

## **The added-value of non-financial reporting in the DACH-region – An empirical analysis**

Prof. Dr. Andreas Grüner (University of St. Gallen, Switzerland)  
Jan-Frederic Schulz (University of St. Gallen, Switzerland)

This empirical analysis examines the development and added-value of non-financial reporting in the DACH Region (Germany, Switzerland and Austria) over the last 11 years. In order to do so the annual and sustainability reports of the 70 companies listed in the prime-indices DAX (Germany), SMI (Switzerland) and ATX (Austria) have been evaluated with regard to 18 criteria. These 18 criteria themselves can be allocated to three sub-categories: Governance & Economy, Social Involvement & Society and Ecology. Furthermore, formal aspects such as length and medium have been evaluated. The non-financial reporting quality has significantly increased in all three countries during the last 11 years. However, reporting quality in Austria is clearly behind the other two countries. The usage of separate sustainability reports and integrated reports has also increased during the observed period. Multiple regression analyses have revealed that the usage of separate and integrated reports does positively affect the reporting quality. Non-financial reporting does negatively affect abnormal volatilities in some of the three subcategories, however, not in Austria.

**Key words:** Non-financial reporting, integrated reporting, sustainability reports, financial-reporting

### **1 Introduction**

Non-financial reporting has become significantly more important in the previous decade. Firms have expanded the scope of their non-financial reporting activities and researchers have started analyzing the developments and effects of voluntary reporting activities. However, the progress on non-financial reporting in major European countries as well as the effect of non-financial reporting quality on abnormal volatilities and abnormal returns have not been analyzed yet.

This paper aims at contributing to the closure of this knowledge gap by examining the development and added-value of non-financial reporting in the DACH Region (Germany, Switzerland and Austria) over 11 years (2002-2012). In order to do so the annual and sustainability reports of the 70 companies listed in the prime-indices DAX (Germany), SMI (Switzerland) and ATX (Austria) will be evaluated with regard to 20 criteria. The focus has been put on these three countries as the market capitalization of these 70 companies sums up to €1.9 trillion while employing 5.2 million people. Thus, these 70 firms are of significant importance for the respective economies but also for the entire European economy.

This paper will focus on three questions. Firstly, how has the non-financial reporting quality developed from 2002 to 2012 and what is the status-quo of non-financial reporting quality in the mentioned three countries? Secondly, which factors do affect non-financial reporting quality? Thirdly, does non-financial reporting quality have an influence on abnormal volatilities and abnormal returns in Germany, Austria or Switzerland?

The literature review which follows this chapter will give an overview of the recent findings on voluntary disclosure policy and non-financial reporting activities. Afterwards the research design and the hypotheses including the data sample and the quality valuation methodology will be described. Eventually, three statistic analyses will answer the three questions mentioned in the previous paragraph. In a first descriptive analysis the development and the differences with regard to non-financial reporting quality between the three countries will be outlined. The second analysis will focus on the factors which impact the reporting quality. Eventually, the third analysis will evaluate the impact of the reporting quality on abnormal volatilities and abnormal returns.

We see an added-value in these analyses for three reasons. Firstly, non-financial reporting is a current topic which has been especially promoted with the recent release of the International Integrated Reporting Framework in December 2013 and this paper will outline how advanced the non-financial reporting of the largest publicly listed companies in the DACH region is. Secondly, the second analysis will reveal how companies can improve their non-financial reporting quality. Thirdly, the

effect of reporting quality on abnormal volatilities and abnormal returns will give investors and analysts an insight whether they should pay attention to the sustainability reports of companies when analyzing new investment opportunities.

There does exist various research on non-financial reporting as it will be outlined in the next chapter. However, this paper does offer three unique characteristics. Firstly, the development of the quality over a period of 11 years is displayed which is unique. Secondly, the influence of the quality level is assessed and more differentiated analyzed. Past paper usually only observed the impact of non-financial reporting's existence on various figures (binominal). Thirdly, in this paper non-financial reporting is regarded from a more holistic perspective as it does consider governance/economy, society/social affairs and environment related topics. Past papers often only focused on the effect environmental issues.

The introduction sets the stage for your research paper, and it also provides the reader with a structural preview of the paper, outlining what will be discussed in the subsequent sections.

## **2 Literature Review**

### **2.1 Theoretical Relevance of non-financial reporting**

From a research perspective non-financial reporting is of relevance as it informs stakeholders about the firm's intellectual capital and any non-financial risks which may arise in the (near) future. The intellectual capital is crucial for a company's value as it determines the firm's ability to generate cash flows in the future (e.g. employees' skills, R&D efforts etc.). Awareness for non-financial risks is important as significant liabilities can arise from such events in the future (e.g. environmental disasters etc.).

Thus, companies that report extensively and on a high quality level about their intellectual capital support investors in valuing the firm's full potential properly. Accordingly, through non-financial reporting companies can maximize their value. Awareness for non-financial risks can reduce the volatility of a company's share as investors will be less surprised by any non-financial events with serious financial impact (e.g. no selling-off etc.).

### **2.2 Research on non-financial reporting**

The literature review will focus on the most central results in the research field of voluntary disclosure and non-financial reporting.

In the past two decades there have been various papers on non-financial reporting. However, most of them focused on voluntary disclosure and not on the impact of non-financial reporting quality. Diamond & Verrechia (1991) have proven that companies which publish more company related information have more institutional investors as they appreciate the reduced information asymmetries. As a consequence the respective share's trading is more liquid which reduces the equity capital costs. Botosan (1997) confirmed these results by analyzing the amount of information which are published in the annual reports. Bushee & Noe (2000) analyzed the shareholder structure as well and also revealed that more published information lead to a higher percentage of institutional investors.

Fischer & Wenzel (2005) examined value-oriented reporting of large German listed companies. According to their analyses value-oriented reporting in 2002 was still on a low quality level and the reporting quality did not have an impact on any share related performance figures such as equity capital costs. In contrast, more recent research by Plumbee, Brown, Hayes & Marshall (2010) showed that good environmental reporting negatively affects capital costs and positively influences future cash flows. Dhaliwal, Li, Tsang & Yang (2011) discovered that companies which start publishing separate CSR-reports do reduce their equity capital costs, increase the number of analysts covering their share and improve their equity capital raising opportunities. The results were confirmed in a similar analysis by Dhaliwal, Radhakrishnan, Tsang & Yang (2012). Eccles, Krzus & Serafeim (2011) disclosed that investors are interested in non-financial information as openness is regarded as a sign of good management. Investors are especially interested in environmental and governance related information.

Author(s) (Year)	Research Focus	Methodology	Results
Diamond & Verrechia (1991)	Influence of the amount of published information on equity capital costs and the share's liquidity	Empirical	Companies that publish plenty of information reduce information asymmetries and can win institutional market participants as investors. Through the higher percentage of institutional investors the share's liquidity increases which in turn reduces equity capital costs.
Botosan (1997)	Influence of the amount of published information in annual reports on equity capital costs	Empirical	Companies which publish plenty of information in their annual reports have lower equity capital costs (adjusted for the company's beta and size).
Bushee & Noe (2000)	Influence of the amount and the quality of published information in annual reports on the shareholder structure	Empirical	Companies which publish many information and information of high quality level have a higher percentage of institutional investors.
Fischer & Wenzel (2005)	Development of the value reporting and the factors affecting value reporting in Germany from 1999-2002	Empirical	Value oriented reporting has improved from 1999 to 2002 significantly in Germany. However, in 2002 the quality was still on a very low level. The profit of a company positively affects the value oriented reporting quality. The quality of the value oriented reporting does not have any impact on company related performance figures.
Plumbee, Brown, Hayes & Marshall (2010)	Influence of environmental reporting on the enterprise value	Empirical	The company value is mainly determined by the following two factors: the capital costs and the expected future cash flows. Good environmental reporting correlates negatively with capital costs and positively with expected future cash flows. Thus, good environmental reporting has a significant positive effect on the company value. Separate sustainability reports reinforce this relation.
Dhaliwal, Li, Tsang & Yang (2011)	Effect of the publishment of CSR-reports on various company related market data	Empirical	Companies that start publishing CSR-Reports reduce their equity capital cost, increase the number of analysts covering their company, reduce the error rate of analysts covering them and improve their chances of raising equity.
Dhaliwal, Radhakrishnan, Tsang & Yang (2012)	Effect of the publishment of CSR-Reports on the prediction errors by analysts who cover the respective companies	Empirical	The prediction errors of analysts on companies which are publishing a separate CSR-report are lower than on those companies which do not publish a separate CSR-Report. The lower prediction errors lead to a lower volatility of the respective share.
Eccles, Krzus & Serafeim (2011)	Investors' interest for non-financial reporting	Empirical	Market participants and investors are interested in the degree of transparency apply when it comes to non-financial developments as good non-financial reporting is regarded as sign for good management. They are more interested in governance and environment related information than for the category „Social Affairs“. Shareholder are more interested in non-financial information than debt holders.
GRI (2011)	The added-value of non-financial reporting for investors and analysts based on questionnaires	Empirical	The survey has revealed that 80% of the polled investors/analysts regard non-financial information as important while the focus lies on Governance related information. The most important source for non-financial information is the sustainability report. Other sources are regarded as less important. More than 80% of the investors belief that integrated reports create an added-value.
Coram, Monroe & Woodliff (2009)	Effect of attesting non-financial performing figures on the target prices of the respective shares	Experimental	Shares of companies which let their non-financial performance ratios certify have higher target prices. However, this relation does only apply if the non-financial performance figures are positive.

Figure 1: Overview Literature Review

### 3 Research Design

#### 3.1 Research Design

In order to answer the three questions mentioned in the introduction three analyses will be conducted. A descriptive statistic will be used to display the development and the status-quo of non-financial reporting quality while two explorative statistics will be used to examine the factors affecting non-financial reporting quality and the effect of non-financial reporting quality on abnormal volatilities and abnormal returns. For these explorative analyses multiple regression analyses will be used (Dougherty, 2011, p. 176).

The quality of the non-financial reports was analyzed based on a set of 18 criteria (see Figure 2). These 18 criteria can be allocated into three categories: Governance & Economy, Social Affairs & Society and Environment (PWC, 2011). The criteria are derived from the G4 Guidelines of the Global Reporting Initiative and aim at giving investors (and other stakeholders) a holistic view on companies' non-financial activities (GRI, 2013b). The quality evaluation is based on a scale from 1 (poor reporting) to 6 (excellent reporting). The value for the three categories is based on the equally weighted average of all values within each category. The evaluation of each criteria is based on a framework. For each condition that is met another point on the scale is given. The maximum score is given if the reporting about the respective topic is standardized, quantified (if possible), displayed in the historical development and illustrated in a clearly arranged graphic/diagram. As the efforts of the Global Reporting Initiative aim at a standardized and easy to interpret non-financial reporting the maximum score is only given if the highest standards are met (GRI 2013a).

Analyzed criteria			
Formality	Governance & Economy	Society & Social Affairs	Environment
<ul style="list-style-type: none"> <li>▪ Length</li> <li>▪ Medium</li> <li>▪ No. of employees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Sustainability strategy</li> <li>▪ Sustainability management</li> <li>▪ Product responsibility</li> <li>▪ Sustainable Innovations</li> <li>▪ Local added value</li> <li>▪ Definition of stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>▪ Corporate Citizenship</li> <li>▪ Training for employees</li> <li>▪ Diversity</li> <li>▪ Human rights</li> <li>▪ Fight against corruption</li> <li>▪ Dialogue with stakeholders</li> <li>▪ On-the-job safety</li> </ul>	<ul style="list-style-type: none"> <li>▪ Emissions and climate protection</li> <li>▪ Energy consumption and energy efficiency</li> <li>▪ Preservation of resources</li> <li>▪ Waste management</li> <li>▪ Nature protection</li> </ul>

Figure 2: Overview of evaluated criteria

As already mentioned before the term “non-financial reporting” does refer to any issues related to the topic of sustainability. In this paper the term “sustainability” does refer to any activities which focus on a sustainable long-term development of the business and not only on environmental aspects. For this reason the PWC framework with 18 criteria was used as it focus on aspects in three categories (Governance & Economy, Society & Social Affairs and Environment).

The main challenge behind this research design is the subjectivity of the reports' evaluation. Even though a clear framework for the evaluation of the non-financial reporting quality has been developed subjectivity cannot be completely eliminated (Rammstedt, 2010). However, an entirely objective evaluation approach is not possible either as the reporting quality can only be assessed through a content analysis. Only such a content analysis allows analyzing the structure, the content and the way the information are illustrated (Stempler, 2001).

#### 3.2 Data Sample

The 70 largest publicly listed companies in Germany, Austria and Switzerland were analyzed. For Germany these are the 30 companies listed in the DAX30, for Austria the 20 companies listed in the ATX and for Switzerland the 20 companies listed in the SMI. For each of these 70 companies the non-financial report for the financial year 2002 to 2012 (11 years) were analyzed with regard to used medium, length and quality. If a company published an integrated report, this report was evaluated. Otherwise, the sustainability/CSR report and afterwards the non-financial sections in the normal annual report were assessed.

With a market capitalization of approx. €950bn. the German DAX is the largest index followed by the SMI (approx. €900 bn) and the ATX (approx. €65bn). Even though, the population size in Switzerland and Austria is comparable (8mio vs. 8.4mio) several large multinational companies are domiciled in Switzerland (e.g. Nestle, Novartis, Roche). Nestle's market capitalization (approx. €180bn) is already larger than that of the entire ATX.

### 3.3 Hypotheses

Based on the literature review the following five main hypotheses were developed:

**H1:** The quality of non-financial reporting has significantly increased from 2002 to 2012.

The length of annual reports has significantly increased during the last decade. On top of that stakeholders have become more sensitive to non-financial issues, especially environmental issues. Accordingly, it can be assumed that firms have clearly improved the quality of their non-financial reporting activities.

Among the three analyzed countries the reporting quality in Austria should be on the lowest level due to cultural reasons. According to Hofstede's (2001) cultural dimensions Austria scores low on the dimension "Pragmatism" which makes Austria less open-minded for changes and unconventional ideas. Thus, the willingness to work on such an unconventional way of reporting might be less pronounced in Austria.

**H2:** The usage of separate sustainability/CSR reports and integrated reports has increased from 2002-2012. However, the usage in Austria is less widespread.

For the reasons mentioned in the paragraph above the usage of separate sustainability/CSR reports and integrated reports should have increased. Furthermore, various initiatives have promoted the usage of such media.

In the ATX such separate or integrated reports should be less common due to the cultural reasons mentioned above and due to the fact that the Austrian companies are significantly smaller.

**H3:** The usage of sustainability reports and integrated reports has a significant positive effect on non-financial reporting quality in all countries.

Sustainability reports focus solely on non-financial aspects. Therefore, it can be assumed that the quality of non-financial information which are presented in such a medium is significantly higher. Integrated reports do not display non-financial developments separately, however, they follow the IIRC framework which determines which and how non-financial information should be published. For this reason, it can be assumed that integrated reports also feature higher non-financial reporting quality.

**H4:** Non-financial reporting quality does negatively affect abnormal volatility.

Non-financial reporting quality should affect negatively abnormal volatility as investors and analysts become better acquainted with non-financial risks which might cause financial damages in the future. Therefore, investors/analysts are less shocked by non-financial events which will lead to negative financial consequences and selling-offs of the respective share appear less often. As a result shares of firms with good non-financial reporting on a holistic basis show lower abnormal volatility.

**H5:** Non-financial reporting quality has significant negative influence on abnormal returns.

Assuming efficient markets lower abnormal volatilities (caused by good non-financial reporting quality) should lead to lower abnormal returns as investors require less risk compensation.

In order to be confirmed a hypothesis needs to meet the following two criteria. Firstly, the relation between the variables needs to be significant, at least at a 10% level. Secondly, a hypothesis gets only confirmed if the direction of influence (positive or negative) is correct. The coefficient determines the degree of influence of the respective independent variable(s). (Wooldrige, 2006, p. 485)

## **4 Analysis I: Development of non-financial reporting quality**

### **4.1 Formalities**

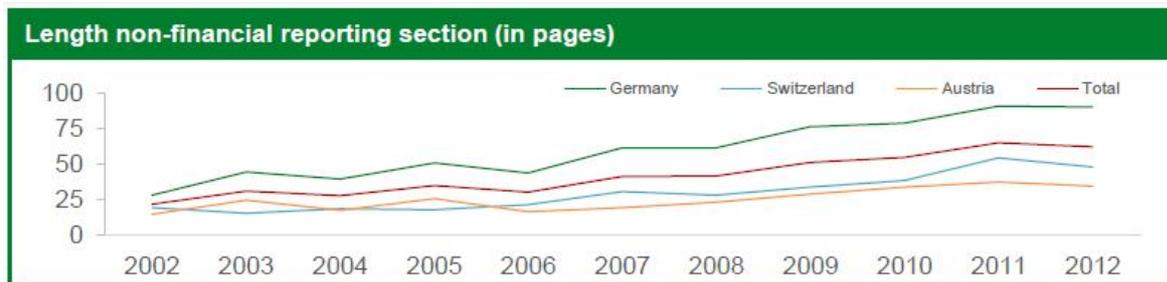


Figure 3: Development of the length of the non-financial reporting section (in pages)

As displayed in Figure 3 non-financial reporting sections have become longer (in terms of pages) in all three countries during the analyzed period. However, in Germany the respective sections are the longest and in Austria the shortest by tendency.

Figure 4 gives an overview of the media which were used for the non-financial reporting in the various countries. One can see that in all countries the percentage of firms that report about their non-financial affairs only in their regular annual report has decreased. There is a strong tendency towards the publication of separate CSR or sustainability reports recognizable. Sustainability reports are published separate to the annual report and report more intensively about the company's impact on economic, social and environmental affairs. In Germany and Switzerland there is only a small percentage left which has still not switched to such a reporting medium. In contrast, in Austria 50% of the analyzed companies have still not switched.

Integrated reports which combine the annual and the separate sustainability report are less widespread today. However, the number of companies using such reporting medium has slightly increased and it can be assumed that such trend will further continue for two reasons in the years to come. Firstly, through integrated reports investors/stakeholders get a more holistic view on a company without the requirement of analyzing two publications and it links financial and non-financial topics. Secondly, as shown in the next chapter, the usage of an integrated report positively affects the non-financial reporting quality. The recent endeavours around the IIRC framework might accelerate this trend.

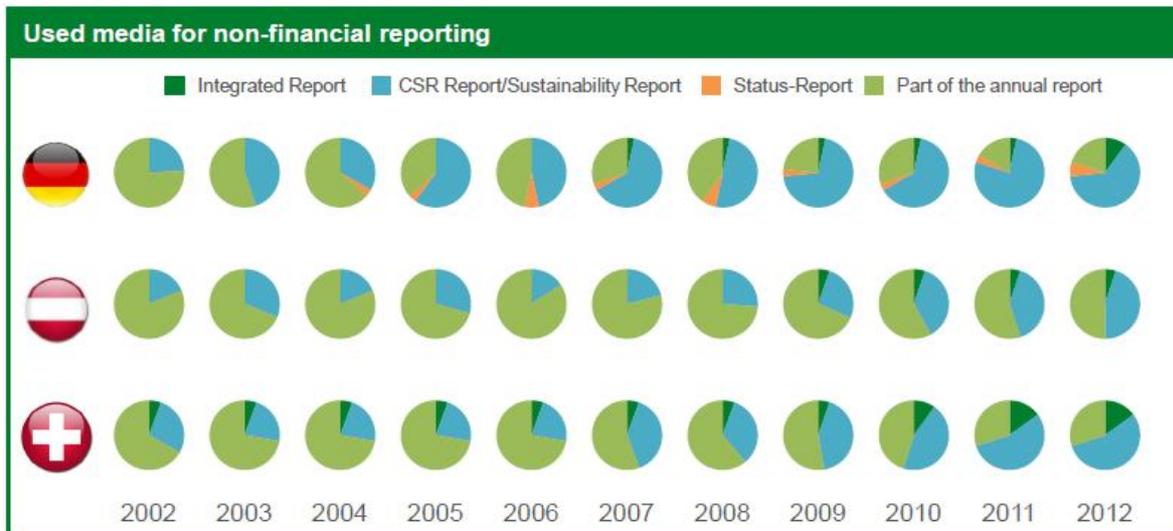


Figure 4: Development of the used media for the non-financial reporting

#### 4.2 Non-financial reporting quality

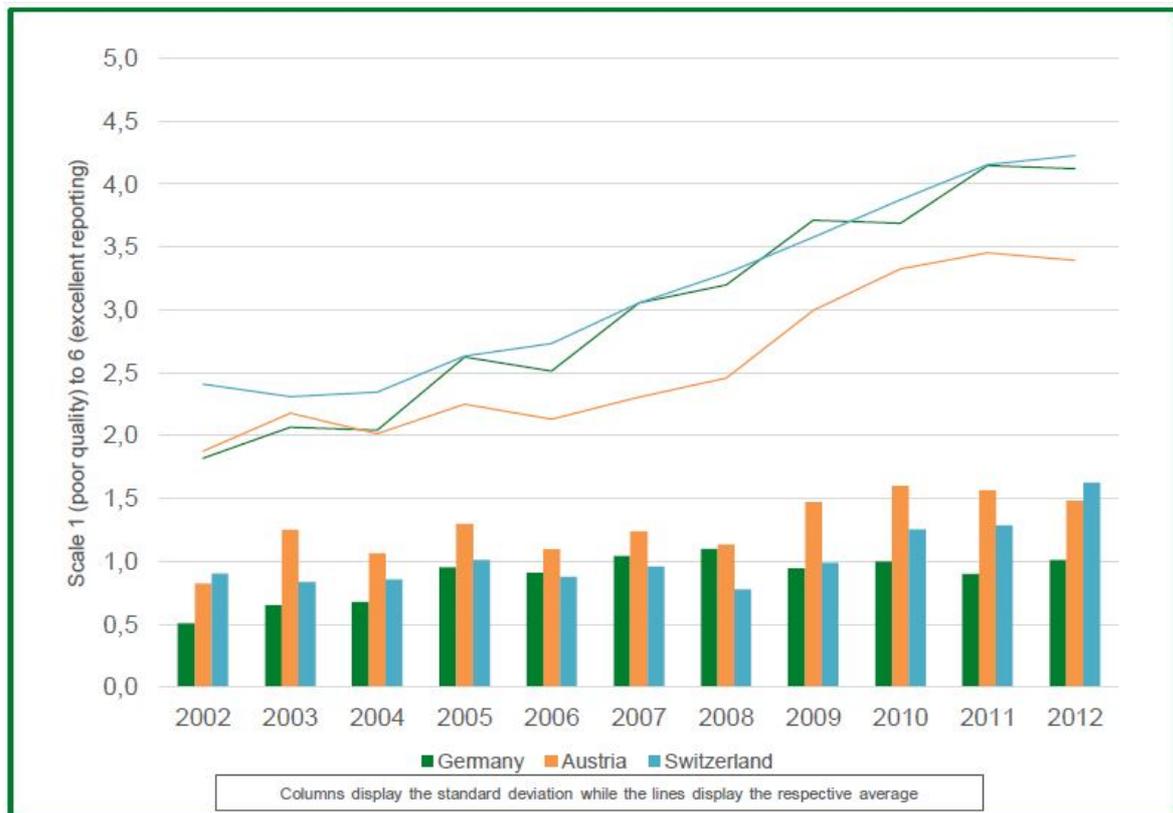


Figure 5: Development of the overall non-financial reporting quality

Figure 5 displays the development of the overall non-financial reporting quality in the DACH-region from 2002 to 2012. The line charts illustrate the average quality for each prime-index while the column charts at the bottom display the standard deviation in each index.

Overall the quality has increased significantly in all three countries quite consistently (slight declines in selected years are due to the fact that some companies publish separate sustainability reports only every second year and in the meanwhile they use a short status-report or a small section the regular annual report). Nevertheless, three points need to be highlighted. Firstly, the reporting quality of

Austrian companies has been most of the time lower than in Germany and Switzerland where the quality was relatively close to each other. Secondly, the standard deviation of the reporting quality has increased in all three countries over time which means that the difference between the companies rose. The German DAX companies show the lowest standard deviation which means that these companies have developed quite homogenously with regard to their non-financial reporting efforts. In Switzerland the standard deviation was 2012 50% higher than in Germany. Such result can be explained through the fact that the size of the SMI companies varies strongly. The three largest companies (Nestle, Novartis and Roche) make up almost 60% of the market capitalization of the entire SMI. Such companies have the capabilities to develop a “state of the art” non-financial reporting system in contrast to smaller companies such as Adecco or Actelion. Thirdly, all companies have still noteworthy upside potential. Assuming the past rates of improvement at least another 10 years (for Austria 13 years) are needed before all companies meet today’s highest standards.

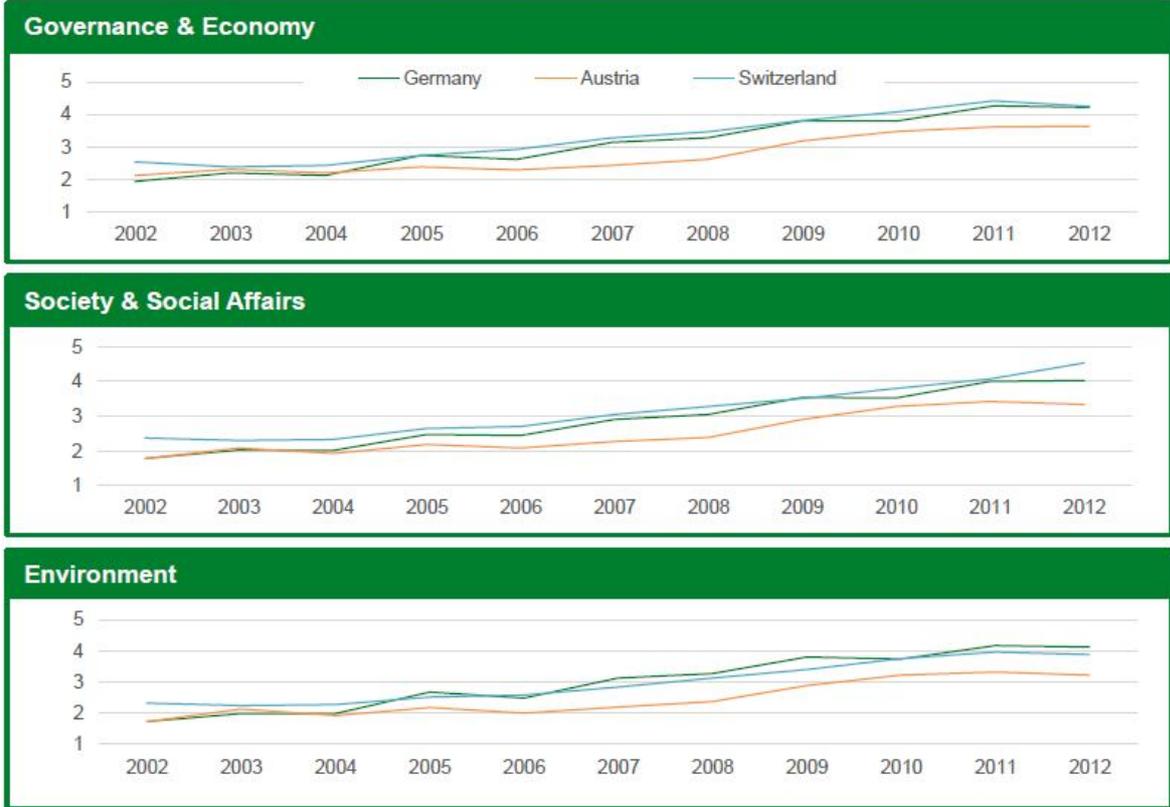


Figure 6: Development of the non-financial reporting quality in the three categories

Figure 6 gives an overview of the development within each of the three categories. In each category the quality has clearly increased over time and Austrian companies are behind. Apart from that the quality level in the three categories does not vary too much.

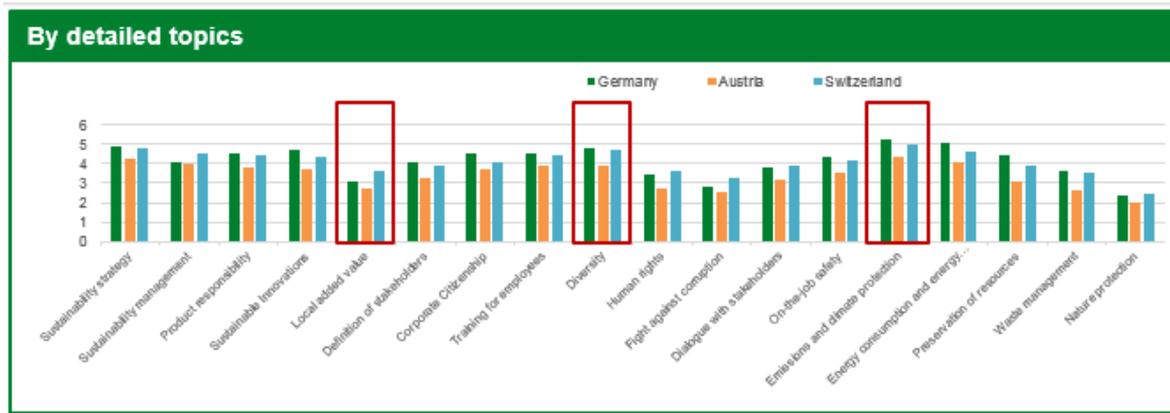


Figure 7: Status-Quo of non-financial reporting quality by criteria in 2012

If one goes even one level further down one can analyze the non-financial reporting quality by each of the 18 criteria. Figure 7 shows the status-quo for the financial year 2012. Three points need to be emphasized. Firstly, the reporting quality about local value creation is comparably low even though all companies are operating across the globe. Secondly, reporting about diversity issues is in Austria clearly lower than in Germany and Switzerland. Thirdly, in all three countries the reporting quality about environmental issues is on a high level with only limited upside potential left.

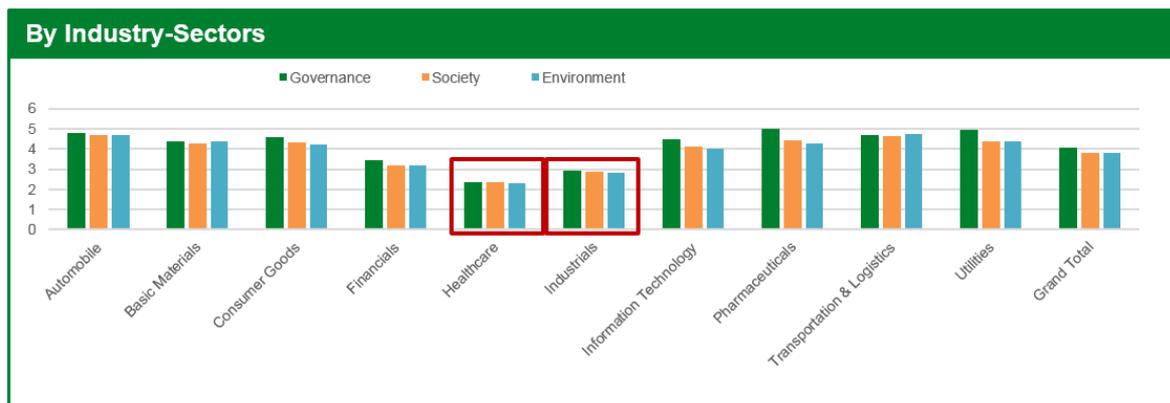


Figure 8: Status-Quo of non-financial reporting quality by industry

The analysis of the status-quo (2012) by industry in Figure 8 shows that the healthcare and the industrials sector lie behind the rest of the field. This can be explained through the fact that these two industries are mainly involved into the B2B sector and are less exposed to the focus of endcustomers and general publicity.

## **5 Analysis II. Factors affecting non-financial reporting quality**

Multiple regression analyses have been conducted to find out which factors do affect non-financial reporting quality in all three countries. For each country four models were used. The dependent variables vary between the four models. As independent variables the non-financial reports' length (in pages), the medium (through dummy variables) and company figures were used. Figure 9 to Figure 11 display the respective results.

Model		1		2		3		4	
Dependent Variable		Governance & Economy		Social Affairs & Society		Environment		Total Non-Financial Reporting	
		Coefficient		Coefficient		Coefficient		Coefficient	
		$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE
Independent Variable	Interception	-0.59	0.46	-0.85*	0.43	-0.77	0.48	-0.74***	0.43
	Pages (log)	1.54***	0.17	1.28***	0.16	1.46***	0.18	1.43***	0.16
	Dummy Status-Report	0.64***	0.22	0.41*	0.21	1.11***	0.24	0.72***	0.21
	Dummy Sustainability Report	0.80***	0.14	0.88***	0.13	1.02***	0.15	0.90***	0.13
	Dummy Integrated Report	1.18***	0.28	1.43***	0.27	1.75***	0.30	1.45***	0.26
	Employees (log)	0.16	0.10	0.24**	0.09	0.16	0.11	0.18**	0.09
	Profit	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Freefloat	-0.01***	0.00	-0.01***	0.00	-0.01**	0.00	-0.01***	0.00
	Statistics								
	R <sup>2</sup>	0.67		0.68		0.68		0.70	
	Adjusted R <sup>2</sup>	0.66		0.67		0.67		0.70	
	F-Statistics	71.33***		73.80***		73.81***		83.87***	

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent.

Figure 9: Factors affecting non-financial reporting quality in Germany

Model		1		2		3		4		
Dependent Variable		Governance & Economy		Social Affairs & Society		Environment		Total Non-Financial Reporting		
Independent Variable		Coefficient		Coefficient		Coefficient		Coefficient		
		$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	
		Interception	0.56***	0.16	0.13	0.17	0.34**	0.16	0.34**	0.15
		Pages (log)	1.82***	0.21	1.93***	0.21	1.80***	0.20	1.85***	0.19
		Dummy Status-Report								
		Dummy Sustainability Report	0.81***	0.24	0.55**	0.25	0.65***	0.24	0.67***	0.22
		Dummy Integrated Report	0.42	0.32	0.07	0.33	0.26	0.32	0.25	0.30
	Employees (log)	0.02	0.04	0.07	0.05	0.03	0.04	0.04	0.04	
Statistics	R <sup>2</sup>	0.87		0.86		0.86		0.88		
	Adjusted R <sup>2</sup>	0.87		0.86		0.86		0.88		
	F-Statistics	337.89***		295.87***		301.43***		367.94***		

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent.

Figure 10: Factors affecting non-financial reporting quality in Austria

Model		1		2		3		4		
Dependent Variable		Governance & Economy		Social Affairs & Society		Environment		Total Non-Financial Reporting		
Independent Variable		Coefficient		Coefficient		Coefficient		Coefficient		
		$\beta$	SE	$\beta$	SE	$\beta$	SE	$\beta$	SE	
		Interception	1.46***	0.52	-0.44	0.61	0.28	0.49	0.43	0.48
		Pages (log)	1.72***	0.19	1.81***	0.22	1.89***	0.18	1.81***	0.18
		Dummy Status-Report								
		Dummy Sustainability Report	0.09	0.20	-0.17	0.23	-0.17	0.19	-0.09	0.18
		Dummy Integrated Report	1.04***	0.26	1.23***	0.31	0.19	0.25	0.82***	0.25
	Employees (log)	-0.08	0.12	0.31**	0.14	0.11	0.12	0.11	0.11	
Statistics	R <sup>2</sup>	0.55		0.52		0.56		0.59		
	Adjusted R <sup>2</sup>	0.54		0.51		0.55		0.58		
	F-Statistics	60.56***		53.08***		63.14***		71.73***		

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent.

Figure 11: Factors affecting non-financial reporting quality in Switzerland

All models are statistically significant and they all show a relatively high adjusted R<sup>2</sup>. Therefore, the explanatory power of these analyses is given and the results can be interpreted (Montgomery, Peck & Vining, 2012).

One can see that the length (in pages) does positively effect the reporting quality in any model (respectively category). Even though quantity does not necessarily equal quality such relation is not surprising. In longer non-financial sections companies can present more information and, thus, are more likely to cover all criteria at least on a low level.

In the German DAX the usage of a non-financial reporting medium other than the regular annual report does positively affect the reporting quality. The same does apply for Austria with the exception of the usage of an integrated report. However, due to the small number of firms that publish an integrated report in Austria this relation can be neglected. In Switzerland the usage of an integrated report improves reporting quality in any category except for environmental affairs. Overall, one can state that the trend towards integrated reporting is justified as it improves by strong tendency non-financial reporting quality.

Looking at company related facts one sees that the number of employees has a significant positive effect on the reporting quality in the category “Social Affairs & Society” in all three countries. This appears logical as companies with a larger workforce also bear a higher responsibility.

## **6 Analysis III: Influence of non-financial reporting quality on abnormal volatilities and abnormal returns**

In this section the influence of non-financial reporting quality on abnormal volatilities and abnormal returns of the respective company shares will be analyzed. This analysis is of great interest as it eventually shows whether good non-financial reporting quality pays off for companies. If reporting quality could negatively affect abnormal volatilities and positively abnormal returns companies could increase their company value.

Lower abnormal volatilities reduce the risks for investors and, therefore, reduce the discount rate they apply on future cash flows. Lower discount rates increase the sum of the present value of future cash flows which raises in turn the company value. Higher abnormal returns make investors pay more for the respective share (until the price is so high that only market adequate returns are earned) (Achtleitner, 2001, p. 6-13).

As reference/market indices for the calculation of the abnormal volatilities and abnormal returns the respective regional industry indices were taken, e.g. for pharmaceutical companies the Bloomberg Europe 500 Pharmaceuticals Index.

Separate multiple regression analyses for Germany, Austria and Switzerland have been applied. For each country 4 models have been used: two with abnormal volatility as the dependent variable and two with abnormal return as the dependent variable. The Model "a" has only the various quality categories as independent variables while model "b" also includes the medium and the length. In all models control variables were used to control for the years and company characteristics such as size, profit and number of employees. Figure 12 to Figure 14 display the results for each of the three countries.

### **6.1 Influence on abnormal volatilities**

The models with the abnormal volatility as the dependent variable are in all three countries statistically significant. However, the influence of the quality varies.

In Germany good reporting quality in the categories "Governance & Economy" and "Society and Social Affairs" does negatively affect abnormal volatility while the quality in the category "Environment" does positively affect abnormal volatility. While the first result is comprehensible the third result, the positive influence of reporting quality on environmental issues, is rather surprising at first sight and needs further clarification. The usage of a separate sustainability report also negatively affects abnormal volatility.

In Austria no statistically significant influence could be detected.

In Switzerland the usage of an integrated report negatively affects abnormal returns which justifies once again the weak trend towards integrated reporting. Good reporting quality in the category "Environment" does negatively affect abnormal volatilities at a 1% level which is in line with the hypothesis.

### **6.2 Influence on abnormal returns**

The models with the abnormal return as the dependent variable are all statistically significant. However, they only show limited statistically relations.

In Germany good reporting quality in the section "Society & Social Affairs" negatively affects abnormal returns while the category "Environment" has a positive influence. These results are in line with the efficient market hypothesis (higher volatility comes along with higher returns and vice versa). The same effect also applied to Switzerland where good reporting in the category "Environment" negatively affects abnormal returns.

Austria does not show any significant relations.

Model Dependent Variable		1a			1b			2a			2b		
		Abnormal Volatility			Abnormal Volatility			Abnormal Return			Abnormal Return		
		Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.
		$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$
Control Variables	Interception	0.31***	0.05		0.30***	0.05		0.41	0.18		0.43**	0.18	
	Dummy Year 2003	-0.06**	0.02	-0.18**	-0.06***	0.02	-0.19***	-0.12*	0.08	-0.12*	-0.11	0.08	-0.11
	Dummy Year 2004	-0.06**	0.02	-0.18**	-0.06***	0.02	-0.19***	-0.01	0.07	-0.01	-0.01	0.08	-0.01
	Dummy Year 2005	-0.04	0.02	-0.11	-0.04	0.02	-0.11	-0.04	0.08	-0.04	-0.03	0.08	-0.03
	Dummy Year 2006	-0.05**	0.02	-0.15**	-0.05**	0.02	-0.16**	-0.00	0.08	-0.00	0.01	0.08	0.01
	Dummy Year 2007	-0.01	0.02	-0.04	-0.02	0.02	-0.06	-0.14*	0.08	-0.15*	-0.13*	0.08	-0.13*
	Dummy Year 2008	0.03	0.02	0.10	0.02	0.02	0.06	0.01	0.08	0.01	0.03	0.08	0.03
	Dummy Year 2009	-0.06	0.03	-0.18	-0.07***	0.03	-0.23***	-0.05	0.08	-0.05	-0.03	0.08	-0.03
	Dummy Year 2010	-0.02	0.03	-0.07	-0.04	0.03	-0.13	-0.11	0.08	-0.11	-0.09	0.08	0.09
	Dummy Year 2011	-0.02	0.03	-0.06	-0.04	0.03	-0.12	-0.06	0.09	-0.06	-0.04	0.09	-0.04
	Dummy Year 2012	-0.00	0.03	-0.01	-0.02	0.03	-0.07	-0.10	0.09	0.10	-0.07	0.09	-0.07
	Employees (log)	-0.03**	0.01	-0.13**	-0.04***	0.01	-0.19***	-0.05	0.04	-0.08	-0.03	0.04	-0.05
	Profit	-0.00*	0.01	-0.13*	0.00*	0.00	-0.10*	-0.00	0.00	-0.05	-0.00	0.00	-0.04
Independent Variable	Quality Governance & Economic	-0.02	0.01	-0.23	-0.02*	0.01	-0.26*	-0.03	0.04	-0.11	-0.02	0.04	-0.08
	Quality Society & Social Affairs	-0.04**	0.01	-0.44**	-0.03**	0.01	-0.37**	-0.07	0.05	-0.30	-0.09*	0.05	-0.38*
	Quality Environment	0.03***	0.01	0.45***	0.04***	0.01	0.49***	0.08**	0.04	0.37**	0.10**	0.04	0.44**
	Pages (log)				0.06***	0.02	0.27***				-0.09	0.08	-0.13
	Dummy Status-Report				-0.01	0.03	-0.02				-0.15	0.09	-0.10
	Dummy CSR Report				-0.06***	0.02	-0.31***				0.04	0.07	0.07
Statistics	Dummy IR				-0.05	0.04	-0.08				0.02	0.12	0.01
	R <sup>2</sup>		0.21			0.24			0.07			0.09	
	Adjusted R <sup>2</sup>		0.17			0.19			0.03			0.03	
	F-Statistic		5.49***			4.97***			1.65*			1.52*	

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent

Figure 12: Influence of non-financial reporting quality in Germany

Model Dependent Variable		1a			1b			2a			2b		
		Abnormal Volatility			Abnormal Volatility			Abnormal Return			Abnormal Return		
		Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.
		$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$	$\beta$	SE	Stand. $\beta$
Control Variables	Interception	-0.06	0.05		-0.04	0.05		0.04	0.14		0.06	0.16	
	Dummy Year 2003	0.08	0.4	0.16*	0.08*	0.04	0.16*	0.18	0.14	0.11	0.18	0.14	0.11
	Dummy Year 2004	0.09	0.4	0.19**	0.10**	0.04	0.19**	0.04	0.14	0.03	0.04	0.14	0.02
	Dummy Year 2005	0.09	0.04	0.04	0.09**	0.04	0.18**	-0.07	0.14	-0.05	-0.07	0.14	-0.05
	Dummy Year 2006	0.12***	0.04	0.25***	0.12***	0.04	0.26***	-0.15	0.14	-0.11	-0.16	0.14	-0.11
	Dummy Year 2007	0.22***	0.04	0.49***	0.23***	0.04	0.49***	-0.22	0.14	-0.11	-0.22	0.14	-0.16
	Dummy Year 2008	0.21***	0.04	0.45***	0.21***	0.04	0.46***	0.32**	0.14	0.23**	0.32	0.14	0.22**
	Dummy Year 2009	0.08*	0.04	0.17*	0.09**	0.05	0.20**	0.05	0.14	0.03	0.03	0.14	0.02
	Dummy Year 2010	0.07*	0.04	0.16*	0.09*	0.05	0.19*	-0.20	0.14	-0.14	-0.22	0.15	-0.15
	Dummy Year 2011	0.08**	0.04	0.18**	0.10**	0.05	0.22**	-0.05	0.14	-0.03	-0.07	0.14	-0.05
	Dummy Year 2012	0.09**	0.04	0.21**	0.11**	0.04	0.23**	-0.22	0.14	-0.16	-0.24	0.14	-0.17
	Employees (log)	0.02	0.01	0.12	0.02*	0.01	0.14*	0.05*	0.03	0.12*	0.06*	0.04	0.14*
Profit													
Independent Variable	Quality Governance & Economic	-0.01	0.03	-0.07	-0.01	0.03	-0.14	-0.15*	0.09	-0.53*	-0.14	0.10	-0.49
	Quality Society & Social Affairs	-0.01	0.03	-0.06	-0.01	0.03	-0.08	0.08	0.10	0.28	0.10	0.11	0.32
	Quality Environment	0.01	0.03	0.14	0.01	0.04	0.09	0.14	0.09	0.14	0.06	0.09	0.18
	Pages (log)				-0.02	0.06	-0.06				-0.16	0.19	-0.21
	Dummy Status-Report												
	Dummy CSR Report				0.06	0.06	0.20				0.07	0.19	0.08
Dummy IR				-0.06	0.08	-0.06				0.14	0.25	0.05	
Statistics	R <sup>2</sup>	0.22			0.24			0.19			0.20		
	Adjusted R <sup>2</sup>	0.16			0.17			0.13			0.12		
	F-Statistic	3.79***			3.32***			3.15***			2.61***		

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent

Figure 13: Influence of non-financial reporting quality in Austria

Model Dependent Variable		1a			1b			2a			2b		
		Abnormal Volatility			Abnormal Volatility			Abnormal Return			Abnormal Return		
		Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.	Coefficient		Std. Coeff.
		β	SE	Stand. β	β	SE	Stand. β	β	SE	Stand. β	β	SE	Stand. β
Control Variables	Interception	0.25***	0.05		0.24***	0.05		0.48***	0.15		0.51***	0.15	
	Dummy Year 2003	-0.02	0.03	-0.07	-0.02	0.03	-0.07	-0.23***	0.08	-0.26***	-0.22***	0.08	-0.26***
	Dummy Year 2004	-0.06**	0.03	-0.22**	-0.06	0.03	-0.22**	-0.17	0.08	-0.20	-0.17**	0.08	-0.20**
	Dummy Year 2005	-0.04*	0.03	-0.15*	-0.04	0.03	-0.15*	-0.04	0.08	-0.04	-0.03	0.08	-0.04
	Dummy Year 2006	-0.05**	0.03	-0.17**	-0.05**	0.03	-0.18**	-0.23***	0.08	-0.27***	-0.23	0.08	-0.27
	Dummy Year 2007	0.02	0.03	0.43	0.02	0.03	0.05*	-0.19**	0.08	-0.22**	-0.20**	0.08	-0.23**
	Dummy Year 2008	0.02	0.03	0.41	0.02	0.03	0.06	0.18**	0.08	-0.21**	-0.18**	0.08	-0.21**
	Dummy Year 2009	-0.06**	0.03	-0.22**	-0.07***	0.03	-0.24***	-0.24***	0.08	-0.29***	-0.25***	0.08	-0.29***
	Dummy Year 2010	-0.02	0.03	-0.06	-0.02	0.03	-0.07	-0.28***	0.08	-0.34***	-0.28***	0.08	-0.34***
	Dummy Year 2011	-0.04	0.03	-0.15	-0.05*	0.03	-0.16*	-0.20**	0.08	-0.25**	-0.21***	0.08	-0.26***
	Dummy Year 2012	-0.03	0.03	-0.11	-0.03	0.03	-0.12	-0.21**	0.08	-0.26**	-0.22***	0.08	-0.27***
	Employees (log)	-0.02*	0.01	-0.12*	-0.02	0.01	-0.11	-0.04	0.08	-0.09	-0.06*	0.03	-0.13*
Profit													
Independent Variable	Quality Governance & Economic	-0.00	0.01	-0.05	0.00	0.01	0.04	-0.01	0.03	-0.07	-0.02	0.03	-0.12
	Quality Society & Social Affairs	0.01	0.01	0.17	0.01*	0.01	0.25*	0.03	0.02	0.17	0.03	0.02	0.19
	Quality Environment	-0.03	0.01	-0.39***	-0.04***	0.01	-0.54***	-0.04	0.03	-0.20	-0.06*	0.03	-0.31*
	Pages (log)				0.01	0.02	0.05				0.09	0.06	0.19
	Dummy Status-Report												
	Dummy CSR Report				0.00	0.02	0.01				0.03	0.05	0.06
Dummy IR				-0.05**	0.02	-0.18**				-0.01	0.08	.01	
Statistics	R <sup>2</sup>	0.25					0.17			0.19			
	Adjusted R <sup>2</sup>	0.19					0.10			0.12			
	F-Statistic	4.46***					2.68***			2.59***			

Note: Asterisks (\*, \*\* and \*\*\*) indicate significance at 10%, 5% and 1% level respectively. Significance is assessed using t-statistics calculated using White's heteroskedasticity consistent

Figure 14: Influence of non-financial reporting quality in Switzerland

## **7 Hypotheses Review & Conclusion**

### **7.1 Hypotheses Review**

In order to be confirmed a hypothesis needs to meet the following two criteria. Firstly, the relation between the variables needs to be significant, at least 10% level. Secondly, a hypothesis gets only confirmed if the direction of influence (positive or negative) is correct.

H1	Confirmed	The quality of non-financial reporting has significantly increased in all three countries from 2002 to 2012. However, Austria is clearly behind the other two countries and all countries have still serious upside potential.
H2	Confirmed	In Switzerland and Germany the vast majority of the analysed companies use separate CSR/sustainability reports. In Austria only 50% use such a medium. There is also a trend towards the implementation of integrated reports recognisable. However, so far only very few companies use such medium.
H3	Confirmed	In Germany the usage of sustainability reports or integrated reports does positively affect reporting quality. In Switzerland integrated reports statistically improve the quality. In Austria such a relation could only be detected for sustainability reports. However, there the results for the integrated reports are not reliable due to the small amount of firms which publish such a report.
H4	(Partly) confirmed	Non-financial reporting quality in the sections “Governance & Economy” and “Society & Social Affairs” does affect negatively abnormal volatilities in Germany while the quality in the section “Environment” has a positive influence. In Austria no effect could be detected. In Switzerland the category “Environment” has a negative impact on abnormal returns.
H5	Declined	In Germany the impact of non-financial reporting quality on abnormal returns does exist, however, it is statistically neglectable. The same does apply for Austria. In Switzerland good environmental reporting does negatively affect abnormal returns, but only at a 10% significance level.

Figure 15: Review of hypotheses

### **7.2 Conclusion & Outlook**

The analyses have shown that there have been significant developments in the area of non-financial reporting in the last 11 years in all three countries. Nevertheless, there does exist still upside potential with regard to the non-financial reporting quality. Companies should try to make use of such remaining potential as a holistic reporting about non-financial aspects in terms of sustainable business developments maximises the company value.

The third empirical analysis has revealed different effects of reporting quality in the environmental category on abnormal volatilities in the various countries. Research which focus specifically on this category might clarify such effect. For more reliable statistical results the data sample might be increased. One could either analyse companies from other countries which would reveal cultural

influences or one could also analyse companies from smaller indices in the DACH countries which could show the status-quo in the sector of mid-size companies.

For the long-term future it would be interesting to analyze in 10-15 years from now the shares of the companies which have performed in the past 10 years very well with regard to the publication of non-financial information. Such an analysis could examine whether good non-financial reporting increases the company value on a long-term basis as it is declared in theory.

The conclusion wraps up your paper by reviewing the main findings and how they were derived. The conclusion might also add some final thoughts that place your research findings into a wider context.

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