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Risk Management in the Real Estate Development Industry

Wiegelmann, Thomas

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Risk Management in the Real Estate Development Industry

*Investigations into the application of risk management concepts
in leading European real estate development organisations*

Presented by

Thomas Wolfgang Wiegmann

Submitted in total fulfillment of the requirements of the degree of

Doctor of Philosophy

Submitted in June 2012

Institute of Sustainable Development & Architecture

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Abstract

Real estate development is a speculative and entrepreneurial activity. Factors such as unknown future demand, risks and uncertainty are key elements of real estate development (BYRNE, 1996; ISAAC/ O'LEARY/ DALEY, 2010; SCHULTE/ BONE-WINKEL/ ROTTKE, 2002). Although not always evident during periods of strong economic growth, risk management is undoubtedly of paramount importance during economic downturns. The global financial crisis and the deterioration in real estate markets across large parts of Europe since 2008/ 2009 - inter alia - demonstrate the significance of the real estate industry for the world economy.

Despite the structural significance of real estate to the economy and notwithstanding the thorough analysis of risk management in academic research, only limited substantive research is available on risk management pertaining directly to real estate development. Even less empirical data exists that can provide an overview of standard industry practice with respect to risk management by major development organisations (GEHNER, 2008; HARTIGAY/ YU, 1993; RICS, 2004; SHUN, 2000).

An in-depth literature study has been undertaken to evaluate the existing knowledge pool and provide a conceptual framework by reviewing risk management and real estate theory in order to offer real estate developers suitable approaches toward the risk management process.

As a major contribution the dissertation provides empirical data on a pan-European perspective with a comparably large size of 69 leading real estate development organisations (response rate of 43.7 per cent) thereby covering various sizes and legal structures. Statistical analysis using exact Fisher's Test and Cramer's V has shown some correlations between different structural characteristics of responding organisation (developer type, geographic scope, ownership structure, project volume) and the consequential understanding and implementation of risk management. Further, the major findings of the empirical study indicate that:

- the developers' approach towards the management of risks tends to be characterized by a lack of formalisation and co-ordination and largely rely on individual judgment and experience;
- risk management is not regarded as a continuous and dynamic process and is often fragmented with only few development organisations having formal processes to align risk management with corporate strategy;
- most real estate developers do not conduct their risk management aligned to the organisation's specific risk appetite;
- many organisations have some measures of risk management activities but few can claim to have an enterprise wide risk management strategy; and
- demand for training and education is vital for a rigorous risk management practise.

Consequently, the results and observations of this research have identified a lack of understanding in respect of risk management by real estate developers and have also distinguished weaknesses in addressing risk management issues. Hence, various potential benefits could be obtained by development organizations through careful review of their existing risk management practices, which subsequently may also have a positive impact upon the wider economy.

Declaration

This thesis is submitted to Bond University in fulfilment of the requirements of the degree of Doctor of Philosophy. This thesis represents my own original work towards this research degree and contains no material which has been previously submitted for a degree or diploma at this University or any other institution, except where due acknowledgement is made.

Acknowledgements

This dissertation on risk management in the real estate development industry stems primarily from my experience in the real estate business; firstly as participant in the international management trainee program with Philipp Holzmann AG from 1998 where it was possible to observe first-hand the operations of this German flagship construction and real estate developer and to follow its subsequent demise, secondly as a Senior Consultant in real estate corporate finance advisory at Ernst & Young in Zurich. It was during this period that the importance of risk management to individual situations, organisations and the wider industry was recognised by me. Today and in the light of the Global Financial Crisis, I am convinced that risk management capabilities are even more crucial to steer real estate development organisations thru tight capital and investment markets.

I like to thank Bond University and the Institute of Sustainable Development & Architecture for providing me with the opportunity to carry out and finalize my dissertation based on a full Dean's Scholarship. I would like to thank my supervisors Professor Dr. George Earl and Professor Dr. Michael Regan as well as Professor Dr. Craig Langston, Associate Director Research, for their interest in the research subject and their academic guidance and extraordinarily valuable insights and suggestions.

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1 Introduction

1.1 Motivation

Risky nature of real estate development

Real estate development is considered to be one of the riskiest corporate activities there is (BARKHAM, 1997; BYRNE, 1996; ISENHÖFER, 1999). As the creation of real estate products is in many cases speculative and therefore in anticipation of an unknown future demand, risk and uncertainty are key elements of real estate development (BYRNE, 1996; FISHER / ROBSON, 2006); RATCLIFFE / STUBBS / KEEPING, 2009; WIEGELMANN, 2012). The development business is to be regarded as highly cyclical and volatile (ISAAC / O'LEARY / DALEY, 2010; TIESDELL / ADAMS, 2011). GEHNER (2008, p.7) asserts that *“real estate development is knowingly taking risk”*. Real estate development is subject to a number of risk factors (MAC-CRATE / PETERSON, 1999; MORLEY, 2002; CADMAN / TOPPING, 1995; FISHER / ROBINSON, 2006). Successful development, inter alia, depends on bringing the adequate real estate product to the market at the right time at the right price. The development profit depends on achieving all that while balancing costs against value.

Development is fixed both in time and space and involves relatively large amounts of capital (ZANI, 1993). Furthermore, real estate development is a very complex and cross-disciplinary task as it typically demands a dedicated team including people with different skill sets and expertise and the co-ordination of a wide range of interrelated activities. Local authorities, legal requirements, residents and neighbours are to be satisfied, design teams and contractors to be managed, time scales, costs and contingencies to be monitored and lenders and other stakeholders - especially prospective tenants and investors - to be satisfied. In addition, real estate developers are often faced with considerable changes in their environment and new challenges driven by the macro-economic, social, urban-planning, political-legal, regulatory, environmental and technological framework conditions (BRADE, 1998; SHIMPI, 1999).

However, in spite of the high risk factors, the real estate development industry lags behind other industries in its sophistication and application of risk identification, evaluation, mitigation and control (GIMPELEVICH, 2011; SCHULTE / BONE-WINKEL / ROTTKE, 2002). As to WILKINSON / REED (2008, p. 120), *“developers are often criticised for not sufficiently understanding and analysing risk.”*

The banking and insurance sectors have long developed and employed sophisticated systems of risk management techniques and methods and the amount of academic research in these areas is too numerous to list. Their efficacy is of course debatable following the global financial crisis, although this is likely to have been due to a lack of diligent application of said techniques. Compliance with statutory requirements on risk factors is also well established in the fields of quality, environment and safety. Risks that remain undetected or are detected too late can trigger crises at project level or even at corporate level. Often irreversible damage has occurred or losses have been incurred by then. As a rule, minimal scope for action is left at this late stage and it is frequently no longer possible to achieve the necessary turnaround.

The real estate development business requires a great awareness of risk and its management. This not only stems from the risky nature of the development process and involved complexity but also from the regulatory, capital market and stakeholders pressures which call for great awareness of risk and risk management. These areas will be examined in turn.

Regulatory pressure

Regulatory and corporate governance provisions are increasingly requiring greater awareness of risk and risk management; it is no longer optional but a mandatory requirement in many countries in order to protect the organisation's stakeholders from the implications of the organisation defaulting on its obligations. The main thrust of regulation has been aimed at the board of directors, calling for more control and discipline towards effective and efficient operation, reliability of financial reporting as well as compliance with laws and regulation.

The regulatory reform of the banking sector through the revised guidelines of the Basel Capital Accord (especially Basel II and III) has an important impact on awareness of risk and risk management in real estate development. Capital adequacy ratios have to take into account credit risk, which lenders are now able to estimate based on an 'Advanced Internal Rating Based Approach'. This means that demonstrably high levels of risk management of the borrower increase the risk weighted asset value of its loan and lower the capital cost of lender (WIEDENMANN, 2005). Therefore Basel should result in greater awareness of risk and risk management in real estate development and it should give a competitive advantage to risk management proficient property develop-

ers who will be able to borrow at more advantageous rates. As a result of a series of EU directives, many European States have issued guidelines, which require or encourage publicly listed organisations to undertake risk management and to make appropriate disclosure to shareholders. Under these directives, risk management activities are taken into account in relation to statutory audit and financial reporting requirements. The audit committee of listed organisations is required to monitor the effectiveness of the organisation's risk management systems and publicly listed organisations are required to publish an annual corporate governance statement including a description of the main features of any existing risk management systems and internal control systems in relation to the financial reporting process.

No statutory requirements for risk management exist for private organisations and several European risk management bodies have promoted the idea of guidelines, frameworks or general principles of best practice, which have created a greater awareness of risk and risk management in real estate development. Indeed results from the 2006 European risk management benchmarking survey conducted by the Federation of European Risk Management Associations indicate that risk management has grown in scope and confidence on the establishment of standards (FERMA, ERNST & YOUNG AND AXA CS, 2006).

Capital markets pressure

In addition to regulatory pressure, the capital market now also requires adequate corporate risk management. In this context, BUTTERWORTH (2001) noted that organisations, which are able to provide evidence of efficient risk management, may benefit from a more favourable cost of capital. In contrast, developers who cannot demonstrate systematic management of risks and opportunities, which is a key component of any corporate control mechanism focused on the creation of value, are not rewarded with a high level of confidence and are penalised by the capital markets. It can be assumed that the capital markets are increasingly determining risk management requirements, with shareholders and stakeholders appearing also as key recipients of risk reporting (SCHULTE / ROTTKE / PITSCHKE, 2005). Effective risk management assists in the targeted control, transparency and communication of the corporate risk situation and should therefore contribute to an improved rating. Thus, against the background of intensified competition for capital, an established and sound risk management process will pro-

vide the organisation with a future cost advantage in terms of borrowing costs and therefore a significant competitive edge.

Institutional and private investors, as well as other capital sources are increasingly take the specific risk of an investment and its strategic management into account when allocating capital. In general, the higher the ensuing risk is considered to be, the higher the associated earnings expectations are (AAKER / JACOBSON, 1987). Shareholders expect an effective allocation and efficient use of capital as well as a risk management strategy aligned to value creation. One of the most common mistakes made by developers in dealing with institutional capital providers is that they rarely identify and discuss the risks and their potential conflicts regarding a project sufficiently (THOMAS, 2001).

The impact of the financial crisis and the deterioration in real estate markets across large parts of Europe since 2007/ 2008 clearly demonstrate the significance of the real estate industry for the world economy. The financial crisis led by failures in the sub-prime mortgage market that manifested itself in the USA in early 2007 and resulted insignificantly reduced real estate valuations across the majority of property sectors in the USA can be identified as the epicentre of the so called 'global financial crisis'. In the context of the fallout from Greece, significant problems in the Eurozone as well as concerns about sovereign debt actually dominate the European capital markets in 2012.

One of the impacts of the crisis has been to see the lending paradigm shift back from investment banks to commercial banks and entails a back-to-basics approach for European real estate commercial lending going forward. This means that there is a greater awareness of risk and risk management in real estate development. Lenders have become extremely cautious about providing debt leading. In this tight capital markets, real estate development organisations will have to demonstrate strong risk management practise not to be shut out of the access to equity or debt sources. On a long term, the global financial crisis may likely act as a catalyst to a change the mentality of real estate development organisations making a risk management culture more entrenched in the industry.

Stakeholders' pressure

Similarly, other stakeholders of real estate development organisations expect an effective allocation and use of capital. It is a safe assumption that organisations, which are able to demonstrate that they are aware of their risks and manage opportunities and threats in an entrepreneurial and effective manner, are able to inspire confidence among their stakeholders including any other business partners who are more likely to consider an organisation managed in a risk-aware manner as being credit-worthy. In communicating risk-specific aspects to key stakeholders, a significant objective for management is to assure them that adequate risk management strategies have been implemented.

Success in winning real estate development mandates or to enter joint venture investments will depend, amongst other things, on demonstrating that sound assumptions regarding risk factors have been taken into account. Without sound risk management, real estate development organisations are likely to be increasingly penalised as awareness of risk and risk management comes to the fore.

There is a widely held belief that a structured risk management approach is a critical success factor for real estate development (MILES / BERENS / EPPLI / WEISS, 2007; MILLINGTON, 2000) and will in most cases be a determinant factor between success and failure. Though not always evident during periods of strong economic growth, it is undoubtedly of paramount importance during economic downturns. MILLINGTON (2000, p. 220) argues that development organisations *"(...) should implement risk reduction and risk control measures."*

The motivation for this dissertation stems from the realization that the nature of the real estate development process is complex and high risk and yet little research work has been done on risk management in this sector. Furthermore, there is rising pressure for improved risk management from regulators, the capital markets, and other stakeholders.

1.2 Research problem

As discussed in chapter 1.1 awareness of risk and risk management in real estate development is of vital importance yet research on the topic is very limited. The importance of knowledge in of risk management principles in real estate has been pointed out by GRAASKAMP in 1977. While extensive literature exists on risk, and general risk management and a limited amount of empirical data on risk for real estate development projects, research specifically addressing risk management approaches in real estate development is relatively scarce.

Previous research focusing on risk management on the real estate development field have been undertaken by BYRNE (1996), GEHNER (2008 / 2003), GEHNER / DE JONGE (2005), MILES / WURTZEBACH (1971), PEISER (1984), PELATT (1972), VAN DENZEN (2009), VERNOR (1989) and WIEDENMANN (2005).

An extensive survey conducted by NEWELL / MCALLISTER / WORZALA (2004) and NEWELL / ACHEAMPONG / WORZALA (2002) concluded that property and portfolio risk was considered as a most under-researched area. The gap between the theory and practice of risk analysis according to GIMPELEVICH (2011), HARGITAY / YU (1993) and SHUN (2000) is particularly wide in real estate development. Furthermore, there is limited research about how professional real estate developers cope with their risky business (GEHNER, 2008).

The empirical research conducted by GEHNER (2008) "Knowingly taking risk: investment decision-making in real estate development" deserves mention in this context. Gehner's work offers insight into the investment decision-making process of three established Dutch real estate development organisations. The results created the basis for a framework, which demonstrates that deriving good investment decisions is not restricted to analysing risks to support the justification of decisions, but it is also necessary to address decision problems in time, and to ensure that someone is accountable for the decision. The results indicate that there is a lack of knowledge about how developers deal with the inherent risks of their business and at the same time, such knowledge is required to support the further professionalization of the industry. Gehner's work concentrates on three Dutch case studies whereas the author's emphasis here is on a larger pan European sample in order to be able to generalise and expand the insight.

1.3 Research objectives

The objective of this dissertation is *to enrich the understanding of the implementation of risk management in the real estate development industry* by conducting empirical research on a broader basis. The dissertation aims to offer an in-depth presentation of risk management practice in leading European real estate development organizations in order to provide a comprehensive quantified “map” so far of risk management practice in leading European real estate development organisations covering all aspects of the risk management process. It questions, how, if at all, different categories of developers vary in the way risk management is conducted. It is hoped that the results of the empirical research will also offer the opportunity for enterprises of drawing conclusions about appropriate approaches towards the risk management process as well as for benchmarking their risk management process against those of other leading European developers, given that existing systematic empirical information is very limited.

Unlike the only limited empirical research available so far, this research aims to provide a pan-European perspective with a comparably large sample size of real estate development organizations. As of today, such an analysis has not been performed and the success of any such study is dependent on the ability to access critical sources. This empiricism not only provides evidence to corroborate or disprove preconceived ideas on actual risk management practice but is also expected to give new insight into the workings of the real estate development industry and will serve, at a minimum, as a guide to responsible executives and staff about the practices of other organizations. On the basis of empirical data and their evaluation, executives may endeavour to derive conclusions on the risk management approach to be taken by their own organizations and consequently to promote further professionalism of the real estate development industry regarding risk management.

1.4 Research framework

A distinctive feature of this dissertation is to compare applied risk management standards against the results of an in-depth empirical study of the industry in question and to strengthen the findings by further quantitative analysis. The goal is to provide a holistic account of risk management in real estate development, which also highlights linkages between different aspects of the risk management process and the structural characteristics of real estate developers.

For this a specific research framework was used (Figure 1-2). The framework defines the sets of different research areas, which would be evaluated to provide insight into the complex system of risk management in the real estate development industry and forms the basis of the research questions outlined in chapter 1.5 below. The dissertation takes the form of a conceptual analysis of risk and risk management and formulates eight propositions on general conclusions derived from business theory, which will then be tested by much-needed empirical research. The empirical research is based on as large as possible and practical, a bank of European developers in the area of risk management in order to provide substantial data to assess and evaluate its practical implementation. The combination of these three areas will provide valuable information to identify the risk management approaches that are currently being used in the industry and to verify the propositions, which have been derived from the theoretical study of risk management in the real estate development industry.

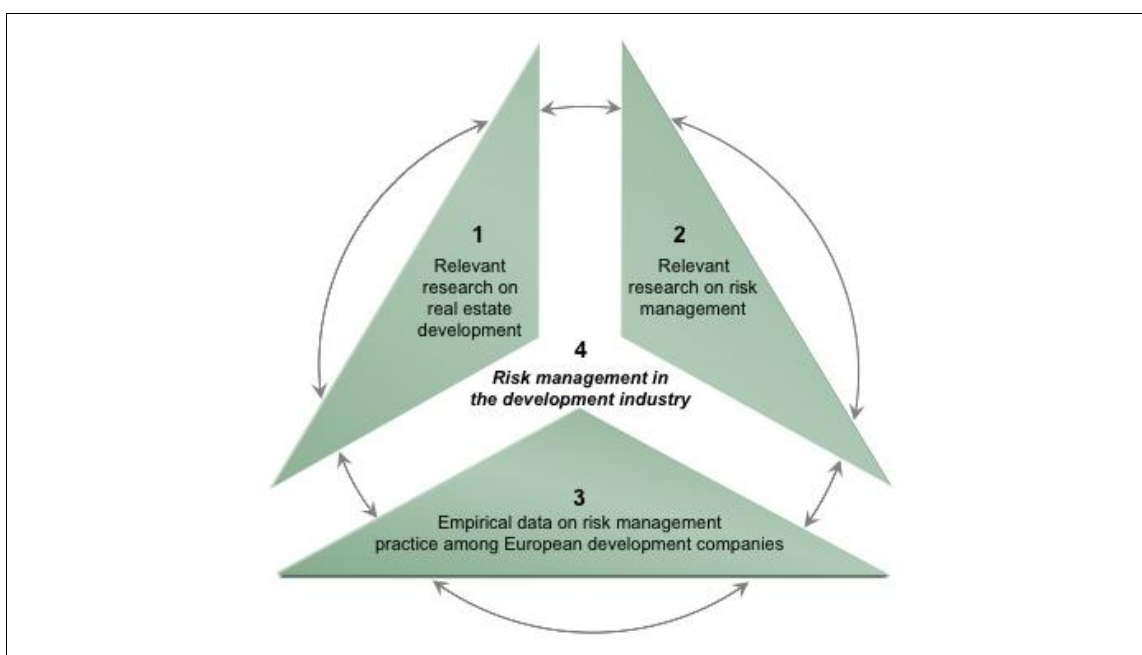


Figure 1-1: Research framework

1.5 Research questions and research approach

A review and comprehensive summary of relevant literature in risk, risk management and real estate development is to be undertaken as part of the process of putting the research into context. The specific research questions explored in this dissertation have been derived from both literature review and the author's experience in the field and are listed below:

1. What are the characteristics, key business processes and associated key risks of real estate development?
2. What are key principles and process-related aspects of risk management according to relevant areas of literature?
3. What are the practices among leading European real estate development organisations concerning risk management?
4. What are the reflections on the findings in light of the global financial crisis since 2008/9?
5. What are the implications of the findings of this dissertation for academic research as well as the real estate development industry?

In figure 1-2, triangles 1, 2 and 3 correspond to the research questions 1, 2 and 3, which are discussed in chapter 1.5. Point 4 in figure 1-2 relates to research question 5 in chapter 1.5. Research question 4 reflects on the changes in the European real estate environment as a result of the events of 2008/9 and the implications that these changes may have on the empirical findings.

While the purpose of all studies is concerned with contributing to knowledge, ROBSON (1993) categorises three possible forms of a study: exploratory, descriptive and explanatory. Exploratory studies seek new insights and ideas and are useful when not enough is known about the area of research and to decide whether it is worth researching into the issue. Descriptive research aims to describe an accurate profile of the phenomenon that is being studied as it occurs and is marked by the prior formulation of specific hypotheses (GRAY, 2004). Consequently it requires extensive previous knowledge of the research area so that sufficient knowledge on appropriate aspects of the research topic can be pre-planned and structured (ROBSON, 1993). The emphasis of an explanatory study is to determine the cause and effect relationships between vari-

ables in order to explain a problem or situation. Control or manipulation of one or more independent variables is often used for this purpose.

At the outset of the research, very limited literature was available and it was felt necessary to obtain descriptive information on risk management within the industry in order to set up a theoretical foundation for relevant risk management aspects in real estate development. Research questions one and two adopt a descriptive approach. The study attempts to apply a generic risk management process to the real estate development process by means of an event sequence model in order to provide an accurate profile of risk management in real estate development (GRAY, 2004). The research questions in this area focus on the form of “what?” and “which?” questions (ROBSON, 1993; WELLINGTON / SZCZERBINSKI, 2007). The questions within the written survey are expected to provide answers as to how risk management is understood and implemented by leading European development organisations.

Research question three leads on to the empirical research to determine risk management practice within the industry and through exploratory quantitative analysis to determine whether there are fundamental connections between independent variables of developers and risk perception indicators. The explanatory nature of this dissertation becomes evident in research questions four and five where the changing real estate environment as well as explanations as to why developers behave in certain ways or use certain methods (WELLINGTON / SZCZERBINSKI, 2007) are considered. These explanations provide invaluable insight into risk management attitudes and behaviour, which has had considerable impact on the industry in the run up to and during the global financial crisis.

1.6 Structure of dissertation

Chapter two explains real estate development and risk. Its main purpose is to identify all potential risks, which are typically found in a real estate development project. This chapter begins with a study of the definition of real estate development and risk through a comprehensive literature review. The application of an event sequence model is used to provide a framework for the study of the identification of potentially associated risks within the different stages of the development process and addresses research question one.

Chapter three addresses research question two by examining risk management in real estate development; the analysis of existing definitions and underlying concepts of risk management, from both a general management perspective and from industry specific academic literature, allows for the formulation of a unique definition which is applied in this dissertation. A study of various risk management processes that is widely accepted in the real estate development industry is made to provide a foundation for core areas, which are to be tested in their practical application. At the end of this chapter, some propositions on risk management in the real estate development industry are formulated which are to be tested by the empirical research. Chapter four provides an introduction to the empirical research. The research design is described and explained. Further statistical analysis was conducted and this is also explained and discussed in this chapter. In chapter five the results of the empirical study answer research question 3. The chapter highlights the risk management practice among European real estate development organisations and is presented and analysed in chapter five. Chapter five addresses two main issues: the internal corporate environment and the risk management process. To complement these results, an evaluation of the eight propositions as stated at the end of chapter three are presented here. These evaluations provide insights into how real estate developers conduct risk management. Chapter six, reflects on recent economic events in the context of the financial crisis, their impact on the real estate development industry and the empirical findings of this thesis and answers research question 4. During the course of writing the dissertation, the entire market context for both occupation and investment aspects of the European real estate market changed dramatically. It became evident that these developments changed the risk profile of developers and it was necessary therefore to reflect on the relevance and the veracity of the empirical findings in the aftermath of the economic crisis. Chapter seven concludes the dissertation with a discussion of the advances made in the understanding of risk management in the real estate development industry through this study and where these propositions have been confirmed or disproved. Where evidence has been inconclusive, recommendations are made for further studies in those areas. Chapter seven provides answers to research question 5.

1.7 Limitations

The topic of risk management in real estate development encompasses many aspects and accordingly there are limitations to this study, which are to be highlighted. This thesis does not provide an in-depth discussion of the options for strategic action available in the area of risk management or formulate possible risk strategies. Aspects concerning the real estate markets are addressed at a secondary level only, as an isolated examination of such aspects would not be expected to offer a significant contribution to the findings of this dissertation and would therefore fall short of its objective. Moreover, the legislative framework of real estate development is not examined, as this framework is subject to constant change at both a national and an international level and is also not expected to contribute to the findings from a conceptual point of view. Thus, the author has largely refrained from making specific reference to legal or tax related issues within the scope of this dissertation.

This dissertation is largely based on the Committee of Sponsoring Organizations of the Treadway Commission (“COSO”) Risk Management Framework (2004) and on the definition and the fundamental characteristics of an effective risk management process as put forward by DELOACH (2000). There is a strong connection between these two pieces of work; DeLoach’s publications on enterprise-wide risk management, amongst other things, earned him a seat on the COSO Advisory Board and he therefore had a major influence on the COSO Framework. The COSO framework was not the only possible point of reference in terms of risk management standard (see chapter 3.3) but was considered useful given its general acceptance in the European context. The author assumes that current accepted views on generic risk management are sound and therefore no attempt has been made to further explore these ideas on which the dissertation is so dependent. It was felt not only that it would go beyond the scope of the dissertation to do this but that it was unnecessary in the circumstances as the purpose of using fundamental ideas and the risk management framework were primarily to provide a framework against which to analyze risk management practices in real estate development.

2 Real estate development and risk

Chapter two uses the theoretical foundation of research on real estate development in order to answer the following research question as set out in chapter one:

- 1 What are the characteristics, key business processes and associated key risks of real estate development?

The purpose of this chapter is to define risk from the perspective of the developer and to identify the different categories of risks that a development organisation faces. This chapter begins with an overview and definition of real estate development (chapter 2.1), its unique and specific characteristics (chapter 2.2) and the different types of real estate developers (chapter 2.3). This is followed by a study of the general concept of risk (chapter 2.4). The application of an event sequence model (chapter 2.5) is used to develop an ideal typical phase model which provides a framework for the study of the identification of potentially associated risks within the different stages of the development process.

2.1 Definition of real estate development

The views expressed in specialist literature regarding the precise definition of the term 'real estate development' (also referred as 'property development') are varied and, in part, differ from each other. Most definitions refer to a sense of creativity and focus and coordination in order to realise real estate assets (NEARY, 2009).

The statutory definition of real estate development as set out in section 55 (i) of the British Town and Country Planning Act 1990, have been quoted by both CADMAN / TOPPING (1995, p.177) and MILLINGTON (2000, p. 1). This states that *"Development means the carrying out of building (...) or other operations in, on, over or under land, or the making of any material change in the use of any buildings or other land."* This definition reflects the functional characteristics of real estate development and continues to be widely used. WILKINSON / REED (2008, p. 2) adopt the definition that real estate development is *"a process that involves changing or intensifying the use of land to produce buildings for occupation"*.

This description, however, does not sufficiently reflect the original character of real estate development and the creative function of real estate developers as a prerequisite for project initiation.

Real estate is often defined as a triangle of space, money and time. In this sense a particular usage is attributed to a defined space which generates an estimated cash flow over a specific period of time. Based on this understanding of real estate, the definition of development postulated by GRAASKAMP (1992, p. 620) “(...) *the creation and management of space time units is termed real estate development*” is applicable. This definition primarily makes reference to the economic benefit derived from the space produced by the developer. The definition of the Urban Land Institute, as formulated by MILES / BERENS / WEISS (2000, p. 4), also refers to the management and entrepreneurial aspect of real estate development: “*Development is an idea that comes to fruition when consumers – tenants or owner occupants - acquire and use the bricks and mortar (space) put in place by the development team. Land, labor, capital, management, and entrepreneurship are needed to transform an idea into reality. Value is created by providing usable space over time with associated services.*”

The purpose of real estate development is therefore to recognise the potential opportunities for increases in value / future cash flows, that are inherent in land or real estate, and to exploit these by suitable measures (BAUM / MACKMIN, 1989; GUY, 1994). The added value created by the developer does not result solely from the fact that a building is constructed on an undeveloped plot or that a condemned property is redeveloped, but may also be based on other measures of increasing the usage of the property and the productivity of space. This includes, in particular, the structural usage of currently unused space on a plot of land or within a property, as well as conversion / rebuilding measures, e.g. turning auxiliary space into rentable space.

Generally, the priority goal of a developer is the optimal realization of the capital appreciation that has been created in connection with the real estate development process. BARKHAM (2002, p. 53) concludes, “*perhaps more than in any other industry the property development entrepreneur resembles the classic entrepreneur of economic history*”.

Similar D'ARCY / KEOGH (2002, p. 19.) state that *"(...) the developer's role is essentially one of supplying a stream of entrepreneurial services to the property market through both the identification and activation of market opportunities."* As to GELTNER / MILLER (2001, p. 23) the real estate development industry *"assembles and applies the financial and physical resources to construct new built space"* (...) in *"its role as a converter of financial capital into physical capital"* (GELTNER / MILLER, 2001, p. 23-24).

To meet its objectives, a developer has to focus on the satisfaction of the needs of both target and client groups, e.g. the users of the property and the investors. The quality of a project from the user's perspective (user's goal system) relates primarily to the three aspects of quality of use, rental price and service or building management. The investor's goal system arises from the classic investment objectives, namely return, preservation of value and liquidity. MALIZIA (1992, p. 643) phrased his understanding of the risk-taking function of the developer as follows: *"Developers may be viewed as the risk-taking entrepreneurs who combine land, labour and capital to plan, manage and market facilities which they believe will provide services demanded by space users."*

GUY / HENNEBERRY (2002, p. 5) describe development as follows: *"Urban development is a complex process which entails the orchestration of finance, materials, labour and expertise by many actors within a wider, social, economic and political environment."* Although this definition refers to urban development, it is useful in that it regards development from a broader perspective to include a wider range of factors applicable to real estate development.

MILES / BERENS / WEISS (2000) describe real estate development as a highly synergistic and creative process in which *"... physical ingredients are effectively combined with financial resources and professional skills, to create a built-environment that is economically sound, aesthetically pleasing and environmentally responsive. (...) At its best, the development process is synergistic – that is, the ultimate combination of resources has a greater value than the sum of the individual parts."* Within the German-speaking region, the following integral-systematic definition by DIEDERICHS (1996, p. 29) has been widely accepted and is favoured for the purposes of this dissertation: *"Real estate development is required to combine the aspects of location, project concept/ idea and (use of) capital so as to achieve multiple objectives: the results need to be (micro eco-*

nomically) competitive on a standalone basis, should create and / or secure employment, need to be socially, macro economically and environmentally acceptable and they need to generate a positive return over their life-cycle in the long term.”

Diederichs distinguishes between real estate development in the strict sense, which comprises the period from project initiation until the decision regarding the further procedure within the conceptual framework, and real estate development in the broader sense, which includes both the planning and construction phase and the usage phase of real estate.

This conceptual understanding makes stronger reference to the production factors of location, project idea and capital, which form the starting point of real estate development and whose effective combination results in a specific investment (HEALEY, 1992). This definition addresses both the macro-economic and the micro-economic effect level of real estate development. From a macro-economic perspective, it is required that the real estate, as the outcome of development process, meets public demand, while it must be competitive, profitable and sustainable from a micro-economic perspective. The dissertation focuses on the micro-economic level. Further, the core focus is to be on the development of real estate assets. Although development organisations may engage in the construction of roads, drainage, water facilities, power generation and other infrastructure, these projects should be ancillary to the core activity of developing buildings for occupation.

2.2 Risky nature of real estate development

2.2.1 Real estate as a unique asset class

When addressing real estate issues, it is necessary to make reference to a number of specifics that are not, or not as prominently, encountered in connection with other investment / asset classes. The most important specific characteristics of real estate as an investment good are described, inter alia, by BONE-WINKEL (1994); BROWN (1971), GESCHWENDER (2010) and MILLINGTON (2000).

The most prominent characteristics of real estate are that it is tied to its location, it is heterogeneous, it is scarce and it has limited substitutability. These factors have far-reaching economic, legal and factual implications. The geographic location alone fre-

quently determines the most likely use as well as the physical and / or structural possibilities, and the value of real estate is largely determined by external factors such as the condition and the possible uses of adjacent properties as well as the infrastructural facilities provided by the public sector.

Land cannot be reproduced, any structures built or developed on a specific piece of land are characterised by a high degree of uniqueness. The heterogeneity of real estate can be derived from its immobility. Low level of heterogeneity results in the creation of material and regional sub-markets, thereby restricting the comparability of real estate. The heterogeneity results in sub-market risks as well as property and valuation risks. Heterogeneity leads to both scarcity and limited substitutability. The possible uses of real estate are largely determined by the combination of geographical location, structural conditions and legal parameters. Thus, real estate is characterised by both scarcity and limited substitutability.

Real estate development is a highly complex, dynamic and multi-disciplinary challenge. The duration and complexity of the development process involves a considerable amount of time (BARKHAM, 1997; BRAUER, 2003; BYRNE, 1996; GEHNER, 2008) and, as a consequence, real estate developers lack the relative flexibility to respond and adjust quickly to any fluctuations in tenant and investment markets. This results in increased economic risk. Furthermore, the construction of real estate and the acquisition of a completed property require a considerable investment (DUBBEN / SAYCE, 1991). Against this background and also in view of the objective of maximising the return on equity, external funds are often necessary to cover capital needs as not all property developers are also property investors. As a result, the development industry and capital market are closely interrelated.

Finally, real estate is also characterised by its long life cycle and useful life. Depending on the purpose of real estate, its capability of being used by third parties and its usage concept, the economic life of real estate ranges between 20 and 100+ years. During this long period of time properties have to be maintained, refurbished or re-positioned.

2.2.2 Specific characteristics of the real estate market

Given the unique characteristics of real estate as an asset class, it follows that the real estate market, defined as a mechanism by which real estate-related assets and services are exchanged (JAFKE / SIRMANS, 1995) - possesses special characteristics in comparison to markets for other goods. The specific features of the real estate market manifest themselves through the creation of sub-markets, the dependence of and interaction with upstream and downstream markets, intransparency and government influence (SCHULTE / VOGLER, 1998).

The real estate market is fundamentally an open, generally accessible market. At the same time, professional development of larger schemes has certain major entry barriers. In general and in terms of matured European countries, the real estate market is a regulated and organised market to a large extent. The allocation of land is not generally left to unrestricted market forces, both by the state and in the interest of as well as for the protection of the common welfare. The state, for instance, exerts its influence through social and tax policy in the form of rent regulations or depreciation allowances, and more directly by setting planning policy frameworks. Moreover, because of the particular characteristics of real estate as an economic asset, the real estate market deviates clearly from the ideal of a perfect market. The most prominent characteristic in this context is the fact that real estate is tied to its location and the immobility that this entails. In addition to being clearly associated with a specific location, real estate is also limited in terms of territory. Thus the catchment area of a property is limited and not fungible. It follows from this that real estate can, in principle, not be duplicated and is differentiated essentially by location, size, use and architectural design (BONE-WINKEL, 1994). In this imperfect market, tenant and landlord or buyer and seller respectively do not possess complete information about all transactions (leases and sales respectively). Generally, the market participants only have access to limited comparables from sales transactions, which circumstance makes the valuation of real estate more difficult. The real estate market thus regularly shows a lack of transparency and complexity and, in part, inefficiency, since the prices do not fully and immediately reflect all facts that constitute drivers of value. It is not possible, on the one hand, to immediately validate current pricing, while it is made significantly more difficult, on the other hand, to ascertain the comparability of the observed (lease and sales) prices.

Regular information bottlenecks and the limited individual possibilities of obtaining, processing and disseminating information interfere with the decisions of the market participants as well as communication between the individual market segments.

The cyclical nature of real estate markets requires strategic planning and sound market analysis. Risk management should be on a development organisation's radar during all phases of the market cycle. Because of the comparably long development phase of schemes, there is always a realistic possibility that the completed real estate product will be delivered to the (tenancy and investment) market in a changing phase within the cycle. Analysing and planning for the different phases within the cycle is therefore a key activity and risk management tool for developers. It is beyond the scope of this dissertation to examine the variables that drive real estate prices but it is necessary to note that real estate markets have always been characterized by cyclical market fluctuations.

2.3 Types of real estate developers

There are many types of developers and an all-encompassing definition is thus hard to present (RATCLIFFE / STUBBS / KEEPING, 2009; NEARY, 2009; NOZEMAN / DORENBOS, 2006). Developers may have an independent background but are also often affiliated to financial or construction mother organisations.

Developers may be classified by their strategic capital role, geographic scope, ownership structure, and product type. These structural characteristics are expected to have an impact on the complexity of risks which would affect the organisation and therefore impinge on the risk management approach. Since no previous empirical research has been conducted on this aspect of risk management in development it is felt that some exploratory research is useful in this respect (chapter 3.4.7).

Essentially, real estate developers operate as either trader or investor developers (WILKINSON / REED, 2008). In addition to both types, SCHULTE / BONE-WINKEL / ROTTKE (2002) distinguish a third category, namely the service developer. In this context MORLEY (2002) notes that different developer types might follow different objectives and also show different risk profiles, which at the same time could have an influence on the risk management approach.

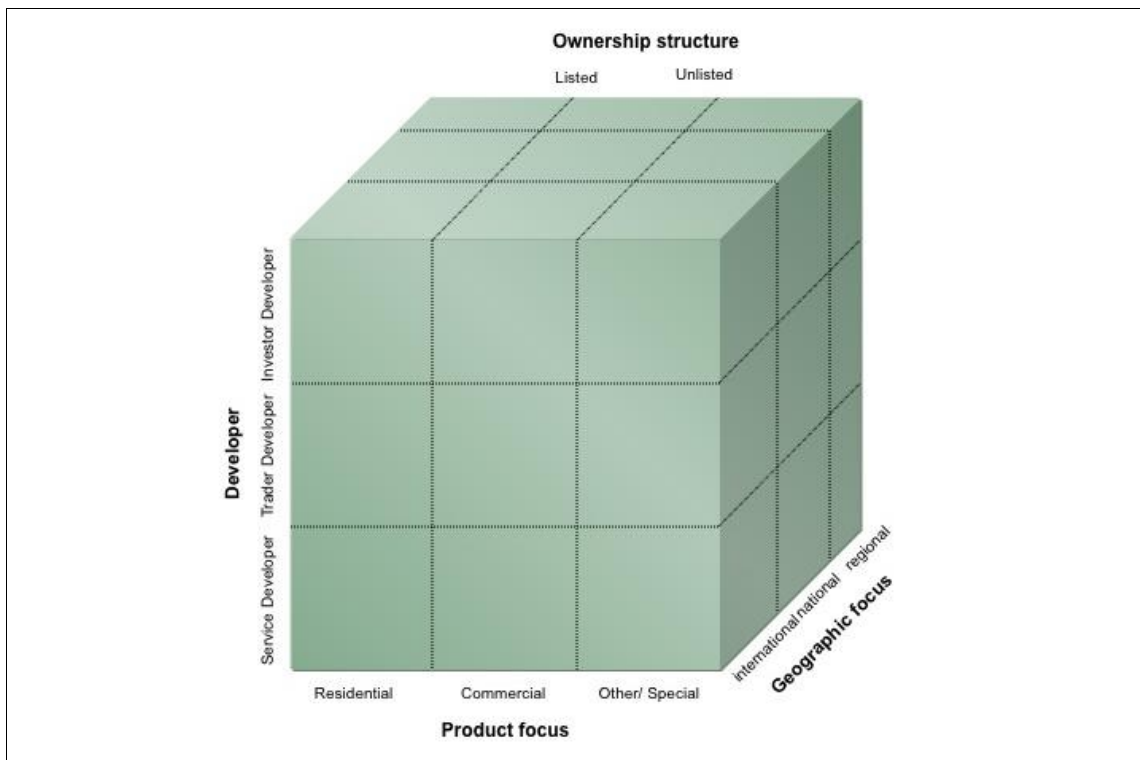


Figure 2-1: Types of real estate developers

Trader-developers typically assume the entire risk until completion of the relevant property, which is then sold together with the land (property and land may even be sold in an earlier development phase in way of forward sales). Their primary corporate goal focuses on exploiting the profit margins throughout the various phases both before and after the actual construction work in the form of development gains. At the end of the development, the trader developer typically decides to sell the property to an investor.

Investor-developers carry out projects to establish a portfolio or for use as owner-occupiers (ISENHÖFER / VÄTH, 1998) and are responsible for the entire project, from its inception to its completion, and then transfer the real estate into their own portfolio. By combining property development with portfolio investment activities, organisation management can use the steady cash flow from investment properties to finance developments even in times when capital markets are generally not focused on real estate projects or the specific project does not match the financing partner criteria. Thus investor-developers do - in addition to development profits - capitalise on capital appreciation.

Investor-developers and trader-developers share many characteristics. However, as the time of project exit shifts (i.e. the point in time when the developer has divested all

its interest in the assets, and only post-contractual obligations may exist), the objectives may differ. (SCHULTE / BONE-WINKEL / ROTTKE, 2002). WILKINSON / REED (2008) state that trader-developers may evolve to a investor-developer profile over time, once profits from trading are available to be retained in completed real estate schemes for the own portfolio.

Service developers render specific real estate development services as a service provider for third parties in the name and for the account of the client without assuming a majority of risks themselves. This role is often assumed by large, mostly international agency firms or specialist management consultancy firms. Service developers typically focus on the process between project conception and planning stage or, respectively, completion of the building permit process. This is often followed by coordination, project management and coaching tasks (KALUSCHE, 2002). Financially, service developers commit themselves to the extent that they bear the ongoing costs of preliminary analytical and planning work in connection with the relevant project. Service developers are typically investing only very limited capital at risk into project schemes and aim to generate fee income. Therefore they bear an operating risk role instead of a capital risk role. The clients of service developers are usually owner-operators or investment organisations without any particular expertise in the development field. In the event of capacity constraints or highly complex or specialised projects, other developer types also engage service developers for individual, clearly defined tasks. However, this type of developer is more the exception than the rule (ISENHÖFER / VÄTH, 1998).

In addition to the principal types of developers described herein, hybrid forms also exist, with their differences not being clearly distinguishable. With regards to the geographical focus of developer's activities, a differentiation into global, national and regional scope may be taken into consideration. The product categories (residential, commercial, special use) may serve as another classification scheme. With respect to the ownership structure, listed and unlisted development organisations may be differentiated.

In order to distinguish between different development projects, it would be advisable or even imperative to base any such differentiation on the investment volumes (DIEDERICH, 1996). Typically, high-volume developments are usually associated with longer development times, entailing greater risks and will likely have an impact on the

risk management strategy. In addition to the investor, upon whose requirements and investment criteria a project should be structured, the project size must also take into consideration the working capital, expertise, capacities and resources of the real estate developer.

Organisational size could potentially act as a further classification aspect for development companies. However, developers are typically not disclosing detailed information on their organisations size, therefore information on the structure of human capital is widely only available to a very limited degree. A reason could be that the human capital aspect is indeed one of the most valuable assets and that information on this topic is therefore kept 'confidential'. As a result, it is difficult to draw conclusions on differences in organisational size of development organisations. Developers typically appoint consultants, the number of which will depend on the developer's ability to undertake certain activities in-house and on the complexity and scale of the proposed development. Thus, the number of senior management and staff may vary significantly from developer to developer (MILLINGTON, 2000). Against this background, the above mentioned criteria 'project volume' may serve as an adequate indicator of organisational size.

2.4 Definition of risk

The application of any risk management process requires an interpretation of 'risk' which varies by specific application and situational context. A discussion of the various components of the term risk is necessary in order to pinpoint the nature of risk within the real estate development industry.

In general, risk has a mostly negative connotation and describes the possibility of unfavourable future developments. Semantic roots of the term risk are related to the Italian 'risco', 'rischio' (verb forms: 'risicare' and 'ris-chare'), which emerged during the renaissance, the Spanish '(ar)risco' (verb form: 'ariscar') and the classical Greek word 'rhiza'. The Italian and Spanish nouns mean 'danger / venture' and the verbs 'to venture', 'to run the risk'. The classical Greek 'rhiza' is translated as 'root / rock / obstacle'. According to BANSE (1996) it is to be assumed that this meaning was included in the Italian verb 'risicare', which is roughly translated as 'to negotiate obstacles'. Even in the area of macro-economic analysis, an almost exclusively negative interpretation of

risk as a risk of loss, and therefore a threat to one's financial situation, pervades (AMHOF / SCHWEIZER, 2000; HOEVE / SCHWEIZER, 2001; MAYNARD, 1999; ROWE, 1977).

Accordingly, risk is generally perceived as an undesirable situation and therefore should be avoided. However, such interpretation does not always include the insight that the assumption of risk is an integral part of entrepreneurial action, or only notes this fact in passing. Hence, a business activity that promises profits or other positive effects for an enterprise is nearly always exposed to potential negative effects.

A risk definition restricted to the risk of loss therefore falls short of today's understanding of a risk concept (DUNCAN, 2002). As only losses constitute a serious threat to the continued existence of an enterprise, the risk concept is often restricted to being a "downside risk". The possibility of a positive discrepancy between the actual value and the expected value (a profit, for example) can therefore be described as an opportunity or upside potential (LEWIN, 2001). Accordingly, both positive and negative deviations from a pre-defined objective with *"(...) uncertainty of outcome, whether positive opportunity or negative threat"* (ROYAL INSTITUTION OF CHARTERED SURVEYORS, 2003) are conceivable. HALLER (1986, p. 18) defines the risk as *"(...) die Summe der Möglichkeiten, dass sich Erwartungen des Systems Unternehmung aufgrund von Störprozessen nicht erfüllen."* This is confirmed by VAUGHAM (1996, p. 8): *"Risk is a condition in which there is a possibility of an adverse deviation from a desired outcome that is expected or hoped for."*

As an example of broadening the definition of risk, the Australian/ New Zealand Standard for Risk Management (AS/NZ 4360, 2004) previously defined risk as *"(...) the possibility of something happening that impacts on your objectives. It is the chance to either make a gain or a loss. It is measured in terms of likelihood and consequence"*. In 2009, adopting the international framework, the revised Australian/ New Zealand Standard for Risk Management known as AS/NZS/ISO 3100 defined risk as *"the effect of uncertainty on objectives"*.

Similarly, DICKINSON (2001, p. 361) also notes *"Enterprise risk is the extent to which the outcomes from the corporate strategy of an organisation may differ from those specified in its corporate objectives, or the extent to which they fail to meet these objectives."*

The relevant definitions imply that both positive and negative deviations from the expected outcome are conceivable. While potential negative deviations are often described as risks in the strictest sense, the possibility of a positive or negative deviation entails a risk in the widest sense, with the positive divergence constituting an opportunity (HOMMEL / LEHMANN, 2002). A positive deviation generally consists in the over-fulfilment of the initial expectations.

Another source of ambiguity is found in the distinction between risk and uncertainty. With regard to real estate development, definitions and discussions about risk and uncertainty are presented in a number of academic sources - most notably, BYRNE / CADMAN (1984), HARGITAY / YU (1993), PELLAT (1972), WHIPPLE (1988). HARGITAY / YU (1993) present a spectrum from certainty to total uncertainty, which is shown in Figure 2-1 below. HARGITAY / YU imply that if all future outcomes can be identified and the likelihood of occurrence can be estimated then there would be no uncertainty. This perspective could be misleading as even if it were possible to identify all future events or outcomes and assess their relative likelihood of occurrence, uncertainty would still exist as it is not possible to identify which of those future events or outcomes would occur. The future is always uncertain. If the future were certain there would be no risk.

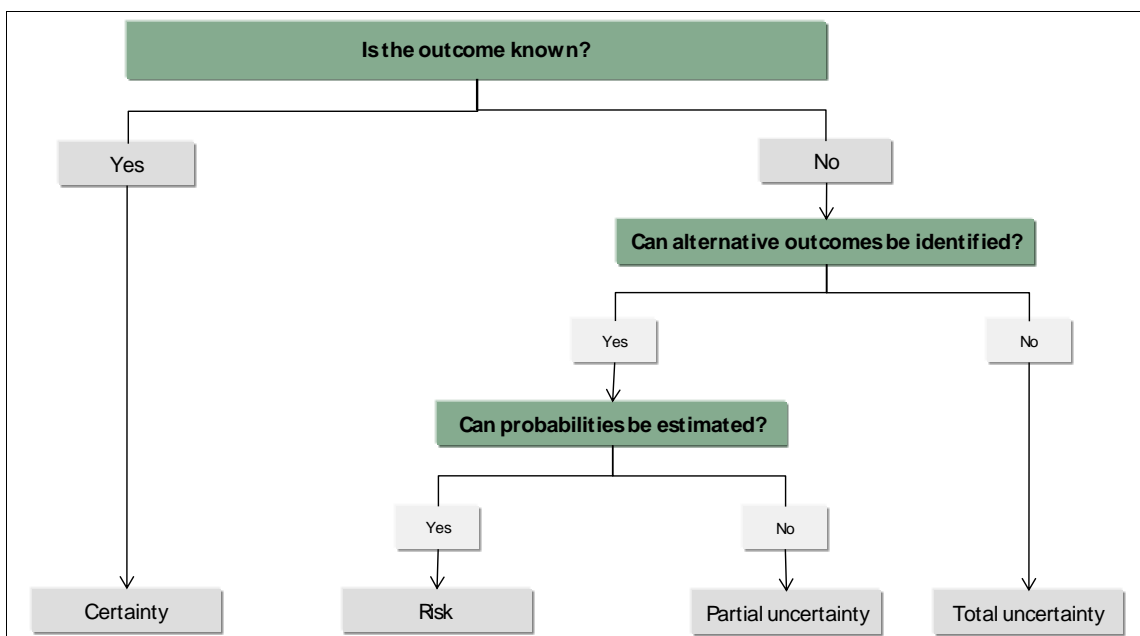


Figure 2-2: The spectrum of uncertainty (after HARGITAY / YU, 1993; FISHER/ ROBSON, 2006)

Decision-making takes place in an environment, which has three components: certainty, (partial) uncertainty and risk (NORMAN / FLANAGAN, 1993). Certainty may be defined as a situation in which all relevant factors can be exactly specified and known by the decision-maker. If probabilities may be estimated then risk exists rather than uncertainty (FISHER / ROBSON, 2006). BYRNE (1996) and WIEDENMANN (2005) define risk as a term appropriate for situations where it is possible to define probability distributions for probable outcomes, whereas uncertainty is a term that better suits situations where such probability distributions cannot be made. Thus, the major difference between risk and uncertainty is related to its quantification. The measure of uncertainty refers only to the probabilities assigned to outcomes, while the measure of risk requires both probabilities for outcomes and losses quantified for outcomes. The ROYAL INSTITUTION OF CHARTERED SURVEYORS (2004, p.7) defines *“Risk is the combination of the probability of an event and its consequences”*. This can be expressed by way of the following formula:

$$\text{Risk} = \text{Probability of event} \times \text{magnitude of loss / gain}$$

From the point of view of the real estate developer, two essential missing elements of the above definition are risk appetite and time horizon. Risk appetite is the degree of uncertainty an enterprise is willing to accept to reach its goals, meaning the point of balance between risk and reward at which a decision-maker feels comfortable in pursuit of stakeholder value (COSO, 2009). Risk appetite is a key factor in evaluating strategic options. An organisation's appetite or tolerance for risk will vary with its strategy as well as evolving conditions in its industry and markets and therefore it is unique to most organisations. Hence, in connection with the decision-making process in real estate development, an unfavourable development consists of the ex post realisation that a decision failed to render the intended result. The decision itself depends on the level of information regarding future situation, on the one hand and on specific risk appetite on the other.

Further, there is substantial uncertainty around estimating the likelihood of occurrence. Figure 2-2 points out that uncertainties are derived from either outcomes which are not identified or for which the likelihood of occurrence is unknown. These uncertainties result in a decision-making process, which relies on multiple views or scenarios

to which the likelihood of occurrence is estimated and which occur over a predefined time horizon. The time horizon has a significant impact on the perception of risk. In conclusion, a definition of risk as best applied to the real estate development industry should consist of the following components:

- It takes into consideration the element of uncertainty in connection with events and their implications;
- It stresses that risk considerations must be aligned with the normative objectives of a real estate development organisation and be in a direct relationship with the relevant expectations and objectives of the organisation within a specified time horizon;
- It includes the principle of materiality that is well established in the financial audit area; and
- It differentiates between negative (threat) and positive (opportunity) aspects of risk, thereby reflecting the fundamental nature of entrepreneurial action within the real estate development industry.

For this dissertation, the following definition shall be used for 'risk', which incorporates the above components and specifically refers to the real estate development industry:

Risk is the uncertainty expressed through the significance and likelihood of events and their outcomes that could have a material effect on the goals of a real estate development organisation over a stated time horizon.

2.5 The real estate development process and related risks

Developers typically take significant risks at the various stages of the development process (ROBSON, 2009). This section provides a thorough understanding of the nature and processes of real estate development. Besides breaking down the real estate development processes into ideal-typical phases by means of an event-sequence model, the emphasis of this section is on the presentation of potential risks associated with the various stages of the process.

2.5.1 Overview to the generic real estate development process

Real estate development is a highly complex, dynamic and multi-disciplinary endeavour, which would be well described in terms of its actual content by means of a process-related perspective. GRAASKAMP (1992, p. 639) notes with regard to the fundamental significance of the real estate development process: *“The development process is our most challenging manufacturing process because its sub-systems are complex and because it is the instrument of change which affects all of a community and a society.”*

Within the context of the present study, the real estate development process as such is based on the understanding formulated by HEALEY (1992, p. 36): *“(...) the transformation of the physical form, bundle of rights, and material and symbolic value of land and buildings from one state to another, through the effort of agents with interests and purposes in acquiring and using resources, operating rules and applying and developing ideas and values.”*

In the case of real estate development, the process starts with the three factors of location, project idea and capital and ends with the real estate object being ready for occupation. Various authors take different approaches, with differing degrees of detail, in mapping the real estate development process by defining its individual phases. BYRNE / CADMAN (1984) for example, propose a 3-tier model, distinguishing between ‘Acquisition’, ‘Production’ and ‘Disposal’. Others such as CADMAN / TOPPING (1995); MILES / BERENS / WEISS (2000) or WILKINSON / REED (2008) differentiate between eight phases, which are ‘Initiation’, ‘Evaluation’, ‘Acquisition’, ‘Design and costing’, ‘Permissions’, ‘Commitment’, ‘Implementation’, ‘Let / manage / dispose’. Despite the existence of different process models with varying numbers of phases, however such models generally cover mostly the same tasks performed by a developer.

For purposes of this dissertation, the processes identified are consolidated into four main phases, namely

- Project initiation
- Project conception
- Project realisation / management
- Project marketing / disposal

A similar phasing is presented by GEHNER (2003), WIEDENMANN (2005) and NOZEMAN (2008). A generic flow diagram of the development process is presented in Figure 2-3. The figure illustrates how a project passes through the various stages of its development.

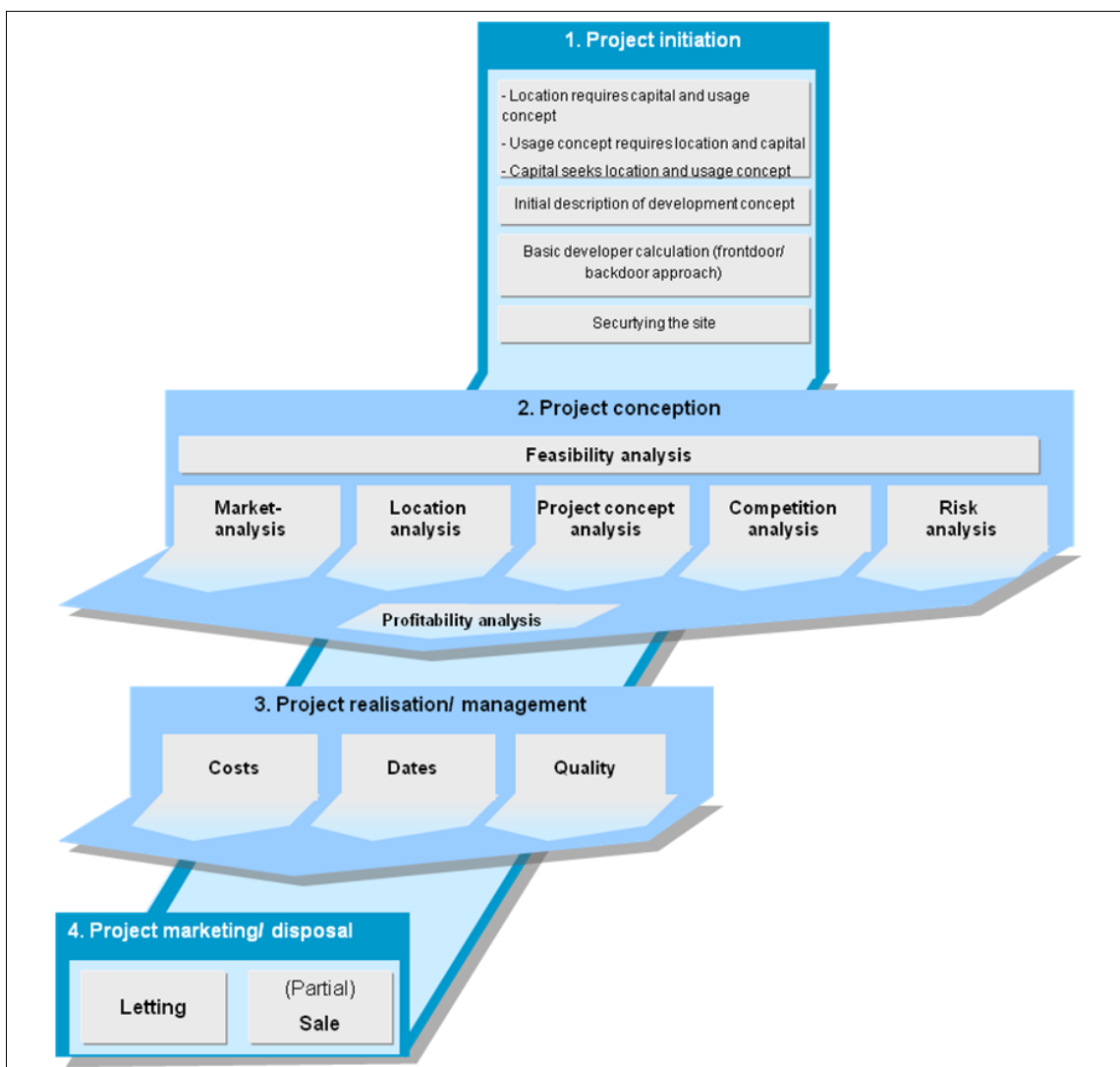


Figure 2-3: Generic real estate development process

Due to the differing strategic starting points the development of a process model is necessarily an organisation-specific task. In order to arrive at an ideal-typical approach for the process model design, the following assumes a developer who carries out all tasks of the real estate development process (in reality, there may be market participants who specialise in certain parts of the overall development process only).

In summary, it should be noted that the complexity and dynamics of the real estate development process might be reflected in ideal-typical form by means of phase models. Nonetheless, it must be conceded that, in reality, the individual phases do not always take place in the sequence stated. In fact, real-life projects are generally characterised by overlaps, parallel operations and feedback effects, which cannot be mapped to a sufficient degree using phase models (ISAAC / O'LEARY / DALEY, 2010). A good example is project marketing whose tools can (or should) be used in an early phase of the real estate development process, as the conclusion of lease agreements at an early project stage will reduce risk and promote the project success or the saleability of the project to investors (WIEGELMANN, 2012).

2.5.2 Project initiation

The initiation phase commences the development process. A main expertise of a development organisation is to identify the future demand on space market to create and provide an adequate supply and thereby to create value (GEHNER, 2008). Creativity and drive are essential for a projects' success. Generating ideas within the framework of project initiation can, in principle, be divided into a level of factual analysis and secondly a level of inspiration and vision (NELL / EMENLAUER, 2002).

Accordingly, the starting situation (cf. Figure 2-4) for a development may either be

- an existing plot of land, for which a use / project concept must be found and financing required;
- a project idea for which a suitable location must be procured respectively capital in search;
- the availability of capital seeking investment in a real estate project and thus a property / micro location and project idea / project concept.

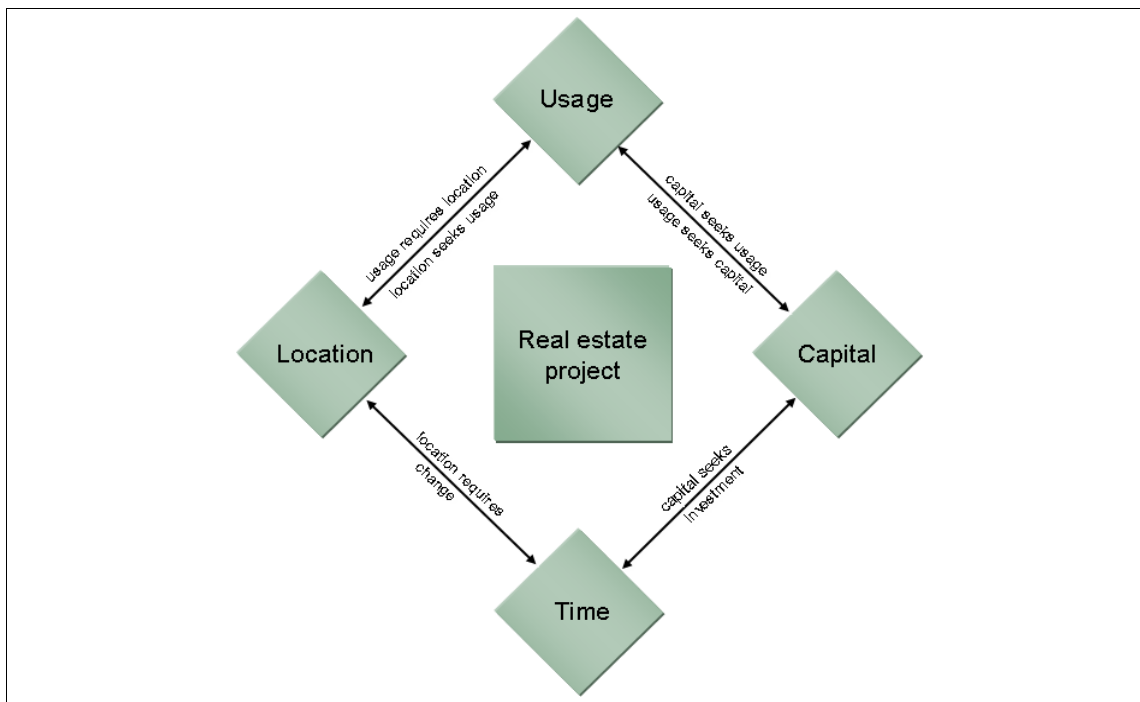


Figure 2-4: Conceivable starting-points for a real estate development (SCHULTE / BONE-WINKEL / ROTTKE, 2002, p. 32)

Accurate and pre-planned ‘timing’ is a critical success factor in this context. This depends on the one hand on project-specific market conditions (tenant and transaction market) and the relevant market cycle and on the other hand on the availability of attractive land plots. In this respect, the developer supplies entrepreneurial services to the property market by identifying and activating market opportunities (D'ARCY / KEOGH, 2002).

Main activities within the project initiation phase are commencing specific market research to ascertain demand from potential users / tenants and potential investor profiles for the proposed development as well as preparing rudimentary development appraisals that will comprise the design, cost and programme elements of the development. In case of a unsatisfying outcome of the concept and its initial economics, the project will likely not be pursued any further.

Based on a positive evaluation, the next major step is to typically obtain approval from the developer’s senior management board and other significant stakeholders to proceed with the initial concept.

If the preliminary review is positive, the next step is to secure the required land in case the site is not already in the developer’s possession or under exclusivity. In that case, a strategy for identifying and securing a site of suitable size, budget and location is to be

elaborated. Often it is preferred by developers not to purchase the land at this stage but ensure exclusivity with the owner(s), given that a full feasibility analysis has not yet been completed. Option agreements or a purchase subject to conditions precedent are possible routes to achieve this. In case the land has to be acquired with immediate effect, a developer is likely to first undertake the following phase of the development process, the project conception phase, prior to signing a purchase agreement.

2.5.3 **Project conception**

The conception phase starts with the project feasibility analysis and ends in the implementation decision, or in abandoning the project. This phase can be qualified as one of the most important ones in the development process given its influence to the decision-making of the developer (WILKINSON / REED, 2008).

Once the rough contours of the project have become visible in the preliminary acquisition review, what matters next is to outline the content of intellectual construct that was created in the initiation phase and to document it as a detailed project concept. This is ultimately intended to answer the question whether and in which manner the project is capable of being realized. According to NOZEMAN (2002, p. 206) real estate concepts *“comprise a great number of elements: function(s), location, size, branch (mix), target group(s), positioning, design, technical implementation / level of finishing, legal structure, marketing strategy, exploitation and management model.”* The term ‘feasibility analysis’ has become accepted as a general term for the many types of analyses in advance of project implementation that are covered in this phase.

The goal of a feasibility study is to articulate a finding about the economic sustainability (feasibility) of the project under review. *“A real estate project is ‘feasible’ when the real estate analyst determines that there is a reasonable likelihood of satisfying explicit objectives when a selected course of action is tested for fit of a context of specific constraints and limited resources”* (GRAASKAMP, 1972).

Prior to committing funds to a development project, a developer as well as his stakeholders and financing partners need a confirmation that market fundamentals will support the values assumed in the project appraisal (BARKHAM, 2002; GRISSOM, 1984).

In terms of content, the feasibility analysis is based on detailed market and location analyses, building code reviews, design studies, use analyses, risk assessments, com-

petitive analyses as well as profitability calculations. Figure 2-5 shows an outline structure of the feasibility analysis. The challenge at this early and uncertain phase of the project is finding a balance between costs (potentially sunk costs), project uncertainty and the necessary quality and detailed specification of the usage concept.

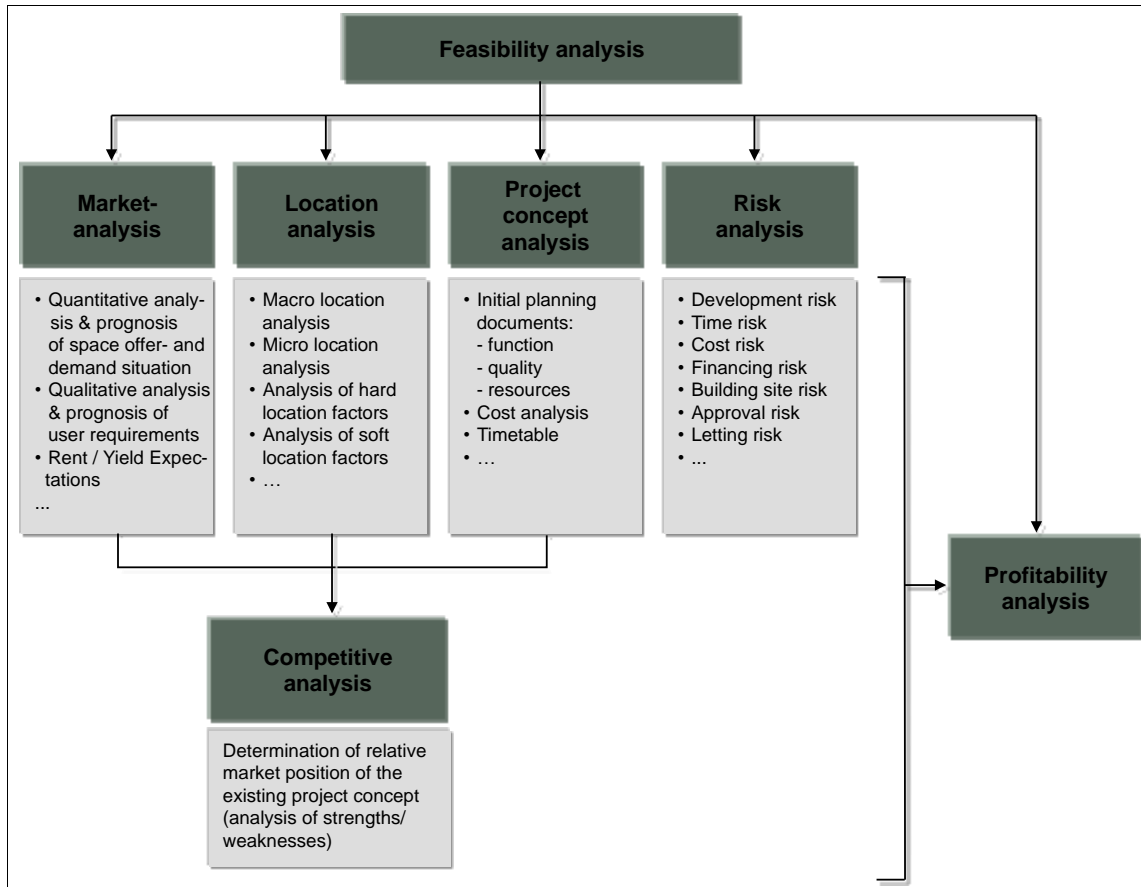


Figure 2-5: Structure of feasibility analysis (based on ISENHÖFER, 1999, p. 66)

2.5.3.1 Market analysis

The market analysis concerns itself with the supply and demand situation in the short to medium term. It identifies the specific market segment (in terms of use and location - geographical and technical sub-markets) applicable to the project. The main criteria to be considered are the requirements of potential users, how readily the project will be absorbed by the market, and subject to the effects of this absorption, the rent and property values applicable to the project. The market analysis should be an objective view of the market, and allow the developer to understand the market dynamics and review, which to its own strengths can be utilised to take advantage of those dynamics.

2.5.3.2 Location analysis

The analysis of the location should critically verify the findings of the inception phase as documented in the preliminary acquisition review. The objective must be to obtain verifiable data that can be analysed and presented in a manner to demonstrate to third parties the planned use of the land. These analyses are concerned with the long term-effective characteristics of micro- and macro locations. The location factors are both easily quantifiable “hard” criteria, as well as more ‘soft’ criteria, which will always retain some level of subjectivity.

2.5.3.3 Project concept analysis

The building or usage concept for the use of the property must be based on the market and location analyses (micro and macro) discussed above. It examines the architectural and technical design of the building. Important criteria are the standard of specifications and the flexibility of the use of the building and its space efficiency. The objective is to meet market demand while minimising cost (to build and operate) and maximising flexibility.

2.5.3.4 Competition analysis

The three above aspects of market, location and usage concept typically run parallel and are combined as the basis of a competition analysis, comparing the market position of the evaluated project with properties, which are or will be in direct competition. The first stage is the identification of appropriate benchmark properties. The objectives are to meet client needs while differentiating the development as much as possible from competitors. However, the weighting of criteria will always retain an element of subjectivity, which leads to residual risk.

2.5.3.5 Risk analysis

While risks are present at all stages of property development, the feasibility analysis offers the opportunity to analyse them at a preliminary stage and review their impact prior to commitment of capital, as well as documenting and trying to mitigate such identified risks during later implementation.

To some extent, the progress of a development project through the phases of development has a general impact on its risk levels.

In its early stages of the development process, the initiation phase is characterised by a high degree of uncertainty and, in particular, creative and complex search and analysis procedures. At the end of this phase, success potentials and competitive advantages of real estate projects are identified and the project fundamentals defined.

The project-specific manoeuvrability, i.e. the scope for structuring architectural, technical, economic and legal aspects, mostly decreases the further the development advances. As a project progresses, types and extent of risks may change; new risks may emerge and existing risks may change in their importance (RAHMAN / KUMARASWAMY, 2002). Of particular importance is the relationship between time and flexibility (BYRNE / CADMAN, 1996) note: *“As the process takes place, the developer's knowledge of the likely outcome increases but, at the same time, the room for manoeuvre decreases. Thus, while at the start of the process developers have maximum uncertainty and manoeuvrability, at the end they know all but can do nothing to change their product which has been manufactured on an essentially once and for all basis”*. Risk management should therefore be a continuing activity throughout duration of the project.

Furthermore, although the overall complexity of the project decreases during the stages of the development process, the ability to influence the project - especially with respect to the commitment of capital or tied-up costs - declines (FISHER / ROBSON, 2006; LONG, 2011). A high level of uncertainty occurs in the early stages of a project, which is also when business decisions of major impact for the success of a project are made. It is therefore imperative that potential risks are identified, assessed and allowed for at the outset of any project.

The developer should consider the risks to the project, attempt to quantify them within the feasibility analysis and potentially adjust the project so as to minimise them, where possible.

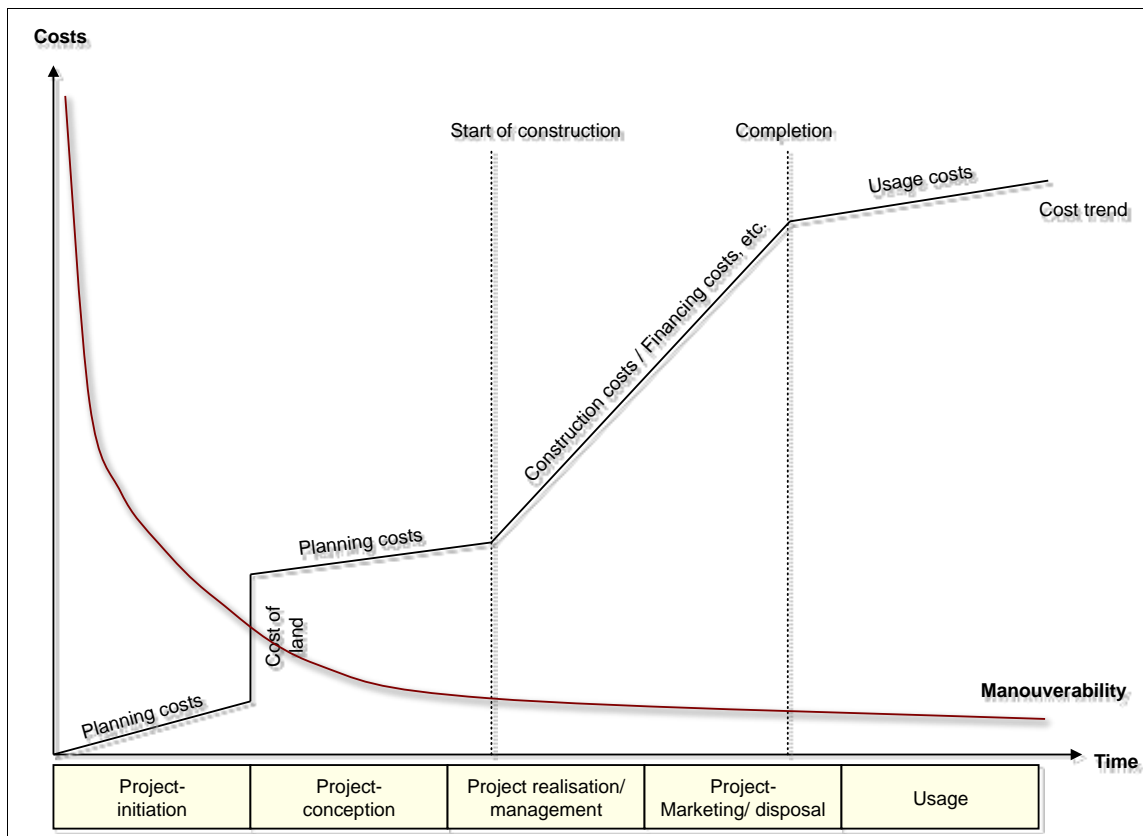


Figure 2-6: The developer's decreasing ability to influence total cost over the life of the project (based on ISENHÖFER / VÄTH 1998, p. 175)

Development risk

Development risk is defined as the risk that the leasing or sale of the project will generate insufficient returns to cover cost and create the desired return due to a lack of sales or inadequately meeting the needs of the market in terms of type and location. The more unusual a particular type of project is for the developer, the higher the chance that the developer will misread the market and the higher the development risk.

Forecasting and planning risk are also part of risk management. The former describes the risk that forecast data used for the evaluation of a project is proven incorrect in relation to the actual outcomes. Planning risk is caused due to sunk costs that need to be borne when a project is aborted during the planning phases. As mentioned above, this should be minimised by appropriate project reviews prior to engagement of external service providers. However, even internal costs as well as the opportunity cost of using internal resources lead to an ever present planning risk. Some ways to mitigate development risk inter alia include a sound and realistic evaluation of the developer's own abilities, the selection of qualified and experienced external suppliers and part-

ners, a systematic and comprehensive feasibility analysis, a timely start to the marketing of the project and potentially the sharing of risks through the formation of strategic alliances.

Time risk

In general, exceeding the planned project time line leads to two main risks: cost of capital such as interest increases with delays reducing project returns, and market conditions change over time reducing the reliability of forecast data. This is especially relevant as usually top of the market conditions trigger developers to pursue marginal opportunities. As markets turn and consolidate, delays in the completion of such projects aggravate losses.

The time risk can be addressed by professional best practice project management including clear documentation, co-ordination and communication between project parties, selection of experienced and qualified external suppliers, and timely commencement of marketing. An overall understanding of market forces and dynamics is critical.

Cost risk

The cost risk is closely related to time risk, as the time needed for real estate development enables cost factors to vary and reduces the reliability of cost forecasts on which the feasibility analysis is based. This means that all the above risk categories also affect the cost risk. Professional project management, in line with corporate best practise, is especially important for effective cost control.

Financing risk

Typically, developers have to obtain appropriate financing schemes at favourable terms, which shall cover the entire length of the development (WILKINSON / REED, 2008). Thus financing partners and financing conditions are crucial. Often, developers seek to obtain a 'forward funding' of a project. In a nutshell, the developer agrees to sell the development on completion to an investor who provides financing during the development process.

Interest rates and financing conditions affect developers both directly and indirectly: as few projects are entirely equity financed, the availability and cost of debt financing affects the overall return and feasibility (also see chapter 5 on current financing environment). Increasing interest rates also increase the expected yield of investment,

thus reducing the sale value of the project at the same level of rental income. Both factors combine to make the feasibility of a project highly sensitive to increasing interest rates.

Also, time and finance risk are driven by related factors, so delays in the timely implementation of the project will also increase the financing risk as interest rates may go up during that period and the additional time needed to completion will add interest cost on the debt financing required.

To reduce financing risk, it is advisable to avoid financial commitment to a project prior to completion of the final feasibility analysis and making a decision to implement. The form of financing should also be considered: interest rates may be hedged, and developers may use strategic alliances introducing joint venture and mezzanine finance, thus reducing the need for outright loan financing.

It should also be considered that there are significant differences between a development financing and a long term financing for a developed and leased property. The lender can only base its risk assessment (and therefore interest rate risk premium demanded) on forecast and projected data, as well as general view on the developer's capital resources and professional competence. In order to secure financing at affordable rates, it is therefore imperative to perform, document and present the preliminary and feasibility analyses in a format useful to potential lenders.

Building site risk

This is the risk that the selected site is unsuitable, or needs to be modified at cost to become suitable, for the intended use due to environmental issues (such as contamination) or its natural characteristics (stability, water levels, subsidence etc.). To minimise these risks appropriate external technical and engineering due diligence is to be sought and acquisition contracts drafted so as to retain a right of redress if the site does not meet expected and agreed criteria. Further, risks on the construction site, which comprise safety of employees, contractors and visitors as well as to assets, should be minimised with appropriate workplace health and safety practises, regulated areas, and use of corporate best practise for safety on construction sites.

Approval risk

All development is subject to planning, and while developers in general apply for permissions that are in line with official planning rules and development plans, the multitude of affected stakeholder interests can lead to specific conditions that affect the cost and feasibility of a project. Also, delays in the planning approval process increase the above mentioned time risk. The approval process should be project managed professionally to minimise this risk. Potentially 'soft' factors such as early communication with other stakeholders and the projection of a positive organisation image can be helpful. Depending on the size and complexity of the development, developers will consider whether it is appropriate to approach the planning authorities for their initial view on the proposed development. Involved architects and planning consultants typically take a lead function when liaising with the planning authorities.

2.5.3.6 Profitability analysis

Combining the results of the five analyses above (market, location, project concept, risk and competitive analysis), the developer needs to calculate a detailed profitability analysis showing appropriate sensitivities for the risks identified.

As to WILKINSON / REED (2008), the profitability of a real estate development project with an already fixed land purchase price is mostly affected by short-term interest rates, building cost, rental values and investment yield. Rental values are largely determined by the demand for and supply of space, whereas the investment yield is driven by capital market perceptions of real estate as an investment asset in general and the evaluation of the specific project concerned. The maturity and liquidity of real estate markets is a key factor for investors to correctly prize markets and projects.

The profitability analysis should use clearly defined quantitative measures of a project's robustness and return, such as net operating income to cover debt service, operating costs (i.e. break-even test), net cash flow after debt service to provide adequate risk adjusted returns on equity, net present value of returns to exceed project cost, and net present value analysis to cover construction, absorption and operations periods.

Figure 2-7 graphically illustrates the possible outcomes of a development project, plotting the expected market value and depreciated replacement value respectively over

the project phases for best, base and worst-case scenarios. The value in use assumes a completion of the project and thus smoothes out differences between phases.

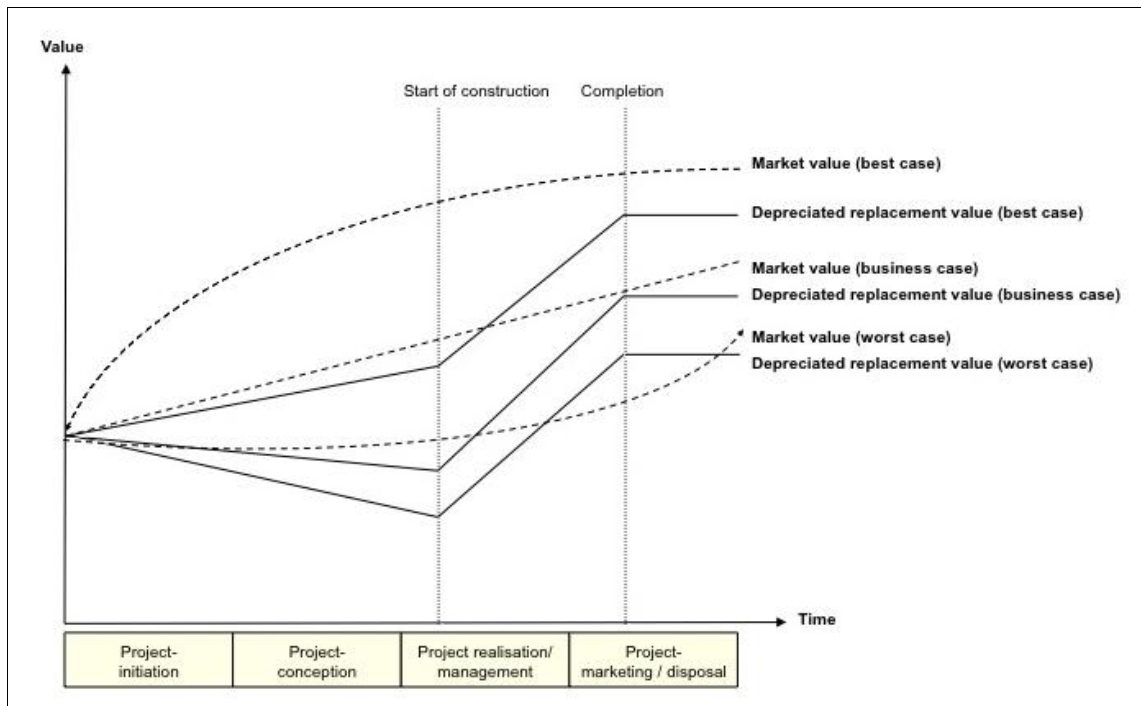


Figure 2-7: Potential valuation throughout the development process (ISENHÖFER / VÄTH, 1998, p. 182)

2.5.3.7 Concluding the feasibility analysis

Having assembled the above data and analysed it based on appropriate assumptions, the results need to be presented and the developer will make a decision whether to proceed with the project. Progressing the feasibility analysis and making the project more concrete involves more effort and cost than optimal in case the project. The risk of sunk costs is ever present, but the level of detail required before a decision can be made should be obtained at reasonable cost, both internal and external. In the framework of the project initiation, it is the objective to answer the question in which manner and in what time the factors location, project idea and capital can be combined against the background of the strategy concept in order to produce a property that is competitive and acceptable in macro-economic terms. MILES / HANEY / BERENS (1995, p.4) have described this relationship as follows: *“Land, labour, capital, management, and entrepreneurship are needed to transform an idea into reality.”* In case the project concept phase did not indicate that the developer’s business requirements and objectives could be met, the project will likely be aborted. In the case of a satisfying outcome and outlook, the phase of project realization / management will be entered.

2.5.4 **Project realisation / management**

The confirmation of the project's potential for success by the feasibility analysis triggers the initiation of negotiation and decision in the realisation phase. At this point, at the very latest, the other parties to the project enter into the development process. These include the property owners, architects and engineers, building authorities and other representatives of the public interest, construction contractors, financial institutions, user groups, special service providers to the real estate industry (project managers, consultants, brokers, etc.) and - unless this is a development for own use - investors.

While the decision to realize the project was only provisional until that time, it can ultimately be made only with the final issuance of the building permit and subject to the presumption that the other negotiations have reached the stage where they meet a certain level of requirements as stipulated by the developer, for instance with respect to financing commitments, leasing status and construction service contracts awarded.

The acquisition is made in the project realisation phase by means of a binding right of purchase or the actual acquisition of the property to be developed. Finalising the purchase can present unexpected difficulties and changes compared to the feasibility study base case as time has passed and stakeholder expectations are evolving. The price offered and agreed should be within the forecast parameters. Legal documents should be subject to appropriate due diligence and mitigation of execution risks. General risks that can occur during this phase include title issues which may not be satisfactorily resolved, inability to reach agreement on purchase / sale terms or inability to achieve a favourable quality of purchase agreement, purchase / sale terms which are less favourable than market comparables, as well as after purchase / sale additional issues that should have been discovered during entitlement and due diligence process.

Another goal of preparing a more detailed usage concept is the definition of an optimal user mix on the basis of the feasibility study, which typically already includes a preliminary usage concept. In the sequence of the development process, this phase of the work is either performed after the acquisition of the property and in the course of the project planning process or - in a case of adequate or guaranteed certainty relative to planning - already during the feasibility study.

Questions of building functionality, flexibility of use, building efficiency and architectural design are discussed as part of the usage concept. Thus a further core task in connection with this phase is the preparation of a planning, implementation and contracting concept.

Obtaining adequate financing on competitive terms is a complex activity that requires for specialist knowledge. The availability and cost of third party financing has a considerable effect on the success of a development and the profit margin of the developer. Depending on the intended holding period of the development project, the developer may pay off a short term financing from the sale of the completed property in order to realise his profit from the development process. Alternatively, the developer may wish to hold the completed asset as investment property (or owner occupied property) and as a result seek to place long term financing.

The (notarized) execution of the negotiated final purchase contract or all contracts required for the acquisition of the property is the basis for the closing of the legal transaction. Inadequate due diligence procedures create potential post-sales risks such as a failure to properly identify environmental issues, or failure to obtain and confirm clean title of the property. Once a transaction is closed, only limited activities along the specific reps & warranty catalogues may be taken to deal with negative aspects, which have not been identified and adequately addressed in the context of a due diligence.

Project design

The objectives of the project design should be to balance the requirements of the intended user (functionality) with construction costs and sustainable operating and facility management costs, the expertise of construction firms, planning requirements, engineering considerations and aesthetic preferences in order to produce a project-specific optimum design for the site.

Detailed plans for land, structural and capital improvements have to be prepared and necessary permits and licences obtained.

With the intended marketing and leasing in mind, the design of the structure to be built and / or capital improvements to be made to an existing structure (taking into account tenant specifications) has to be completed and documented in detailed working drawings and specifications. The feasibility analysis should be kept updated with

the approved development / capital improvement plans, intelligence on competitor activities, engineering analyses, regulatory requirements, detailed land development, architectural and capital improvement plans and drawings for project, project budget, and approved building permits.

A significant risk is that the project design does not meet market needs and results in lower than anticipated rents or sales proceeds. Also, the initial project design may not address all regulatory issues. Costs to comply with regulatory requirements may reduce projected margin or return.

Procurement

One of the main procurement tasks of the real estate developer is to obtain a building permit within the schedule and on the basis of the previously developed usage type. The usual risk during this stage is that bids from vendors / contractors require more time and / or money than originally anticipated in the feasibility study, and that satisfactory vendors / contractors cannot be identified. Vendor/ contractor negotiations may result in substantial revisions to project design.

Construction

The construction phase starts with the granting of the building permit and the aim is the completion of the project within the planned framework of schedules, costs and quality. Once all necessary permits have been obtained, the developer gives the orders to start work.

The real estate developer retains a coordination and internal reporting function. The building owner's functions that cannot be delegated are performed within the context of corporate management. All construction, planning and consulting contracts are entered into, and project controlling / project accounting tasks are performed in this context. There are further obligations to act as representative vis-à-vis all project participants and especially vis-à-vis the public during the entire development period, as well as the task of reporting to the principal / investor or the providers of outside capital.

The high portion of outside financing makes real estate developers very susceptible to variations in the project yield because of the leverage effect. Negative as well as positive events have an over-proportional influence on the developer's equity yield. Risks during this phase include the weather affecting building time, the viability and reliabil-

ity of vendors and contractors, change in prices for materials and labour, as well as physical characteristics of property and improvements and changes to building code, labour laws and regulations driving time and cost changes. The availability of financing depends on credit market conditions, economic conditions and industry trends, which are affecting construction prices, availability and letting prospects. Even changes in such inconspicuous items as accounting rules may result in differences to forecasted (if not underlying commercial) profit and affect investors' and lenders' perception. Failure to meet construction deadlines will result in penalties, and inadequate procurement process may lead to excessive costs, as would poor construction management oversight.

The marketing of the project via leasing or sale can begin at any time in the process, but is likely to occur towards the end or after completion. This is however, a market driven and asset type related decision. Typically it is the objective of the trader developer to market as early as possible, as an early leasing or sale will reduce financing costs and minimise the risk that specific tenants requirements necessitate late and costly changes to design and construction. Thus, the project marketing must be a priority in the developer's initiation / concept from the very beginning.

2.5.5 Project marketing / disposal

In real estate industry practice, distribution policy is often characterized by specific forms of in-house and third party sales. Specialized forms, such as the sale of shares in open-ended or closed real estate funds will not be more closely considered at this point. As the completion of the construction project approaches, activities shift increasingly in favour of project marketing, while some individual marketing tasks have already proceeded in parallel with the entire development process. The tasks associated with marketing can be assigned to third parties, i.e. brokerage organisations. Since the long-term success of the property is very strongly dependant on an effective leasing strategy in general and on finding an appropriate mix of tenants in particular, many developers retain marketing in house.

The focus is therefore on developing and safeguarding a 'unique selling proposition' (USP), which endows the project with advantages or benefits in the eyes of later users

or investors compared to competing projects or properties, and in this way introduces important determinants of competition in addition to price.

A generally applicable incorporation of the leasing performance phase into the development process is not possible and not required. Leasing activities commence with the initial contacts with users. The earlier leasing takes place, the greater will be the (financial) security of the entire development project.

Marketing and prospecting aim to provide promotional materials and information to prospects and enable to identify tenants to lease the property.

As part of this task it is necessary to plan and budget a detailed marketing, advertising, and promotion program. Cooperative agreements with brokers need to be developed and managed, and leasing staff and internal procedures have to be in compliance with government regulations. After initially providing promotional materials to prospective tenants, it is necessary to collect their data and conduct follow-up contacts.

Significant risks relate to the effectiveness of marketing: advertisements may not be placed effectively and may be unable to reach its target market, the advertising may be excessive and not cost effective, advertisements and promotional materials may be visually unappealing, and promotional materials may not contain sufficient information to satisfy prospective tenant's questions.

Lease negotiation and execution involves the screening of prospective tenants, and negotiating, preparing, and executing lease agreements, thus allowing the property to be leased at the highest possible rent to tenants with low credit risk. Ideally, the quality of the tenant will enhance the value of the location.

Key performance indicators to evaluate the effectiveness of the leasing process are brokerage expense as a percentage of annual rental income, advertising money spent per prospect or advertising money spent per square meter leased. A comparison of budgeted rent to actual rent should be made throughout the leasing process, and the occupancy rate should be monitored. Other data to be collected and analysed includes leasing and marketing expense as per cent of revenue, and average free rent (or concessions) on new leases.

Significant risks of the leasing process are that not sufficient tenants are attracted to the development. In a bid to achieve full occupancy, larger incentives may have to be

provided to tenants and sub-optimal contracts are signed, ultimately resulting in lower returns. Insufficient occupancy may be because contracts cannot be executed due to qualification issues, or tenants decide not to lease space due to market reasons or asset type. Further, sub-optimal contracts arise if lease agreements are not prepared in accordance with legal requirements, clauses in lease agreements are vague and cause misunderstandings, and uncompetitive lease terms are granted because of a lack of market knowledge or negotiation skills. There is a significant risk that a tenant can terminate a legally faulty agreement prematurely, especially after market rents have declined, forcing the owner to seek a new tenant in adverse market conditions. Other risks include the possibility of breaching laws if leasing agents do not produce sufficient documentation to comply with laws of equity. Finally, a less quantifiable risk is to generate an unattractive tenant mix, which affects the perceived popularity of the project and negatively affects long term rent levels achievable by the property.

The development process ends with the completion, handover for use and / or disposal of the project. In the event that the project is not intended for sale, it is transferred into the developer's own holdings. From the perspective of the property life cycle, this initiates the property and asset management phase, which extends until the redevelopment of the property. The timing of the property sale is dependent on the exit strategy of the project sponsors. Accordingly, it is not possible to assign a generally applicable place within the overall development process to this stage in the value-added chain. Risks related to exit can be caused by a failure to exit at the right time. Capital tied up in excess / underutilized real estate undermines returns and prevents it being recycled into higher yielding projects. Also, if the selected exit strategy does not correctly reflect market conditions, it will not maximize return. Limited access to capital markets (e.g. IPO, securitization) may negatively affect returns and prevent exits altogether. If the developer is unable to manage flow of information to prospective purchasers, or has insufficient contact management, the selection of potential purchasers will be sub-optimal and potentially lead to lower than possible sales prices being achieved. There are also execution risks in the form of inadequate due diligence procedures (post-sales risk) and mismanagement of the closing process. Both can cause uncertainty, delays and financial loss. An insufficient executive approval process shows the failure of internal risk management.

2.6 Concluding remarks

The concept of risk from the perspective of real estate development comprises four fundamental components; it carries an element of uncertainty, it affects the objectives of the development organisation, it potentially has a material effect on the organisation and it is viewed not only as a threat but also as an opportunity thereby reflecting the entrepreneurial nature of the industry. The identification of risks involves identifying those incidents occurring internally and externally that could affect the strategy and achievability of the objectives of the development organisation. The multi dimensional study of risks provides the criteria by which to analyse risks in the real estate development sector. The characteristics of real estate development can be divided into those that are unique, those that are generic and those that are specific. Real estate development is unique in that it is inherently risky; it is tied to its location, is heterogeneous, scarce and has limited substitutability. The generic characteristics of real estate development are that it is complex, dynamic and is a multi-disciplinary challenge. The duration and complexity involves time to complete a project and a lack of flexibility to react to changes in demand. Furthermore acquisition and contracting requires considerable investment, which usually is also provided by external sources. The long life cycle means that refurbishment and repositioning are required at specific points in the lifespan of the asset. The specific characteristics encompass the existence of sub markets, the dependency of and interrelation with upstream and downstream markets, intransparency and government influence. The study of risk from the perspective of the developer has given a clear insight into the research question, which this chapter addressed:

- 1 What are the characteristics, key business processes and associated key risks of real estate development?

Due to the complex and unique nature of real estate development, event-sequence modelling of the development process provides a clear understanding of the different process stages. During each stage of a real estate development - project initiation phase, project conception, project realisation and management, and project marketing and disposal - a range of process specific areas of risk has been identified which could materialise, leaving a significant to high impact on the outcome of the project.

3 Risk management in real estate development

Chapter three examines the academic and applied considerations which underlie the risk management aspect of this dissertation and provides insight into the following related research question:

- 2 What are key principles and process-related aspects of risk management according to relevant areas of literature?

In this context, definitions, fundamental characteristics and approaches of risk management are explained, utilising existing concepts. The generic risk management processes described in existing risk management standards such as COSO and the UK risk Management Standard are being considered to provide a foundation for devising a model to be discussed in the context of the real estate development industry. The common core elements in the generic processes are identified and combined with academic research on the risk management process in order to arrive at a simple model for application in the real estate development industry. The relevant fields of literature relating to this question are presented and reviewed and a criterion for effective risk management is established. The examination is performed with a focus on risk management as part of general management theory, drawing upon and applying it to the real estate development industry as appropriate. This is followed by establishing eight propositions on how real estate developers practice risk management, which are to be tested by empirical research in the following chapters. In this context, insights are drawn from previous research and other literature conducted in this area and others are based on the author's working experience in the real estate development sector.

3.1 Definition of risk management

Risk management is a rapidly developing discipline and there are many and varied views and descriptions of what risk management involves, how it should be conducted and what it is for. The handling of risk has been an issue from time immemorial. While the role of a risk manager has been described as one of the very first challenges faced by mankind, risk management as a business concept and strategy emerged during the

course of the economic developments of the 19th century. BERNSTEIN (1996, p. 3) describes risk appetite and management as the key to economic prosperity as follows: *"The capacity to manage risk, and with it the appetite to take risk and make forward-looking choices, are key elements of the energy that drives the economic system forward."*

As with the definition of risk, there are equally various definitions of risk management in use (MAIER, 2004). LASTER (1999b, p. 15) noted that: *"Since the whole idea of a professional risk management is fairly recent, there are many different definitions of just what management is."*

If management is understood, as per ULRICH / DYLLICK / PROBST (1984), as a task encompassing the structure, control and development of social, purpose-oriented systems, risk management should be perceived as a discipline that addresses the systematic and successful handling of risks arising within an organisation. HOEVE / SCHWEIZER (2001) state that an 'enterprise-wide' or 'integrated risk management' is the most comprehensive and consistent form of risk management which links the risk management process in all areas of the organisation with its strategy and ongoing planning, control and other corporate processes. DICKINSON (2001, p. 360) further defines the enterprise risk management as: *"(...) a systematic and integrated approach to the management of the total risk that a company faces."* The essence of an integrated risk management according to DOWD (1998, p. 230) is the *"(...) management of overall institutional risk across all risk categories and business units"*.

The aim of risk management is to improve the risk situation of an enterprise to achieve a higher level of corporate security, thereby supporting value and success-oriented corporate governance. For PEZIER (2002), risk management is to be regarded as an integral part of good management. It is therefore the task of risk management to continuously provide management with the best possible information, systems and procedures to form a solid foundation for the risk decision-making process regarding uncertainties and / or potential opportunities and risks. This includes, in particular, information that is relevant for executive decisions as well as information regarding factors which have an impact on risk and, their possible implications and which strategies and options the management can resort to when handling risks. However, the objective of corporate risk management cannot be the minimisation of all risks. Rather, given the

fact that entrepreneurial action is always associated with the assumption of risks, the goal must be to attain a well-balanced situation between risks and expected returns (risk / reward), taking into consideration the comparative advantages of the enterprise and the risk appetite of the decision-makers. Thus, the management of risks must be based on the top corporate objectives and results in the management being permanently faced with considerations regarding opportunities and risks. Risk management must enable the organisation's management to actively influence the corporate risk as an additional operational parameter in order to reflect the pre-set corporate objectives and the risk policy requirements.

This dissertation is based on a risk management understanding in accordance with DELOACH (2000).

Risk management is a structured and disciplined approach that aligns strategy, processes, people, technology and knowledge with the purpose of evaluating and managing the uncertainties a real estate development organisation faces as it creates value.

This definition reflects certain fundamental ideas, namely that risk management is

- a systematic process;
- an ongoing challenge;
- applied in strategy formulation;
- aligned with the real estate development organisation's specific risk appetite;
- applied across the whole real estate development organisation, involving every unit and level;
- designed in order to identify events potentially affecting the real estate development organisation; and
- intended to preserve value and allow value to be created.

3.2 Benefits of an effective risk management system

An effective risk management system should potentially benefit the organisation in a number of ways (JORION, 2001; MEULBROEK, 2001). These have been divided into internal and external benefits for discussion below.

The most obvious of the internal benefits are the ability to gain a much better understanding of the risks that are potentially facing a development organisation and its activities and viewing risks as opportunities rather than solely as threats. Risk management therefore shall support a sound decision-making, balancing risks and rewards (GEHNER, 2008; PEZIER, 2002). Risk management provides valuable information for strategic planning and decision-making by the organisation and facilitates a sound identification and assessment of risks. As a result of this, decision-makers in the development industry are expected to make better decisions with respect to strategic and operational choices. An organisation may pursue opportunities with greater confidence knowing that it understands the risks inherent in its development activities. At senior management and board level both accountability for and confidence in managing risks are increased, thereby enhancing corporate governance through oversight structure and systematically aligning risk management activities with business strategies. This flows through in terms of aggregating risks and opportunities for improving results, leading to sustainable capital allocation. Finally formalized risk management procedures and documentation result in the identification of opportunities to share knowledge and best practice. It acts as an appropriate working tool, creating transparency and confidence in the organisation's business processes. The external benefits encompass the areas capital raising, insurance and meeting regulatory requirements. Formalised risk management processes are important when raising capital from banks and other capital partners or in order to demonstrate to the public the credit worthiness in connection with the handling of risk. With regard to buying insurance solutions, the organisation benefits from the possibility of risk-adjusted insurance premiums with corresponding surplus sharing if there is evidence of a well-developed risk management culture within the organisation. A documented risk management system facilitates the documentation of compliance with statutory requirements in the areas of product liability, occupational safety and data protection. Thus, effective risk management supports increasingly demanding investor's and regulator's requirements.

3.3 Risk management process

A risk management process is comprised of all organisational rules and procedures for the identification, analysis, assessment and control of all potential risks as well as the control and supervision of the profitability and efficiency of any measures taken. Risk management practices vary greatly and the process itself has meant different things to different people. As a result, risk management operations run the risk of being fragmented and lack central visibility and overview.

In its practical implementation, a risk management system requires a clearly defined risk policy, a uniform risk terminology, a uniform risk management process, standardised tools and an appropriate risk management organisation. To this end, various risk management bodies have provided risk management frameworks to provide the structured generic guidance to help enterprise to enhance their risk management efforts and to better deal with risks in achieving their objectives. These standards enable organisations to compare their own risk management procedures against best practice and what is regarded as acceptable by other organisations.

Recent risk management standards and guidelines include inter alia: the risk management standards of the Canadian Standards Association (1997), the Standards Australian and Standards New Zealand (2004) or the Federation of European risk Management Associations (2002). The International Organization for Standardization (ISO) has published the so-called ISO 31000: "Risk Management – Principles and Guidelines". All these standards are similar with regard to the generic process of risk management. In addition, the Practice Standard for Project Risk Management (2009) published by the Project Management Institute provides benchmark for project management professionals for single projects.

Two important risk management standards frequently used in Europe are The Committee of Sponsoring Organisations of the Treadway Commission (known as COSO) '*Enterprise Risk Management (ERM) – Integrated Framework*' published in 2004 and the '*Risk Management Standard*', published in the United Kingdom in 2002. These two standards will be presented in further detail in this dissertation. The COSO standard is a comprehensive guide to effective ERM, which is defined by COSO (2004, executive summary, p.4) as:

“Enterprise risk management is a process, effected by an entity’s board of directors, management and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives.”

It covers all aspects of ERM including definitions, language, roles and responsibilities within the organisation, criteria for determining risk management effectiveness and provides detailed guidance. The COSO standard also provides examples of approaches used by various risk management practitioners.

The framework considers objectives at the various corporate levels in four categories: strategic, operations, reporting and compliance. In parallel, it focuses on eight interrelated components of the risk management process as shown in the diagram below:



Figure 3-1: Key elements of enterprise risk management (COSO, 2004, exhibit 1)

The UK Risk Management Standard is the result of a joint effort by AIRMIC (the private sector risk management association) and ALARM (the public sector risk management association) and IRM (the profession's educational body). The intention of the standard was fourfold: to provide agreed terminology, process, organisational structure and objective for risk management.

The purpose was to develop a practical standard which was not rigid but instead set out the principles to be followed. Risk was defined using ISO/IEC guide 73 which encompasses both the upside as well as downside. The standard sees risk management as an ongoing process, which is core to both strategic management and organisation's culture. The standard outlines the strategic process, starting with an organisation's objectives through to the identification, evaluation, mitigation and transfer of risk.



Figure 3-2: The Risk Management Process (IRM / AIRMIC / ALARM)

It is beyond the scope of this dissertation to conduct an in-depth study and comparison of the various aspects of these standards. However, for the purpose of this dissertation, the standards provide a sound basis for reviewing the various stages of a systematic risk management process, which has been identified as one of the fundamental elements of risk management. In general, each risk management framework constitutes a permanent, dynamic and systematic process in the sense of a control loop, with

the risk management process essentially consisting of four phases, namely identification, assessment, control and documentation (or monitoring). Although each individual framework has these four core areas in common, the terminologies, components and complexities of the control loop vary. The risk identification process is to identify possible risks which may affect, either negatively or positively, the objectives of the business and the activity under analysis. Risk assessment is defined as the overall process of risk analysis and risk evaluation (ISO/IEC Guide 73) and will help in determining which risks have a greater consequence and impact than others as well as the probability of the event occurring. This is followed by the risk control phase, which evaluates whether the level of risk found during the assessment process requires management attention. Risk monitoring is the periodic tracking of risks and reviews the effectiveness of the treatment plan.

This approach has been widely used by many academic researchers such as HALLER (1986) and WIEDENMANN (2005) and will be further examined below from the perspective of the real estate development industry.

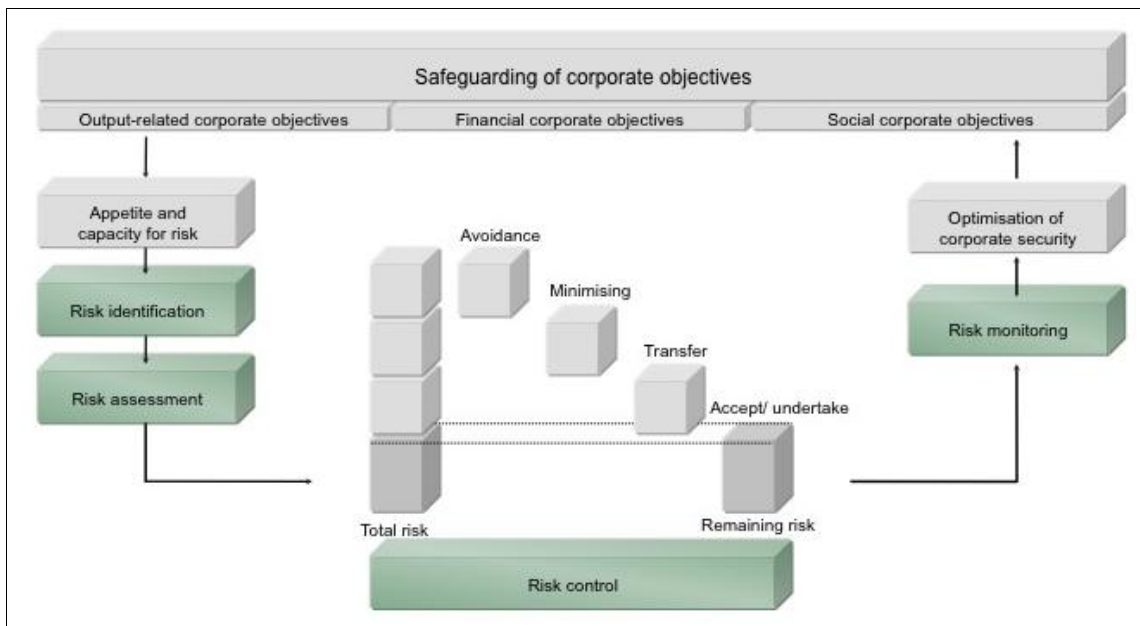


Figure 3-3: Risk management process in the real estate development industry (based on HALLER ,1986, pp. 25 and 27 and WIEDENMANN, 2005, p. 24)

The safeguarding of corporate objectives; output-related, financial as well as social encompasses all areas of the risk management process. All development risk management begins with the assessment of the corporate appetite and capacity for risk fol-

lowed by the four core risk management activities, namely risk identification, risk assessment, risk control and risk monitoring. These are discussed below.

3.3.1 **Strategic objectives and risk appetite**

The fundamentals of risk management must be formulated in the form of a risk policy, which is considered part of the general business policy (KNIGHT / PRETTY, 2001). The risk policy focuses on safeguarding the corporate objectives, particularly regarding the continuation of a company as a going concern. While the practical implementation can take on very different forms, it is possible to summarize some characteristics of an organisation's risk policy:

- it constitutes a 'system of policy decisions' for the purpose of guiding operating activities with respect to the problem of risk;
- as a specific segment of general corporate policy, risk policy articulates the organisation's fundamental approach to risk, security and control;
- risk policy sets the principal direction intended to serve as the established objective for any risk management program from a strategic perspective.

The risk strategy is therefore a key component of the overall corporate strategy and indicates the risk / reward ratio the organisation is prepared to accept. GEHNER (2008) points out that the acceptable level of project related risks in relation to the organisational objective of continuity (risk appetite) is that the total risk of all projects must not jeopardize the survival of the organisation.

A common understanding of how risk and its management is to be defined in the organisation and a uniform use of language and terms are indispensable. With increasing globalisation of real estate development organisations, a common organisational culture becomes increasingly more challenging. DORENBOS / HAGENBEEK / NOZEMAN (2007) point out the respective idiosyncrasies of various cultures in regard to risk and note that some corporations avoid activities with a totally different culture for this reason.

The creation of a uniform risk culture thus becomes a management task comprising the use of common definitions, support and understanding of risk management, clear concepts and approaches as well as all of management acting as a model. It should also be noted that the quality of the entire risk management process depends on appropriate definition and classification.

3.3.2 Risk identification

The primary objective of this phase is the comprehensive identification of any disruptive factors and their effects within the overall context of corporate practice (HALLER, 1986; HANLEY, 2001). The categorization of risk can be used to give an insight into the various types of risks and can also be used for structuring the identification of risk and placing the identified risks on to the critical path of the real estate development process (GEHNER 2008, p.30). According to ROTH / ESPERSEN (2002) such risk categorisation achieves two important goals, namely (a) the identification of the existing risks within an organisation and (b) the combination of risk information within one consistent reference framework, which permits the mutual understanding and monitoring of the risks identified.

Risk categorization may differentiate, amongst others, between strategic and operational risks, output-related and financial risks, internal and external risks, individual and aggregated risks (cf. Inter alia COSO 2004; DOHERTY, 2000; MILLER, 1992; SANTOMERO / OLDFIELD, 1997; VAUGHAM, 1997).

For the purpose of this dissertation, a general risk categorization as referred to by DELOACH (2000) is favored, which differentiates risks into the following three main categories:

- i) Environmental: uncertainties affecting viability of the business model (when external forces affect the organization's performance, or make its choices regarding its strategy, operations, client relationships, organisational structure or financing obsolete or ineffective)
- ii) Process risks: uncertainties affecting the execution of the business model (arising when internal processes do not achieve the objectives they were implemented for)
- iii) Information for decision-making risks: uncertainties over the relevance and reliability of information that support value creation decisions (arising when information used to support business decisions is incomplete, not actual, inaccurate and not liable or also irrelevant for a decision to be made)

This categorization benefits from giving due weight to both internal and external factors and also from being integrative through its cross functionality. It also benefits

from being highly adaptable to change which, in times of economic uncertainty when risk management is most important, is essential. An example of general corporate risks classified in three categories is shown in Figure 3-4.

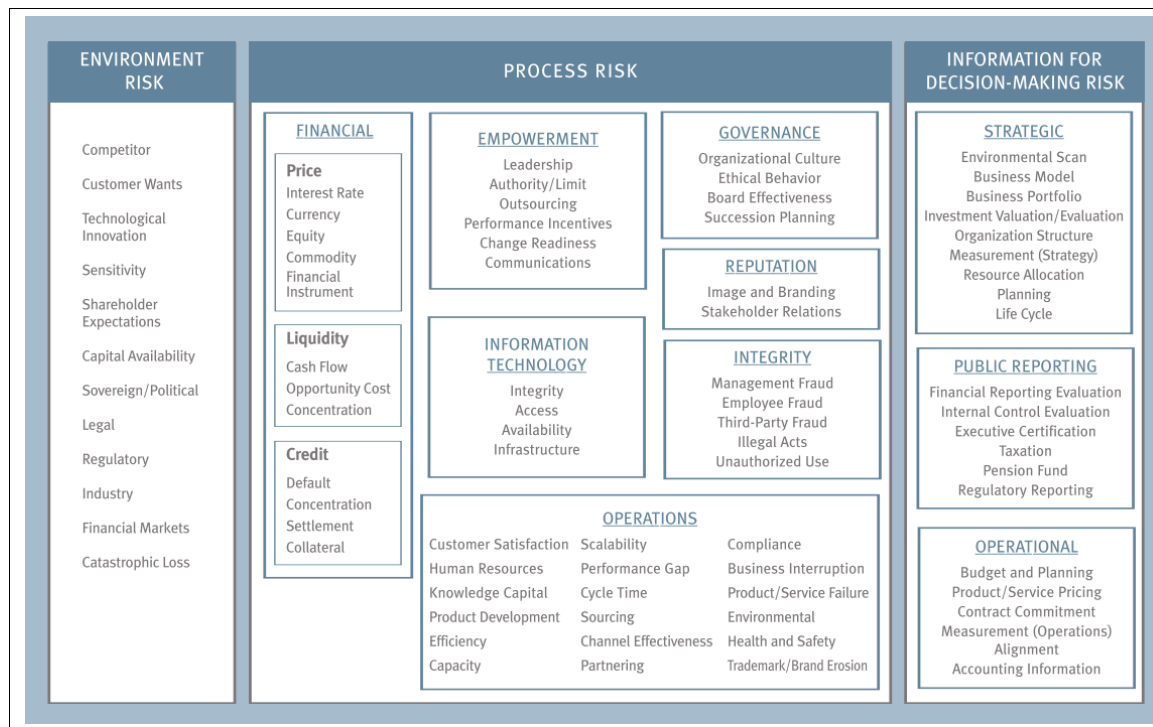


Figure 3-4: Generic corporate risk model (PROTIVITI, 2006, p. 54)

From the perspective of real estate risks, MAIER (2004) presents a risk matrix as shown below.

<div> <div></div> <div>Risk- categories</div> </div>	Systematic risks	Unsystematic risks
Existential risks	<ul style="list-style-type: none"> • Administrative risk • Employment market risk • Employment risk • Income risk • Inflation risk • Infrastructure risk • Communication risk • Economic risk • Culture risk • Country risk • Nature risk • Regulatory risk • Political risk • Price risk • Legal risk • Socio-demographic risk • Tax risk 	<ul style="list-style-type: none"> • Risk of inherited environmental liabilities • Structural construction risk • Taxation risk • Operator risk • Land risk • Revenue risk • Completion risk • Investment risk • Cost overrun risk • Management risk • Market transparency risk • Property risk • Risk of accidental loss/destruction • Location risk • Environmental risk • Depreciation risk
Financial risks	<ul style="list-style-type: none"> • Base risk • Capital market risk • Conversion risk • Transfer risk • Currency risk • Exchange rate risk • Interest rate risk • Term structure exposure • Interest volatility risk 	<ul style="list-style-type: none"> • Lending value risk • Consultancy risk • Valuation risk • Credit risk • Business partner risk • Capital structure risk • Know-how risk • Pricing risk • Default risk • Leverage risk • Liquidity risk • Planning risk • Realisation risk • Fixed-rate risk • Interest rate risk

Figure 3-5: Risk categories and risk types in the real estate sector, MAIER (2004)

This draws a distinction between systematic risk in general market development which cannot be influenced and unsystematic risk in micro economic determinants which can be directly influenced to some degree.

A further distinction is made according to their areas of origin, between existential and financial risks. Existential risks result from the property-specific uncertainties of a real estate investment (or enterprise) and reflect an operational uncertainty. Similar to unsystematic risks, existential risks can be reduced through diversification. Financial risks are independent of the individual property and originate from financial transactions and/or strategies. A wide range of tools offered by modern financial management may facilitate the control these risks.

The effectiveness of risk identification has a marked impact on downstream management processes. It is important to ensure that each risk is carefully defined and explained to facilitate further analysis and this is critical to successful risk management. Only those risks that have been identified can be analysed and controlled. Errors in risk identification only become apparent when an undetected risk becomes acute and therefore potentially threatens the very existence of the enterprise. The challenge is to achieve a degree of risk identification that is as comprehensive and up-to-date as possible. The risk identification process is usually both time-consuming and complex, particularly in the case of initial identification (HOBUSS, 1999).

To a certain degree, the identification of risk in real estate development is expected to be performed intuitively and therefore based on subjective experience. The level of knowledge, the qualifications and the experience of the personnel involved in risk identification play a significant role within the identification process. In order to obtain a wide variety of subjective risk identification perspectives, a diversified and robust employment program should be in place. The risk management program should incorporate the subjective experiences of the specialist personnel and have an enterprise wide input in the risk management system. This however, must be a controlled process. According to CAREY / TURNBULL (2001), risk identification must be performed systematically and by using appropriate methods in order to increase effectiveness (also HÖLSCHER, 1999). In this context, a close connection to the specific industry as well as the specific situation of the individual organisation at a given key date, which forms the starting point for risk identification purposes, is decisive (CAREY / TURNBULL, 2001). The UK risk management standard recognises that this process can be carried out by outside consultants but it promotes an 'in-house' approach as a preference for better effectiveness (section 4.1 Risk Identification, p.5 of the Standard). ROMEIKE breaks down the methods available for risk identification into collection and search methods as presented in Figure 3-6.

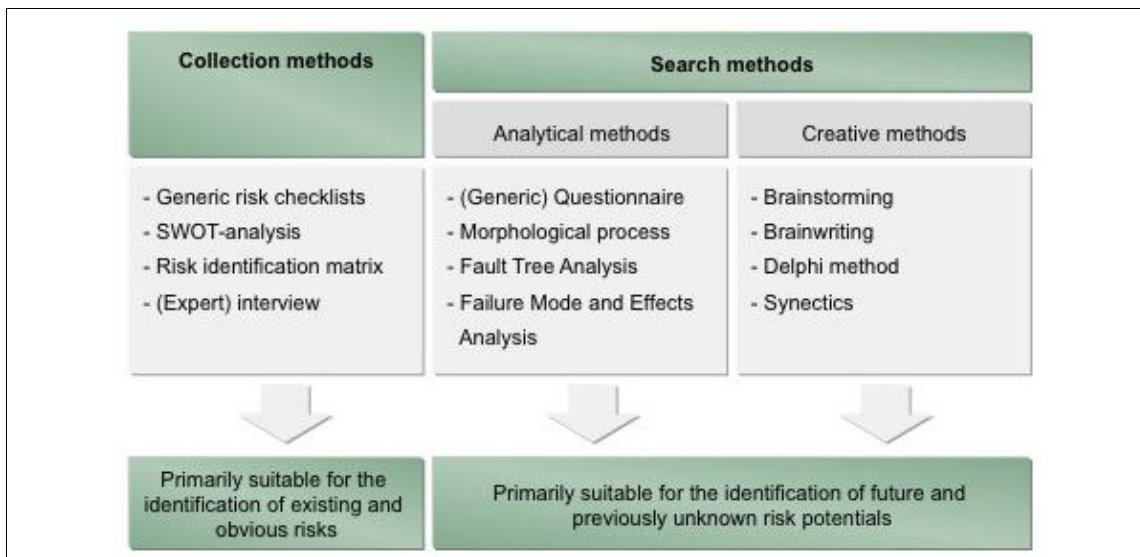


Figure 3-6: Methods of risk identification (ROMEIKE, 2003, p. 174)

The COSO ERM Framework states that companies more advanced in enterprise risk management typically employ a combination of techniques that consider both past and potential future events. It recommends that an organisation should select techniques, which are in line with corporate philosophy, and that resources are made available for training and appropriate tools for the process (COSO, 2004, section 4).

3.3.3 Risk assessment

Risk assessment is the process of evaluating identified risks and the interrelation between risks. During the risk assessment, the individual risk situation of any given organisation (risk portfolio) is mapped, forming the basis for subsequent risk control. In order to derive an overview of the appropriate actions required in respect of the risks identified, these risks are therefore, in a second step, analysed and evaluated. The aim is to obtain insights into the expected value of risk and the degree to which risks may jeopardise the achievement of corporate objectives (GLEISSNER / WIEGELMANN, 2012; HÖLSCHER, 1999). In addition, the higher the expected likelihood of occurrence, the less the potential future event is a risk and the more it is an operational issue. This relationship between strategic and operational risks is discussed above.

The meaningfulness of the assessment models used depends significantly on the amount of data available and the specific data quality. Due to the significance of the data, many organisations establish a special data management capability, which is generally considered a critical success factor in risk management.

3.3.3.1 Assessment methods

The methods used for risk assessment depend on the wealth and quality of available information (WIEGELMANN, 2012). Assessment methods can be broken down into quantitative methods and qualitative methods. The quantitative approaches are based on mathematical methods and only apply if sufficient risk-specific data are available. In the ideal scenario and where sufficient data is available, both significance and likelihood can be derived on a quantitative, and therefore objective, basis. Quantitative assessment techniques can be broken down into benchmarking, probabilistic and non probabilistic methods (COSO, 2004, exhibit 5.2, p.52). The most rudimentary form of risk analysis takes the form of simple adjustments of development variables along the lines of a worst-case scenario (DUBBEN / SAYCE, 1991; HARVEY, 2000). For example, construction costs can be calculated at higher than current estimates and rental values can be calculated at lower than current figures. However, such rudimentary risk-adjustment is deterministic and highly subjective, leading to rather questionable estimates.

A more systematic approach to risk analysis is sensitivity / scenario analysis. Sensitivity analysis examines the effects on profitability of changes (such as high, low and medium values) of any of the key variables (GLEISSNER / WIEGELMANN, 2012). It identifies the key variables and how changes in individual variables might impact on the final value. Scenario testing is a methodical improvement on sensitivity analysis. Its aim is to examine how a combination of changes in the development variables in an appraisal affects the outcome (RODNEY / VENMORE-ROWLAND, 1996). In the UK, MARSHAL / KENNEDY (1992) found sensitivity analysis was used by 95 per cent of developers. While sensitivity / scenario analyses are useful as rudimentary risk analysis techniques that allow developers to arrive at a decision, they fail to identify the chances of the possible variations becoming fact (BAUM / CROSBY, 1988).

Probabilistic risk evaluation techniques, which came in the early 1960s, are a systematic advance on sensitivity / scenario analysis. According to BYRNE / CADMAN (1984), probabilistic techniques are a way of measuring uncertainty. They assist the appraiser in progressing from identifying a range of outcomes for control variables to assigning probabilities to each of these variables.

A methodical improvement in probabilistic techniques is Monte Carlo simulation, initially developed by HERTZ (1964). A study by MARSHALL / KENNEDY (1992) shows that only 5 per cent of UK practitioners claimed to occasionally use it, owing to its academic nature. This is despite the vast expansion in the use of spread sheets, which facilitate simulation exercises.

3.3.3.2 Differentiation of degrees of urgency

Risk as such entails a potential threat to the achievement of corporate objectives, which has a certain probability of materialising. The assessment of risk is therefore intended to indicate how great a deviation from corporate objectives is to be expected, i.e. it is intended to express the urgency of a risk. As a first step, a rough classification of the different degrees of urgency is carried out as follows (HALLER, 1975; HÖLSCHER, 1999):

The first category includes 'small risks' which are characterised by a low degree of urgency. The frequent occurrence of small risks generally results in an even burden on liquidity, which can be addressed accordingly.

The occurrence of 'medium risks' may pose major problems for an organisation and therefore requires coordinated risk management measures. While a medium risk may cause a significant deviation from key corporate objectives, it does not threaten the sustained existence of an organisation. In contrast, a 'major risk' not only threatens the achievement of a specific goal, but also the sustained existence of an organisation.. Major risks, in particular the risk of natural disasters, should be avoided when possible or at least reduced to a level that is viable for the enterprise.

The above classifications of the levels of urgency are used in corporate practice whenever risks are to be expressed verbally. However, an adequate differentiation between the degrees of urgency of any specific risk is hardly feasible on this purely qualitative basis.

In order to form a sound opinion on a risk and its degree of urgency, an in-depth assessment of its likelihood as well as significance is needed.

An assessment may be performed on a quantitative or qualitative basis. In addition to the primary risk type, the possibility of carrying out a measurement is decisively de-

terminated by its ability to be performed, utilising an appropriate input of time and resources, and the available data. Models should be realistic enough to provide valuable results, but also compact enough to be used frequently and rapidly.

3.3.3.3 Expected value and risk portfolio

The determination of different degrees of risk urgency in its original form is the so-called expected value. This value is derived from the multiplication of the likelihood by the significance of a given risk (BANSE / BECHMANN, 2001). All other things being equal, the greater the likelihood and the significance of the deviation from the target are, the higher is the urgency of any given risk.

As BERNSTEIN (2000, p. 634) states *“Measuring risk without consideration of consequences converts risk management into little more than a game for mathematicians to play. (...) The focus of risk management must be on consequences.”*

The utilisation of a variety of assessment methods is intended to enable the mapping of the current risk situation of an organisation. This is often done by way of a risk portfolio which, in an ideal scenario, maps all the inherent risks of an organisation. This 'risk mapping' (SHIMPI, 1999 and HANLEY, 2001) enables the management to obtain a pragmatic overview of all relevant risks within the organisation. During the risk mapping process, the relevant process owners record and assess any risks identified in their area. DELOACH (2000, p. 118) describes risk mapping as *“(...) by far the most useful and widely deployed tool for risk identification and prioritization.”*

A risk area which is acceptable for the organisation and an unacceptable risk area are then determined for the risk portfolio, taking into consideration the risk policy. This will, in all probability, also necessitate the inclusion of aspects such as risk appetite and risk-carrying capability.

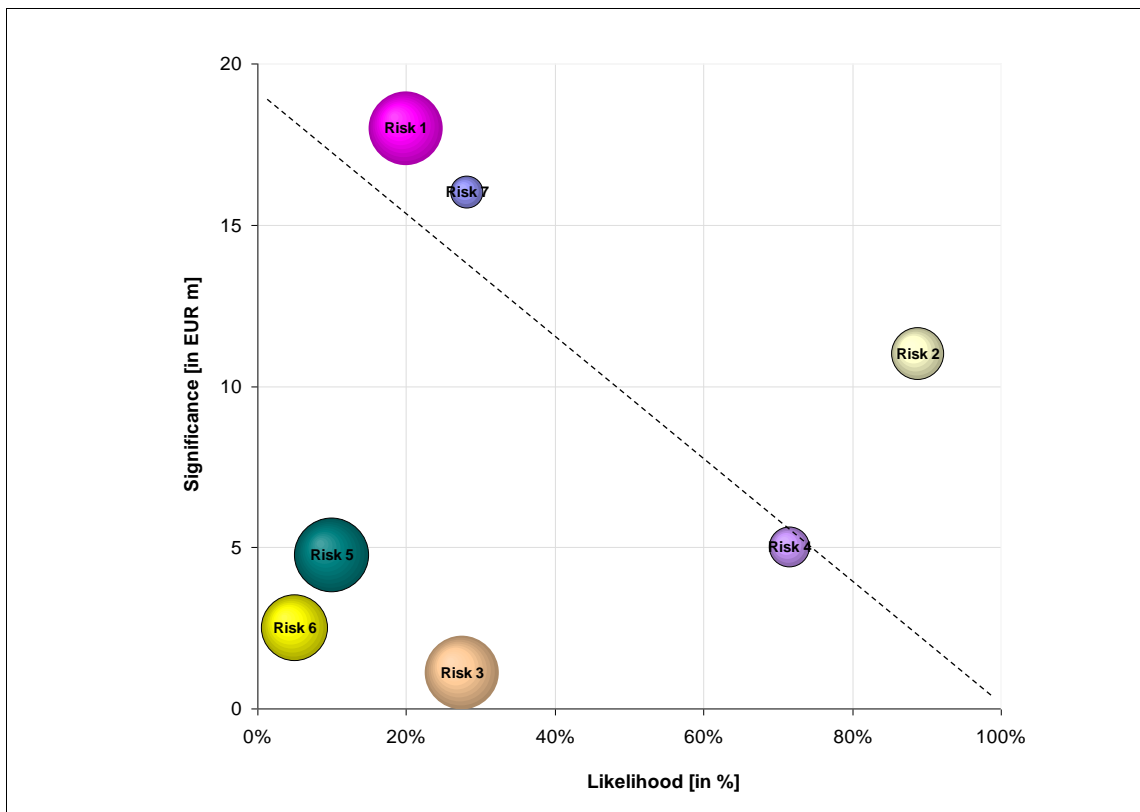


Figure 3-7: Example illustration of a risk portfolio

The translation of all risks shown in the above matrix results in the risk profile of a development project on an enterprise. The likelihood is indicated on the ordinate and the significance on the abscissa. In addition, it must be determined which fields within the matrix will trigger the need for further action.

It is possible to differentiate risk areas - on the basis of the formulated risk policy as well as the risk appetite of the responsible executive management - that are indicators of a specific need for action. Using the risk tolerance limit or a defined target margin of safety (target value), the tolerance limits can easily be recorded in the risk matrix in the form of a boundary line. All risks outside this line are in the range that is no longer tolerable and must be addressed by appropriate measures (critical risks). In aggregate, the overall risk situation thus serves to reveal priorities and constitutes a well-founded basis for decisions about precautions and control measures to be taken.

The basic principles of established methods for the assessment of likelihood and impact are set out below. In order to develop a more in-depth understanding of the possibilities for measuring risk, this is preceded by a categorisation of the different levels of uncertainty and the associated implications for assessment.

3.3.3.4 Relevant requirements for risk assessment methods in real estate development

The goal of risk assessment is to measure the risks assumed by an organisation and to express these risks in the form of an indicator. However, this indicator is not only intended to serve risk assessment but also the subsequent risk management and control. To ensure this, the risk assessment method for the developer must meet the following requirements:

The measure used for risk should be transparent and easily interpretable; otherwise it will not be accepted within the organisation. The risk measurement is likely to be interpretable as an impending monetary loss or gain. Moreover, as practice shows, risks that are not quantifiable in monetary terms are often excluded from risk management.

As risk is not only determined by the potential deviation from the target but also by probability considerations, any risk indicator should also include the probability aspect.

Where risk is intended to be measured at a higher aggregation level, the existing compensatory effects must be identified by means of diversification, as a simple adding up would considerably over-estimate the actual risk. Where feasible, the risk measurement should be carried out in an objective manner by using market prices or other external data. Corporate risk control can only be effective if it is based on a consistent system of risk measurement. The processes used for risk measurement must therefore be defined for the entire organisation. Finally, it would be desirable if the risk measure was suitable for the early detection of threats to the organisation and therefore for utilisation within an early warning system.

3.3.3.5 Risk catalogue

The insights gained during the risk identification and risk assessment are compiled in a risk catalogue for further analysis.

The development of a risk catalogue should fulfil two criteria. Firstly, a mutual understanding and / or a common definition of risk within an enterprise must be established. Secondly, all relevant risks must be identified but should only be included once in the risk catalogue (ERNST & YOUNG AG, 2002). It typically contains the following data for each risk identified:

- general categorisation the risk falls under (e.g. financial risk);
- specific categorisation of risk (e.g. interest rate risk);
- qualitative description of risk (perhaps coupled with an example scenario);
- assessment of probability of the risk identifies how likely this risk is to occur, classified into low, medium and high assessment of the impact of the risk as an assumption as to how sensitive the output is to this specific risk.

3.3.4 Risk control

Once risks have been identified and evaluated, it must be determined which risks require further action. Risk control is intended to actively influence the risks identified and assessed in order to manage all significant loss exposures through the targeted use of risk management measures. Those business processes, process components or audit areas for review having the highest risks should be prioritised. According to McNAMEE / SELIM (1998), the audit areas must meet the following three requirements: (1) they must contribute to the achievement of the enterprise's objectives (effectiveness); (2) they must be material with regard to their influence on the business processes (efficiency) and (3) the probability and the implications of a loss must be greater than the expenses incurred for control and management (profitability).

Fundamentally there are four risk control strategies (COSO, 2004; HALLER, 1986; LASTER, 1999a; NOZEMAN, 2008). Firstly, risks can be avoided by refraining from transacting high-risk business. Secondly, risk reduction can also be achieved by a timely reduction of the expected value of loss. Thirdly, transferring them to third parties may outsource risks. Finally, the acceptance of the residual risk that remains after taking risk control measures is also an option. There are a number of cause-related and effect-related strategies to handle the identified risks. Both active and passive risk management represent a further possibility for systemisation (HÖLSCHER, 1999). Active risk management directly affects the risk determinants by influencing the likelihood and / or significance of a given risk. In contrast to active measures, the tools of passive risk management do not alter the actual risk. Instead, passive risk management aims at enabling the organisation to cope with a risk when it materialises.

3.3.4.1 Risk avoidance

Where the risk assessment determines that particular risk position significantly exceed the limits of the risk strategy, risk control must be intensified. The most radical form of risk management is risk avoidance, which prevents any risks from materialising by reducing their likelihood to nil. Given an existing risk, risk avoidance implies the intentional exclusion of potential opportunities (HALLER, 1986). Therefore, risk avoidance will generally apply only where a risk represents a significant exposure potential when using alternative management measures and if it exceeds the risk appetite of an organisation (FÜRER, 1990; LASTER, 1999a).

Every entrepreneurial activity has an element of risk as it is impossible to eradicate risk completely. It is only possible to optimize risk outside of the risk appetite of an organization. Characteristic strategies in this area are retreat and exit strategies that aim at not assuming risks in the first place, or at eliminating such risks as quickly as possible should they arise.

3.3.4.2 Risk reduction

The prevention or limitation of loss by decreasing the likelihood of a disturbance occurring and its significance is called risk reduction (HALLER, 1986). For risks that do not appear suddenly, but rather emerge over a period of time, risk-reducing measures (so-called reactive measures) may be taken even after the risk has materialised. Another form of risk reduction is risk diversification whereby a single risk is disaggregated into several individual risks, which should, where possible, not be positively correlated (LASTER, 1999a).

3.3.4.3 Risk transfer

In the case of risk transfer, an organisation transfers the business implications of risks to external risk bearers (LASTER, 1999a). In principle, this strategy does not eliminate the cause of risk but merely passes the implications of risks on to third parties. On the one hand, the risk can be spread across multiple partners, with not only the risk but also the profit being shared among the partners; alternatively it is possible to transfer risk to third parties entirely:

The shifting of risk is the safest type of risk management; however, it is associated with relatively high costs and limited applicability. Certain risks, for example, may be transferred to suppliers or customers by way of contractual arrangements.

3.3.4.4. Risk retention

Risk retention entails the voluntary and involuntary assumption of possible risk implications (LASTER, 1999a). In this case, when safeguarding against risks, the relevant risks and their possible impact on the investment decision are deliberately accepted, with the risk appetite of the individual investor being the principal criterion for this decision.

3.3.5 Risk monitoring

The goal of risk monitoring is to examine to what extent operating processes adhere to the planned standards. In the monitoring phase, the primary focus is on evaluating the risk management process across all units and functions. Risk monitoring is multi-tiered and is primarily intended to determine whether

- the established goals have been met,
- risk management complies with risk policy;
- the organisation is efficiently designed and a corresponding risk culture is in place, and whether
- responsibilities have been clearly defined.

Risk monitoring consists of two core elements: control and reporting. During the control stage, risk management data are gathered and analysed through key indicator analysis and benchmark comparisons, among others, and reported both internally to the responsible functions and externally to its stakeholders.

Controls are generally related to operational or strategic aspects. While operational controls monitor the achievement of predefined targets, thereby performing a corrective function, strategic controls perform an anticipatory function in support of planning. The major risk control tools are systematic key indicator comparisons in the form of period, cross-section and target-to-actual comparisons. This tests the risk position of the organisation at a specific point in time. In this connection, value-at-risk is increas-

ingly used as a control. These tools represent a major contribution to the mapping of the risk position.

A risk management system must be adequately documented and the safeguards and control measures that have been adopted must be recorded in a summary report. This documentation serves not only to protect internal and external confidence but, in a loss event, is also considered important proof that a risk management system was created, that corporate risk management was improved and that the necessary loss prevention measures were taken. Further good reporting practises are an indication of continued corporate governance, which is important for financiers, investors, and other stakeholders of the project or organization. This is discussed further in the dissertation.

Reporting is vital at all levels of an organisation for risk monitoring. Management reports are designed in line with the information needs of individuals who are responsible for executing processes in line with the risk strategy / appetite of the development organisation.

Typically, the Board of Directors is primarily responsible for ensuring that an effective risk management system is in place. From an internal reporting perspective, communication of information is required in the first instance to establish a foundation by providing a tone from the top that stresses the importance of monitoring (COSO Guidance on Monitoring).

Risk monitoring is the final stage within the risk management process, but it does not represent the end of the risk management cycle. Up until now, the project risks have been identified, assessed, analysed, and some kind of risk handling strategy has been adopted for them. It is vital to continuously assess the effectiveness and efficiency of risk management in order to be able to identify areas for possible improvement (DELOACH, 2000). The risk management process must in no way be interpreted as a one-off event, but is necessarily subject to an ongoing adjustment and improvement process. Also risks are time-based and as such their impact and probability will vary with time. DELOACH (2000, p. 4) concludes, *"(...) redefining the value proposition of risk management is vital in this day and age."*

The ongoing monitoring and control of the entire risk management process generally results in a noticeable increase in process quality. Effective risk monitoring should have the following characteristics:

- the monitoring process is built into the daily working activities of the organisation as much as possible;
- when performed properly, risk monitoring will provide objective assessments of the effectiveness of the internal control system;
- it will use knowledgeable evaluators who fully understand the evaluation process and the organisation's objectives and are able to evaluate how they relate to each other;
- management and the board should be open to feedback on the effectiveness of the internal control system; and
- evaluations should be adjusted in its scope and frequency depending on the importance of the underlying controls and on the results of other monitoring procedures.

3.3.6 Structure and administration of risk management

Risk management is a critical task and part of the responsibilities of the Managing Directors or the Board of Management respectively. It is implemented in the organisation by way of a delegation of tasks, though the overall responsibility and the supervisory role remain with the Managing Directors or the Board of Management. The organisation's risk management policy and its characteristics have been discussed in chapter 3.3.1. This document sets down the organisation's risk strategy, appetite and management approach. Business unit management has primary responsibility to implement the daily workings of the risk management system.

Risk management's roles and responsibilities must be firmly established to cover as much as possible of the entire organisation. The objective is to avert undesirable events proactively through responsible action wherever possible; in terms of response, a detailed allocation of responsibilities promises quicker action in the event of a disruption, which has a positive effect on overcoming such incidents.

As a general overview, there are several possible approaches to implementing the risk management system within an organisation, with various options for structuring the organisational allocation of responsibilities:

Specialized risk management function

Depending on the size of the organisation and the specific characteristics of the industry, it may be advisable to establish a central risk management organisation. In practice, this area reports most frequently either to the CFO or directly to the CEO.

Risk management committee (Steering Committee)

Under this form of organisational implementation, a permanent project committee is formed, which is charged as a 'Risk Panel', monitoring the activities of the organisation, and serving as an advisory body to senior management.

Risk management outsourcing

The risk management tasks are assumed by an external partner, which provides the desired services to the organisation. However, the responsibility for strategic risk management always rests with senior management and / or the organisation's Supervisory Board.

Chief Risk Officer (CRO)

Under this approach, the responsibility for risk management is vested in the person of the 'Risk Manager' or possibly under the responsibility of the Compliance Officer. Thus this function is becoming increasingly prevalent in larger organisations along with the CEO and the CFO. In most cases, the area of the 'Chief Risk Officer' reports directly to the CEO and is thus very favourably established in the hierarchy. The assignment of personnel to a specialized function offers the advantage of enabling the monitoring and the reporting of risk situations to be centrally coordinated and implemented with clear roles and responsibilities.

3.4 Propositions on risk management practice in the real estate development industry

The analysis of risk management within real estate development in chapter 3.1 presents seven fundamental characteristics of an effective risk management system. This section utilises these characteristics to provide a framework for presenting the propositions on whether and to what extent real estate development organisations implement effective risk management. These propositions are formulated in order to represent what would be considered best practice and are used in the dissertation as an ob-

jective benchmark against which practice in the industry can be measured. Propositions based on the structural characteristics of the development organisation are also presented afterwards. These propositions form the basis for the second part of this dissertation where empirical research is conducted to determine their validity.

3.4.1 Risk management a systematic process?

The successful implementation of an ERM framework within the development organisation provides a high standard for a systematic risk management process (see chapter 3.3 for a discussion of the risk management process). A risk management approach that is characterized by a low degree of formalization and co-ordination may result in the application of differing terminologies and methods during risk identification, measurement and control by different individuals. In such a situation, there is no shared understanding of risks that may threaten a project or the development organisation as a whole. It is directly linked with the overall strategy and decision-making processes of the organisation. Threats and opportunities are identified and managed and risk optimization is an ongoing process.

Proposition 1: Developers have a structured approach towards the management of risks.

This would be evidenced by the presence of a formalised and integrated risk management framework to a large extent, standardised risk management processes being for the major risk categories, risk management being a topic at management level with a clear definition of duties and responsibilities, regular reporting of risk and risk management and there being suitable tools and systems available for identification, measurement and control of risk.

3.4.2 Risk management an ongoing challenge?

Risk management should be a continuous and dynamic process that is not limited to one-time actions and application. Rather it should be a regular process, which is embedded in other management activities. As an intrinsic component of daily activities, it means that a proactive rather than a reactive approach is taken to the management of risks. In practice, there is evidence that the development industry is practicing varying degrees of risk management. At the very least, feasibility analyses of projects are gen-

erally conducted at the onset of a project where the analyst would measure the incoming flows and outflows which require proper market analysis (BOYKIN, 1985). GEHNER / HALMAN / DE JONGE (2006) found that development sector made use of decision criteria to decide on the continuation of a project for example at the start of development and at the start of construction. These decision criteria can be seen as risk measures to keep the development process under control.

Proposition 2: Risk Management tends to be a regular process within real estate development organisations.

This would be evidenced by frequent risk reviews, systematic and defined control and monitoring procedures, ease with which the organisation performs the risk management process and the existence of an effective specialised risk management committee to oversee and manage the risk management process.

3.4.3 Risk management applied in strategy formulation?

The COSO ERM Framework requires that risk is managed from the top down rather than driven from the bottom up. Strong support from top management instils a sense of responsibility for risk management throughout the organisation. Objectives, strategies, policies and guidelines should be actively supported and communicated by the board and are executed and updated dynamically. The process of framing a risk policy helps executives and the board clarify to their understanding of the risks and their related impact on the business. The board of directors and senior management are responsible for establishing the appropriate culture to facilitate an effective internal control process and for continuously monitoring its effectiveness. A comprehensive approach for real estate developers to managing risk must take into consideration the reality that the organisation is managed within an environment of uncertainty. Risk management must be embedded in both the strategic planning process as well as the operations of the development business.

As a result, it is believed that real estate developers perform in line with regulatory requirements in this aspect, that is, that management of listed real estate developers have set objectives, strategies and guidelines and have communicated these to the adequate level of the divisions. It is believed that these are derived from the organisation's objectives, are updated on an annual basis and that the implementation and

execution of the guidelines are dynamically and actively supported by all business units and divisions. It is however unknown as whether there is a difference between the approaches of listed and non listed real estate developers. The main obstacles in applying risk management at the initial stage of the project life cycle have been identified as inadequate knowledge of risk assessment techniques and the lack of understanding of its potential benefits (GEHNER / HALMAN / DE JONGE, 2006; UHER / TOAKLEY, 1999). At the same time in early stages of the development process there is typically the most opportunity. In applying this to the development industry, it needs to be established whether organisations have formal processes to align risk management with corporate strategy which is an essential element for embedding a risk culture throughout the organisation.

Proposition 3: Risk management is an integrated process and development organisations have formal processes to align risk management with corporate strategy.

This would be evidenced by an enterprise wide strategy for risk management, and the recognition of the intrinsic benefits of risk management by the drivers and the composition of the risk management committee. Risk management should also be within the real estate development organisation's specific risk appetite.

According to the COSO ERM Framework, the risk appetite of the organisation acts as 'a guidepost' in setting the strategy of the organisation. Only after fully understanding the risk appetite, should the organisation set its objectives in the areas of strategy, operations, reporting and compliance. The risk appetite is in turn based on the corporate philosophy and the management style of senior management and indicates the risk / reward trade-offs within the organisation. A common definition of risk concepts, a common understanding of risk management and a uniform risk culture are indispensable in this context.

Proposition 4: Real estate developers conduct their risk management within the organisation's specific risk appetite.

This would be evidenced by a uniform understanding of the concept of risk and the awareness of the organisation's objectives and risk appetite, and these organisations have a risk management process, which is sufficiently effective in dealing with identified risks.

3.4.4 Risk Management applied across the whole real estate development organisation?

The COSO ERM Framework encourages organisations to take a holistic approach to risk management rather than confining risk management to various individual departments such as compliance, internal audit or insurance. In performing risk management in aggregate, this provides for uniformity, gives clarity, reduces overall costs and allows long-term value to be created for the organisation.

Proposition 5: Most development organisations have some measure of risk management activities and can claim to have an enterprise wide risk management strategy, i.e. risk management tends to be applied across the whole real estate development organisation.

This would be evidenced by a consistent and adequate risk management process; frequent risk reviews, systematic and defined control and monitoring procedures, the ease with which the organisation performs the risk management process and the effectiveness of a specialised risk management committee to oversee and manage the risk management process.

3.4.5 Risk Management designed in order to identify, assess and manage events potentially affecting the real estate development organisation?

Risk identification is considered to be the most important phase in the risk management process, for the very reason that, without identifying a risk, it is impossible to analyse, assess, or control it. Its function is threefold: to detect risks, which have not yet been recognized; to detect changes in those, which have already been recognized; and to detect emerging risks. During risk identification, an inventory of risks is taken for each process and function throughout all the levels of the organisation so that every potential risk may be identified (see chapter 2 for risk identification of potential risks which may affect the real estate development organisation).

Proposition 6: Risk management is implemented to identify, assess and manage all events potentially affecting the real estate development organisation.

This is evidenced by an apparent awareness of risk priority as well as the use of a comprehensive risk catalogue, the presence of clear reporting lines and receptiveness to

communication on all aspects of risk and adequate staff training to ensure suitable capabilities for the risk management process.

3.4.6 Risk Management intended to preserve value and allow value to be created?

Value creation has been associated with strong corporate governance and the achievement of the organisation's long-term objectives in order to protect the interests of all its stakeholders. The implementation of effective risk management may also reveal areas where undiscovered value may be found. The COSO ERM framework advocates achieving good corporate governance through effective risk monitoring, comprehensive understanding of risk management and of the organisation's risk appetite. For an environment that allows the development organisation to create value, the assets and processes to create value need to be reviewed for vulnerability to major uncertainties and to identify opportunities within this context. This balancing between appropriate corporate governance measures and aggressive value creation strategies is one of the most important objectives of risk management.

Proposition 7: Development organisations have intended and designed their risk management for the purpose of strong corporate governance, which would preserve and allow value to be created.

This would be evidenced by finding that the drivers for the implementation of risk management are for reporting requirements as well as good corporate governance and intrinsic value creation, the presence of a uniform understanding of the concept of risk, the awareness of the organisation's objectives and risk appetite, and most organisations have a risk management process which is sufficiently effective in dealing with identified risks.

3.4.7 The impact of structural characteristics of an organisation on the effectiveness of their risk management system

The study of real estate development is generally based on a uniform group and no differentiation has previously been made amongst the different structural characteristics of an organisation. The author believes that the structural characteristics are independent variables that are likely to influence some aspects of risk management. The main structural differences are developer type, ownership structure, the geographic

scope as well as the optimal investment volume for individual development projects (cf. chapter 2.5). If there are differences in approach among the categories, further research may be possible in the individual categories and it may provide further depth in understanding the tendencies of different organisations in their approach. These differences in approach to risk management are considered below:

Developer type and risk management approach

It is believed that investor developers are more risk averse than trader developers. This may be because the investor developer intends to hold the developed asset for the long term as an investment in the portfolio, which will demand, for an even more careful assessment of risk.

The trader developer is more focused on a comparably fast exit of the development and therefore requires a more short-term assessment of risk.

Ownership structure and risk management approach

It is believed that, publicly listed real estate development corporations at least satisfy statutory and corporate governance obligations with regards to risk management. Private real estate development organisations are encouraged to implement risk management systems although there is no legal requirement to do so. As a result, it is believed that real estate developers perform in line with regulatory requirements in this aspect, that is, that management of publicly listed real estate developers have set objectives, strategies and guidelines and have communicated these to the adequate level of the divisions. These are derived from the organisation's objectives, and are updated on an annual basis. The implementation and, execution of the guidelines need to be dynamically and actively supported by all business units and divisions. It needs to be established whether there is a difference between listed and non listed real estate developers towards meeting the recommended practice and formalizing and updating these guidelines.

Project size and risk management approach

It can be expected that the larger the project, the longer the time to completion giving greater risk that market conditions could change. This makes the monitoring process within risk management significantly more important. The complexity of the risk management system increases with large-scale projects as the number of different parties,

processes and complexities involved becomes very large. It is noted also that the effectiveness of the risk management process will in part be dependent on the developer staying within a predetermined project size. Empirical research may give some indication on whether there is an inter-dependence between size of project and risk management approach. For example, larger projects would be expected to have a unique set of risks whereas smaller and mid-size projects could be expected to be more standardized.

Geographic scope and risk management approach

Cross border organisations are expected to have a more effective risk management system as the risks are more diverse operating across a range of different factors which affect different geographical markets. These factors include political, economic, cultural and environmental issues. Due to the variety and complexity of risk related issues that they face, international organisations require very structured and efficient risk management systems with a uniform risk culture, which comprise the use of common definitions, support and understanding of risk management.

Proposition 8: Different structural characteristics of a development organisation are expected to have an impact on the risk management approach. Specifically the independent variables considered are developer type (investor developers are more risk than trader developers?), ownership structure (determined by regulatory requirements?), project size (the larger the more unique the risks?), geographic risk (the greater the spread the more effective the risk management?).

The proposition will be tested by statistical analysis. In order to determine whether there is dependence between specific structural characteristics of the responding development organisation and responses regarding risk management practise, tests of significance will be used. The results of the tests of significance would indicate whether the research results have occurred by chance or whether there is a relationship among the variables.

3.5 Concluding remarks

The preceding sections have addressed the following research question:

- 2 What are the characteristics, key business processes and associated key risks of real estate development?

The concept of risk management is recognized and established in the relevant fields of literature. Risk management is fairly well developed in both the academic and applied literature with regard to generic risk management theory and practice. It is noteworthy that both the academic and applied literature on risk management specific to real estate development is not so well developed. The definition of risk management as proposed by DeLoach has been found to be the most appropriate for real estate development. This definition comprises seven fundamental characteristics and is used to provide a framework to study the risk management approaches in the real estate development sector in the empirical part of this dissertation. The study of the risk management process is based on the approach taken by the COSO ERM Framework and the UK Risk Management Standard. In its practical implementation, risk management constitutes a permanent, active and systematic process in the sense of a control loop, with the risk management process consisting of four constitutive phases, namely identification, assessment, control and monitoring. A risk management control loop in the real estate development industry based on Haller and Wiedenmann was presented and the individual phases and their main characteristics and methods are outlined for the real estate development industry.

In order to verify the propositions, empirical research was deemed necessary. A series of industry specific questions were formulated to determine how and to what extent developers practice risk management and to determine corporate philosophy. The understanding in chapter 2 on the generic process of real estate development and the identification of related risks provides the basis for the understanding of the risks involved are used for the elaboration and structuring of the questionnaire. The study in chapter 3 on generic risk management concepts and processes has formed the basis for a questionnaire by applying it to the real estate development market. The methodology of the empirical research is presented in chapter 4 and the results and interpretation of the empirical research are to be found in chapter 5.

4 Empirical research design

4.1 Objective and contents of empirical research

While the theoretical foundation of risk management in general has largely been explored in the field of general management research, this dissertation focuses on an industry, which is of macro-economic significance but is characterised by a knowledge gap in the area of risk management. Primary empirical research was deemed necessary in order to provide much needed factual data against which to compare and analyse the theoretical framework and existing research presented in the subsequent chapter. A considerable advantage can be gained from an empirical study because it reflects actual rather than merely theoretical data. The success of any such complex study is highly dependent on the ability to access critical sources. This empiricism not only provides evidence to corroborate or disprove preconceived ideas on prevailing practice but is intended to also give new insight into the workings of the real estate development industry.

The present study ventures to offer an in-depth presentation of risk management practice in leading European real estate development organisations. The content of the study is derived from the objectives of the dissertation and the specific issues researched therein. Its main focus is on the findings relating to risk management in real estate development. It is the primary goal of this empirical study to obtain information about risk management practice among real estate development organisations in order to analyse current practice relative to theory.

It aims to answer the following research question presented in the introduction

3 What are the practices among leading European real estate development organisations concerning risk management?

There has only been limited previous research conducted on how development organisations structure their risk management processes and thus this study is intended to expand knowledge on existing risk management practices in real estate development to allow the confrontation of theory with practice to verify theory. On the basis of em-

pirical data analysis, this dissertation will determine conclusions that allow existing theory to be confirmed or modified.

The study centres on micro-economic aspects of risk management in a real estate development context. To ensure a clear focus, the following distinctions are drawn:

- The study primarily addresses the following research areas: risk management approach, risk identification, assessment and analysis, control, monitoring, review and reporting, organisation and culture;
- The survey relates to leading European real estate development organisations engaged in the development of different properties, from the more general forms of commercial and residential developments to the more specialist such as hotel, logistics, production and leisure developments.

4.2 Research purpose

The empirical part of this dissertation aims to explore, describe and explain actual risk management practise in real estate development. The general purpose here is to describe current practice as accurately and thoroughly as possible, to highlight any questions which need to be resolved and to provide valuable input for explanation (VAUS, 1996). The formulation of some conceptual propositions (BAILEY 1994) on the *modi operandi* of risk management in real estate development and the research in the theoretical part of this dissertation were used as foundations for empirical research in order to gather information to describe appropriate aspects of risk management. This was achieved by means of a quantitative cross-sectional survey (chapter 4.3).

In the first instance, results will be analysed (chapter 4.5.5), interpreted and reported to describe the *a priori* categories within the risk management process (WELLINGTON / SZCZERBINSKI 2007). Then the data will be rearranged in order to test the propositions (chapter 3.4). The exploratory aspect of the dissertation also aim to identifying relationships between the independent variables and dependent variables; statistical tests of significance will be performed to identify statistical dependences and to ensure that the results have not occurred by chance (see chapter 4.5.5.1 proposition 8). Where strong associations are evident, some *ex post facto* postulations (rather than explanations) will be put forward for explanation (BAILEY, 1994; VAUS, 1996).

The research methods related to this approach strive to gather data that is as reliable and accurate as possible to support the depiction of the studied item. The author's sound previous knowledge of the real estate development industry was beneficial in gathering the appropriate information relating to the various aspects of risk management. The research methods adopted in this dissertation are explored in greater detail below.

4.3 Quantitative research approach

In the world of social research methodologies the qualitative and the quantitative approach may be differentiated. The quantitative approach was selected for the reasons given below:

Quantitative research methods are generally linked to positivist research approaches (MILES / HUBERMAN, 1994) and refer to methodologies that primarily seek to express information numerically in terms of measurements and counts. This offers a high degree of standardisation (REMENYI / WILLIAMS / MONEY / SCHWARTZ, 1998). Quantitative research - quantitative surveys in particular - is widespread and has enjoyed a long tradition in the field of social studies.

The underlying objective of quantitative research is to identify common processes and / or patterns characterizing a population to be examined and to derive explanations of cause-and-effect relationships (BENTZ / SHAPIRO, 1998). By quantifying the relevant characteristics under examination, research aims at enabling the comparison of data and making it suitable for statistical evaluation processes. This allows ascertainment of comparisons and interdependencies if appropriate. A major strength of the quantitative approach is, that it offers peer researchers the opportunity of relatively easy replication of studies in order to corroborate or disprove previous evidence (REMENYI / WILLIAMS / MONEY / SCHWARTZ, 1998). Quantitative approaches enable the examination of a large sample, therefore facilitating representative findings with results generated often referred to as being 'rigorous' or 'hard' and, due to a large sample, enjoy a comparatively high external validity. On the other hand, in the high degree of standardisation lies a material disadvantage of the quantitative approach, as this does not permit the depiction of complex interrelationships that characterise corporate practice, which cannot be reduced to figures alone (BENTZ / SHAPIRO, 1998).

4.4 Written survey as choice of research method

A written survey was chosen as the most effective method to meet the objective of this study. This method would enable obtaining data that is not at hand so far, and the written format maximises the chances of response from the target population. MANNING / HARRISON / ROULAC / LIZIERI / KAISER / CASE (2008), suggest for those wishing to do Applied Research publishable in academic journals that inductive investigation of primary data using Delphi or another survey method stands at the beginning of applied research, followed by other methods such as grounded theory or case study research methodology. This research approach is believed to be the most adequate research methodology for several reasons. During the study of relevant literature, a dearth of empirical data was noted within the context of the formulated issue. A broad analysis of the risk management practice among real estate developers would therefore appear to be the most appropriate option. For this purpose, a fully standardised survey was initiated in order to obtain broad-based insights into the industry examined. The issues being researched that require answering as part of the empirical research were mainly formulated in the form of 'what' questions. As in YIN (2003) the answer to 'what' questions may be answered in the way of surveys or archival analysis (cf. table below).

Strategy	Form of research question	Required control of behavioral events?	Focuses on contemporary events?
Experiment	how, why?	Yes	Yes
Survey	who, what, where, how many, how much?	No	Yes
Archival analysis	who, what, where, how many, how much?	No	Yes/No
History	how, why?	No	No
Case study	how? why?	No	Yes

Table 4-1: Relevant situations for different research strategies (YIN, 2003, p. 5)

This dissertation is based on an survey conducted among leading European real estate developers by way of questionnaires (SCHNELL / HILL / ESSER, 1999) sent out by regular mail. As the group to be assessed was quiet homogenous, a written survey was considered to be more cost-efficient (CZAJA / BLAIR, 1996) than an oral survey. In addition, it

was possible to structure the subject matter of the survey to a higher degree in a written survey.

A decisive disadvantage of this written survey is the fact that there is virtually no control over the circumstances under which the questionnaires are completed. For example, it is even hard to verify whether or not the target person addressed has in fact completed the questionnaire him / herself (ATTESLANDER, 1991). Moreover, individual questions may be overlooked or answered incompletely. The design of a questionnaire therefore required a high level of care and consideration (SCHNELL / HILL / ESSER, 1999) in order to minimise these problems.

In general terms, it should also be noted that one of the most significant restrictions in the collection of data by way of surveys is their typically low response rate (BEREKHOVEN / ECKERT / ELLENRIEDER, 2006). This is even more the case when surveying industrial populations, with the potential participants receiving the questionnaire at their work place. In these cases, factors such as high workload, organisation policies and confidentiality of information result in a lower response rate than is the case for consumer populations (MILES / HUBERMAN, 1994). In order to overcome this problem, the survey relied heavily on personal contacts and networks to produce maximum participation.

Figure 4-1 summarises the research design that was elaborated in the context of this dissertation:

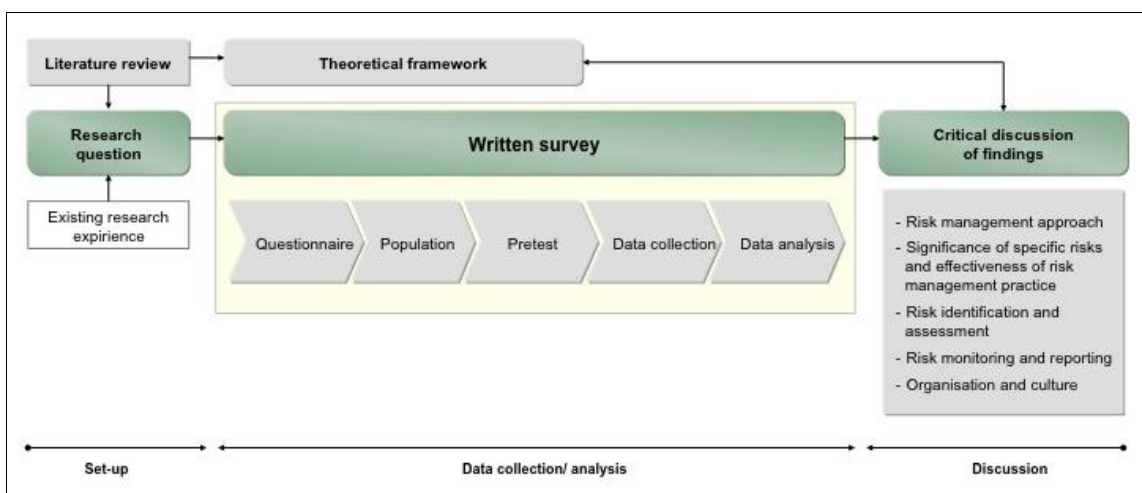


Figure 4-1: Structure of empirical research design

A questionnaire was prepared and send to collect data in order to provide an accurate profile of how risk management was practiced in real estate development between

October 2004 and March 2005, following earlier rigorous preparation, identification of population, pre-test procedures and adjustments of the questionnaire based on insights gained during pre-tests. Evaluation, interpretation and documentation of results from the empirical survey were completed by mid of 2007. These results underwent further statistical analyses, the interpretation of which were finalised by end of 2008. In September 2009, because of the time that had elapsed between the collection of the data and the finalisation of the thesis, it was felt necessary to review subsequent developments, especially in view of the financial crisis, which came to light in the second half of 2008 (see inter alia chapter 6).

4.4.1 Questionnaire

The questionnaire (see Appendix C) translates the terms and concepts outlined in the previous chapters into terms and questions easily understandable by the survey participants. The survey questions focus on three main areas: the structural characteristics of the respondents, the internal corporate environment and the risk management process. These are discussed in detail below in 4.5.6.

As the survey results provide the decisive data material for the empirical part of this study, a considerable amount of time and care went into designing the questionnaire and its technical implementation / realisation. As a matter of principle, great attention was paid to formulating short and simple but precise questions. Particular focus was given to the wording of the questions and the specialist terms used to prevent any possible misinterpretations.

With a view to evaluating questionnaires, closed questions are preferable to open questions because the respondents know clearly the purpose of the question and are limited to a set of choices where one answer is right for them. Therefore, most questions were intentionally worded as closed questions with preset answers to choose from. When offering rating scales for answering purposes, the medium / neutral category was often intentionally left out, leaving only positive and negative answer options. This was intended to avoid respondents falling back, by default, on one of the more evasive answers available. Where an exhaustive selection of multiple-choice questions was not feasible, semi-open (hybrid) questions were asked which entailed 'Other' as a possible answer. The preset answers were formulated in such a way that

either single response only would be appropriate or multiple responses could be given by selecting several preset answers with a cross simultaneously. In these cases, the relevant questions stated the fact that multiple responses were possible.

4.4.2 Population

The study relates to organisations whose core competency is real estate development. Due to its focus on the developer function, the empirical research is designated as an industry-specific study. The developers targeted were not selected randomly, but were chosen because of their recognized leading position in their respective market. In order to achieve further comparability within the elementary unit, organisations were selected as the target group of the study whose primary business activity is the initiation and realisation of real estate projects ('pure developer'). Moreover, organisations which have (re-)discovered real estate development as a lucrative business segment and have been able to successfully develop this segment are also included in the study if they have a leading position in their relevant market. This includes, for example, financial services institutions, construction organisations, as well as strategic and institutional investors. As organisations within this industry are increasingly competing on global markets, it appeared appropriate or even necessary to base such a study not only on geographical parameters but examine organisation attributes within a pan-European context. For this reason, the author has concentrated on developers in seven countries, the Netherlands, Germany, the United Kingdom, France, Spain, Italy and Switzerland. The choice for these countries is particularly made out of practical reasons. As in NOZEMAN / DORENBOS (2006), the Netherlands, France, Germany and the United Kingdom can be characterized as mature markets.

The identification of development organisations to be included in the population proved to be a major and time consuming challenge, given that there was no generally accepted ranking list of developers in the relevant countries in early 2004. Statistical information on organisations in the real estate sector is only available to a limited extent and also difficult to compare at an international level due to a multitude of definitions (NOZEMAN, 2004). In addition, it was felt that in order to obtain meaningful results for this survey, it was critical that personal working judgement and networks would be necessary in order to attain viable participation. The discussion on response rates in chapter 5.3.4 below highlight how critical this was to attain the best response. As a re-

sult of this, Belgium, Austria and Scandinavia were regrettably omitted from the survey. However, it was felt that as the purpose of this dissertation was to gain good access to data rather than for a comparison of risk management practice amongst the European countries, this was not considered material to the dissertation.

In the light of the above mentioned aspects, various sources were used to identify potential target organisations:

- Listing and position of development organisations in the business information system 'OneSource'. OneSource is a comprehensive source for global information on organisations, industries and executives. Research was undertaken under the categories 'developer', 'construction services' and 'real estate operations'. Organisation data have been analysed based on turnover figures, numbers of employees as well as - when available - project volume.
- Listing of organisations in so-called 'expert' or 'Top' lists provided by experts on country level.
- Information provided by the European Public Real Estate Association (EPRA) on development organisations.
- Involvement of expertise from national experts such as CB Richard Ellis, Cushman & Wakefield Healey & Baker, Ernst & Young, Jones Lang LaSalle, KPMG and PriceWaterhouseCoopers.

Finally, 158 organisations (see Appendix A) were selected on the basis that they were reputable market players in the selected countries and were known to industry experts. The author believes that the selection criteria have substantially enhanced the response rate (see chapter 4.3.4.).

Since 2004, more ranking tables of real estate developers have become available. Examples for so called 'Top Lists' are amongst others: 'Top 25 pan-European Players' / 'Leading Developers in Europe', both published by the PropertyEU Magazine (2008), 'Top 101 Ontwikkelaars' published by PropertyNL Magazine (2007) or 'Ranking Immobiliarias, specifically Ranking Promotoras' by Metros² (2008). Even though 'Top Lists' are highly dynamic, they provide a basis to determine the leading organisations which are generally regarded as stable and established players in the relevant markets.

Most of the 158 organisations which have been targeted in this research are found amongst those reported as leading developers in available 'Top Lists' which confirms the quality of the population selection for this dissertation.

In January 2012 a further review of the population has been undertaken in order to verify whether the companies included in the selection have had significant changes in their 'standing'. As a result it can be quoted that there has only been limited changes in terms of mergers or bankruptcies. The Amadeus data file was used to check the status of the 69 responding organisations. This is one of the few semi-public sources containing balance sheet totals of European development companies derived from annual reports sent in to the Chamber of Commerce. It is noteworthy that it does not contain data of companies, which are a subsidiary of a larger corporation (consolidated figures). Moreover much financial data is missing for various countries.

4.4.3 Pretest

To verify the feasibility of the survey, the author conducted a pre-test, taking into account feedback from both practitioners and academics. The pre-test concentrated on the comprehensibility of the questions and the verification of clarity and completeness of the preset answers. In addition, the time required to complete the questionnaire was ascertained. As in MAYER (2004), it is rather difficult to assess the time required for completion of a questionnaire as it depends on the respondent's motivation and current frame of mind. However, in the context of the specific research, it was important to ensure that no more than 40 minutes were required for answering the questions.

4.4.4 Data collection

158 organisations were included in the sample. The questionnaire was accompanied by a covering letter (Appendix B). In order to ensure a target-group-specific approach, the questionnaire was made available in English, French and German. In most cases the questionnaire was addressed to the CEO, CFO or managing partner of the selected organisations. Where no reply was received by the deadline stated in the questionnaire, addressees were chased by e-mail and telephone.

4.4.5 Data analysis

The objective of the evaluation is to ascertain how responses and the characteristics of the responding organisations are correlated, and to verify the propositions made in formulating the research questions for the questionnaire. The response received were recorded and analysed in MS Excel spread sheets. The statistical software SPSS (Statistical Package for the Social Sciences) was then used to calculate statistical values. The analysis conducted in this research concentrated mainly on obtaining percentage shares of the answers. Both description and analysis of the results are supported by the presentation in the form of graphics and tables (MS Excel and Amigo).

Some findings and trends relate to respondents in general while others relate to specific respondent categories. In the event that there was only a small number of a respondent within a specific category, where all respondents showed similar answers, a common position was deemed to have been established. One can state with some confidence as to a common position when all respondents show similar answers.

4.4.6 Presentation of results and determination of propositions

The presentation of the data in chapter 5 fulfills the three research purposes of the empirical study as discussed in chapter 4.2. The outcome of all the questions posed in the questionnaire is presented in chapter 5.1 to 5.4. This essentially describes risk management attitudes and behavior by presenting a comprehensive 'map'. This is followed by the results of the evaluation of the eight propositions; the first seven of which measure risk management practice against an objective benchmark and the eighth proposition, which explores the possibility of a dependence between structural characteristics of respondents and their responses. The author felt that the results in chapter 5.1 to 5.4 were a prerequisite to the evaluation of the eight propositions and hence both sets of results were inextricably connected in the understanding of risk management practice in real estate development.

Chapter 5 presents the analysed results under three headings:

The structural characteristics cover areas of classification and categorization of respondents, namely development activities of the organisation, geographic scope, ownership structure, usage distribution of the real estate development activities and optimum volume for individual projects (cf. question numbers 1, 2, 3, 4, 5).

The internal corporate environment covers both the conceptual views of risk perception, risk management approach and drivers in the implementation of their risk management (cf. question 6, 7, 8, 9, 10, 11 12) and the more practical aspects of accountability (cf. question 13) structure, training and IT solutions of risk management within the organisation (cf. question 21, 22, 23, 24, 25).

Questions on the risk management process include areas discussed in chapter 3.3.1 to 3.3.6 on setting corporate objectives (cf. question 11, 12), risk identification (cf. question 7, 8, 14, 15, 20), risk assessment (cf. question 14, 16, 17, 18), risk control (cf. question 19) and risk monitoring (cf. question 21, 24).

The survey questions focus on a number of key areas comprising fundamental characteristics of an effective risk management as laid out in chapter 3.1. In order to arrive at a decision based on the confrontation between each proposition stated in chapter 3.4 versus praxis (hereafter referred to as the 'determination'), responses from the questionnaire were regrouped and analysed by means of investigations relating to specific areas and presented in chapter 5.5 as follows. A detailed description of how the propositions were tested is given in Appendix G. The approach and data of the statistical analysis are presented in Appendix D,E and F.

4.4.7 Limitations on the empirical research

Subjective view

Where respondents were required to give a self-rating or a subjective point of view on an aspect of the organisation's risk management, the answers provided would necessarily suffer from subjective bias. In this context a limitation may be seen in the fact that questionnaires were addressed to the CEO, CFO or managing partner of the selected organisations (see chapter 4.5.4). However, as a general aspect of questionnaires, the recipient was at liberty to pass the questionnaire onto another person within the organisation, which may have influenced the responses in terms of bias. At the same time it may be assumed that given the specific nature of the questionnaire will be handled over to specialized experts within the team (if at all). The data nevertheless provide an indication as to the self-perception of survey participants'. It was expected that overall these answers would be more positive than reality, due to a potential lack of objectivity.

Collection of data

The most notable shortcoming regarding data collection has been that the size of organisation has not been chosen as part of the structural characteristic information. There were a number of reasons for this. An organisation can be sized according to turnover, assets and number of employees. However often these do not reflect the true size of the organisation. Most real estate developers are an arm of a larger company that is involved in a range of activities with turnover and assets of real estate development not being split out. In addition it is very difficult to have valid information on size in terms of employees given that many aspects may be outsourced and therefore comparability is not a given. Although this information would have provided a more detailed picture, it was felt that there was a danger that the information gathered could be misinterpreted and therefore misleading.

5 Results of the empirical research on risk management in the real estate development industry

In order to put the results of the study into context, an analysis of the response rate (chapter 5.1) and background characteristics of the respondents (chapter 5.2) have been made. This is followed by a discussion of the results under three main headings; internal corporate environment (chapter 5.3), the risk management process (chapter 5.4) and the evaluation of propositions (chapter 5.5). The internal corporate environment corresponds to the discussion in chapter 3.3.1 (including 3.3.7) relating to strategic objectives and risk appetite, which are the prerequisites for establishing an effective risk management system. The risk management process refers to the four core risk management activities as discussed in chapter 3.3.2 - 3.3.6 (risk identification, risk assessment, risk control and risk monitoring). The evaluation of propositions relates to the discussion in chapter 3.1 and chapter 3.4 on the components of effective risk management. The chapter concludes with a reflection of the findings in relation to the research question, which the survey aims to address.

5.1 Response rate

A total of 69 completed questionnaires suitable for evaluation were returned, from 158 questionnaires dispatched. This corresponds to an overall response rate of 43.7 per cent. The response rate was comfortably high; according to BEREKHOVEN / ECKERT / ELLENRIEDER (2006), 15 to 60 per cent may generally be expected as a response rate range for written surveys.

The overall high response rate is a further indication of the high level of interest respondents took in the subject matter of the survey. Response rates from Switzerland, the United Kingdom, Germany and the Netherlands were noticeably higher than those from France, Italy and Spain. Although it took a considerable length of time for completed questionnaires to be returned, the direct approach to target organisations through building direct contacts and work with reminders sent to non-respondents contributed to the comparably high response rate.

	Questionnaire dispatch		Response rate		
	Number	in %	Number	in % of dispatch by country	in % of responses (R= 69)
France	18	11,4%	4	22,2%	5,8%
Germany	30	19,0%	18	60,0%	26,1%
Italy	20	12,7%	6	30,0%	8,7%
Spain	25	15,8%	6	24,0%	8,7%
Switzerland	10	6,3%	10	100,0%	14,5%
The Netherlands	35	22,2%	16	45,7%	23,2%
United Kingdom	20	12,7%	9	45,0%	13,0%
Total	158	100,0%	69	43,7%	100,0%

Table 5-1: Questionnaire and response rate (countries in alphabetical order)

Comparatively low response rates were received from organisations in France, Italy and Spain. Without any further research into the matter it could be assumed that the lower response rate is due to a weaker personal link with the organisations polled in these countries as well as a language barrier in Spain and Italy given the questionnaire was presented in English, French and German

However, as all respondents answered not all questions, the survey sample size varies for each question evaluated. Therefore, as part of the following elaborations, the individual survey samples (R= number of responses) do not refer to the entire survey population but only to the specific respondents who answered the relevant question or partial question.

5.2 Background characteristics of respondents

Chapter 2.4 has presented classification aspects of developer types. In the context of the survey, a series of questions were formulated to establish a classification of the responding organisations' structural characteristics; the questions covered the ownership structure, the geographic scope as well as the optimal investment volume for individual development projects. The structural characteristics are considered as independent variables that were believed likely to influence most aspects of risk management and provide a broad platform from which further survey results could be analysed to a higher degree of differentiation.

		Mainly Trader-Developer (R= 37)		Mainly Investor-Developer (R= 32)		Total	
		Number	in %	Number	in %	Number	in %
Ownership Structure	Listed	12	17,4%	11	15,9%	23	33,3%
	Unlisted	25	36,2%	21	30,4%	46	66,7%
Total		37		32		69	
Geographic Scope	Regional	2	2,9%	4	5,8%	6	8,7%
	National	21	30,4%	15	21,7%	36	52,2%
	International	14	20,3%	13	18,8%	27	39,1%
Total		37		32		69	
Project Size Classification	Small (EUR < 5 - 10 million)	4	5,8%	3	4,3%	7	10,1%
	Medium (EUR > 10 - 50 million)	24	34,8%	16	23,2%	40	58,0%
	Large (EUR > 50 - 250 million)	9	13,0%	13	18,8%	22	31,9%
Total		37		32		69	

Table 5-2: Background characteristics of respondents

Developer type

As outlined in chapter 2.4, various types of developers may be differentiated. To carry out a preliminary structuring of the empirical data collected, the organisations polled were asked to state the type of their development venture (cf. Appendix C - Question 1). All 69 participating organisations responded to this question. Within the survey, 53.6 per cent of respondents were trader-developers and 46.4 per cent were investor-developers (for a differentiation of key characteristics of developer types see chapter 2.3).

Ownership structure

Of the 69 respondents (R= 69), only 33.3 per cent are listed organisations with the remaining 66.7 per cent being unlisted organisations. This low level of listed organisations is believed to be as a result of the complexity and high level of volatility associated with property development (DORENBOS / NOZEMAN, 2006).

Against this background, the study investigates how organisations with various ownership structures implement risk management and whether there are significant differences in risk management between listed and unlisted developers. Although information is limited, due to statutory audit and financial reporting requirements, knowledge of some risk management practices in publicly listed organisations is generally reported and therefore available. Publicly listed organisations are believed to have more developed risk management systems because of the reporting requirements and therefore the results are likely to be biased towards a less effective risk management process due to the higher proportion of unlisted respondents.

The higher percentage of unlisted respondents is encouraging as this provides insight into this sector where previously there was no information available. Their participation also indicates that they understand the importance of information sharing in order to benchmark and / or improve their risk management systems.

Geographic scope

52.2 per cent of respondents (R= 69), which geared towards their relevant domestic market, accounted for the largest share, followed by 39.1 per cent of international players. Furthermore, six completed questionnaires (8.7 per cent) were received from organisations operating regionally (cf. Appendix C - Question 2). It is believed that the more international an organisation is, the more important political risk becomes a part of the risk management process. Due to the variety and complexity of risk related issues that they face, international organisations require more structured risk management systems with a uniform risk culture which comprises the use of common definitions, support and understanding of risk management. The responses are likely to be slightly more biased towards the behaviour of organisations, which operate within the domestic market.

Investment volumes of individual projects

In addition to representation across developer classification and geographic scope, the survey participants included a broad range of project sizes measured in terms of an optimal volume for individual projects. The size categories used in the questionnaire were selected on an exponentially increasing range size to facilitate responding and subsequent analysis.

The question regarding the optimum individual investment volume for real estate projects was answered by 69 respondents (cf. Appendix C - Question 5); the results are shown below.

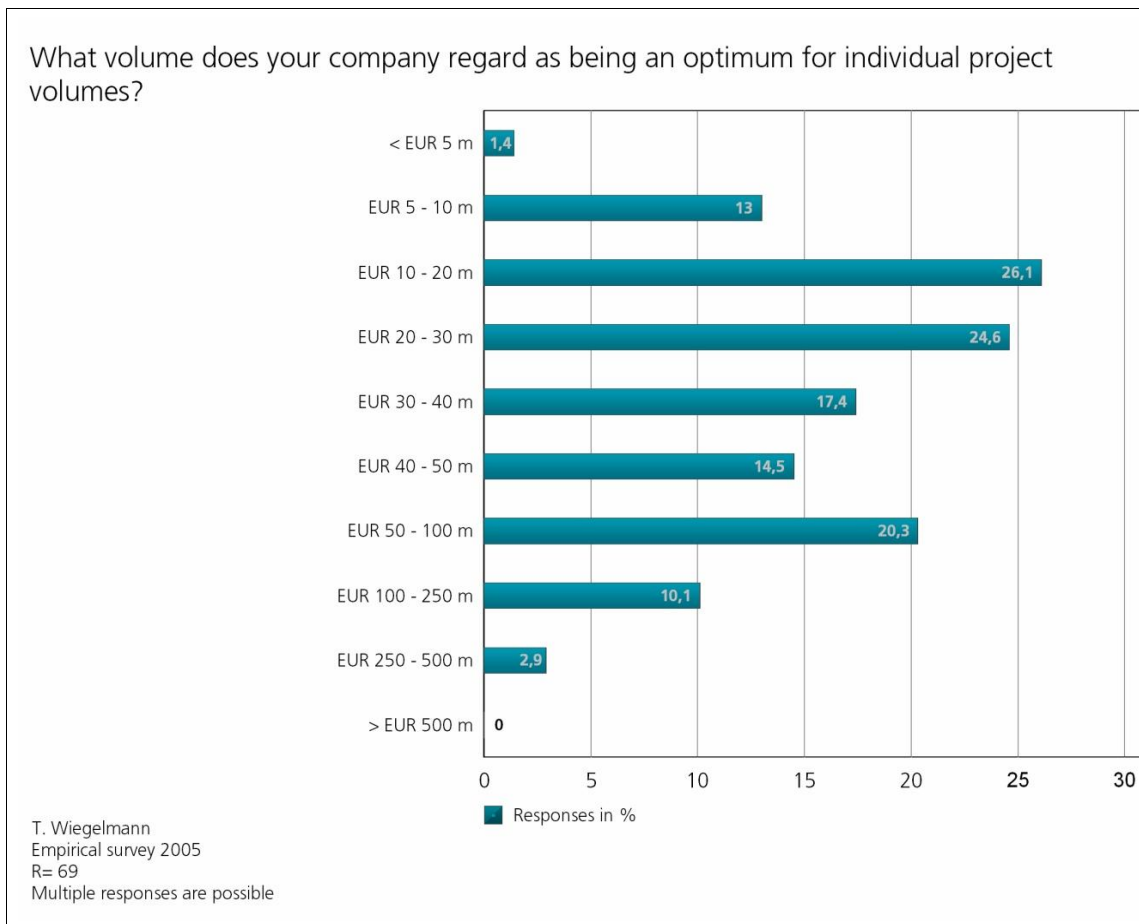


Figure 5-1: Optimal volume for individual projects

It is interesting to note that, with 20.3 per cent (R= 69, multiple responses are possible), individual investments ranging from EUR 50 to 100 million were cited more often as the optimum investment volume than the segments involving lower investment volumes, i.e. EUR 30 to 40 million (17.4 per cent) and EUR 40 to 50 million (14.5 per cent). Overall, there appear to be two peaks of favourite investment size, namely between EUR 10 and 30 million (50.7 per cent) and between EUR 50 and 100 million. Only 2.9 per cent of organisations polled cited projects having volumes over EUR 250 million as being optimal. In the author's opinion, this result also reflects the respondent organisations' assessment of the fungibility of projects with differing volumes. It should be noted that the respondents have very little inclination to accept size disadvantages such as cluster risks and a lack of disposability in connection with any intended sale.

It can be assumed that the individual project volumes specified also take into account the investment volume expectations of potential investors in addition to the tenancy market situation, location, usage and the developer's competencies. This way, the de-

veloper wishes to secure good selling opportunities and the broadest possible buyer spectrum.

Based on the replies to this question, the data has been re-analysed within broader categories of project volumes into 'small' (EUR < 5 - 10 million), 'medium' (EUR > 10 - 50 million) and 'large' (EUR > 50 - 250 million) projects. Where an organisation provided multiple responses, the allocation to a particular category depended on the highest individual project volume specified. 10.1 per cent (R= 69) of survey participants stated that they focus on a project volume of up to EUR 10 million. Real estate developers involved in target projects that fall into medium-size categories (between EUR 10 and 50 million) represent the largest group with 58.0 per cent. With 31.9 per cent, organisations specialised in large-scale projects also account for a significant share. Generally speaking, the larger the project size, the greater the time that it takes for completion of the project. During the time of the development, market conditions could change and the monitoring process within risk management becomes paramount importance. The large numbers of different parties involved in the development of a large-scale project increases the complexity of the risk management system. The bias towards medium and larger project volumes suggests that the results show a more effective monitoring process than the norm due to the perception of a higher level of risk.

Usage focus of development activities

A further question on the respondents' background relates to the usage type focus of their products and services (cf. Appendix C - Question 4). The majority of developers who responded pursue a product development strategy geared towards a broad spectrum of usage types. The development of office space and residential construction projects are the prevailing usage type among the survey participants whilst by contrast, the development of hotels, logistics, production space and leisure facilities play only a secondary role.

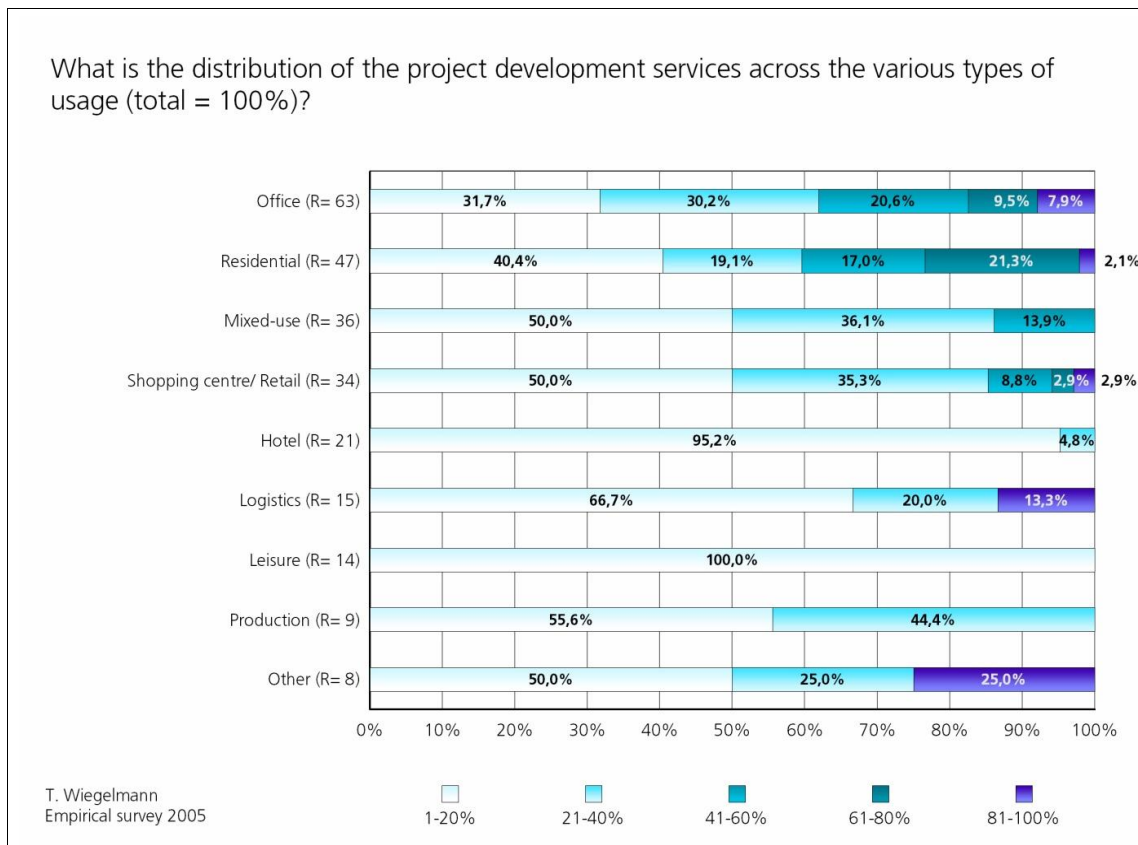


Figure 5-2: Usage-focus of development activities

The examination of the individual types of usage shows that, with 63 responses, the development of office space is the prevailing usage type among the survey participants. This applies to all size categories and developer types. 17.5 per cent (R= 63) base their strategy, either largely or exclusively, on the development of office space (share ranging from 61 to 100 per cent). 47 developers initiate or realise housing construction projects, while 36 organisations include mixed-use projects in their product strategy. The weighting of the shopping centre / retail category is also worth mentioning: 34 organisations stated they have their focus in this development segment. Only 21 organisations include the development of hotels in their strategy. Real estate developments to meet the demand for logistics (R= 15) and production (R= 9) space or leisure facilities (R= 14) play only a secondary role. This also applies to other usage segments (R= 8), such as the development of hospitals, assisted-living facilities and parking garages, which were mentioned by some respondents. It is interesting to note that there is a tendency to integrate special uses and theme properties in the product spectrum; this applies primarily to smaller organisations focused on the development of specialised real estate and established big players. Such specialised developers typically establish long-term relationships with favoured anchors and other key tenants.

The advantages for developers are that they understand how these tenants run their business, what their specifications and requirements for location are and under what circumstances they will perform well. With that partnership-oriented background, the development activity often becomes less speculative.

5.3 Internal corporate environment

5.3.1 Focus on risk perception

Figure 5-3 shows how the sample population's perception of increasing risk in their marketplace has grown over the last five years (cf. Appendix C - Question 9).

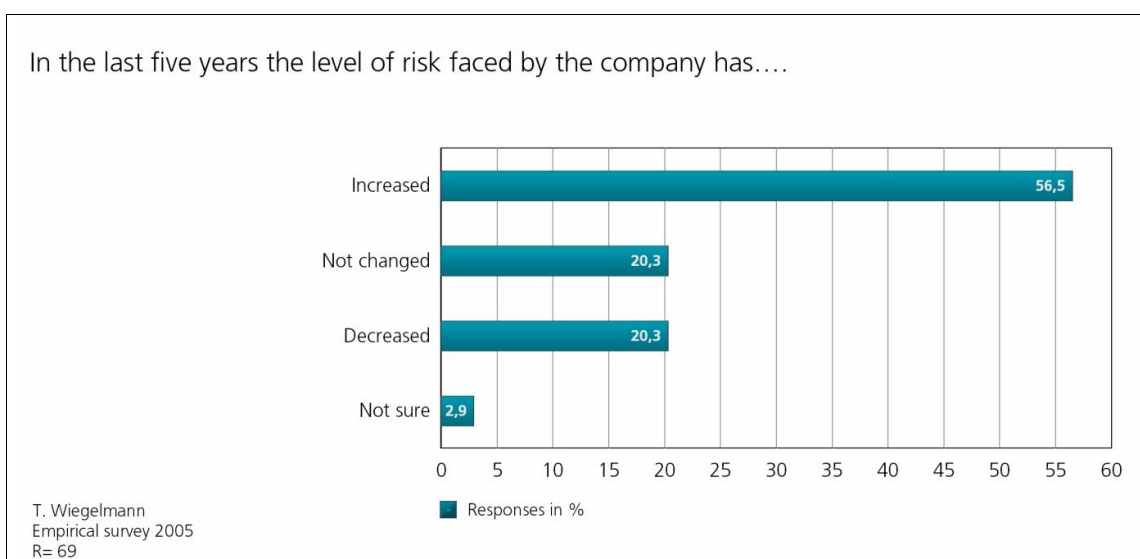


Figure 5-3: Development of risk situation

The survey results confirm the original impression that, from the developer's perspective, the risk situation of the corporate environment has clearly intensified. 56.5 per cent of all respondent organisations (R= 69) stated that the level of risk they face has increased over recent years. This is of particular importance as it suggests that either there is an increase in the perception of risk levels or a lower tolerance of risk. It is also likely that both explanations may be applicable at the same time. Moreover, this finding may also serve as an empirical confirmation of the topicality of the present study.

Of particular interest are the survey results when analysed according to size classes. Fisher's exact test and Cramer's V tests show dependence between this question and project size (Cramer' V= 0.377; p-value= 0.002). The project size influences the assessment of the development of the level of risk; companies with bigger project sizes con-

ceive an increased level of risk. As stated by 71.4 per cent of respondents (R= 7) active in this size class rate, it seems obvious that the level of perception of risk for smaller projects has decreased in recent years. The perception of risk for medium and large-scale developments has increased. 62.5 per cent of medium size project developers (R= 40) and 63.6 per cent of large-scale project developer (R= 22) rated the level of risk as having increased.

Risk appetite by comparison with competitors

The question relating to the risk appetite of the respondents' own organisations, when compared to their competitors, was intended to ascertain the survey participants' self-image (cf. Appendix C - Question 10).

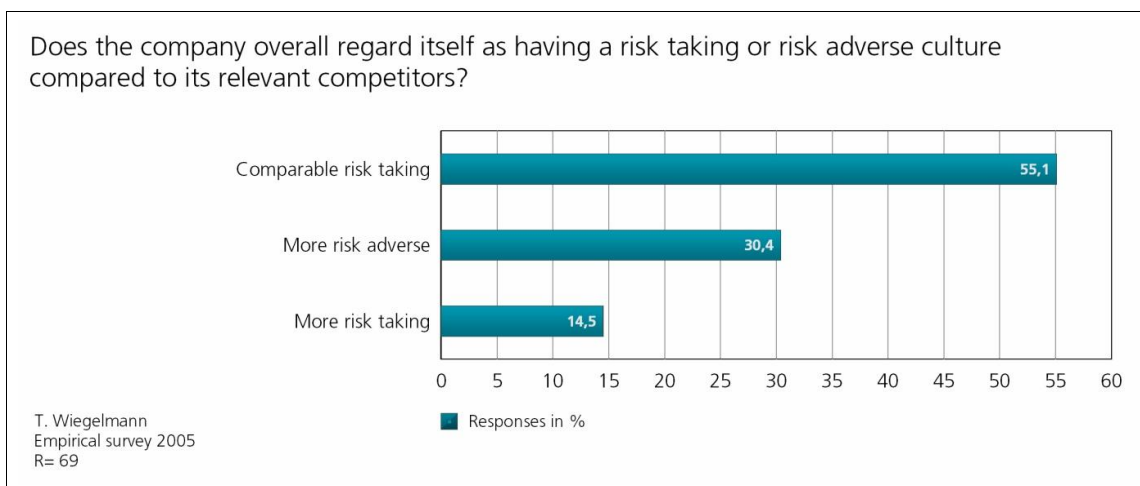


Figure 5-4: Risk culture compared to its relevant competitors

Developers tend to regard their activities as comparable as or even more cautious than those of their competitors. 55.1 per cent of respondents (R= 69) claim a comparable risk attitude to their relevant competitors, while 30.4 per cent position themselves as being more risk adverse. Only 14.5 per cent stated that they have cultivated a higher risk tolerance than their competitors.

When broken down by ownership structure, it becomes evident that privately owned organisations tend to be more risk taking compared to publicly held organisations. Privately held developers rate themselves to 17.4 per cent (R= 46) as taking more risks than their competitors, whereas only 8.7 per cent of publicly held organisations (R= 23) join this self-image. At the same time, 39.1 per cent of publicly owned state to be more risk averse, compared to 26.1 per cent held privately.

Concept

While the majority of respondents agree with a balanced approach to risk, far fewer appear to have clearly defined concepts of it.

Risk in the context of real estate development has been defined as “(...) a concept used to express the significance and likelihood of events and / or their outcomes that could have a material effect on the goals of a real estate development organisation” (cf. chapter 2.4). Differing points of view exist within corporate risk management, ranging from emphasis on the potential negative impacts to focusing on improved results through risk-oriented corporate governance. Ideally, both risks and rewards should be taken into consideration in equal measures. An evaluation of how participating organisations regard risk as a concept in their business objectives and a common understanding of the concept of risk (cf. Appendix C - Question 12) is illustrated by Figure 5-5 below.

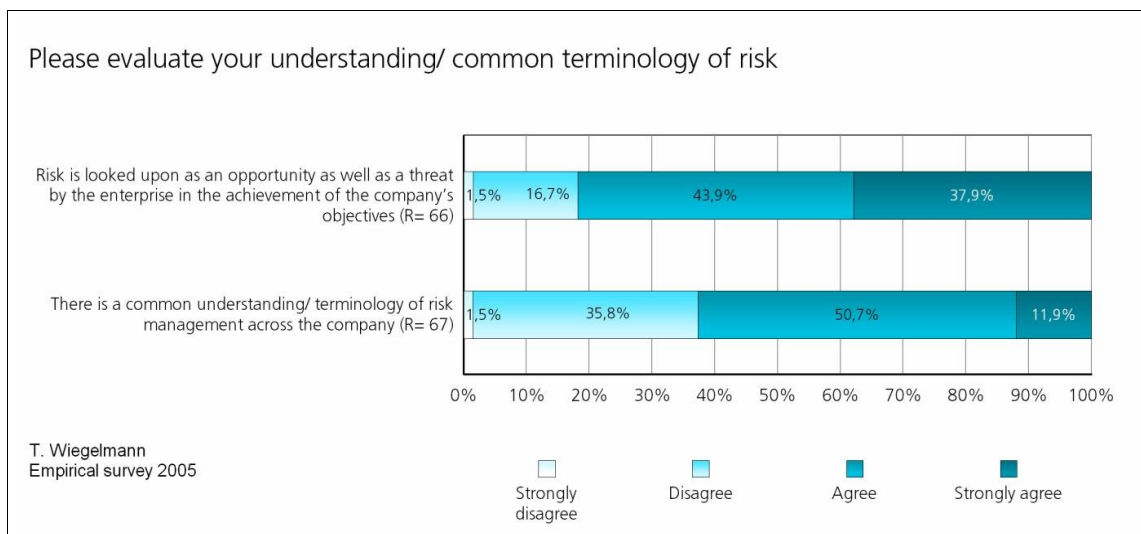


Figure 5-5: Common understanding / terminology of risk

As the survey shows, 81.8 per cent (R= 66) of the developers polled follow a reward-oriented interpretation of the concept of risk. In this regard, the relevant organisations largely follow the principles advocated in theory. 16.7 per cent of all respondents do not perceive a link between risks and rewards, with one organisation completely rejecting the reward aspect of risk. Accordingly, the expectation that developers closely associate risk with an upside potential seems plausible. The results suggest that developer's understanding of risk management is definitely not about completely eliminat-

ing risk, or not taking risks at all. Rather, developers generate value and business confidence by their ability to balance and accept opportunities and risks.

The fact that 37.3 per cent (R= 67) of the survey participants did not indicate a common definition of risk across their organisation suggests that the practice of risk management has yet to be integrated into many organisations. There was an association found during the Fisher's exact test and Cramer's V analyses between geographic scope and the common understanding of risk management (Cramer's V= 0.365; p-value= 0.016). In this context it is to note that especially internationally active developers showed a common understanding of risk management across the organisation with 80.8 per cent (R= 26) agreeing or strongly agreeing to this question.

5.3.2 Structure and accountability

The organisational risk management framework must ensure the proper identification, assessment and development of suitable measures for optimizing the risk profile by the decision makers. One condition for the effective functioning of a risk management system is that it must be firmly rooted in the corporate organisation and corporate management processes.

The risk and control culture is one of the vital determinants of effective risk management. It reflects the shared fundamental framework of standards and values of organisation management as well as the employees. Standards and values are part of any corporate culture. This culture promotes the development of the organisation and its competitive success by influencing the behaviour of the organisation's employees. An active risk and control culture as part of a risk-oriented organisation culture ensures the necessary risk awareness on the part of the staff and reinforces the general acceptance of the risk management system.

Figure 5-6 relates to the organisation and the degree to which structure and culture support risk management (cf. Appendix C - Question 24).



Figure 5-6: Efficiency of structure and culture

An organisational structure depends inter alia on its size and the nature of its activities. A highly structured procedure with formal decision-making and reporting levels and responsibilities may be adequate for a large organisation that has numerous divisions. However such a structure could impede the necessary flow of information in a small and highly entrepreneurial organisation. The organisational structure should enable effective risk management and the carrying out of business activities to achieve the organisation's objectives. The responses show that only a small minority of respondents believe to have structures and cultures in place that do not support effective risk management. However, somewhat less than half of the answers indicate improvements are needed. 47.0 per cent of the responding development organisations (R= 66) report that the organisation structure supports effective risk management. 43.9 per cent report that there is significant potential for optimizing the organisational structure with respect to its support of risk management. Just 3.0 per cent report that the organisational structure makes only inadequate provision for risk management requirements. 6.1 per cent of the survey participants were not able to respond to this question. 42.4 per cent of the responding development organisations (R= 66) - according to their own reporting - enjoy a suitable corporate culture that meets the requirements of effective risk management. At 48.5 per cent of survey participants, the corporate culture needs improvement in terms of functional support for corporate risk management. 6.1 per cent describe their corporate culture as not supportive of risk management and 3.0 per cent of the survey participants were not able to respond to this question.

Primary responsibility

In order to provide an insight into the organisational structure and relevance of risk management in practice, the survey participants were asked to state who is primarily responsible for the risk management within their respective organisations (cf. Appendix C - Question 13). The result, which is based on the responses from 67 organisations, is summarised in Figure 5-7 (multiple responses were possible).

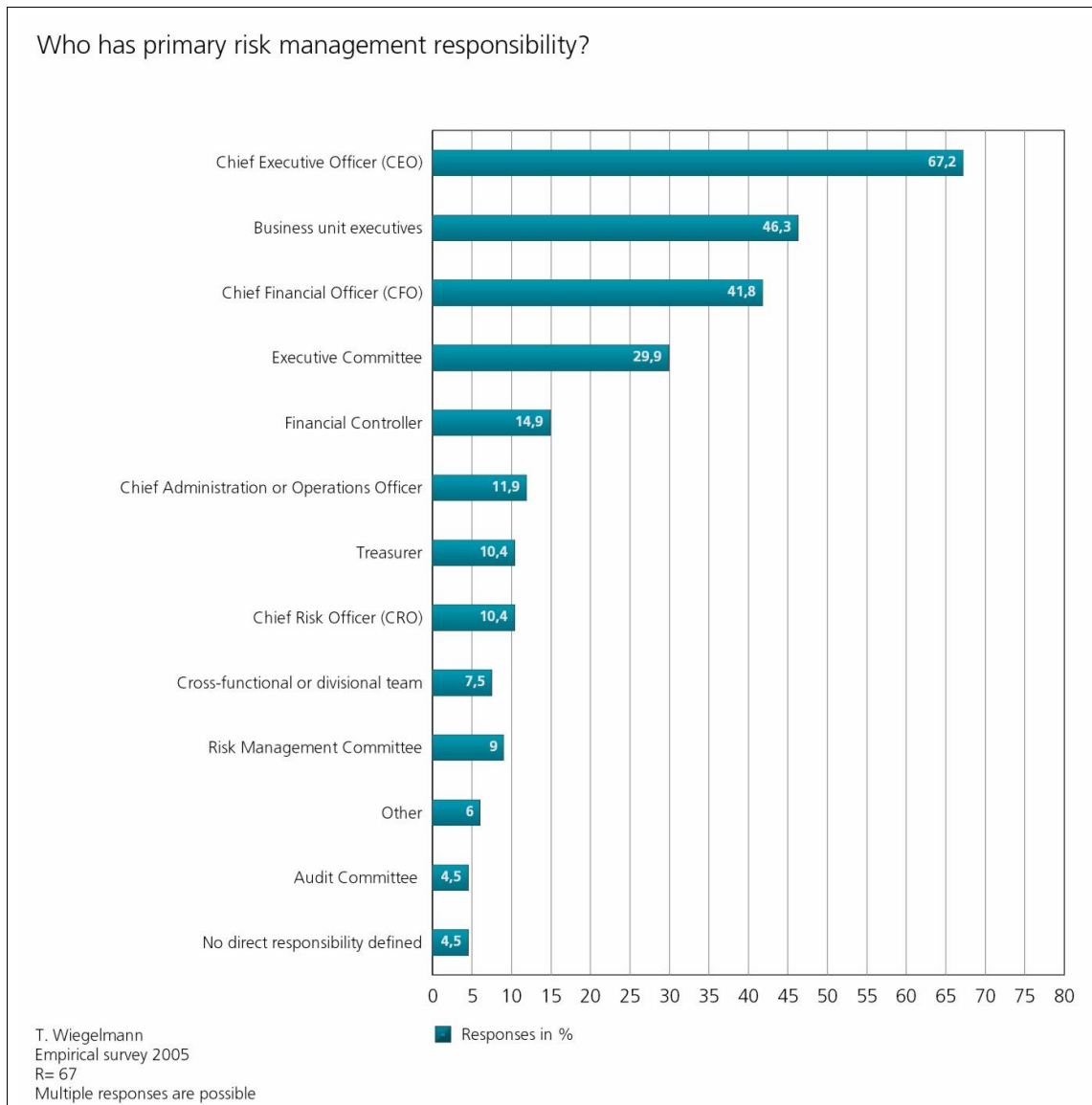


Figure 5-7: Primary risk management responsibility

The survey results indicate corporate practice within the real estate development industry. They show that primary responsibility for risk management clearly lies with organisation management. 67.2 per cent (R= 67) parties polled stated that risk management is primarily the responsibility of the CEO and therefore 'a matter for the boss'.

This result indicates again the high priority of risk management. But this result begs the question as to whether the responsible executives have sufficient knowledge and expertise to make the required decisions necessary for risk management. Real estate development involves areas such as treasury, hedging, or environmental claims which require a high degree of specialisation which may not be the particular strength of senior executives. An effective and transparent involvement of subordinate experts and professional advisors is often required and often leads to the establishment of risk management committees.

In 46.3 per cent of cases, business unit executives are responsible for risk management. From the point of view of the relevant survey participants, a tight integration of risk management objectives and tasks with strategic and operative development activities opens up the greatest synergy potential.

Often, this responsibility is assigned to the finance and accounting function, bringing risk management under the 'jurisdiction' of the Chief Financial Officer (41.8 per cent) or the Financial Controller (14.9 per cent). The preference of attaching the risk management supervisory function to the financial division can, at least in part, be justified by the fact that the financial function is responsible for summarising the presentation of the overall business situation of a real estate development organisation. Moreover, the advantages arising from the co-operation with external experts and auditors, who also collect and evaluate information in the organisation's risk situation, can be efficiently leveraged. 10.4 per cent of the responding development organisations have established a centralized coordinating point to facilitate risk management within the organisation. In such organisations, a dedicated Chief Risk Officer takes ownership for a continual examination of risk management issues. Within 4.5 per cent of organisations, the organisational structure in terms of the allocation of responsibilities and competencies is defined either only in part or not at all. These organisations may be characterised by a certain lack of consensus as to who is responsible for systematic risk assessment, risk control and a timely reporting process as appropriate for the individual levels.

The results support the thesis, that as a rule, there is no 'one size fits all' answer to the allocation of internal responsibility for risk management. Rather, the specific allocation will depend on the individual situation of each organisation. Nonetheless, organisa-

tions that have assigned responsibility for the implementation of risk management to two or more different divisions have to ask themselves whether or not a uniform approach is perhaps more effective than where tasks and responsibilities are fragmented.

Risk management committee

In order to support organisation management and / or those in charge of risk management, a function or a body may be created which handles the tasks arising from a centralised and organisation-wide control of risk management and risk aspects of specific development projects. 66 developers answered the question regarding the existence and the composition of a risk management committee (cf. Appendix C - Question 25). 47 organisations stated that they have a risk management committee. Where such a committee is established, 44 survey respondents provided information on the composition of the committee.

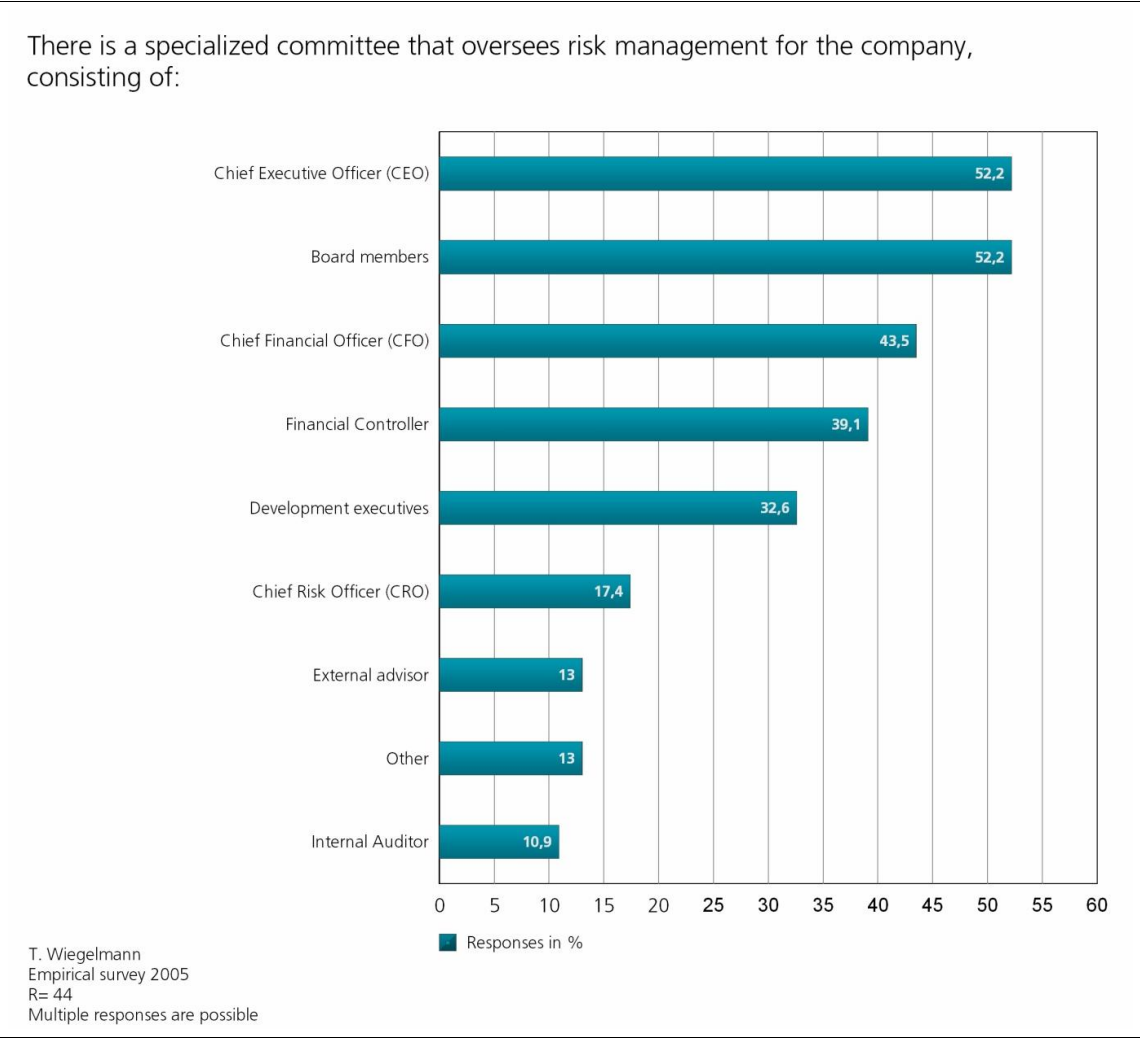


Figure 5-8: Specialized committee overseeing risk management

The management of development organisations enjoys top priority within the composition of any monitoring body. This result is also reflected in the evaluation of the question regarding primary responsibility for risk management. If and when required, 13 per cent, (R= 44), external experts are involved in an advisory capacity. External professionals provide management a unique, independent and therefore more objective view, which can contribute to the achievement of organisation's objectives.

Thus, the composition of risk management committees combines a high level of expertise and decision-making authority. It would appear that this combination has also proven successful with regard to the examination and approval of real estate projects and the possible imposition of conditions and / or the development of project-related risk management measures to be taken.

The comparatively low level of involvement of the internal audit function is an interesting aspect to note, since the monitoring of risk management effectiveness by way of regular checks is one of its foremost tasks.

Exact Fisher and Cramer's V tests show an association between project size and the existence of a specialised risk management committee (Cramer's V= 0.398; p-value= 0.005). The project size of a company influences if there exists a specialised risk management committee or not. The majority of developers of smaller and larger scale projects have a risk management committee. Most of the medium projects incline on having no specialized committee.

Training

The question regarding adequate risk management training for organisation management and staff (cf. Appendix C - Question 24) is of paramount importance and has been answered by 66 survey participants.

The potential for improvements is evident: for instance, only 16.7 per cent of all respondents (R= 66) stated that they receive adequate training. A further 77.2 per cent reported that they receive no suitable or, at best, inadequate training. 6.1 per cent of responding developers do not know if adequate risk management is provided.

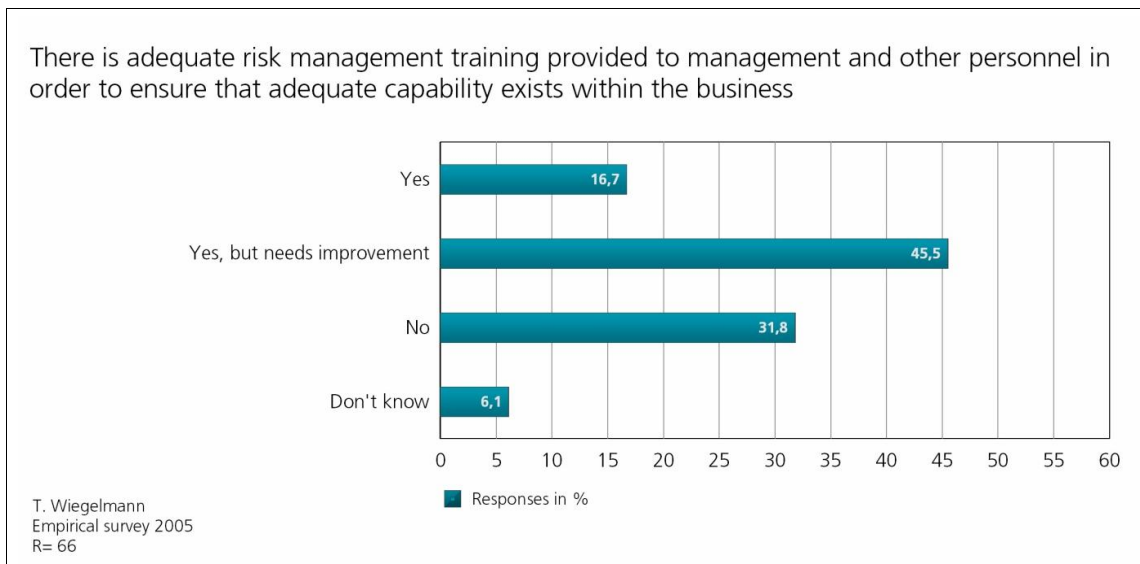


Figure 5-9: Risk management training

This survey result allows two interpretations: on the one hand, it could be concluded that real estate development organisations provide insufficiently for the training of their staff and that risk management expertise and skills are insufficiently reinforced by training measures. On the other hand, the survey result could be interpreted as being indicative of a lack of suitable training offers addressing risk management. This is a more likely interpretation. Chapter one has already identified a lack of industry-specific insights, both from a scientific and a practice-oriented perspective. This result underscores the need for industry-specific risk management know-how and therefore the topicality and the importance of the study of this empirical data

IT solutions to support effective risk management

Modern information technology plays a key role in achieving risk management objectives, offering a multitude of ways to optimize the processes and data that constitute the foundations of risk management. Effectiveness and efficiency of risk management during all phases depend inter alia on the performance of the organisation's IT systems. A distinction can be drawn between simple and complex systems, with integrated management information systems probably having the highest degree of complexity (cf. Appendix C - Question 23).

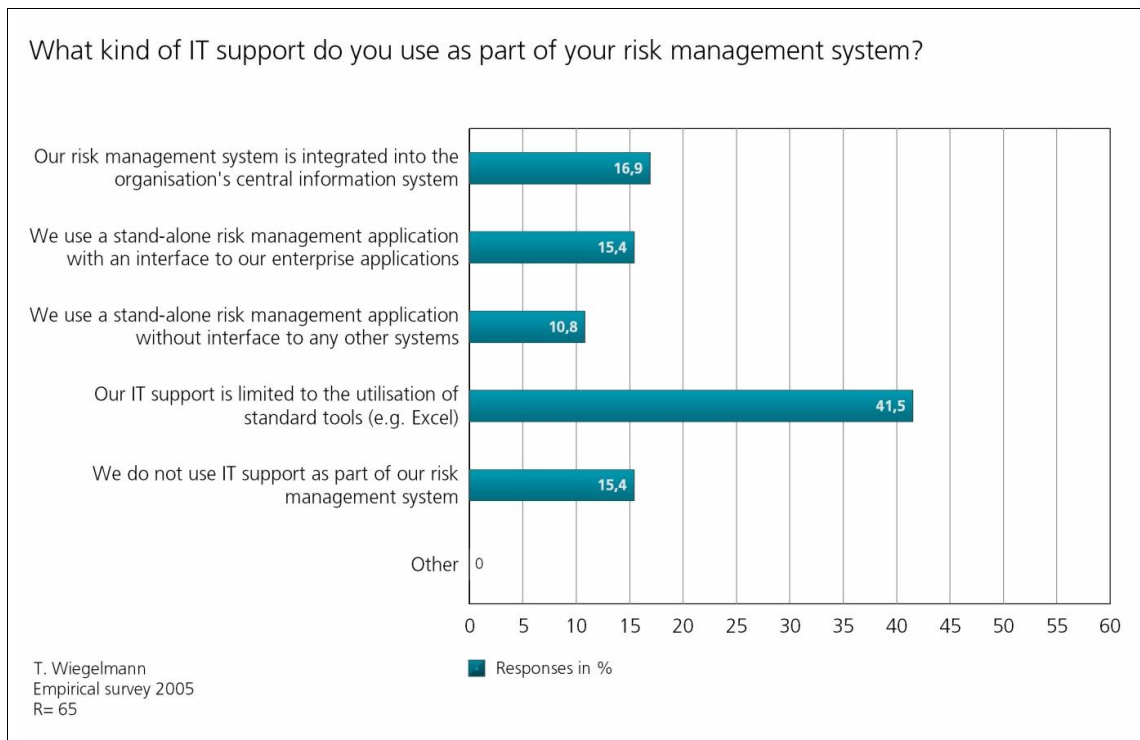


Figure 5-10: IT solutions in risk management

The survey revealed that 41.5 per cent of all respondents (R= 65) support risk management via IT solutions, with the use of standardised stand-alone solutions, such as Microsoft Excel, dominating. These solutions are characterised by a comparatively low level of automation and networking, which - in principal - favours the development of island solutions. 15.4 per cent of respondents use stand-alone applications, with a preference for networking while 10.8 per cent do not operate with an interface to other organisation applications or systems. Only 16.9 per cent of all respondents operate a comprehensive and fully integrated management information system (MIS), while 15.4 per cent of all survey participants reported that they have not integrated risk management into their corporate IT solutions. The degree of complexity of an IT system (which is an integral part of an organisational structure) is generally a good indication of the importance that an organisation places on risk control and the resources made available for this purpose.

The survey results would indicate a lack of adequate IT products that meet the specific requirements of risk analysis for real estate developments. Increased activities on the part of software developers would certainly be required to improve this situation by facilitating the cost-efficient adjustment to the specific circumstances of individual organisations. Exact Fisher and Cramer's V analyses reveal that there is an association

between project size and IT support for risk management systems (Cramer's $V = 0.359$; $p\text{-value} = 0.019$). The project size of the companies affects the use of IT in their risk management system. All companies with large project sizes use IT as part of their risk management, whereas, some companies with smaller and medium project schemes do not use the IT as part of their risk management. The larger the project size of the developer, the complexity of the project is likely higher. IT is being involved to reduce the complexity and to enhance efficiency.

The effective and efficient execution of an organisation-wide risk management process requires the use of an adequate software solution. 67 organisations responded to the question whether appropriate tools are being used in support of risk management (cf. Appendix C - Question 21).



Figure 5-11: Tools for risk management

More than 60 per cent see need for improvement or have no appropriate IT tools, which is a very large portion. Thus 28.4 per cent of the responding organisations (R= 67) confirmed that appropriate tools support risk management. With 34.3 per cent of respondents, certain tools have been established, but do not adequately satisfy the requirements of the organisations in question. Moreover, about 29.9 per cent of the organisations map the risk management process entirely without appropriate software solutions. Another 7.5 per cent were not able to respond to this question because they did not know the answer.

Many organisations in the size ranges surveyed sooner or later come up against their limits when using standard products as well as IT solutions developed in-house. Fisher's exact test and Cramer's V have indicated an association between ownership structure and appropriate tools to support risk management (Cramer's V= 0.351; p-value= 0.027). The ownership structure has influence on supportive risk management tools. Only approximately 20 per cent of the listed respondents do not have risk management tools to support their risk management process. However, a much larger proportion of approximately 50 per cent of unlisted respondents do not make use of any such tools. This association is expected to result from accounting standards (such as the German §289 HGB or IFRS 7) which request listed companies to establish appropriate tools to support, inter alia, the reporting.

5.3.3 Risk management strategy

In order to obtain an overview of the status quo of risk management based on empirical data, developers were asked to provide information on the existence of an organisation-wide risk management strategy (cf. Appendix C - Question 6). The results are summarised in Figure 5-12 below.

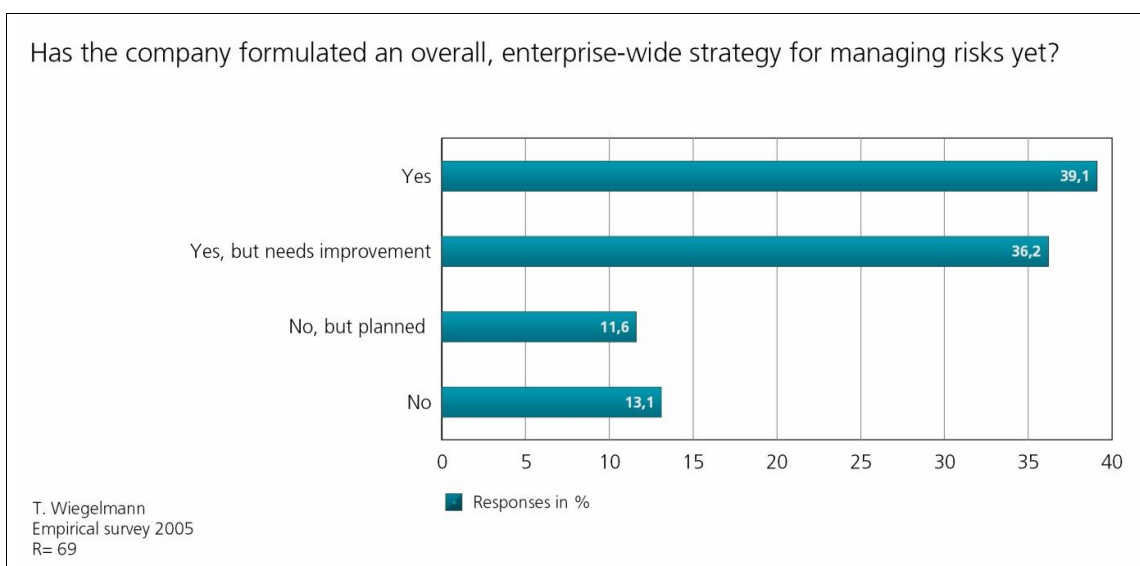


Figure 5-12: Risk management strategy

The results of this study can be broken down into two distinct categories: organisations with a defined risk management strategy (39.1 per cent, R= 69), and those without risk management or overarching strategies or where risk management and overarching strategies are only established in parts of the organisation (60.9 per cent). No

less than 36.2 per cent of all developers polled stated that they had not yet finalised the formulation of a risk management strategy or have identified a need for optimization with regard to material strategic issues. A value of this order allows two interpretations: a number of organisations may have corporate strategies in place that entail some risk policy implications but do not fulfil the requirements of an organisation-wide risk management or that, as a first implementation step, initially concentrate on meeting the minimum statutory requirements. As compliance with regulatory requirements was not a key driver of creating a risk management system in most cases but rather the provision of support for management in their decision-making process, this would tend to support the first interpretation. 24.7 per cent of all respondents reported having no enterprise-wide risk management, with 11.6 per cent of all organisations polled planning the development of risk-related strategic approaches. It would appear self-evident that the lack of a formulated and frequently communicated risk management strategy does not support consistent risk awareness in relevant organisations, nor is it likely to induce the staff members to be uniformly conscious of risk in their actions.

However, the statements derived from the overall picture cannot necessarily be applied to the evaluation results of different ownership categories. Exact Fisher and Cramer's V analyses show a very strong association between ownership structure and formulation of an enterprise wide strategy for managing risks (Cramer's $V = 0.412$; $p\text{-value} = 0.007$). The ownership-based analysis reveals a tendency towards increasing professionalism of risk management on listed organisations. For instance, 65.2 per cent of the relevant organisations ($R = 23$) apply an organisation-wide risk strategy. A further 26.1 per cent has developed initial risk strategy approaches but stated that there is a significant need for improvement. In contrast, 32.6 per cent of non-listed organisations do not have an enterprise-wide risk management strategy in place.

5.3.4 Risk management as an integral aspect of management

A key principle of risk management is that it should be fully integrated into an organisation's business planning processes. The question as to whether organisations include risk management as an integral component in all the relevant strategy, control and monitoring processes is therefore of interest in order to be able to analyse risk management practice among leading European real estate development organisations (cf. Appendix C - Question 12). Figure 5-13 presents the answers of 67 responding organisations.

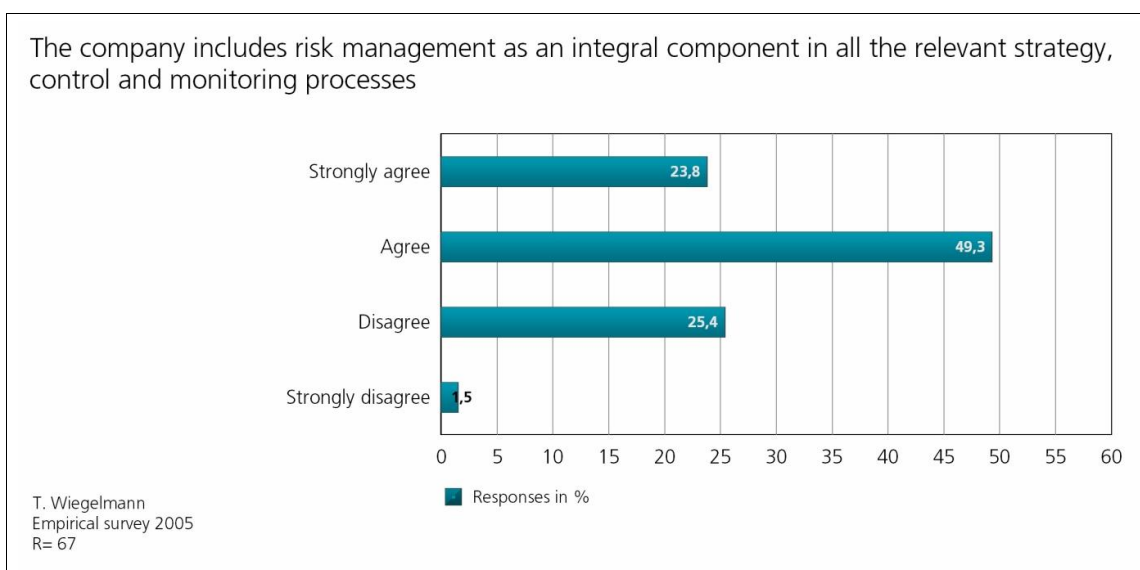


Figure 5-13: Risk management in strategy, control and monitoring processes

A majority of organisations agreed (49.3 per cent, R= 67) or strongly agreed (23.8 per cent) including risk management as an integral component in all relevant processes. 25.4 per cent disagreed, reflecting a fragmented approach towards the management of risks.

Risk management principles

It is normally at Board level that the parameters of systematic risk management are determined and consequently applied across all corporate levels. These parameters are then outlined in the form of risk management policies and principles. A formal policy framework includes specific guidelines as well as the more general principles that shall apply to the aspects of the business and the management of its risks. This includes, inter alia, binding statements on security objectives, selected assessment

methods, decision-making criteria for risk prevention measures, organisational aspects of risk management and reporting parameters. At the same time, a standardised nomenclature is included for reference in order to facilitate clear interpretation. Policies enable risk owners to understand what the organisation intends to accomplish.

The relevant rules and regulations may range from written general frameworks to detailed directives and comprehensive manuals. Moreover, policies can also consist of an implicit understanding of the orientation of risk-policy aspects, without being documented in writing. This would appear especially true for smaller organisations.

The survey participants were asked to provide details on the existence of written statements regarding risk management (cf. Appendix C - Question 24). This question was based on the preliminary impression that the majority of developers do not base their risk management on written guidelines.



Figure 5-14: Written statements on risk management

As illustrated by Figure 5-14, this assumption can now be considered as having been essentially verified by 40.9 per cent of respondents (R= 66). The survey results show that clearly defined, written risk policies are not widely used in practice. 53 per cent of all respondents stated that they use written risk management statements. In the case of approx. 28.8 per cent, risk-policy objectives seem to be firmly entrenched at management level, but are not sufficiently or conclusively set down in writing and show potential for improvement. The fact that 6.1 per cent did not have the knowledge to answer this question would indicate that an organisation-wide risk management approach has not yet been established within these organisations. Exact Fisher and

Cramer's V analyses show a strong association between written risk management statements and developer type (Cramer's V= 0.405; p-value= 0.009) and geographic scope (Cramer's V= 0.381; p-value= 0.001) of the respondents. Approximately 75 per cent of the investor developers have clear and written management statements on risk management and approx. 60 per cent of the responding trader developers have no management statements on risk management.

The comparatively small number of employees, flat hierarchies and strong corporate culture would suggest that highly formalised risk management processes may be regarded as not appropriate within the real estate development industry. This assumption is supported by the fact that organisations may reinforce their risk management philosophy not only through written statements and policies but also through everyday actions.

However, this assumption is clearly refuted by the results regarding the uniform understanding and definition of risk that applies organisation-wide (cf. Figure 5-7), indicating that in a large number of cases a uniform understanding has only partially been established, if at all. As a consequence, risk management will be characterised by a lack of consistency and uniformity, with the risk tolerance of the individual staff members being the primary driver of their decision-making behaviour. However, consistent and risk-sensitive behaviour of all employees is an indispensable prerequisite for efficient risk management. Significant improvements in risk management should be achieved if staff was sufficiently aware of the risk management policies and strategies formulated by organisation management and were therefore better equipped to respond to risks and opportunities in a more effective manner and in accord with the organisation's level of risk tolerance.

5.3.5 Overall confidence in risk management

Figure 5-15 illustrates the effectiveness of the risk management processes to handle selected risks at corporate level from the perspective of the developers polled. While using self-rating on the effectiveness of the respondents' risk management may suffer from subjective bias, this question nevertheless provides an indication as to the self-perception of survey participants. It was expected that the answers would be, overall, rather positive.

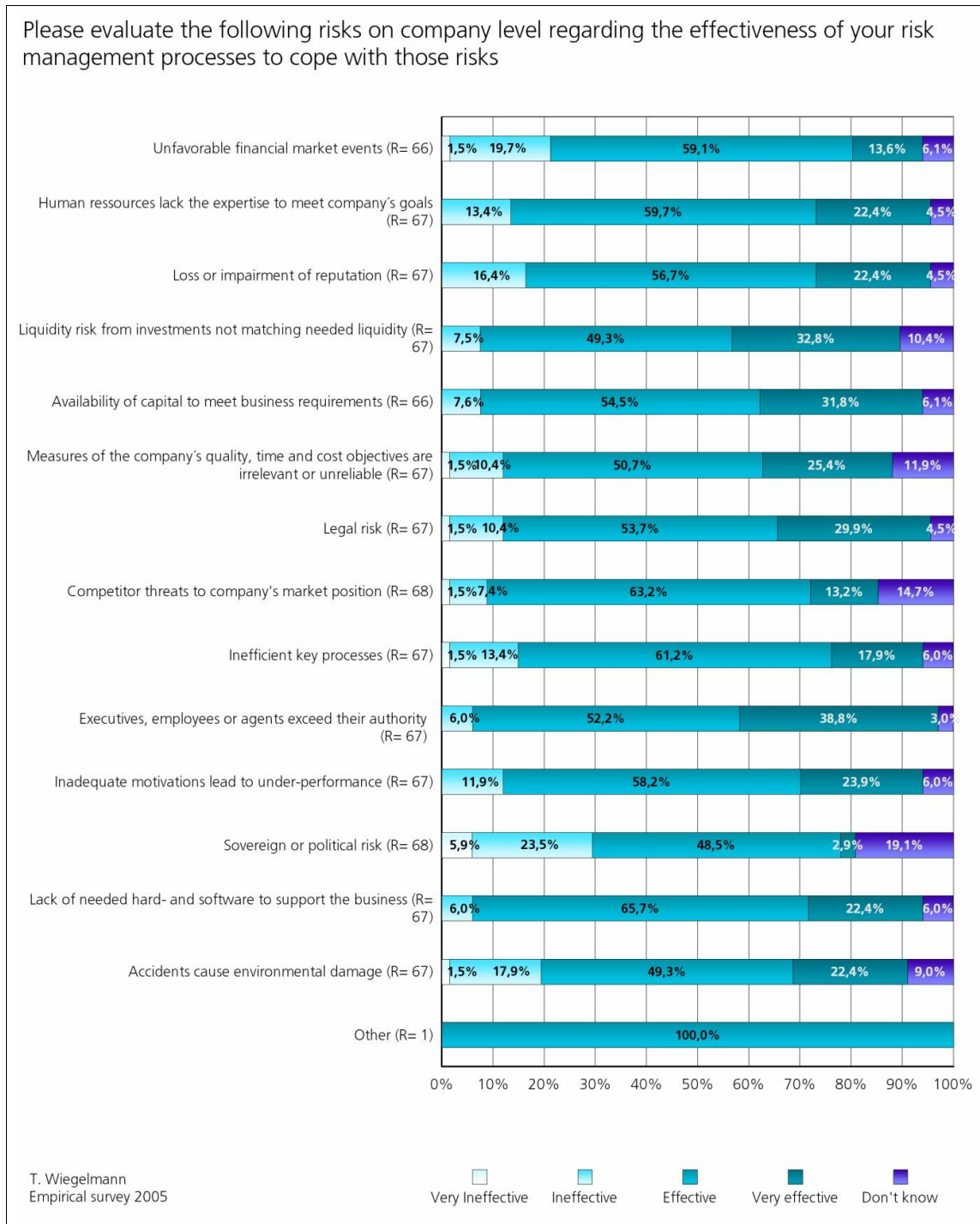


Figure 5-15: Risk management capability on organisation level

Figure 5-16 evaluates how the developers view the effectiveness of their risk management processes to deal with risks, which the participants consider to have a significant impact on the organisation's objectives on a project level.

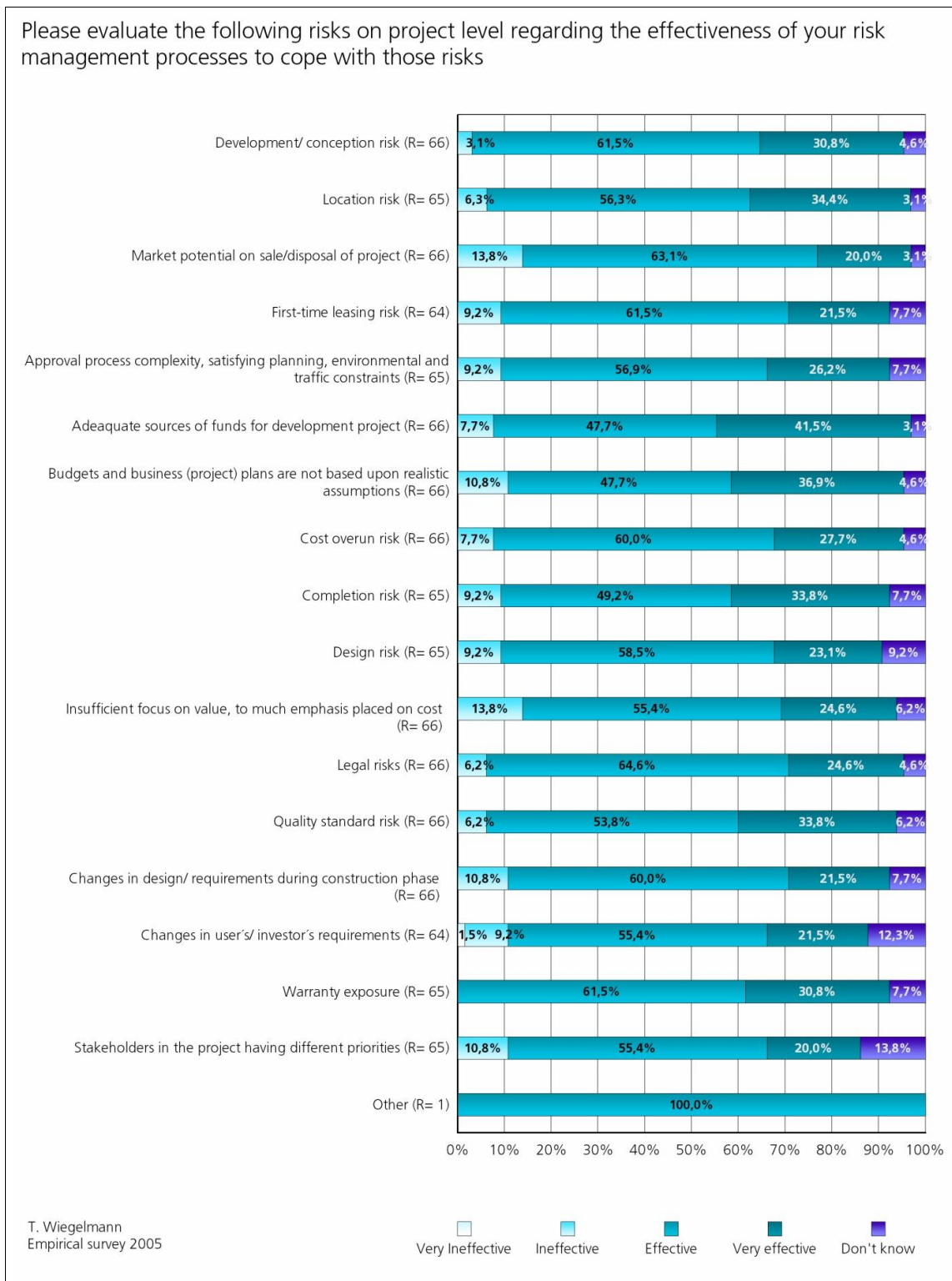


Figure 5-16: Risk management capability on project level

Undoubtedly there is a very high level of confidence amongst real estate developers that their risk management is in fact effective, with significant risks being identified, assessed and managed as part of the entire process. Figure 5-17 illustrates the frequency distribution with regard to the developers' confidence in their own risk management (cf. Appendix C - Question 22).



Figure 5-17: Overall confidence in risk management

3.0 per cent (R= 66) are absolutely convinced of the quality of their risk management system, 89.4 per cent of responding developers believe, to a greater or lesser extent, that their own risk management process identifies all potential risks that could jeopardize their existence, that it assesses these risks and has them adequately under control. Only 7.6 per cent stated that their confidence in their own risk management capabilities is either limited or non-existent.

5.4 Risk management process

5.4.1 Setting corporate objectives

As was ascertained in the theoretical part of this study, the definition of corporate objectives is a vital prerequisite for the effective management of risks. It was noted, for instance, that risk is, inter alia, defined as the possibility of deviating from a given target. All organisations set themselves specific strategic and operative goals, with a distinction to be drawn between output-related, financial and social goals. The significance of effective risk management for the achievement of corporate objectives will be described below (cf. Appendix C - Question 12).

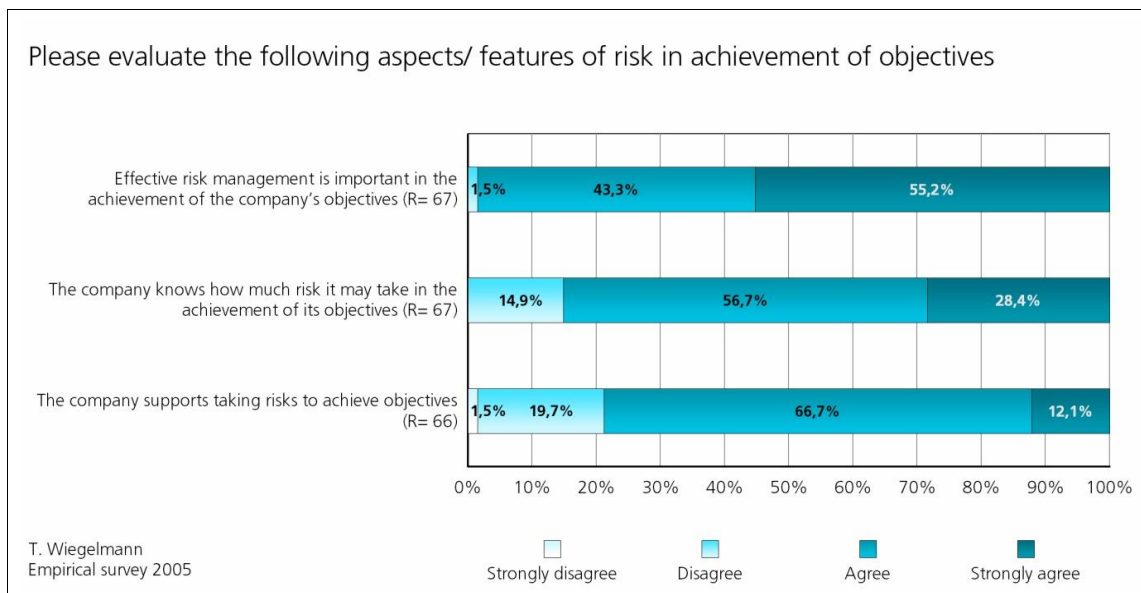


Figure 5-18: Risk in achievement of objectives

98.5 per cent of respondents (R= 67) agree or strongly agree that effective risk management is important for the achievement of corporate objectives. This result demonstrates that effective risk management is indispensable for sustained corporate success in real estate development. There is also an inter-dependence found between developer type and the importance of risk management (Cramer's V= 0.342; p-value= 0.013) during the Exact Fisher and Cramer's V analyses; the results of the questionnaire confirm that issue that especially investor developer strongly agree (71 per cent, R= 31) with the importance of risk management in achieving corporate objectives.

85.1 per cent (R= 67) agreed or strongly agreed that their organisations have a correct understanding of the scope of risks they are required to assume in order to achieve

corporate goals. However, 14.9 per cent of the respondents stated that they are not aware of the risks to be assumed. In all probability, the relevant organisations will not be able to determine their appropriate and individual level of risk appetite.

Almost all respondents affirmed their belief in the significance of risk management and awareness of the risk appetite of their organisations, yet 21.2 per cent of all respondents (R= 66) stated that their organisations fail to encourage the conscious assumption of risk in order to achieve corporate goals. Consequently a confirmative association has been identified between the ownership structure of the respondent and the risk attitude to achieving the organisation's objectives during the Exact Fisher and Cramer's V tests (Cramer's V= 0.356; p-value= 0.023).

5.4.2 Motives and goals of risk management implementation

The importance and benefits of risk management have already been outlined in the theoretical part of this thesis. The presentation and description of the objectives and motives of real estate development organisations are intended to illustrate the fundamental role in the formulation and definition of a risk policy. The starting point of the analysis is the expectation that the optimization of corporate decisions lies at the heart of the real estate developers' risk-policy considerations.

In order to test this, the organisations polled were presented (cf. Appendix C - Question 11) with a catalogue of potential drivers for the implementation of risk management (multiple responses were possible). The following Figure 5-19 shows the ranking, in order of importance, of the key risk management drivers for the 69 developers polled that formed the survey population.

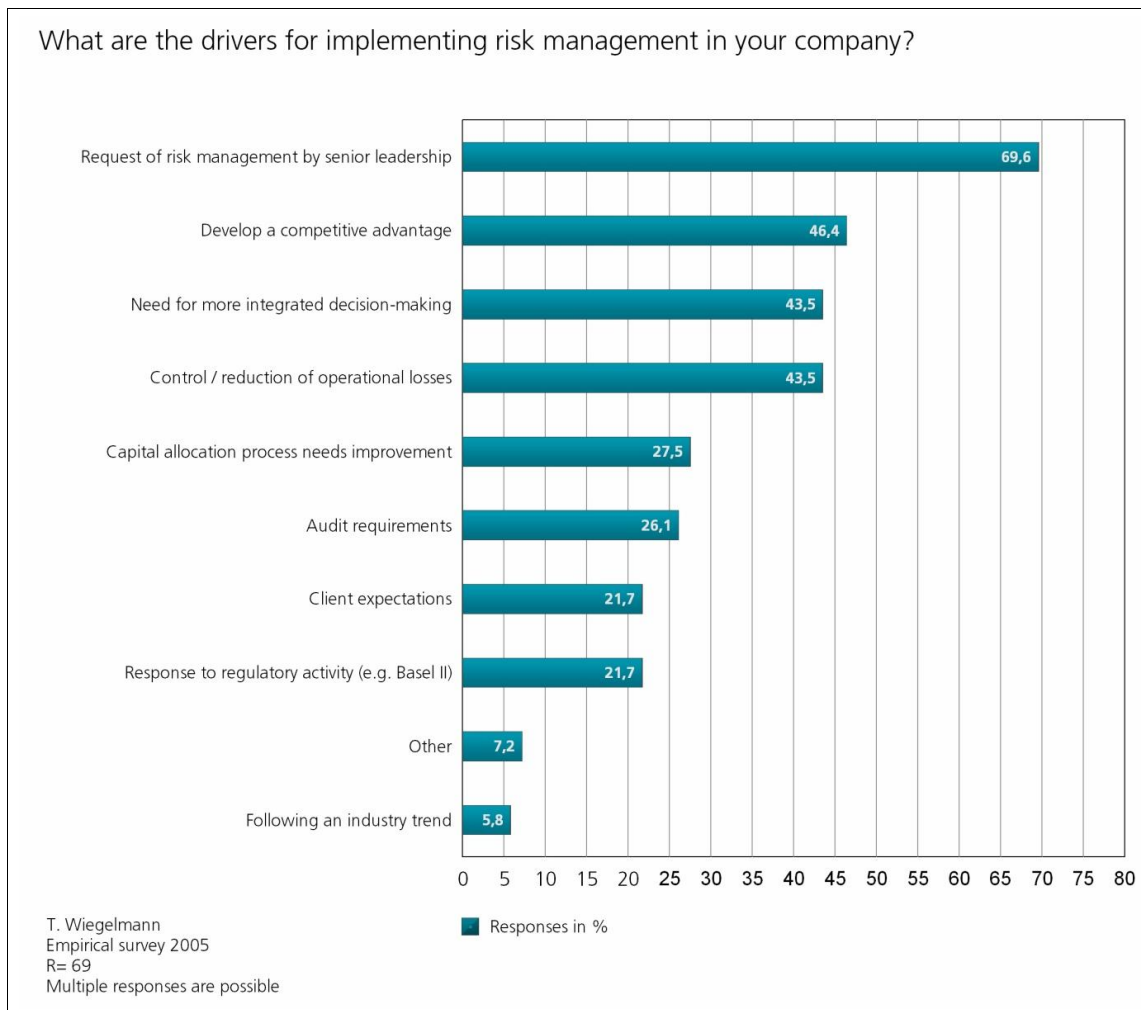


Figure 5-19: Drivers for risk management implementation

Having been identified by 69.6 per cent (R= 69), the request by senior leadership is the primary driver for the implementation of risk management in corporate practice. The results strongly points to the conclusion that the respondents' risk management philosophy is driven from the top down and consequently that value contribution attributed to effective risk management is considered very high. The creation of a competitive advantage ranks second with 46.4 per cent. Accordingly, developers do not view risk management as a bureaucratic tool favoured by auditors, but rather as a control instrument to ensure sound business decisions on a sustainable basis. For instance, 43.5 per cent of all organisations polled integrate risk management as an additional control instrument for a successful decision-making process. Taking this result into account, survey participants demonstrate confidence that the corporate decision-making process, which is - at present - strongly characterised by intuitive judgement calls, will become increasingly objective and fact-based by the incorporation of risk management techniques. Other drivers are the control and / or reduction of operational losses (43.5

per cent) as well as the optimization of capital allocation processes (27.5 per cent). Overall, the survey findings suggest that senior management expectations and business imperatives - rather than regulatory requirements (21.7 per cent) or industry trends (5.8 per cent) - are driving forces in risk management. This indicates that developers try to realize the benefits of effective risk management.

5.4.3 Risk identification

During the risk identification phase, all operational risks should be identified in a systematic and timely manner, assessing their potential impact on a real estate project and the overall risk position of the organisation. This is a prerequisite for any evaluation of the risks identified and the subsequent focus areas of the risk management strategy.

Thorough and comprehensive identification of risks is therefore of vital importance. The survey on the ability of organisations to identify its main risks showed that 92.8 per cent of all survey participants (R= 69) almost unanimously stated that they do not consider the identification of risks to be difficult (cf. Appendix C - Question 14). Further statistical analyses show that there is an association especially between developer type and risk identification during the Exact Fisher and Cramer's V tests (Cramer's V= 0.341; p-value= 0.025).

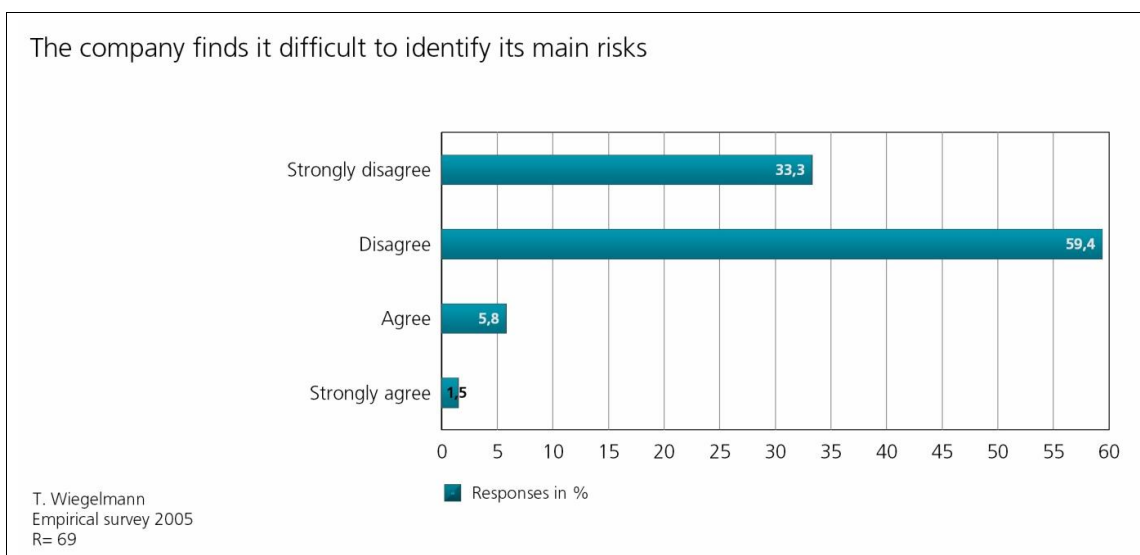


Figure 5-20: Risk identification

The method by which the organisations identify their risks appears to be unsystematic as only 17.4 per cent of the 69 respondents stated that they use a comprehensive risk catalogue for risk identification purposes (cf. Appendix C - Question 15). A further 33.3 per cent possess and use risk catalogues of sorts but recognise that there are deficiencies. In contrast, 49.3 per cent stated that they do not maintain any risk catalogues. It seems doubtful whether such organisations are in fact able to carry out a comprehensive identification and assessment of their risk position. This reveals that there is a lot of room for improvement in this respect. At least, 26.5 per cent of all organisations that do not use a risk catalogue for risk identification (R= 34) recognise this as a shortcoming and plan to remedy this situation.

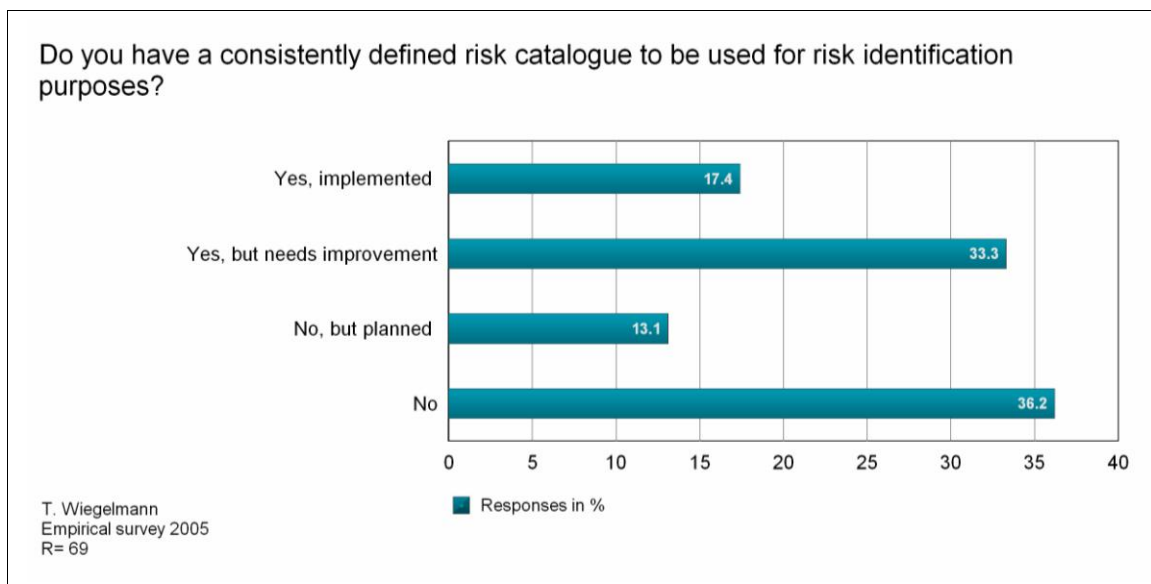


Figure 5-21 Risk Catalogue

Relevance of risk types for development organisations

In order to perform an in-depth assessment of the relevance of different risk types, the survey participants were presented with a catalogue of risk types (cf. Appendix C - Questions 7 and 8). They were asked to apply these firstly at organisational level and then at project level.

As a first step, a scale ranging from 'low' through 'medium' to 'high' and 'very high' was used to obtain information on the relevance of certain risks regarding their significance to achieving the organisation's objectives. The next question asked the participants to describe the effectiveness of their own risk management to cope with those risks, choosing one out of five options, namely 'very ineffective', 'ineffective', 'effective', 'very effective' and 'don't know'.

The risk universe at corporate level is highly complex. For practical reasons, the participants were presented with a list of 14 different options and a 15th 'other' option to cover for significant omissions. Figure 5-22 illustrates the relevance of selected risks at corporate level from the perspective of the developers polled, with the various risk types being ranked in their order of significance for the responding organisations.

Please evaluate the following risks on company level regarding their significance to achieving your company's objectives

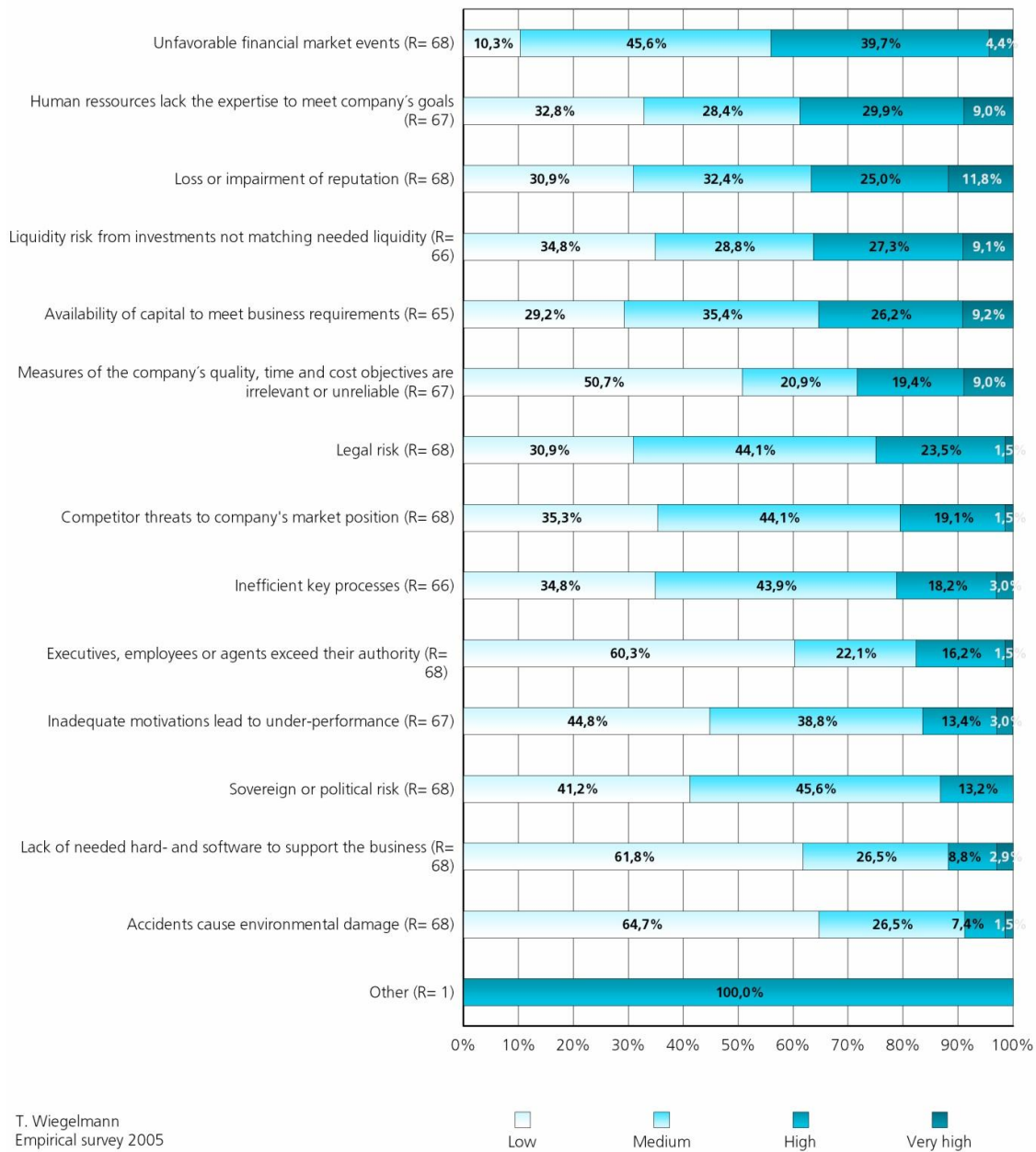


Figure 5-22: Significance of risks on organisation level

The risk universe, which is associated with real estate investments in general and real estate development in particular, was documented in the theoretical part of this study. The developers polled were given 17 different options and an 18th 'other' option to cover for significant omissions. The following Figure 5-23 highlights the risks on project level that participants consider to have a significant impact on the organisation's objectives

Please evaluate the following risks on project level regarding their significance to achieving your company's objectives

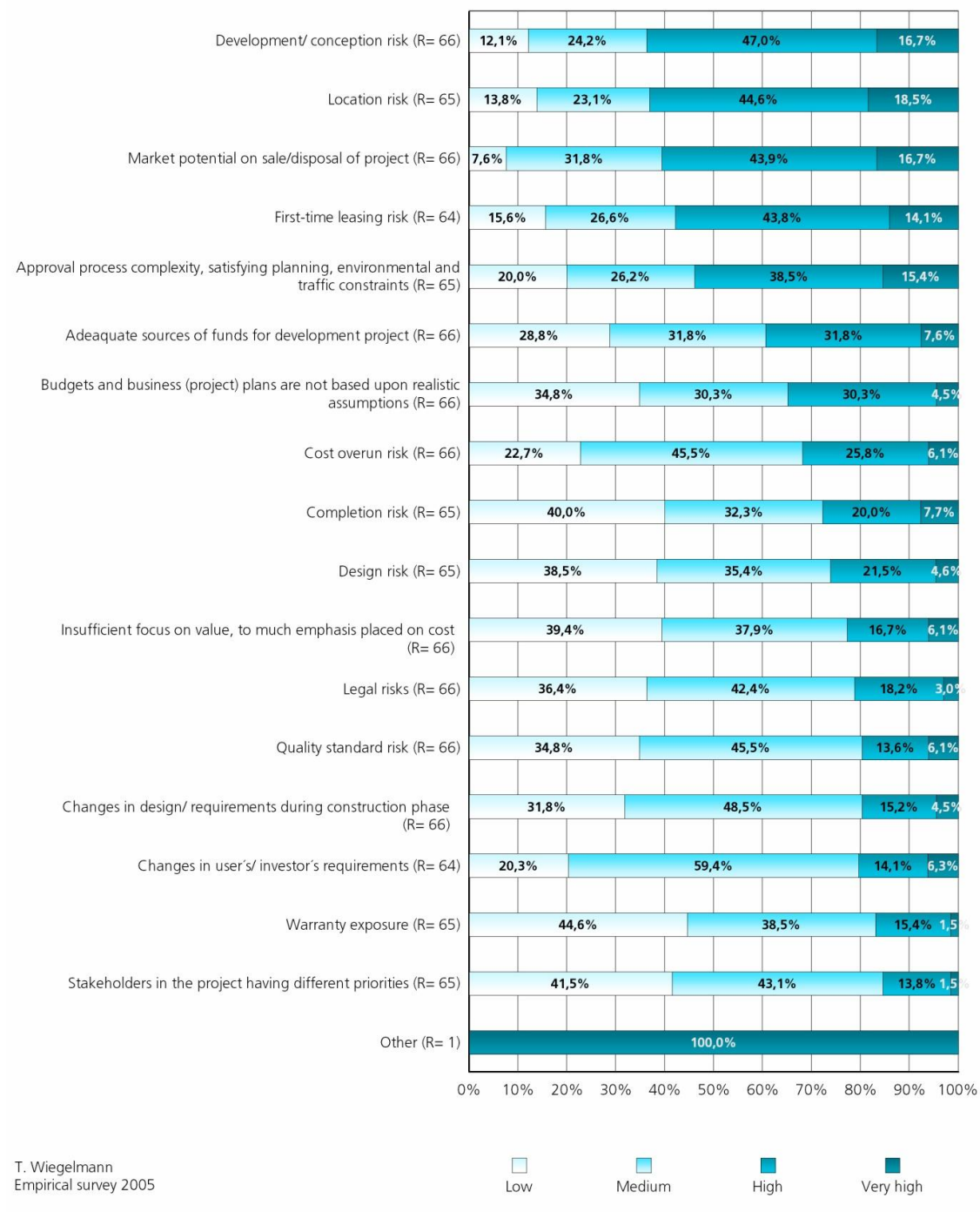


Figure 5-23: Significance of risks on project level

Most development organisations face a number of principal business risks that are critical to their success, survival and strategy. It is important that developers understand what these risks are and what risks are regarded by the industry as being 'top risks'. There is a high consensus amongst participants on the categories of risks which have a significant impact on the real estate developer both at project and corporate

levels. However, there are fewer consensuses amongst the participants with regards to the ranking order on corporate level than at project level. For example the highest consensus was only 44.1 per cent of participants ranking 'high' or 'very high' the significance of 'unfavourable financial market events' to achieving the organisation's objective but 63.7 per cent ranked development / conception risk, which tops the list, as 'high' or 'very high'.

5.4.4 Risk assessment

The consistent application of risk assessment methods constitutes a critical success factor for risk management, which provides the framework for ascertaining the significance of risks and their probability in order to derive appropriate risk management and monitoring measures. The survey results reveal a substantial deficit in such a consistent risk assessment concept (cf. Appendix C - Question 14).

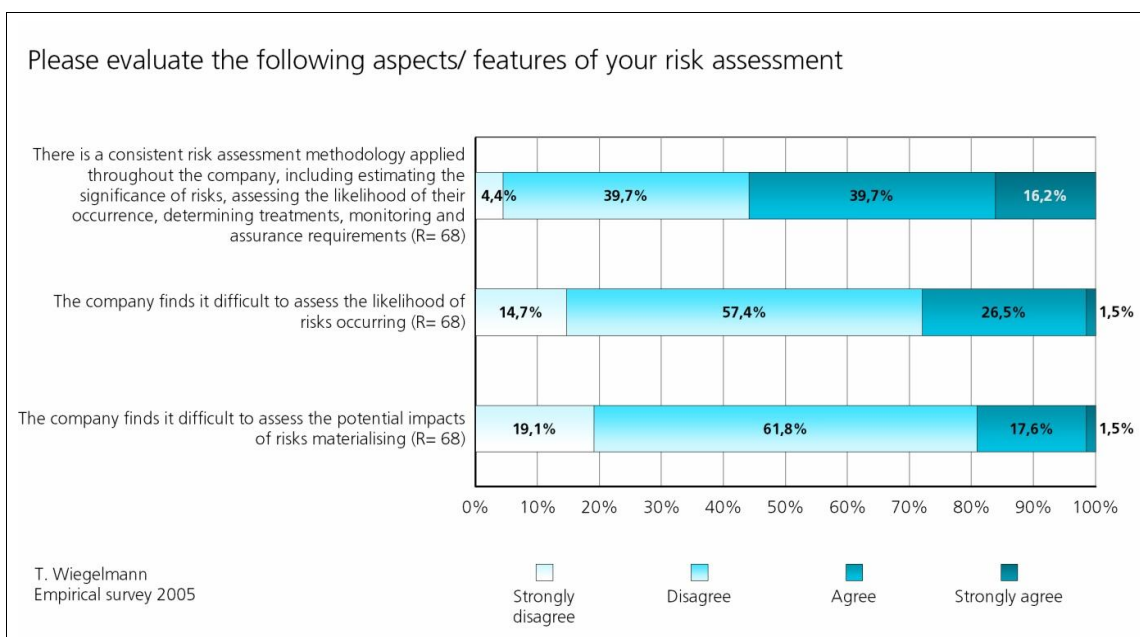


Figure 5-24: Aspects of risk assessment

44.1 per cent of respondents (R= 68) stated that they do not apply an integrated comprehensive risk assessment approach. This result is surprising in that the survey participants are, according to their own assessment, convinced that their own risk management is, in principle, effective. It would be reasonable to assume that organisations focusing on projects with higher investment volumes apply a more professional approach. However, an analysis of the answers, when differentiated according to size categories, refutes this assumption. Exact Fisher and Cramer's V analyses show a very

strong association between ownership structure and the assessment of potential impacts of risk materialising (Cramer's $V = 0.489$; $p\text{-value} = 0.000$). About 9 per cent of the responding unlisted companies find risk assessment difficult compared to 35 per cent of listed companies

When evaluating and analysing risk, any given real estate developer will be required to determine two factors: firstly, the probability of risk and secondly, the extent of the possible damage in case the relevant risk materialises. The survey results reveal a trend that the survey participants have fewer difficulties in making an informed assessment of the possible implications of an event than in estimating its probability. No less than 80.1 per cent ($R = 68$) stated that they had no difficulties assessing the implications of risk, while 72.1 per cent ($R = 68$) stated that they had no difficulties estimating the probability of any given risk materialising.

Risk assessment on strategic and operational level

The results to the question, whether developers implement risk assessments across the organisation in a timely way at strategic and operational level (cf. Appendix C - Question 16), are illustrated in Figure 5-25.

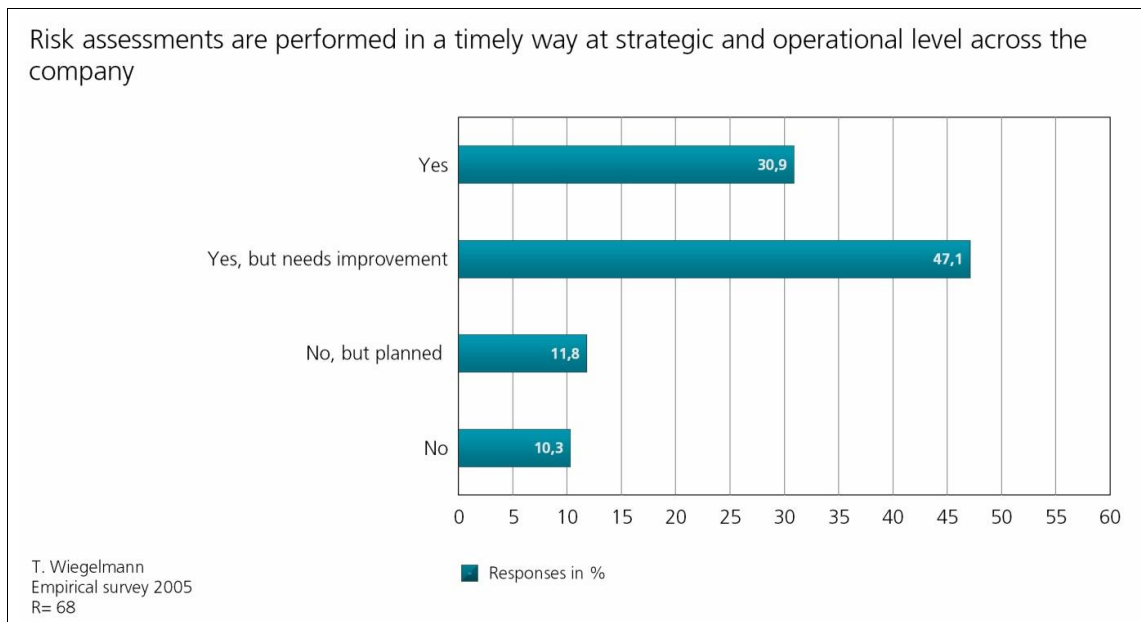


Figure 5-25: Risk assessment on strategic and operational level

Organisation-wide risk management should, as a rule, take into consideration all strategic and operational levels within the organisation. 30.9 per cent ($R = 68$) of all survey participants agree with this approach. A total of 22.1 per cent stated that they do not

take strategic or operational aspects into consideration, with 11.8 per cent intending to rectify this situation. The majority of 47.1 per cent of all respondents, initiate regular risk assessments at both the strategic and operational level, but recognise that there is significant room for improvement.

Methods and method sets of risk assessment

The theoretical realm of literature provides a host of methods and techniques for the general assessment of risk. Figure 5-26 illustrates the frequency distribution of the methods used by the survey participants (cf. Appendix C - Question 18) for the assessment of risk (multiple responses were possible). Overall, subjective assessment methods ('gut feeling') appear by far the most popular.

Even today, with the availability of sophisticated analysis methods, the determination of the risk associated with individual developments depends primarily on the subjective and intuitive view of the relevant developer. For example, when assessing risks, 69.9 per cent (R= 69) prefer an assessment based on subjective views of individual representatives. In this case, great stock is being placed on the personal experience of the person carrying out the assessment as well as that person's 'common sense' or 'gut feeling'.

With 43.5 per cent each, scenario techniques and sensitivity analysis are also popular risk assessment methods. 34.8 per cent stated that they use external experts and specialists. However, this does not mean that the risk assessment function is outsourced: all of the organisations polled carry out their own assessments of the risk situation, even when using third-party services. This study would allow for the conclusion that developers avail themselves of independent expert opinions in order to verify their own assumptions. 17.4 per cent consider a risk-specific approach to premiums or discounts on multipliers as being suitable to assess identified risks. The use of simulation methods is lower than expected at 10.1 per cent of responding developers. It is also noted that with 7.2 per cent, the application of the value-at-risk method is not a popular technique within this industry. Having been mentioned by only 4.3 per cent, decision tree procedures are largely unused.

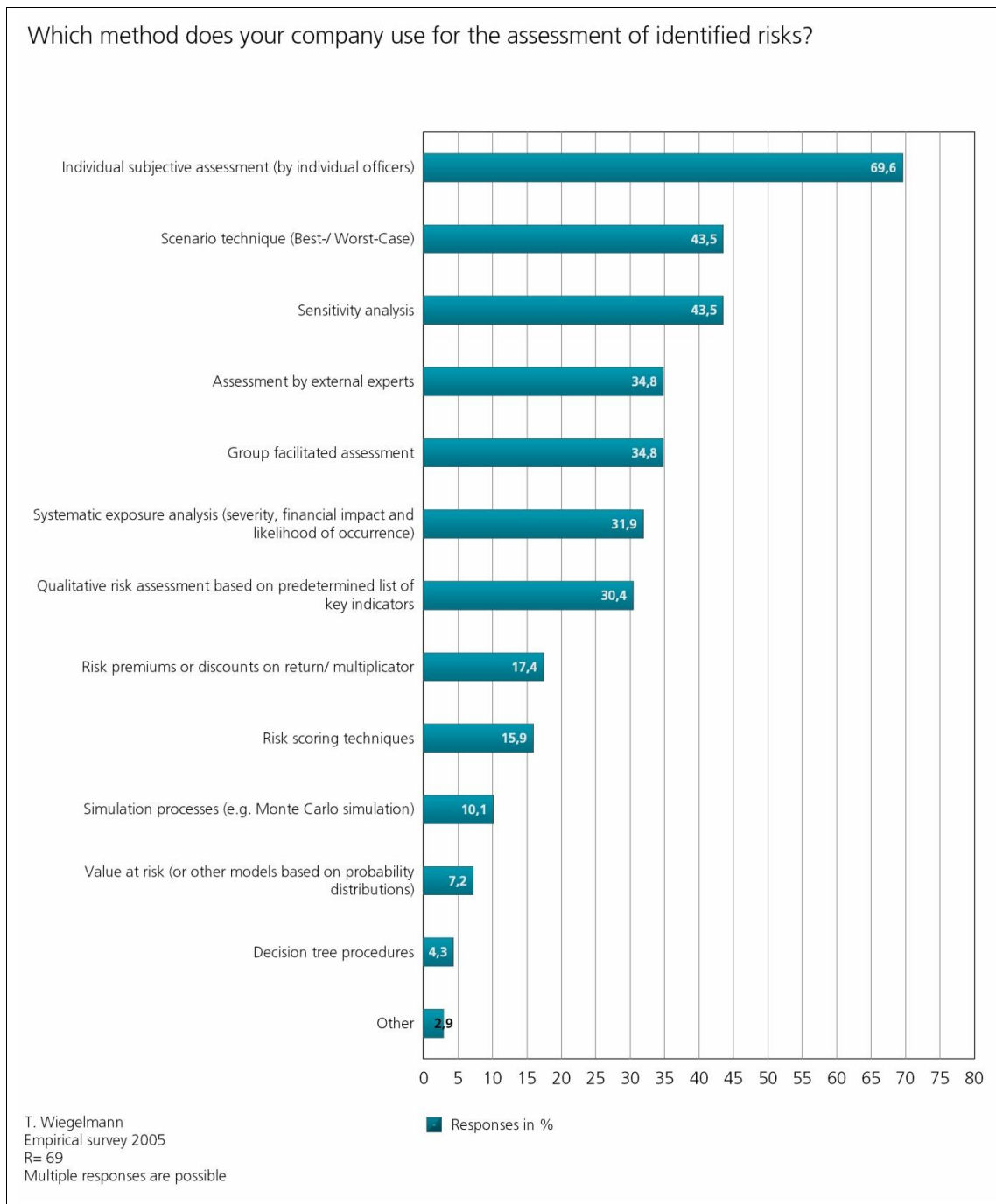


Figure 5-26: Risk assessment methods

The reasons for the preferred application of these assessment approaches and processes are likely to be based on their ease of use and staff qualifications.

In theory, the application of suitable analytical techniques, the assimilation of realistic information and a comprehensive understanding of risk enable developers to assess risks both accurately and conclusively. In addition to the generally large amount of risks as well as financial and time-related restrictions, further critical factors include the incompleteness of data in many real estate (sub-)markets in particular. For this

reason, a wide range of models for the quantification of risks arising within the real estate sector may be of considerable benefit from a theoretical perspective. Yet their practical use and the feasibility of calculations of risk measures, such as standard deviation, variance or value-at-risk, appear limited. Insufficient depth and density of comparable data as well as the lack of sufficiently long running time series may be the reason for its limited use. Table 5-3 provides an overview of a range of risk assessment methods

Number of methods	1	2	3	4	5	6	7	Total
Total number of responses	6	16	20	10	5	8	4	69
Responses in % (R= 69)	8,7%	23,2%	29,0%	14,5%	7,2%	11,6%	5,8%	100,0%

Table 5-3: Number of risk assessment methods

Only 8.7 per cent of all real estate developers (R= 69) use one single evaluation method alone, with the emphasis being on the individual subjective assessment (five out of six responses).

91.3 per cent of all survey participants prefer the use of multiple criteria as part of their risk evaluation. The focus is on a method set consisting of at least two different methods, with the use of three methods being ranked first (29.0 per cent). Not less than 40 per cent of all survey participants use four or more methods. On average, the survey participants use a method mix consisting of 3.5 different methods for risk assessment.

The most common combination of methods was a combination of the creation of scenarios, sensitivity analyses and insights gained from subjective evaluations of individuals. This would seem to indicate that quantitative results gained from any evaluations play a supplementary role to subjective personal evaluation, which is far easier to carry out.

The preference for method sets over any single method can be explained by the fact that the main problem encountered during risk assessment is the procurement of data material and only to a lesser extent the processing of such data using the appropriate methods. Moreover, owing to the use of information technology, the application of method sets reduces the input in terms of time, costs and labour.

Information needs at project level

The existence of an in-depth analysis of project information is a crucial factor of the investment decision process and the evaluation of a risk profile. Indeed, 66 survey participants reported a comprehensive need for information (cf. Appendix C - Question 20). The results are summarised in Figure 5-27 (multiple responses were possible).

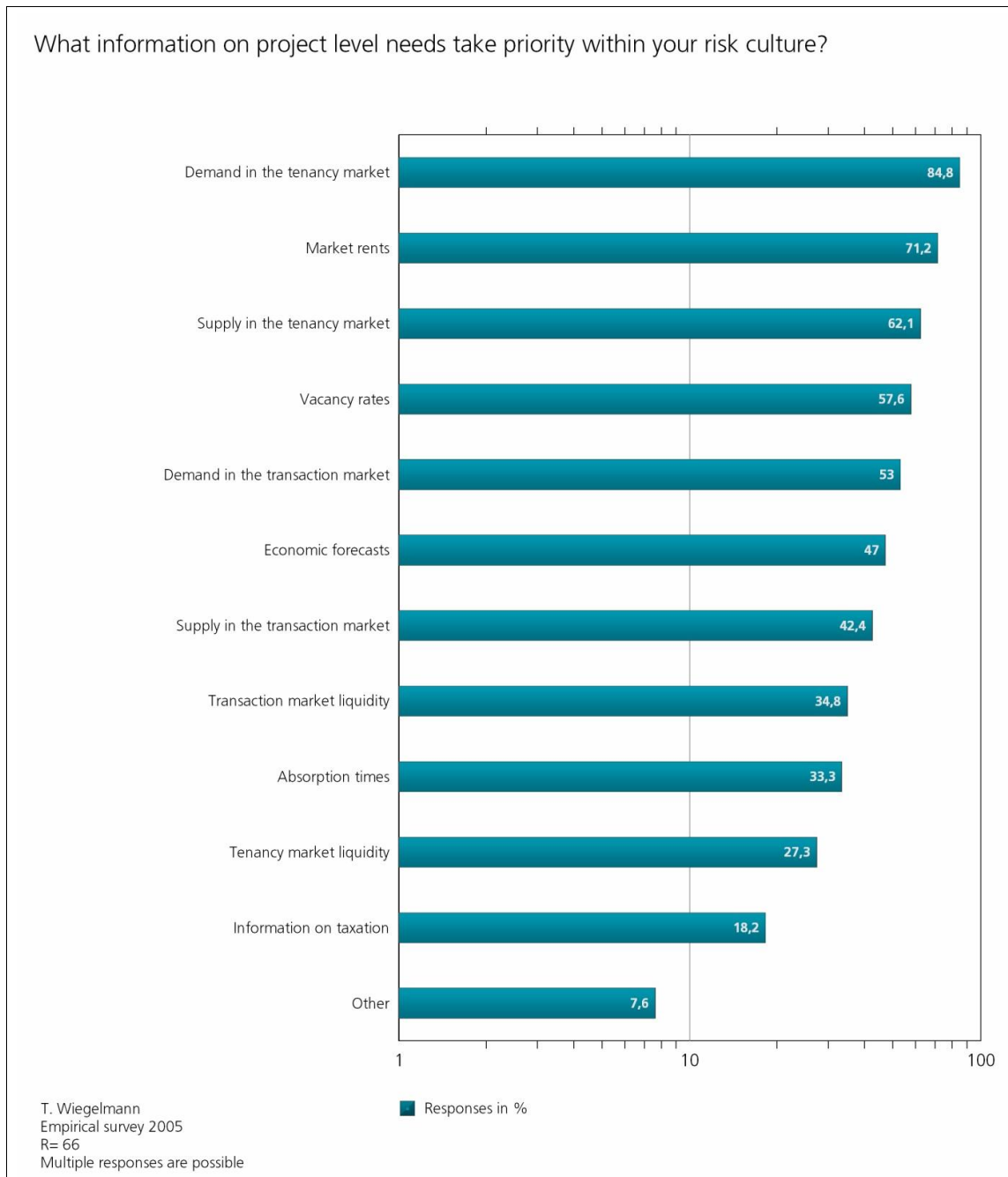


Figure 5-27: Information demand on project level

An analysis of the priority of information for real estate developers at project level revealed that information on the tenancy market is clearly the most important. The real estate developers polled named both the demand (84.8 per cent, R= 66) and the supply (62.1 per cent) on the tenancy markets and market rents (71.2 per cent) as the three most important types of information for risk assessment purposes in connection with real estate projects. Information regarding vacancy rates (57.6 per cent) and absorption times (33.3 per cent) complete the evaluation of the relevant tenancy market.

The significance of this information may also be driven by the growing popularity of transparent valuation methods, such as the discounted cash flow (DCF) method. A DCF valuation is therefore, among other things, based on assumptions regarding market rents, vacancy and absorption scenarios as well as rent increases. Accordingly, a thorough evaluation requires in-depth and current knowledge of the relevant market segment.

Further significant information needs to exist with respect to data on demand in the transaction market (53.0 per cent) and transaction market liquidity (27.3 per cent). An informed assessment of disposability and developer profit is only possible on the basis of this information. 47.0 per cent of respondents take into consideration information on the general economic forecasts.

Only 18.2 per cent survey participants have an information need for project-related data on the general framework of taxation. Tax aspects such as land tax, property transfer tax and depreciation options are specific to the real estate development industry. When a completed property is intended for sale, tax-related 'deal-breakers' for potential investors are fully researched.

The reason for the comparatively low level of interest in the transaction markets may be found in the lack of statistically valid historical and actual data regarding comparable transactions of the various usage segments. As a consequence, substantiated research is difficult to carry out. It is in particular the information on yields, liquidity of various markets and segments that would constitute a solid basis for the investment decision-making process associated with development projects and for ongoing reporting and control.

Time dimension of risk assessment

Given the constant change in framework conditions, risk management should be a continuous process throughout the time span of real estate development rather than a one-off assessment. Risk information should be collected on a regular basis in order to be able to recognize changes to existing risks as well as the emergence of new risks.

The routine assessment of the risk situation of any given organisation and its potential impact on the business are vital components of risk management. In order to gain insights into the frequency of risk analysis, the survey participants were given the choice between five different frequencies (cf. Appendix C - Question 17). The results of the survey revealed that quarterly / tertially assessment is most popular, but no single frequency was chosen by a majority of respondents (cf. Figure 5-28).

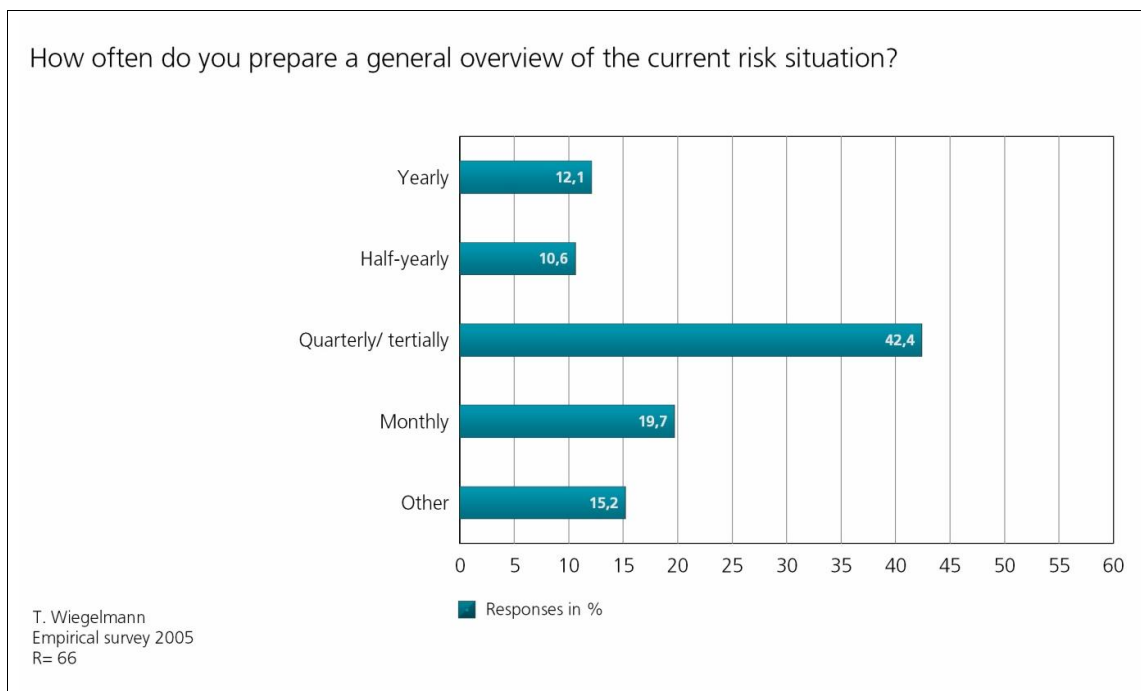


Figure 5-28: Time dimension of risk assessment

In this context it is quite remarkable that the focus is not so much on longer periods (“yearly” was cited by 12.1 per cent of the survey respondents (R= 66) and “half-yearly” by 10.6 per cent), but rather on short intervals (42.4 per cent) in the form of quarterly or tertiary analysis. The emphasis on this time interval could be a reflection of or coincides with financial reporting requirements; both publicly traded and privately held organisations must disclose material changes to their risk position to

shareholders in order to present a fair view of future business trends in the context of their quarterly reporting.

19.7 per cent of developers polled carry out a monthly assessment of the risk situation. Only 15.2 per cent do not routinely assess their overall risk situation at pre-defined intervals. However, the fact that no specific evaluation period has been determined is not necessarily an indication of less systematic risk management. The survey participants cited project-related factors and ad-hoc evaluations as appropriate times for an assessment of the risk situation. Another organisation stated that its assessment intervals are aligned with the timing of board meetings.

5.4.5 Risk control

Risk control is one of the core activities, consisting of a tool set consisting of various measures. It is intended to improve the risk position as part of risk optimisation. The aim is to initiate suitable measures, using the data collected and interpreted, in order to achieve corporate objectives while taking into consideration the specific risk appetite of the organisation. This may result in the prevention, reduction or transfer of risk. The question of how developers address material risks that may threaten their organisation (cf. Appendix C - Question 19) has been answered by 67 organisations (multiple responses were possible). The results are summarised in Figure 5-29 below.

With 67.2 per cent (R= 67), the situation-specific derivation of ad-hoc measures constitutes the preferred practice for the optimisation of the risk situation. The systematic development of an action task list is carried out by 47.8 per cent of the responding organisations, with the risk-policy measures being subject to periodic monitoring. 21.4 per cent organisations stated that a pre-defined risk owner controls the relevant measures. However, only 29.9 per cent document the measures used in order to analyse their effect. 1.5 per cent does not take or complete any measures for the optimisation of the risk situation.

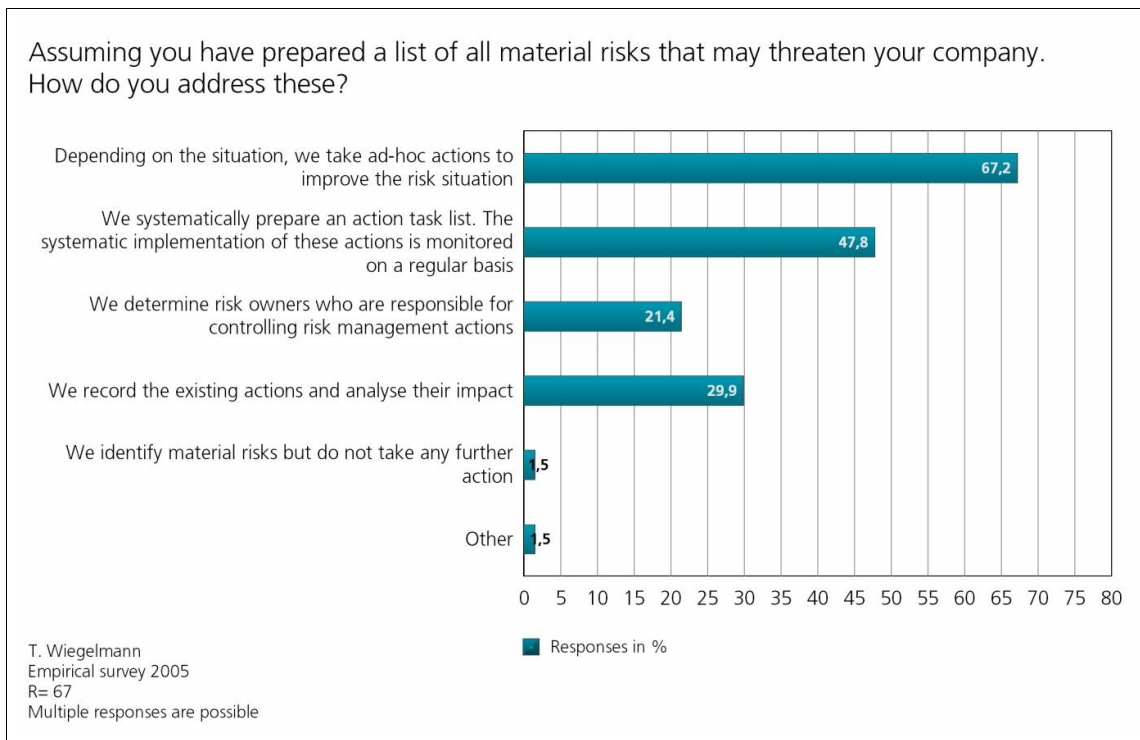


Figure 5-29: Measures to optimize the risk situation

These results would permit the conclusion that developers essentially respond to their risk situation in a reactive manner. Ultimately, the preference for ad-hoc measures implies that a deviation from the target has occurred or that the relevant risks have in some part materialised. Active risk management, by contrast, is proactive, directing management attention to uncertainties and risks before the events have happened, when there are still opportunities to do something to avoid, mitigate, or manage them or to stop a project if they cannot be managed (cf. chapter 3.3.5). It should be feasible to achieve an increase in efficiency if developers designed their risk management as a proactive process that is integrated into their business processes and both anticipate and handle any risks associated with these business processes. Such risk-oriented organisation management would ultimately facilitate the leveraging of any opportunities that may arise.

5.4.6 Risk monitoring

In this section the questions seek to establish how organisations address or manage their risks and how management activities and risks are monitored and reported.

Reporting

Figure 5-30 provides an overview of key issues regarding the practical application of risk-related reporting in the real estate development industry (cf. Appendix C - Questions 21 and 24).

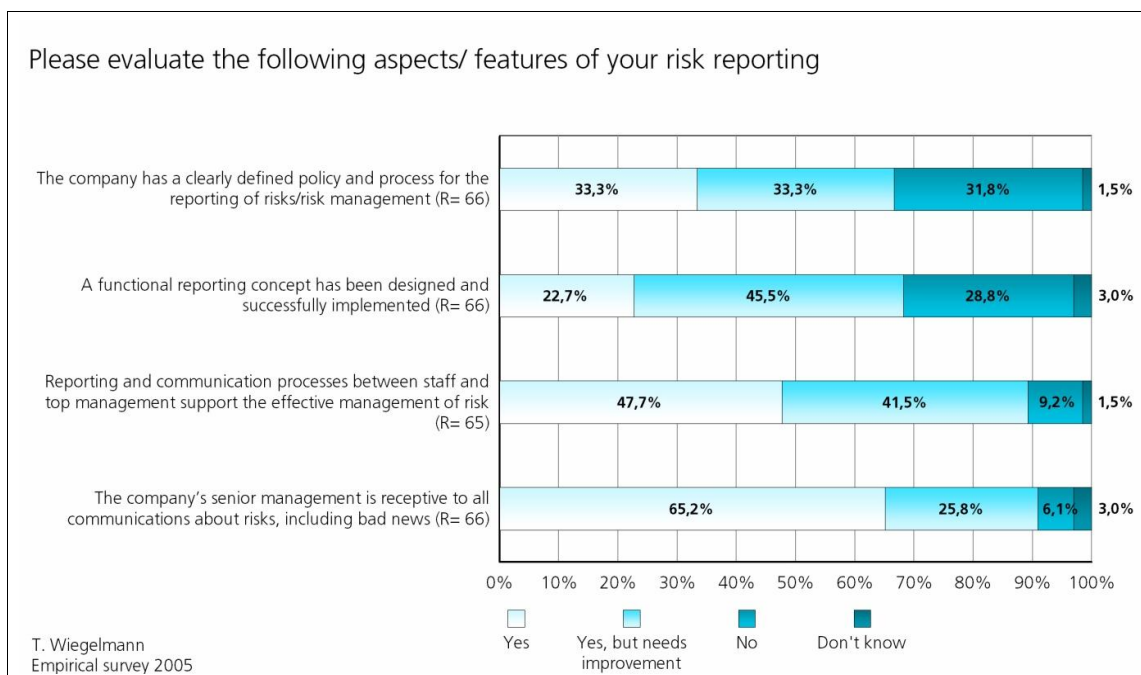


Figure 5-30: Reporting policies and processes

Of the responding real estate developers, 33.3 per cent (R= 66) report a clearly defined policy and process for risk reporting. 33.3 per cent report that the beginnings of a reporting system are in place, but state nevertheless that there is significant potential for improvements with respect to risk reporting. As many as 31.8 per cent state that they have no risk management reporting in place; 1.6 per cent cannot conclusively answer the question. Exact Fisher and Cramer's V tests show there is an association between geographic scope of the respondent's organisation and a clearly defined risk reporting process (Cramer's V= 0.332; p-value= 0.040). The results of the responses emphasize the test as more companies with an international scope have a clearly defined policy and process for risk reporting than companies with national scope.

A functional reporting concept has been designed by 22.7 per cent per cent of responding real estate developers (R= 66). 45.5 per cent report that there is significant potential for improvement with respect to functional risk reporting. As many as 28.8 per cent state that they have no functional risk management reporting in place; 3.0 per cent cannot conclusively answer the question.

47.7 per cent (R= 65) state that reporting and communication processes between staff and top management support the effective management of risks. 41.5 per cent identify a potential for optimization with respect to communications between staff and top management as regards risk management; only 9.2 per cent state that communication barriers are an obstacle to effective risk management.

Well over 65.2 per cent (R= 66) indicate, that the senior management is receptive to all communications about risks, including bad news.

Risk monitoring

In order to gain insights into the risk monitoring of leading developers, a series of questions (cf. Appendix C - Questions 21 and 24) were formulated whose results are summarised in Figure 5-31 below. It is noted that as tasks become more specific, fewer and fewer respondents answered in the affirmative.

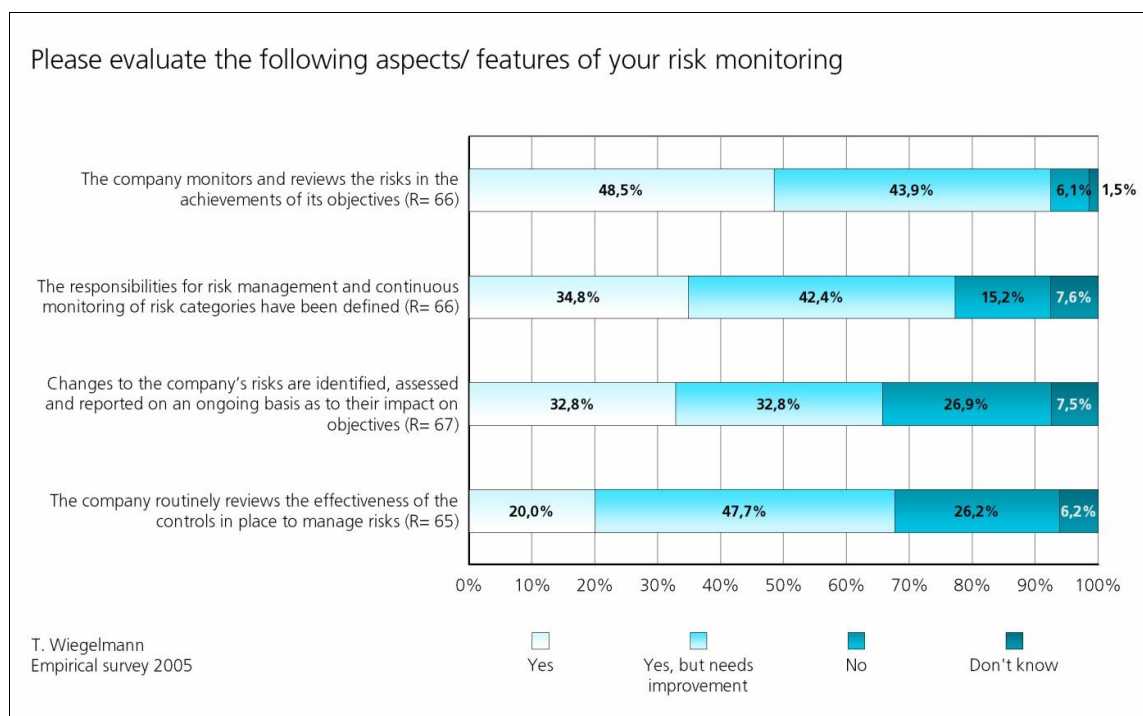


Figure 5-31: Aspects of risk monitoring

Monitoring and reviewing risks can be described as being established in most of the industry. This is confirmed by 48.5 per cent of responding developers (R= 66), another 43.9 per cent report that they have developed activities in this area, but that there is still significant potential for optimization. Only 6.1 per cent do not undertake any monitoring and review of risks in the achievement of the objectives. This underlines the significance of risk management. A clear assignment of responsibilities in connection with continuous monitoring of risk categories is affirmed by 34.8 per cent of the responding organisations (R = 66). 42.4 per cent have established certain responsibilities, but ultimate accountability has not been fixed in these organisations. 15.2 per cent of the developers report not having established any responsibilities; 7.6 per cent are unable to provide a definitive answer to this question.

About 32.8 per cent of respondents (R= 67) monitor the risk environment. In this process, changes to risks faced by the organisation are continuously identified, assessed and reported. 32.8 per cent of responding developers endeavour to maintain adequate control over changes to the risk situation which could impact their corporate goals, but report significant need for optimization in this context. 26.9 per cent of responding organisations do not deal with changes in their risk environment, nor with their assessment and reporting. 7.5 per cent are unable to respond to this question. It is assumed that the organisations concerned have not implemented suitable concepts, instruments and measures.

The survey results indicate that there is considerable potential to improve risk management procedures amongst the population. 26.2 per cent of respondents (R= 65) do not evaluate the effectiveness of risk management activities; 6.1 per cent were not able to respond to this question; only 20.0 per cent routinely review the effectiveness of the controls in place to manage risks. While 47.7 per cent conduct efficiency tests, they have identified that there is significant potential for optimizing the established practice. Without effective risk monitoring, changes in the organisation's individual risk positions cannot be identified and communicated on a timely basis. Thus it is not possible for the elements that have already been successfully implemented in an organisation, such as

- establishment of an organisation-wide risk-management organisation,
- periodic and complete risk identification,

- definition of appropriate, effective and efficient risk control measures
- assignment of responsibility for their implementation
- integrated internal risk reporting systems

to be fully effective.

Key indicators and threshold values

The establishment of a suitable monitoring system is intended to ensure that substantial risks and changes to these risks are recorded and communicated in such a manner that management has adequate time for initiating effective control measures. To this end, the mere monitoring of changes to identified risk positions is a necessary but not fully sufficient element. Instead in the course of risk monitoring it is necessary to define appropriate early warning indicators that allow new risks or changes to existing risk positions to be recognized before the risk analysis is performed in detail.

The setting of threshold values permits the continuous monitoring of quantifiable risks and the associated predefined indicators. Where the relevant threshold values are exceeded, a risk warning will be triggered. The setting of individual threshold values will depend on corporate strategy and risk policy or risk appetite.

The following survey results were ascertained to determine whether real estate developers have derived key indicators and threshold values for the monitoring of material risks (cf. Appendix C - Question 21).

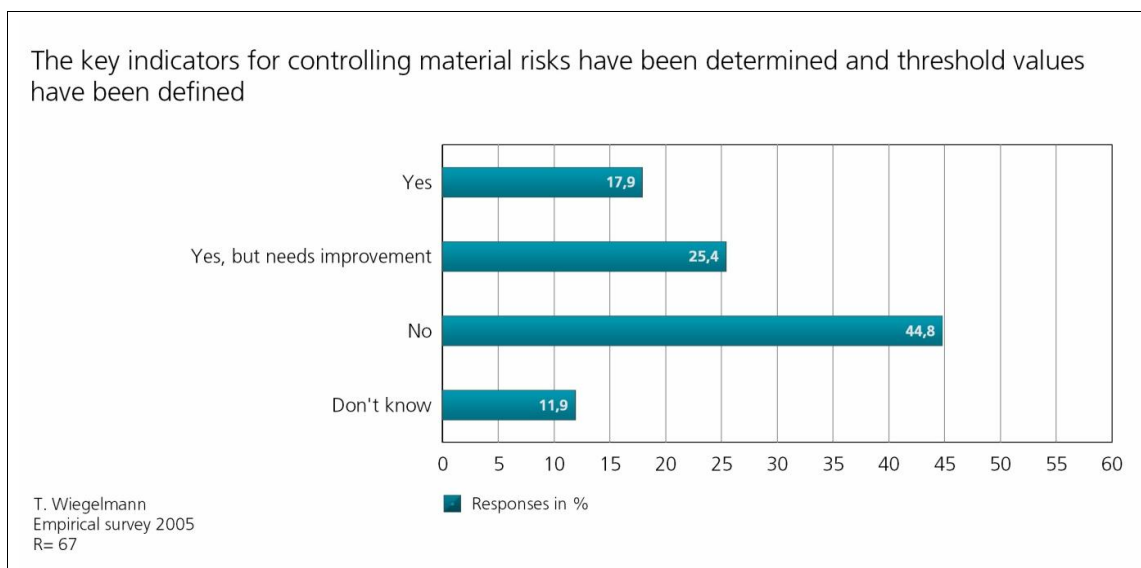


Figure 5-32: Key indicators and threshold values

Only 17.9 per cent of the survey population ($R= 67$) assess and analyse material risks on the basis of operating ratios, taking into account specific threshold values. 70.2 per cent of all respondents use indicators either partially, or not at all, as a benchmark for the assessment and evaluation of risk. An astoundingly high share of respondents (11.9 per cent) is unaware of any indicators, which have been established as a basis of organisation management.

The results of the survey show that many organisations have failed so far to implement systems and processes to ensure the early identification of risks. For such a system to be effective, the key prerequisite is a corresponding data matrix with respect to key indicators and early warning indicators. This may constitute a significant hurdle to implementing such early warning systems.

A differentiated analysis - according to developer types - of those organisations, which use key indicators and threshold values for efficient risk management, reveals an interesting tendency. Exact Fisher and Cramer's V test show an association between these two variables (Cramer's $V= 0.401$; $p\text{-value}= 0.013$). The developer type of a company affects the features of risk management of the company. Most of the investor developers tend to have key indicators and threshold values for their risk management, whereas, most of the trader developers do not make use from key indicators and threshold values.

An analysis related to the size of individual projects demonstrated that 54.5 per cent ($R= 11$) of all developers polled, who apply key indicators, are geared towards the realisation of projects that fall under the 'large' category. The share of organisations focusing on medium-size project volumes is 27.3 per cent, while organisations concentrating on smaller projects account for 18.2 per cent. Again, these results confirm the expectation that as the complexity of projects increases, more sophisticated management and monitoring tools are required to provide effective project- and risk-management.

5.5 Evaluation of propositions

Determination of Proposition 1: The analysis of the results of the survey reveal that generally developers rely on individual judgement and experience rather than systematic enterprise wide risk management frameworks using comprehensive methods and tools.

Four main areas of investigation were used to determine this proposition: the use of an enterprise wide risk management framework in the risk management process, whether the risk management process is methodical and carried out using step-by-step procedures, whether the process is purposefully regular and whether systematic tools are utilized.

The results indicate that developers tend to lack a well formulated and well defined risk management strategy throughout the organisation (Figure 5-12). It is believed that a number of organisations may have corporate strategies in place that entail some risk policy implications but do not fulfil the requirements of an organisation-wide risk management framework.

The empirical data collected on the risk management process suggests the development industry lacks a formal systematic and proactive approach and that there is a reliance on the traditional method of intuitive judgement dependent on individual skills, experience and risk appetite of key project participants. There is clear evidence that the large majority of respondents understand and agree with the concept and scope of setting corporate objectives and risk appetite (Figure 5-18) but the results suggest a misalignment between the concept and the practice in this area. A much larger proportion of organisations have a clearly defined corporate definition of risk (Figure 5.5) than they have an unambiguous written risk management statement on organisation policy (Figure 5-14).

The survey results indicate that there is considerable potential to improve risk management procedures amongst the population. The results on the use of a comprehensive risk catalogue for risk identification purposes (Figure 5.21) suggests that organisations lack a formal and structured approach to the process of risk identification. The preference for ad-hoc measures for the optimisation of the risk situation (Figure 5-26) suggests that developers essentially respond to their risk situation in a reactive rather

than a proactive manner. The most common mix of assessment methods is qualitative rather than quantitative risk assessment. Quantitative evaluations play a supplementary role to subjective personal evaluation, which is far easier to carry out. The preferred practice of risk control by ad-hoc measures (Figure 5-29) also implies a reactive rather than a proactive approach to risk control. Monitoring and reviewing risks in the achievement of objectives can be described as being established in most of the responding organisations although there is still significant potential for optimization. Over one third of respondent organisations have a clear assignment of responsibilities and continuous monitoring and response to changes in the risk environment and under one third of respondents evaluate the effectiveness of risk management activities (Figure 5-31).

There is strong evidence that the risk management process falls short of the objective of being purposeful regular management, rather tending to be reactive and secondary to the reporting cycle. Regular risk assessments at both the strategic and operational levels are performed by under half of all respondents (Fig. 5-25) with the strongest focus on quarterly analysis (Figure 5-28). This time interval is believed to coincide with financial reporting requirements. There is a preference for optimisation of the risk situation on a reactive rather than a regular proactive review basis (Figure 5-29) and there is also evidence that there is a preference for responding organisations to carry out and regularly monitor action task lists only when risks, which may threaten the organisation, have been identified (Figure 5-29). Only 20 per cent of all respondents perform regular monitoring of their overall risk management process (Figure 5-31).

With regard to the utilisation of systematic tools, the results reveal that there is a lot of room for improvement as evidenced by a small proportion of all respondents having either a comprehensive risk catalogue (Figure 5-21) or a comprehensive and fully integrated management information system. In general, the most dominant approaches in risk assessment methods are based on qualitative techniques whereas the least used methods are reliant on quantitative tools with general IT-support. (Figure 5-26). Although a large number of organisations surveyed use IT support as part of their risk management system, less than half that number makes only limited use of stand-alone solutions such as Microsoft Excel (Figure 5-10). Figure 5-11 confirms that unacceptable numbers of organisations have either insufficient tools to adequately satisfy the needs

of the organisations in question or they map the risk management process entirely without appropriate software solutions.

Determination 1: Developers' approach towards the management of risks tends to be characterized by a lack of formalization and co-ordination and largely rely on individual judgment and experience.

Determination of Proposition 2: There is conflicting evidence regarding this proposition. While the results show that risk management is not performed on a regular basis and support the proposition, the existence of a specialised risk management committee and the overwhelming confidence that their risk management process is considered effective appear to contradict the proposition.

Three areas of investigation were taken into consideration to determine this proposition: the regularity of the risk management process, how difficult the organisation finds the risk identification and risk assessment processes and the existence of a risk management committee. The results indicate that the risk management process falls short of purposeful regular management. Risk management appears to be reactive and secondary to the reporting cycle. 47.1 per cent (Figure 5-25) of all respondents initiate regular risk assessments at both the strategic and operational level, but recognise that there is significant room for improvement with the strongest focus on quarterly analysis (Figure 5-28). This time interval is believed to coincide with financial reporting requirements. 67.2 per cent of respondents have a preference for optimisation of the risk situation on a reactive rather than a regular proactive review basis (Figure 5-29). 47.8 per cent of the responding organisations carry out and regularly monitor action task lists when risks which may threaten the organisation have been identified (Figure 5-29) but only 20 per cent of all respondents perform regular monitoring of their overall risk management process (Figure 5-31).

The respondent organisations did not find it difficult to identify (Figure 5-20) or assess (Figure 5-24) the risks, which the organisation was likely to face. The overall confidence by these organisations would suggest that either their risk management process was very effective or there was complacency in the organisation with regard to risk management and this could possibly have led to an ad hoc approach to management.

Based on all the evidence collected by this empirical study, the latter explanation is more likely to be the case.

The existence of a specialised risk management committee in a large proportion of the organisations in Figure 5-8 suggests that risk management would be systematic rather than on an ad hoc basis. 71.2 per cent of respondents stated that they have a specialised risk management committee to ensure that there is a centralised and organisation-wide control of risk management and risk aspects of specific development projects.

Determination 2: Risk Management tends to be performed primarily to coincide with financial reporting requirements and is not regarded as a continuous and dynamic process.

Determination of Proposition 3: Developers tend to lack a fully integrated enterprise wide risk management strategy despite the high priority given to risk management by senior management.

Three main categories of investigation areas were taken into consideration; whether the organisation has an enterprise wide strategy for risk management, what drives the organisation to implement risk management and the composite and primary responsibility of the risk management function?

The results are in line with the expectation that developers tend to lack a well formulated and well defined risk management strategy throughout the organisation (Figure 5-12). This shows that risk management is not aligned with corporate strategy. It is believed however, that a number of organisations may have corporate strategies in place that entail some risk policy implications but which do not fulfil the requirements of an organisation-wide risk management.

The top drivers identified for the implementation of risk management were requested by senior leadership, the creation of a competitive advantage and the need for more integrated decision-making and control / reduction of operational losses (Figure 5-19). Client expectations, response to regulatory activity and following an industry trend were the least popular drivers amongst the respondents. This suggests that the mo-

tives and goals of senior management to realise the intrinsic benefits of effective risk management is evidenced.

The study of the composition of risk management committees and primary responsibility for the risk management function indicate a high priority of risk management within these organisations although only 10.4 per cent of the responding development organisations had a dedicated Chief Risk Officer acting as a centralized coordinating point to facilitate risk management within the organisation (Figure 5-7). Where a specialised risk management committee existed, senior management of the organisation appear to dominate the composition of the committee; the CEO and Board members and the CFO (Figure 5-8).

Determination 3: Risk management is often fragmented and few development organisations have formal processes to align risk management with corporate strategy.

Determination of Proposition 4: The majority of real estate developers appear to conduct risk management within their organisation's specific risk appetite and they are particularly confident of their risk management on project levels. This determination is mainly based on two areas. The first one is the awareness and understanding of the concept of risk and risk appetite and the second one on the effectiveness of the risk management process in dealing with identified risks. In spite of increasing perception of risk in real estate development, it is surprising that only 56.5 per cent of all respondent organisations stated that the level of risk they face has increased over the preceding years (Figure 5-3). A similar result (55.1 per cent) has indicated that they have a comparable risk attitude to their relevant competitors (Figure 5-4).

In terms of understanding the concept, 81.8 per cent of developers polled follow a reward-oriented interpretation of the concept of risk (Figure 5-5) and almost unanimously, 98.5 per cent of respondents agree or strongly agree that effective risk management is important for the achievement of corporate objectives and 85.1 per cent agreed or strongly agreed that organisations have a correct understanding of the scope of risks they are required to assume in order to achieve corporate goals (Figure 5-18). Despite so many organisations having this clear interpretation of the concept of risk, 37.3 per cent of organisations polled did not have a common definition on risk

throughout their organisations (Figure 5-5) and 14.9 per cent of the respondents stated that they are not aware of the risks to be assumed (Figure 5-18).

The empirical data above suggest that the majority of developers have a clear awareness and understanding of the concept of risk and risk appetite and that it is necessary to balance and accept opportunities and risks. Developers tend to regard their activities as comparable to/ or even more cautious than those of their competitors. There is however a significant minority that do not have a common organisation wide definition of risk and a further though smaller minority that are not aware of the risk appetite of the organisation.

With regards to the effectiveness of the risk management process in dealing with identified risks, developers showed more confidence about their risk management skills at project rather than corporate level; seven areas of risks on corporate level were identified as areas in which the risk management processes were 'very ineffective' compared to only one area on project level and there is a greater agreement with regards to the ranking order of significance of risks at project level than at corporate level. The highest consensus was only 44.1 per cent of participants ranking 'high' or 'very high' the significance of 'unfavourable financial market events' to achieving the organisation's objective but 63.7 per cent ranked development / conception risk, which tops the list, as 'high' or 'very high'. Undoubtedly there is a very high level of confidence amongst real estate developers that their risk management is in fact effective, with significant risks being identified, assessed and managed as part of the entire process. There is strong evidence that developers are highly comfortable with the risk management process and believe in their own ability to cope with risks more confidently on project rather than corporate levels.

Determination 4: Most real estate developers do not conduct their risk management in alignment with the organisation's specific risk appetite.

Determination of Proposition 5: The majority of development organisations do not have risk management, which is applied across the whole organisation.

A direct survey as to whether the organisation has an enterprise-wide strategy for risk management has been conducted. In addition, the existence of a specialised risk management committee within the organisation has also provided evidence of a higher probability that the organisation would have an enterprise wide risk management strategy.

Figure 5-12 shows that 39.1 per cent of respondents have a defined risk management strategy and 60.9 per cent of respondent organisations either have an unsatisfactory or no enterprise wide strategy for risk management. This also indicates that there is not an inclusive strategy in place taking into account the experiences and knowledge of the employees, specialists and key decision makers in the organisation.

Contrary to the proposition, developers tend to lack a well formulated and well defined risk management strategy applied across the organisation. However a number of organisations do have corporate strategies in place that entail some risk policy implications but do not fulfil the requirements of an organisation-wide risk management.

The majority of respondents stated that they have a specialised risk management committee to ensure that there is a centralised and organisation-wide control of risk management and risk aspects of specific development projects (Figure 5-8).

Those organisations which have a specialised risk management committee are more likely to have risk management which is operational throughout the organisation but as this is not reflected in the area of investigation above, it is probable that these committees are not as systematic and all encompassing as they should be.

Determination 5: Many organisations have some measure of risk management activities but few can claim to have an enterprise wide risk management strategy, i.e. risk management tends not to be applied across the whole real estate development organisation.

Determination of proposition 6: Contrary to the proposition, risk management within many responding organisations is not implemented in a way that it allows to identify, assess and manage all events potentially affecting the real estate development organisation.

The lack of utilisation of systematic tools, formal reporting lines and staff training indicate that the process is unlikely to be robust in spite of the fact that there is high confidence by the organisations themselves.

Four main areas of investigation were used to determine this proposition: how confident the organisation is in their risk management process, whether systematic tools are utilised, whether there are effective reporting lines and whether there is adequate risk management training.

There is a high level of confidence by the respondents that their risk management is effective (Figure 5-17). This is also confirmed by the fact that the respondent organisations did not find it difficult to identify or assess the risks, which the organisations were likely to face (Figure 5-20 / Figure 5-24). The overall confidence by these organisations would suggest that either their risk management process was very effective or there was complacency in the organisation with regard to risk management. Based on all the evidence collected by this empirical study, the latter explanation is more likely to be the case.

The tools taken into account include the use of a risk catalogue, suitable IT-support, appropriate tools and risk assessment methods. The results reveal that there is a lot of room for improvement with regard to the utilisation of systematic tools as evidenced by fewer than 20 per cent having either a comprehensive risk catalogue or a comprehensive and fully integrated management information system.

Only 17.4 per cent of the respondents use a comprehensive risk catalogue for risk identification purposes. A further 33.3 per cent possess and use risk catalogues of sorts but recognise that there are deficiencies. In contrast, 49.3 per cent stated that they do not maintain any risk catalogues (Figure 5-21). In general, the most dominant approaches in risk assessment methods are based on qualitative techniques whereas the least used methods are reliant on quantitative tools which require IT-support (Figure 5-26). Although 84.6 per cent of organisations surveyed use IT support as part of their

risk management system, 41.5 per cent make only limited use of stand-alone solutions such as Microsoft Excel. 16.9 per cent of all respondents operate a comprehensive and fully integrated management information system (Figure 5-10). 28.4 per cent of the responding organisations confirmed that there are appropriate tools in place to support risk management. With 34.3 per cent of respondents, certain tools have been established, but do not adequately satisfy the needs of the organisations in question. 29.9 per cent of the organisations map the risk management process entirely without appropriate software solutions (Figure 5-11).

The empirical data collected on risk reporting policies and processes indicate that developers lack a formal and clearly defined policy and process (Figure 5-30). However, they state that communication processes between staff and senior management are effective and this suggests that risks impacting the organisation are communicated throughout the organisation, which can then be managed effectively. The lack of suitable risk management training is evident (Figure 5-9) and consequently a lack of expertise and specialist knowledge required for effective risk management may be expected to be missing to a significant degree.

Determination 6: The actual status of risk management implementation does not allow for the identification, assessment and management of all events potentially affecting many responding real estate development organisations.

Determination of Proposition 7: The empirical data suggests that real estate developers have intended and designed their risk management systems to preserve and allow value to be created. The motivation, goals and awareness of risk concept are positive and in line with risk management theory as evidenced by their perceived effectiveness of the risk processes.

Three areas of investigation were used to determine this proposition: the drivers for implementing risk management in the organisation, the organisation's awareness and understanding of the concept of risk and risk appetite and the effectiveness of the risk management process in dealing with identified risks. The survey findings suggest that senior management recognizes the intrinsic benefits of effective risk management for value creation and preservation (Figure 5-19).

The results of the investigation into common understanding/terminology of risk suggest that the majority of developers have a clear awareness and understanding of the concept of risk and risk appetite and that there is the recognition of upside potential through effective risk management which would preserve and create value (Figure 5-5 and 5-18). There is, however, a significant minority that do not have a common organisation wide definition of risk and a further though smaller minority that is not aware of the risk appetite of the organisation, which may impair the implementation of its risk management.

This study of effectiveness of the risk management process in dealing with identified risks takes the form of a study into the data collected for the significance of risks on organisational and project levels and the respective risk management capability in dealing with those risks. If the organisations can manage the most significant risks then it shows that their risk management systems are effective and would create value. The study indicates that at corporate level, the four most significant risks identified were unfavourable financial market events, human resources lack the expertise to meet organisation's goals, loss or impairment of reputation and liquidity risk from investments not matching needed liquidity (Figure 5-22). All but the unfavourable financial market events were felt to be dealt with effectively by 80 per cent or more of respondents as compared to an average of 76.4 per cent for all risks (Figure 5-15). At project level, the four most significant risks identified were development / conception risk, location risk, market potential on sale / disposal of project and first time leasing risk (Figure 5-23). Developers were highly effective with regard to managing the first two types of risk and were comfortable with the last two types (Figure 5-16).

Undoubtedly there is a very high level of confidence amongst real estate developers that their risk management is in fact effective, with significant risks being identified, assessed and managed as part of the entire process. This would seem to indicate that majority of real estate development organisations have intended and designed their risk management systems to be effective at preserving and allowing value to be created.

Determination 7: The majority of development organisations have intended and designed their risk management in order to preserve and allow value to be created.

Determination of Proposition 8: It is necessary to put the results of the statistical analysis into perspective; the number of instances where dependencies have been identified has not been great in relation to the number of variables, which have been tested. Nevertheless, there are some trends, which have been suggested by the results, and these provide additional insight on the impact of structural characteristics on the understanding and implementation of risk management of the responding organisations. The strong dependencies found within each structural category are examined below:

Three types of statistical measures were selected as being the most appropriate for assessing the dependencies between independent variables; these were Fisher's exact test, Phi and Cramer's V (chapter 4.5.5.1 and Appendix D, E and F). The use of these tests gave more depth into the analysis of the structural background of the respondents and their responses on risk management. The results confirmed dependencies which were believed to be relevant and in some instances highlighted dependencies which otherwise may not have been identified. There were 18 sets of variables, which proved to be significant (significance level (p) was less than 0.05 and the Cramer's V was more than 0.03).

Developer type

Results from the exact Fisher test and Cramer's V analyses have indicated strong associations between developer type and clear and written management statements on risk management (Cramer's V= 0.405; p -value= 0.009), key indicators for controlling material risks and defined threshold values (Cramer's V= 0.401; p -value= 0.013), the importance of risk management for the achievement of the company's objective (Cramer's V= 0.342; p -value = 0.013) and risk identification (Cramer's V= 0.341; p -value= 0.025). These associations support the belief that generally investor developers take a more considerate approach to risk management than trader developers as they have a longer commitment to development projects.

Ownership structure

The exact Fisher test and Cramer's V analyses have shown that there are strong associations between ownership structure and risk assessment of potential impacts of risks materialising (Cramer's V= 0.489; p -value= 0.000), the formulation of an overall, enterprise-wide strategy for managing risks (Cramer's V= 0.412; p -value= 0.007), risk atti-

tude to achieving objectives (Cramer's $V = 0.356$; $p\text{-value} = 0.023$), effective risk management (Cramer's $V = 0.755$; $p\text{-value} = 0.000$) and appropriate tools to support risk management (Cramer's $V = 0.351$; $p\text{-value} = 0.027$). These results suggests that publicly listed companies are more inclined to have effective risk management systems due to corporate governance and reporting requirements than unlisted companies.

Geographic scope

Exact Fisher and Cramer's V analyses show that there are strong associations between geographic scope and clear written management statements on risk management (Cramer's $V = 0.381$; $p\text{-value} = 0.001$), clearly defined policy and process for the reporting of risks and risk management (Cramer's $V = 0.332$; $p\text{-value} = 0.040$), optimum project volume (Cramer's $V = 0.454$; $p\text{-value} = 0.003$) and understanding of risk management (Cramer's $V = 0.295$; $p\text{-value} = 0.032$). It is believed that the more international an organisation is, the more important political risk becomes a part of the risk management process. Due to the variety and complexity of risk related issues that they face, international organisations require more structured risk management systems with a uniform risk culture which comprises the use of common definitions, support and understanding of risk management.

Investment volumes of individual projects

The exact Fisher test and Cramer's V analyses have shown strong associations between project size with specialised risk management committee for the organisation (Cramer's $V = 0.398$; $p\text{-value} = 0.005$), the perception of the level of risk that the company has experienced (Cramer's $V = 0.377$; $p\text{-value} = 0.002$), the comprehension of the concept of risk as an opportunity as well as a threat (Cramer's $V = 0.365$; $p\text{-value} = 0.016$) and I.T. support for risk management (Cramer's $V = 0.359$; $p\text{-value} = 0.019$). Generally speaking, the larger the project size, the greater the time that it takes for completion of the project. During the time of the development, market conditions could change and the monitoring process within risk management becomes significantly important. The large numbers of different parties involved in the development of a large-scale project increases the complexity of the risk management system.

Determination 8: Different structural characteristics of an organisation have a clear little impact on the understanding and implementation of risk management, i.e.:

- investor developers have a more considered approach to risk management than trader developers;
- publicly listed companies are more inclined to have effective risk management systems due to corporate governance and reporting requirements than unlisted companies;
- developers with larger project sizes have more complex risk management systems than developers with small or medium project sizes;
- cross border organisations consider to have more effective risk management systems than national organisations.

5.6 Concluding remarks

It is the primary goal of chapters four and five to obtain information and to provide an overview of the risk management practice among leading real estate development organisations (research question 3) thereby contributing to the limited previous academic research so far conducted on this topic and also to provide executives, on the basis of this empirical data and their evaluation, a benchmark against which to compare their own risk management practices. The empirical study is based on a written survey carried out in late 2004/5. Due to an evaluable response rate of 43.7 per cent, which documents a great level of interest among the target group, highly meaningful results were obtained. The results provided a reliable and accurate profile in regards to the risk management practice in the industry and also reflect the success of the selection and targeting process, which was adopted in the preparation of this survey. The background characteristics showed that the study is biased towards unlisted organisations, which operate in medium sized domestic projects. The implication of the bias of each structural variable tended to offset each other and consequently taken as a whole these have little significance on the results of the empirical data collected.

Internal corporate environment

The results confirm that developers generally regard risk management as a means to generate value and business confidence by their ability to balance and accept opportunities and risks. The primary drivers for the implementation of risk management in corporate practice indicate an understanding of the benefits of effective risk management. Compliance with regulatory requirements and industry trends were not dominant drivers. 90.9 per cent report that the organisational structure enables effective risk management and carrying out business activities to achieve the organisation's objectives with primary responsibility of risk management mainly resting on the Chief Executive Officer and / or the Chief Finance Officer.

There is conflicting evidence on how much organisational support there is for risk management. The most tangible evidence that there is organisational support for risk management arises from the analysis of risk management committees. 70 per cent of all participating organisations have a risk management committee. However, this result is not compatible with those found in the analysis of the use of appropriate software and the provision of adequate risk management training. 29.9 per cent of the organisations map the risk management process entirely without appropriate software solutions and only 16.7 per cent of all respondents believe that they receive adequate training.

Whilst it is particularly encouraging that developers are confident that their risk management system is effective, the organisational structure enables effective risk management, and that the majority of developers have a balanced approach to risk, there is evidence to suggest that there is a misalignment between this opinion and the behavioural changes that they are prepared to make in order to achieve this.

Risk management process

There is strong evidence that developers are highly comfortable with the risk management process and believe in their own ability to cope with risks at both project and corporate levels. Developers showed more confidence about their risk management skills at project rather than corporate level; 7 areas of risks on corporate level were identified as areas in which the risk management processes were 'very ineffective' compared to only one area on project level and there is a greater agreement with regards to the ranking order of significance of risks at project level than at corporate

level. The highest consensus was only 44.1 per cent of participants ranking 'high' or 'very high' the significance of 'unfavourable financial market events' to achieving the organisation's objective but 63.7 per cent ranked development / conception risk, which tops the list, as 'high' or 'very high'.

Empirical data collected suggests that risk management is often dependent on individual skills, experience and risk appetite of key project participants. Without an enterprise-wide and inclusive risk management strategy this knowledge bank of information may not be collected within the organisation and further, the information risks being lost when key project participants leave the organisation. With responses indicating such an emphasis on personal judgement as a key risk minimisation strategy, it is astonishing to note that the formal strategy does not encompass this. Only a small percentage of the respondents use a comprehensive risk catalogue for risk identification purposes and there is inefficient use of an integrated comprehensive risk assessment approach. When assessing risks, the preference is for method sets over any single method. Nevertheless, the single most significant method employed is assessment based on personal experience and subjective views of the risk assessor at 69.9 per cent. These findings are significant as they suggest that reliance on the traditional method of intuitive judgement is still very much in evidence.

There is evidence that developers tend to take a more reactive rather than a proactive approach to managing risks. The preference for ad-hoc measures for the optimisation of the risk situation at 67 per cent suggests that developers essentially respond to their risk situation in a reactive rather than a proactive manner.

There are indications that at least a substantial part of the development industry lacks a formal and structured approach throughout the risk management process. The quota for use of a comprehensive risk catalogue for risk identification purposes was 17.4 per cent, an integrated comprehensive risk assessment approach was 44.1 per cent, a systematic action task list to carry out risk control was 47.8 per cent, a clearly defined policy and process for risk reporting was 33.3 per cent, a clearly defined corporate definition of risk was just under two-thirds, unambiguous written risk management statements on organisation policy was 24.2 per cent and 29.9 per cent of the organisations map the risk management process entirely without appropriate software solutions.

These figures show that the risk management process fall short of a fully integrated enterprise wide risk management framework.

Evaluation of proposition

The results of the evaluation confirm the view that where risk management is performed, there is a tendency for it to be an ad-hoc and unstructured process where intuition, the experience and risk-orientation of the decision-maker dominates (chapter 3.4.1). Of the seven fundamental characteristics of effective risk management (chapter 3.1), only two were evident from the empirical data; that risk management is within the organisation's specified risk appetite and that risk management is intended to preserve value and allow value to be created. These two characteristics reflect the essence of the developer's purpose and its priority goal to recognise and consequently to exploit potential opportunities for increases in value as discussed in chapter 2.3. The remaining five characteristics, however, refer to the mechanism and application in the synthesis of risk management. These characteristics were not so well defined; there was evidence that risk management tended to be unstructured, irregularly employed, not applied across all departments and levels, not applied in strategic formulation, not supported by comprehensive methods and tools and as a consequence, not designed, inter alia, to identify events potentially affecting the real estate development organisation,

In conclusion, the evidence points towards developers managing their risks intuitively, based on the confidence that their risk management is effective. At the same time their practice of risk management does not satisfy 'risk management' as defined in chapter three.

The results of the statistical analysis have established some strong dependencies between different structural characteristics of a real estate development organisation and its understanding and implementation of risk management. These dependencies uphold the theory that such structural differences are significant not only on understanding risk management within the industry but the industry as a whole.

6 Reflections on the findings in the light of recent economic events

6.1 Introduction

Recent history makes the findings of this dissertation all the more relevant as events have shown that in many cases the implementation of risk management within the development industry was not well developed which could well have contributed to the severe impact of events of the last few years. The results of the empirical work showed that risk management is lacking understanding and implementation in the real estate development industry (see chapter five). The most notable of the conclusions is that risk management in the real estate development industry is largely intuitive. In spite of this, management generally has confidence that the risk management is effective even though it does not satisfy 'risk management' as defined by the theoretical concepts and best practice. Against the background of the high-risk world of real estate development, these findings were astonishing.

The findings of the thesis have led the author to a period of reflections on a number of areas that will be considered in this chapter to answer the following question:

- 4 What are the reflections on the findings in light of the global financial crisis since 2008/9?

Three areas will be covered in this chapter, which will demonstrate that the empirical research within this dissertation still has validity in 2012. Firstly reflections on the development of mature European real estate markets since 2003/4 will be discussed. This takes into account shifts of real estate market environment before, during and subsequent to collection of the empirical data. Secondly, consideration will be given to the proposition that risk management practice in the real estate development industry is not expected to having improved significantly since 2004/5 when the empirical data was derived. Thirdly, some thoughts on the reasons for the identified gap between risk management theory and the practice in the real estate development industry will be presented.

6.2 Reflections on the real estate development market between 2003 and the beginning of the financial crisis

The empirical survey was prepared and conducted in the end of 2004 and in the first half of 2005. Since the collection of the empirical data, there have been two distinct phases in the environment for real estate developers. The first started in around 2003/4 and extended up to 2007. This period may be qualified as one of the most unusual periods in European real estate history; a time of market recovery in terms of tenancy market demand combined with a much greater strength and activity in the investment market. In particular, the real estate and capital market environment was driven by a number of separate but linked aspects, such as:

- underlying economic trends and occupier demand;
- property supply, development activity and rents;
- the emerging integration of Europe following the introduction of the Euro as a currency in January 2002;
- prevailing low inflation and comparably low interest rates;
- innovation in the financial (particularly debt) markets; and
- yields and the behaviour of real estate investors.

Particularly in the early stages of an economic upturn, investors tend to base their pricing decisions on the expectation of enhanced future income.

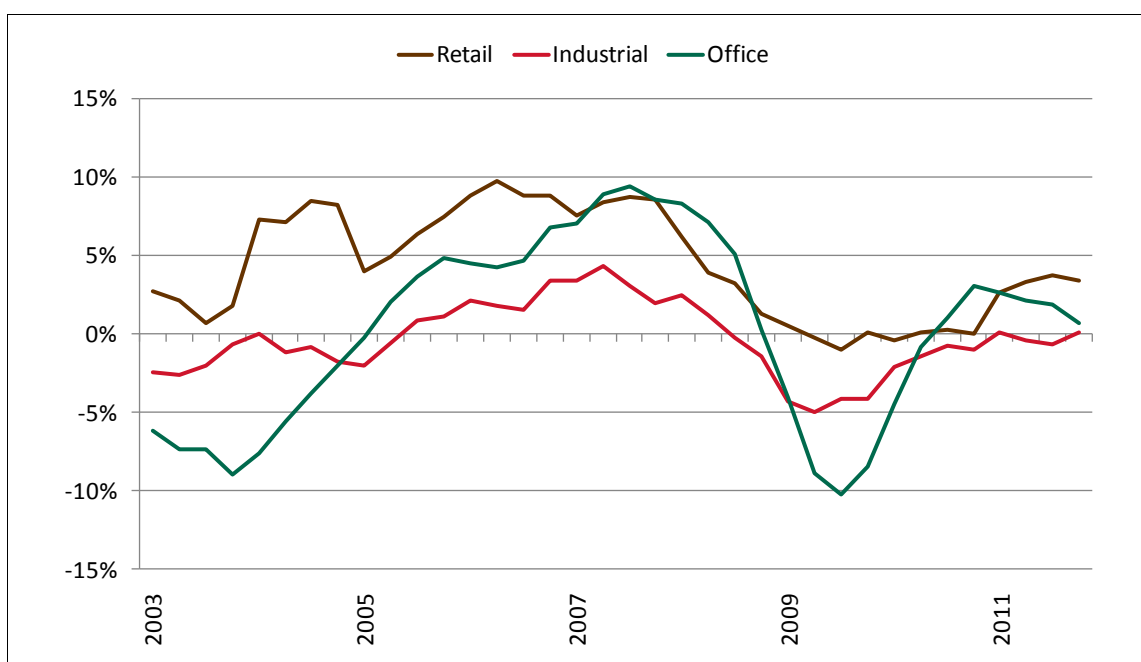


Figure 6-1: CB Richard Ellis EU-15 Rental Value Index, February 2012

The middle of 2003 and 2004 marked the point at which expectations of economic growth began to strengthen significantly. As illustrated by CB Richard Ellis EU-15 Rental Value Index, rents and capital values were at a relative low level from a historic perspective. At that time, a significant improvement of the economy was a widely followed expectation as the recovery gathered pace.

Since the middle of 2003 up to the end of 2007 the investment market environment was driven by yield compression. By the middle of 2007, the European real estate market had experienced a sustained period of significant value increase and unprecedented growth in investment activity. Capital values (as measured inter alia by the CB Richard Ellis EU-15 all Sector Prime Capital Value Index) rose by approximately 60 per cent from September 2003 to September 2007. The volume of investment transactions had more than tripled from around EUR 80 billion in 2003 to EUR 255 billion in 2007 allowing for a significant liquidity in major European markets.

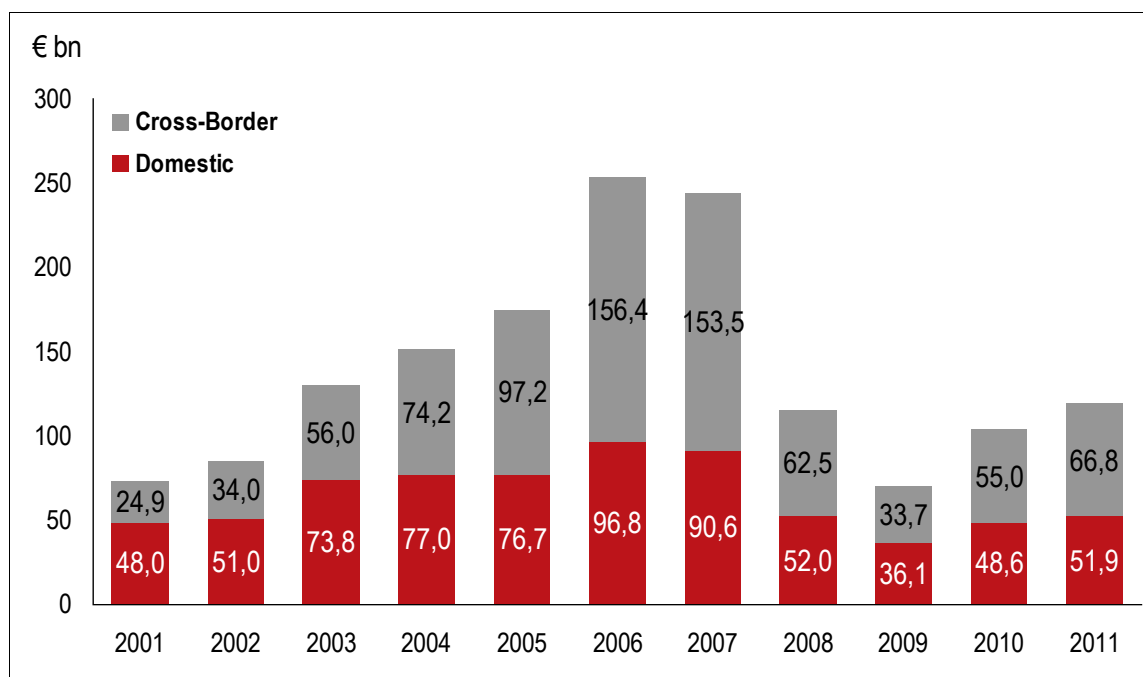


Figure 6-2: European direct real estate investment volumes (source: Jones Lang LaSalle, Property Data, KTI, Akershus Eiendom, Athens Economics, Sadolin & Albaek, February 2012)

As a general observation, it may be well stated that investor perceptions of volatility and risk fell progressively from early 2003 to 2007. This observation may be supported by the development of the CBOE Volatility Index, which serves as a key measure of market expectations of near-term volatility conveyed by S&P 500 stock index option prices. Since its introduction in 1993, the VIX has been considered as the world's pre-

mier barometer of investor sentiment and market volatility. As indicated in the following figure, the investment community generally saw minor risk in the global economies and/ or investment markets during 2003 and mid of 2007. In combination with steadily falling yields in the same period, the same conclusion may also be drawn for the mature European real estate markets.

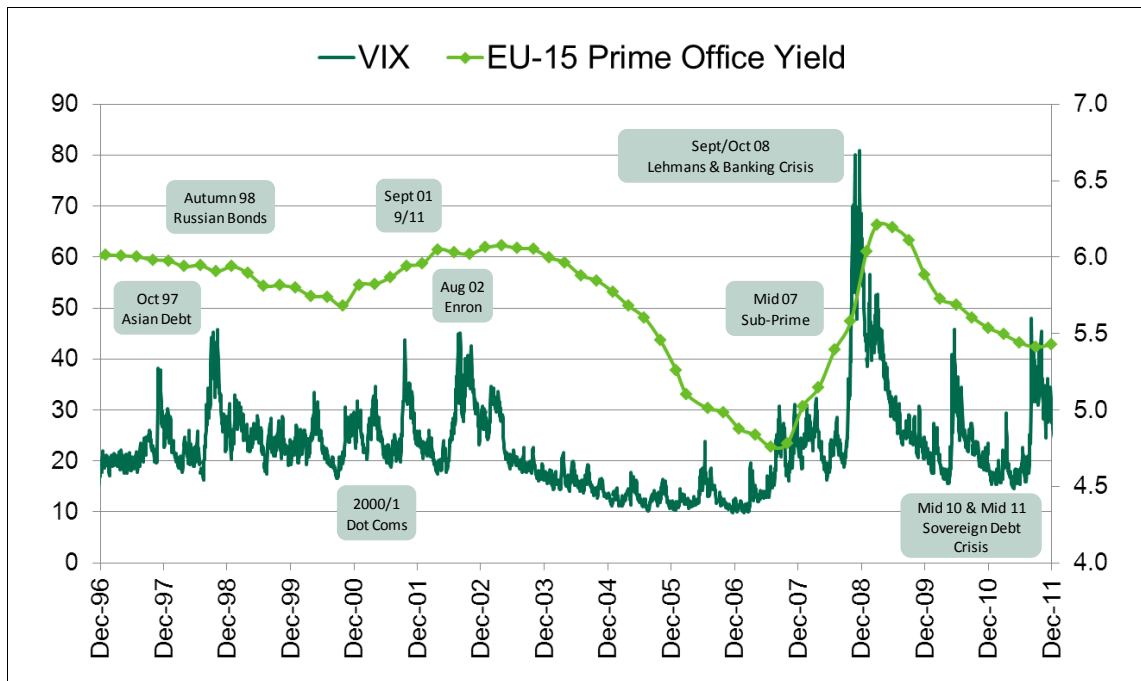


Figure 6-3: CBOE VIX (8th March 2010), CB Richard Ellis, EU-15 Office Yield Index February 2012

Yields were continuing to fall resulting in rising market values, investors still had the appetite to invest, and rents were being underpinned by healthy tenant demand. The financial markets generally operated in an environment, which may be characterised by:

- a comparably low risk expectation/ economic outlook with historically cheap debt funding opportunities and strong competition amongst debt providers to capture and secure market share lead to competitive financing conditions;
- increasing global capital markets integration and development of complex synthetic investment products;
- strong emerging markets growth;
- rapid capital markets innovations within a relatively deregulated operating environment; and
- strong investor appetite for the resulting attractive availability and cost of debt.

Of these various factors, it was availability of comparably “cheap” money coupled with the innovation in financial markets, with their combined effects on the availability of low cost debt, that were to have key implications for the real estate market. In the booming markets, real estate investors as well as developers were players in a lender’s market and found comparatively cheap and readily available sources of lending at favourable terms with which to finance their development respectively investment activities.

The following criteria may be taken into consideration when describing the lending situation:

- lenders were generally able to secure loans of 80 to 85 per cent or more (even up to 95 per cent) of the value of the investment (LTV) or alternatively acquisition costs (LTC);
- valuations on which loans were based incorporated expectations of future income growth;
- lending margins fell to 50-90 bps over swap rates;
- repayments were often on ‘interest only’ terms basis;
- no prepayment penalties, allowing easy refinancing if more attractive terms became available;
- borrowers were allowed to take equity out of refinancing/ distributions;
- most arrangements were structured as non-recourse debt (secured against the property and pledges, rather than the overall assets of beneficial shareholder);
- most terms and conditions in the loan documentation were favourably negotiable for the lenders;
- due diligence and information gathering by the banks (and also some investors) was comparably limited in quality and extent, especially as profitability became linked to the volume and speed with which deals could be securitised.

When the empirical data on risk management in the real estate development industry was collected in 2004/5, markets for developer tended to be forgiving and for the unwary allowed risk management practices to continue unaltered, i.e. in many cases rather under-developed. During this period there was little apparent incentive for developers to improve their risk management disciplines and for the unwary there was

the potential for the build up of considerable additional risk; with hindsight it can be seen that many were unaware of the actual market fundamentals. The results of the empirical work of this study bear this out, especially in view of subsequent events, and the lack of concern for risk management is likely to have become more acute during this period.

6.3 Reflections on the real estate development market since the financial crisis and declining real estate markets from late 2007

The worsening global economic climate has had a visible influence on real estate markets. From mid-late 2007 the entire market context for both tenant and investment aspects of the European real estate market changed dramatically; the financial crisis having lead to weakened global property fundamentals.

In the four economies that make up approximately 80 per cent of the Euro-area economy - Germany, France, Italy and Spain - unemployment has rising since the financial crisis, which is expected to have a negative impact on the demand for office space and increase sub-letting, which may not be reflected in official vacancy or market activity monitors. As a result of the sinking occupier market, rental expectations are now rather negative across most European regions, with weaker occupier demand likely to lead to further rises in the available space and looser market conditions across all emerging and development markets.

In addition the landscape in the financing sector has changed dramatically since the financial crisis. Construction loans - especially for speculative developments - remain amongst the hardest types of financing to secure since the middle of calendar year 2008. Lenders generally remain discerning on the standing and track record of prospective borrowers and more demanding on loan-to-value ratios, lending margins and pre-let requirements. With many banks struggling to come to terms with rapidly falling collateral values from their existing loan book, a significant number simply stopped lending. The handful of lenders that remained active were issuing loans to be held on balance sheet as the securitisation market evaporated overnight and has, at the time of writing of this dissertation, yet to return. At the low point for the market in late 2008/ early 2009, with no clear indication that the market had bottomed the only means to protect themselves was to lend on significantly tighter terms and in smaller volumes, than previously, e.g.:

- reduced loan volumes (debt volumes of over EUR 70 plus million being difficult to be secured and rarely from a single lender);
- LTVs fell to 50-60 per cent of the value of the investment respectively costs (LTC);
- lending margins increased to up to 280 bps or more over swap rates;
- loans became amortising rather than being 'interest only';
- reintroduction of penalties for early prepayment;
- stricter financing terms and conditions, which were hardly negotiable;
- valuations on which lending was based reflected only contractual rent receivable rather than rent potential (no 'discounted hope' in markets);
- due diligence and information gathering by the banks became much more extensive, in relation to both the development project / property and the borrower and his track-record;
- lease length and covenant strength of the tenants were key to loan availability;
- many banks would only lend to borrowers with whom they had existing, strong relationships;
- financing for development projects was available only to a very limited extent; and
- traditional long term financing has been significantly cut back to shorter lending exposure periods.

Investors and developers with strong equity sources are (more or less) aware of the lending market situation and their good position in the investment market because of the very limited competition. Active institutional investors in times of the financial crisis are insurance companies, single open-ended and closed funds as well as special and pension funds. Private equity funds which have (mostly temporarily limited) access to equity also become visible on the buy side. Such investors only buy real estate products when they feel like they have reached a price level at which they 'can do no wrong purchase', reflecting a very low risk profile. Therefore the investment demand in 2008 to late 2011 was highly focused on real estate opportunities if they were to be considered 'very competitive' in terms of risk-adjusted pricing or in case the product is 'core' (well-let, prime assets with high creditability of tenants and long term leases). Due to a lack of suitable core investment opportunities and to some degree investment pres-

sure from the investor side, this has the potential to exert downward pressure on prime yields in this specific sector.

Most market experts expect that the investment market will remain under pressure or partially illiquid due to a significant bid-ask-spread in yields in 2012. Investment values are expected to reflect lower or more volatile income expectations, and increased views of the risks attaching to this income.

In the shadow of the current banking and investment environment, one critical issue for both investors and lenders is cash flow security of the underlying assets. More risks have therefore been passed back from the investor and lender sphere to the developer and, with construction finance and also re-financing market likely to remain difficult to secure, many developers will face considerable challenges over the next few years. The impact of these dramatic changes to the real estate development market has been to bring risk management back into the spotlight again. Also the fast and severe development of economies as well as real estate markets demonstrated the importance of a close monitoring and risk management function to facilitate the prediction of downturns or other adverse conditions. Every development organisation should monitor the marketplace in regards to their business and develop strategies to act in the face of such changing conditions (HEWLETT, 2008). This is clearly not what was happening in most real estate development companies prior to the recent financial crisis.

6.4 Reflections on improvements in risk management practice in real estate development

As explained before, the mature European real estate markets have been subject to dramatic changes in the course of the financial crisis, which changed the risk profile of developers. Exit risk has increased most notably and makes the results of this study even more relevant than they were in 2005. As investors faced greater difficulty in finding standing investments in stagnant transaction markets, many investors began to focus on forward-funding or forward-purchasing developments (sometimes whole project pipelines) as a means of securing investment stock. Such agreements are typically subject to rent guarantees and other conditions, whereby the developer agrees to secure a tenant and underwrite the rental income for a given period of time. However, as competition amongst investors increased, developers were more and more able to forward-sell much of their development pipeline at favourable conditions. The market

environment allowed developers to transfer major proportions of risks, which are usually transferred by the developer to investors, at comparably early stages of the development process. This had a number of consequences: not least, it allowed developers to recycle their invested capital efficiently and to move on to initiate new projects fairly quickly. This in turn may inevitably have encouraged some developers to focus on rapidly securing new scheme opportunities to sell on to investors, with less concern over the quality and viability of those schemes than if they were carrying a higher risk profile by themselves. In addition, the debt markets may have motivated developers to increase the leverage on a project basis.

In the course of the financial crisis, these circumstances have changed dramatically. Developers are finding it far harder to sell anything other than assets being in line with 'core' criteria (cf. Chapter 6.3). Investors are conducting more detailed due diligence, and demanding more stringent guarantees and conditions associated with any risk element of a scheme, which has not been completed. MAC RUAIRI / SEEBUS (2010) state that *"the days that a developer could get forward funding with an investor for a new development culminating in a sale at a fixed yield at the end of the process are over"* (MAC RUAIRI / SEEBUS, 2010, p. 50). One of the ways in which the financial crisis and recession have affected the real estate industry has been to cause a sharp reduction and deferrals in the scale of development activity in most of the main European markets. Significant restrictions in the availability and cost of development financing, coupled with a weakening tenant demand and falling values are main drivers for this development. As a result it is to be expected, that speculative development schemes will only be brought to market to a very limited extent the 2012.

It is believed from the author's experience that the inability to pass on risk has resulted in a decrease in projects rather than significant improvement in risk management practice. This is in contrast to the pre-credit crunch period when the approach was predominantly opportunistic. COSO (2009) noted that there has been improved supervision on the part of company boards for some organisations but this has yet to feed through generally across the market and will be in large part dependent on the attitude of the banks going forward. If the availability of credit improves again then an opportunistic approach by developers is likely to predominate.

6.5 Potential reasons for the difference between the theory of risk management and the practice applied by developers

Reflecting on the results of this dissertation, it became apparent to the author that there were a number of reasons why there was a difference between the theory of risk management and the practice applied by developers. Underlying these is the fact that developers are masters of 'opportunism' and 'the transfer of risk'. In addition developers tend to have to be very flexible; looking for the most optimistic investor for their projects rather than building long-term relationships. Indeed it is difficult to find a developer that carries out risk management according to the theoretical frameworks. The reasons for the difference between theory and practice of risk management are considered in more detail below:

6.5.1 Risk transfer

One of the key characteristics of successful developers is that they specialize in risk transfer and opportunism, which was very prevalent prior to the credit crunch. During the development process, major risks were transferred in various ways. A Special Purpose Vehicle (SPV) would be created to isolate the developer's exposure to risks that may arise during the development process and transfer risk to the various parties that are dealt with during the development process. Loan to cost (LTC) financing was common before the credit crunch and transferred a lot of risk to the banks. The buying of the project by an investor would usually remove the letting risk from the developer. Other examples of risk transfer were option agreements made with the seller of the ground, which is to be developed, and the construction company taking the major construction risks.

In addition the risk of the developer was further limited to the equity employed, which can be quite limited. The developers are always trying to be risk averse – they coordinate the project but transfer all the risk to third parties. These risk transfers mitigate risks for the development organisation and consequently the perceived need for risk management as expressed in theory is reduced in practice.

Since the credit crunch though, the ability to transfer risk has been much more limited especially with regard to the banks hence the emergence of greater interest in theoretical risk management. Whether this continues is believed to very much dependent

on the banking sector – should banks become more aggressive in their lending practices again then LTC lending will resume and formal risk management will once again move down the agenda.

6.5.2 Judgement, flexibility and speed

Flexibility is regarded as more relevant than sophisticated risk management processes by practitioners, given that the development process itself is iterative and hardly straightforward. GEHNER (2008, p. 34) summarizes *“the success of a project largely depends on the developer’s expertise to coordinate the development activities in such a way that either enough flexibility remains to deal with external influences and market dynamics or other activities do not affect this activity anymore.”* Compared to other industries ‘gut feeling’ and intuitiveness are very important coupled with the ability to react quickly. It is this flexibility that is often key to the profit maximization objectives of the developer. The whole development process tends to be dynamic and from the author’s experience not too many processes are replicable between projects. The focus is on maximizing profits from the sale of the project as rapidly as possible.

6.5.3 Behavioural characteristics

The risk attitude of senior management and development team members will have implications for the risk management approach. According to HILLSON / MURRAY-WEBSTER (2007), risk seekers are attracted by challenges and are likely orientated to underestimate threats and overestimate opportunities. This tends to create an environment where the need for risk management is not always to the fore. Developers tend to be ‘chance-orientated’ rather than seeing the potential negative downside in a situation. This is a significant and in many ways necessary characteristics of developers as they have to motivate others to undertake the development. Development tends to be a creative, flexible, complex and partly intuitive process, these characteristics in many ways being essential for a projects success. Thus this does not create an environment in which a structured approach to risk management is always encouraged

6.5.4 Lack of expertise

The level of risk management understanding, implementation and sophistication still remains fairly immature for most responding organisations to the empirical survey. GEHNER (2003) argues that the reasons for using sophisticated quantitative risk analysis methods much less than qualitative techniques may be due to a lack of familiarity and expertise as well as a lack of reliable data and understanding of the potential benefits.

6.5.5 Regulatory oversight

There is no official regulatory body that oversees the real estate development industry neither in individual countries nor across the mature markets of Europe as a whole. This is very different from the financial industry where there are regulatory bodies across each individual country and at a higher level across the European Union. As a result there is no obligatory external regulatory input for a standard minimum risk management system and practice in real estate development companies, with the exception of requirements of listed organisations generally and the occasional non-binding guidelines of industry and professional bodies. This leaves it to the responsibility of the management of the real estate development company and the providers of finance to ensure that adequate risk management is pursued. As recent developments in the banking sector have shown though the existence of a regulator does not on its own ensure that risk management is effective.

6.6 Concluding remarks

The empirical research explores the practice of risk management by developers as of 2004/5, which has been reflected in the light of the current environment. At the time of the data collection, developers enjoyed a largely positive macro-economic environment and comparably liquid investment, tenancy and lending markets with a variety of international investors being interested to acquire project schemes in the early stages of development. Also, competition for projects was strong. The combination of these positive overall economic market factors caused due diligence (for both developers and investors) not to be given a particularly high priority. Investors and developers

who applied rigorous analysis that were time-intensive in the transaction phase, may have lost transactions to others who did not apply the same scope of due diligence.

The author recognises the time differential between the data collection (2004/5) and the final presentation of the study. It is felt that nevertheless the applicability of the results and the conclusions remains highly relevant and has been more than borne out by events since 2007. The empirical research provides highly valuable data for analysis of the pre credit crunch situation. The economic environment has clearly changed since 2004/5 but based on the author's industry experience, it is the author's opinion that to date developers' behaviour towards risk management has not changed to a comparable degree. The results and observations of this research nevertheless lead to the conclusion that there are significant potential benefits that could be realized by having development organisations carefully reviewing and optimizing their existing risk management practice. According to COSO (2009, p.3) states that the *"financial crisis, coupled with global integration and the rapidity of change, has highlighted the benefits of more sophisticated risk management practices among senior leadership and improved risk oversight on the part of boards of directors for some organisations."* But whether this will be borne out in significantly changed practice across the industry will be very much dependent on the banks attitude to lending in the future.

7 Conclusion and directions for further research

The objective of this dissertation is to gain an understanding of the implementation of risk management in the real estate development industry by conducting empirical research on a broader basis. Through the literature review, the dissertation has given a detailed overview of the subject. The empirical part of this dissertation, a survey among leading European real estate development organisations, reviewed specific aspects of the actual risk management approach of such organisations. The discussions and remarks presented in the previous chapters have given a detailed account of the main findings of the research undertaken. This chapter closes this dissertation and is intended to give answer to the following question:

- 5 What are the implications of the findings of this dissertation for academics as well as the real estate development industry?

7.1 Implications for real estate research

A major contribution of this study to theory has been to provide a theoretical foundation for identifying, assessing and analysing risks in the real estate development industry. A considerable amount of research has been undertaken on risk management generally and to a lesser extent on real estate development. However as existing research on risk management in the real estate development industry is comparably limited, one of the reasons for writing this dissertation was to bring together existing research on risk management and research on real estate development. The principle contributions of the dissertation to real estate theory is epitomised in the following ways:

1. A simple yet comprehensive definition of risk management in the context of real estate development has been presented, referring to a structured and disciplined approach that aligns strategy, processes, people, technology and knowledge with the purpose of evaluating and managing the uncertainties a real estate development organisation faces as it creates value.
2. This dissertation has applied general principles of risk management specifically to the real estate development industry. The analysis of the development process and

key risks by means of a phase model has provided a theoretical foundation for risk management analysis in the industry. It is anticipated this will have utility for both academics and practitioners in the industry.

3. The study provides information concerning applied risk management in the sector. This was achieved through the collection and analysis of empirical data on corporate practice from 69 established development organisations in seven European countries. The comprehensive analysis shows the positions against upper and lower benchmarks on major aspects of the risk management process. More specifically, key aspects risk management have been cross-referenced with structural characteristics of developers in order to provide greater depth in understanding the real estate development industry. The findings provide a useful benchmarking tool both for the survey participants as well as for the larger real estate development industry. The work presented in the empirical part of this study represents a considerable advance in our understanding of risk management practice by providing a broad pattern of empirical evidence.
4. Previous practise that traditionally risk management has been carried out largely on an ad-hoc and subjective basis and the lack of literature or academic research in this area leaves us to believe this has not changed. This study has used empirical research to verify the status by means of a written survey. The results of which have shown that developers believe that they are undertaking effective risk management; however based upon this study's empirical research, there is strong evidence that developers tend to take a more reactive rather than proactive stance to managing risks and there are also indications that the development industry lacks a formal and structured approach throughout the risk management process. This dissertation consequently previous knowledge about developers' approach to risk management.
5. The dissertation has presented a comprehensive review of important and influential literature about risk management and the real estate development industry to date. Risk management theories have been documented and discussed. The incorporation of a broad range of literature, from academic sources on risk, risk management and real estate development, best practice standards, has provided a sound basis for the research.

7.2 Directions for further research

This dissertation represents a considerable advance in our understanding of the risk management practice within the real estate development industry. The primary empirical data has been used to identify areas of strengths and weaknesses in status of implementation of risk management and it has also highlighted a number of areas, which may be considered for further study:

1. Further work may be carried out to establish if there is causality between risk management and enhanced performance. It could look to answer questions of whether better risk management indicates a more successful business and whether good performance indicates good risk management. Organisations are likely to adopt better practice more readily on their own accord if they see its value.
2. A study of which methods of risk analysis / assessment are most effective in the real estate development industry through a modelling approach would provide a useful contribution to the development of the risk management process.
3. It would be beneficial to conduct an empirical investigation, through the use of case studies, into the relationship between perceived and actual risk in the real estate development industry and to investigate the factors, for example geographical location or ownership structure, which affect the risk categories.
4. It would be insightful to conduct research into the extent to which real estate development organisations have used risk transfer and flexibility as a substitute for more systematic risk management systems and if this will continue in the current economic climate.
5. A comparative study of risk management approaches could be made between the real estate development industry and another industry, for example, private equity investment or infrastructure. This would provide further information to further develop the risk management concept for the real estate development industry.
6. It would be meaningful to conduct research on how knowledge management approaches can help to secure personal experience and expertise of key development professionals within an organisation given the strong role of individual judgement and 'gut feeling' within the real estate development industry.

7.3 Implications for industry practitioners

The implications of this dissertation are significant as they suggest that the system of risk management in practice is far from systematic or holistic. The author's perception is that organisations, who fail to implement a risk management system beyond the relevant regulatory requirements, will find themselves increasingly penalised by the capital markets and financing partners and particularly so during times of economic turbulence. The implementation of new and the enhancement of existing risk management concepts within the real estate development industry will result in a sustainable optimisation in the handling of business risks and enhance developers' ability to profitably complete riskier or tighter margined projects. As regulators can only set up risk management guidelines, it is ultimately up to the management to determine an organisation's risk appetite and to identify measure and control the risk exposure of the organisation. Furthermore, the real estate development industry is a multi billion Euro industry and the complexities of the systems and stakeholders involved should not be underestimated. In the event that a high profile real estate developer fails, it would not only affect the immediate parties within the corporation but also a wide range of other stakeholders.

Various shortcomings in the risk management methods and systems, which are currently employed in the sector, have been identified in detail in the previous chapters and recommendations have been made to improve these. It is one thing to address these shortcomings but another to deal with the underlying issues, which are fundamental to the industry. Despite some efforts to improve risk management in the real estate development industry over the years a number of fundamental problems persist.

First and foremost is the low awareness, understanding and co-operation across the industry to address the problems of ineffective risk management systems that currently exist.

A more proactive culture must prevail not only at project and corporate levels but also at industry level. The danger is that the optimistic attitude towards current risk management practices within the industry reflects the optimism of the global real estate prices boom of the last decade rather than the effectiveness of the systems employed or the current harsh economic reality across Europe. Secondly, the need to invest the

time and resources necessary to develop effective strategies, systems, methodologies and processes specific to the industry. Significant amounts of money are spent every year in the real estate development industry and yet the analysis of IT support and risk management training as confirmed by the author's working knowledge of the industry together with the results of the industry survey suggest that the amount invested in research, education and development of effective risk management systems is, disproportionately small as compared to the amounts spent on other aspects of corporate activities.

Thirdly, there is a lack of high quality industry specific data and research to provide the necessary theoretical framework and strategies, which key personnel can apply. To this end, leading international property professional bodies should work closely with the industry and academics to facilitate the sharing of data and other information thereby enhancing the reliability and accuracy of real estate information.

The impact of the current economic environment on real estate developers has been discussed in chapter 1.1 and chapter 6. The lack of financing availability and the downturn in the investment market have caused an increase in exit risk and much pricing insecurity. These conditions would most likely affect risk management practices of real estate developers in a number of ways: higher industry standards emphasizing a more rigorous risk management approach will be inevitable, difficult market conditions will require a much more detailed due diligence, demand for more sophistication in risk management of development organisations and their counterparties and clients (both tenants and investors) will become more evident and there will also likely be more industry emphasis on formal documentation and greater concern and awareness of legal liabilities.

7.4 Conclusion

This chapter has addressed research question 5. Concluding that on the one level, it reflects the need for responsibility in the handling of money and the conduct of commercial activities; while risk management is a rather technical term to professionals and academics, the fundamental issues are judgement and value. At another level, it refers to the system by which key personnel are to be accountable and transparent. By using a systemic process of risk management, in a worst case scenario, could provide a “box ticking” compliance mentality in some organisations but it is hoped that in most instances it would provide the necessary framework to develop risk management strategies and systems that may sustain individual projects and the organisation as a whole through the inevitable down cycles that occur. A lack of understanding, implementation of risk management and risk awareness exposes a development organisation to unnecessary threats and disruptive processes, thereby restricting the organisation’s scope for realizing opportunities on the one hand and in circumventing threats on the other hand. The early recognition of risks and opportunities, as well as the ability to manage these pro-actively, are critical success factors for the long-term prosperity of development organisations. It is to be assumed that management is often unable to properly assess risk. The lack of research has shown that it lags other industries; a multi billion industry with high relevance to various stakeholders should rather set the direction for risk management rather than lag other sectors. The price of poor risk management processes can result not only in the failure of individual projects but also whole organisations which have proven to have devastating effects not only on the organisation itself but on the other stakeholders involved such as employees, suppliers, tenants and financiers. There is a limited amount of academic research done in the area of risk management in real estate development. This failing is detrimental to the real estate development industry as it inhibits the exchange of information and learning. This means that risk management tends to be less structured in its approach and suffers from being unable to draw upon the experience of others and on past experience indicating an inability to develop a sustainable and ongoing knowledge bank on risk management.

The author hopes that this dissertation will contribute to an increasingly conscious handling and management of risks and a focus on “risk adjusted” decisions-making, so

that the incidence of poor risk management which may lead to negative impacts on projects or entire organisation and even - in the extreme case - systems, risks can thereby be reduced. MILES / BERENS/ WEISS (2000, p.3) did not underestimate the risky nature of this industry by saying that *"Few business ventures are as heavily leveraged as traditional real estate development projects, magnifying the risk of ruin but also increasing the potential for high returns to equity."* On the other hand, taking the positive aspect of risk into account, it allows for the possibility not just to generate attractive profits when developments are completed with a high level of expertise, but also to positively manage risk in order to maximise long-term returns for all stakeholders involved. At the same time it became clear that despite all of the technological innovations of the past years, a simple truth remains: it is people that make business successful.

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Appendix A - Developer list (population)

France	
Altarea/ Cogedim	Meunier
BNP Paribas Immobilier	Nexity
Bouygues Immobilier	Ogic
CFA - Groupe Duval	Pitch Immobilier
Codic	Silic
Eiffage	Sodearif
Icade Tertial	Sogeprom
Lazard Promotion	SORIF
Les nouveaux constructeurs	Vinci Immobilier Promotion

GERMANY	
Accumulata Immobilien Development	ECE Projektmanagement
Allianz Immobilien	FOM Real Estate
AMB Generali Holding	Frankonia Eurobau
aurelis Real Estate	Groß & Partner Grundstücks-entwicklungsgesellschaft
Bauwert Property Group	HochTief Projektentwicklung
Bayerische Bau und Immobilien Gruppe	Investa
Baywobau Baubetreuung GmbH	IVG Development
BEOS Projektentwicklung	KanAm International
Bilfinger Berger	Lammerting Immobilien Gruppe
Centrum	mfi - Management für Immobilien
CM Immobilien-Entwicklung	OFB Projektentwicklung
Concept Bau-Premier	Patrizia
Corpus Sireo	Sonae Development
Deutsche Immobilienchancen	Thyssen-Krupp Immobilien Development
DIBAG Industriebau	Vivico Real Estate

Italy	
Acqua Marcia	Grupo Statuto
Addamiano Group	IGD Immobiliare
Aedes	Immobiliare Lombarda
Bastogi / Brioschi finanziaria	Immsi SAP
Beni Stabili	Ipi
Fintecna	La Gaiana
Gabetti	Magiste
Galotti	Pirelli Real Estate
Generali Properties	Pria
Gruppo Aedes	Risanamento
Gruppo Statuto	

Spain	
Acciona	Metrovacesa
Afirma	Neinver
Aifos	Noriega
Chamartin	Nozar
Habitat	Polaris World
Hercesa	Prasa
Iberdrola	Procam
Grupo Sando	Realia
Grupo Urvasco	Renta Corporación
Colonial	Reyal Urbis
Lar	Sacresa
Marina D´Or	Vallehermoso
Martinsa Fadesa	

Switzerland	
Allreal Generalunternehmung	Karl Steiner
Batigroup	Mobimo Verwaltungs
Credit Suisse Asset Management	PSP Swiss Property
Halter Generalunternehmung	Rentenanstalt - Swiss Life Property
HRS Hauser Rutishauser Suter	Zschokke Holding

The Netherlands	
3W Vastgoed	Johan Matser Projectontwikkeling
AM	MAB Groep
Ballast Nedam	Multi Corporation
BAM Vastgoed	NS Poort
Blauwhoed Vastgoed	NS Vastgoed
Bouwfonds Property Development	OVG Projectontwikkeling
BPF Bouwinvest	Provastgoed Nederland
Breevast	Rabo
Burgfonds	Redema Group
Chipshol Holding	Redevco
Corio	Rodamco Europe
Dura Vermeer	Schiphol Real Estate
Eurocommerce	TCN Property Projects
Fortis Vastgoed Ontwikkeling	Top Vastgoed Planontwikkeling
Giesbers Groep	Trimp & Van Tartwijk Property Development
Heijmans Vastgoed	Van Wijnen Groep
Hurks Bouw & Vastgoed	Volker Wessels
ING Real Estate Development	

United Kingdom	
AIG/Lincoln	Helical Bar
British Land	Hines Europe
Canary Wharf Group plc	Land Securities
Derwent London	Prupim
Development Securities	Segro
Doughty Hanson	Simon Property Group
Frognore Estates	Tishman Speyer Properties
Grainger's	Town Centre Securities
Grosvenor Group	Westfield Group
Hammerson	Wilson Bowden Development

Appendix B - Covering Letter

Dear Mrs. / Mrs. XXX

«AddressBlock»We are pleased to present you the questionnaire “*BUSINESS RISK MANAGEMENT IN THE REAL ESTATE DEVELOPMENT INDUSTRY*“. The questionnaire is an essential part of the Ph.D. thesis of Thomas Wiegelmann. The objective of the practice-oriented thesis is to formulate the requirements and core elements of a conceptual risk management framework for real estate development companies. By way of synthesising theory and practice, the thesis is intended to extract structural rules for risk management in real estate development. The research project has two major deliverables, deriving from the main research question:

- to document the current state of risk management and to gain a profound understanding of the typical risks in real estate development as well as to identify how leading developers approach risk management.
- to make a valuable contribution by elaborating on conceptual risk management recommendations for the real estate development industry.

Hence, the purpose of this questionnaire is to obtain information and to provide an overview of the extent and practise of risk management across leading real estate development companies in Europe. You have been identified as one of those leading companies. The questionnaire should be completed by the senior executives most familiar with the company’s risk management processes. Regardless of what stage your company is in regarding the development of a risk management process, your responses are valuable to us.

In order to be able to make a consistent and representative evaluation, we are would be grateful to you for answering all questions. If you, however, cannot or would not to like to answer all questions, please still return the partially completed questionnaire.

As a participant of the survey, you will have the option to receive a **summary of the results** as long as you specify your contact data. The collected data will remain **strictly confidential** and will be published exclusively anonymous or in aggregated form.

We would be very grateful, if you could return the completed questionnaire by **6th November 2004**. If you have any questions regarding the questionnaire please do not hesitate to contact Thomas Wiegelmann via telephone +41-76-582 90 01 or email: twiegelmann@swissonline.ch.

Thank your very much for your effort and the invested time. Your contribution is much appreciated.

Sincerely,

Appendix C - Questionnaire

“BUSINESS RISK MANAGEMENT IN THE REAL ESTATE DEVELOPMENT INDUSTRY” - Questionnaire -

The compiled data is **strictly confidential** and will be published exclusively anonymous or in aggregated form. As a participant in the survey, your company will have the option of receiving a **summary of the results** as long as you specify your contact details.

Questionnaire completed by

Company name:	<input type="text"/>
Respondent's name:	<input type="text"/>
Email:	<input type="text"/>
Date:	<input type="text"/>

Most questions can be answered by marking the appropriate preset answers with a cross. The addition of brief comments may be helpful when wanting to provide more details.

In order to make a consistent and representative evaluation, the researcher is very grateful to the respondent for answering all questions. If you, however, cannot or would not like to answer all questions, please still return the partially answered questionnaire. Regardless of what stage your company is in regards to the development of a risk management process, your responses are extremely valuable to the research.

1. Under which developer category would you mainly classify the development activities of your company?

- ☐ Mainly Service Developer (Development as a service for third parties)
☐ Mainly Trader-Developer (Development including project sale)
☐ Mainly Investor-Developer (Development for own portfolio)
☐ Acquisition (anticipated services for future planning or construction mandate)
☐ Other (please specify)

2. What is the geographic scope of the company's activities?

- ☐ Regional ☐ Over-regional ☐ National ☐ International

3. Please provide details on the ownership structure of your company

- ☐ Privately owned ☐ Public

4. What is the usage distribution of your project development activities (total =100%)?

No.	Type of usage	1 - 20%	21 - 40%	41 - 60%	61 - 80%	81 - 100%
1	Residential	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Mixed-use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Shopping centre	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Hotel	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Logistics	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Leisure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Other (please specify) <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

5. What volume does your company regard as being an optimum volume for individual projects?

- ☐ < € 5 Mio. ☐ € 40 bis 50 Mio.
☐ € 5 bis 10 Mio. ☐ € 50 bis 100 Mio.
☐ € 10 bis 20 Mio. ☐ € 100 bis 250 Mio.
☐ € 20 bis 30 Mio. ☐ € 250 bis 500 Mio.
☐ € 30 bis 40 Mio. ☐ > € 500 Mio.

6. Has the company formulated an overall, enterprise-wide strategy for managing risks yet?

- ☐ Yes, implemented ☐ Yes, but needs improvement ☐ No, but planned ☐ No

7. Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company. Please evaluate the following risks on a company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes in coping with those risks.

No. Type of risk	How significant is this risk to achieving your company's objectives?				How effective are your processes at managing this risk?				
	Low	Medium	High	Very high	Very ineffective	Ineffective	Effective	Very effective	Don't know
Risks on a company level									
1 Competitor threats to company's market position	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Sovereign or political risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Unfavorable financial market events	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Availability of capital to meet business requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Legal risk (e.g. business law suits)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Inefficient key processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Loss or impairment of reputation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Human resources lack the expertise to meet company's goals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Accidents causing environmental damage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Executives, employees or agents exceed their authority	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Inadequate motivations lead to under-performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Lack of needed hard- and software to support the business	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Liquidity risk from investments not matching needed liquidity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Measures of the company's quality, time and cost objectives are irrelevant or unreliable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Other (please specify) <input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. A large number of risks, which may affect the projected return, arise during project development. Below please find a non-exhaustive list of these risks. Please evaluate the following risks by project level based on their significance to achieving your company's objectives. Please also evaluate the effectiveness of your risk management processes in coping with these risks.

No. Type of risk Specific risks by real estate project level	How significant is this risk to achieving your company's objectives?				How effective are your processes at managing this risk?				
	Low	Medium	High	Very high	Very ineffective	Ineffective	Effective	Very effective	Don't know
1 Development/ conception risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 Location risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 Adequate sources of funds for development project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 First-time leasing risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 Market potential on sale/disposal of project (market risk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 Changes in user / investor requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7 Completion risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8 Cost overrun risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9 Quality risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10 Legal risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11 Design risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12 Approval process complexity, satisfying planning, environmental and traffic constraints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13 Stakeholders in the project having different priorities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14 Budgets and business (project) plans are not based upon realistic assumptions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15 Insufficient focus on value, too much emphasis placed on cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16 Changes in design and requirements during construction phase	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17 Warranty exposure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18 Other (please specify) <div></div>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

9. In the last five years the level of risk faced by the company has...

☐ Increased ☐ Decreased ☐ Not changed ☐ Not sure

10. Does the company overall regard itself as having a risk taking or risk averse culture compared to its relevant competitors?

☐ More risk taking ☐ Comparable risk taking ☐ More risk adverse

11. What are the drivers for implementing risk management in your company?

Multiple responses are possible

- | | |
|--|---|
| <input type="checkbox"/> Request of risk management by senior leadership | <input type="checkbox"/> Following an industry trend |
| <input type="checkbox"/> Client expectations | <input type="checkbox"/> Audit requirements |
| <input type="checkbox"/> Control/ reduction of operational losses | <input type="checkbox"/> Capital allocation process needs improvement |
| <input type="checkbox"/> Response to regulatory activity (e.g. Basel II) | <input type="checkbox"/> Other (please specify): |
| <input type="checkbox"/> Developing a competitive advantage | <div></div> |
| <input type="checkbox"/> Need for more integrated decision-making | |

12. Please evaluate the following aspects/ features of your risk management

No.	Strongly disagree	Disagree	Agree	Strongly agree
1 Effective risk management is important in the achievement of the company's objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2 The company supports taking risks to achieve objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3 The company knows how much risk it may take in the achievement of its objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4 Risk is looked upon as an opportunity as well as a threat in the achievement of the company's objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5 There is a common understanding/ terminology of risk management across the company	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6 The company includes risk management as an integral component in all the relevant strategy, control and monitoring processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

13. Who has primary risk management responsibility? *Multiple responses are possible*

- | | |
|---|---|
| <input type="checkbox"/> Chief Executive Officer (CEO) | <input type="checkbox"/> Executive Committee |
| <input type="checkbox"/> Chief Financial Officer (CFO) | <input type="checkbox"/> Audit Committee |
| <input type="checkbox"/> Chief Risk Officer (CRO) | <input type="checkbox"/> Financial Controller |
| <input type="checkbox"/> Treasurer | <input type="checkbox"/> Risk Management Committee |
| <input type="checkbox"/> Chief Administration or Operations Officer | <input type="checkbox"/> No direct responsibility defined |
| <input type="checkbox"/> Business unit executives | <input type="checkbox"/> Other (please specify): |
| <input type="checkbox"/> Cross-functional or divisional team | <div></div> |

14. Please evaluate the following aspects/ features of your risk management

No.	Type of risk	Strongly disagree	Disagree	Agree	Strongly agree
1	There is a consistent risk assessment methodology applied throughout the company, including estimating the significance of risks, assessing the likelihood of their occurrence, determining treatments, monitoring and assurance requirements.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The company finds it difficult to identify its main risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The company finds it difficult to assess the likelihood of risks occurring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	The company finds it difficult to assess the potential impacts of risks materialising	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

15. Do you have a consistently defined risk catalogue to be used for risk identification purposes?

<input type="checkbox"/> Yes, implemented	<input type="checkbox"/> Yes, but needs improvement	<input type="checkbox"/> No, but planned	<input type="checkbox"/> No
---	---	--	-----------------------------

16. Risk assessments are performed in a timely way at strategic and operational level across the company.

<input type="checkbox"/> Yes, implemented	<input type="checkbox"/> Yes, but needs improvement	<input type="checkbox"/> No, but planned	<input type="checkbox"/> No
---	---	--	-----------------------------

17. How often do you prepare a general overview of the current risk situation?

<input type="checkbox"/> Yearly	<input type="checkbox"/> Half-yearly	<input type="checkbox"/> Quarterly/tertiarily	<input type="checkbox"/> Monthly	<input type="checkbox"/> Other (please specify):
				<input type="text"/>

18. Which method does your enterprise use for the assessment of identified risks?*Multiple responses are possible*

<input type="checkbox"/> Individual subjective assessments (by individual officers)	<input type="checkbox"/> Risk scoring techniques
<input type="checkbox"/> Assessment by external experts	<input type="checkbox"/> Value at risk (or other models based on probability distributions)
<input type="checkbox"/> Group facilitated assessment	<input type="checkbox"/> Decision tree procedures
<input type="checkbox"/> Qualitative risk assessment based on predetermined list of key indicators	<input type="checkbox"/> Scenario technique (Best-/ Worst-Case)
<input type="checkbox"/> Systematic exposure analysis (severity, financial impact and likelihood of occurrence)	<input type="checkbox"/> Sensitivity analysis
<input type="checkbox"/> Risk premiums or discounts on return/multiplier	<input type="checkbox"/> Other (please specify):
<input type="checkbox"/> Simulation using probabilities (e.g. Monte Carlo simulation)	<input type="text"/>

19. Assuming you have prepared a list of all material risks that may threaten your company. How do you address these? *Multiple responses are possible*

<input type="checkbox"/> Depending on the situation, we take ad-hoc actions to improve the risk situation.	<input type="checkbox"/> We record the existing actions and analyse their impact.
<input type="checkbox"/> We determine risk owners who are responsible for controlling risk management actions.	<input type="checkbox"/> We identify material risks but do not take any further action.
<input type="checkbox"/> We systematically prepare an action task list. The systematic implementation of these actions is monitored on a regular basis.	<input type="checkbox"/> Other (please specify): <input type="text"/>

20. What information on a project level needs to take priority within your risk culture? *Multiple responses are possible*

<input type="checkbox"/> Demand in the tenancy market	<input type="checkbox"/> Vacancy rates
<input type="checkbox"/> Supply in the tenancy market	<input type="checkbox"/> Absorption times
<input type="checkbox"/> Tenancy market liquidity	<input type="checkbox"/> Economic forecasts
<input type="checkbox"/> Demand in the transaction market	<input type="checkbox"/> Information on taxation
<input type="checkbox"/> Supply in the transaction market	<input type="checkbox"/> Other (please specify): <input type="text"/>
<input type="checkbox"/> Transaction market liquidity	
<input type="checkbox"/> Market rents	

21. Please evaluate the following aspects/ features of your risk management

No.		Yes	Yes, but needs improvement	No	Don't know
1	The company evaluates risks to make decisions on what actions to take	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The company monitors and reviews the risks in the achievements of its objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	The company has a clearly defined policy and process for the reporting of risks/ risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Changes to the company's risks are identified, assessed and reported on an ongoing basis as to their impact on objectives	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The company routinely reviews the effectiveness of the controls in place to manage risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	The key indicators for controlling material risks have been determined and threshold values have been defined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	There are appropriate tools in place to support risk management (e.g. standard templates, modeling tools, valuation tools)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

22. How confident is your company that its business risk management process is identifying, measuring and managing mainly all potentially significant risks?

<input type="checkbox"/> No confidence	<input type="checkbox"/> More or less confidence	<input type="checkbox"/> Confidence	<input type="checkbox"/> Absolute confidence
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23. What kind of IT support do you use as part of your risk management system?

- ☐ Our risk management system is integrated into the company's central information system.
☐ We use a stand-alone risk management application with an interface to our company applications.
☐ We use a stand-alone risk management application without interface to any other systems.
☐ Our IT support is limited to the utilisation of standard tools (e.g. Excel).
☐ We do not use IT support as part of our risk management system.
☐ Other (please specify)

24. Please evaluate the following aspects/ features of your risk management

No.		Yes	Yes, but needs improvement	No	Don't know
1	The company's structure supports effective risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	The company's culture supports effective risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Reporting and communication processes between staff and top management support the effective management or risk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Roles, responsibilities and accountabilities have been clearly defined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	There are clear and written management statements on risk management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	The company's senior management is receptive to all communications about risks, including bad news	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	There is adequate risk management training provided to management and other personnel in order to ensure that adequate capabilities exist within the business.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	The responsibilities for risk management and continuous monitoring of risk categories have been defined.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	A functional reporting concept has been designed and success fully implemented.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

25. Is there a specialized committee that oversees risk management for the company?

☐ No
☐ Yes, consisting of (check all that apply)

<input type="checkbox"/> Board members	<input type="checkbox"/> Financial Controller
<input type="checkbox"/> CEO	<input type="checkbox"/> Development executives
<input type="checkbox"/> CFO	<input type="checkbox"/> Other (please specify)
<input type="checkbox"/> Chief Risk Officer	<input type="text"/>
<input type="checkbox"/> Internal auditor	
<input type="checkbox"/> External advisor	

This is the end of the questionnaire.
Thank you for your time and for the information you have provided.

Appendix D – Statistical analysis

The questionnaire only consists of nominal variables that can be illustrated in contingency tables. The first step of statistical analysis is to analyse whether row and column variable are independent or not. By default the chi-square test is used for this problem. The chi-square statistic compares the observed frequencies with the expected frequencies. The latter are frequencies that result when the independence assumption is complied

$$\hat{E}(N_{ij}) = \frac{(Rowtotal) * (Columntotal)}{(N)}$$

Afterwards the test statistic is compared to the critical value of a chi-square distribution with $(r-1)(c-1)$ degrees of freedom. However, this method is an asymptotic one. Given a sufficiently large sample size, this means that p values are estimated based on the assumption that the data conform to a particular distribution. The common rule to produce reliable results indicates that you should not use a chi-square test when at least one expected frequency is less than five (AGRESTI, 2007).

Considering the data of the questionnaire several expected frequencies in the $r \times c$ contingency tables are less than five and the chi-square test cannot be used. In this case, calculating a significance level based on the exact distribution of the test statistic is preferable. Consequently an accurate p value is obtained without relying on any assumptions.

An alternative for testing independence of variables with the asymptotic chi-square test is Fisher's exact test (FISHER, 1934). It is traditionally associated with a 2×2 contingency table. FREEMAN / HALTON (1951) first proposed an extension to $r \times c$ tables.

The hypotheses are denoted by

H_0 : Row variable and column variable are independent

H_1 : Row variable and column variable are not independent.

Let x denote the $r \times c$ contingency table actually observed and y denote a $r \times c$ contingency table of a reference set of $r \times c$ contingency tables that could have been observed. The reference set Γ is defined as follows:

$$\Gamma = \left\{ y : y \text{ is } r \times c; \sum_{j=1}^c y_{ij} = m_i; \sum_{i=1}^r y_{ij} = n_j \forall i, j \right\}.$$

It can be shown that, under the hypothesis of independence, the probability of observing any $y \in \Gamma$ is

$$P(y) = \frac{\prod_{j=1}^c n_j! \prod_{i=1}^r m_i!}{N! \prod_{j=1}^c \prod_{i=1}^r y_{ij}!}.$$

The test statistic for any observed $r \times c$ contingency table is computed by

$$FI(x) = -2 \log(\gamma P(x)),$$

where

$$\gamma = (2\pi)^{(r-1)(c-1)/2} N^{-(rc-1)/2} \prod_{j=1}^c (n_j)^{(r-1)/2} \prod_{i=1}^r (m_i)^{(c-1)/2}.$$

Following notations were used in the precedent formulas: The number of rows is r , c is the number of columns, N is the number of all observations, m_i is the total sum of row i , n_j is the total sum of columns j .

The exact p value is defined as the sum of null probabilities of all the tables in the reference set Γ that are at least as extreme as the observed table x with respect to $FI(x)$:

$$p = \sum_{FI(y) \geq FI(x)} P(y) = \Pr\{FI(y) \geq FI(x)\},$$

where \Pr denotes probability.

As the exact p value is calculated, in this approach no distribution is taken as a basis for the test. Consequently no critical value is needed and the decision if H_0 is rejected or not only base on the exact p value:

- The null hypothesis is rejected, if the exact p value is bigger than 0.05.
- The null hypothesis is accepted if the exact p value is smaller or equal to 0.05.

In this work, the p value is used for assessing significance and the significance level (α) is 0.05. (FISHER, 1925) If the p value is bigger than 0.05, the null hypothesis is accepted and the results show that there is no association among the variables and the risk perception indications. If the null hypothesis is rejected the result of depending variables

is considered to be significant. To get uniform results for all contingency tables Fisher's exact test is applied to all tables even if the chi-square test could have been used.

For all calculated statistical values the statistical software SPSS (Statistical Package for the Social Sciences) was used.

Appendix E - Results from Cramer's V / p-value analysis

p-value	Cramer's Value	Association found between	Question no. in questionnaire
0,000	0,489	Risk Assessment and Ownership Structure	14(4)
0,000	0,413	Geographic scope and Project Size	2
0,000	0,755	Effective Risk Management and Ownership Structure	12(1)
0,001	0,381	Risk Management Principles and Geographic Scope	24(5)
0,002	0,377	Risk Perception and Project Size	9
0,003	0,454	Optimum project volume and Geographic Scope	5
0,005	0,398	Risk Management Committee and Project Size	25(1)
0,007	0,412	Risk Management Strategy and Ownership Structure	6
0,009	0,405	Risk Management Principles and Developer Type	24(5)
0,013	0,401	Key Indicators/threshold values and Developer Type	21(6)
0,013	0,342	Setting Corporate Objectives and Developer Type	12(1)
0,016	0,365	Setting Corporate Objectives and Project Size	12(4)
0,019	0,359	IT Support and Project Size	23
0,023	0,356	Setting Corporate Objectives and Ownership Structure	12(2)
0,025	0,341	Risk Identification and Developer Type	14(2)
0,027	0,351	Appropriate Tools and Ownership Structure	21(7)
0,032	0,295	Understanding of Risk Management and Geographic Scope	12(5)
0,040	0,332	Risk Reporting and Geographic Scope	21(3)

Appendix F – Empirical results

1) Under which developer category would you classify the development activities of your enterprise?

	Mainly Trader-Developer (Development including project sale)		Mainly Investor-Developer (Development for own portfolio)		Number of Responses	
Total Respondants	37	53,6%	32	46,4%	69	100,0%

Ownership structure

- Listed	12	52,2%	11	47,8%	23	33,3%
- Unlisted	25	54,3%	21	45,7%	46	66,7%
Total Ownership Structure	37	53,6%	32	46,4%	69	100,0%

p value (Fisher's exact test)	1,000	φ (Phi)	-0,021	Cramer's V	0,021
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Geographic Scope

- Regional	2	33,3%	4	66,7%	6	8,7%
- National	21	58,3%	15	41,7%	36	52,2%
- International	14	51,9%	13	48,1%	27	39,1%
Total Geographic Scope	37	53,6%	32	46,4%	69	100,0%

p value (Fisher's exact test)	0,514	φ (Phi)	0,140	Cramer's V	0,140
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Project Size Classification

- Small (EUR < 5 - 10 million)	4	57,1%	3	42,9%	7	10,1%
- Medium (EUR > 10 - 50 million)	24	60,0%	16	40,0%	40	58,0%
- Large (EUR > 50 - 250 million)	9	40,9%	13	59,1%	22	31,9%
Total Project Size Classification	37	53,6%	32	46,4%	69	100,0%

p value (Fisher's exact test)	0,349	φ (Phi)	0,175	Cramer's V	0,175
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2) What is the geographic scope of the company's activities?

			Regional		National		International		Number of Responses	
Total Respondants			6	8,7%	36	52,2%	27	39,1%	69	100,0%
Developer Classification										
- Mainly Trader-Developer			2	5,4%	21	56,8%	14	37,8%	37	53,6%
- Mainly Investor-Developer			4	12,5%	15	46,9%	13	40,6%	32	46,4%
Total Developer Classification			6	8,7%	36	52,2%	27	39,1%	69	100,0%
p value (Fisher's exact test)		0,514	φ (Phi)		0,140	Cramer`s V		0,140		
Ownership structure										
- Listed			3	13,0%	11	47,8%	9	39,1%	23	33,3%
- Unlisted			3	6,5%	25	54,3%	18	39,1%	46	66,7%
Total Ownership Structure			6	8,7%	36	52,2%	27	39,1%	69	100,0%
p value (Fisher's exact test)		0,610	φ (Phi)		0,113	Cramer`s V		0,113		
Project Size Classification										
- Small (EUR < 5 - 10 million)			2	28,6%	3	42,9%	2	28,6%	7	10,1%
- Medium (EUR > 10 - 50 million)			4	10,0%	28	70,0%	8	20,0%	40	58,0%
- Large (EUR > 50 - 250 million)			0	0,0%	5	22,7%	17	77,3%	22	31,9%
Total Project Size Classification			6	8,7%	36	52,2%	27	39,1%	69	100,0%
p value (Fisher's exact test)		0,000	φ (Phi)		0,584	Cramer`s V		0,413		

3) Please provide details on the ownership structure of your company

	Unlisted		Listed		Number of Responses	
Total Respondants	46	66,7%	23	33,3%	69	100,0%
Developer Classification						
- Mainly Trader-Developer	25	67,6%	12	32,4%	37	53,6%
- Mainly Investor-Developer	21	65,6%	11	34,4%	32	46,4%
Total Developer Classification	46	66,7%	23	33,3%	69	100,0%
p value (Fisher's exact test)	1,000	φ (Phi)	0,021	Cramer`s V	0,021	
Geographic Scope						
- Regional	3	50,0%	3	50,0%	6	8,7%
- National	25	69,4%	11	30,6%	36	52,2%
- International	18	66,7%	9	33,3%	27	39,1%
Total Geographic Scope	46	66,7%	23	33,3%	69	100,0%
p value (Fisher's exact test)	0,930	φ (Phi)	0,113	Cramer`s V	0,113	
Project Size Classification						
- Small (EUR < 5 - 10 million)	3	42,9%	4	57,1%	7	10,1%
- Medium (EUR > 10 - 50 million)	27	67,5%	13	32,5%	40	58,0%
- Large (EUR > 50 - 250 million)	16	72,7%	6	27,3%	22	31,9%
Total Project Size Classification	46	66,7%	23	33,3%	69	100,0%
p value (Fisher's exact test)	0,335	φ (Phi)	0,177	Cramer`s V	0,177	

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Residential

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses	
Total Respondants	19	40.4%	9	19.1%	8	17.0%	10	21.3%	1	2.1%	47	100.0%
Developer Classification												
- Mainly Trader-Developer	8	28.6%	9	32.1%	3	10.7%	8	28.6%	0	0.0%	28	59.6%
- Mainly Investor-Developer	11	57.9%	0	0.0%	5	26.3%	2	10.5%	1	5.3%	19	40.4%
Total Developer Classification	19	40.4%	9	19.1%	8	17.0%	10	21.3%	1	2.1%	47	100.0%
Ownership structure												
- Listed	7	38.9%	2	11.1%	4	22.2%	4	22.2%	1	5.6%	18	38.3%
- Unlisted	12	41.4%	7	24.1%	4	13.8%	6	20.7%	0	0.0%	29	61.7%
Total Ownership Structure	19	40.4%	9	19.1%	8	17.0%	10	21.3%	1	2.1%	47	100.0%
Geographic Scope												
- Regional	0	0.0%	1	25.0%	2	50.0%	1	25.0%	0	0.0%	4	8.5%
- National	11	42.3%	5	19.2%	3	11.5%	6	23.1%	1	3.8%	26	55.3%
- International	8	47.1%	3	17.6%	3	17.6%	3	17.6%	0	0.0%	17	36.2%
Total Geographic Scope	19	40.4%	9	19.1%	8	17.0%	10	21.3%	1	2.1%	47	100.0%
Project Size Classification												
- Small (EUR < 5 - 10 million)	1	20.0%	1	20.0%	1	20.0%	2	40.0%	0	0.0%	5	10.6%
- Medium (EUR > 10 - 50 million)	9	33.3%	6	22.2%	4	14.8%	7	25.9%	1	3.7%	27	57.4%
- Large (EUR > 50 - 250 million)	9	60.0%	2	13.3%	3	20.0%	1	6.7%	0	0.0%	15	31.9%
Total Project Size Classification	19	40.4%	9	19.1%	8	17.0%	10	21.3%	1	2.1%	47	100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Office

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses	
Total Respondants	20	31.7%	19	30.2%	13	20.6%	6	9.5%	5	7.9%	63	100.0%
Developer Classification												
- Mainly Trader-Developer	13	37.1%	9	25.7%	6	17.1%	5	14.3%	2	5.7%	35	55.6%
- Mainly Investor-Developer	7	25.0%	10	35.7%	7	25.0%	1	3.6%	3	10.7%	28	44.4%
Total Developer Classification	20	31.7%	19	30.2%	13	20.6%	6	9.5%	5	7.9%	63	100.0%
Ownership structure												
- Listed	8	40.0%	6	30.0%	2	10.0%	2	10.0%	2	10.0%	20	31.7%
- Unlisted	12	27.9%	13	30.2%	11	25.6%	4	9.3%	3	7.0%	43	68.3%
Total Ownership Structure	20	31.7%	19	30.2%	13	20.6%	6	9.5%	5	7.9%	63	100.0%
Geographic Scope												
- Regional	1	20.0%	2	40.0%	2	40.0%	0	0.0%	0	0.0%	5	7.9%
- National	10	27.8%	12	33.3%	7	19.4%	4	11.1%	3	8.3%	36	57.1%
- International	9	40.9%	5	22.7%	4	18.2%	2	9.1%	2	9.1%	22	34.9%
Total Geographic Scope	20	31.7%	19	30.2%	13	20.6%	6	9.5%	5	7.9%	63	100.0%
Project Size Classification												
- Small (EUR < 5 - 10 million)	1	20.0%	2	40.0%	1	20.0%	1	20.0%	0	0.0%	5	7.9%
- Medium (EUR > 10 - 50 million)	11	28.2%	13	33.3%	11	28.2%	1	2.6%	3	7.7%	39	61.9%
- Large (EUR > 50 - 250 million)	8	42.1%	4	21.1%	1	5.3%	4	21.1%	2	10.5%	19	30.2%
Total Project Size Classification	20	31.7%	19	30.2%	13	20.6%	6	9.5%	5	7.9%	63	100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Mixed-use

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses	
Total Respondants	18	50.0%	13	36.1%	5	13.9%	0	0.0%	0	0.0%	36	100.0%
Developer Classification												
- Mainly Trader-Developer	11	47.8%	7	30.4%	5	21.7%	0	0.0%	0	0.0%	23	63.9%
- Mainly Investor-Developer	7	53.8%	6	46.2%	0	0.0%	0	0.0%	0	0.0%	13	36.1%
Total Developer Classification	18	50.0%	13	36.1%	5	13.9%	0	0.0%	0	0.0%	36	100.0%
Ownership structure												
- Listed	5	45.5%	5	45.5%	1	9.1%	0	0.0%	0	0.0%	11	30.6%
- Unlisted	13	52.0%	8	32.0%	4	16.0%	0	0.0%	0	0.0%	25	69.4%
Total Ownership Structure	18	50.0%	13	36.1%	5	13.9%	0	0.0%	0	0.0%	36	100.0%
Geographic Scope												
- Regional	1	33.3%	1	33.3%	1	33.3%	0	0.0%	0	0.0%	3	8.3%
- National	12	60.0%	4	20.0%	4	20.0%	0	0.0%	0	0.0%	20	55.6%
- International	5	38.5%	8	61.5%	0	0.0%	0	0.0%	0	0.0%	13	36.1%
Total Geographic Scope	18	50.0%	13	36.1%	5	13.9%	0	0.0%	0	0.0%	36	100.0%
Project Size Classification												
- Small (EUR < 5 - 10 million)	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	5.6%
- Medium (EUR > 10 - 50 million)	11	47.8%	7	30.4%	5	21.7%	0	0.0%	0	0.0%	23	63.9%
- Large (EUR > 50 - 250 million)	6	54.5%	5	45.5%	0	0.0%	0	0.0%	0	0.0%	11	30.6%
Total Project Size Classification	18	50.0%	13	36.1%	5	13.9%	0	0.0%	0	0.0%	36	100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Shopping centre/ Retail

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses	
Total Respondants	17	50.0%	12	35.3%	3	8.8%	1	2.9%	1	2.9%	34	100.0%
Developer Classification												
- Mainly Trader-Developer	8	53.3%	5	33.3%	2	13.3%	0	0.0%	0	0.0%	15	44.1%
- Mainly Investor-Developer	9	47.4%	7	36.8%	1	5.3%	1	5.3%	1	5.3%	19	55.9%
Total Developer Classification	17	50.0%	12	35.3%	3	8.8%	1	2.9%	1	2.9%	34	100.0%
Ownership structure												
- Listed	4	44.4%	5	55.6%	0	0.0%	0	0.0%	0	0.0%	9	26.5%
- Unlisted	13	52.0%	7	28.0%	3	12.0%	1	4.0%	1	4.0%	25	73.5%
Total Ownership Structure	17	50.0%	12	35.3%	3	8.8%	1	2.9%	1	2.9%	34	100.0%
Geographic Scope												
- Regional	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	2.9%
- National	8	50.0%	6	37.5%	1	6.3%	1	6.3%	0	0.0%	16	47.1%
- International	9	52.9%	5	29.4%	2	11.8%	0	0.0%	1	5.9%	17	50.0%
Total Geographic Scope	17	50.0%	12	35.3%	3	8.8%	1	2.9%	1	2.9%	34	100.0%
Project Size Classification												
- Small (EUR < 5 - 10 million)	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2	5.9%
- Medium (EUR > 10 - 50 million)	10	52.6%	7	36.8%	1	5.3%	1	5.3%	0	0.0%	19	55.9%
- Large (EUR > 50 - 250 million)	6	46.2%	4	30.8%	2	15.4%	0	0.0%	1	7.7%	13	38.2%
Total Project Size Classification	17	50.0%	12	35.3%	3	8.8%	1	2.9%	1	2.9%	34	100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Hotel

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses
Total Respondants	20	95.2%	1	4.8%	0	0.0%	0	0.0%	0	0.0%	21 100.0%
Developer Classification											
- Mainly Trader-Developer	9	90.0%	1	10.0%	0	0.0%	0	0.0%	0	0.0%	10 47.6%
- Mainly Investor-Developer	11	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	11 52.4%
Total Developer Classification	20	95.2%	1	4.8%	0	0.0%	0	0.0%	0	0.0%	21 100.0%
Ownership structure											
- Listed	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	6 28.6%
- Unlisted	14	93.3%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	15 71.4%
Total Ownership Structure	20	95.2%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	21 100.0%
Geographic Scope											
- Regional	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1 4.8%
- National	12	92.3%	1	7.7%	0	0.0%	0	0.0%	0	0.0%	13 61.9%
- International	7	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7 33.3%
Total Geographic Scope	20	95.2%	1	4.8%	0	0.0%	0	0.0%	0	0.0%	21 100.0%
Project Size Classification											
- Small (EUR < 5 - 10 million)	2	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2 9.5%
- Medium (EUR > 10 - 50 million)	10	90.9%	1	9.1%	0	0.0%	0	0.0%	0	0.0%	11 52.4%
- Large (EUR > 50 - 250 million)	8	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8 38.1%
Total Project Size Classification	20	95.2%	1	4.8%	0	0.0%	0	0.0%	0	0.0%	21 100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Production

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses
Total Respondants	5	55.6%	4	44.4%	0	0.0%	0	0.0%	0	0.0%	9 100.0%
Developer Classification											
- Mainly Trader-Developer	3	75.0%	1	25.0%	0	0.0%	0	0.0%	0	0.0%	4 44.4%
- Mainly Investor-Developer	2	40.0%	3	60.0%	0	0.0%	0	0.0%	0	0.0%	5 55.6%
Total Developer Classification	5	55.6%	4	44.4%	0	0.0%	0	0.0%	0	0.0%	9 100.0%
Ownership structure											
- Listed	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1 11.1%
- Unlisted	4	50.0%	4	50.0%	0	0.0%	0	0.0%	0	0.0%	8 88.9%
Total Ownership Structure	5	55.6%	4	44.4%	0	0.0%	0	0.0%	0	0.0%	9 100.0%
Geographic Scope											
- Regional	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1 11.1%
- National	3	50.0%	3	50.0%	0	0.0%	0	0.0%	0	0.0%	6 66.7%
- International	2	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2 22.2%
Total Geographic Scope	5	55.6%	4	44.4%	0	0.0%	0	0.0%	0	0.0%	9 100.0%
Project Size Classification											
- Small (EUR < 5 - 10 million)	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2 22.2%
- Medium (EUR > 10 - 50 million)	4	57.1%	3	42.9%	0	0.0%	0	0.0%	0	0.0%	7 77.8%
- Large (EUR > 50 - 250 million)	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0 0.0%
Total Project Size Classification	5	55.6%	4	44.4%	0	0.0%	0	0.0%	0	0.0%	9 100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Logistics

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses
Total Respondants	10	66.7%	3	20.0%	0	0.0%	0	0.0%	2	13.3%	15 100.0%
Developer Classification											
- Mainly Trader-Developer	4	80.0%	0	0.0%	0	0.0%	0	0.0%	1	20.0%	5 33.3%
- Mainly Investor-Developer	6	60.0%	3	30.0%	0	0.0%	0	0.0%	1	10.0%	10 66.7%
Total Developer Classification	10	66.7%	3	20.0%	0	0.0%	0	0.0%	2	13.3%	15 100.0%
Ownership structure											
- Listed	6	75.0%	0	0.0%	0	0.0%	0	0.0%	2	25.0%	8 53.3%
- Unlisted	4	57.1%	3	42.9%	0	0.0%	0	0.0%	0	0.0%	7 46.7%
Total Ownership Structure	10	66.7%	3	20.0%	0	0.0%	0	0.0%	2	13.3%	15 100.0%
Geographic Scope											
- Regional	1	50.0%	1	50.0%	0	0.0%	0	0.0%	0	0.0%	2 13.3%
- National	6	75.0%	2	25.0%	0	0.0%	0	0.0%	0	0.0%	8 53.3%
- International	3	60.0%	0	0.0%	0	0.0%	0	0.0%	2	40.0%	5 33.3%
Total Geographic Scope	10	66.7%	3	20.0%	0	0.0%	0	0.0%	2	13.3%	15 100.0%
Project Size Classification											
- Small (EUR < 5 - 10 million)	1	33.3%	1	33.3%	0	0.0%	0	0.0%	1	33.3%	3 20.0%
- Medium (EUR > 10 - 50 million)	8	72.7%	2	18.2%	0	0.0%	0	0.0%	1	9.1%	11 73.3%
- Large (EUR > 50 - 250 million)	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1 6.7%
Total Project Size Classification	10	66.7%	3	20.0%	0	0.0%	0	0.0%	2	13.3%	15 100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Leisure

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses
Total Respondants	14	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14 100.0%
Developer Classification											
- Mainly Trader-Developer	8	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8 57.1%
- Mainly Investor-Developer	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	6 42.9%
Total Developer Classification	14	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14 100.0%
Ownership structure											
- Listed	5	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	5 35.7%
- Unlisted	9	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9 64.3%
Total Ownership Structure	14	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14 100.0%
Geographic Scope											
- Regional	2	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2 14.3%
- National	8	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8 57.1%
- International	4	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4 28.6%
Total Geographic Scope	14	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14 100.0%
Project Size Classification											
- Small (EUR < 5 - 10 million)	1	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1 7.1%
- Medium (EUR > 10 - 50 million)	10	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	10 71.4%
- Large (EUR > 50 - 250 million)	3	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	3 21.4%
Total Project Size Classification	14	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	14 100.0%

4) What is the distribution of the project development services across the various types of usage? (total = 100%):

Other

	1-20%		21-40%		41-60%		61-80%		81-100%		Number of Responses	
Total Respondants	4	50.0%	2	25.0%	0	0.0%	0	0.0%	2	25.0%	8	100.0%
Developer Classification												
- Mainly Trader-Developer	3	50.0%	2	33.3%	0	0.0%	0	0.0%	1	16.7%	6	75.0%
- Mainly Investor-Developer	1	50.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	2	25.0%
Total Developer Classification	4	50.0%	2	25.0%	0	0.0%	0	0.0%	2	25.0%	8	100.0%
Ownership structure												
- Listed	2	40.0%	2	40.0%	0	0.0%	0	0.0%	1	20.0%	5	62.5%
- Unlisted	2	66.7%	0	0.0%	0	0.0%	0	0.0%	1	33.3%	3	37.5%
Total Ownership Structure	4	50.0%	2	25.0%	0	0.0%	0	0.0%	2	25.0%	8	100.0%
Geographic Scope												
- Regional	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
- National	4	66.7%	0	0.0%	0	0.0%	0	0.0%	2	33.3%	6	75.0%
- International	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	2	25.0%
Total Geographic Scope	4	50.0%	2	25.0%	0	0.0%	0	0.0%	2	25.0%	8	100.0%
Project Size Classification												
- Small (EUR < 5 - 10 million)	0	0.0%	1	100.0%	0	0.0%	0	0.0%	0	0.0%	1	12.5%
- Medium (EUR > 10 - 50 million)	3	60.0%	1	20.0%	0	0.0%	0	0.0%	1	20.0%	5	62.5%
- Large (EUR > 50 - 250 million)	1	50.0%	0	0.0%	0	0.0%	0	0.0%	1	50.0%	2	25.0%
Total Project Size Classification	4	50.0%	2	25.0%	0	0.0%	0	0.0%	2	25.0%	8	100.0%

5) What volume does your company regard as being an optimum for individual project volumes? Multiple responses are possible

		< EUR 5 million												EUR 5 to 10 million												EUR 10 to 20 million												EUR 20 to 30 million												EUR 30 to 40 million												EUR 40 to 50 million												EUR 50 to 100 million												EUR 100 to 250 million												EUR 250 to 500 million												> EUR 500 million												Total											
Total Respondants		1		1,1%		9		10,0%		18		20,0%		17		18,9%		12		13,3%		10		11,1%		14		15,6%		7		7,8%		2		2,2%		0		0,0%		90		100,0%																																																																																									
Developer Classification																																																																																																																																					
- Mainly Trader-Developer																																												1		2,2%		5		10,9%		10		21,7%		11		23,9%		5		10,9%		4		8,7%		6		13,0%		3		6,5%		1		2,2%		0		0,0%		46		51,1%																																															
- Mainly Investor-Developer																																												0		0,0%		4		9,1%		8		18,2%		6		13,6%		7		15,9%		6		13,6%		8		18,2%		4		9,1%		1		2,3%		0		0,0%		44		48,9%																																															
Total Developer Classification		1		1,1%		9		10,0%		18		20,0%		17		18,9%		12		13,3%		10		11,1%		14		15,6%		7		7,8%		2		2,2%		0		0,0%		90		100,0%																																																																																									
p value (Fisher's exact test)		0,900		φ(Phi)																																								0,209		Cramer's V																																								0,209																																															
Ownership structure																																																																																																																																					
- Listed																																												1		3,2%		3		9,7%		7		22,6%		9		29,0%		3		9,7%		2		6,5%		4		12,9%		2		6,5%		0		0,0%		0		0,0%		31		34,4%																																															
- Unlisted																																												0		0,0%		6		10,2%		11		18,6%		8		13,6%		9		15,3%		8		13,6%		10		16,9%		5		8,5%		2		3,4%		0		0,0%		59		65,6%																																															
Total Ownership Structure		1		1,1%		9		10,0%		18		20,0%		17		18,9%		12		13,3%		10		11,1%		14		15,6%		7		7,8%		2		2,2%		0		0,0%		90		100,0%																																																																																									
p value (Fisher's exact test)		0,585		φ(Phi)																																								0,287		Cramer's V																																								0,287																																															
Geographic Scope																																																																																																																																					
- Regional																																												1		11,1%		2		22,2%		2		22,2%		2		22,2%		1		11,1%		1		11,1%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		9		10,0%																																															
- National																																												0		0,0%		5		10,2%		14		28,6%		11		22,4%		8		16,3%		6		12,2%		4		8,2%		1		2,0%		0		0,0%		0		0,0%		49		54,4%																																															
- International																																												0		0,0%		2		6,3%		2		6,3%		4		12,5%		3		9,4%		3		9,4%		10		31,3%		6		18,8%		2		6,3%		0		0,0%		32		35,6%																																															
Total Geographic Scope		1		1,1%		9		10,0%		18		20,0%		17		18,9%		12		13,3%		10		11,1%		14		15,6%		7		7,8%		2		2,2%		0		0,0%		90		100,0%																																																																																									
p value (Fisher's exact test)		0,003		φ(Phi)																																								0,642		Cramer's V																																								0,454																																															
Project Size Classification																																																																																																																																					
- Small (EUR < 5 - 10 million)																																												1		14,3%		6		85,7%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		7		7,8%																																															
- Medium (EUR > 10 - 50 million)																																												0		0,0%		3		5,8%		16		30,8%		16		30,8%		10		19,2%		7		13,5%		0		0,0%		0		0,0%		0		0,0%		0		0,0%		52		57,8%																																															
- Large (EUR > 50 - 250 million)																																												0		0,0%		0		0,0%		2		6,5%		1		3,2%		2		6,5%		3		9,7%		14		45,2%		7		22,6%		2		6,5%		0		0,0%		31		34,4%																																															
Total Project Size Classification		1		1,1%		9		10,0%		18		20,0%		17		18,9%		12		13,3%		10		11,1%		14		15,6%		7		7,8%		2		2,2%		0		0,0%		90		100,0%																																																																																									
p value (Fisher's exact test)		0,000		φ(Phi)																																								1,158		Cramer's V																																								0,757																																															

6) Has the company formulated an overall, enterprise-wide strategy for managing risks yet?

	Yes, implemented		Yes, but needs improvement		No, but planned		No		Number of Responses	
Total Respondants	27	39,1%	25	36,2%	8	11,6%	9	13,0%	69	100,0%

Developer Classification

- Mainly Trader-Developer	11	29,7%	15	40,5%	4	10,8%	7	18,9%	37	53,6%
- Mainly Investor-Developer	16	50,0%	10	31,3%	4	12,5%	2	6,3%	32	46,4%
Total Developer Classification	27	39,1%	25	36,2%	8	11,6%	9	13,0%	69	100,0%

p value (Fisher's exact test)	0,241	φ (Phi)	0,251	Cramer's V	0,251
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Ownership structure

- Listed	15	65,2%	6	26,1%	2	8,7%	0	0,0%	23	33,3%
- Unlisted	12	26,1%	19	41,3%	6	13,0%	9	19,6%	46	66,7%
Total Ownership Structure	27	39,1%	25	36,2%	8	11,6%	9	13,0%	69	100,0%

p value (Fisher's exact test)	0,007	φ (Phi)	0,412	Cramer's V	0,412
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Geographic Scope

- Regional	3	50,0%	3	50,0%	0	0,0%	0	0,0%	6	8,7%
- National	10	27,8%	13	36,1%	6	16,7%	7	19,4%	36	52,2%
- International	14	51,9%	9	33,3%	2	7,4%	2	7,4%	27	39,1%
Total Geographic Scope	27	39,1%	25	36,2%	8	11,6%	9	13,0%	69	100,0%

p value (Fisher's exact test)	0,369	φ (Phi)	0,326	Cramer's V	0,231
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Project Size Classification

- Small (EUR < 5 - 10 million)	3	42,9%	2	28,6%	0	0,0%	2	28,6%	7	10,1%
- Medium (EUR > 10 - 50 million)	15	37,5%	14	35,0%	5	12,5%	6	15,0%	40	58,0%
- Large (EUR > 50 - 250 million)	9	40,9%	9	40,9%	3	13,6%	1	4,5%	22	31,9%
Total Project Size Classification	27	39,1%	25	36,2%	8	11,6%	9	13,0%	69	100,0%

p value (Fisher's exact test)	0,742	φ (Phi)	0,237	Cramer's V	0,168
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7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

1 Competitor threats to company's market position

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?									
Low					Medium		High		Very high		Number of Responses			
24					35.3%	30	44.1%	13	19.1%	1	1.5%	68	100.0%	
Developer Classification														
- Mainly Trader-Developer					10	27.8%	18	50.0%	7	19.4%	1	2.8%	36	52.9%
- Mainly Investor-Developer					14	43.8%	12	37.5%	6	18.8%	0	0.0%	32	47.1%
Total Developer Classification					24	35.3%	30	44.1%	13	19.1%	1	1.5%	68	100.0%
Ownership structure														
- Listed					5	22.7%	13	59.1%	4	18.2%	0	0.0%	22	32.4%
- Unlisted					19	41.3%	17	37.0%	9	19.6%	1	2.2%	46	67.6%
Total Ownership Structure					24	35.3%	30	44.1%	13	19.1%	1	1.5%	68	100.0%
Geographic Scope														
- Regional					3	50.0%	3	50.0%	0	0.0%	0	0.0%	6	8.8%
- National					14	38.9%	16	44.4%	5	13.9%	1	2.8%	36	52.9%
- International					7	26.9%	11	42.3%	8	30.8%	0	0.0%	26	38.2%
Total Geographic Scope					24	35.3%	30	44.1%	13	19.1%	1	1.5%	68	100.0%
Project Size Classification														
- Small (EUR < 5 - 10 million)					2	28.6%	3	42.9%	1	14.3%	1	14.3%	7	10.3%
- Medium (EUR > 10 - 50 million)					12	30.0%	20	50.0%	8	20.0%	0	0.0%	40	58.8%
- Large (EUR > 50 - 250 million)					10	47.6%	7	33.3%	4	19.0%	0	0.0%	21	30.9%
Total Project Size Classification					24	35.3%	30	44.1%	13	19.1%	1	1.5%	68	100.0%

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

2 Sovereign or political risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?																			
					Low				Medium		High		Very high		Number of Responses									
					28	41.2%	31	45.6%	9	13.2%	0	0.0%	4	5.9%	16	23.5%	33	48.5%	2	2.9%	13	19.1%	68	100.0%
Developer Classification																								
- Mainly Trader-Developer					11	30.6%	19	52.8%	6	16.7%	0	0.0%	1	2.8%	9	25.0%	19	52.8%	1	2.8%	6	16.7%	36	52.9%
- Mainly Investor-Developer					17	53.1%	12	37.5%	3	9.4%	0	0.0%	3	9.4%	7	21.9%	14	43.8%	1	3.1%	7	21.9%	32	47.1%
Total Developer Classification					28	41.2%	31	45.6%	9	13.2%	0	0.0%	4	5.9%	16	23.5%	33	48.5%	2	2.9%	13	19.1%	68	100.0%
Ownership structure																								
- Listed					6	27.3%	14	63.6%	2	9.1%	0	0.0%	1	4.5%	7	31.8%	11	50.0%	0	0.0%	3	13.6%	22	32.4%
- Unlisted					22	47.8%	17	37.0%	7	15.2%	0	0.0%	3	6.5%	9	19.6%	22	47.8%	2	4.3%	10	21.7%	46	67.6%
Total Ownership Structure					28	41.2%	31	45.6%	9	13.2%	0	0.0%	4	5.9%	16	23.5%	33	48.5%	2	2.9%	13	19.1%	68	100.0%
Geographic Scope																								
- Regional					3	50.0%	3	50.0%	0	0.0%	0	0.0%	1	16.7%	1	16.7%	3	50.0%	0	0.0%	1	16.7%	6	8.8%
- National					19	52.8%	12	33.3%	5	13.9%	0	0.0%	1	2.8%	5	13.9%	21	58.3%	1	2.8%	8	22.2%	36	52.9%
- International					6	23.1%	16	61.5%	4	15.4%	0	0.0%	2	7.7%	10	38.5%	9	34.6%	1	3.8%	4	15.4%	26	38.2%
Total Geographic Scope					28	41.2%	31	45.6%	9	13.2%	0	0.0%	4	5.9%	16	23.5%	33	48.5%	2	2.9%	13	19.1%	68	100.0%
Project Size Classification																								
- Small (EUR < 5 - 10 million)					2	28.6%	3	42.9%	2	28.6%	0	0.0%	0	0.0%	3	42.9%	3	42.9%	0	0.0%	1	14.3%	7	10.3%
- Medium (EUR > 10 - 50 million)					19	47.5%	16	40.0%	5	12.5%	0	0.0%	3	7.5%	8	20.0%	21	52.5%	2	5.0%	6	15.0%	40	58.8%
- Large (EUR > 50 - 250 million)					7	33.3%	12	57.1%	2	9.5%	0	0.0%	1	4.8%	5	23.8%	9	42.9%	0	0.0%	6	28.6%	21	30.9%
Total Project Size Classification					28	41.2%	31	45.6%	9	13.2%	0	0.0%	4	5.9%	16	23.5%	33	48.5%	2	2.9%	13	19.1%	68	100.0%

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

3 Unfavorable financial market events

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							
Low					Medium					High					Very high					Number of Responses					Very Ineffective					Ineffective					Effective					Very effective					Don't know					Number of Responses																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

4 Availability of capital to meet business requirements

		How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				
		Low					Very Ineffective				
		Medium					Ineffective				
		High					Effective				
		Very high					Very effective				
		Number of Responses					Don't know				
Total Respondants		19	29.2%	23	35.4%	17	26.2%	6	9.2%	65	100.0%
Developer Classification											
- Mainly Trader-Developer	11	33.3%	12	36.4%	7	21.2%	3	9.1%		33	50.8%
- Mainly Investor-Developer	8	25.0%	11	34.4%	10	31.3%	3	9.4%		32	49.2%
Total Developer Classification	19	29.2%	23	35.4%	17	26.2%	6	9.2%		65	100.0%
Ownership structure											
- Listed	6	30.0%	9	45.0%	3	15.0%	2	10.0%		20	30.8%
- Unlisted	13	28.9%	14	31.1%	14	31.1%	4	8.9%		45	69.2%
Total Ownership Structure	19	29.2%	23	35.4%	17	26.2%	6	9.2%		65	100.0%
Geographic Scope											
- Regional	1	20.0%	3	60.0%	0	0.0%	1	20.0%		5	7.7%
- National	11	30.6%	13	36.1%	10	27.8%	2	5.6%		36	55.4%
- International	7	29.2%	7	29.2%	7	29.2%	3	12.5%		24	36.9%
Total Geographic Scope	19	29.2%	23	35.4%	17	26.2%	6	9.2%		65	100.0%
Project Size Classification											
- Small (EUR < 5 - 10 million)	3	50.0%	1	16.7%	2	33.3%	0	0.0%		6	9.1%
- Medium (EUR > 10 - 50 million)	12	30.0%	13	32.5%	10	25.0%	5	12.5%		36	55.4%
- Large (EUR > 50 - 250 million)	4	21.1%	9	47.4%	5	26.3%	1	5.3%		19	29.2%
Total Project Size Classification	19	29.2%	23	35.4%	17	26.2%	6	9.2%		65	100.0%

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

5 Legal risk (e.g. business law suits)

		How significant is this risk to achieving your objectives?				How effective are your processes at managing this risk?					Number of Responses								
		Low	Medium	High	Very high	Very Ineffective	Ineffective	Effective	Very effective	Don't know									
Total Respondants		21	30.9%	30	44.1%	16	23.5%	1	1.5%	7	10.4%	36	53.7%	20	29.9%	3	4.5%	67	100.0%
Developer Classification		12	33.3%	13	36.1%	10	27.8%	1	2.8%	0	0.0%	3	8.3%	16	44.4%	14	38.9%	3	8.3%
- Mainly Trader-Developer		9	28.1%	17	53.1%	6	18.8%	0	0.0%	1	3.2%	4	12.9%	20	64.5%	6	19.4%	0	0.0%
Total Developer Classification		21	30.9%	30	44.1%	16	23.5%	1	1.5%	1	1.5%	7	10.4%	36	53.7%	20	29.9%	3	4.5%
Ownership structure		6	27.3%	12	54.5%	4	18.2%	0	0.0%	0	0.0%	2	9.1%	10	45.5%	10	45.5%	0	0.0%
- Listed		15	32.6%	18	39.1%	12	26.1%	1	2.2%	1	2.2%	5	11.1%	26	57.8%	10	22.2%	3	6.7%
Total Ownership Structure		21	30.9%	30	44.1%	16	23.5%	1	1.5%	1	1.5%	7	10.4%	36	53.7%	20	29.9%	3	4.5%
Geographic Scope		1	16.7%	4	66.7%	1	16.7%	0	0.0%	0	0.0%	1	16.7%	4	66.7%	1	16.7%	0	0.0%
- Regional		15	41.7%	10	27.8%	11	30.6%	0	0.0%	1	2.9%	2	5.7%	20	57.1%	10	28.6%	2	5.7%
- National		5	19.2%	16	61.5%	4	15.4%	1	3.8%	0	0.0%	4	15.4%	12	46.2%	9	34.6%	1	3.8%
Total Geographic Scope		21	30.9%	30	44.1%	16	23.5%	1	1.5%	1	1.5%	7	10.4%	36	53.7%	20	29.9%	3	4.5%
Project Size Classification		2	28.6%	3	42.9%	2	28.6%	0	0.0%	0	0.0%	0	0.0%	5	71.4%	2	28.6%	0	0.0%
- Small (EUR < 5 - 10 million)		13	32.5%	16	40.0%	10	25.0%	1	2.5%	1	2.6%	4	10.3%	21	53.8%	12	30.8%	1	2.6%
- Medium (EUR > 10 - 50 million)		6	28.6%	11	52.4%	4	19.0%	0	0.0%	0	0.0%	3	14.3%	10	47.6%	6	28.6%	2	9.5%
Total Project Size Classification		21	30.9%	30	44.1%	16	23.5%	1	1.5%	1	1.5%	7	10.4%	36	53.7%	20	29.9%	3	4.5%

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

6 Inefficient key processes

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?									
LowMediumHighVery high										Very IneffectiveIneffectiveEffectiveVery effectiveDon't know									
Number of Responses										Number of Responses									
Total Respondants										Total Respondants									
2334.8%2943.9%1218.2%23.0%										66100.0%4161.2%1217.9%46.0%									
Developer Classification										Developer Classification									
- Mainly Trader-Developer										- Mainly Trader-Developer									
1337.1%1645.7%514.3%12.9%										3553.0%2158.3%822.2%38.3%									
- Mainly Investor-Developer										- Mainly Investor-Developer									
1032.3%1341.9%722.6%13.2%										3147.0%2064.5%412.9%13.2%									
Total Developer Classification										Total Developer Classification									
2334.8%2943.9%1218.2%23.0%										66100.0%4161.2%1217.9%46.0%									
Ownership structure										Ownership structure									
- Listed										- Listed									
942.9%628.6%523.8%14.8%										2131.8%1254.5%627.3%29.1%									
- Unlisted										- Unlisted									
1431.1%2351.1%715.6%12.2%										4568.2%2964.4%613.3%24.4%									
Total Ownership Structure										Total Ownership Structure									
2334.8%2943.9%1218.2%23.0%										66100.0%4161.2%1217.9%46.0%									
Geographic Scope										Geographic Scope									
- Regional										- Regional									
233.3%350.0%116.7%00.0%										69.1%466.7%233.3%00.0%									
- National										- National									
1338.2%1235.3%720.6%25.9%										3451.5%2057.1%617.1%38.6%									
- International										- International									
830.8%1453.8%415.4%00.0%										2639.4%1765.4%415.4%13.8%									
Total Geographic Scope										Total Geographic Scope									
2334.8%2943.9%1218.2%23.0%										66100.0%4161.2%1217.9%46.0%									
Project Size Classification										Project Size Classification									
- Small (EUR < 5 - 10 million)										- Small (EUR < 5 - 10 million)									
342.9%114.3%342.9%00.0%										710.6%457.1%114.3%00.0%									
- Medium (EUR > 10 - 50 million)										- Medium (EUR > 10 - 50 million)									
1537.5%1742.5%615.0%25.0%										4060.6%2564.1%717.9%12.6%									
- Large (EUR > 50 - 250 million)										- Large (EUR > 50 - 250 million)									
526.3%1157.9%315.8%00.0%										1928.8%1257.1%419.0%314.3%									
Total Project Size Classification										Total Project Size Classification									
2334.8%2943.9%1218.2%23.0%										66100.0%4161.2%1217.9%46.0%									
Number of Responses										Number of Responses									
67100.0%										67100.0%									
3653.7%										3653.7%									
3146.3%										3146.3%									
67100.0%										67100.0%									

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

7 Loss or impairment of reputation

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

8 Human resources lack the expertise to meet company's goals

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?													
		Low		Medium		High		Very high		Number of Responses		Very Ineffective		Ineffective		Effective		Very effective		Don't know		Number of Responses	
Total Respondants		22	32.8%	19	28.4%	20	29.9%	6	9.0%	67	100.0%	0	0.0%	9	13.4%	40	59.7%	15	22.4%	3	4.5%	67	100.0%
Developer Classification																							
- Mainly Trader-Developer	11	31.4%	12	34.3%	9	25.7%	3	8.6%	35	52.2%	0	0.0%	4	11.1%	20	55.6%	9	25.0%	3	8.3%	36	53.7%	
- Mainly Investor-Developer	11	34.4%	7	21.9%	11	34.4%	3	9.4%	32	47.8%	0	0.0%	5	16.1%	20	64.5%	6	19.4%	0	0.0%	31	46.3%	
Total Developer Classification	22	32.8%	19	28.4%	20	29.9%	6	9.0%	67	100.0%	0	0.0%	9	13.4%	40	59.7%	15	22.4%	3	4.5%	67	100.0%	
Ownership structure																							
- Listed	6	27.3%	7	31.8%	7	31.8%	2	9.1%	22	32.8%	0	0.0%	3	13.6%	17	77.3%	2	9.1%	0	0.0%	22	32.8%	
- Unlisted	16	35.6%	12	26.7%	13	28.9%	4	8.9%	45	67.2%	0	0.0%	6	13.3%	23	51.1%	13	28.9%	3	6.7%	45	67.2%	
Total Ownership Structure	22	32.8%	19	28.4%	20	29.9%	6	9.0%	67	100.0%	0	0.0%	9	13.4%	40	59.7%	15	22.4%	3	4.5%	67	100.0%	
Geographic Scope																							
- Regional	2	33.3%	2	33.3%	2	33.3%	0	0.0%	6	9.0%	0	0.0%	2	33.3%	3	50.0%	1	16.7%	0	0.0%	6	9.0%	
- National	10	27.8%	10	27.8%	11	30.6%	5	13.9%	36	53.7%	0	0.0%	2	5.7%	22	62.9%	10	28.6%	1	2.9%	35	52.2%	
- International	10	40.0%	7	28.0%	7	28.0%	1	4.0%	25	37.3%	0	0.0%	5	19.2%	15	57.7%	4	15.4%	2	7.7%	26	38.8%	
Total Geographic Scope	22	32.8%	19	28.4%	20	29.9%	6	9.0%	67	100.0%	0	0.0%	9	13.4%	40	59.7%	15	22.4%	3	4.5%	67	100.0%	
Project Size Classification																							
- Small (EUR < 5 - 10 million)	4	57.1%	0	0.0%	3	42.9%	0	0.0%	7	10.4%	0	0.0%	2	28.6%	3	42.9%	2	28.6%	0	0.0%	7	10.4%	
- Medium (EUR 10 - 50 million)	10	25.0%	11	27.5%	14	35.0%	5	12.5%	40	59.7%	0	0.0%	4	10.3%	25	64.1%	10	25.6%	0	0.0%	39	58.2%	
- Large (EUR > 50 - 250 million)	8	40.0%	8	40.0%	3	15.0%	1	5.0%	20	29.9%	0	0.0%	3	14.3%	12	57.1%	3	14.3%	3	14.3%	21	31.3%	
Total Project Size Classification	22	32.8%	19	28.4%	20	29.9%	6	9.0%	67	100.0%	0	0.0%	9	13.4%	40	59.7%	15	22.4%	3	4.5%	67	100.0%	

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

9 Accidents cause environmental damage

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

10 Executives, employees or agents exceed their authority

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?																																							
Low										Very Ineffective																																							
Medium										Ineffective																																							
High										Effective																																							
Very high										Don't know																																							
Number of Responses										Number of Responses																																							
Total Respondants										68	100.0%	67										100.0%																											
Developer Classification																																																	
- Mainly Trader-Developer										36	52.9%											36										53.7%																	
- Mainly Investor-Developer										32	47.1%											31										46.3%																	
Total Developer Classification										68	100.0%											67										100.0%																	
Ownership structure																																																	
- Listed										22	32.4%																					22										32.8%							
- Unlisted										46	67.6%																					45										67.2%							
Total Ownership Structure										68	100.0%																					67										100.0%							
Geographic Scope																																																	
- Regional										6	8.8%																					6										9.0%							
- National										36	52.9%																					35										52.2%							
- International										26	38.2%																					26										38.8%							
Total Geographic Scope										68	100.0%																					67										100.0%							
Project Size Classification																																																	
- Small (EUR < 5 - 10 million)										7	10.3%																					7										10.4%							
- Medium (EUR > 10 - 50 million)										24	60.0%																					39										58.2%							
- Large (EUR > 50 - 250 million)										21	30.9%																					21										31.3%							
Total Project Size Classification										68	100.0%																					67										100.0%							

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

11 Inadequate motivations lead to under-performance

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?									
LowMediumHighVery high										Very IneffectiveIneffectiveEffectiveVery effectiveDon't know									
Number of Responses										Number of Responses									
Total Respondants										Total Respondants									
3044.8%2638.8%913.4%23.0%										67100.0%00.0%811.9%3958.2%1623.9%46.0%									
Developer Classification										Developer Classification									
- Mainly Trader-Developer										- Mainly Trader-Developer									
1337.1%1748.6%411.4%12.9%										3552.2%									
- Mainly Investor-Developer										- Mainly Investor-Developer									
1753.1%928.1%515.6%13.1%										3247.8%									
Total Developer Classification										Total Developer Classification									
3044.8%2638.8%913.4%23.0%										67100.0%00.0%811.9%3958.2%1623.9%46.0%									
Ownership structure										Ownership structure									
- Listed										- Listed									
1152.4%733.3%29.5%14.8%										2131.3%									
- Unlisted										- Unlisted									
1941.3%1941.3%715.2%12.2%										4668.7%									
Total Ownership Structure										Total Ownership Structure									
3044.8%2638.8%913.4%23.0%										67100.0%00.0%811.9%3958.2%1623.9%46.0%									
Geographic Scope										Geographic Scope									
- Regional										- Regional									
466.7%233.3%00.0%00.0%										69.0%									
- National										- National									
1644.4%1233.3%616.7%25.6%										3653.7%									
- International										- International									
1040.0%1248.0%312.0%00.0%										2537.3%									
Total Geographic Scope										Total Geographic Scope									
3044.8%2638.8%913.4%23.0%										67100.0%00.0%811.9%3958.2%1623.9%46.0%									
Project Size Classification										Project Size Classification									
- Small (EUR < 5 - 10 million)										- Small (EUR < 5 - 10 million)									
457.1%342.9%00.0%00.0%										710.4%									
- Medium (EUR > 10 - 50 million)										- Medium (EUR > 10 - 50 million)									
1742.5%1537.5%615.0%25.0%										4057.7%									
- Large (EUR > 50 - 250 million)										- Large (EUR > 50 - 250 million)									
945.0%840.0%315.0%00.0%										2029.9%									
Total Project Size Classification										Total Project Size Classification									
3044.8%2638.8%913.4%23.0%										67100.0%00.0%811.9%3958.2%1623.9%46.0%									
67100.0%										67100.0%									

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

12 Lack of needed hard- and software to support the business

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				
Low					Very Ineffective				
Medium					Ineffective				
High					Effective				
Very high					Very effective				
					Don't know				
Number of Responses					Number of Responses				

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

13 Liquidity risk from investments not matching needed liquidity

How significant is this risk to achieving your objectives?				How effective are your processes at managing this risk?											
				Low			Medium		High		Very high		Number of Responses		

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

14 Measures of the company's quality, time and cost objectives are irrelevant or unreliable

		How significant is this risk to achieving your objectives?				How effective are your processes at managing this risk?			
		Low				Very Ineffective			
		Medium				Effective			
		High				Very effective			
		Very high				Don't know			
		Number of Responses				Number of Responses			
Total Respondants		34	50.7%	14	20.9%	13	19.4%	6	9.0%
Developer Classification									
- Mainly Trader-Developer		16	45.7%	8	22.9%	8	22.9%	3	8.6%
- Mainly Investor-Developer		18	56.3%	6	18.8%	5	15.6%	3	9.4%
Total Developer Classification		34	50.7%	14	20.9%	13	19.4%	6	9.0%
Ownership structure									
- Listed		11	50.0%	4	18.2%	5	22.7%	2	9.1%
- Unlisted		23	51.1%	10	22.2%	8	17.8%	4	8.9%
Total Ownership Structure		34	50.7%	14	20.9%	13	19.4%	6	9.0%
Geographic Scope									
- Regional		4	66.7%	2	33.3%	0	0.0%	0	0.0%
- National		18	50.0%	6	16.7%	8	22.2%	4	11.1%
- International		12	48.0%	6	24.0%	5	20.0%	2	8.0%
Total Geographic Scope		34	50.7%	14	20.9%	13	19.4%	6	9.0%
Project Size Classification									
- Small (EUR < 5 - 10 million)		4	57.1%	2	28.6%	1	14.3%	0	0.0%
- Medium (EUR > 10 - 50 million)		19	47.5%	9	22.5%	7	17.5%	5	12.5%
- Large (EUR > 50 - 250 million)		11	55.0%	3	15.0%	5	25.0%	1	5.0%
Total Project Size Classification		34	50.7%	14	20.9%	13	19.4%	6	9.0%

7) Risk is a concept used to express uncertainty about events and/or their outcomes that could have a material effect on the goals of the company.
Please evaluate the following risks on company level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

15 Other

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?									
LowMediumHighVery high					Very IneffectiveIneffectiveEffectiveVery effectiveDon't know									
Number of Responses					Number of Responses									
Total Respondants					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
Developer Classification														
- Mainly Trader-Developer					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
- Mainly Investor-Developer					0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total Developer Classification					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
Ownership structure														
- Listed					0	0.0%	0	0.0%	1	0.0%	0	0.0%	1	100.0%
- Unlisted					0	0.0%	0	0.0%	0	100.0%	0	0.0%	0	0.0%
Total Ownership Structure					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
Geographic Scope														
- Regional					0	0.0%	0	0.0%	1	0.0%	0	0.0%	1	100.0%
- National					0	0.0%	0	0.0%	0	100.0%	0	0.0%	0	0.0%
- International					0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total Geographic Scope					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
Project Size Classification														
- Small (EUR < 5 - 10 million)					0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
- Medium (EUR > 10 - 50 million)					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%
- Large (EUR > 50 - 250 million)					0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Total Project Size Classification					0	0.0%	0	0.0%	1	100.0%	0	0.0%	1	100.0%

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

1 Development/ conception risk

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?														
Low					Medium					High					Very high					Number of Responses				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

2 Location risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

3 Adequate sources of funds for development project

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

4 First-time leasing risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

5 Market potential on sale/disposal of project (market risk)

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?											
LowMediumHighVery high										Very IneffectiveIneffectiveEffectiveVery effectiveDon't know											
Number of Responses										Number of Responses											
Total Respondants										Total Respondants											
5	7.6%	21	31.8%	29	43.9%	11	16.7%	66	100.0%	0	0.0%	9	13.8%	41	63.1%	13	20.0%	2	3.1%	65	100.0%
Developer Classification										Developer Classification											
- Mainly Trader-Developer										- Mainly Trader-Developer											
1	2.9%	12	34.3%	18	51.4%	4	11.4%	35	53.0%	0	0.0%	4	11.4%	22	62.9%	7	20.0%	2	5.7%	35	53.8%
4	12.9%	9	29.0%	11	35.5%	7	22.6%	31	47.0%	0	0.0%	5	16.7%	19	63.3%	6	20.0%	0	0.0%	30	46.2%
Total Developer Classification										Total Developer Classification											
5	7.6%	21	31.8%	29	43.9%	11	16.7%	66	100.0%	0	0.0%	9	13.8%	41	63.1%	13	20.0%	2	3.1%	65	100.0%
Ownership structure										Ownership structure											
- Listed										- Listed											
1	5.0%	7	35.0%	9	45.0%	3	15.0%	20	30.3%	0	0.0%	2	10.0%	15	75.0%	3	15.0%	0	0.0%	20	30.8%
4	8.7%	14	30.4%	20	43.5%	8	17.4%	46	69.7%	0	0.0%	7	15.6%	26	57.8%	10	22.2%	2	4.4%	45	69.2%
Total Ownership Structure										Total Ownership Structure											
5	7.6%	21	31.8%	29	43.9%	11	16.7%	66	100.0%	0	0.0%	9	13.8%	41	63.1%	13	20.0%	2	3.1%	65	100.0%
Geographic Scope										Geographic Scope											
- Regional										- Regional											
0	0.0%	1	16.7%	3	50.0%	2	33.3%	6	9.1%	0	0.0%	1	16.7%	5	83.3%	0	0.0%	0	0.0%	6	9.2%
2	5.6%	13	36.1%	13	36.1%	8	22.2%	36	54.5%	0	0.0%	2	5.7%	24	68.6%	8	22.9%	1	2.9%	35	53.8%
3	12.5%	7	29.2%	13	54.2%	1	4.2%	24	36.4%	0	0.0%	6	25.0%	12	50.0%	5	20.8%	1	4.2%	24	36.9%
Total Geographic Scope										Total Geographic Scope											
5	7.6%	21	31.8%	29	43.9%	11	16.7%	66	100.0%	0	0.0%	9	13.8%	41	63.1%	13	20.0%	2	3.1%	65	100.0%
Project Size Classification										Project Size Classification											
- Small (EUR < 5 - 10 million)										- Small (EUR < 5 - 10 million)											
0	0.0%	1	16.7%	5	83.3%	0	0.0%	6	9.1%	0	0.0%	2	33.3%	4	66.7%	0	0.0%	0	0.0%	6	9.2%
2	5.1%	12	30.8%	16	41.0%	9	23.1%	39	59.1%	0	0.0%	6	15.8%	25	65.8%	7	18.4%	0	0.0%	38	58.5%
3	14.3%	8	38.1%	8	38.1%	2	9.5%	21	31.8%	0	0.0%	1	4.8%	12	57.1%	6	28.6%	2	9.5%	21	32.3%
Total Project Size Classification										Total Project Size Classification											
5	7.6%	21	31.8%	29	43.9%	11	16.7%	66	100.0%	0	0.0%	9	13.8%	41	63.1%	13	20.0%	2	3.1%	65	100.0%

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

6 Changes in user's / investor's requirements

	How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				
	Low	Medium	High	Very high	Number of Responses	Very Ineffective	Ineffective	Effective	Very effective	Don't know
Total Respondants	13	20.3%	38	59.4%	9	14.1%	4	6.3%	64	100.0%
Developer Classification										
- Mainly Trader-Developer	6	17.6%	22	64.7%	4	11.8%	2	5.9%	34	53.1%
- Mainly Investor-Developer	7	23.3%	16	53.3%	5	16.7%	2	6.7%	30	46.9%
Total Developer Classification	13	20.3%	38	59.4%	9	14.1%	4	6.3%	64	100.0%
Ownership structure										
- Listed	6	33.3%	11	61.1%	0	0.0%	1	5.6%	18	28.1%
- Unlisted	7	15.2%	27	58.7%	9	19.6%	3	6.5%	46	71.9%
Total Ownership Structure	13	20.3%	38	59.4%	9	14.1%	4	6.3%	64	100.0%
Geographic Scope										
- Regional	1	20.0%	4	80.0%	0	0.0%	0	0.0%	5	7.8%
- National	6	16.7%	21	58.3%	6	16.7%	3	8.3%	36	56.3%
- International	6	26.1%	13	56.5%	3	13.0%	1	4.3%	23	35.9%
Total Geographic Scope	13	20.3%	38	59.4%	9	14.1%	4	6.3%	64	100.0%
Project Size Classification										
- Small (EUR < 10 million)	1	20.0%	4	80.0%	0	0.0%	0	0.0%	5	7.8%
- Medium (EUR > 10 - 50 million)	8	20.5%	21	53.8%	7	17.9%	3	7.7%	39	60.9%
- Large (EUR > 50 - 250 million)	4	20.0%	13	65.0%	2	10.0%	1	5.0%	20	31.3%
Total Project Size Classification	13	20.3%	38	59.4%	9	14.1%	4	6.3%	64	100.0%

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

7 Completion risk

	How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				
	Low	Medium	High	Very high	Number of Responses	Very Ineffective	Ineffective	Effective	Very effective	Don't know
Total Respondants	26	40.0%	21	32.3%	13	20.0%	5	7.7%	65	100.0%
Developer Classification										
- Mainly Trader-Developer	13	38.2%	10	29.4%	8	23.5%	3	8.8%	34	52.3%
- Mainly Investor-Developer	13	41.9%	11	35.5%	5	16.1%	2	6.5%	31	47.7%
Total Developer Classification	26	40.0%	21	32.3%	13	20.0%	5	7.7%	65	100.0%
Ownership structure										
- Listed	9	47.4%	4	21.1%	3	15.8%	3	15.8%	19	29.2%
- Unlisted	17	37.0%	17	37.0%	10	21.7%	2	4.3%	46	70.8%
Total Ownership Structure	26	40.0%	21	32.3%	13	20.0%	5	7.7%	65	100.0%
Geographic Scope										
- Regional	1	16.7%	1	16.7%	2	33.3%	2	33.3%	6	9.2%
- National	16	44.4%	13	36.1%	5	13.9%	2	5.6%	36	55.4%
- International	9	39.1%	7	30.4%	6	26.1%	1	4.3%	23	35.4%
Total Geographic Scope	26	40.0%	21	32.3%	13	20.0%	5	7.7%	65	100.0%
Project Size Classification										
- Small (EUR < 5 - 10 million)	3	50.0%	1	16.7%	2	33.3%	0	0.0%	6	9.2%
- Medium (EUR > 10 - 50 million)	14	35.9%	13	33.3%	8	20.5%	4	10.3%	39	60.0%
- Large (EUR > 50 - 250 million)	9	45.0%	7	35.0%	3	15.0%	1	5.0%	20	30.8%
Total Project Size Classification	26	40.0%	21	32.3%	13	20.0%	5	7.7%	65	100.0%

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

8 Cost overrun risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

9 Quality standard risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				
</									

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

10 Legal risks

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?																																							
Low					Medium					High					Very high					Number of Responses																													
																				Very Ineffective					Ineffective					Effective					Very effective					Don't know					Number of Responses				
Total Respondants										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		
Developer Classification										12	34.3%	13	37.1%	8	22.9%	2	5.7%	35	53.0%	0	0.0%	3	8.6%	21	60.0%	8	22.9%	3	8.6%	35	53.8%																		
- Mainly Investor-Developer										12	38.7%	15	48.4%	4	12.9%	0	0.0%	31	47.0%	0	0.0%	1	3.3%	21	70.0%	8	26.7%	0	0.0%	30	46.2%																		
Total Developer Classification										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		
Ownership structure										9	45.0%	6	30.0%	4	20.0%	1	5.0%	20	30.3%	0	0.0%	1	5.0%	17	85.0%	2	10.0%	0	0.0%	20	30.8%																		
- Listed										15	32.6%	22	47.8%	8	17.4%	1	2.2%	46	69.7%	0	0.0%	3	6.7%	25	55.6%	14	31.1%	3	6.7%	45	69.2%																		
Total Ownership Structure										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		
Geographic Scope										0	0.0%	5	83.3%	0	0.0%	1	16.7%	6	9.1%	0	0.0%	1	16.7%	4	66.7%	1	16.7%	0	0.0%	6	9.2%																		
- Regional										16	44.4%	13	36.1%	6	16.7%	1	2.8%	36	54.5%	0	0.0%	1	2.9%	23	65.7%	9	25.7%	2	5.7%	35	53.8%																		
- International										8	33.3%	10	41.7%	6	25.0%	0	0.0%	24	36.4%	0	0.0%	2	8.3%	15	62.5%	6	25.0%	1	4.2%	24	36.9%																		
Total Geographic Scope										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		
Project Size Classification										2	33.3%	2	33.3%	1	16.7%	1	16.7%	6	9.1%	0	0.0%	0	0.0%	4	66.7%	2	33.3%	0	0.0%	6	9.2%																		
- Small (EUR < 5 - 10 million)										14	35.9%	16	41.0%	8	20.5%	1	2.6%	39	59.1%	0	0.0%	2	5.3%	28	73.7%	7	18.4%	1	2.6%	38	58.5%																		
- Medium (EUR > 10 - 50 million)										8	38.1%	10	47.6%	3	14.3%	0	0.0%	21	31.8%	0	0.0%	2	9.5%	10	47.6%	7	33.3%	2	9.5%	21	32.3%																		
- Large (EUR > 50 - 250 million)										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		
Total Project Size Classification										24	36.4%	28	42.4%	12	18.2%	2	3.0%	66	100.0%	0	0.0%	4	6.2%	42	64.6%	16	24.6%	3	4.6%	65	100.0%																		

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

11 Design risk

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

12 Approval process complexity, satisfying planning, environmental and traffic constraints

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

13 Stakeholders in the project having different priorities

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?											
		Low		Medium		High		Very high		Very Ineffective		Ineffective		Effective		Very effective		Don't know		Number of Responses	
Total Respondants		27	41.5%	28	43.1%	9	13.8%	1	1.5%	0	0.0%	7	10.8%	36	55.4%	13	20.0%	9	13.8%	65	100.0%
Developer Classification		15	42.9%	13	37.1%	6	17.1%	1	2.9%	0	0.0%	5	14.3%	19	54.3%	7	20.0%	4	11.4%	35	53.8%
- Mainly Investor-Developer		12	40.0%	15	50.0%	3	10.0%	0	0.0%	0	0.0%	2	6.7%	17	56.7%	6	20.0%	5	16.7%	30	46.2%
Total Developer Classification		27	41.5%	28	43.1%	9	13.8%	1	1.5%	0	0.0%	7	10.8%	36	55.4%	13	20.0%	9	13.8%	65	100.0%
Ownership structure		9	47.4%	6	31.6%	4	21.1%	0	0.0%	0	0.0%	3	15.0%	12	60.0%	2	10.0%	3	15.0%	20	30.8%
- Listed		18	39.1%	22	47.8%	5	10.9%	1	2.2%	0	0.0%	4	8.9%	24	53.3%	11	24.4%	6	13.3%	45	69.2%
Total Ownership Structure		27	41.5%	28	43.1%	9	13.8%	1	1.5%	0	0.0%	7	10.8%	36	55.4%	13	20.0%	9	13.8%	65	100.0%
Geographic Scope		0	0.0%	5	83.3%	1	16.7%	0	0.0%	0	0.0%	2	33.3%	3	50.0%	1	16.7%	0	0.0%	6	9.2%
- Regional		17	48.6%	11	31.4%	6	17.1%	1	2.9%	0	0.0%	2	5.7%	21	60.0%	5	14.3%	7	20.0%	35	53.8%
- National		10	41.7%	12	50.0%	2	8.3%	0	0.0%	0	0.0%	3	12.5%	12	50.0%	7	29.2%	2	8.3%	24	36.9%
Total Geographic Scope		27	41.5%	28	43.1%	9	13.8%	1	1.5%	0	0.0%	7	10.8%	36	55.4%	13	20.0%	9	13.8%	65	100.0%
Project Size Classification		3	50.0%	2	33.3%	1	16.7%	0	0.0%	0	0.0%	3	50.0%	2	33.3%	1	16.7%	0	0.0%	6	9.2%
- Small (EUR < 5 - 10 million)		16	42.1%	15	39.5%	6	15.8%	1	2.6%	0	0.0%	3	7.9%	24	63.2%	6	15.8%	5	13.2%	38	58.5%
- Medium (EUR > 10 - 50 million)		8	38.1%	11	52.4%	2	9.5%	0	0.0%	0	0.0%	1	4.8%	10	47.6%	6	28.6%	4	19.0%	21	32.3%
- Large (EUR > 50 - 250 million)		27	41.5%	28	43.1%	9	13.8%	1	1.5%	0	0.0%	7	10.8%	36	55.4%	13	20.0%	9	13.8%	65	100.0%

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

14 Budgets and business (project) plans are not based upon realistic assumptions

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

15 Insufficient focus on value, to much emphasis placed on cost

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

16 Changes in design and requirements during construction phase

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?				

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

17 Warranty exposure

How significant is this risk to achieving your objectives?										How effective are your processes at managing this risk?									
LowMediumHighVery high										Very IneffectiveIneffectiveEffectiveVery effectiveDon't know									
Number of Responses										Number of Responses									
Total Respondants										29	44.6%	25	38.5%	10	15.4%	1	1.5%	65	100.0%
Developer Classification																			
- Mainly Trader-Developer										12	35.3%	15	44.1%	6	17.6%	1	2.9%	34	52.3%
- Mainly Investor-Developer										17	54.8%	10	32.3%	4	12.9%	0	0.0%	31	47.7%
Total Developer Classification										29	44.6%	25	38.5%	10	15.4%	1	1.5%	65	100.0%
Ownership structure																			
- Listed										13	68.4%	4	21.1%	1	5.3%	1	5.3%	19	29.2%
- Unlisted										16	34.8%	21	45.7%	9	19.6%	0	0.0%	46	70.8%
Total Ownership Structure										29	44.6%	25	38.5%	10	15.4%	1	1.5%	65	100.0%
Geographic Scope																			
- Regional										1	16.7%	3	50.0%	1	16.7%	1	16.7%	6	9.2%
- National										19	52.8%	12	33.3%	5	13.9%	0	0.0%	36	55.4%
- International										9	39.1%	10	43.5%	4	17.4%	0	0.0%	23	35.4%
Total Geographic Scope										29	44.6%	25	38.5%	10	15.4%	1	1.5%	65	100.0%
Project Size Classification																			
- Small (EUR < 5 - 10 million)										1	20.0%	3	60.0%	1	20.0%	0	0.0%	5	7.7%
- Medium (EUR > 10 - 50 million)										18	46.2%	13	33.3%	7	17.9%	1	2.6%	39	60.0%
- Large (EUR > 50 - 250 million)										10	47.6%	9	42.9%	2	9.5%	0	0.0%	21	32.3%
Total Project Size Classification										29	44.6%	25	38.5%	10	15.4%	1	1.5%	65	100.0%
										6	9.2%	35	53.8%	24	36.9%	65	100.0%		
										20	30.8%	45	69.2%	65	100.0%				
										6	9.2%	35	53.8%	24	36.9%	65	100.0%		
										6	9.2%	35	53.8%	24	36.9%	65	100.0%		

8) A large number of risks, which may affect the projected return, arise during project development. Please find below a non-exhaustive list of these risks.
Please evaluate the following risks on project level regarding their significance to achieving your company's objectives as well as the effectiveness of your risk management processes to cope with those risks.

18 Other

How significant is this risk to achieving your objectives?					How effective are your processes at managing this risk?							
Low		Medium		High	Very high	Very Ineffective		Ineffective	Effective	Very effective	Don't know	Number of Responses
		</										

9) In the last five years the level of risk faced by the company has....

	Increased		Decreased		Not changed		Not sure		Number of Responses	
Total Respondants	39	56,5%	14	20,3%	14	20,3%	2	2,9%	69	100,0%
Developer Classification										
- Mainly Trader-Developer	21	56,8%	7	18,9%	7	18,9%	2	5,4%	37	53,6%
- Mainly Investor-Developer	18	56,3%	7	21,9%	7	21,9%	0	0,0%	32	46,4%
Total Developer Classification	39	56,5%	14	20,3%	14	20,3%	2	2,9%	69	100,0%
p value (Fisher's exact test)	0,715	φ (Phi)		0,165	Cramer`s V		0,165			
Ownership structure										
- Listed	12	52,2%	6	26,1%	4	17,4%	1	4,3%	23	33,3%
- Unlisted	27	58,7%	8	17,4%	10	21,7%	1	2,2%	46	66,7%
Total Ownership Structure	39	56,5%	14	20,3%	14	20,3%	2	2,9%	69	100,0%
p value (Fisher's exact test)	0,756	φ (Phi)		0,125	Cramer`s V		0,125			
Geographic Scope										
- Regional	2	33,3%	3	50,0%	1	16,7%	0	0,0%	6	8,7%
- National	22	61,1%	9	25,0%	4	11,1%	1	2,8%	36	52,2%
- International	15	55,6%	2	7,4%	9	33,3%	1	3,7%	27	39,1%
Total Geographic Scope	39	56,5%	14	20,3%	14	20,3%	2	2,9%	69	100,0%
p value (Fisher's exact test)	0,070	φ (Phi)		0,380	Cramer`s V		0,269			
Project Size Classification										
- Small (EUR < 5 - 10 million)	0	0,0%	5	71,4%	1	14,3%	1	14,3%	7	10,1%
- Medium (EUR > 10 - 50 million)	25	62,5%	7	17,5%	8	20,0%	0	0,0%	40	58,0%
- Large (EUR > 50 - 250 million)	14	63,6%	2	9,1%	5	22,7%	1	4,5%	22	31,9%
Total Project Size Classification	39	56,5%	14	20,3%	14	20,3%	2	2,9%	69	100,0%
p value (Fisher's exact test)	0,002	φ (Phi)		0,533	Cramer`s V		0,377			

10) Does the company overall regard itself as having a risk taking or risk adverse culture compared to its relevant competitors?

	More risk taking		Comparable risk taking		More risk adverse		Number of Responses	
Total Respondants	10	14,5%	38	55,1%	21	30,4%	69	100,0%
Developer Classification								
- Mainly Trader-Developer	5	13,5%	21	56,8%	11	29,7%	37	53,6%
- Mainly Investor-Developer	5	15,6%	17	53,1%	10	31,3%	32	46,4%
Total Developer Classification	10	14,5%	38	55,1%	21	30,4%	69	100,0%
p value (Fisher's exact test)	1,000	φ (Phi)	0,039	Cramer`s V	0,039			
Ownership structure								
- Listed	2	8,7%	12	52,2%	9	39,1%	23	33,3%
- Unlisted	8	17,4%	26	56,5%	12	26,1%	46	66,7%
Total Ownership Structure	10	14,5%	38	55,1%	21	30,4%	69	100,0%
p value (Fisher's exact test)	0,434	φ (Phi)	0,157	Cramer`s V	0,157			
Geographic Scope								
- Regional	0	0,0%	4	66,7%	2	33,3%	6	8,7%
- National	4	11,1%	19	52,8%	13	36,1%	36	52,2%
- International	6	22,2%	15	55,6%	6	22,2%	27	39,1%
Total Geographic Scope	10	14,5%	38	55,1%	21	30,4%	69	100,0%
p value (Fisher's exact test)	0,552	φ (Phi)	0,223	Cramer`s V	0,158			
Project Size Classification								
- Small (EUR < 5 - 10 million)	2	28,6%	3	42,9%	2	28,6%	7	10,1%
- Medium (EUR > 10 - 50 million)	4	10,0%	23	57,5%	13	32,5%	40	58,0%
- Large (EUR > 50 - 250 million)	4	18,2%	12	54,5%	6	27,3%	22	31,9%
Total Project Size Classification	10	14,5%	38	55,1%	21	30,4%	69	100,0%
p value (Fisher's exact test)	0,675	φ (Phi)	0,174	Cramer`s V	0,123			

11) What are the drivers for implementing risk management in your company? Multiple responses are possible

Request of risk management or senior leadership																	Client expectations				Control / reduction of operational losses		Response to regulatory activity (e.g. Basel II)		Develop a competitive advantage		Need for more integrated decision-making		Following an industry trend		Audit requirements		Capital allocation process needs improvement		Other				
Total Respondants																	48	22.2%	15	6.9%	30	13.9%	15	6.9%	32	14.8%	30	13.9%	4	1.9%	18	8.3%	19	8.8%	5	2.3%	216		100.0%
Developer Classification																																							
- Mainly Trader-Developer																																							
- Mainly Investor-Developer																																							
Total Developer Classification																																							
χ² (chi-square)																																							
p-value																																							
Ownership structure																																							
- Listed																																							
- Unlisted																																							
Total Ownership Structure																																							
χ² (chi-square)																																							
p-value																																							
Geographic Scope																																							
- Regional																																							
- National																																							
- International																																							
Total Geographic Scope																																							
χ² (chi-square)																																							
p-value																																							
Project Size Classification																																							
- Small (EUR < 5 - 10 million)																																							
- Medium (EUR > 10 - 50 million)																																							
- Large (EUR > 50 - 250 million)																																							
Total Project Size Classification																																							
χ² (chi-square)																																							
p-value																																							

12) Please evaluate the following aspects/features of your risk management:

1 Effective risk management is important in the achievement of the company's objectives

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	0	0,0%	1	1,5%	29	43,3%	37	55,2%	67	100,0%

Developer Classification

- Mainly Trader-Developer	0	0,0%	0	0,0%	21	58,3%	15	41,7%	36	53,7%
- Mainly Investor-Developer	0	0,0%	1	3,2%	8	25,8%	22	71,0%	31	46,3%
Total Developer Classification	0	0,0%	1	1,5%	29	43,3%	37	55,2%	67	100,0%

p value (Fisher's exact test)	0,013	φ (Phi)		0,342	Cramer's V		0,342
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Ownership structure

- Listed	0	0,0%	0	0,0%	9	39,1%	14	60,9%	23	34,3%
- Unlisted	0	0,0%	1	2,3%	20	45,5%	23	52,3%	44	65,7%
Total Ownership Structure	0	0,0%	1	1,5%	29	43,3%	37	55,2%	67	100,0%

p value (Fisher's exact test)	0,000	φ (Phi)		0,114	Cramer's V		0,114
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Geographic Scope

- Regional	0	0,0%	1	16,7%	1	16,7%	4	66,7%	6	9,0%
- National	0	0,0%	0	0,0%	17	48,6%	18	51,4%	35	52,2%
- International	0	0,0%	0	0,0%	11	42,3%	15	57,7%	26	38,8%
Total Geographic Scope	0	0,0%	1	1,5%	29	43,3%	37	55,2%	67	100,0%

p value (Fisher's exact test)	0,148	φ (Phi)		0,417	Cramer's V		0,295
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	0	0,0%	5	71,4%	2	28,6%	7	10,4%
- Medium (EUR > 10 - 50 million)	0	0,0%	1	2,6%	18	47,4%	19	50,0%	38	56,7%
- Large (EUR > 50 - 250 million)	0	0,0%	0	0,0%	6	27,3%	16	72,7%	22	32,8%
Total Project Size Classification	0	0,0%	1	1,5%	29	43,3%	37	55,2%	67	100,0%

p value (Fisher's exact test)	0,159	φ (Phi)		0,294	Cramer's V		0,208
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12) Please evaluate the following aspects/features of your risk management:

2 The company supports taking risks to achieve objectives

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	1	1,5%	13	19,7%	44	66,7%	8	12,1%	66	100,0%
Developer Classification										
- Mainly Trader-Developer	1	2,8%	8	22,2%	22	61,1%	5	13,9%	36	54,5%
- Mainly Investor-Developer	0	0,0%	5	16,7%	22	73,3%	3	10,0%	30	45,5%
Total Developer Classification	1	1,5%	13	19,7%	44	66,7%	8	12,1%	66	100,0%
p value (Fisher's exact test)	0,742		φ (Phi)		0,159		Cramer`s V		0,159	
Ownership structure										
- Listed	0	0,0%	8	36,4%	10	45,5%	4	18,2%	22	33,3%
- Unlisted	1	2,3%	5	11,4%	34	77,3%	4	9,1%	44	66,7%
Total Ownership Structure	1	1,5%	13	19,7%	44	66,7%	8	12,1%	66	100,0%
p value (Fisher's exact test)	0,023		φ (Phi)		0,356		Cramer`s V		0,356	
Geographic Scope										
- Regional	0	0,0%	1	16,7%	3	50,0%	2	33,3%	6	9,1%
- National	1	2,9%	10	29,4%	19	55,9%	4	11,8%	34	51,5%
- International	0	0,0%	2	7,7%	22	84,6%	2	7,7%	26	39,4%
Total Geographic Scope	1	1,5%	13	19,7%	44	66,7%	8	12,1%	66	100,0%
p value (Fisher's exact test)	0,092		φ (Phi)		0,374		Cramer`s V		0,265	
Project Size Classification										
- Small (EUR < 5 - 10 million)	0	0,0%	1	14,3%	5	71,4%	1	14,3%	7	10,6%
- Medium (EUR > 10 - 50 million)	1	2,7%	10	27,0%	23	62,2%	3	8,1%	37	56,1%
- Large (EUR > 50 - 250 million)	0	0,0%	2	9,1%	16	72,7%	4	18,2%	22	33,3%
Total Project Size Classification	1	1,5%	13	19,7%	44	66,7%	8	12,1%	66	100,0%
p value (Fisher's exact test)	0,597		φ (Phi)		0,264		Cramer`s V		0,187	

12) Please evaluate the following aspects/features of your risk management:

3 The company knows how much risk it may take in the achievement of its objectives

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	0	0,0%	10	14,9%	38	56,7%	19	28,4%	67	100,0%
Developer Classification										
- Mainly Trader-Developer	0	0,0%	7	19,4%	22	61,1%	7	19,4%	36	53,7%
- Mainly Investor-Developer	0	0,0%	3	9,7%	16	51,6%	12	38,7%	31	46,3%
Total Developer Classification	0	0,0%	10	14,9%	38	56,7%	19	28,4%	67	100,0%
p value (Fisher's exact test)	0,174		φ (Phi)		0,229		Cramer`s V		0,229	
Ownership structure										
- Listed	0	0,0%	4	17,4%	13	56,5%	6	26,1%	23	34,3%
- Unlisted	0	0,0%	6	13,6%	25	56,8%	13	29,5%	44	65,7%
Total Ownership Structure	0	0,0%	10	14,9%	38	56,7%	19	28,4%	67	100,0%
p value (Fisher's exact test)	0,879		φ (Phi)		0,056		Cramer`s V		0,056	
Geographic Scope										
- Regional	0	0,0%	0	0,0%	5	83,3%	1	16,7%	6	9,0%
- National	0	0,0%	7	20,0%	19	54,3%	9	25,7%	35	52,2%
- International	0	0,0%	3	11,5%	14	53,8%	9	34,6%	26	38,8%
Total Geographic Scope	0	0,0%	10	14,9%	38	56,7%	19	28,4%	67	100,0%
p value (Fisher's exact test)	0,668		φ (Phi)		0,220		Cramer`s V		0,156	
Project Size Classification										
- Small (EUR < 5 - 10 million)	0	0,0%	1	14,3%	3	42,9%	3	42,9%	7	10,4%
- Medium (EUR > 10 - 50 million)	0	0,0%	6	15,8%	23	60,5%	9	23,7%	38	56,7%
- Large (EUR > 50 - 250 million)	0	0,0%	3	13,6%	12	54,5%	7	31,8%	22	32,8%
Total Project Size Classification	0	0,0%	10	14,9%	38	56,7%	19	28,4%	67	100,0%
p value (Fisher's exact test)	0,841		φ (Phi)		0,139		Cramer`s V		0,099	

12) Please evaluate the following aspects/features of your risk management:

4 Risk is looked upon as an opportunity as well as a threat by the enterprise in the achievement of the company's objectives

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	1	1,5%	11	16,7%	29	43,9%	25	37,9%	66	100,0%

Developer Classification

- Mainly Trader-Developer	1	2,9%	5	14,3%	16	45,7%	13	37,1%	35	53,0%
- Mainly Investor-Developer	0	0,0%	6	19,4%	13	41,9%	12	38,7%	31	47,0%
Total Developer Classification	1	1,5%	11	16,7%	29	43,9%	25	37,9%	66	100,0%

p value (Fisher's exact test)	0,971	φ (Phi)	0,135	Cramer's V	0,135
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Ownership structure

- Listed	0	0,0%	6	27,3%	8	36,4%	8	36,4%	22	33,3%
- Unlisted	1	2,3%	5	11,4%	21	47,7%	17	38,6%	44	66,7%
Total Ownership Structure	1	1,5%	11	16,7%	29	43,9%	25	37,9%	66	100,0%

p value (Fisher's exact test)	0,369	φ (Phi)	0,219	Cramer's V	0,219
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Geographic Scope

- Regional	0	0,0%	0	0,0%	3	50,0%	3	50,0%	6	9,1%
- National	1	2,9%	8	22,9%	17	48,6%	9	25,7%	35	53,0%
- International	0	0,0%	3	12,0%	9	36,0%	13	52,0%	25	37,9%
Total Geographic Scope	1	1,5%	11	16,7%	29	43,9%	25	37,9%	66	100,0%

p value (Fisher's exact test)	0,334	φ (Phi)	0,314	Cramer's V	0,222
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Project Size Classification

- Small (EUR < 5 - 10 million)	1	14,3%	0	0,0%	4	57,1%	2	28,6%	7	10,6%
- Medium (EUR > 10 - 50 million)	0	0,0%	6	15,8%	21	55,3%	11	28,9%	38	57,6%
- Large (EUR > 50 - 250 million)	0	0,0%	5	23,8%	4	19,0%	12	57,1%	21	31,8%
Total Project Size Classification	1	1,5%	11	16,7%	29	43,9%	25	37,9%	66	100,0%

p value (Fisher's exact test)	0,016	φ (Phi)	0,517	Cramer's V	0,365
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12) Please evaluate the following aspects/features of your risk management:

5 There is a common understanding / terminology of risk management across the company

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	1	1,5%	24	35,8%	34	50,7%	8	11,9%	67	100,0%

Developer Classification

- Mainly Trader-Developer	1	2,8%	16	44,4%	16	44,4%	3	8,3%	36	53,7%
- Mainly Investor-Developer	0	0,0%	8	25,8%	18	58,1%	5	16,1%	31	46,3%
Total Developer Classification	1	1,5%	24	35,8%	34	50,7%	8	11,9%	67	100,0%

p value (Fisher's exact test)	0,234	φ (Phi)	0,242	Cramer's V	0,242
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Ownership structure

- Listed	0	0,0%	6	26,1%	14	60,9%	3	13,0%	23	34,3%
- Unlisted	1	2,3%	18	40,9%	20	45,5%	5	11,4%	44	65,7%
Total Ownership Structure	1	1,5%	24	35,8%	34	50,7%	8	11,9%	67	100,0%

p value (Fisher's exact test)	0,589	φ (Phi)	0,181	Cramer's V	0,181
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Geographic Scope

- Regional	0	0,0%	3	50,0%	1	16,7%	2	33,3%	6	9,0%
- National	1	2,9%	16	45,7%	14	40,0%	4	11,4%	35	52,2%
- International	0	0,0%	5	19,2%	19	73,1%	2	7,7%	26	38,8%
Total Geographic Scope	1	1,5%	24	35,8%	34	50,7%	8	11,9%	67	100,0%

p value (Fisher's exact test)	0,032	φ (Phi)	0,417	Cramer's V	0,295
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	3	42,9%	3	42,9%	1	14,3%	7	10,4%
- Medium (EUR > 10 - 50 million)	1	2,6%	13	34,2%	20	52,6%	4	10,5%	38	56,7%
- Large (EUR > 50 - 250 million)	0	0,0%	8	36,4%	11	50,0%	3	13,6%	22	32,8%
Total Project Size Classification	1	1,5%	24	35,8%	34	50,7%	8	11,9%	67	100,0%

p value (Fisher's exact test)	0,990	φ (Phi)	0,131	Cramer's V	0,093
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12) Please evaluate the following aspects/features of your risk management:

6 The company includes risk management as an integral component in all the relevant strategy, control and monitoring processes

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	1	1,5%	17	25,4%	33	49,3%	16	23,9%	67	100,0%

Developer Classification

- Mainly Trader-Developer	1	2,8%	11	30,6%	16	44,4%	8	22,2%	36	53,7%
- Mainly Investor-Developer	0	0,0%	6	19,4%	17	54,8%	8	25,8%	31	46,3%
Total Developer Classification	1	1,5%	17	25,4%	33	49,3%	16	23,9%	67	100,0%

p value (Fisher's exact test)	0,633	φ (Phi)	0,179	Cramer's V	0,179
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Ownership structure

- Listed	0	0,0%	4	17,4%	11	47,8%	8	34,8%	23	34,3%
- Unlisted	1	2,3%	13	29,5%	22	50,0%	8	18,2%	44	65,7%
Total Ownership Structure	1	1,5%	17	25,4%	33	49,3%	16	23,9%	67	100,0%

p value (Fisher's exact test)	0,359	φ (Phi)	0,217	Cramer's V	0,217
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Geographic Scope

- Regional	0	0,0%	2	33,3%	3	50,0%	1	16,7%	6	9,0%
- National	1	2,9%	11	31,4%	13	37,1%	10	28,6%	35	52,2%
- International	0	0,0%	4	15,4%	17	65,4%	5	19,2%	26	38,8%
Total Geographic Scope	1	1,5%	17	25,4%	33	49,3%	16	23,9%	67	100,0%

p value (Fisher's exact test)	0,370	φ (Phi)	0,292	Cramer's V	0,206
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	1	14,3%	5	71,4%	1	14,3%	7	10,4%
- Medium (EUR > 10 - 50 million)	1	2,6%	10	26,3%	16	42,1%	11	28,9%	38	56,7%
- Large (EUR > 50 - 250 million)	0	0,0%	6	27,3%	12	54,5%	4	18,2%	22	32,8%
Total Project Size Classification	1	1,5%	17	25,4%	33	49,3%	16	23,9%	67	100,0%

p value (Fisher's exact test)	0,808	φ (Phi)	0,223	Cramer's V	0,158
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13) Who has primary risk management responsibility? Multiple responses are possible

Chief Executive Officer (CEO)															Chief Executive Officer (CEO)	Chief Financial Officer (CFO)	Chief Risk Officer (CRO)	Treasurer	Chief Administration or Operations Officer	Business unit executives	Cross-functional or divisional team	Executive Committee	Audit Committee	Financial Controller	Risk Management Committee	No direct responsibility defined	Other	Total														
Total Respondents															45	25.4%	28	15.8%	7	4.0%	7	4.0%	8	4.5%	31	17.5%	5	2.8%	20	11.3%	3	1.7%	10	5.6%	6	3.4%	3	1.7%	4	2.3%	177	100.0%
Developer Classification																																										
- Mainly Trader-Developer															29	28.7%	15	14.9%	4	4.0%	3	3.0%	4	4.0%	17	16.8%	3	3.0%	13	12.9%	0	0.0%	5	5.0%	4	4.0%	0	0.0%	4	4.0%	101	57.1%
- Mainly Investor-Developer															16	21.1%	13	17.1%	3	3.9%	4	5.3%	4	5.3%	14	18.4%	2	2.6%	7	9.2%	3	3.9%	5	6.6%	2	2.6%	3	3.9%	0	0.0%	76	42.9%
Total Developer Classification															45	25.4%	28	15.8%	7	4.0%	7	4.0%	8	4.5%	31	17.5%	5	2.8%	20	11.3%	3	1.7%	10	5.6%	6	3.4%	3	1.7%	4	2.3%	177	100.0%
Ownership structure																																										
- Listed															14	23.3%	8	13.3%	3	5.0%	3	5.0%	3	5.0%	13	21.7%	3	5.0%	4	6.7%	2	3.3%	3	5.0%	3	5.0%	0	0.0%	1	1.7%	60	33.9%
- Unlisted															31	26.5%	20	17.1%	4	3.4%	4	3.4%	5	4.3%	18	15.4%	2	1.7%	16	13.7%	1	0.9%	7	6.0%	3	2.6%	3	2.6%	3	2.6%	117	66.1%
Total Ownership Structure															45	25.4%	28	15.8%	7	4.0%	7	4.0%	8	4.5%	31	17.5%	5	2.8%	20	11.3%	3	1.7%	10	5.6%	6	3.4%	3	1.7%	4	2.3%	177	100.0%
Geographic Scope																																										
- Regional															5	27.8%	2	11.1%	1	5.6%	1	5.6%	2	11.1%	2	11.1%	1	5.6%	1	5.6%	0	0.0%	1	5.6%	1	5.6%	1	5.6%	0	0.0%	18	10.2%
- National															26	26.8%	16	16.5%	2	2.1%	5	5.2%	2	2.1%	17	17.5%	2	2.1%	10	10.3%	3	3.1%	7	7.2%	3	3.1%	1	1.0%	3	3.1%	97	54.8%
- International															14	22.6%	10	16.1%	4	6.5%	1	1.6%	4	6.5%	12	19.4%	2	3.2%	9	14.5%	0	0.0%	2	3.2%	2	3.2%	1	1.6%	1	1.6%	62	35.0%
Total Geographic Scope															45	25.4%	28	15.8%	7	4.0%	7	4.0%	8	4.5%	31	17.5%	5	2.8%	20	11.3%	3	1.7%	10	5.6%	6	3.4%	3	1.7%	4	2.3%	177	100.0%
Project Size Classification																																										
- Small (EUR < 5 - 10 million)															5	22.7%	3	13.6%	1	4.5%	1	4.5%	2	9.1%	4	18.2%	2	9.1%	0	0.0%	0	0.0%	2	9.1%	2	9.1%	0	0.0%	0	0.0%	22	12.4%
- Medium (EUR > 10 - 50 million)															28	28.3%	16	16.2%	3	3.0%	3	3.0%	2	2.0%	18	18.2%	1	1.0%	12	12.1%	2	2.0%	6	6.1%	2	2.0%	2	2.0%	4	4.0%	99	55.9%
- Large (EUR > 50 - 250 million)															12	21.4%	9	16.1%	3	5.4%	3	5.4%	4	7.1%	9	16.1%	2	3.6%	8	14.3%	1	1.8%	2	3.6%	1	1.8%	0	0.0%	56	31.6%		
Total Project Size Classification															45	25.4%	28	15.8%	7	4.0%	7	4.0%	8	4.5%	31	17.5%	5	2.8%	20	11.3%	3	1.7%	10	5.6%	6	3.4%	3	1.7%	4	2.3%	177	100.0%

14) Please evaluate the following aspects/features of your risk management:

1 There is a consistent risk assessment methodology applied throughout the company, including estimating the significance of risks, assessing the likelihood of their occurrence, determining treatments, monitoring and assurance requirements

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	3	4,4%	27	39,7%	27	39,7%	11	16,2%	68	100,0%

Developer Classification

- Mainly Trader-Developer	1	2,8%	19	52,8%	12	33,3%	4	11,1%	36	52,9%
- Mainly Investor-Developer	2	6,3%	8	25,0%	15	46,9%	7	21,9%	32	47,1%
Total Developer Classification	3	4,4%	27	39,7%	27	39,7%	11	16,2%	68	100,0%

p value (Fisher's exact test)	0,102	φ (Phi)	0,291	Cramer's V	0,291
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Ownership structure

- Listed	2	8,7%	7	30,4%	9	39,1%	5	21,7%	23	33,8%
- Unlisted	1	2,2%	20	44,4%	18	40,0%	6	13,3%	45	66,2%
Total Ownership Structure	3	4,4%	27	39,7%	27	39,7%	11	16,2%	68	100,0%

p value (Fisher's exact test)	0,401	φ (Phi)	0,205	Cramer's V	0,205
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Geographic Scope

- Regional	0	0,0%	3	50,0%	3	50,0%	0	0,0%	6	8,8%
- National	3	8,3%	14	38,9%	12	33,3%	7	19,4%	36	52,9%
- International	0	0,0%	10	38,5%	12	46,2%	4	15,4%	26	38,2%
Total Geographic Scope	3	4,4%	27	39,7%	27	39,7%	11	16,2%	68	100,0%

p value (Fisher's exact test)	0,695	φ (Phi)	0,267	Cramer's V	0,189
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	3	42,9%	4	57,1%	0	0,0%	7	10,3%
- Medium (EUR > 10 - 50 million)	2	5,1%	17	43,6%	13	33,3%	7	17,9%	39	57,4%
- Large (EUR > 50 - 250 million)	1	4,5%	7	31,8%	10	45,5%	4	18,2%	22	32,4%
Total Project Size Classification	3	4,4%	27	39,7%	27	39,7%	11	16,2%	68	100,0%

p value (Fisher's exact test)	0,849	φ (Phi)	0,218	Cramer's V	0,154
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14) Please evaluate the following aspects/features of your risk management:

2 The company finds it difficult to identify its main risks

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	23	33,3%	41	59,4%	4	5,8%	1	1,4%	69	100,0%

Developer Classification

- Mainly Trader-Developer	10	27,0%	26	70,3%	0	0,0%	1	2,7%	37	53,6%
- Mainly Investor-Developer	13	40,6%	15	46,9%	4	12,5%	0	0,0%	32	46,4%
Total Developer Classification	23	33,3%	41	59,4%	4	5,8%	1	1,4%	69	100,0%

p value (Fisher's exact test)	0,025	φ (Phi)	0,341	Cramer's V	0,341
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Ownership structure

- Listed	11	47,8%	11	47,8%	1	4,3%	0	0,0%	23	33,3%
- Unlisted	12	26,1%	30	65,2%	3	6,5%	1	2,2%	46	66,7%
Total Ownership Structure	23	33,3%	41	59,4%	4	5,8%	1	1,4%	69	100,0%

p value (Fisher's exact test)	0,031	φ (Phi)	0,228	Cramer's V	0,228
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Geographic Scope

- Regional	0	0,0%	6	100,0%	0	0,0%	0	0,0%	6	8,7%
- National	13	36,1%	20	55,6%	2	5,6%	1	2,8%	36	52,2%
- International	10	37,0%	15	55,6%	2	7,4%	0	0,0%	27	39,1%
Total Geographic Scope	23	33,3%	41	59,4%	4	5,8%	1	1,4%	69	100,0%

p value (Fisher's exact test)	0,453	φ (Phi)	0,280	Cramer's V	0,198
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Project Size Classification

- Small (EUR < 5 - 10 million)	1	14,3%	6	85,7%	0	0,0%	0	0,0%	7	10,1%
- Medium (EUR > 10 - 50 million)	15	37,5%	23	57,5%	1	2,5%	1	2,5%	40	58,0%
- Large (EUR > 50 - 250 million)	7	31,8%	12	54,5%	3	13,6%	0	0,0%	22	31,9%
Total Project Size Classification	23	33,3%	41	59,4%	4	5,8%	1	1,4%	69	100,0%

p value (Fisher's exact test)	0,455	φ (Phi)	0,298	Cramer's V	0,211
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14) Please evaluate the following aspects/features of your risk management:

3 The company finds it difficult to assess the likelihood of risks occurring

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	10	14,7%	39	57,4%	18	26,5%	1	1,5%	68	100,0%
Developer Classification										
- Mainly Trader-Developer	4	11,1%	21	58,3%	10	27,8%	1	2,8%	36	52,9%
- Mainly Investor-Developer	6	18,8%	18	56,3%	8	25,0%	0	0,0%	32	47,1%
Total Developer Classification	10	14,7%	39	57,4%	18	26,5%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,785		φ (Phi)		0,155		Cramer`s V		0,155	
Ownership structure										
- Listed	6	26,1%	10	43,5%	7	30,4%	0	0,0%	23	33,8%
- Unlisted	4	8,9%	29	64,4%	11	24,4%	1	2,2%	45	66,2%
Total Ownership Structure	10	14,7%	39	57,4%	18	26,5%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,143		φ (Phi)		0,270		Cramer`s V		0,270	
Geographic Scope										
- Regional	0	0,0%	3	50,0%	3	50,0%	0	0,0%	6	8,8%
- National	6	17,1%	19	54,3%	9	25,7%	1	2,9%	35	51,5%
- International	4	14,8%	17	63,0%	6	22,2%	0	0,0%	27	39,7%
Total Geographic Scope	10	14,7%	39	57,4%	18	26,5%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,782		φ (Phi)		0,232		Cramer`s V		0,164	
Project Size Classification										
- Small (EUR < 5 - 10 million)	1	14,3%	4	57,1%	2	28,6%	0	0,0%	7	10,3%
- Medium (EUR > 10 - 50 million)	7	17,9%	23	59,0%	8	20,5%	1	2,6%	39	57,4%
- Large (EUR > 50 - 250 million)	2	9,1%	12	54,5%	8	36,4%	0	0,0%	22	32,4%
Total Project Size Classification	10	14,7%	39	57,4%	18	26,5%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,806		φ (Phi)		0,206		Cramer`s V		0,146	

14) Please evaluate the following aspects/features of your risk management:

4 The company finds it difficult to assess the potential impacts of risks materialising

	Strongly disagree		Disagree		Agree		Strongly agree		Number of Responses	
Total Respondants	13	19,1%	42	61,8%	12	17,6%	1	1,5%	68	100,0%
Developer Classification										
- Mainly Trader-Developer	7	19,4%	22	61,1%	6	16,7%	1	2,8%	36	52,9%
- Mainly Investor-Developer	6	18,8%	20	62,5%	6	18,8%	0	0,0%	32	47,1%
Total Developer Classification	13	19,1%	42	61,8%	12	17,6%	1	1,5%	68	100,0%
p value (Fisher's exact test)	1,000	φ (Phi)			0,118	Cramer`s V			0,118	
Ownership structure										
- Listed	8	34,8%	7	30,4%	8	34,8%	0	0,0%	23	33,8%
- Unlisted	5	11,1%	35	77,8%	4	8,9%	1	2,2%	45	66,2%
Total Ownership Structure	13	19,1%	42	61,8%	12	17,6%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,000	φ (Phi)			0,489	Cramer`s V			0,489	
Geographic Scope										
- Regional	0	0,0%	4	66,7%	2	33,3%	0	0,0%	6	8,8%
- National	9	25,7%	20	57,1%	5	14,3%	1	2,9%	35	51,5%
- International	4	14,8%	18	66,7%	5	18,5%	0	0,0%	27	39,7%
Total Geographic Scope	13	19,1%	42	61,8%	12	17,6%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,602	φ (Phi)			0,256	Cramer`s V			0,181	
Project Size Classification										
- Small (EUR < 5 - 10 million)	1	14,3%	5	71,4%	1	14,3%	0	0,0%	7	10,3%
- Medium (EUR > 10 - 50 million)	9	23,1%	24	61,5%	5	12,8%	1	2,6%	39	57,4%
- Large (EUR > 50 - 250 million)	3	13,6%	13	59,1%	6	27,3%	0	0,0%	22	32,4%
Total Project Size Classification	13	19,1%	42	61,8%	12	17,6%	1	1,5%	68	100,0%
p value (Fisher's exact test)	0,788	φ (Phi)			0,222	Cramer`s V			0,157	

15) Do you have a consistently defined risk catalogue to be used for risk identification purposes?

	Yes, implemented		Yes, but needs improvement		No, but planned		No		Number of Responses	
Total Respondants	12	17,4%	23	33,3%	9	13,0%	25	36,2%	69	100,0%

Developer Classification

- Mainly Trader-Developer	3	8,1%	12	32,4%	6	16,2%	16	43,2%	37	53,6%
- Mainly Investor-Developer	9	28,1%	11	34,4%	3	9,4%	9	28,1%	32	46,4%
Total Developer Classification	12	17,4%	23	33,3%	9	13,0%	25	36,2%	69	100,0%

p value (Fisher's exact test)	0,150	φ (Phi)	0,287	Cramer's V	0,287
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Ownership structure

- Listed	6	26,1%	7	30,4%	2	8,7%	8	34,8%	23	33,3%
- Unlisted	6	13,0%	16	34,8%	7	15,2%	17	37,0%	46	66,7%
Total Ownership Structure	12	17,4%	23	65,2%	9	13,0%	25	36,2%	69	100,0%

p value (Fisher's exact test)	0,597	φ (Phi)	0,175	Cramer's V	0,175
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Geographic Scope

- Regional	0	0,0%	2	33,3%	1	16,7%	3	50,0%	6	8,7%
- National	7	19,4%	8	22,2%	7	19,4%	14	38,9%	36	52,2%
- International	5	18,5%	13	48,1%	1	3,7%	8	29,6%	27	39,1%
Total Geographic Scope	12	17,4%	23	33,3%	9	13,0%	25	36,2%	69	100,0%

p value (Fisher's exact test)	0,203	φ (Phi)	0,340	Cramer's V	0,240
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Project Size Classification

- Small (EUR < 5 - 10 million)	1	14,3%	1	14,3%	1	14,3%	4	57,1%	7	10,1%
- Medium (EUR > 10 - 50 million)	7	17,5%	10	25,0%	6	15,0%	17	42,5%	40	58,0%
- Large (EUR > 50 - 250 million)	4	18,2%	12	54,5%	2	9,1%	4	18,2%	22	31,9%
Total Project Size Classification	12	17,4%	23	33,3%	9	13,0%	25	36,2%	69	100,0%

p value (Fisher's exact test)	0,194	φ (Phi)	0,346	Cramer's V	0,245
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16) Risk assessments are performed in a timely way at strategic and operational level across the company

	Yes, implemented		Yes, but needs improvement		No, but planned		No		Number of Responses	
Total Respondants	21	30,9%	32	47,1%	8	11,8%	7	10,3%	68	100,0%

Developer Classification

- Mainly Trader-Developer	8	21,6%	19	51,4%	5	13,5%	5	13,5%	37	54,4%
- Mainly Investor-Developer	13	41,9%	13	41,9%	3	9,7%	2	6,5%	31	45,6%
Total Developer Classification	21	30,9%	32	47,1%	8	11,8%	7	10,3%	68	100,0%

p value (Fisher's exact test)	0,350	φ (Phi)	0,230	Cramer's V	0,230
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Ownership structure

- Listed	7	31,8%	13	59,1%	1	4,5%	1	4,5%	22	32,4%
- Unlisted	14	30,4%	19	41,3%	7	15,2%	6	13,0%	46	67,6%
Total Ownership Structure	21	30,9%	32	47,1%	8	11,8%	7	10,3%	68	100,0%

p value (Fisher's exact test)	0,388	φ (Phi)	0,227	Cramer's V	0,227
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Geographic Scope

- Regional	1	16,7%	4	66,7%	0	0,0%	1	16,7%	6	8,8%
- National	12	33,3%	13	36,1%	7	19,4%	4	11,1%	36	52,9%
- International	8	30,8%	15	57,7%	1	3,8%	2	7,7%	26	38,2%
Total Geographic Scope	21	30,9%	32	47,1%	8	11,8%	7	10,3%	68	100,0%

p value (Fisher's exact test)	0,343	φ (Phi)	0,317	Cramer's V	0,224
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Project Size Classification

- Small (EUR < 5 - 10 million)	2	28,6%	4	57,1%	0	0,0%	1	14,3%	7	10,3%
- Medium (EUR > 10 - 50 million)	11	28,2%	17	43,6%	6	15,4%	5	12,8%	39	57,4%
- Large (EUR > 50 - 250 million)	8	36,4%	11	50,0%	2	9,1%	1	4,5%	22	32,4%
Total Project Size Classification	21	30,9%	32	47,1%	8	11,8%	7	31,7%	68	100,0%

p value (Fisher's exact test)	0,858	φ (Phi)	0,212	Cramer's V	0,150
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17) How often do you prepare a general overview of the current risk situation?

	Yearly		Half-yearly		Quarterly/ tertiarly		Monthly		Other		Number of Responses	
Total Respondants	8	12,1%	7	10,6%	28	42,4%	13	19,7%	10	15,2%	66	100,0%
Developer Classification												
- Mainly Trader-Developer	3	8,8%	3	8,8%	17	50,0%	7	20,6%	4	11,8%	34	51,5%
- Mainly Investor-Developer	5	15,6%	4	12,5%	11	34,4%	6	18,8%	6	18,8%	32	48,5%
Total Developer Classification	8	12,1%	7	10,6%	28	42,4%	13	19,7%	10	15,2%	66	100,0%
p value (Fisher's exact test)	0,679	φ (Phi)		0,189		Cramer`s V		0,189				
Ownership structure												
- Listed	0	0,0%	4	19,0%	9	42,9%	6	28,6%	2	9,5%	21	31,8%
- Unlisted	8	17,8%	3	6,7%	19	42,2%	7	15,6%	8	17,8%	45	68,2%
Total Ownership Structure	8	12,1%	7	10,6%	28	42,4%	13	19,7%	10	15,2%	66	100,0%
p value (Fisher's exact test)	0,093	φ (Phi)		0,341		Cramer`s V		0,341				
Geographic Scope												
- Regional	1	16,7%	0	0,0%	3	50,0%	1	16,7%	1	16,7%	6	9,1%
- National	2	5,7%	5	14,3%	16	45,7%	6	17,1%	6	17,1%	35	53,0%
- International	5	20,0%	2	0,0%	9	36,0%	6	24,0%	3	12,0%	25	37,9%
Total Geographic Scope	8	12,1%	7	10,6%	28	42,4%	13	19,7%	10	15,2%	66	100,0%
p value (Fisher's exact test)	0,773	φ (Phi)		0,272		Cramer`s V		0,192				
Project Size Classification												
- Small (EUR < 5 - 10 million)	0	0,0%	1	16,7%	1	16,7%	1	16,7%	3	50,0%	6	9,1%
- Medium (EUR > 10 - 50 million)	4	10,5%	3	7,9%	19	50,0%	8	21,1%	4	10,5%	38	57,6%
- Large (EUR > 50 - 250 million)	4	18,2%	3	0,0%	8	36,4%	4	18,2%	3	13,6%	22	33,3%
Total Project Size Classification	8	12,1%	7	10,6%	28	42,4%	13	19,7%	10	15,2%	66	100,0%
p value (Fisher's exact test)	0,377	φ (Phi)		0,374		Cramer`s V		0,265				

18) Which method does your company use for the assessment of identified risks? Multiple responses are possible

		Individual subjective assessments Subjective assessment (by individual officers)		Assessment by external experts		Group facilitated assessment		Qualitative risk assessment based on predetermined list of key indicators		Systematic exposure analysis (severity, financial impact and likelihood of occurrence)		Risk premiums or discounts on return/multiplier		Simulation processes (e.g. Monte Carlo simulation)		Risk scoring techniques		Value at risk (or other models based on probability distributions)		Decision tree procedures		Scenario technique (Best- / Worst-Case)		Sensitivity analysis		Other		Number of Responses			
Total Respondents		48	20.1%	24	10.0%	24	10.0%	21	8.8%	22	9.2%	12	5.0%	7	2.9%	11	4.6%	5	2.1%	3	1.3%	30	12.6%	30	12.6%	2	0.8%	239	100.0%		
Developer Classification																															
- Mainly Trader-Developer		25	21.0%	9	7.6%	16	13.4%	8	6.7%	14	11.8%	6	5.0%	3	2.5%	3	2.5%	1	0.8%	2	1.7%	17	14.3%	14	11.8%	1	0.8%	119	49.8%		
- Mainly Investor-Developer		23	19.2%	15	12.5%	8	6.7%	13	10.8%	8	6.7%	6	5.0%	4	3.3%	4	3.3%	8	6.7%	4	3.3%	1	0.8%	13	10.8%	16	13.3%	1	0.8%	120	50.2%
Total Developer Classification		48	20.1%	24	10.0%	24	10.0%	21	8.8%	22	9.2%	12	5.0%	7	2.9%	7	2.9%	11	4.6%	5	2.1%	3	1.3%	30	12.6%	30	12.6%	2	0.8%	239	100.0%
Ownership structure																															
- Listed		17	21.0%	7	8.6%	6	7.4%	9	11.1%	11	13.6%	1	1.2%	0	0.0%	0	0.0%	6	7.4%	1	1.2%	3	3.7%	11	13.6%	9	11.1%	0	0.0%	81	33.9%
- Unlisted		31	19.6%	17	10.8%	18	11.4%	12	7.6%	11	7.0%	11	7.0%	7	4.4%	7	4.4%	5	3.2%	4	2.5%	0	0.0%	19	12.0%	21	13.3%	2	1.3%	158	66.1%
Total Ownership Structure		48	20.1%	24	10.0%	24	10.0%	21	8.8%	22	9.2%	12	5.0%	7	2.9%	7	2.9%	11	4.6%	5	2.1%	3	1.3%	30	12.6%	30	12.6%	2	0.8%	239	100.0%
Geographic Scope																															
- Regional		4	26.7%	2	13.3%	1	6.7%	1	6.7%	2	13.3%	0	0.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	0	0.0%	2	13.3%	2	13.3%	0	0.0%	15	6.3%
- National		24	19.2%	8	6.4%	14	11.2%	11	8.8%	10	8.0%	6	4.8%	4	3.2%	4	3.2%	6	4.8%	4	3.2%	1	0.8%	19	15.2%	16	12.8%	2	1.6%	125	52.3%
- International		20	20.2%	14	14.1%	9	9.1%	9	9.1%	10	10.1%	6	6.1%	3	3.0%	3	3.0%	4	4.0%	1	1.0%	2	2.0%	9	9.1%	12	12.1%	0	0.0%	99	41.4%
Total Geographic Scope		48	20.1%	24	10.0%	24	10.0%	21	8.8%	22	9.2%	12	5.0%	7	2.9%	7	2.9%	11	4.6%	5	2.1%	3	1.3%	30	12.6%	30	12.6%	2	0.8%	239	100.0%
Project Size Classification																															
- Small (EUR < 5 - 10 million)		5	26.3%	3	15.8%	4	21.1%	1	5.3%	1	5.3%	0	0.0%	0	0.0%	0	0.0%	1	5.3%	1	5.3%	0	0.0%	2	10.5%	1	5.3%	0	0.0%	19	7.9%
- Medium (EUR > 10 - 50 million)		28	19.4%	13	9.0%	14	9.7%	13	9.0%	14	9.7%	7	4.9%	5	3.5%	5	3.5%	7	4.9%	3	2.1%	1	0.7%	20	13.9%	18	12.5%	1	0.7%	144	60.3%
- Large (EUR > 50 - 250 million)		15	19.7%	8	10.5%	6	7.9%	7	9.2%	7	9.2%	5	6.6%	2	2.6%	2	2.6%	3	3.9%	1	1.3%	2	2.6%	8	10.5%	11	14.5%	1	1.3%	76	31.8%
Total Project Size Classification		48	20.1%	24	10.0%	24	10.0%	21	8.8%	22	9.2%	12	5.0%	7	2.9%	7	2.9%	11	4.6%	5	2.1%	3	1.3%	30	12.6%	30	12.6%	2	0.8%	239	100.0%

19) Assuming you have prepared a list of all material risks that may threaten your company. How do you address these? Multiple responses are possible

	Depending on the situation, we take ad-hoc actions to improve the risk situation		We determine risk owners who are responsible for controlling risk management actions		We systematically prepare an action task list. The systematic implementation of these actions is monitored on a regular basis		We record the existing actions and analyse their impact		We identify material risks but do not take any further action		Other		Number of Responses	
Total Respondants	45	35,7%	27	21,4%	32	25,4%	20	15,9%	1	0,8%	1	0,8%	126	100,0%
Developer Classification														
- Mainly Trader-Developer	24	36,4%	16	24,2%	17	25,8%	9	13,6%	0	0,0%	0	0,0%	66	52,4%
- Mainly Investor-Developer	21	35,0%	11	18,3%	15	25,0%	11	18,3%	1	1,7%	1	1,7%	60	47,6%
Total Developer Classification	45	35,7%	27	21,4%	32	25,4%	20	15,9%	1	0,8%	1	0,8%	126	100,0%
p value (Fisher's exact test)	0,771				φ (Phi)		0,159				Cramer's V		0,159	
Ownership structure														
- Listed	15	37,5%	5	12,5%	13	32,5%	6	15,0%	0	0,0%	1	2,5%	40	31,7%
- Unlisted	30	34,9%	22	25,6%	19	22,1%	14	16,3%	1	1,2%	0	0,0%	86	68,3%
Total Ownership Structure	45	35,7%	27	21,4%	32	25,4%	20	15,9%	1	0,8%	1	0,8%	126	100,0%
p value (Fisher's exact test)	0,284				φ (Phi)		0,219				Cramer's V		0,219	
Geographic Scope														
- Regional	4	44,4%	1	11,1%	2	22,2%	1	11,1%	0	0,0%	1	11,1%	9	7,1%
- National	24	38,1%	16	25,4%	13	20,6%	9	14,3%	1	1,6%	0	0,0%	63	50,0%
- International	17	31,5%	10	18,5%	17	31,5%	10	18,5%	0	0,0%	0	0,0%	54	42,9%
Total Geographic Scope	45	35,7%	27	21,4%	32	25,4%	20	15,9%	1	0,8%	1	0,8%	126	100,0%
p value (Fisher's exact test)	0,392				φ (Phi)		0,373				Cramer's V		0,264	
Project Size Classification														
- Small (EUR < 5 - 10 million)	4	30,8%	3	23,1%	3	23,1%	2	15,4%	0	0,0%	1	7,7%	13	10,3%
- Medium (EUR > 10 - 50 million)	28	38,4%	16	21,9%	20	27,4%	9	12,3%	0	0,0%	0	0,0%	73	57,9%
- Large (EUR > 50 - 250 million)	13	32,5%	8	20,0%	9	22,5%	9	22,5%	1	2,5%	0	0,0%	40	31,7%
Total Project Size Classification	45	35,7%	27	21,4%	32	25,4%	20	15,9%	1	0,8%	1	0,8%	126	100,0%
p value (Fisher's exact test)	0,487				φ (Phi)		0,324				Cramer's V		0,229	

20) What information on project level needs take priority within your risk culture? Multiple responses are possible

	Demand in tenancy market	Supply in tenancy market	Tenancy market liquidity	Demand in transaction market	Supply in transaction market	Transaction market liquidity	Market rents	Vacancy rates	Absorption times	Economic forecasts	Information on taxation	Other	Number of Responses
Total Respondants	56	41	18	35	28	23	47	38	22	31	12	5	356
Developer Classification													
- Mainly Trader-Developer	29	21	7	23	15	13	24	13.0%	18	6.5%	15	2.7%	184
- Mainly Investor-Developer	27	20	11	12	13	10	23	13.4%	20	5.8%	16	4.1%	172
Total Developer Classification	56	41	18	35	28	23	47	13.2%	38	6.2%	31	5	356
Ownership structure													
- Listed	18	13	6	13	11	9	14	11.7%	12	5.0%	12	0.8%	120
- Unlisted	38	28	12	22	17	14	33	14.0%	26	6.8%	19	3.0%	236
Total Ownership Structure	56	41	18	35	28	23	47	13.2%	38	6.2%	31	5	356
Geographic Scope													
- Regional	5	4	0	2	1	2	3	12.5%	4	0.0%	2	0.0%	24
- National	30	23	10	17	15	13	27	13.9%	19	7.7%	15	3.6%	194
- International	21	14	8	16	12	8	17	12.3%	15	5.1%	14	2.9%	138
Total Geographic Scope	56	41	18	35	28	23	47	13.2%	38	6.2%	31	5	356
Project Size Classification													
- Small (EUR < 5 - 10 million)	5	3	0	3	2	2	4	13.8%	3	3.4%	3	6.9%	29
- Medium (EUR > 10 - 50 million)	34	26	12	22	17	16	30	13.7%	25	5.9%	17	2.3%	219
- Large (EUR > 50 - 250 million)	17	12	6	10	9	5	13	12.0%	10	7.4%	11	4.6%	108
Total Project Size Classification	56	41	18	35	28	23	47	13.2%	38	6.2%	31	5	356

21) Please evaluate the following aspects/features of your risk management:

1 The company collates risks for decision making on what actions to take

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

Developer Classification

- Mainly Trader-Developer	17	45,9%	17	45,9%	3	8,1%	0	0,0%	37	56,1%
- Mainly Investor-Developer	15	51,7%	13	44,8%	1	3,4%	0	0,0%	29	43,9%
Total Developer Classification	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,730	φ (Phi)	0,103	Cramer's V	0,103
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Ownership structure

- Listed	13	59,1%	9	40,9%	0	0,0%	0	0,0%	22	33,3%
- Unlisted	19	43,2%	21	47,7%	4	9,1%	0	0,0%	44	66,7%
Total Ownership Structure	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,286	φ (Phi)	0,210	Cramer's V	0,210
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Geographic Scope

- Regional	1	16,7%	4	66,7%	1	16,7%	0	0,0%	6	9,1%
- National	17	50,0%	14	41,2%	3	8,8%	0	0,0%	34	51,5%
- International	14	53,8%	12	46,2%	0	0,0%	0	0,0%	26	39,4%
Total Geographic Scope	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,201	φ (Phi)	0,283	Cramer's V	0,200
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Project Size Classification

- Small (EUR < 5 - 10 million)	5	71,4%	2	28,6%	0	0,0%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	16	41,0%	19	48,7%	4	10,3%	0	0,0%	39	59,1%
- Large (EUR > 50 - 250 million)	11	55,0%	9	45,0%	0	0,0%	0	0,0%	20	30,3%
Total Project Size Classification	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,430	φ (Phi)	0,266	Cramer's V	0,188
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21) Please evaluate the following aspects/features of your risk management:

2 The company monitors and reviews the risks in the achievements of its objectives

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100%

Developer Classification

- Mainly Trader-Developer	17	45,9%	17	45,9%	3	8,1%	0	0,0%	37	56,1%
- Mainly Investor-Developer	15	51,7%	13	44,8%	1	3,4%	0	0,0%	29	43,9%
Total Developer Classification	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,730	φ (Phi)	0,103	Cramer's V	0,103
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Ownership structure

- Listed	13	59,1%	9	40,9%	0	0,0%	0	0,0%	22	33,3%
- Unlisted	19	43,2%	21	47,7%	4	9,1%	0	0,0%	44	66,7%
Total Ownership Structure	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,286	φ (Phi)	0,210	Cramer's V	0,210
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Geographic Scope

- Regional	1	16,7%	4	66,7%	1	16,7%	0	0,0%	6	9,1%
- National	17	50,0%	14	41,2%	3	8,8%	0	0,0%	34	51,5%
- International	14	53,8%	12	46,2%	0	0,0%	0	0,0%	26	39,4%
Total Geographic Scope	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,201	φ (Phi)	0,283	Cramer's V	0,200
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Project Size Classification

- Small (EUR < 5 - 10 million)	5	71,4%	2	28,6%	0	0,0%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	16	41,0%	19	48,7%	4	10,3%	0	0,0%	39	59,1%
- Large (EUR > 50 - 250 million)	11	55,0%	9	45,0%	0	0,0%	0	0,0%	20	30,3%
Total Project Size Classification	32	48,5%	30	45,5%	4	6,1%	0	0,0%	66	100,0%

p value (Fisher's exact test)	0,430	φ (Phi)	0,266	Cramer's V	0,188
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21) Please evaluate the following aspects/features of your risk management:

3 The company has a clearly defined policy and process for the reporting of risks / risk management

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	22	33,3%	22	33,3%	21	31,8%	1	1,5%	66	100,0%

Developer Classification

- Mainly Trader-Developer	9	24,3%	11	29,7%	16	43,2%	1	2,7%	37	56,1%
- Mainly Investor-Developer	13	44,8%	11	37,9%	5	17,2%	0	0,0%	29	43,9%
Total Developer Classification	22	33,3%	22	33,3%	21	31,8%	1	1,5%	66	100,0%

p value (Fisher's exact test)	0,067	φ (Phi)	0,317	Cramer's V	0,317
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Ownership structure

- Listed	10	45,5%	8	36,4%	4	18,2%	0	0,0%	22	33,3%
- Unlisted	12	27,3%	14	31,8%	17	38,6%	1	2,3%	44	66,7%
Total Ownership Structure	22	33,3%	22	33,3%	21	31,8%	1	1,5%	66	100,0%

p value (Fisher's exact test)	0,130	φ (Phi)	0,283	Cramer's V	0,283
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Geographic Scope

- Regional	1	16,7%	3	50,0%	2	33,3%	0	0,0%	6	9,1%
- National	10	29,4%	7	20,6%	17	50,0%	0	0,0%	34	51,5%
- International	11	42,3%	12	46,2%	2	7,7%	1	3,8%	26	39,4%
Total Geographic Scope	22	33,3%	22	33,3%	21	31,8%	1	1,5%	66	100,0%

p value (Fisher's exact test)	0,004	φ (Phi)	0,470	Cramer's V	0,332
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Project Size Classification

- Small (EUR < 5 - 10 million)	3	42,9%	2	28,6%	2	28,6%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	9	23,1%	13	33,3%	16	41,0%	1	2,6%	39	59,1%
- Large (EUR > 50 - 250 million)	10	50,0%	7	35,0%	3	15,0%	0	0,0%	20	30,3%
Total Project Size Classification	22	33,3%	22	33,3%	21	31,8%	1	1,5%	66	100,0%

p value (Fisher's exact test)	0,269	φ (Phi)	0,318	Cramer's V	0,225
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21) Please evaluate the following aspects/features of your risk management:

4 Changes to the company's risks are identified, assessed and reported on an ongoing basis as to their impact on objectives

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	22	32,8%	22	32,8%	18	26,9%	5	7,5%	67	100,0%

Developer Classification

- Mainly Trader-Developer	10	27,0%	11	29,7%	12	32,4%	4	10,8%	37	55,2%
- Mainly Investor-Developer	12	40,0%	11	36,7%	6	20,0%	1	3,3%	30	44,8%
Total Developer Classification	22	32,8%	22	32,8%	18	26,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,377	φ (Phi)	0,221	Cramer's V	0,221
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Ownership structure

- Listed	9	40,9%	8	36,4%	4	18,2%	1	4,5%	22	32,8%
- Unlisted	13	28,9%	14	31,1%	14	31,1%	4	8,9%	45	67,2%
Total Ownership Structure	22	32,8%	22	32,8%	18	26,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,602	φ (Phi)	0,176	Cramer's V	0,176
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Geographic Scope

- Regional	1	16,7%	3	50,0%	2	33,3%	0	0,0%	6	9,0%
- National	10	28,6%	12	34,3%	9	25,7%	4	11,4%	35	52,2%
- International	11	42,3%	7	26,9%	7	26,9%	1	3,8%	26	38,8%
Total Geographic Scope	22	32,8%	22	32,8%	18	26,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,749	φ (Phi)	0,243	Cramer's V	0,172
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Project Size Classification

- Small (EUR < 5 - 10 million)	2	28,6%	2	28,6%	3	42,9%	0	0,0%	7	10,4%
- Medium (EUR > 10 - 50 million)	11	27,5%	17	42,5%	8	20,0%	4	10,0%	40	59,7%
- Large (EUR > 50 - 250 million)	9	45,0%	3	15,0%	7	35,0%	1	5,0%	20	29,9%
Total Project Size Classification	22	32,8%	22	32,8%	18	26,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,285	φ (Phi)	0,330	Cramer's V	0,233
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21) Please evaluate the following aspects/features of your risk management:

5 The company routinely reviews the effectiveness of the controls in place to manage risks

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	13	20,0%	31	47,7%	17	26,2%	4	6,2%	65	100,0%

Developer Classification

- Mainly Trader-Developer	6	16,7%	18	50,0%	8	22,2%	4	11,1%	36	55,4%
- Mainly Investor-Developer	7	24,1%	13	44,8%	9	31,0%	0	0,0%	29	44,6%
Total Developer Classification	13	20,0%	31	47,7%	17	26,2%	4	6,2%	65	100,0%

p value (Fisher's exact test)	0,277	φ (Phi)	0,255	Cramer's V	0,255
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Ownership structure

- Listed	5	22,7%	11	50,0%	5	22,7%	1	4,5%	22	33,8%
- Unlisted	8	18,6%	20	46,5%	12	27,9%	3	7,0%	43	66,2%
Total Ownership Structure	13	20,0%	31	47,7%	17	26,2%	4	6,2%	65	100,0%

p value (Fisher's exact test)	0,952	φ (Phi)	0,083	Cramer's V	0,083
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Geographic Scope

- Regional	0	0,0%	5	83,3%	1	16,7%	0	0,0%	6	9,2%
- National	8	24,2%	14	42,4%	9	27,3%	2	6,1%	33	50,8%
- International	5	19,2%	12	46,2%	7	26,9%	2	7,7%	26	40,0%
Total Geographic Scope	13	20,0%	31	47,7%	17	26,2%	4	6,2%	65	100,0%

p value (Fisher's exact test)	0,814	φ (Phi)	0,248	Cramer's V	0,176
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	4	57,1%	1	14,3%	2	28,6%	7	10,8%
- Medium (EUR > 10 - 50 million)	6	15,8%	19	50,0%	11	28,9%	2	5,3%	38	58,5%
- Large (EUR > 50 - 250 million)	7	35,0%	8	40,0%	5	25,0%	0	0,0%	20	30,8%
Total Project Size Classification	13	20,0%	31	47,7%	17	26,2%	4	6,2%	65	100,0%

p value (Fisher's exact test)	0,132	φ (Phi)	0,428	Cramer's V	0,303
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21) Please evaluate the following aspects/features of your risk management:

6 The key indicators for controlling material risks have been determined and threshold values have been defined

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses		
Total Respondants	12	17,9%	17	25,4%	30	44,8%	8	11,9%	67	100,0%	
Developer Classification											
- Mainly Trader-Developer	3	8,1%	7	18,9%	20	54,1%	7	18,9%	37	55,2%	
- Mainly Investor-Developer	9	30,0%	10	33,3%	10	33,3%	1	3,3%	30	44,8%	
Total Developer Classification	12	17,9%	17	25,4%	30	44,8%	8	11,9%	67	100,0%	
p value (Fisher's exact test)	0,013	φ (Phi)			0,401	Cramer`s V			0,401		
Ownership structure											
- Listed	4	18,2%	8	36,4%	8	36,4%	2	9,1%	22	32,8%	
- Unlisted	8	17,8%	9	20,0%	22	48,9%	6	13,3%	45	67,2%	
Total Ownership Structure	12	17,9%	17	25,4%	30	44,8%	8	11,9%	67	100,0%	
p value (Fisher's exact test)	0,538	φ (Phi)			0,185	Cramer`s V			0,185		
Geographic Scope											
- Regional	1	16,7%	1	16,7%	4	66,7%	0	0,0%	6	9,0%	
- National	5	14,3%	9	25,7%	17	48,6%	4	11,4%	35	52,2%	
- International	6	23,1%	7	26,9%	9	34,6%	4	15,4%	26	38,8%	
Total Geographic Scope	12	17,9%	17	25,4%	30	44,8%	8	11,9%	67	100,0%	
p value (Fisher's exact test)	0,864	φ (Phi)			0,218	Cramer`s V			0,154		
Project Size Classification											
- Small (EUR < 5 - 10 million)	2	28,6%	1	14,3%	2	28,6%	2	28,6%	7	10,4%	
- Medium (EUR > 10 - 50 million)	4	10,0%	11	27,5%	21	52,5%	4	10,0%	40	59,7%	
- Large (EUR > 50 - 250 million)	6	30,0%	5	25,0%	7	35,0%	2	10,0%	20	29,9%	
Total Project Size Classification	12	17,9%	17	25,4%	30	44,8%	8	11,9%	67	100,0%	
p value (Fisher's exact test)	0,266	φ (Phi)			0,325	Cramer`s V			0,230		

21) Please evaluate the following aspects/features of your risk management:

7 There are appropriate tools in place to support risk management (e.g. standard templates, modelling tools, valuation tools)

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	19	28,4%	23	34,3%	20	29,9%	5	7,5%	67	100,0%

Developer Classification

- Mainly Trader-Developer	7	18,9%	11	29,7%	15	40,5%	4	10,8%	37	55,2%
- Mainly Investor-Developer	12	40,0%	12	40,0%	5	16,7%	1	3,3%	30	44,8%
Total Developer Classification	19	28,4%	23	34,3%	20	29,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,061	φ (Phi)		0,335	Cramer's V		0,335
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Ownership structure

- Listed	10	45,5%	8	36,4%	2	9,1%	2	9,1%	22	32,8%
- Unlisted	9	20,0%	15	33,3%	18	40,0%	3	6,7%	45	67,2%
Total Ownership Structure	19	28,4%	23	34,3%	20	29,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,027	φ (Phi)		0,351	Cramer's V		0,351
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Geographic Scope

- Regional	0	0,0%	3	50,0%	3	50,0%	0	0,0%	6	9,0%
- National	9	25,7%	13	37,1%	10	28,6%	3	8,6%	35	52,2%
- International	10	38,5%	7	26,9%	7	26,9%	2	7,7%	26	38,8%
Total Geographic Scope	19	28,4%	23	34,3%	20	29,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,576	φ (Phi)		0,275	Cramer's V		0,194
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Project Size Classification

- Small (EUR < 5 - 10 million)	2	28,6%	2	28,6%	2	28,6%	1	14,3%	7	10,4%
- Medium (EUR > 10 - 50 million)	8	20,0%	15	37,5%	13	32,5%	4	10,0%	40	59,7%
- Large (EUR > 50 - 250 million)	9	45,0%	6	30,0%	5	25,0%	0	0,0%	20	29,9%
Total Project Size Classification	19	28,4%	23	34,3%	20	29,9%	5	7,5%	67	100,0%

p value (Fisher's exact test)	0,415	φ (Phi)		0,293	Cramer's V		0,207
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22) How confident is your company that its business risk management process is identifying, measuring and managing mainly all potentially significant risks?

	No confidence		More or less confidence		Confidence		Absolute confidence		Number of Responses	
Total Respondants	2	3,0%	18	27,3%	41	62,1%	5	7,6%	66	100,0%
Developer Classification										
- Mainly Trader-Developer	1	2,9%	13	37,1%	19	54,3%	2	5,7%	35	53,0%
- Mainly Investor-Developer	1	3,2%	5	16,1%	22	71,0%	3	9,7%	31	47,0%
Total Developer Classification	2	3,0%	18	27,3%	41	62,1%	5	7,6%	66	100,0%
p value (Fisher's exact test)	0,220	φ (Phi)			0,238	Cramer`s V			0,238	
Ownership structure										
- Listed	1	4,5%	4	18,2%	17	77,3%	0	0,0%	22	33,3%
- Unlisted	1	2,3%	14	31,8%	24	54,5%	5	11,4%	44	66,7%
Total Ownership Structure	2	3,0%	18	27,3%	41	62,1%	5	7,6%	66	100,0%
p value (Fisher's exact test)	0,153	φ (Phi)			0,274	Cramer`s V			0,274	
Geographic Scope										
- Regional	1	16,7%	1	16,7%	4	66,7%	0	0,0%	6	9,1%
- National	1	2,9%	10	29,4%	20	58,8%	3	8,8%	34	51,5%
- International	0	0,0%	7	26,9%	17	65,4%	2	7,7%	26	39,4%
Total Geographic Scope	2	3,0%	18	27,3%	41	62,1%	5	7,6%	66	100,0%
p value (Fisher's exact test)	0,671	φ (Phi)			0,287	Cramer`s V			0,203	
Project Size Classification										
- Small (EUR < 5 - 10 million)	0	0,0%	2	28,6%	4	57,1%	1	14,3%	7	10,6%
- Medium (EUR > 10 - 50 million)	2	5,3%	9	23,7%	24	63,2%	3	7,9%	38	57,6%
- Large (EUR > 50 - 250 million)	0	0,0%	7	33,3%	13	61,9%	1	4,8%	21	31,8%
Total Project Size Classification	2	3,0%	18	27,3%	41	62,1%	5	7,6%	66	100,0%
p value (Fisher's exact test)	0,848	φ (Phi)			0,199	Cramer`s V			0,141	

23) What kind of IT support do you use as part of your risk management system?

	Our risk management system is integrated into the organisation's central information system		We use a stand-alone risk management application with an interface to our enterprise applications		We use a stand-alone risk management application without interface to any other systems		Our IT support is limited to the utilisation of standard tools (e.g. Excel)		We do not use IT support as part of our risk management system		Other (please specify)		Number of Responses	
Total Respondants	11	16,9%	10	15,4%	7	10,8%	27	41,5%	10	15,4%	0	0,0%	65	100,0%
Developer Classification														
- Mainly Trader-Developer	6	16,7%	4	11,1%	2	5,6%	20	55,6%	4	11,1%	0	0,0%	36	55,4%
- Mainly Investor-Developer	5	17,2%	6	20,7%	5	17,2%	7	24,1%	6	20,7%	0	0,0%	29	44,6%
Total Developer Classification	11	16,9%	10	15,4%	7	10,8%	27	41,5%	10	15,4%	0	0,0%	65	100,0%
p value (Fisher's exact test)	0,097	φ (Phi)					0,346	Cramer's V					0,346	
Ownership structure														
- Listed	5	23,8%	5	23,8%	2	9,5%	4	19,0%	5	23,8%	0	0,0%	21	32,3%
- Unlisted	6	13,6%	5	11,4%	5	11,4%	23	52,3%	5	11,4%	0	0,0%	44	67,7%
Total Ownership Structure	11	16,9%	10	15,4%	7	10,8%	27	41,5%	10	15,4%	0	0,0%	65	100,0%
p value (Fisher's exact test)	0,086	φ (Phi)					0,341	Cramer's V					0,341	
Geographic Scope														
- Regional	0	0,0%	2	33,3%	0	0,0%	1	16,7%	3	50,0%	0	0,0%	6	9,2%
- National	4	11,8%	6	17,6%	3	8,8%	15	44,1%	6	17,6%	0	0,0%	34	52,3%
- International	7	28,0%	2	8,0%	4	16,0%	11	44,0%	1	4,0%	0	0,0%	25	38,5%
Total Geographic Scope	11	16,9%	10	15,4%	7	10,8%	27	41,5%	10	15,4%	0	0,0%	65	100,0%
p value (Fisher's exact test)	0,073	φ (Phi)					0,479	Cramer's V					0,339	
Project Size Classification														
- Small (EUR < 5 - 10 million)	3	42,9%	2	28,6%	0	0,0%	1	14,3%	1	14,3%	0	0,0%	7	10,8%
- Medium (EUR > 10 - 50 million)	4	10,5%	6	15,8%	2	5,3%	17	44,7%	9	23,7%	0	0,0%	38	58,5%
- Large (EUR > 50 - 250 million)	4	20,0%	2	10,0%	5	25,0%	9	45,0%	0	0,0%	0	0,0%	20	30,8%
Total Project Size Classification	11	16,9%	10	15,4%	7	10,8%	27	41,5%	10	15,4%	0	0,0%	65	100,0%
p value (Fisher's exact test)	0,019	φ (Phi)					0,508	Cramer's V					0,359	

24) Please evaluate the following aspects/features of your risk management:

1 The company's structure supports effective risk management

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	31	47,0%	29	43,9%	2	3,0%	4	6,1%	66	100,0%

Developer Classification

- Mainly Trader-Developer	13	35,1%	20	54,1%	1	2,7%	3	8,1%	37	56,1%
- Mainly Investor-Developer	18	62,1%	9	31,0%	1	3,4%	1	3,4%	29	43,9%
Total Developer Classification	31	47,0%	29	43,9%	2	3,0%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,129	φ (Phi)	0,278	Cramer's V	0,278
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Ownership structure

- Listed	13	59,1%	7	31,8%	0	0,0%	2	9,1%	22	33,3%
- Unlisted	18	40,9%	22	50,0%	2	4,5%	2	4,5%	44	66,7%
Total Ownership Structure	31	47,0%	29	43,9%	2	3,0%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,334	φ (Phi)	0,235	Cramer's V	0,235
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Geographic Scope

- Regional	3	50,0%	2	33,3%	1	16,7%	0	0,0%	6	9,1%
- National	16	47,1%	15	44,1%	0	0,0%	3	8,8%	34	51,5%
- International	12	46,2%	12	46,2%	1	3,8%	1	3,8%	26	39,4%
Total Geographic Scope	31	47,0%	29	43,9%	2	3,0%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,542	φ (Phi)	0,301	Cramer's V	0,213
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Project Size Classification

- Small (EUR < 5 - 10 million)	4	57,1%	3	42,9%	0	0,0%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	17	43,6%	17	43,6%	1	2,6%	4	10,3%	39	59,1%
- Large (EUR > 50 - 250 million)	10	50,0%	9	45,0%	1	5,0%	0	0,0%	20	30,3%
Total Project Size Classification	31	47,0%	29	43,9%	2	3,0%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,824	φ (Phi)	0,232	Cramer's V	0,164
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24) Please evaluate the following aspects/features of your risk management:

2 The company's culture supports effective risk management

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	28	42,4%	32	48,5%	4	6,1%	2	3,0%	66	100,0%

Developer Classification

- Mainly Trader-Developer	12	32,4%	22	59,5%	1	2,7%	2	5,4%	37	56,1%
- Mainly Investor-Developer	16	55,2%	10	34,5%	3	10,3%	0	0,0%	29	43,9%
Total Developer Classification	28	42,4%	32	48,5%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,052	φ (Phi)	0,330	Cramer's V	0,330
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Ownership structure

- Listed	10	45,5%	10	45,5%	2	9,1%	0	0,0%	22	33,3%
- Unlisted	18	40,9%	22	50,0%	2	4,5%	2	4,5%	44	66,7%
Total Ownership Structure	28	42,4%	32	48,5%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,732	φ (Phi)	0,157	Cramer's V	0,157
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Geographic Scope

- Regional	2	33,3%	3	50,0%	1	16,7%	0	0,0%	6	9,1%
- National	14	41,2%	18	52,9%	1	2,9%	1	2,9%	34	51,5%
- International	12	46,2%	11	42,3%	2	7,7%	1	3,8%	26	39,4%
Total Geographic Scope	28	42,4%	32	48,5%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,768	φ (Phi)	0,198	Cramer's V	0,140
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Project Size Classification

- Small (EUR < 5 - 10 million)	5	71,4%	2	28,6%	0	0,0%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	13	33,3%	23	59,0%	1	2,6%	2	5,1%	39	59,1%
- Large (EUR > 50 - 250 million)	10	50,0%	7	35,0%	3	15,0%	0	0,0%	20	30,3%
Total Project Size Classification	28	42,4%	32	48,5%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,142	φ (Phi)	0,386	Cramer's V	0,273
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24) Please evaluate the following aspects/features of your risk management:

3 Reporting and communication processes between staff and top management support the effective management or risk

	<div>Yes</div> <div>Yes, but needs improvement</div> <div>No</div> <div>Don't know</div>								Number of Responses	
Total Respondants	31	47,7%	27	41,5%	6	9,2%	1	1,5%	65	100,0%

Developer Classification

- Mainly Trader-Developer	18	50,0%	12	33,3%	5	13,9%	1	2,8%	36	55,4%
- Mainly Investor-Developer	13	44,8%	15	51,7%	1	3,4%	0	0,0%	29	44,6%
Total Developer Classification	31	47,7%	27	41,5%	6	9,2%	1	1,5%	65	100,0%

p value (Fisher's exact test)	0,232	ϕ (Phi)	0,251	Cramer's V	0,251
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Ownership structure

- Listed	9	40,9%	11	50,0%	2	9,1%	0	0,0%	22	33,8%
- Unlisted	22	51,2%	16	37,2%	4	9,3%	1	2,3%	43	66,2%
Total Ownership Structure	31	47,7%	27	41,5%	6	9,2%	1	1,5%	65	100,0%

p value (Fisher's exact test)	0,764	ϕ (Phi)	0,147	Cramer's V	0,147
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Geographic Scope

- Regional	3	50,0%	2	33,3%	1	16,7%	0	0,0%	6	9,2%
- National	15	45,5%	15	45,5%	3	9,1%	0	0,0%	33	50,8%
- International	13	50,0%	10	38,5%	2	7,7%	1	3,8%	26	40,0%
Total Geographic Scope	31	47,7%	27	41,5%	6	9,2%	1	1,5%	65	100,0%

p value (Fisher's exact test)	0,870	ϕ (Phi)	0,187	Cramer's V	0,132
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Project Size Classification

- Small (EUR < 5 - 10 million)	3	42,9%	2	28,6%	2	28,6%	0	0,0%	7	10,8%
- Medium (EUR > 10 - 50 million)	18	47,4%	16	42,1%	3	7,9%	1	2,6%	38	58,5%
- Large (EUR > 50 - 250 million)	10	50,0%	9	45,0%	1	5,0%	0	0,0%	20	30,8%
Total Project Size Classification	31	47,7%	27	41,5%	6	9,2%	1	1,5%	65	100,0%

p value (Fisher's exact test)	0,654	ϕ (Phi)	0,260	Cramer's V	0,184
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24) Please evaluate the following aspects/features of your risk management:

4 Roles, responsibilities and accountabilities have been clearly defined

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	36	54,5%	21	31,8%	7	10,6%	2	3,0%	66	100,0%

Developer Classification

- Mainly Trader-Developer	21	56,8%	11	29,7%	4	10,8%	1	2,7%	37	56,1%
- Mainly Investor-Developer	15	51,7%	10	34,5%	3	10,3%	1	3,4%	29	43,9%
Total Developer Classification	36	54,5%	21	31,8%	7	10,6%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,966	φ (Phi)	0,058	Cramer's V	0,058
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Ownership structure

- Listed	9	40,9%	10	45,5%	2	9,1%	1	4,5%	22	33,3%
- Unlisted	27	61,4%	11	25,0%	5	11,4%	1	2,3%	44	66,7%
Total Ownership Structure	36	54,5%	21	31,8%	7	10,6%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,282	φ (Phi)	0,226	Cramer's V	0,226
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Geographic Scope

- Regional	4	66,7%	2	33,3%	0	0,0%	0	0,0%	6	9,1%
- National	17	50,0%	9	26,5%	7	20,6%	1	2,9%	34	51,5%
- International	15	57,7%	10	38,5%	0	0,0%	1	3,8%	26	39,4%
Total Geographic Scope	36	54,5%	21	31,8%	7	10,6%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,195	φ (Phi)	0,345	Cramer's V	0,244
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Project Size Classification

- Small (EUR < 5 - 10 million)	5	71,4%	1	14,3%	1	14,3%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	17	43,6%	15	38,5%	5	12,8%	2	5,1%	39	59,1%
- Large (EUR > 50 - 250 million)	14	70,0%	5	25,0%	1	5,0%	0	0,0%	20	30,3%
Total Project Size Classification	36	54,5%	21	31,8%	7	10,6%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,464	φ (Phi)	0,298	Cramer's V	0,211
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24) Please evaluate the following aspects/features of your risk management:

5 There are clear and written management statements on risk management

	<div> <div>Yes</div> <div>Yes, but needs improvement</div> <div>No</div> <div>Don't know</div> </div>								Number of Responses	
Total Respondants	16	24,2%	19	28,8%	27	40,9%	4	6,1%	66	100,0%

Developer Classification

- Mainly Trader-Developer	6	16,2%	7	18,9%	21	56,8%	3	8,1%	37	56,1%
- Mainly Investor-Developer	10	34,5%	12	41,4%	6	20,7%	1	3,4%	29	43,9%
Total Developer Classification	16	24,2%	19	28,8%	27	40,9%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,009	ϕ (Phi)	0,405	Cramer's V	0,405
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Ownership structure

- Listed	6	27,3%	9	40,9%	6	27,3%	1	4,5%	22	33,3%
- Unlisted	10	22,7%	10	22,7%	21	47,7%	3	6,8%	44	66,7%
Total Ownership Structure	16	24,2%	19	28,8%	27	40,9%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,321	ϕ (Phi)	0,228	Cramer's V	0,228
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Geographic Scope

- Regional	1	16,7%	3	50,0%	2	33,3%	0	0,0%	6	9,1%
- National	11	32,4%	2	5,9%	19	55,9%	2	5,9%	34	51,5%
- International	4	15,4%	14	53,8%	6	23,1%	2	7,7%	26	39,4%
Total Geographic Scope	16	24,2%	19	28,8%	27	40,9%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,001	ϕ (Phi)	0,539	Cramer's V	0,381
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Project Size Classification

- Small (EUR < 5 - 10 million)	1	14,3%	3	42,9%	3	42,9%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	9	23,1%	8	20,5%	19	48,7%	3	7,7%	39	59,1%
- Large (EUR > 50 - 250 million)	6	30,0%	8	40,0%	5	25,0%	1	5,0%	20	30,3%
Total Project Size Classification	16	24,2%	19	28,8%	27	40,9%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,498	ϕ (Phi)	0,284	Cramer's V	0,201
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24) Please evaluate the following aspects/features of your risk management:

6 The company's senior management is receptive to all communications about risks, including bad news

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	43	65,2%	17	25,8%	4	6,1%	2	3,0%	66	100,0%

Developer Classification

- Mainly Trader-Developer	23	62,2%	10	27,0%	3	8,1%	1	2,7%	37	56,1%
- Mainly Investor-Developer	20	69,0%	7	24,1%	1	3,4%	1	3,4%	29	43,9%
Total Developer Classification	43	65,2%	17	25,8%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,884	φ (Phi)	0,109	Cramer's V	0,109
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Ownership structure

- Listed	15	68,2%	4	18,2%	1	4,5%	2	9,1%	22	33,3%
- Unlisted	28	63,6%	13	29,5%	3	6,8%	0	0,0%	44	66,7%
Total Ownership Structure	43	65,2%	17	25,8%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,193	φ (Phi)	0,273	Cramer's V	0,273
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Geographic Scope

- Regional	4	66,7%	1	16,7%	1	16,7%	0	0,0%	6	9,1%
- National	21	61,8%	9	26,5%	2	5,9%	2	5,9%	34	51,5%
- International	18	69,2%	7	26,9%	1	3,8%	0	0,0%	26	39,4%
Total Geographic Scope	43	65,2%	17	25,8%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,772	φ (Phi)	0,232	Cramer's V	0,164
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Project Size Classification

- Small (EUR < 5 - 10 million)	4	57,1%	3	42,9%	0	0,0%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	27	69,2%	7	17,9%	3	7,7%	2	5,1%	39	59,1%
- Large (EUR > 50 - 250 million)	12	60,0%	7	35,0%	1	5,0%	0	0,0%	20	30,3%
Total Project Size Classification	43	65,2%	17	25,8%	4	6,1%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,646	φ (Phi)	0,265	Cramer's V	0,188
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24) Please evaluate the following aspects/features of your risk management:

7 There is adequate risk management training provided to management and other personnel in order to ensure that adequate capability exists within the business.

	<div>Yes</div> <div>Yes, but needs improvement</div> <div>No</div> <div>Don't know</div>								Number of Responses	
Total Respondants	11	16,7%	30	45,5%	21	31,8%	4	6,1%	66	100,0%

Developer Classification

- Mainly Trader-Developer	4	10,8%	14	37,8%	16	43,2%	3	8,1%	37	56,1%
- Mainly Investor-Developer	7	24,1%	16	55,2%	5	17,2%	1	3,4%	29	43,9%
Total Developer Classification	11	16,7%	30	45,5%	21	31,8%	4	11,6%	66	100,0%

p value (Fisher's exact test)	0,073	ϕ (Phi)	0,322	Cramer's V	0,322
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Ownership structure

- Listed	4	18,2%	13	59,1%	3	13,6%	2	9,1%	22	33,3%
- Unlisted	7	15,9%	17	38,6%	18	40,9%	2	4,5%	44	66,7%
Total Ownership Structure	11	16,7%	30	45,5%	21	31,8%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,111	ϕ (Phi)	0,284	Cramer's V	0,284
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Geographic Scope

- Regional	1	16,7%	4	66,7%	1	16,7%	0	0,0%	6	9,1%
- National	5	14,7%	12	35,3%	15	44,1%	2	5,9%	34	51,5%
- International	5	19,2%	14	53,8%	5	19,2%	2	7,7%	26	39,4%
Total Geographic Scope	11	16,7%	30	45,5%	21	31,8%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,429	ϕ (Phi)	0,296	Cramer's V	0,209
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Project Size Classification

- Small (EUR < 5 - 10 million)	1	14,3%	3	42,9%	3	42,9%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	4	10,3%	20	51,3%	12	30,8%	3	7,7%	39	59,1%
- Large (EUR > 50 - 250 million)	6	30,0%	7	35,0%	6	30,0%	1	5,0%	20	30,3%
Total Project Size Classification	11	16,7%	30	45,5%	21	31,8%	4	6,1%	66	100,0%

p value (Fisher's exact test)	0,597	ϕ (Phi)	0,271	Cramer's V	0,191
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24) Please evaluate the following aspects/features of your risk management:

8 The responsibilities for risk management and continuous monitoring of risk categories have been defined

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	23	34,8%	28	42,4%	10	15,2%	5	7,6%	66	100,0%

Developer Classification

- Mainly Trader-Developer	11	29,7%	17	45,9%	6	16,2%	3	8,1%	37	56,1%
- Mainly Investor-Developer	12	41,4%	11	37,9%	4	13,8%	2	6,9%	29	43,9%
Total Developer Classification	23	34,8%	28	42,4%	10	15,2%	5	7,6%	66	100,0%

p value (Fisher's exact test)	0,833	φ (Phi)	0,121	Cramer's V	0,121
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Ownership structure

- Listed	7	31,8%	11	50,0%	2	9,1%	2	9,1%	22	33,3%
- Unlisted	16	36,4%	17	38,6%	8	18,2%	3	6,8%	44	66,7%
Total Ownership Structure	23	34,8%	28	42,4%	10	15,2%	5	7,6%	66	100,0%

p value (Fisher's exact test)	0,720	φ (Phi)	0,147	Cramer's V	0,147
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Geographic Scope

- Regional	2	33,3%	3	50,0%	1	16,7%	0	0,0%	6	9,1%
- National	10	29,4%	13	38,2%	8	23,5%	3	8,8%	34	51,5%
- International	11	42,3%	12	46,2%	1	3,8%	2	7,7%	26	39,4%
Total Geographic Scope	23	34,8%	28	42,4%	10	15,2%	5	7,6%	66	100,0%

p value (Fisher's exact test)	0,468	φ (Phi)	0,284	Cramer's V	0,201
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Project Size Classification

- Small (EUR < 5 - 10 million)	4	57,1%	1	14,3%	2	28,6%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	8	20,5%	21	53,8%	6	15,4%	4	10,3%	39	59,1%
- Large (EUR > 50 - 250 million)	11	55,0%	6	30,0%	2	10,0%	1	5,0%	20	30,3%
Total Project Size Classification	23	34,8%	28	42,4%	10	15,2%	5	7,6%	66	100,0%

p value (Fisher's exact test)	0,067	φ (Phi)	0,410	Cramer's V	0,290
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24) Please evaluate the following aspects/features of your risk management:

9 A functional reporting concept has been designed and successfully implemented

	Yes		Yes, but needs improvement		No		Don't know		Number of Responses	
Total Respondants	15	22,7%	30	45,5%	19	28,8%	2	3,0%	66	100,0%

Developer Classification

- Mainly Trader-Developer	7	18,9%	18	48,6%	11	29,7%	1	2,7%	37	56,1%
- Mainly Investor-Developer	8	27,6%	12	41,4%	8	27,6%	1	3,4%	29	43,9%
Total Developer Classification	15	22,7%	30	45,5%	19	28,8%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,881	φ (Phi)	0,109	Cramer's V	0,109
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Ownership structure

- Listed	9	40,9%	8	36,4%	4	18,2%	1	4,5%	22	33,3%
- Unlisted	6	13,6%	22	50,0%	15	34,1%	1	2,3%	44	66,7%
Total Ownership Structure	15	22,7%	30	45,5%	19	28,8%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,060	φ (Phi)	0,324	Cramer's V	0,324
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Geographic Scope

- Regional	1	16,7%	1	16,7%	4	66,7%	0	0,0%	6	9,1%
- National	5	14,7%	16	47,1%	12	35,3%	1	2,9%	34	51,5%
- International	9	34,6%	13	50,0%	3	11,5%	1	3,8%	26	39,4%
Total Geographic Scope	15	22,7%	30	45,5%	19	28,8%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,066	φ (Phi)	0,396	Cramer's V	0,280
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Project Size Classification

- Small (EUR < 5 - 10 million)	3	42,9%	2	28,6%	2	28,6%	0	0,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	5	12,8%	19	48,7%	13	33,3%	2	5,1%	39	59,1%
- Large (EUR > 50 - 250 million)	7	35,0%	9	45,0%	4	20,0%	0	0,0%	20	30,3%
Total Project Size Classification	15	22,7%	30	45,5%	19	28,8%	2	3,0%	66	100,0%

p value (Fisher's exact test)	0,309	φ (Phi)	0,325	Cramer's V	0,230
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25. Is there a specialized committee that oversees risk management for the company? Multiple responses are possible

Executive Leadership & Board Composition																			Number of Responses	
Board members	Chief Executive Officer (CEO)		Chief Financial Officer (CFO)		Chief Risk Officer (CRO)		Internal Auditor		External advisor		Financial Controller		Development executives		Other					
Total Respondants	24	19,0%	24	19,0%	20	15,9%	8	6,3%	5	4,0%	6	4,8%	18	14,3%	15	11,9%	6	4,8%	126	100,0%
Developer Classification																				
- Mainly Trader-Developer	11	17,2%	13	20,3%	11	17,2%	4	6,3%	1	1,6%	2	3,1%	9	14,1%	9	14,1%	4	6,3%	64	50,8%
- Mainly Investor-Developer	13	21,0%	11	17,7%	9	14,5%	4	6,5%	4	6,5%	4	6,5%	9	14,5%	6	9,7%	2	3,2%	62	49,2%
Total Developer Classification	24	19,0%	24	19,0%	20	15,9%	8	6,3%	5	4,0%	6	4,8%	18	14,3%	15	11,9%	6	4,8%	126	100,0%
Ownership structure																				
- Listed	9	18,8%	10	20,8%	7	14,6%	2	4,2%	2	4,2%	2	4,2%	8	16,7%	6	12,5%	2	4,2%	48	38,1%
- Unlisted	15	19,2%	14	17,9%	13	16,7%	6	7,7%	3	3,8%	4	5,1%	10	12,8%	9	11,5%	4	5,1%	78	61,9%
Total Ownership Structure	24	19,0%	24	19,0%	20	15,9%	8	6,3%	5	4,0%	6	4,8%	18	14,3%	15	11,9%	6	4,8%	126	100,0%
Geographic Scope																				
- Regional	2	20,0%	2	20,0%	1	10,0%	1	10,0%	0	0,0%	0	0,0%	2	20,0%	2	20,0%	0	0,0%	10	7,9%
- National	11	17,5%	13	20,6%	11	17,5%	2	3,2%	3	4,8%	3	4,8%	9	14,3%	9	14,3%	2	3,2%	63	50,0%
- International	11	20,8%	9	17,0%	8	15,1%	5	9,4%	2	3,8%	3	5,7%	7	13,2%	4	7,5%	4	7,5%	53	42,1%
Total Geographic Scope	24	19,0%	24	19,0%	20	15,9%	8	6,3%	5	4,0%	6	4,8%	18	14,3%	15	11,9%	6	4,8%	126	100,0%
Project Size Classification																				
- Small (EUR < 5 - 10 million)	3	17,6%	3	17,6%	2	11,8%	1	5,9%	1	5,9%	1	5,9%	3	17,6%	3	17,6%	0	0,0%	17	13,5%
- Medium (EUR > 10 - 50 million)	12	22,2%	10	18,5%	11	20,4%	2	3,7%	1	1,9%	2	3,7%	7	13,0%	8	14,8%	1	1,9%	54	42,9%
- Large (EUR > 50 - 250 million)	9	16,4%	11	20,0%	7	12,7%	5	9,1%	3	5,5%	3	5,5%	8	14,5%	4	7,3%	5	9,1%	55	43,7%
Total Project Size Classification	24	19,0%	24	19,0%	20	15,9%	8	6,3%	5	4,0%	6	4,8%	18	14,3%	15	11,9%	6	4,8%	126	100,0%

25) Is there a specialized committee that oversees risk management for the company?

	No		Yes		Number of Responses	
Total Respondants	19	28,8%	47	71,2%	66	100,0%

Developer Classification

- Mainly Trader-Developer	12	32,4%	25	67,6%	37	56,1%
- Mainly Investor-Developer	7	24,1%	22	75,9%	29	43,9%
Total Developer Classification	19	28,8%	47	71,2%	66	100,0%

p value (Fisher's exact test)	0,586	ϕ (Phi)	0,091	Cramer's V	0,091
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Ownership structure

- Listed	3	14,3%	18	85,7%	21	31,8%
- Unlisted	16	35,6%	29	64,4%	45	68,2%
Total Ownership Structure	19	28,8%	47	71,2%	66	100,0%

p value (Fisher's exact test)	0,089	ϕ (Phi)	-0,219	Cramer's V	0,219
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Geographic Scope

- Regional	3	50,0%	3	50,0%	6	9,1%
- National	11	32,4%	23	67,6%	34	51,5%
- International	5	19,2%	21	80,8%	26	39,4%
Total Geographic Scope	19	28,8%	47	71,2%	66	100,0%

p value (Fisher's exact test)	0,264	ϕ (Phi)	0,202	Cramer's V	0,202
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Project Size Classification

- Small (EUR < 5 - 10 million)	0	0,0%	7	100,0%	7	10,6%
- Medium (EUR > 10 - 50 million)	17	43,6%	22	56,4%	39	59,1%
- Large (EUR > 50 - 250 million)	2	10,0%	18	90,0%	20	30,3%
Total Project Size Classification	19	28,8%	47	71,2%	66	100,0%

p value (Fisher's exact test)	0,005	ϕ (Phi)	0,398	Cramer's V	0,398
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Appendix G - How the propositions were tested

To test proposition 1

The proposition was tested by means of investigations relating to the following questions:

1. Is the risk management process based on an enterprise wide risk management framework? Q6
2. Is it methodical and carried out using step-by-step procedures?
 - a. Setting corporate objectives Q11, Q12, Q24 b, Risk Identification Q 14.2, Q15
 - c. Risk Assessment Q14.1, Q14.3, Q14.4, Q18
 - d. Risk Control Q19
 - e. Risk Monitoring Q21.3, Q24.3, Q24.6, Q24.9
3. Is it purposefully regular Q16, Q17, Q19, Q21.5?
4. Are systematic tools utilised? Q15, Q18, Q21.7, Q23

To test proposition 2

The proposition was tested by means of investigations relating to the following questions:

Is the risk management process regular? Q17, Q19, Q24.8

How difficult does the organisation find the risk identification and risk assessment process? Q14.2, Q14.3, Q14.4

Does the organisation have a specialised risk management committee? Q25

To test proposition 3

The proposition was tested by means of investigations relating to the following questions:

Does the organisation have an enterprise-wide strategy for risk management? Q6

What are the drivers for implementing risk management in the organisation? Q11

Who has the primary responsibility of the risk management function and what is the composition of the risk management committee? Q13, Q25

To test proposition 4

The proposition was tested by means of investigations relating to the following questions:

What is the awareness and understanding of the concept of risk and risk appetite Q9, Q10, Q12.2, Q12.3, Q12.4, Q12.5?

What is the effectiveness of the risk management process in dealing with identified risks Q7, Q8?

To test proposition 5

The proposition was tested by means of investigations relating to the following questions:

Does the organisation have an enterprise-wide strategy for risk management? Q6

Does the organisation have a specialised risk management committee? Q25

To test proposition 6

The proposition was tested by means of investigation relating to the following questions:

How confident is the organisation in their risk management process? Q22, Q14.2, Q14.3, Q14.4

Are systematic tools utilised? Q15, Q18, Q21.7, Q23

Are there effective reporting lines? Q24.6

Is there adequate risk management training? Q24.7

To test proposition 7

The proposition was tested by investigations relating to the following questions:

What are the drivers for implementing risk management in the organisation? Q11

What is the awareness and understanding of the concept of risk and risk appetite? Q 9, Q10, Q12.2, Q12.3, Q12.4, Q12.5

What is the effectiveness of the risk management process in dealing with identified risks? Q7, Q8

To test proposition 8

The dissertation conducted limited quantitative analysis by means of statistical techniques, namely Fisher's exact test, Phi and Cramer's V, to measure the fundamental connection between empirical observation and mathematical analysis. To assess the association for two sets of variables the Chi-square test is used by default. However, the survey data do not satisfy the basic assumptions of the Chi-square test. This test supposes that the frequencies that are expected under the independence assumption are at least five. As several expected frequencies in the data of the questionnaire are less than five the Chi-square test is not applicable. Consequently a transition to the analogue exact test is necessary. Therefore Fisher's exact test was chosen to analyse the dependency structure of the variables. Because of its exact calculation approach this test has no requirements on the data. The significance of the independent variables; ownership structure, developer type, investment volumes and geographical scope on the dependent ones; risk perception indicators was proven by using the exact test of Fisher. Cramer's V was then used to determine the strength of association after Fisher's exact test determined the existence of significance.

The survey collected a wide range of structural characteristics of the respondent organisations (Appendix A - Questionnaire Q1 to Q25). The analysis begins with the grouping of the collected data into classes, in this case a contingency table (McCLAVE / BENSON / SINCICH, 2007). Fisher's exact test of independence was then applied to find out if there is significant relation between these independent variables (ownership structure, geographic scope, project size and developer type) and the dependent variables (the risk perception indicators).

The null hypothesis and the alternative hypothesis are formulated. The null hypothesis is that there is no relation between the risk perception indicators and the variables and the alternative hypothesis is that there is a relation between them:

H_0 : There is no association among the variables and the risk perception indicators;

H_a : There is an association among the variables and the risk perception indicators.