

# Risk Management in Logistics Enterprises: Findings from the 2013 Empirical Study

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Recent developments and events – e.g. trend to globalization, outsourcing activities, shorter life time cycles, but also natural disasters and others – have led to the increase of risks in business. Furthermore, regional and global financial and economic crises have brought additional and often unexpected risks into business. Therefore, risk management has been identified as one of the important management tasks supporting a company in reaching its objectives. In many countries, implementation and use of risk management is required by law. In Germany, the so-called KonTraG (Corporate Sector Supervision and Transparency Act) prescribes risk management for all incorporated companies. Although there is no mandated risk management for other legal forms of organizations, the KonTraG has also impact on those forms of organizations, especially on attestation by external auditors.

This paper focuses on the industrial sector of logistics service providers (LSPs). The logistics service industry in Germany is a fragmented market. Although there are some ‘big players’, i.e. large LSPs, that are involved in national and international logistics activities, there also exists a large number of small and medium-sized enterprises (SMEs). For those small and medium-sized LSPs, risk management is not compulsory. Nevertheless, they face at least the same risks as the big players – if not even more (e.g. due to smaller market shares and lower market power).

There is a number of questions involved with risk management in logistics enterprises: Is risk management an approach used by LSPs – and to what extent? Who initiates risk management in logistics enterprises? What is the degree of maturity of risk management in the logistics industry? What tools and methods are used by LSPs? Are companies evaluating risk management as beneficial?

Not much research has been conducted in the logistics service industry so far. Thus, to answer those questions, the authors started to conduct a first empirical study in 2008. This study was followed by a second field study in 2011, i.e. directly after the first global financial and economic crisis. In 2013, the authors carried out the third empirical study on the status of risk management in logistics enterprises in Germany. The study allows for both stating the current status of risk management and identifying developments and trends in the logistics industry related to risk management.

This paper intends to highlight the most important findings from the 2013 field study and to evaluate the status quo of risk management in logistics enterprises. It also specifies room for improvement to reach a higher degree of professionalism in risk management in the logistics industry.

**Keywords:** Risk Management, Logistics, Logistics Service Provider.

## 1. INTRODUCTION

Recent developments and events – e.g. trend to globalization, outsourcing activities, shorter life time cycles, but also natural disasters and others – have led to the increase of risks in business. For example, the earthquake close to the Japanese East Coast in 2011, the following tsunami, and the melt-down of the nuclear power plant in Fukushima not only led to more than 25,000 killed people, but also resulted in economic losses of more than 200

billion US\$ [1]. Furthermore, regional and global financial and economic crises have brought additional and often unexpected risks into business. Additionally, all risks are expected to increase over the next few years [2].

Therefore, risk management has been identified as one of the important management tasks supporting a company in reaching its objectives. Risk management can be seen as a management system that should enable a corporation to identify, assess, and prioritize risk, to develop and

implement counteractions to reduce risks, and to continuously monitor risks [3]. It should be interpreted and set-up as a process cycle that consists of risk identification, risk assessment, risk control, and risk monitoring. The framework for this risk management cycle is the risk management strategy [4].

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The logistics service industry in Germany is a fragmented market [5]: Although there are some 'big players', i.e. large LSPs, that are involved in national and international logistics activities, there also exists a large number of small and medium-sized enterprises (SMEs). For those small and medium-sized LSPs, risk management is not compulsory. Not much research on risk management has been conducted in the logistics service industry so far. Thus, to gain insights into the status of risk management in the logistics sector, the authors started to conduct a first empirical study in 2008 [4]. This study was followed by a second field study in 2011, i.e. directly after the first global financial and economic crisis [6]. In 2013, the authors carried out the third empirical study on the status of risk management in logistics enterprises in Germany. This paper intends to highlight the most important findings from the 2013 field study and aims to evaluate the status quo of risk management in logistics enterprises. It also specifies room for improvement to reach a higher degree of professionalism in risk management in the logistics industry.

The structure of the paper is as follows: In section 2, the design of the 2013 study will be outlined, so the reader gets an impression about the basic data of the survey and the questionnaire. When implementing risk management, it makes sense to have a first impression of the most important risks for a company or in an industry. Therefore, section 3 focuses on both current and future risk for logistics enterprises. Section 4 presents the main findings of the 2013 empirical study. It also reviews the results, so it is possible to evaluate the maturity of risk management in the

logistics industry. Finally, section 5 summarizes the results and gives an outlook, how risk management in the logistics market will or should develop in the future.

## 2. DESIGN OF THE 2013 EMPIRICAL STUDY

For the 2013 empirical study, the questionnaire used in the previous studies had been adopted, slightly adjusted and extended. The questionnaire was prepared both as a word form and as an online survey using EFS Survey ([www.unipark.info/](http://www.unipark.info/)).

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Due to the open access to the online survey, it is not possible to state the basic population. However, the online survey showed a good response: 211 individuals started to answer the questionnaire. The number of participants who finished the questionnaire, either fully or to a large extend, is 85, whereof 44 answered all questions. In comparison with previous studies, the number of participants has declined. Therefore, the significance of the results has decreased – this is especially true for the statistical validity. Nevertheless, the study allows for deducing of statements that characterize the development of risk management in the logistics industry.

The questionnaire consists of four different parts. Part 1 contains 10 questions regarding statistical aspects, the structure, and the main business focus of the participating companies. The second part addresses current and future risks in the logistics industry. It also focuses on the question if risk management is already in use – or if the implementation is planned for the future (7 questions). All participants should be able to answer the questions of the first two parts, irrespective of existing experience with risk management. The following two parts focus on enterprises that already have risk management in use and are able to report on their practical experience. Thus, part 3 contains 8 questions

regarding both the structure and the process of risk management. The final part 4 consists of 5 questions addressing what typical methods are used in risk identification, assessment, control, and monitoring, and what kinds of software tools can support an effective risk management.

### 3. CURRENT AND FUTURE RISKS IN THE LOGISTICS INDUSTRY

The analysis of both current and future risks can be used as an indicator, what risks are important from the point of view of the participants. It can also be used to evaluate, if the participants see any changes in the importance of risks for their companies.

However, the limitations of the analysis must also be taken into account. The perceived importance of distinct risks seems to be influenced by global events (e.g. Fukushima) or the current economic and/or business situation of the enterprise (e.g. the ongoing economic crisis within the European Union). It might also be biased by the role of the person within a company who answers the questionnaire. Therefore, a comparison of the identified top risks with the risks mentioned in previous surveys might lead to erroneous conclusions. Thus, we will focus on the risks listed in the current study.



Fig. 1. Current and future risks

Figure 1 shows the most important risks in the opinion of the logistics service providers. LSPs were asked for up to five main risks for their business, both today and in the future (i.e. in 5 to 10 years). Figure 1 makes it clear that companies do not see major shifts in the top three risks over time.

LSPs see the competitive conditions as the most risky factor for their business. The competition in

logistics industry in comparison to other economic sectors is particularly strong [7]. This is especially true for relatively simple processes, e.g. full truck load transportation with no specific additional requirements. Those processes are easy to adopt, so that companies are – to some extent – replaceable. At the same time, profit margins in the transportation and/or warehousing sector are low. For example, the average profit-turnover ratio in German transport companies had decreased from 1.7 % in 2007 to 0.2 % in 2009; in comparison, companies focusing not only on transportation but on all types of logistics still realized an average profit-turnover ratio of 3.3 % in 2009 [8].

This type of risk is by far the most important category. It is followed by human resource related risks. In most cases, those risks refer to the shortage of truck drivers. There is a growing gap between the need for drivers due to increasing demand for transportation, and the stagnant or even decreasing number of truck drivers [9]. Besides that, when companies are facing high-complexity challenges, for example in contract logistics projects, they fear a lack of highly educated staff capable of managing those projects.

Operational risks are risks that might realize in typical logistics operations processes [10]. Those risks had been mentioned as the third important type of risks. Companies also see risks related to (increasing) energy prices as a future risk; see similar results in [11]. This risk is especially important for companies that have a high fraction of transportation processes and, therefore, spend a large portion of their costs for fuel [12].

### 4. MATURITY OF RISK MANAGEMENT IN LOGISTICS ENTERPRISES

Numerous reasons exist, why companies should implement and use risk management. On the one hand, companies should have an intrinsic motivation to be able to identify, prioritize and handle risks, so that they can reduce or even eliminate the negative consequences of risks that are realized. On the other hand, there are influencing factors that lead to extrinsic motivation. These can be laws and regulations, e.g. the Sarbanes Oxley Act, the Basel Conventions, and – for Germany – the aforementioned KonTraG. These can also be stakeholders of the company, especially banks, auditors, insurance companies, consultants, and – last but not least – customers [4]. If you take into account those internal and external factors, a company should

already have set-up and using a risk management system (where system does not necessarily mean an IT system, but risk management as a systematic and regular approach to deal with risk).

implementing such a program, and another 8 % are planning to create one.

Although there had been numerous risks with influence on logistics enterprises on world-wide,

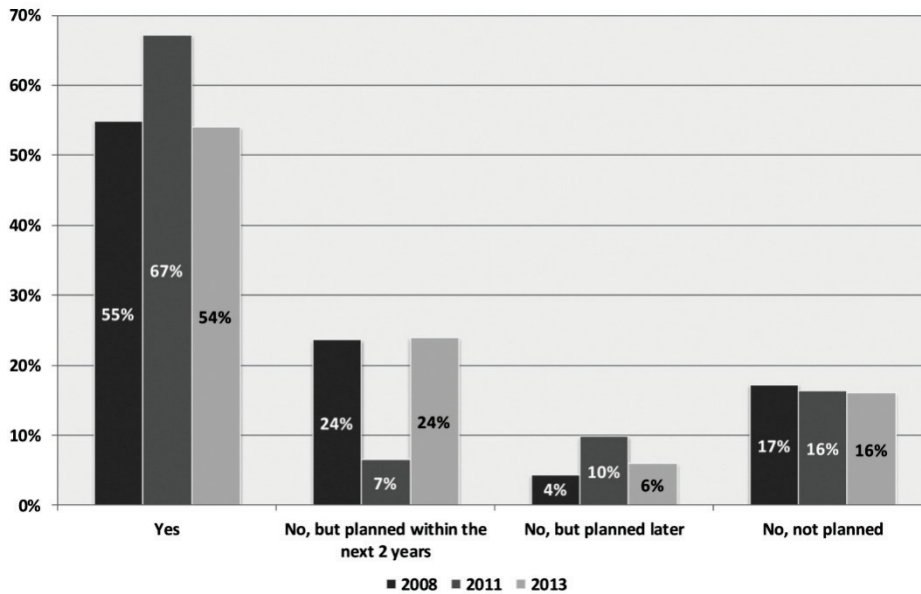


Fig. 2. Current status of risk management in logistics enterprises

Figure 2 shows that, despite the necessity of having risk management in place, only little more than half of the companies that took part in the survey are using a risk management system. Another 24 % of the participating logistics enterprises are planning to set up risk management within 2 years. A slightly higher degree of implementation is shown in [13]: In 2012 some 62 % of the enterprises already have a risk management program in place, 21 % are currently

European and local level, surprisingly there is a fraction of more than 20 % of the participants that does not have the implementation of risk management on their agenda.

As pointed out by the figure, there is almost no positive development regarding the use of risk management over the past five years. Some deviations in the numbers might stem from the different constitution of the group of participants.

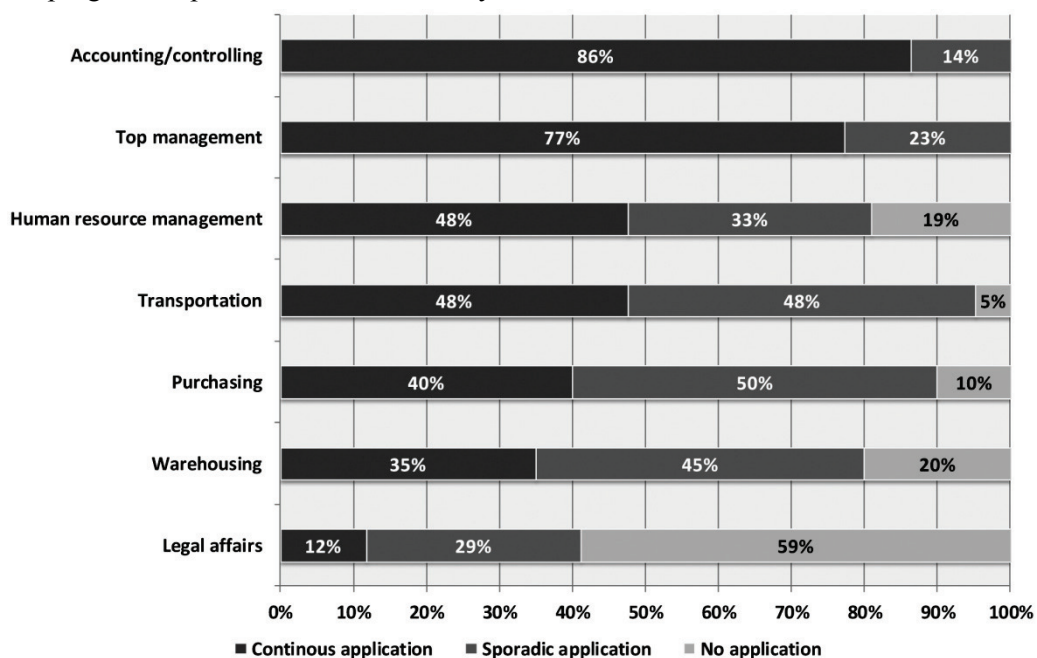


Fig. 3. Intensity of risk management practice in different departments

There are some functional areas in an enterprise where the application of risk management is almost self-evident. This is true for functions that directly deal with financial aspects, e.g. accounting, controllership, budgeting, and also for the general or top management of a company. Also, the purchasing function has an obvious relation to risk management, due to risks both in quality, timeliness, and price of the products and services purchased, as well as the risk of corruption [14].

With one exception, those relations can be found in the results of the survey. Figure 3 shows that companies with a risk management system in place, have a 100 % usage of risk management (continuously or sporadic) to accounting/controllerships and to the top management.

Surprisingly, other business functions are subject of risk management to a smaller extent. Only 2 out of 5 companies with a risk management system in use regularly apply it onto the

category. As mentioned in section 3, the possible lack of truck drivers plays a major role, but the same is true for qualified trainees and graduates. However, only every second company uses risk management in the HR function on a regular basis. Here again we can see a gap between the importance of a certain type of risks and the (regular and periodical) application of risk management.

Similarly, participants also mentioned operational risks as a third major group of risks. But, as the diagram above indicates, less than 50 % of the companies regularly apply risk management to the transportation function. Even more drastically, only one third of the companies uses risk management approaches on a continuous basis for their warehousing function.

The maturity of risk management in the logistics industry can also be assessed by looking at both the software applications and the methods used in risk management. We will start by focusing on the IT support for risk management.

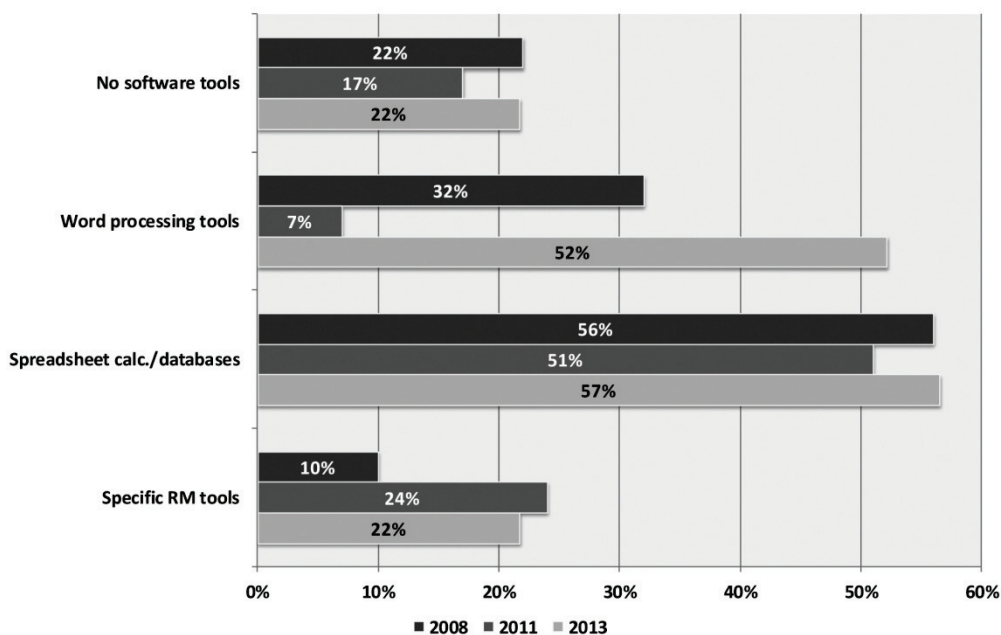


Fig. 4. Use of software applications to support risk management (multiple answers possible)

aforementioned purchasing function. This is not consistent with the top five risks listed in Figure 1, especially the risk of increasing or fluctuating energy prices. There are, for example, some risk management approaches dealing with fluctuating prices of required materials, such as sharing price risk with supply chain partners, forward buying, or hedging [15].

Risks related to human resources had been identified as the second most important risk

Figure 4 indicates that most of the companies applying risk management use spreadsheet calculations and/or self-developed databases to support risk management. Although one could argue, that those tools are far from a standard application, it must be stated that for most of the companies, this approach is sufficient: As mentioned before, many players in logistics industry are small and medium enterprises. For those companies, specific risk management tools

are often oversized both regarding the functional and/or technical aspects as well as regarding the price. Thus, self-developed tools are an effective and efficient approach to support a structured and continuous risk management [16].

Although more than 20 % of the companies reported they were using specific risk management software, this number seems to be too optimistic. When asked for the type of specific risk management tool, participants mentioned, for example, their internal accounting software. Thus, it must be doubted that all specific software mentioned is in fact designed for risk management.

There is still room for improvement, as the data show: More than 20 % of the participants do not use any software application to support risk management. However, applying risk management without any documentation of the results from the different phases of risk management using some software might by itself already be a serious risk.

Brainstorming and interviews might lead to the identification of new or unknown risks, but they do not support a structured risk management process. Checklists can be structured; at least, they can contain different categories of risks. However, they might not enable a company to identify new and so far unknown risks.

There is a large gap between the percentage of use of the top three methods and other, more sophisticated approaches. For example, the failure mode and effect analysis (FMEA) is a well-known and established method that is widely used in many industries [17]. It can support a holistic risk management, because it can be applied to all phases of the risk management circle. Although the method is widely used and accepted, less than one third of the participating LSPs use the FMEA to support risk management.

The same is true for the so-called risk map, which is a portfolio-based approach for

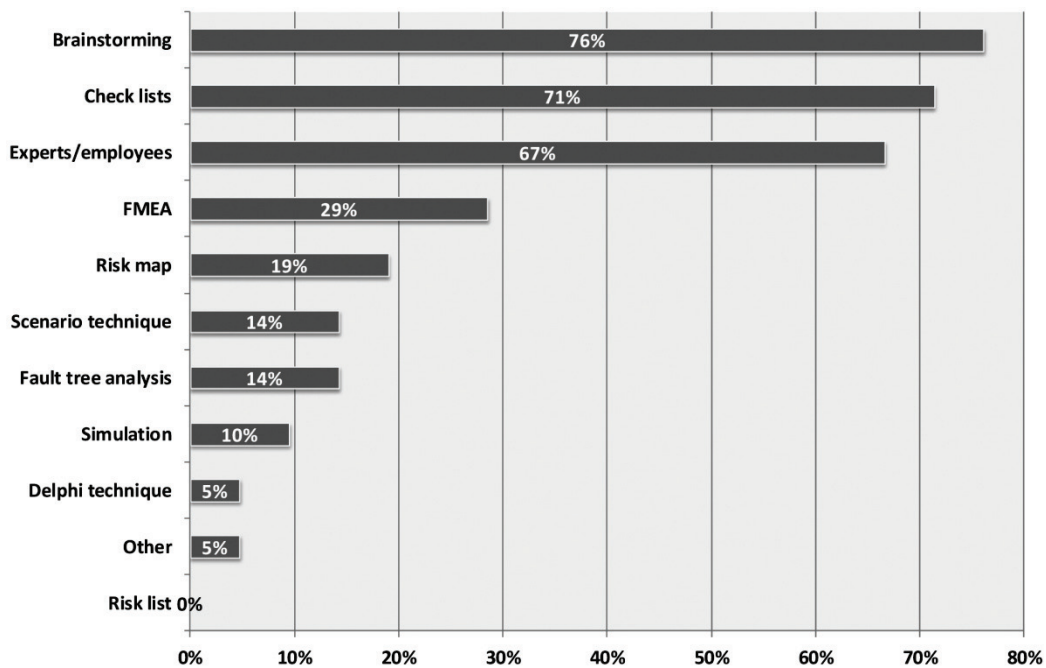


Fig. 5. Use of specific methods used in risk management (multiple answers possible)

Last but not least, an analysis of the methods used in risk management delivers insights into the maturity of risk management in the logistics industry. Figure 5 illustrates the use of specific methods. It can be seen that most LSPs use easy to apply methods, such as brainstorming, check lists, and interviews with employees and/or experts. Those approaches are easy to implement: No specific knowledge is required, and the costs for implementation and use are low. On the other hand, those methods contain some drawbacks:

visualization of risks [18]. Again, this method is relatively easy to apply, and it can effectively support decision making in risk management. However, less than 20 % of the LSPs use risk maps.

## 5. SUMMARY AND OUTLOOK

If one compares the requirements for LSPs regarding risk management and the scope to which LSPs currently use risk management, a gap – and a

relatively low degree of professionalism – must be stated.

Globalization, demographic developments, external crises, catastrophic events (both man-made, as terrorism, and natural disasters), increasing complexity of logistics processes, and other factors such as higher requirements by customers already lead to a rising number of risks. Combined with an often highly competitive logistics market the risks and related consequences can be too high for some companies. To proactively deal with those risks – i.e. identify, analyze, prioritize, manage, and monitor risks – the implementation and use of a risk management system is highly recommended (if not required by laws and/or regulations).

The logistics industry however, shows a relatively low degree of using risk management. A little more than half of the companies have a risk management system in use. Two business functions (general management and accounting/controllership) are fully covered by continuous or at least sporadic risk management. Other functions are covered only to a certain degree. This is not consistent with the top risks stated by the participating managers.

At the same time, companies with a risk management in place show a relatively low degree of maturity of their risk management. This can be stated based on the application of both software tools and specific risk management methods.

It can be assumed that in the future LSPs must spend more attention to risk management. Requirements – by laws and regulations as well as by auditors, banks, and especially customers – will increase (in correlation to increasing complexity of logistics businesses). At the same time, LSPs should not see risk management as an unnecessary administrative task, but a chance to proactively deal with risks. Thereby, risk management will help to secure a competitive position in the logistics market.

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