

## Study

# Prevention Accounting and Return on Prevention

Prevention means spending for companies. The benefits of prevention result in appreciation in value and profits. The authors prove in the following report that it can be worthwhile for companies to invest in prevention work.

## Abstract

Companies invest in prevention work to improve occupational safety and health. They follow not only legal and social requirements, but also their own business concerns. Costs and monetary benefits of prevention work can be found out empirically and compared in prevention accounting with single corporate focus. The difference between costs and monetary benefits can be disclosed as the prevention profit or loss of investments in prevention work. The “return on prevention”, defined as benefit-cost ratio, illustrates economic potential. The result of the study exposes that it is worth for businesses to invest in prevention work.

## 1 Aim of the Study


Companies invest in prevention work in order to abide by statutory requirements and fulfil their employee social responsibility. They also do so as an investment in company interests. Through a reduced number of work-related accidents and occupational illnesses, it is possible, for example, to reduce stoppages and increase productivity. Therefore, it is useful to know whether spending on prevention work actually generates a financial return, and if so, to what extent.<sup>1</sup> It is also useful to know if a return on investment arises. To be able to provide answers to these questions, it is necessary to investigate the return on prevention within an individual company.<sup>2</sup> On a prevention balance sheet, the money a company invests in prevention work should be set against the prevention benefits. The return on prevention is calculated by the assessment of costs and benefits, or more specifically calculated as a bottom line figure. To help illustrate the prevention benefits, the prevention impact must be evaluated in monetary terms. The evaluation can be empirically carried out on the basis of a company survey.

## 2 Operational Accounting

Operational accounting traditionally consists of financial, as well as economic performance accounting. Financial accounting processes payments (in-payments and out-payments, revenues and expenditures, profits and expenses). Investment and financing statements, as well as annual statements of accounts, consisting of balance sheets and profit and loss statements, all fall into this bracket. Economic performance accounting covers costs and profits (income, or rather benefits). Traditional accounting consists of cost accounting and cost-benefit analyses within the individual company. Financial and economic performance accounting is oriented towards the external capital market or the internal decision-making processes, each being directed towards specific aims. A complementary societal and ecological perspective goes along with social and ecological accounting. The fore mentioned bottom line figure (societal and environmental costs and benefits) depends upon the financial and economic performance analysis level, takes into consideration external impacts and allows for the evaluation of interferences and third party favouritism.



A prevention balance sheet can neither be expressed as financial and economic performance accounting, nor as societal or ecological accounting. The costs of prevention work are regularly made up of expenditures and business costs, however that doesn't necessarily mean that the benefits of prevention work lead directly to income or profits. Due to the fact that the impact of corporate prevention work doesn't develop in third party establishments but rather in one's own company, the prevention benefits therefore, by definition, don't fall under the societal and environmental bottom line figure. As a result, the costs and benefits of prevention work do not conform to the traditional balance sheet. The costs of preven-



Prevention costs can be relatively easily calculated, whereas data acquisition and evaluation problems arise when trying to calculate prevention benefits

On the other hand, the prevention measures have successful results for the company, for example, through the direct prevention of accidents in the workplace, occupational illnesses and work-related health risks, or indirectly through the prevention of wastage and stoppages, a reduction of the time spent catching up after stoppages, increased employee motivation, product innovation and better quality products.<sup>3</sup>

All of this accounts for qualitative and quantitative return on prevention. For example, the success of prevention work from a qualitative point of view, can be measured using a points system, and the quantitative side can be deduced from the difference between the monetary benefits and the money invested by a company prevention work. From these values, a "Return on Prevention (ROP)" can be expressed as a quotient, using the returns of prevention work (its monetary value) and the spending on prevention work. The ROP can also be expressed as a prevention cost-benefit ratio.

#### 4 Prevention Balance Sheet

A prevention balance sheet is not an assets account but rather a means of calculating the economic return of prevention measures. It sets the money a company invests in prevention work against the prevention benefits gained by a company. Fundamentally, the return on prevention can be defined for individual types of prevention work, e.g. training courses. Given the relationship between the effects of particular prevention measures and the reduction of the already complex study design, it's obvious that the return on prevention should be used as a means of focusing on corporate prevention work as a whole.

While the costs of prevention work, due to the help of cost accounting and financial controlling, can be relatively easily calculated, data acquisition and evaluation problems arise when trying to determine the benefits of prevention work. To be able to identify the benefits through the prevention of damages, it is necessary to take a step backwards and examine social accounting and empirical social research methods. Prevention accounting involves industry-specific or cross-industry approaches, within a comparatively narrow timeframe. Additionally, a comparison of prevention costs and prevention benefits over several years could be possible.

It is often the case that ambiguous cause and effect relations appear in prevention accounting. For example, corporate prevention work, technical advances, social awareness and other factors, collectively provide for more safety in the workplace. A single benefit of prevention work cannot be easily identified. In addition to this, the impact of prevention work often develops over an extended period of time. Moreover, the purchase price of resources already includes the additional costs of safety-relevant amenities, which have become a general standard nowadays. Firstly, because of safety-relevant amenities and secondly, due to the need to fulfil effective safety standards, it is difficult to distinguish the different costs of prevention work. A formal appreciation of prevention accounting and a justifiable demand for it have reached their limits. Therefore, the prevention balance sheet will be based on an economic model. Although the new model is fundamentally based on restrictive assumptions (within the premise of the use of appropriate methodology), it facilitates the evaluation of prevention work within the individual company. ▶

#### \* Footnotes

- 1 An analysis of economic models can be found in Kramer, L.; Bödeker, W.: Return on Investment im Kontext der betrieblichen Gesundheitsförderung und Prävention, IGA-Report 16, 2008.
- 2 Previous approaches have been oriented towards accident costs and the costs of an uninterrupted working hour. See: Gut, P.; Steffen, E.-J.: Zur präventiven Bedeutung einzel- und gesamtwirtschaftlicher Unfallkostenrechnungen. In: Bundesanstalt für Arbeitsschutz (pub.): Kosten der Arbeitsunfähigkeit, Dortmund 1983, p.148-179; Hauptverband der gewerblichen Berufsgenossenschaften (pub.): BGZ-Report 4/95, Produktivitätsfaktore Gesundheit – mehr Wirtschaftlichkeit durch Sicherheit und Gesundheit bei der Arbeit, Sankt Augustin 1995; Kohstall, T.; Lüdeke, A.: Neue Wege der betrieblichen Unfallkostenrechnung. In: Ecker, F.; Kohstall, T. (pub.): Arbeitsschutz besser managen, 16. Ergänzungs-Lieferung, December 2003, Cologne 2003, 10900.
- 3 For more information on the impact of occupational safety on the success of the company, see Packebusch, L.; Herzog, B.; Laumen, S.: Erfolg durch Arbeitsschutz, Dortmund; Berlin; Dresden 2003, p35 et seq.

tion convert to expenditures from a financial point of view, and to costs from an economic performance point of view. The prevention benefits illustrate impacts, which indirectly facilitate business and company performance. A prevention balance sheet is best portrayed as an extended investment or as a special form of cost-benefit statement.

#### 3 Return on Prevention

The return on prevention can be defined as the result of positive or negative implications of corporate prevention work. It is necessary, on the one hand, for the implementation of prevention measures for resource leverage, which results in prevention costs.

## 5 Empirical Data Collection

In 2007 and 2008, a survey was carried out among 39 companies of various sizes and structures, and from different sectors, in order to practically determine the costs of prevention work as well as its benefits. The selected companies showed interest in occupational safety and also conveyed their willingness to participate in the survey. In this respect, the survey was a cross-sectional study based on positive selection. It took the form of a standard interview, which was theoretically aimed towards the company. For practical reasons, only a limited number of employees from each company were selected for interview (for example, the works council, controller, safety experts and business people). The persons surveyed received either a personal visit or were contacted by telephone or email. Ideally, answers were given as a group effort as opposed to answers from individuals. The costs of prevention work were

comparatively easy to determine. The following are different types of prevention work in which a company invests: cost of personal protective equipment, company medical support and guidance on safety technology, deployment of safety officers, prevention training and preventive medical check-ups, as well as organisational, investment and start-up costs (see Table 1).

Difficulties were met when trying to assess the prevention benefits (see Table 2). This is noticeable by the low number of answers received. Therefore, as an alternative, an indirect estimation procedure was introduced, relating to a projection of those showing willingness to pay for prevention work. The interviewees were asked to imagine prevention accounting as a set of balance scales. Based on their individual experiences, they were expected to estimate whether the total costs of prevention and the total benefits of prevention work would hold the balance le-

vel or whether either the costs or the benefits would tip the scales. In the case that the costs turn out to have a greater value than the benefits, or vice versa, an operating ratio beginning at 1.0 and increasing at intervals of 0.2 was suggested as means of assessment. The interviewees were encouraged to choose ratios, which were relevant to their experiences (see Table 3).<sup>4</sup>

**Table 3:** Distribution of company by company basis cost-benefit quotients \*

Quotient	Quantity
< 1	1
1–1.99	20
2–2.99	11
3–3.99	1
4–4.99	1

\* Source: Authors, see [www.dguv.de](http://www.dguv.de) (webcode d13809, Sub-project 5)

**Table 1:** Company prevention costs \*

Company prevention costs (Costs in euro per employee and per year)	n	Median value	Average value	Minimum/Maximum
Cost of personal protective equipment	38	116.00	166.80	0.00/700.00
Cost of company medical support and guidance on safety technology	34	72.00	114.40	5.00/464.00
Payroll costs of safety officers (excluding company medical support and guidance on safety technology)	24	100.00	199.70	5.00/1071.00
Cost of prevention training	30	60.00	95.00	2.00/500.00
Cost of preventive medical check-ups	13	20.00	22.50	4.00/84.00
Organisational costs	9	60.00	91.20	10.00/374.00
Investment costs	10	26.00	68.00	6.00/303.00
Start-up costs	7	25.00	82.90	5.00/282.00

\* Source: Authors, see [www.dguv.de](http://www.dguv.de) (webcode d13809, Sub-project 5)

**Table 2:** Company prevention benefits \*

Company prevention benefits (Value in euro per employee and per year)	n	Median value	Average value	Minimum/Maximum
Cost savings through prevention of stoppages	3	75.00	175.00	50.00/400.00
Cost savings through prevention of wastage and reduction of time spent catching up after stoppages	2	65.50	65.50	10.00/121.00
Added value generated by increased employee motivation and satisfaction	4	56.00	80.25	10.00/200.00
Added value generated by sustained focus on quality and better quality products	3	31.00	47.00	10.00/100.00
Added value generated by product innovation	3	31.00	47.00	10.00/100.00
Added value generated by better corporate image	4	21.00	60.25	0.00/200.00

\* Source: Authors, see [www.dguv.de](http://www.dguv.de) (webcode d13809, Sub-project 5)

Using this approach, the relationship between prevention benefits and its costs could be easily illustrated. In those companies, where the total costs of prevention had already been calculated, it was possible to calculate the benefits of prevention.<sup>5</sup> The next step involved sorting the benefits into subcategories of different types of benefits. The interviewees were then prompted to respond to the following questions with a simple “yes” or “no” answer:

- Has your company made savings through the prevention of stoppages?
- Has your company made savings through the prevention of wastage and the reduction of time spent catching up after stoppages?
- Has your company experienced an increase in value through increased employee motivation and satisfaction?
- Has your company experienced an increase in value through sustained focus on quality as well as better quality products?
- Has your company experienced an increase in value due to product innovation?
- Has your company experienced an increase in value due to an improved corporate image?

The interviewees identified those benefits which were relevant for their company with a “yes-answer”. Subsequently, the total number of “yes-answers” for each type of benefit was calculated. The weightage for each type of benefit was calculated



A prevention balance sheet is a comparison of prevention costs and prevention benefits

by comparing the total number of “yes-answers” given for each question with the overall number of “yes-answers” given by all companies. The following are the results expressed as percentages:

- Benefits through the prevention of stoppages: 20 percent
- Benefits through the prevention of wastage and the reduction of time spent catching up after stoppages: 8 percent
- Benefits due to increased employee motivation and satisfaction: 25 percent
- Benefits due to sustained focus on quality and better quality products: 17 percent
- Benefits due to product innovation: 8 percent
- Benefits due to an improved corporate image: 22 percent

Fundamentally, the benefit distribution should be relevant for each company. However, in the case that not all benefits were relevant for a company, the weightage of those which had been proven to be relevant had to be accordingly scaled up. The total monetary profit of a specific type of prevention benefit was calculated by adding the individual monetary profits of each type of benefit (see Table 4).

## 6 Empirical Results

The following prevention balance sheet (see Table 5) summarises the results of empirical data collection. The net or bottom line figure expresses either a positive or negative return on prevention. As is standard when calculating the economic return of prevention mea-

asures, the prevention costs and benefits are structured according to specific types of costs and benefits. The costs and profits amounts have been calculated as average values, so that all values, including minimum and maximum values, have been similarly taken into consideration. Another possible method is to express the values as median values. Using this method, the structural value of the prevention balance sheet and the recognition of a positive return on prevention would not change. The results of prevention accounting are based on a positive selection of surveyed companies, which of course has both advantages and disadvantages. The first risk is that these companies, who show motivation towards prevention work, overestimate the benefits of prevention work. ▶

Table 4: Empirical investigated prevention benefits \*

Company prevention benefits (Value in euro per employee and per year)	n	Median value	Average value	Minimum/ Maximum
Cost savings through prevention of stoppages	21	245.80	304.80	50.00/974.30
Cost savings through prevention of wastage and reduction of time spent catching up after stoppages	8	73.20	98.60	10.00/331.10
Added value generated by increased employee motivation and satisfaction	30	306.60	375.70	10.00/1274.00
Added value generated by sustained focus on quality and better quality products	18	98.80	150.00	10.00/477.30
Added value generated by product innovation	8	41.10	62.00	10.00/144.90
Added value generated by better corporate image	25	186.40	285.50	0.00/1071.70

\* Source: Authors, see www.dguv.de (webcode d13809, Sub-project 5)

## \* Footnotes

- 4 Referring to Jones-Lee, M. W.: Personal Willingness to Pay for Prevention: Evaluating the Consequences of Accidents as a Basis for Preventive Measures. In: Addiction, Vol. 88, 1993, pp. 913-921.
- 5 Attempts of an economic evaluation of “soft facts”, based on an extended cost-benefit analysis, can be found in Fritz, S.: Ökonomischer Nutzen “weicher” Kennzahlen, Zurich 2005. [Economic Benefits of “soft” indices]



An example of a company health programme: the impacts of preventions measures often develop over an extended period of time

This answer pattern doesn't however, fluctuate to such an extent, to make the assumption unjustifiable, that this effect is most noticeable in individual cases and not as an overview of all companies. Those companies which show interest in prevention work also show increased willingness to cooperate and respond more actively to the posed questions. To that effect, the validity of the results increases. Furthermore, the validity of the results increases because those companies, which had previously invested little in prevention work (of which the results are described as return on prevention), provide the opportunity for undeveloped business potential to turn out better as expected. This in turn justifies the relatively justified scope of the survey.

In order to increase the practical and normative value of the prevention balance sheet, it is useful to calculate the prevention cost-benefit ratio, which expresses the return on prevention of prevention work carried out in the workplace. Using the following data sets, paired and unpaired benefit-cost ratios are formed and their averages are calculated. For the companies involved in this study, the return on prevention was 1.6. The return on prevention describes a potential economic return on corporate prevention work. However, a financial or economic performance operationalisation (for example, in the form of a linear relationship between expenditure and revenue) doesn't allow for this. It is rather a matter of theoretical quantity, which describes orientation and strength of the interdependency between preventions costs and prevention benefits. In this study it

proves that investment in prevention work, within this model of prevention accounting and against the backdrop of the surveyed companies, has a positive effect on the success of the company. In this respect, companies invest in prevention work, not only to fulfil statutory regulations and social responsibility, but also in the interest of

the company.<sup>6</sup> Ongoing considerations for strategic optimisation could, in the future, become a part of prevention controlling.<sup>7</sup> ●

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\* Footnotes

- 6 cf. Kuhn, K.: Arbeitsschutz und Wirtschaftlichkeit. In: WSI Mitteilungen, 1995, p. 89-98.
- 7 cf. Langhof, T.: Ergebnisorientierter Arbeitsschutz, Dortmund and Berlin 2002, p.37 et seq.

Table 5: Prevention balance sheet based on averages \*

Prevention balance sheet (n=39, based on averages)			
Company prevention costs	Value in euro per employee/ per year	Company prevention benefits	Value in euro per employee/ per year
Cost of personal protective equipment	166.80	Cost savings through prevention of stoppages	304.80
Cost of company medical support and guidance on safety technology	114.40	Cost savings through prevention of wastage and reduction of time spent catching up after stoppages	98.60
Payroll costs of safety officers (excluding company medical support and guidance on safety technology)	199.70	Added value generated by increased employee motivation and satisfaction	375.70
Cost of prevention training	95.00	Added value generated by sustained focus on quality and better quality products	150.00
Cost of preventive medical check-ups	22.50	Added value generated by product innovation	62.00
Organisational costs	91.20	Added value generated by better corporate image	285.50
Investment costs	68.00		
Start-up costs	82.90		
<b>Total</b>	<b>840.50</b>	<b>Total</b>	<b>1276.60</b>
(Monetary net) Return on Prevention: 436.10 euro per employee/per year			

\* Source: Authors, see www.dguv.de (webcode d13809, Sub-project 5)