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IMPACT OF INVESTMENTS IN HEALTHY AND SAFE WORKING
CONDITIONS ON INCREASING PRODUCTIVITY
AND EFFECTIVENESS OF LIGHT
AND HEAVY INDUSTRY ENTERPRISES IN THE REPUBLIC OF NORTH
MACEDONIA COMPARED TO THE REPUBLIC OF GERMANY

Abstract: Investing in occupational health and safety (OHS) has not been paid much attention, but in the context of modern production, it is one of the most important issues. The reason for this is that investing in safety at work helps in achieving certain effects and in minimizing the negative consequences and the negative impact on the business economy caused by unfavourable working conditions. On the other hand, investing in occupational safety increases productivity and economic quality in companies. The purpose of this study is to obtain knowledge about the effects of OHS investments on financial, non-financial, and employee performance of organizations in North Macedonia and in Germany, and to carry out a comparative analysis of these effects in order to contribute to the existing evidence of the relationship between investments in OHS and organizational and individual performance. The results obtained are consistent with the available knowledge in professional literature, i.e. it can be said that companies benefit from OHS investments regarding their financial, non-financial, and employee performance.

Keywords: occupational health and safety; investment; financial performance; non-financial performance; employee performance.

Introduction

From an economic point of view, occupational health and safety (OHS) is unequivocally a thoughtful approach to saving financial and material resources, both for employees and for the state itself, where social funds for treatment compensation, recovery period, etc., are uncontrollably exhausted. The traditional approach, which considers the improvement of occupational health and safety an additional cost, is slowly being replaced by an approach where workers' health, safety, and well-being are an integral part of the economic state and organizational development of business entities (Linhard, 2005).

Occupational health and safety is an interdisciplinary concept for the well-being of people involved in the work process, but at the same time, it serves as a protection of employers from unforeseen and uncontrolled economic and material losses, which arise from damages caused by non-application occupational health and safety measures (Али, 2011). Therefore, any investment in occupational health and safety measures, and in workers' protection in general, is a beneficial investment for employers.

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Investments in Occupational Health and Safety

Classical forms of investment have the primary task of achieving the expected effects in the production area, regardless of whether it is about the creation of new investment objects or about the reconstruction of existing ones. In both cases, investments are expected to improve the quality of a company's economy, primarily by increasing productivity (Elgstrand & Petersson, 2009).

When it comes to investments in occupational health and safety, then the most expected effects are reduction of the number of injuries at work, fatal injuries, and disability (Clinch et al., 2000). However, investing in OHS is also important in terms of increasing productivity. Namely, OHS measures aim at improving work results, as these effects are directly related to investments in OHS (Todorović, 2010).

Given the complexity of occupational health and safety, there is almost no area in the company where the application of such measures would not affect the increase of productivity. The application of appropriate OHS measures can have a direct impact not only on reducing the number of workplace injuries and the number of occupational diseases, but also on increasing productivity (Roxane, 2009).

Based on the current knowledge about the issue of investing in occupational health and safety, we generally mean all investments related to safety at work, investments in general working conditions, as well as the ones related to the improvement of accommodation, nutrition, medical care, transportation, etc. (Van der Broek & Kruger, 2010).

Classification of Investments in Occupational Health and Safety

As for the classification of investments in OHS, the basic criteria for their division can be:

- time of investment;
- manner of investment.

Given the *time of investment*, investments in occupational health and safety can be divided into:

- previous (preventive) investments;
- additional investments.

Investments in the OHS according to the *manner (purpose)* can be classified into investments in:

- immediate protection;
- social standards;
- social protection (Spasić, 2003).

Investments in Occupational Health and Safety According to the Time of Investment

Previous (preventive) investments. Previous investments are provided by applying certain measures and norms of health and safety at work in the phase of designing and creating investment objects, as well as in the organization of the technological process. Preventive measures in achieving health and safety at work are provided by applying modern technical, ergonomic, medical, educational, social, organizational, and other measures and means to eliminate or minimize the risk of injury and damage to employees' health (Stone, 2005).

Additional investments. Despite the importance of preventive measures in the field of occupational health and safety, which aim to prevent injuries and diseases, it is not uncommon for work to be performed in unfavourable conditions, so the risk of worker injury and illness in such an environment is always present. That is the main reason for those companies to make additional investments that have the character of such investments (Rohs, 2006). When it comes to additional investments in OHS, it is important for them to be made efficiently and quickly, because any indecision can cause a number of negative consequences. In addition, it should be taken into account that any additional OHS measure does not always require large financial resources. In some cases, even with minimal investment, very large effects can be achieved (Clayton, 2002).

Investments in Occupational Health and Safety According to the Purpose of Investment

As already stated, according to this criterion, there are three basic groups of investments: in immediate protection, in social standards, and in social protection.

Investments in immediate protection. They include all investments whose main task is to directly influence the prevention of occupational injuries and diseases. This type of investment includes investments in personal protection, in healthcare, and in technical protection (Cigna, 2008).

Investments in social standards. They include investment in workers' education, nutrition, transportation, leisure, recreation, and residency. Many of these measures can contribute to the maintenance of good health and working ability, especially in workers who work under severely unfavourable and difficult working conditions (Spasić, 2003).

Investments in social protection. Investments in social protection are covered by the social security system. Basic risks covered by insurance, which are related to OHS, include: illness, death, injury, permanent or temporary disability, etc. This form of protection is regulated by the regulations related to health, pension, and disability insurance. Insurance itself consists of securing cash and other tangible assets when the insured risk occurs (Ikpe et al., 2011).

Benefits of OHS Investments for the Financial, Non-Financial, and Employee Performance of a Business Entity

The introduction of a good health and safety system accomplishes not only the legal and social obligations of a company, but it also leads to certain benefits for more successful business results. A well-planned OHS system in a business entity means that it is socially responsible, protects and improves its brand image and brand value, increases the employees' productivity (and thus creates a more competent and healthier workforce), reduces operating costs, and encourages the workforce to stay active for a longer period. They all undoubtedly have a positive effect on the company's financial performance (Lamm et al., 2007).

The quality and productivity of work play an important role in the economic development of a business entity. Reduced accidents at work and health-endangering factors, increased productivity and efficiency, and, consequently, better financial performance can be monitored as a result of:

- ▶ improving the level of motivation, cooperation, and morale of the workforce;
- ▶ more productive employees and more efficient work methods;
- ▶ minimizing unplanned costs through continuous and effective planning;
- ▶ improving the quality of employees through recruitment and retention;
- ▶ reducing insurance premiums;
- ▶ reducing potential exposure to criminal or civil court proceedings (Muniz et al., 2009).

Hence, investing in occupational health and safety undoubtedly pays, because the existence of a clear and direct relationship between OHS investments and better financial performance is evident.

Occupational health and safety are of great importance in the work environment, because, nowadays, human resources are the most valuable asset that an organization has. A poor working environment can greatly affect the performance of employees (Ward et al., 2008). If the workplace does not provide measures for danger protection, it will cause illness in the workforce and thus negatively affect employee performance and, consequently, organizational performance (Ѓорѓиев, 2016). In general, taking care of OHS is an obvious prerequisite for good performance. High performance means creating an environment in which people feel physically and psychologically safe, which also means a fairly fundamental proof that employees are valued. This means that, if there is a lack of high performance, organizational performance is also affected, which calls into question the overall organization performance (Jelimo, 2007).

Comparative Analysis of Benefits of OHS Investments in Germany and North Macedonia

Employers are obliged to implement preventive measures before and during the work process, as well as with each change of the technological procedure, by selecting the working and production methods that provide the greatest possible health and safety at work, based on the application of OHS regulations, labour law, technical regulations and standards, healthcare regulations, occupational hygiene, health, pension and disability insurance, etc. This protection provides the most ideal solutions to

prevent injuries at work and occupational diseases. However, the management often wants to make as much money as possible, considering only short-term interests or because of the current lack of money, and ‘forgets’ to implement OHS measures, which later comes back to the company like a boomerang. Due to a large number of injuries, illnesses, disabilities, an increase in sick leave, and lost working days, companies are doomed to losses.

The extent to which investments in OHS can affect organizational financial and non-financial performance in our country in comparison with other countries can be best seen from the research results below.

Braunig and Kohstall (Braunig & Kohstall, 2011) conducted research in Germany as part of a wider international study, which investigated how investments in occupational health and safety programmes benefit companies. In fact, the research was a focused conceptual review of the idea of accounting prevention, aiming to calculate the microeconomic effects of occupational safety and health in terms of qualitative and quantitative metrics, and to develop a cost-benefit analysis.

Data on the microeconomic effects of workplace prevention were obtained using standardized interviews with experts in the selected companies. The interviewees made an assessment of the costs and benefits of occupational safety and health on the basis of their previous experience. Therefore, the companies from which there were respondents who entered the persistence sample had to have experience with prevention in the workplace. The research results do not refer to individual companies, but they represent abstract statistical consideration.

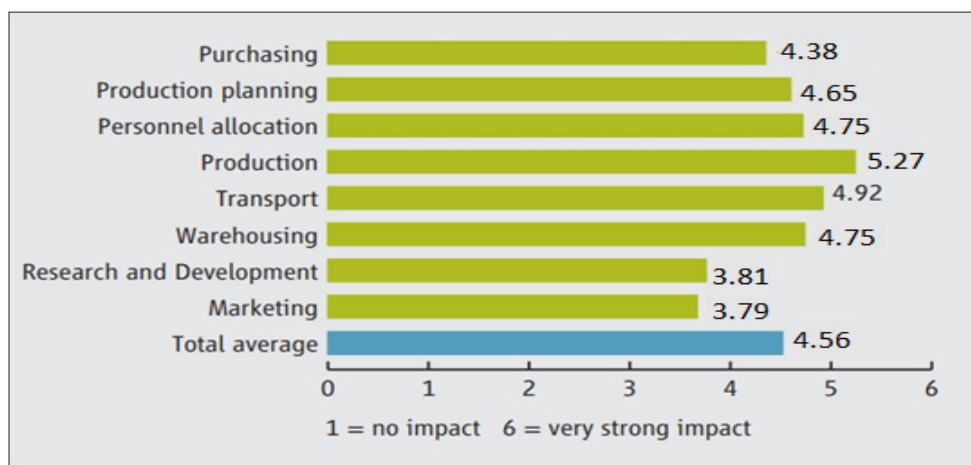


Figure 1. Impact of OHS in selected areas

As can be seen from Figure 1, the effects of occupational health and safety are positively evaluated in all areas. Moreover, prevention has the strongest impact in the areas of production, transport, and warehousing.

According to Figure 2, the direct effects of prevention are reflected through reduction of hazards, increased awareness of hazards, and reduction of dangerous behaviour and accidents. Among the indirect effects, the most significant ones are the improvements in the company’s image and culture.

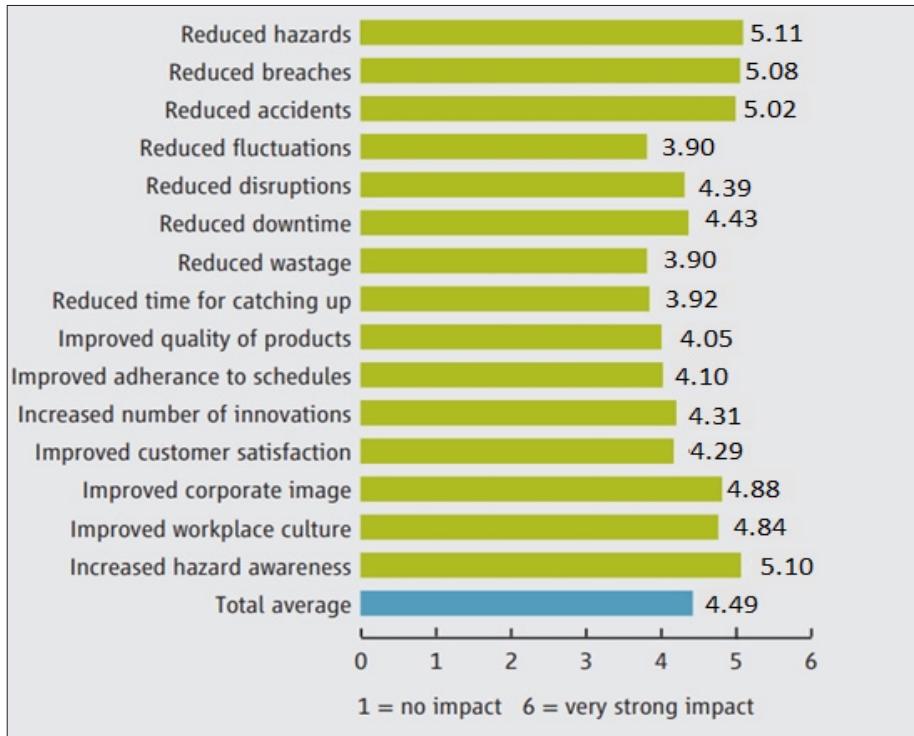


Figure 2. Effects of OHS within the company

According to the results shown in Figure 3, half of the companies believe that additional investments in safety and health at work will reduce the company's costs in the long term.

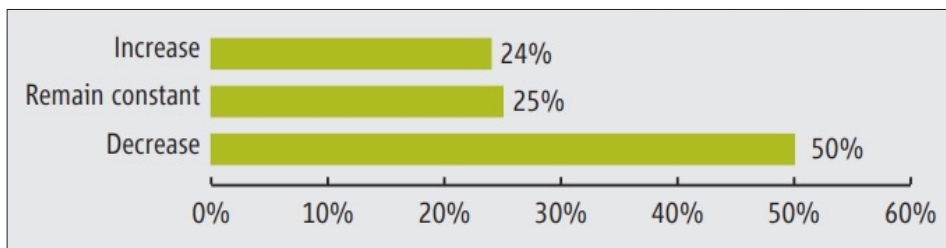


Figure 3. Additional investments in OHS affecting company costs

Figure 4 indicates the ranking of Return on Prevention (RoP) by the interviewed companies. Note that the average RoP was 2.2.

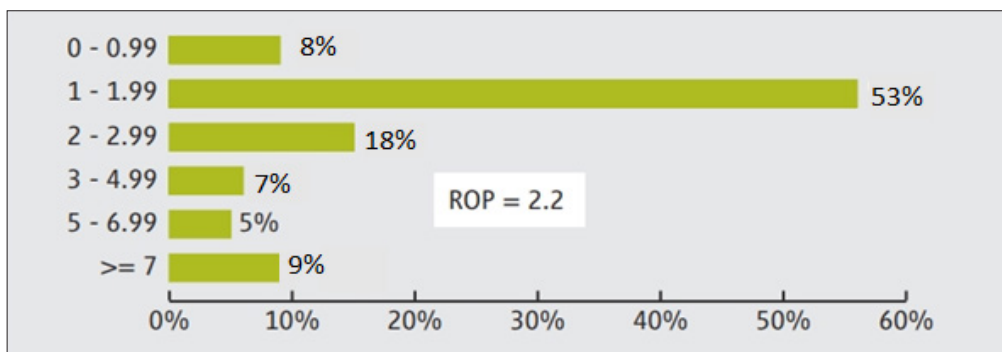


Figure 4. Return on Prevention

Figure 5 presents the evaluation of the benefits of safety and health at work, and, as can be seen, all the benefits evaluated by the companies have particular importance for financial, non-financial, and employee performance.

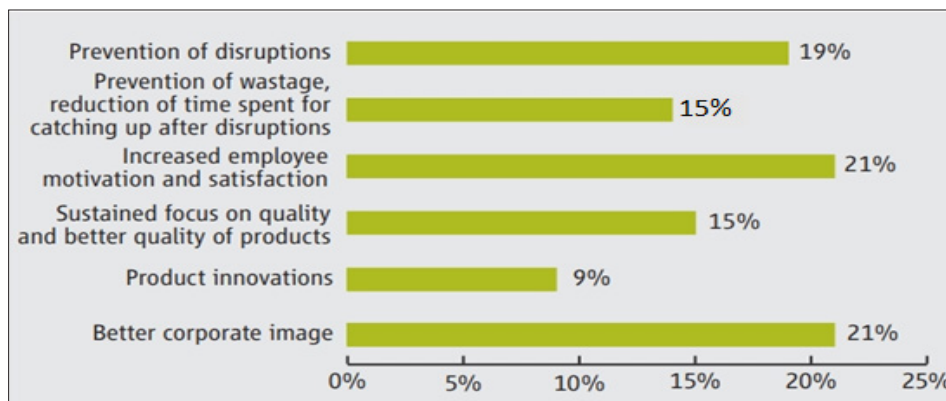


Figure 5. Relevant benefit types

Finally, Table 1 shows the balance sheet for prevention, which compares the costs of prevention with the monetary benefits of prevention. Success in prevention has been estimated at 1,445.

Table 1. Prevention balance

OHS costs (for companies) Value in EUR Per employee per year		OHS benefits (for companies) Per employee per year	
Personal protective equipment	151	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		
Total costs	1.200	Total benefits	2.645
Prevention success = 1.445			

The research in North Macedonia, the aim of which was to obtain knowledge about the OHS investments and the financial, non-financial, and employee performance of companies, as well as about the correlation among investments and the three types of performance, was conducted at the end of 2021 and included 28 company managers from different industries. The data were obtained using questionnaires about companies' OHS investments, financial performance, non-financial performance, and employee performance.

OHS investments in this research are understood as financial resources allocated by a company for ensuring healthy and safe working conditions, for OHS education and re-education of employees, as well as for redesigning OHS policies in order to ensure that they are in line with current OHS standards. According to the time of investment, they are preventive.

Financial performance is a measure that shows how well a company uses the funds from its primary operation mode and generates revenue.

Non-financial performance is a quantitative measure of a company's performance, which is not expressed in monetary units (e.g. quality of relations with business partners, consumers/clients, quality of work organization, employee fluctuation, employee risk exposure, the company's reputation).

The performance of employees in this research considers all the activities that are expected to be performed by an employee, as well as the quality they are performed with.

According to OHS investments, companies are divided into two groups: companies with lower OHS investments with a score lower than or equal to 39 on the questionnaire about OHS investments, and companies with higher OHS investments with a score higher than 39 on the same questionnaire. Their descriptive statistics regarding the financial, non-financial, and employee performance are shown in Table 2. They indicate that companies with higher OHS investments have higher means for all three types of performance.

Table 2. Descriptive statistics for financial, non-financial, and employee performance of companies with different OHS investments

OHS investments		Report		
		Financial performance	Non-financial performance	Employee performance
Lower OHS investments	Mean	43.80	42.53	56.93
	N	15	15	15
	Std. Deviation	2.757	2.875	2.314
Higher OHS investments	Mean	51.08	51.69	65.00
	N	13	13	13
	Std. Deviation	2.431	2.562	2.944
Total	Mean	47.18	46.79	60.68
	N	28	28	28
	Std. Deviation	4.497	5.370	4.839

Table 3 shows the results about the correlation between OHS investments and financial performance of companies. It can be seen that the Pearson correlation coefficient $r = .939$, and that it is significant at the 0.01 level. Hence, higher investments in OHS are correlated with better financial performance, i.e. higher OHS investments will lead to better financial performance of companies.

Table 3. Correlation between OHS investments and financial performance of companies

		Correlations	
		OHS investments	Financial performance
OHS investments	Pearson Correlation	1	.939**
	Sig. (2-tailed)		<.001
	N	28	28
Financial performance	Pearson Correlation	.939**	1
	Sig. (2-tailed)	<.001	
	N	28	28

** Correlation is significant at the 0.01 level (2-tailed).

Table 4 consists of research results about the correlation between OHS investments and non-financial companies' performance. The Pearson correlation coefficient $r = .903$ is significant at the 0.01 level. This means that higher investments in OHS are correlated with better non-financial performance, i.e. higher OHS investments will lead to better non-financial performance of companies.

Table 4. Correlation between OHS investments and non-financial performance of companies

		Correlations	
		OHS investments	Non-financial performance
OHS investments	Pearson Correlation	1	.903**
	Sig. (2-tailed)		<.001
	N	28	28
Non-financial performance	Pearson Correlation	.903**	1
	Sig. (2-tailed)	<.001	
	N	28	28

** Correlation is significant at the 0.01 level (2-tailed).

The results in Table 5 represent the correlation between OHS investments and employee performance in companies included in this research. The Pearson correlation coefficient in this case is $r = .892$, and this correlation is significant at the 0.01 level. This means that higher investments in OHS are positively correlated with employee performance, or, in other words, higher OHS investments will lead to better performance of employees.

Table 5. Correlation between OHS investments and employee performance of companies

		Correlations	
		OHS investments	Employee performance
OHS investments	Pearson Correlation	1	.892**
	Sig. (2-tailed)		<.001
	N	28	28
Employee performance	Pearson Correlation	.892**	1
	Sig. (2-tailed)	<.001	
	N	28	28

** Correlation is significant at the 0.01 level (2-tailed).

Conclusion

Based on the comparison of the results of the two surveys, it can be concluded that investments in occupational health and safety programmes provide benefits to employees by preventing occupational accidents and occupational diseases. However, even the best compensation and rehabilitation programmes cannot compensate for the loss in quality of life that occurs as a result of an occupational accident or illness. What is also important is that such programmes should be financially sustainable in the long term.

Only by investing in effective workplace prevention strategies aimed at reducing the frequency and severity of insured risk events can the potential loss in quality of life be minimized and the financial sustainability of workers' compensation and rehabilitation programmes be ensured.

Occupational health and safety is a legal obligation for employers that benefits employees, as well as an important factor in business success. Taking into account the results of the studies mentioned and the increasing global attention paid to the issues of safety and health at work, this message deserves to be more intensively promoted at the national and international level.

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