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# Calculating the international return on prevention for companies: Costs and benefits of investments in occupational safety and health

FINAL REPORT 2013



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The final report is a revised version of the ISSA research report “The return on prevention: Calculating the costs and benefits of investments in occupational safety and health in companies”.

Calculating the international return on prevention for companies: Costs and benefits of investments in occupational safety and health

## Final report

A project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the Energy,  
Textile, Electrical and Media Products Sector (BG ETEM)

*Final report • Version 2, February 2013*

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## List of abbreviations

<b>BG ETEM</b>	German Social Accident Insurance Institution for the Energy, Textile, Electrical and Media Products Sectors, Cologne
<b>DGUV</b>	German Social Accident Insurance, Berlin
<b>e.g.</b>	exempli gratia
<b>etc.</b>	et cetera
<b>ff.</b>	and following (pages)
<b>IAG</b>	Institute for Work and Health of the German Social Accident Insurance, Dresden
<b>ISSA</b>	International Social Security Association, Geneva
<b>n</b>	number of answers
<b>no.</b>	number
<b>p.</b>	page
<b>ROP</b>	Return on Prevention

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## Executive summary

The issue addressed here is whether workplace prevention has a micro-economic effect that benefits a company's bottom line. In order to study this question, in early 2010 the International Social Security Association (ISSA), the German Social Accident Insurance (DGUV) and the German Social Accident Insurance Institution for the Energy, Textile, Electrical and Media Products Sectors (BG ETEM) launched a research project called "Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health". The results of the 19 participating countries and 337 interviewed companies are presented in this report in consolidated form.

The micro-economic effects of occupational safety and health can be measured only indirectly. The use of standardized interviews is a tried and tested measurement method that is methodologically well-suited to prevention accounting. Companies are asked to (subjectively) rate the qualitative and quantitative effects (including the costs and monetary benefits) of occupational safety and health. As such, only those companies and employees with experience in occupational safety and health are asked to participate.

The strongest impact of occupational safety and health is assessed in the company areas of production, transport, personnel allocation and warehousing. The strongest effects of occupational safety and health are defined as follows: reduced hazards, increased employee hazard awareness, reduced breaches and reduced workplace accidents as well as improved corporate image, improved workplace culture, reduced downtime and reduced disruptions. According to the vast majority of the companies interviewed, additional investment in occupational safety and health will result in company costs remaining the same or decreasing over the long term.

The three most significant cost and benefit types of occupational safety and health are called: [costs] guidance on safety technology and company medical support, investment costs, organizational costs, and [benefits] added value generated by better corporate image, added value generated by increased employee motivation and satisfaction and cost savings through prevention of disruptions. According to the companies interviewed, spending on occupational safety and health is an investment that "pays off" for companies. The Return on Prevention (ROP) is assessed to be 2.2.

The survey data identifies significant correlations pointing to different prevention cultures.



## 1. Objective

The primary beneficiaries of occupational safety and health are the employees of the company thanks to the prevention of workplace accidents. Even the best rehabilitation and compensation cannot make up for the loss in quality of life that arises from a workplace accident. This also applies to occupational illnesses. In addition, effective prevention ensures that rehabilitation and compensation can be sustainably financed. Thus, occupational prevention work must, for ethical and social reasons, be focused on reducing the number and severity of workplace accidents as effectively as possible. Companies are also obliged to comply with national occupational safety and health regulations.

The issue is whether workplace prevention has a micro-economic effect that benefits a company's bottom line. To study this question, in early 2010 the International Social Security Association (ISSA), the German Social Accident Insurance (DGUV) and the German Social Accident Insurance Institution for the Energy, Textile, Electrical and Media Products Sectors (BG ETEM) launched a research project called "Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health". It is an international study based on the results of the earlier project "Prevention Balance Sheets from a Theoretical and Empirical Point of View".<sup>1</sup>

In order to answer the question of whether occupational safety and health "pays off" for a company, it is important to first consider the theory of prevention accounting, then collect data empirically and evaluate it statistically. Besides, it should also be noted that prevention accounting features a quantitative and a qualitative dimension. The indicator "Return on Prevention" (ROP) expresses the economic success of investing in occupational safety and health in an abstract and a concise fashion.

The results of the 19 participating countries from the first and second round of evaluation (Australia, Austria, Azerbaijan, Canada, Côte d'Ivoire, Czech Republic, Germany, Hong Kong (China), India, Malaysia, Republic of Korea, Romania, Russian Federation, Singapore, Sweden, Switzerland, Turkey, United States, Viet Nam) are presented in consolidated form below. A breakdown of the results from individual countries has been deliberately excluded from the final report. Unpublished country reports contain the results of prevention accounting from each country.

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1. Dietmar Bräunig and Katrin Mehnert, Präventionsbilanz aus theoretischer und empirischer Sicht, Abschlussbericht des Teilprojekts 5 des Projekts „Qualität in der Prävention“, Dresden 2008 (English version: Dietmar Bräunig and Katrin Mehnert, Prevention Balance Sheets from a Theoretical and Empirical Point of View, final report of subproject 5 of the "Quality in Prevention" project, Dresden 2008).

## 2. Concept

### 1. Basis

Prevention accounting is used to determine the micro-economic effects of occupational safety and health. Traditional financial and performance management accounting (e.g. bookkeeping, annual financial statements, and cost accounting) does not provide suitable information data. Similarly, social accounting and environmental accounting (e.g. social and ecological balance sheets) have a different relevance. In morphological terms, prevention accounting compares the company's costs and benefits of occupational safety and health. As such, prevention accounting shares a certain similarity with a cost-benefit analysis, although it focuses on an income statement for prevention economics rather than multidimensional decision accounting.

A differentiation can be made between direct effects of workplace prevention (e.g. reduction in workplace accidents and occupational illnesses) and indirect ones (e.g. improvements in company image and productivity). They have a qualitative (e.g. rating of the importance of occupational safety and health in a company) and a quantitative (e.g. reduction in operational disruptions following an accident) dimension. While the costs of workplace prevention are short-term, the benefits often appear over the long-term but are sustainable. The effects of occupational safety and health have proven to be quite complex. As a rule, direct measurement is not possible.

### 2. Approach and method

Prevention accounting is represented through an economic model. Assumptions reduce the complex nature of the real situation and simplify their appropriate depiction. The premises of the model are included in the results of prevention accounting. For example, occupational safety and health should be considered "as a whole". Investigating the effects of individual prevention activities would be possible as part of a more comprehensive study. In addition, the effects of social and technical progress on workplace prevention and safety costs as part of working equipment are not considered. Since occupational safety and health contributes, at least partially, to triggering social and technical progress, there is an interconnection problem. As such, the effects of social and technical progress can only be separated out in exceptional circumstances. The same applies to safety costs as part of working equipment. Further assumptions relate to recording costs and benefits of workplace prevention.

The success of prevention can be defined both qualitatively and quantitatively. Of course, qualitative values should be measured on an ordinal scale and quantitative values on a cardinal scale. The success of prevention in monetary terms is the difference between the monetary benefit of prevention and the cost of prevention. By definition, prevention accounting should take into consideration qualitative and quantitative prevention success. Prevention accounting in a narrower sense is limited to the success of prevention in monetary terms.

The indicator "Return on Prevention" represents the ratio between the monetary benefits of prevention and the costs of prevention; it illustrates the potential economic success of workplace prevention. Whether that potential can actually be achieved depends, to a large degree, on market conditions and competitiveness.

The Return on Prevention expresses the direction and strength of occupational safety and health effects on helping to achieve company goals. It is a concise indicator of whether, and to what extent, prevention pays off for a company.

The micro-economic effects of occupational safety and health can be measured only indirectly. In empirical social research, the use of standardized interviews is a tried and tested measurement method that is methodologically well-suited to prevention accounting. Companies are asked to (subjectively) rate the qualitative and quantitative effects (including the costs and monetary benefits) of occupational safety and health. As such, only those companies and employees with experience in occupational safety and health (e.g. company owner, controller, safety officer, and work council member) are asked to participate. This positive selection of companies may potentially lead to overestimating the positive effects of occupational safety and health. However, companies and employees that have little experience with workplace prevention are not in a position to make reliable statements regarding the benefits of prevention. In fact, considering the unrealized benefit potential, their ratings of occupational safety and health benefits would most likely be even higher. As such, the positive selection tends to provide a more conservative estimate. Ideally, the interviews are conducted in groups referring to the guidelines. Based on experience, the negotiating process associated with group interviews combined with pressure to mutually agree on answers produces reliable results. If for some reason, group interviews are not feasible, individual interviews may be conducted and the results averaged across the company. The interviewer is responsible for making this decision on site.

The questionnaire used (see Appendix "Project Questionnaire") includes both qualitative (Nos. 1 to 5) and quantitative (Nos. 6 to 8) questions. Usually, there are no problems for companies to answer the qualitative questions, estimate costs (question 6) and name relevant benefit types (question 8). For question 7 (estimation of the benefit-cost ratio of occupational safety and health), the interviewer can help by providing a visual example. Interviewees should imagine prevention accounting as a scale with occupational safety and health benefits on one side and occupational safety and health costs on the other. Based on their experience, they answer by stating which way the scale tips. When estimating the benefit-cost ratio, the interviewer asks about the just-acceptable proportion. The interviewer begins with a relation of 1.0 and suggests further relations in upward increments of 0.2 (when benefits outweigh costs) or downward increments of 0.2 (when costs outweigh benefits).<sup>2</sup> This rating method is reminiscent of the well-known willingness-to-pay approach from social accounting, which also implicitly requires a benefit-cost ratio.

The types of costs and benefits used in the questionnaire (questions 6 and 8) are based on those used in the project "Prevention Balance Sheets from a Theoretical and Empirical Point of View". They continue to be both meaningful and practical.

The monetary value of occupational safety and health costs per employee are directly available for different types of costs; however, the corresponding monetary value for benefits can only be calculated indirectly. This requires two steps. First, the monetary value of total benefits is determined as a product of total costs (sum of costs as per question 6) and of Return on Prevention (average value as per question 7). Second, total benefits are distributed proportionally to each individual benefit type according to their significance (as per question 8). It would be more accurate to calculate this for each individual company but the general problem of proportional distribution of total benefits would remain. Additionally, missing values would in certain cases prohibit to make this type of calculation. Furthermore, prevention accounting is actually a "structural analysis".

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2. See footnote 1.

The exact monetary values are not the key point but rather their magnitudes and relationships to one another.

The data collected from the companies was analyzed statistically. For the most part, available data are processed descriptively on the basis of averages (chapter III.1.). In addition, analytic procedures to identify differences and correlations are used (chapter III.2.). The consolidated prevention accounts of the participating countries comprises the mean values of each answer (the top and bottom 5 per cent of cardinal values were excluded). The use of truncated means with cardinal values offers advantages because outliers are not included in calculating the mean. Correlation and variance analyses are performed to identify significant correlations. A significance level of 5 per cent is generally assumed to ensure relatively high reliability of statements.

### 3. Practical realization

The questionnaire used in the interviews is an adaptation of the questionnaire used with the project "Prevention Balance Sheets from a Theoretical and Empirical Point of View".<sup>3</sup> For example, the international version (see appendix "Project Questionnaire") does not consider the special characteristics of occupational safety and health in Germany. Participating countries were asked to interview one company per one million persons in the workforce with a minimum of 10 and a maximum of 40 companies. Companies were chosen from across all sectors regardless of company size. Companies from the mining, construction, trade and manufacturing sectors are particularly suited for the project from a morphological perspective, in addition they are found in almost every country. The interviews were conducted in Germany in 2007 and 2008 as part of the project "Prevention Balance Sheets from a Theoretical and Empirical Point of View" and in other countries from mid-2010 until early-2011 (first round) and 2012 (second round). Because the questionnaire was adapted, the German data had to be recoded for the evaluation. In total, there are datasets from 337 companies across 19 countries.

Each participating country had an interview coordinator who received an up-to-date project description, the questionnaire, the guidelines, a leaflet entitled "Five Steps to the Interview" and a video of an interview role play (see appendices). They also had the opportunity to attend a workshop. The interviewers were asked to visit the companies in-person and conduct the interviews on-site. It was recommended to send the questionnaire and guidelines in advance. If a face-to-face interview was not possible, a telephone or an email interview could be conducted. The coordinators and interviewers were responsible for the proper implementation of the interviews. Companies participated in the project voluntarily and only if they showed an interest in the study. This proved to be a necessary prerequisite for the interview as it ensured that they allocated enough time for the questioning and answered the questions seriously.

The members of the full project team were in on-going communication and exchanged information on a regular basis. Participants' suggestions from the first workshop and feedback from coordinators was continually incorporated into the project. When the completed questionnaires were returned, they underwent a plausibility check. Any discrepancies were promptly clarified with the coordinator responsible for that country.

The project was conducted in English. In some cases, the project description, questionnaire and guidelines were translated into the language of the participating country.

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3. See footnote 1.

## 3. Results

### 1. Prevention accounts<sup>4</sup>

In the following pages the qualitative and quantitative results of the questioning (prevention accounting in the broader sense) will be presented. They are shown as means calculated on the basis of descriptive statistics. For pragmatic reasons, a calculation of arithmetic averages on the base of point values also occurs with ordinal scaled answers. Firstly, each question is stated.

This is followed by a figure showing the results of the question. There is a brief explanation and summary beneath the figure for comprehension. The monetary prevention balance sheet (prevention accounting in its narrower sense) was calculated, as explained in chapter II.2., based on the data collected in questions 6, 7 and 8.

The structural data listed below illustrates the scope of the study and select characteristics of the companies interviewed. To avoid benchmarking, the decision was made not to provide a further breakdown by country and continent. This kind of benchmarking would not be appropriate because of differences in company and country cultures as well as the phenomenon of diminishing marginal utility of workplace prevention. It also would not contribute to the work on prevention accounting.

#### Structural data

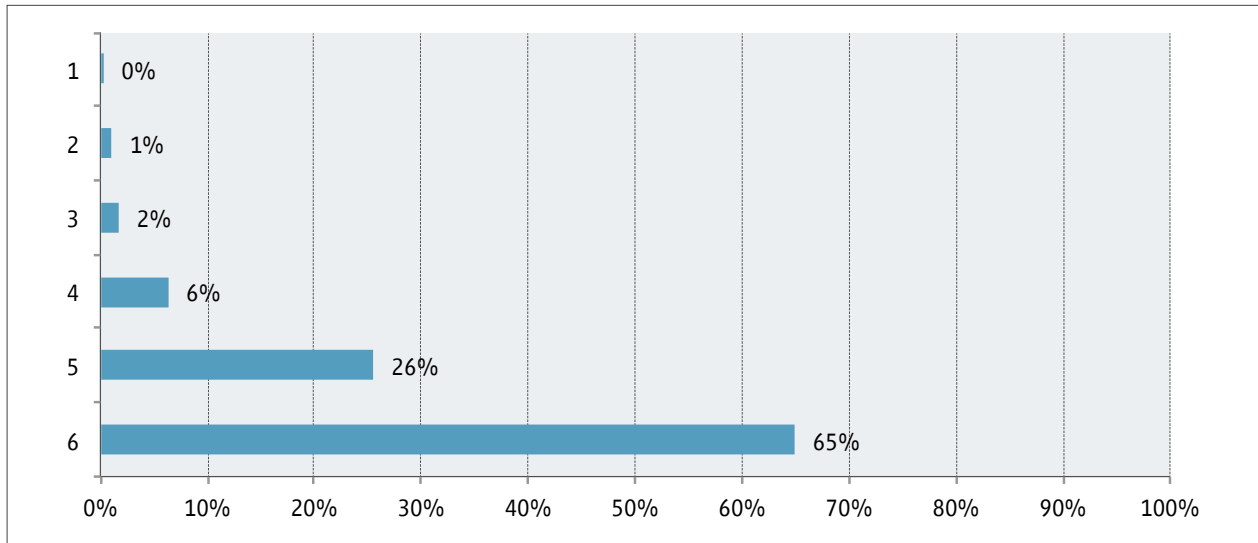
Number of companies interviewed/datasets: 337

Company size	data	Sectors	data
< 50 employees:	40	Mining	21
50-249 employees	89	Construction	46
250-999employees	116	Trade	19
> 999 employees	90	Manufacturing	166
Not stated	2	Other	82
		Not stated	3

4. We wish to thank Gabriele Sparing and Verena Peters for their assistance with the analysis.

**Question 1:** How do you rate the relative importance of occupational safety and health within your company?

**Figure 1:** Relative importance of occupational safety and health within the company



**Notes**

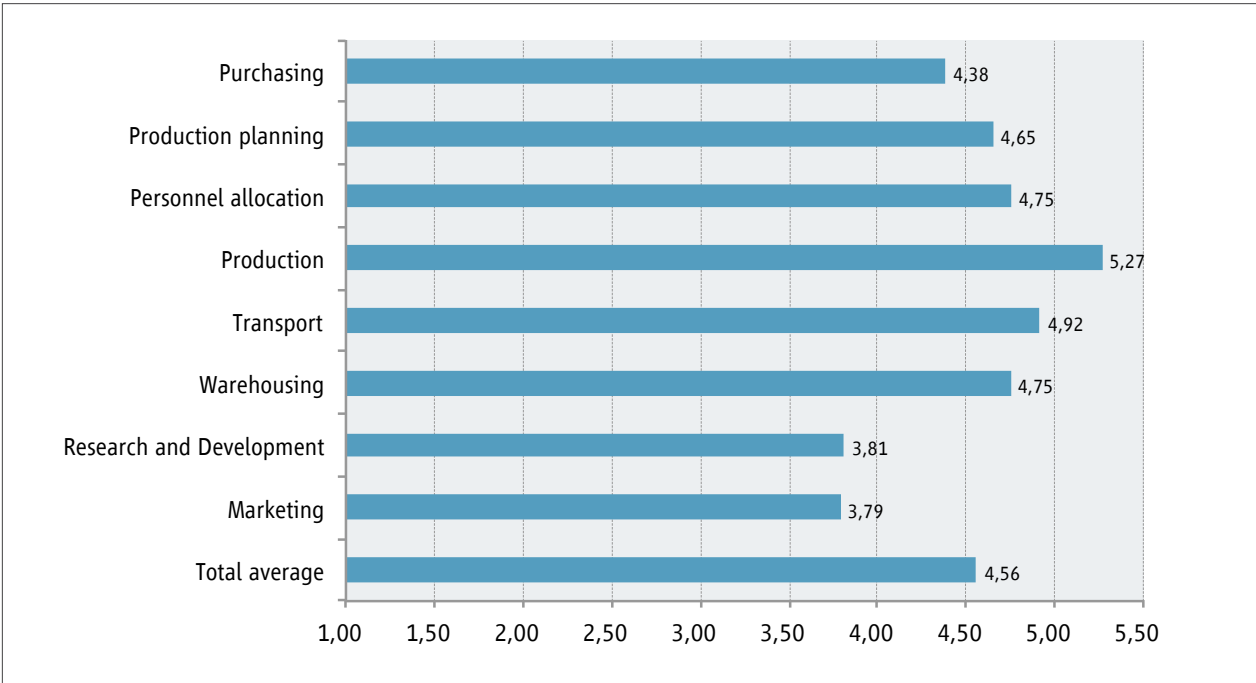
- Total answers (n): 297 (excluding Germany due to technical reasons regarding the adaptation of the questionnaire).
- Ratings were based on a scale from 1 "Occupational safety and health is unimportant within the company" to 6 "Occupational safety and health is very important within the company".

**Results**

The vast majority of the interviewed companies rated occupational safety and health as important or very important. The results show that the companies were positively selected as intended.

**Question 2:** How do you rate the impact of occupational safety and health within the following areas of your company?

**Figure 2:** Impact of occupational safety and health in different company areas



**Notes**

- Total answers (n): purchasing (331), production planning (330), personnel allocation (333), production (324), transport (327), warehousing (321), research and development (295), marketing (317).
- Ratings were based on a scale from 1 "There is no impact" to 6 "The impact is very strong".

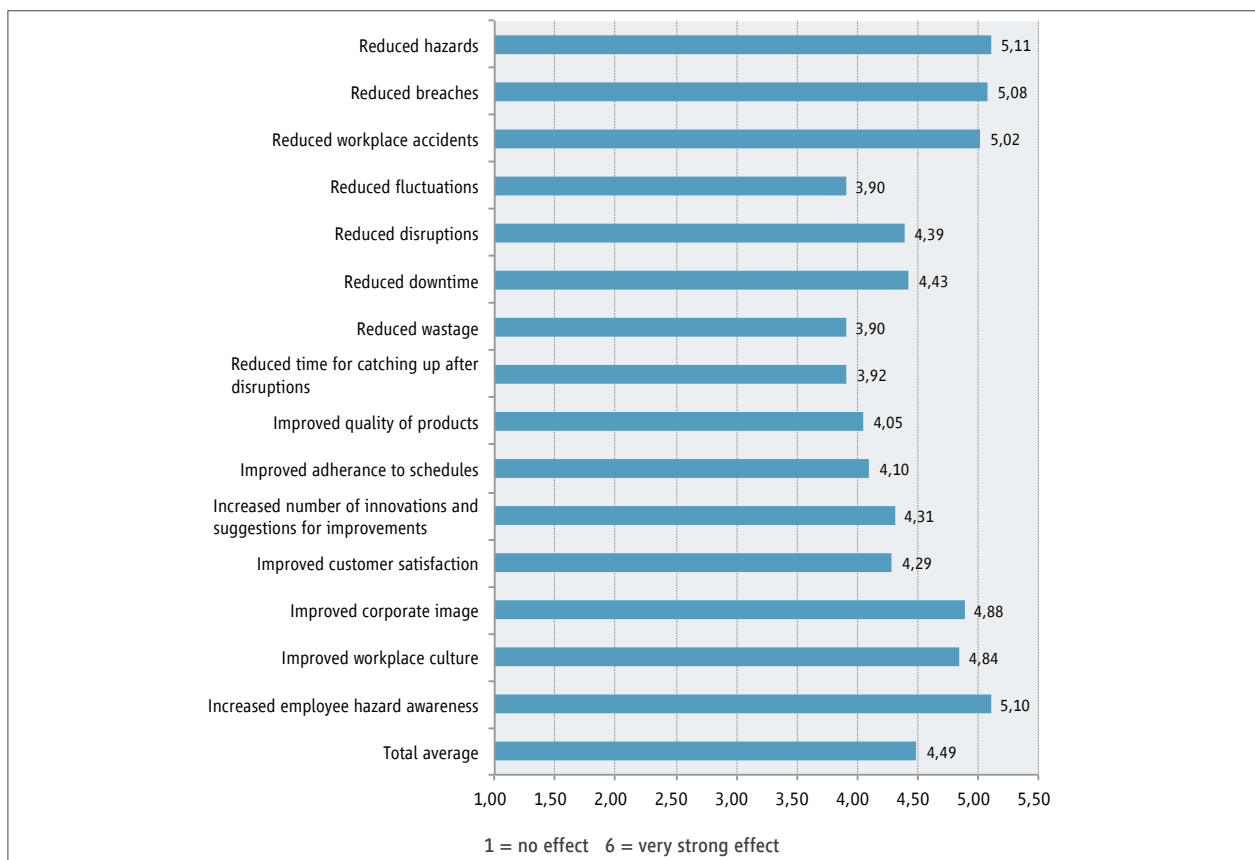
**Results**

Occupational safety and health was rated as having the strongest impact on the following company areas: *production, transport, personnel allocation and warehousing.*

\* In order of decreasing impact

**Question 3: How do you rate the effects of occupational safety and health within your company?**

**Figure 3: Effects of occupational safety and health within the company**



**Notes**

- Total answers (n): reduced hazards (332), reduced breaches (333), reduced workplace accidents (332), reduced fluctuations (323), reduced disruptions (329), reduced downtime (329), reduced wastage (316), reduced time for catching up after disruptions (318), improved quality of products (325), improved adherence to schedules (326), increased number of innovations and suggestions for improvements (331), improved customer satisfaction (326), improved corporate image (328), improved workplace culture (330), increased employee hazard awareness (333).
- Ratings were based on a scale from 1 "There is no effect" to 6 "The effect is very strong".

**Results**

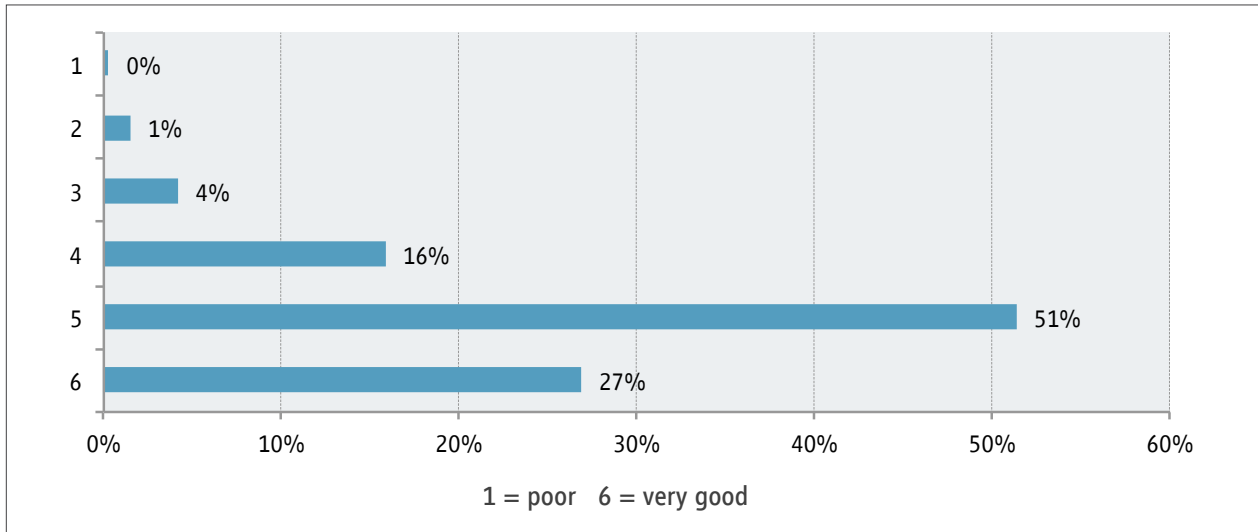
Occupational safety and health was rated as having the strongest effect on the following: reduced hazards, increased employee hazard awareness, reduced breaches and reduced workplace accidents as well as improved corporate image, improved workplace culture, reduced downtime and reduced disruptions.\*

\* In order of decreasing effect



**Question 4: How do you rate the current occupational safety and health measures within your company?**

**Figure 4: Rating of current occupational safety and health measures within the company**



**Notes**

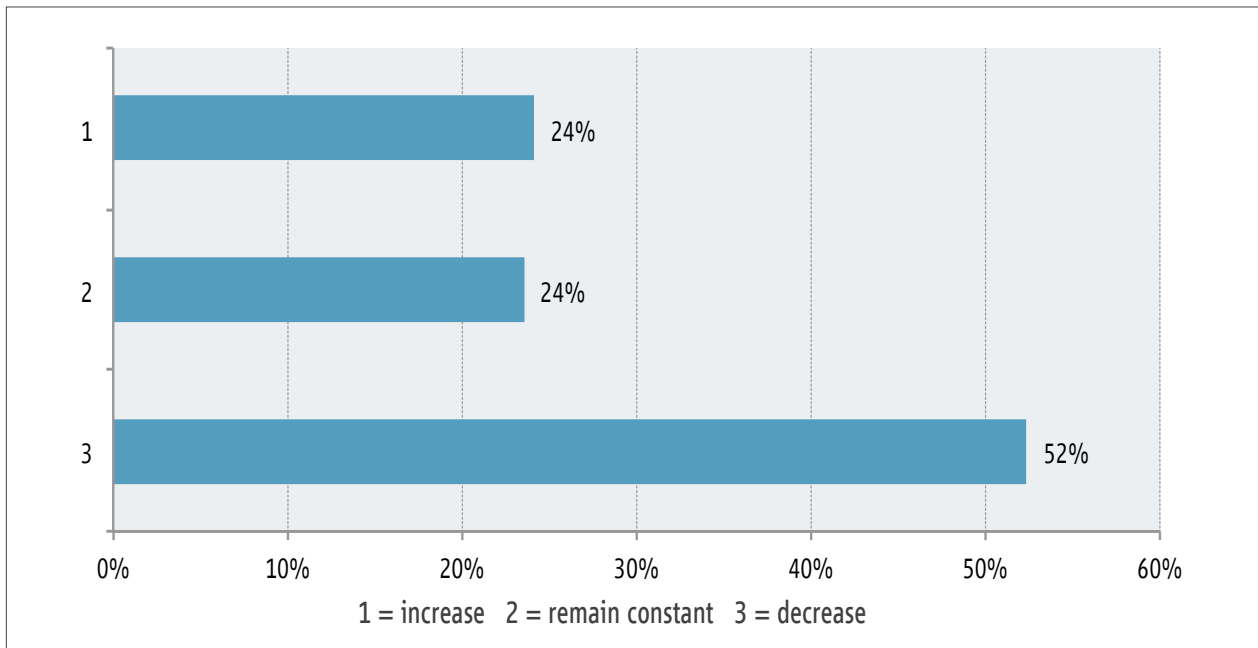
- Total answers (n): 335.
- Ratings were based on a scale from 1 "The current occupational safety and health measures are poor within the company" to 6 "The current occupational safety and health measures are very good within the company".

**Results**

The vast majority of companies rated occupational safety and health as good or very good. Once again, the results show that companies were chosen by positive selection as intended. This raises the issue of whether the different results for questions 1 and 4 indicate the potential for optimization.

**Question 5:** In your opinion, how would additional investments in prevention work affect company costs in the long term?

**Figure 5:** Long-term effects on company costs from additional investments in occupational safety and health



**Notes**

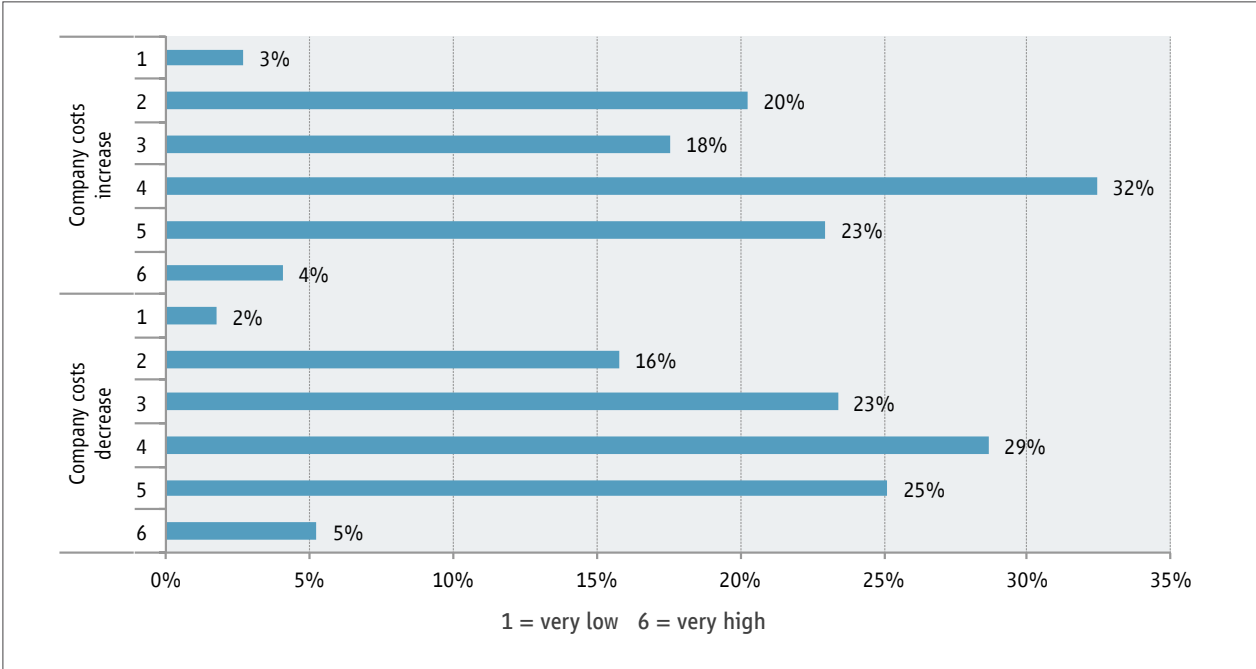
- Total answers (n): 336.

**Results**

According to the vast majority of companies, additional investments in occupational safety and health would result in company costs remaining constant or decreasing over the long term.

In your opinion, to what extent would company costs change?

**Figure 6:** Extent of change of company costs from additional investments in occupational safety and health



**Notes**

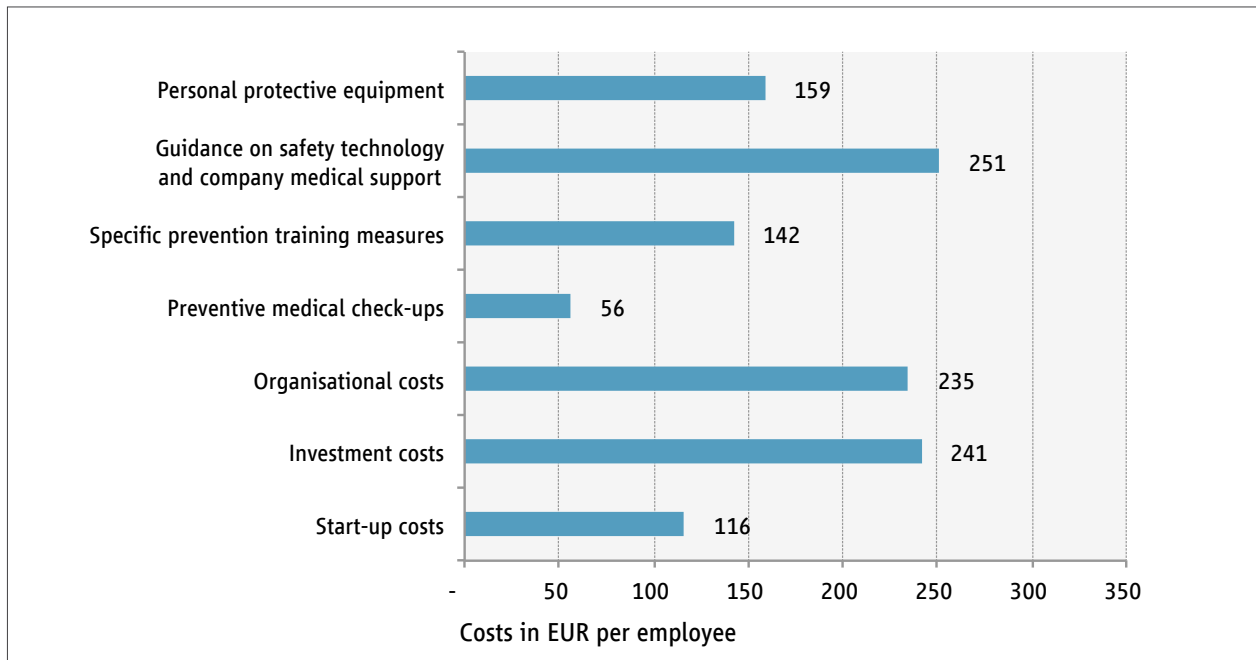
- Total answers (n): 254.
- Ratings were based on a scale from 1 "Company costs would increase or decrease very low" to 6 "Company costs would increase or decrease very high".

**Results**

According to the vast majority of companies, additional investments in occupational safety and health would result in neither very low nor very high increased or decreased costs.

**Question 6:** Please estimate, for each individual cost type, the occupational safety and health costs (in your currency) per employee accrued by your company in 2009.

**Figure 7:** Costs of occupational safety and health per employee



### Notes

- Costs as 5 per cent truncated means.
- Local currencies converted into EUR.
- Total answers (n): personal protective equipment (323), guidance on safety technology and company medical support (306), specific prevention training measures (305), preventive medical check-ups (273), organizational costs (260), investment costs (247), start-up costs (223).

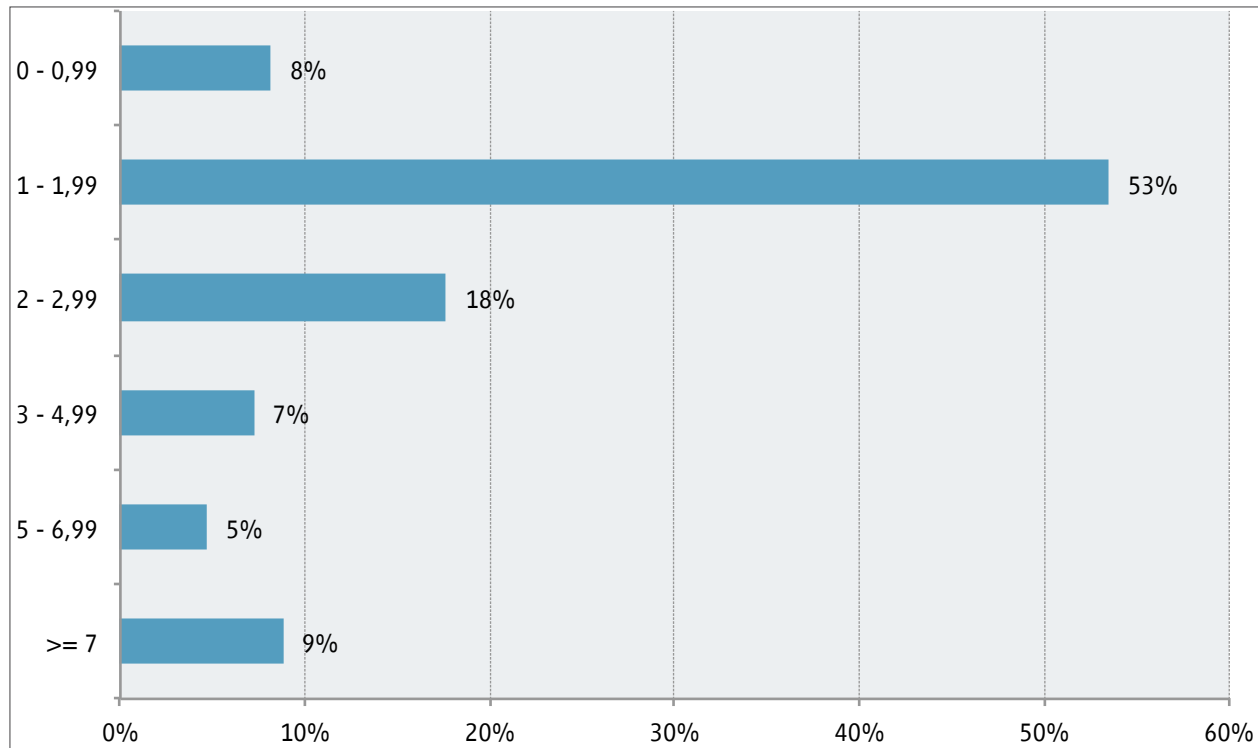
### Results

Companies rated the following three cost types of occupational safety and health as the most significant: *guidance on safety technology and company medical support, investment costs, organizational costs.* \*

\* In order of decreasing significance

**Question 7:** Based on your experiences, how do you rate (estimate!) the relationship between occupational safety and health benefits and its costs within your company?

**Figure 8:** Benefit-cost ratio (Return on Prevention) of occupational safety and health



### Notes

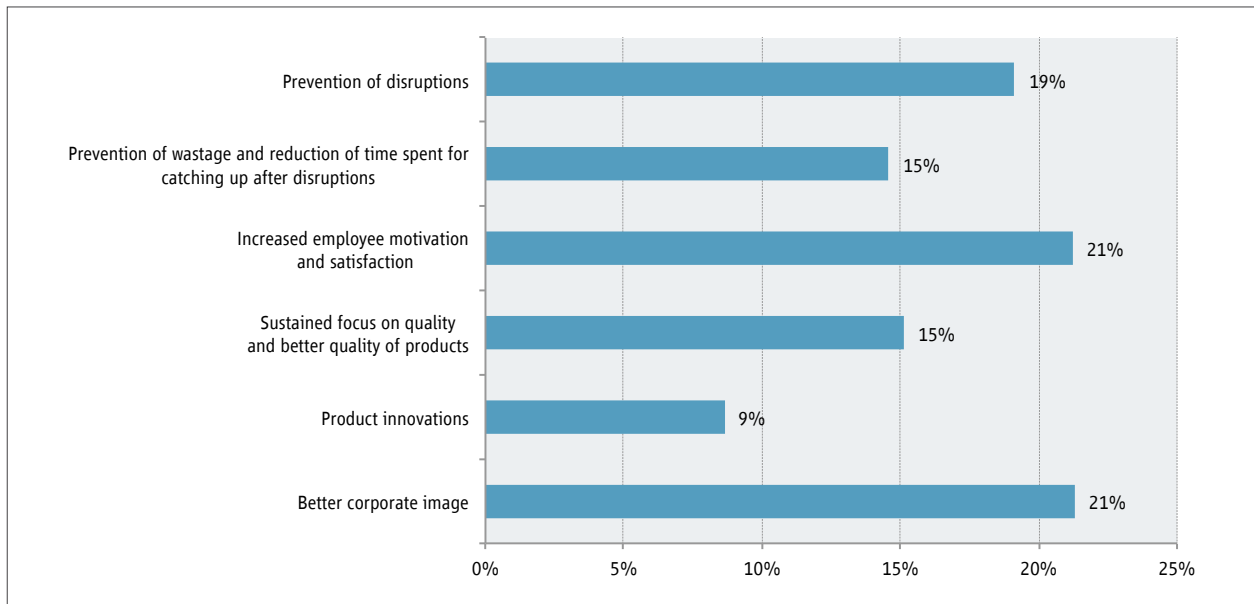
- Return on Prevention (ROP) as 5 per cent truncated means.
- Total answers (n): 318.

### Results

Most companies rated the benefit-cost ratio between 1 and 1.99. The mean benefit-cost ratio (Return on Prevention) was 2.2.

**Question 8:** Please tick all the occupational safety and health benefit types which are relevant for your company (multiple responses possible).

**Figure 9:** Significance of different benefit types of occupational safety and health



## Notes

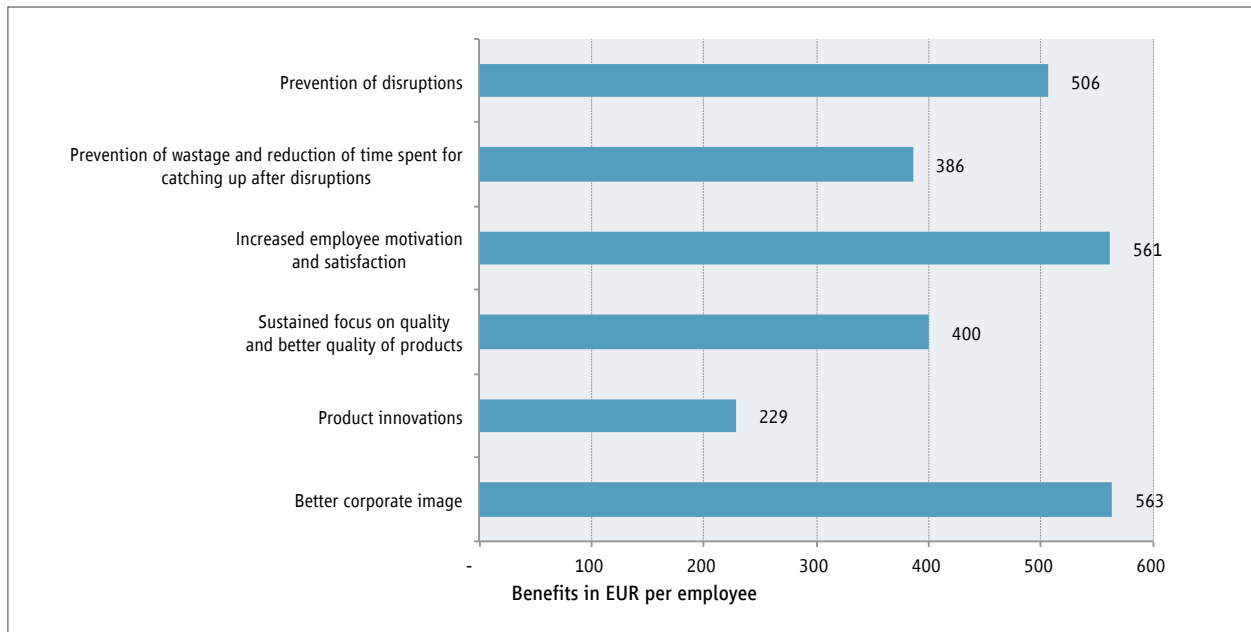
- Total answers (n): 337.

## Results

Companies named the following occupational safety and health types of benefits most often: increased employee motivation and satisfaction, better corporate image, prevention of disruptions.\*

\* In decreasing order of frequency

**Figure 10:** Benefits of occupational safety and health per employee (in EUR)



### Notes

- The monetary total benefit can be calculated as the product of the total costs (sum of the individual cost types in figure 7) and the ratio "return on prevention" (i.e. 2.2, as per figure 8). The different types of benefits resulted from categorizing the total benefit as per figure 9.

## Prevention Balance Sheet

**Figure 11:** Companies' prevention costs and benefits of occupational safety and health

Prevention Balance Sheet			
Occupational safety and health costs per employee per year (in EUR)		Occupational safety and health benefits per employee per year (in EUR)	
Personal protective equipment	159	Cost savings through prevention of disruptions	506
Guidance on safety technology and company medical support	251	Cost savings through prevention of wastage and reduction of time spent for catching up after disruptions	386
Specific prevention training measures	142	Added value generated by increased employee motivation and satisfaction	561
Preventive medical check-ups	56	Added value generated by sustained focus on quality and better quality of products	400
Organizational costs	235	Added value generated by product innovations	229
Investment costs	241	Added value generated by better corporate image	563
Start-up costs	116		
<b>Total costs</b>	<b>1,200</b>	<b>Total benefits</b>	<b>2,645</b>
<b>Prevention net benefit = 1,445</b>			

### Notes

- The prevention balance sheet includes occupational safety and health costs (figure 7) and benefits (figure 10) per employee.
- The prevention net benefit as well as the Return on Prevention express the economic success of occupational safety and health from different perspectives.



## 2. Further data analysis<sup>5</sup>

Analytical statistics makes it possible to identify significant correlations between the survey data. The following four results are of particular interest:

- Large companies tend to rate the effect of occupational safety and health as higher than smaller companies.<sup>6</sup>
- Asian companies tend to rate the impact/effect of occupational safety and health as higher than companies in Europe.<sup>7</sup>
- Statistically, there is a positive correlation between the effect of occupational safety and health and the global competitiveness.<sup>8 9</sup> Because of positive selection of interviewed companies, this point should be interpreted carefully.
- Asian companies tend to state that additional investments in occupational safety and health lead to costs increasing or decreasing, while companies in Europe and North America tend to respond that costs remain the same or decrease.<sup>10</sup>

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5. We wish to thank Dr. Annekatrin Wetzstein for her assistance with the analysis.

6. Variance analysis (questions 3, difference in means, significance between groups),  $p < 0.05$ .

7. Variance analysis (questions 2 and 3, difference in means, significance between groups),  $p < 0.05$ .

8. Labour market efficiency data was obtained from World Economic Forum. 2009. *The global competitiveness report 2009-2010*. Geneva.

9. Correlation analysis (questions 3, Global Competitiveness Index),  $r = .15$ ,  $p < 0.01$ .

10. Chi-square test (question 5, difference in frequencies, asymptotic significance),  $p < 0.01$ .

## 4. Summary

The most important results can be summarized in normative terms as follows:

- The strongest impact of occupational safety and health is seen in the areas of *production, transport, personnel allocation and warehousing*.
- The strongest effects of occupational safety and health are defined as follows: reduced hazards, increased employee hazard awareness, reduced breaches and reduced workplace accidents as well as improved corporate image, improved workplace culture, reduced downtime and reduced disruptions. The order reflects the difference between direct and indirect effects of workplace prevention (as defined in Section 2.1).
- According to approximately 75 per cent of the companies interviewed, additional investment in occupational safety and health will lead to company costs remaining the same or decreasing over the long term.
- The three most significant cost and benefit types of occupational safety and health are called: [costs] guidance on safety technology and company medical support, investment costs and organizational costs, and [benefits] added value generated by better corporate image, added value generated by increased employee motivation and satisfaction and cost savings through prevention of disruptions.
- Expenditure on occupational safety and health is an investment that “pays off” for companies according to the companies interviewed. The Return on Prevention (ROP) is assessed to be 2.2.
- The data collected from the survey identifies significant correlations that point to different prevention cultures.

For methodological and statistical reasons, the results should not be over-interpreted. After all, they are estimates. However, they should not be underestimated because the individuals interviewed are professionals in occupational safety and health and the interview itself is an ambitious method of data collection. As such, the project sees itself as a first step in the right direction – nothing more and nothing less. Further national and international research is required in the field of prevention accounting.

The legitimization of occupational safety and health is founded on three pillars. First and foremost it protects employees against workplace accidents and illnesses on the basis of ethical and humanitarian grounds. Second, in social terms, only effective occupational safety and health can ensure the sustainability of statutory accident insurance and social protection of employees. The importance of both of these pillars justifies the need for legal provisions for occupational safety and health.

In addition, the results of this project show that occupational safety and health spending is an investment that pays off in micro-economic terms and can benefit the company itself.<sup>11</sup> This is the basis for defining a third “prevention pillar”. In the interest of employees, society and companies, it should play an important role in future national and international occupational safety and health policy.

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11. Van den Broek et al. (2011) obtained similar results using an entirely different methodological approach <<http://ec.europa.eu/social/BlobServlet?docId=7416&langId=en>>.



## Appendices

Project Description

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Project Questionnaire

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Project Guidelines

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Project Short Leaflet: Five Steps to the Interview

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Project Movie Script – Interview Role-Play

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## Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health

Project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the  
Energy, Textile, Electrical and Media Products Sectors (BG ETEM)

**Description** (version 1 January 2010, with marginal modifications)

### 1. Aim

Companies spend money on prevention work with regard to occupational safety and health in order to follow legal and/or social requirements. These expenses also represent investments, since the companies benefit economically from the effects of prevention measures. Therefore, it is of interest whether spending for prevention work delivers a monetary return, and if so, to what extent the "Return on Prevention" comes up. To answer these questions, it is necessary to account for prevention work. The difference between single-economic costs and monetary benefits processed in a prevention balance sheet shows the prevention profit or loss. The Return on Prevention, defined as benefit-cost ratio, illustrates the economic potential of investments in prevention work.

The aim of the cross-country project is to draw up prevention balance sheets (in monetary format) for companies in different countries and to calculate the country-specific return on prevention. Afterward, it is possible to consolidate the results and to estimate the global single-economic costs and benefits of investments in occupational safety and health. In addition, the particular relevance of prevention work (in non-monetary format) in companies is of importance. From the international point of view, it is of interest to identify different attitudes towards prevention work with respect to occupational safety and health.

### 2. Method<sup>12</sup>

Traditional accounting does not report the costs and monetary benefits of prevention work. Instead, it is oriented towards the external capital market or the internal decision-making process. Prevention accounting explicitly discloses the costs and benefits of prevention work. While the costs of prevention

lead in the short-term to expenses, the revenues of the benefits of prevention emerge in the long term. Morphologically, it is helpful to perceive prevention accounting as a specific form of cost-benefit analysis. The return consists directly of the prevention of occupational accidents, diseases and health risks, and

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12. Dietmar Bräunig and Katrin Mehnert, Präventionsbilanz aus theoretischer und empirischer Sicht, Abschlussbericht des Teilprojekts 5 des Projekts „Qualität in der Prävention“, Dresden 2008, Dietmar Bräunig, Thomas Kohstall and Katrin Mehnert, Präventionsbilanz und Präventionserfolg, in: DGUV Forum, 2009, pp. 22-27 <[http://www.dguv.de/iag/en/forschung\\_en/forschungsprojekte\\_en/rop\\_en/index.jsp](http://www.dguv.de/iag/en/forschung_en/forschungsprojekte_en/rop_en/index.jsp)>.

indirectly of secondary effects generating economic advantages for the company. Even though it is possible to account for prevention costs and benefits of specific types of prevention measures, it seems to be more practicable to focus the prevention work of the company "as a whole".

The prevention profit or loss is the difference between the costs and the benefits of the prevention work in companies. It is possible to draw a distinction between the following categories of prevention costs: costs of personal protective equipment, costs of company medical support and guidance on safety technology, payroll costs of company safety officer/s (excluding company medical support and guidance on safety technology), costs of specific prevention training measures, costs of preventive medical check-ups, organisational costs, investment costs, start-up costs. It proves to be appropriate to distinguish between the following categories of prevention benefits: cost savings through prevention of disruptions of operations, cost savings through prevention of wastage and reduction of time spent catching up after disruptions of operations, added value generated by increased employee motivation and satisfaction, added value generated by sustained focus on quality and better quality products, added value generated by product innovations, added value generated by better corporate image.

It is quite easy to determine the prevention costs with the help of controlling and especially cost accounting. To evaluate prevention benefits, an indirect empirical social research approach following the concept of the willingness to pay-method seems to be appropriate. The idea is to find out if a company estimates (due to experience) whether the prevention costs and the prevention benefits balance each other or whether the costs or the benefits outweigh. Accordingly, it is important to assess the proportionality factor between prevention benefits and prevention costs. Afterward, it is possible to calculate the company's total monetary prevention benefit. In the next step, the total monetary benefit has to be allocated to the particular categories of prevention benefit according to their relevance. As a result, it is possible to draw up the prevention balance sheet for every company, in a consolidated form for a country and/or the whole world. The key indicator Return on Prevention ("International Return on Prevention") demonstrates the ratio between the monetary value of the benefits and the costs of prevention work. Please find below the structure of a prevention balance sheet.

Prevention Balance Sheet			
Prevention costs (of companies)	Value in € per employee and year	Prevention benefits (of companies)	Value in € per employee and year
Costs of personal protective equipment		Cost savings through prevention of disruptions of operations	
Costs of company medical support and guidance on safety technology		Cost savings through prevention of wastage and reduction of time spent catching up after disruptions of operations	
Payroll costs of company safety officer/s (excluding company medical support and guidance on safety technology)		Added value generated by increased employee motivation and satisfaction	
Costs of specific prevention training measures		Added value generated by sustained focus on quality and better quality products	
Costs of preventive medical check-ups		Added value generated by product innovations	
Organisational costs		Added value generated by better corporate image	
Investment costs			
Start-up costs			
<b>Total</b>		<b>Total</b>	
(Monetary net) prevention profit:			
Return on Prevention:			

Sources: Bräunig and Mehnert (2008)<sup>13</sup>; Bräunig, Kohstall and Mehnert (2009).<sup>14</sup>

The empirical research is based on interviews expressing subjective estimations according to particular experiences with prevention work. Of course, it would be better if it rested on "hard" facts (e.g. changes of the productivity). Because of a lack of indicators related to the effects of occupational safety and health, evaluating the perceptions and appraisals of experts represents a practicable and methodically-based alternative.

Companies included in the survey have to show interest in occupational safety and health and decide voluntarily to cooperate. This positive selection of companies goes on the one hand along with the risk of answers that are too positive. On the other and more important hand, companies that are less interested in occupational safety and health normally should have even higher benefits of prevention work.

13. Dietmar Bräunig and Katrin Mehnert, Präventionsbilanz aus theoretischer und empirischer Sicht, Abschlussbericht des Teilprojekts 5 des Projekts "Qualität in der Prävention", Dresden 2008.

14. Dietmar Bräunig, Thomas Kohstall and Katrin Mehnert, Präventionsbilanz und Präventionserfolg, in: DGUV Forum, 2009, pp. 22-27.

The cross-survey in the form of standardized interviews is addressed abstractly to the companies. For practical reasons, members respectively experts (change manager, controller, employer, member of the workers' council, safety officer, etc.) of the companies are interviewed. Ideally, they express themselves as group and deliver a common and intra-coordinated answer.

The prevention balance sheet formats the prevention costs and benefits in the style of prevention statements in monetary values. Of course, prevention accounting is an economic model that is based upon assumptions. For example, it does not consider the effects of technical and social progress on the occupational risks regarding safety and health. Also, it is not possible to isolate singular effects because prevention work interconnects almost everything in the working world or to isolate prevention costs (e.g. technical safety standards) included in prices of goods. In spite of restrictive assumptions, the monetary net prevention profit or loss formatted in the prevention balance sheet gives a rough impression of the economic potential of occupational safety and health.

### **3. Study**

The project should be international as far as possible: the more countries actively supporting the project, the better. The project management team on behalf of the German Social Accident Insurance (DGUV) will prepare the questionnaire and guidelines for the interviews. To collect valid empirical data regarding prevention costs and benefits, one company per one million persons employed in the country (minimal ten, maximal 40) should be interviewed. Preferred branches are: mining, construction, electrical engineering or other industries. Positively selected companies interested in prevention work and holding experience in effects of occupational safety and health are most welcome.

The interviews should start in spring 2010 because the filled questionnaires are required until 30.09.2010. On the World Congress on Safety and Health at Work in Turkey 2011, the results of the project are supposed to be presented. Furthermore, publications are planned. Each country taking part at the project will be able to publish the national estimates on the economic benefits of prevention.

### **4. Significance**

Prevention work with regard to occupational safety and health follows legal and/or social requirements. Likewise, the companies benefit economically from the effects of prevention measures. The project intends to focus these single-economic effects and to gain new experiences in prevention approaches. If the empirical results demonstrate that it is worthwhile for companies to invest in occupational safety and health, future discussions about the usefulness of prevention work have to take the Return on Prevention into consideration – national and international.



**Calculating the International Return on Prevention for Companies:  
Costs and Benefits of Investments in Occupational Safety and Health**

Project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the  
Energy, Textile, Electrical and Media Products Sectors (BG ETEM)

**Questionnaire<sup>1</sup>** (with marginal modifications)

Date of interview: .....

Country and currency: .....

Positions held by interviewees: (Please do not note any names. The interview should be completely anonymous.)

.....  
 .....  
 .....  
 .....

How many people did the company employ in 2009? ..... persons (fulltime and fulltime-equivalent)

**To what industry does the company belong?**

mining	construction	trade	manufacturing	others
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

<sup>1</sup> Based on Dietmar Bräunig and Katrin Mehnert, Präventionsbilanz aus theoretischer und empirischer Sicht, Abschlussbericht des Teilprojekts 5 des Projekts „Qualität in der Prävention“, Dresden 2008, pp. 58 – 68 <[http://www.dguv.de/iag/en/forschung\\_en/forschungsprojekte\\_en/rop\\_en/index.jsp](http://www.dguv.de/iag/en/forschung_en/forschungsprojekte_en/rop_en/index.jsp)>.



**1. How do you rate the relative importance of occupational safety and health within your company?**

unimportant (---)	(--)	(-)	(+)	(++)	very important (+++)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**2. How do you rate the impact of occupational safety and health within the following areas of your company?**

	no impact (---)	(--)	(-)	(+)	(++)	very strong (+++)
Purchasing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production Planning	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Personnel Allocation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transport	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Warehousing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Research and Development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Marketing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**3. How do you rate the effects of occupational safety and health within your company?**

	no effect (---)	(--)	(-)	(+)	(++)	very strong (+++)
The implementation of occupational safety and health measures has directly reduced the number of hazards as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has directly reduced the number of breaches of safety and health regulations as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has directly reduced the number of workplace accidents as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly reduced the number of fluctuations as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly reduced the number of disruptions as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly reduced the amount of downtime as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly reduced the amount of wastage as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	no impact (--)	(--)	(-)	(+)	(++)	very strong (+++)
The implementation of occupational safety and health measures has indirectly improved the quality of products as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly improved the adherence to schedules as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly increased the number of innovations and suggestions for improvements as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly improved the customer satisfaction as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly improved the corporate image as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly improved the workplace culture as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly increased the employee hazard awareness as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The implementation of occupational safety and health measures has indirectly reduced the amount of time needed for catching up after disruptions as follows:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. How do you rate the current occupational safety and health measures within your company?

poor (---)	(--)	(-)	(+)	(++)	very good (+++)
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. In your opinion, how would additional investments in prevention work affect company costs in the long term?

Company costs would increase.	Company costs would remain constant.	Company costs would decrease.
<input type="checkbox"/>	<input type="checkbox"/> go to question 6	<input type="checkbox"/>

	very low	low	more than low	less than high	high	very high
In your opinion, to what extent would company costs change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Please estimate, for each individual cost type, the occupational safety and health costs (in your currency) per employee accrued by your company in 2009.

		Costs per employee
6.1.	Costs of personal protective equipment (e.g. ear defenders, boots, work clothes)	
6.2.	Costs of guidance on safety technology and company medical support (e.g. in-house/external safety professional(s), in-house/external occupational physician(s), documentation)	
6.3.	Costs of specific prevention training measures (e.g. initial and ongoing training of safety experts and officers, e.g. safely securing loads, forklift trucks, time off for first-aid training)	
6.4.	Costs of preventive medical check-ups	
6.5.	Organisational costs (e.g. additional costs associated with ensuring that production processes meet safety and health requirements, proportional costs of the safety and health management system)	
6.6.	Investment costs (e.g. proportional depreciations of safety technology and workplace organisation costs required for prevention measures)	
6.7.	Start-up costs (additional safety and health costs involved during production start-up or during introduction phase of prevention measures)	
	TOTAL	

7. Based on your experiences, how do you rate (estimate!) the relationship between occupational safety and health benefits and its costs within your company?

$$\left( \frac{\text{benefits}}{\text{costs}} \right) = \left( \frac{\text{.....}}{1,0} \right) \leftarrow \text{Please fill in.}$$

8. Please tick all the occupational safety and health benefit types which are relevant for your company (multiple responses possible).

<input type="checkbox"/>	Cost savings through prevention of disruptions
<input type="checkbox"/>	Cost savings through prevention of wastage and reduction of time spent for catching up after disruptions
<input type="checkbox"/>	Added value generated by increased employee motivation and satisfaction
<input type="checkbox"/>	Added value generated by sustained focus on quality and better quality of products
<input type="checkbox"/>	Added value generated by product innovations
<input type="checkbox"/>	Added value generated by better corporate image

Thank you for your assistance!



## Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health

Project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the  
Energy, Textile, Electrical and Media Products Sectors (BG ETEM)

### Guidelines (version 13 July 2010, with marginal modifications)

The guidelines will be amended and sent out again by email distribution list whenever new commentary is added. Please do not hesitate to contact us ([rop@dguv.de](mailto:rop@dguv.de)) if you have any problems with the interviews or the questionnaire. We will be glad to propose solutions and inform all members of the ROP-family as soon as possible.

### General notes

- In many cases, the effects of prevention work can not be measured objectively. Thus, most of the answers are based upon **estimations**. This approach is accepted in empirical social research, especially if the interviewees have extended experiences.
- The interviewed companies should be **interested** and **experienced** in prevention work.
- The interviews should be addressed to experts of the companies (change manager, controller, employer, member of the workers' council, safety officer). If possible, the interviews should be **group interviews**. In this case, the interviewees have to express themselves as group and deliver common and intra-coordinated answers. If this is not possible, **individual interviews** are also possible. Then, the average values of the interview answers have to be put in the company's questionnaire.
- The interviewees should be **personally visited** to promote the group atmosphere. If this is not possible, the interviews could be conducted by **phone** or **email**.
- It could be helpful to send the questionnaire and/or the guidelines to the interviewed companies **in advance**. They could prepare the answers and resolve all open issues.
- Companies with plants or subsidiaries in foreign countries should answer the questions regarding the experiences in their respective countries. It is recommended to focus on a specific **plant**.
- Since the interviews should be completely anonymous, please do not note the name of the interviewees and the company.
- The questionnaire could be **translated** in other languages in one's own responsibility. We can not provide any translation support. Please make sure that the filled questionnaire that we will get back is in English.

- To keep the survey practicable, the **number** of interviewed companies should be one per one million person employed in the country, but at least ten and maximum 40.

### Questions No. 1-4

Subjective questioning of interviewees is most welcome. Instead of the terms listed, you can imagine a data scale of 1 to 6.

### Questions No. 3

“The implementation of occupational safety and health measures has directly reduced the number of hazards as follows.”

Intended for inclusion are hazards in the workplace.

“The implementation of occupational safety and health measures has directly reduced the number of breaches of safety regulations as follows.”

Breaches of regulations do not refer to the necessary caution needed due to hazards for example at dealing with materials or machines.

“The implementation of occupational safety and health measures has directly reduced the number of workplace accidents as follows.”

This deals with all accidents, regardless of whether it is obligatory to report the incident according to federal state law.

“The implementation of occupational safety and health measures has indirectly reduced the number of fluctuations as follows.”

The term fluctuation covers personal changes of the employees as well as changes in composition of the staff.

“The implementation of occupational safety and health measures has indirectly reduced the number of disruptions as follows.”

A disruption can be defined as an unplanned interruption of operations in production.

“The implementation of occupational safety and health measures has indirectly reduced the amount of downtime as follows.”

Downtime occurs when an employee is not fit for work after a workplace accident.

“The implementation of occupational safety and health measures has indirectly reduced the amount of wastage as follows.”

Wastages accrue due to a lack of production, which could recently be related back to occupational accidents.



“The implementation of occupational safety and health measures has indirectly reduced the amount of time needed for catching up after disruptions as follows.”

Workplace deficits (e.g. in ergonomics, lighting, noise etc.) as well as accidents in the workplace can lead to a lack of production. This then leads to diverse catching-up work for finished and unfinished products.

“The implementation of occupational safety and health measures has indirectly improved the quality of products as follows.”

For instance, better lighting conditions lead to fewer mistakes and less accidents and therefore better quality. Undisturbed production processes as well as thoughts about occupational safety and health including positive workplace culture go along with better quality of products.

“The implementation of occupational safety and health measures has indirectly improved the adherence to schedules as follows.”

Less disruptions because of less production problems and less occupational accidents lead to better adherence to schedules.

“The implementation of occupational safety and health measures has indirectly increased the number of innovations and suggestions for improvements as follows.”

Of importance for this point are further technical developments through the use of occupational safety and health.

“The implementation of occupational safety and health measures has indirectly improved the customer satisfaction as follows.”

The diverse effects of occupational safety and health are intended for inclusion here.

“The implementation of occupational safety and health measures has indirectly improved the corporate image as follows.”

A company which boasts a distinct accident rate doesn't have the best reputation among the public.

“The implementation of occupational safety and health measures has indirectly improved the workplace culture as follows.”

Occupational safety and health outlines a whole conception for a company with impact on company culture.

“The implementation of occupational safety and health measures has indirectly increased the employee hazard awareness as follows.”

A high sensitivity towards hazards in the workplace is a requirement for successful occupational safety and health.

## Questions No. 6

The prevention costs should be determined comparatively easy by means of management accounting and in particular cost accounting. Considered are all costs paid by the company.

6.6. Investment costs (e.g. depreciations): expenditures for investments uniformly allocated to average useful life (e.g. anticipated years of use) of safety technology etc.

## Questions No. 1-4

Normally, most interviewees may find it difficult to answer this fairly abstract question. Please clarify that this response also concerns a subjective assessment, taking the past into consideration.

Please ask the interviewees to imagine prevention accounting as a set of balance scales. Based on their individual experiences, they are expected to estimate whether the total benefits and the total costs of prevention work hold the balance level, or whether the benefits or the costs outweigh. In case that the benefits or the costs outweigh, the interviewees have to estimate the ratio between benefits and costs. If the benefits are estimated to be greater, propose ratios beginning at 1.0 and increasing with steps of 0.2 upwards. If the costs are estimated to outweigh, propose ratios beginning at 1.0 and decreasing with steps of 0.2 downwards. The companies have to assess the highest ratio which still meets acceptance.

The conversation could be as follows:

**Interviewer:** Please imagine prevention accounting as a set of balance scales. Regarding your experiences, do you see that the total benefits and the total costs of prevention work hold the balance level, or do you think that the total benefits or the total costs outweigh?

### Alternative 1

**Interviewees:** It is difficult to say, but I would estimate that the benefits of prevention work outweigh.

**Interviewer:** Now we have to estimate the ratio between the benefits and the costs. Do you think it will be 1.0, 1.2, 1.4 ...?

**Interviewees:** Stop at 1.4.

**Interviewer:** Thank you! I will put 1.4 in the questionnaire.

$$\left( \frac{\text{benefits}}{\text{costs}} \right) = \left( \frac{1,4}{1,0} \right)$$

## Alternative 2

**Interviewees:** It is difficult to say, but I would estimate that the costs of prevention work outweigh.

**Interviewer:** Now we have to estimate the ratio between the benefits and the costs. Do you think it will be 1.0, 0.8, 0.6 ...?

**Interviewees:** Stop at 0,6.

**Interviewer:** Thank you! I will put 0,6 in the questionnaire.

$$\left( \frac{\text{benefits}}{\text{costs}} \right) = \left( \frac{1,6}{1,0} \right)$$

Starting from the total costs of occupational safety and health (as listed in question no. 6, referring to the number of employees), the benefit-costs ratio is the basis for calculating the total monetary benefit – referring to one company in each case.

The spread of positive answers reveals the key for the spread of the total occupational safety and health benefits (as listed in question no. 7, referring to total costs) over the individual benefit types – referring to one company in each case.



## Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health

Project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the  
Energy, Textile, Electrical and Media Products Sectors (BG ETEM)

### Short Leaflet: Five Steps to the Interview (with marginal modifications)

#### 1. Set up and coordinate your interview team or conduct your interviews yourself.

- ✓ Read the information materials.

#### 2. Look for companies.

- ✓ Companies should be interested in and have experience with prevention work.
- ✓ Preferred branches: mining, construction, trade, manufacturing.
- ✓ Small, medium-sized or big companies.

#### 3. Contact the companies.

- ✓ Introduce the project.
- ✓ Propose for the interview a personal visit and arrange a meeting.
- ✓ Ask the company to group occupational safety and health experts for the interview.
- ✓ Thank for the time the company will spend for the project.

#### 4. Send the questionnaire, guidelines and project description to the companies.

- ✓ Send the questionnaire, guidelines and project description by mail or email.

#### 5. Interview the group of safety and health experts.

- ✓ Introduce the project.
- ✓ Point out the anonymity of the project.
- ✓ Explain that the answers are based on subjective estimations.
- ✓ Explain that the group has to find common answers.



## Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health

Project of the International Social Security Association (ISSA),  
German Social Accident Insurance (DGUV),  
German Social Accident Insurance Institution for the  
Energy, Textile, Electrical and Media Products Sectors (BG ETEM)

### Movie Script – Interview Role-Play

\* A member of management, a safety expert, a member of the controlling team, a member of the works council are sitting around a table with the interviewer. The interviewer outlines the purpose of the interview. Prior to the interview, the company received a copy of the questionnaire as means of preparation. \*

\* The following people take part in the interview: Company Manager (Myers), Safety Expert (Brown), Controller (Miller), Works Council Member (Morgan), Interviewer (Smith)\*

#### INTERVIEWER (SMITH)

\* The interviewer notes down the date of the interview, the country and currency as well as the position held by the participants. \*

Ladies and gentlemen, I would firstly like to thank you for your willingness to participate in this interview for the project "Calculating the International Return on Prevention for Companies: Costs and Benefits of Investments in Occupational Safety and Health". May I ask you to introduce yourselves briefly, focusing in particular on your positions within the company?

#### ■ COMPANY MANAGER (MYERS)

Well Mr. Smith, I am company director. Our company is a leading one within the civil engineering field. Before we get started with the interview, for the benefit of me and my colleagues, I would like to ask you to explain the aim of the research project and how our company can help to achieve its aim.

#### ■ CONTROLLER (MILLER)

My name is Miller, I am the head of the controlling team within our company.

#### ■ WORKS COUNCIL MEMBER (MORGAN)

I'm the spokesperson for the works council. My name is Morgan.

■ SAFETY EXPERT (BROWN)

My name is Brown and in this interview, I'm taking part as a safety expert.

**INTERVIEWER (SMITH)**

So ladies and gentlemen, before we get started, I would like to assure you that the interview will be treated confidentially. The questionnaire will be returned to the central evaluation office in Germany without the company name and the name of the interviewee. The only detail that will be noted is the country, in which the interview takes place. This ensures that the interview and interviewees remain anonymous. The answers will only be used for statistical evaluation.

**INTERVIEWER (SMITH)**

Ladies and gentlemen, I would now like to present to you some information about the purpose of the interview and the project as a whole.

Companies spend money on prevention work with regard to occupational safety and health in order to follow legal and/or social requirements. These expenses also represent investments, since the companies benefit economically from the effects of prevention measures. Therefore, it is of interest whether spending for prevention work delivers a monetary return, and if so, to what extent the "Return on Prevention" comes up. To answer these questions, it is necessary to account for prevention work. The difference between single-economic costs and monetary benefits processed in a prevention balance sheet shows the prevention profit or loss. The Return on Prevention, defined as benefit-cost ratio, illustrates the economic potential of investments in prevention work.

The aim of the cross-country project is to draw up prevention balance sheets (in monetary format) for companies in different countries and to calculate the country-specific return on prevention. Afterward, it is possible to consolidate the results and to estimate the global single-economic costs and benefits of investments in occupational safety and health. In addition, the particular relevance of prevention work (in non-monetary format) in companies is of importance. From the international point of view, it is of interest to identify different attitudes towards prevention work with respect to occupational safety and health.

■ COMPANY MANAGER (MYERS)

Many thanks for the information, but what are the real benefits of the project for our company?

**INTERVIEWER (SMITH)**

Mr. Myers, a concrete benefit for your company is that at the end of the interview you will have a clear picture of prevention costs and prevention benefits for your company. We will also send you the electronic version of the final report.

■ COMPANY MANAGER (MYERS)

Mr. Smith, I am somewhat sceptical about this project, after having examined the questionnaire prior to today's appointment. But I feel we should take part anyway, as our company can only gain new knowledge from it. I am also of the opinion that we should support research into the economics of occupational safety and health despite all the difficulties met along the way.

■ SAFETY EXPERT (BROWN)

Mr. Smith, dear colleagues, this project is extremely exciting for a safety expert because there are always demands for the return on prevention figure when making investment decisions. It is often the case that money needed for urgent and necessary measures is not available. If this project can produce something more transparent, then I am more than willing to cooperate.

■ WORKS COUNCIL MEMBER (MORGAN)

As works council member, I would like to second Mr. Brown. Improved transparency of occupational safety and health benefits would improve the position of employees when implementing prevention measures. Apart from that, our colleagues also benefit from successful occupational safety and health.

■ CONTROLLER (MILLER)

I am having difficulties understanding my role in today's meeting. Occupational safety and health is a matter for safety experts and not for the controlling team. However, I do not want to anticipate the survey.

■ SAFETY EXPERT (BROWN)

Safety and health protection in the workplace is the duty of company management as well as all executives. But when it concerns the calculation of the return on prevention, in your role as controller, you can surely present some key figures and estimates.

■ CONTROLLER (MILLER)

Of course, I have many balance sheet figures. I will have to wait and see, exactly what is required in today's interview.

**INTERVIEWER (SMITH)**

Thank you for the round of introductions. I already have the impression that each of you can make an important contribution to the project.

**INTERVIEWER (SMITH)**

Now for the questionnaire: How many people were employed in the company in 2009?

■ COMPANY MANAGER (MYERS)

In 2009, the company had 354 employees, 34 of which were employed on a part-time basis.

**INTERVIEWER (SMITH)**

Can you please quote the number of employees based on the standard weekly working hours, those which we can refer to as full-time employees?"

■ COMPANY MANAGER (MYERS)

Based on the standard weekly working hours, the company employed 332 workers.

\* Interviewer takes note of the figure in the questionnaire. \*

#### INTERVIEWER (SMITH)

To what industry does the company belong: mining, construction, trade, manufacturing, or other?

#### ■ COMPANY MANAGER (MYERS)

The company is predominantly operative in manufacturing.

\* Interviewer notes down the response in the questionnaire. \*

#### INTERVIEWER (SMITH)

**Question no. 1:** How do you rate the relative importance of occupational safety and health within your company: unimportant, moderately unimportant, slightly unimportant, slightly important, moderately important and very important?

#### ■ COMPANY MANAGER (MYERS)

I would say "moderately important".

#### ■ WORKS COUNCIL MEMBER (MORGAN)

I have to disagree here. According to the opinion of the works council, the importance of occupational safety and health is more like "slightly unimportant".

#### ■ SAFETY EXPERT (BROWN)

From my point of view, occupational safety and health in our company is above average, therefore I think that "slightly important" is the correct response to this question.

#### ■ COMPANY MANAGER (MYERS)

Fair enough, as a compromise, we will settle for "slightly important".

\* The company manager has the final say in determining answers for the interview. \*

#### INTERVIEWER (SMITH)

**Now to question no. 2:** How do you rate the impact of occupational safety and health within the following areas of your company?

#### ■ SAFETY EXPERT (BROWN)

Well Mr. Smith, we have already tried to answer this question prior to today's meeting. For purchasing, we have agreed on "less than strong", for production planning "little impact", for personnel allocation "little impact", for production "strong", for transport "strong", and for warehousing "very strong". We don't have a separate area of research and development within our company, and within the area of marketing, we have not yet noticed any impact.



### INTERVIEWER (SMITH)

**Question no. 3:** How do you rate the effects of occupational safety and health within your company?

#### ■ SAFETY EXPERT (BROWN)

Again, prior to this meeting we were able to agree on an answer to this question. In our opinion, the direct impact of occupational safety and health regarding the reduction of the number of hazards is “strong”, regarding the reduction of breaches of regulations is “less than strong”, regarding the reduction of workplace accidents is “more than little”...

#### ■ COMPANY MANAGER (MYERS)

In comparison to other companies within our industry, our company has had a low accident rate for many years. Therefore it will be difficult to achieve further reduction in the number of accidents.

#### ■ SAFETY EXPERT (BROWN)

That’s correct but the best within our industry already have an accident rate which lays 40% below our figure.

### INTERVIEWER (SMITH)

That’s true but within the different industries some customers have already detected varying amounts of occupational safety and health. In the service area of your company, for example, it is immediately noticeable when a member of staff is missing.

#### ■ SAFETY EXPERT (BROWN)

Now, let us move onto workplace culture.  
We agreed on “less than strong” in response to this question.

#### ■ WORKS COUNCIL MEMBER (MORGAN)

I would most definitely like to second that. Occupational safety and health has a positive impact on the management team and the rest of the staff.

#### ■ SAFETY EXPERT (BROWN)

Employee hazard awareness has experienced a “strong” increase.

### INTERVIEWER (SMITH)

Many thanks, may I propose to move on to question no. 4. How do you rate the current occupational safety and health measures within your company?

#### ■ COMPANY MANAGER (MYERS)

The response to this question is most definitely “good”. Do you all agree with that?

*\* Myers takes a look around at the others. His colleagues are clearly nodding. \**

### INTERVIEWER (SMITH)

**On to question 5:** In your opinion, how would additional investments in prevention work affect company costs in the long term?

#### ■ CONTROLLER (MILLER)

Investments in occupational safety and health increase fixed costs and are therefore referred to as cost drivers.

#### ■ SAFETY EXPERT (BROWN)

I don't see it like that. Many activities relating to occupational safety and health directly or indirectly improve the productivity within the company. Here I would just like to point out the risk assessment.

#### ■ CONTROLLER (MILLER)

Yes but the personal protective equipment is only a cost.

#### ■ SAFETY EXPERT (BROWN)

Personal protective equipment costs money but it prevents negative effects concerning colleagues' health and safety, thanks to its known direct and indirect impacts.

#### ■ WORKS COUNCIL MEMBER (MORGAN)

And it also promotes company atmosphere. From our point of view as colleagues, it proves that our work is valued by the management team when they are prepared to order new personal protective equipment. Anyway, our health is most important to us.

### INTERVIEWER (SMITH)

We're taking your answer as the final word Mr Myers. How do you feel about question no. 5?

#### ■ COMPANY MANAGER (MYERS)

I would ask that we respond to this question with "company costs would decrease".

*\* If response is "company costs would increase" or "company costs would decrease", continue with question 5, otherwise continue to question 6. \**

### INTERVIEWER (SMITH)

In your opinion, to what extent would company costs change?

#### ■ CONTROLLER (MILLER)

The only possible response to this question is "more than low".

■ SAFETY EXPERT (BROWN)

I tend not to agree with you. I feel the correct response is “high” if you take into account the monetary as well as the non-monetary benefits, in relation to expenditure.

■ WORKS COUNCIL MEMBER (MORGAN)

I completely agree with the safety expert.

■ COMPANY MANAGER (MYERS)

I think we should therefore meet in the middle at “less than high”. I would more than agree with this level regarding the company’s performance.

**INTERVIEWER (SMITH)**

Now to question no. 6: Please estimate, for each individual cost type, the occupational safety and health costs per employee accrued by your company in 2009.

*\* Please, take the currency of your country. \**

**INTERVIEWER (SMITH)**

Costs of specific prevention training measures (e.g. initial and ongoing training of safety experts and officers, e.g. safely securing loads, forklift trucks, time-off for first-aid training)

■ CONTROLLER (MILLER)

These costs are 95 currency units per employee.

**INTERVIEWER (SMITH)**

Costs of preventive medical check-ups

■ CONTROLLER (MILLER)

These costs come in at 20 currency units per employee.

**INTERVIEWER (SMITH)**

Organisational costs (e.g. additional costs associated with ensuring that production processes meet safety and health requirements, proportional costs of the safety and health management system)

■ CONTROLLER (MILLER)

I’m not able to quote these costs because the controlling team does not deal with these sets of data.

■ COMPANY MANAGER (MYERS)

We do not explicitly record the costs of special occupational safety and health organization. I will make an estimate. You can assume a total of 95 currency units.

### INTERVIEWER (SMITH)

Investment costs (e.g. proportional depreciations of safety technology and workplace organisation costs required for prevention measures)

#### ■ CONTROLLER (MILLER)

I am also unable to quote these costs as we do not have any data in controlling.

#### ■ COMPANY MANAGER (MYERS)

We also do not explicitly record investment costs for safety technology and workplace organisation costs for occupational safety and health. These costs are a part of the running costs. Mr. Miller, do you agree with a value of 65 currency units?

#### ■ CONTROLLER (MILLER)

Most definitely – such a figure is reasonable.

### INTERVIEWER (SMITH)

Start-up costs (additional safety and health costs involved during production start-up or during introduction phase of prevention measures)

#### ■ CONTROLLER (MILLER)

These costs are 80 currency units per employee.

### INTERVIEWER (SMITH)

Question no. 7: Based on your experiences, how do you rate the relationship between occupational safety and health benefits and its costs within your company?

#### ■ COMPANY MANAGER (MYERS)

For the previously mentioned costs per employee and taking into account the direct and indirect benefits, I can estimate a cost-benefit ratio of between 1.0 and 2.0, say 1.6.

*\* Myers looks at the others and the other colleagues are clearly nodding. \**

### INTERVIEWER (SMITH)

For question no. 8: Please tick all the occupational safety and health benefit types which are relevant for your company. Multiple responses are explicitly possible.

#### ■ SAFETY EXPERT (BROWN)

We had previously agreed on section 1, 2, 3, 4 and 5 for this question.

**INTERVIEWER (SMITH)**

Ladies and gentlemen many thanks for participating in this project. The project team in Germany will evaluate the data collected worldwide and will present the results at the World Congress in Istanbul in 2011. You will be notified separately by me when the final report has been published.

## International Social Security Association

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