for ER in the pre-work out phases are lower than the economic benefits from the achieved reduction of credit losses. Hence the management of ER in the credit management process can be considered profitable for most banks.
Conclusions

The following conclusions can be drawn:

- In the credit management process the integration of ER varies intensely from one process phase to another.
- According to responses of the questionnaire, the UNEP-banks act according to their commitment. They consider ER in the credit management process more often than Non-UNEP-banks.
- The results of our research indicate that the efforts of the UNEP-banks in the pre-work out phases lead to a reduced effort in the work out phase.
- The most developed banks in terms of ER management consider ER in all phases of the credit risk management process.

From these results the following recommendations can be derived:

- Banks should integrate ER systematically not only in the rating phase but in all phases of the credit management process.
- Banks should evaluate ER appropriately in the rating. Banks that do not take ER into consideration when they evaluate a lender and assign him/her to a risk class, also ignore ER in the pricing. Hence credit defaults due to ER are not contained in the risk premiums and have to be carried by the bank.
- The default volume due to ER needs to be registered in the costing. This assures that the relevance of ER gets acquired. Furthermore the analysis of credit losses due to ER provides important hints of applicable indicators. However, currently there are only very few banks that record their credit losses due to ER.

Even though we could not provide empirical evidence that the benefits from reduced credit losses compensate for the costs caused by the development and maintenance of an evaluation system for ER, we could highlight the huge influence a single credit default has on the economic success of the credit business. Hence it is very likely that the efforts for the management of ER in the pre-work out phases are profitable due to a reduced number of bad credits in the work out.

Besides the above results our survey also identified great methodological differences among the banks that consider ER in the credit management process. The approaches vary from a single question concerning ER to sophisticated evaluation tools developed by a small number of banks. These findings confirm the findings of Weber, Reiland and Weber (Weber, Reiland, & Weber, 2002) and Jeucken and Bouma (Jeucken & Bouma, 2001). This shows that the management of ER in the credit business is still in an early stage of development. Therefore banks that improve their performance in this area have a good chance to gain competitive advantage. On the other side banks that continue to ignore the impact of ER will suffer from competitive disadvantage in the near future caused by adverse selection.
Our analysis is based on opinions because the data on environmental performance required to conduct a standardized credit risk assessment was not available until lately. This is about to change. Among others the Global Reporting Initiative is harmonizing some of the most developed standards for environmental performance measurement such as ISO 14001 and the Eco-Management and Audit Scheme in Europe. Hence it is very likely that the reporting of corporate environmental performance will be standardized within a few years. Based on these data further research on the improvement of credit management decisions through the integration of ER into the credit management process should be conducted.

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UNS-Working Paper 16 (Out of Print)

UNS-Working Paper 17

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