



Economic Relevance of Corporate Real Estate in Germany

Expert opinion commissioned by the client consortium

BASF SE

CoreNet Global Inc., Central Europe Chapter

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German Property Federation (ZIA)

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EXECUTIVE SUMMARY

The following study demonstrates the special importance of corporate real estate for the success of companies and for the stability of the German economy. In this study, the term 'corporate real estate' refers to any real estate that is directly used by companies for the production of goods or services, or at least that is acquired for this purpose. Real estate resources are in a constant conflict of interest between:

1. the users, who optimize them according to efficiency criteria governed by their individual production processes;
2. the owners, who wish to maximize the value of the capital they invested in the property;
3. the producers of buildings and real estate services, whose objective is the maximization of sales.

The main purpose of corporate real estate management is to efficiently solve the economic conflict of interest that arises between the operative business units and core property users, the finance department, and the construction and property unit and facility management.

At a value of 3,000 billion euro, corporate real estate amounts to one third of Germany's real estate assets

In 2013, approximate calculations estimate the total value of corporate real estate at 3,000 billion euros, the pro rata value of the premises being 500 billion euros. These figures are rough estimates. Although they are plausible in terms of scale, they do require detailed verification. The hypothesis claiming that corporate real estate is dominated by production proves to be incorrect when tested. Instead, it is trading and warehousing property that constitute the lion's share of areas held by corporate real estate at 35%. It is followed by office and administrative buildings at 29%, factory and workshop buildings at 22%, others at 10%, and hotels and restaurants at 4%. The availability of more precise information concerning buildings and premises would be desirable.

Real estate costs are regularly companies' second-largest pool of costs at 10–20%

Depending on a company's industry and business model, its real estate costs represent, on average, approximately 10-20% of its total costs. In the particular case of knowledge-intensive companies, they usually constitute the second-largest pool of costs after human resources. With regards to companies' cost management of real estate, the most important reference value is the life-cycle cost of buildings. The annual usage cost of a standard office building amounts to approximately 10% of the building's cost of construction. In cases of highly intensive

usage (e.g. in hospitals or educational institutions), this proportion can increase to a quarter or, in extreme cases, to a third of the building's construction cost.

Optimized CREM increases labor productivity by 13% on average

A comprehensive study conducted among people responsible for CREM in German companies suggests that the labor productivity of every staff member can be increased by an average 13%, approximately, through the optimization of real estate management. Based on this figure, it is possible to estimate that leveraging this real estate management potential would correspond to an increase in labor productivity representing 178 billion euros per year in Germany. This amount is equivalent to the total increase in labor productivity over the last 18 years. However, the effect of real estate resources on business success is highly complex and is not yet sufficiently understood, either from a scientific or a practical point of view. There is an urgent need for a complete and systemic explanation of the causal relationship between real estate resources and labor productivity, based on practical and theoretical research.

The strategic potential of real estate for companies' competitiveness is often underestimated

Corporate real estate management often guarantees companies' competitiveness. A company's stock of real estate is often a prerequisite for the strategic options of different business units. Because of their high degree of specificity, real estate assets can frequently influence a company's competitive position, both in the procurement markets (in particular the labor market) and in the sales markets, independently of whether the business unit is in a situation of cost competition or quality competition. In the current labor market, for example, real estate management can offer good opportunities for companies to succeed in the "war of talents" by designing attractive workplaces. Likewise, real estate resources used effectively are often the source of strategic cost and differentiation advantages. To the rest of the world, real estate can be a visible symbol of a company's economic prosperity and stability, as well as a sign of its innovative strength and flexibility. A

company's stock of real estate shapes to a significant extent its identity-establishing values, such as ecological orientation, climate protection awareness, employee orientation, or cultural and social responsibility.

At 2,100 billion euros, German companies have tied up a very large part of their capital in real estate

For companies, real estate does not only constitute a resource, but also an important capital investment. German companies hold an average of 70% of the real estate they use as their own property. Based on the assumptions made above concerning the total value of German corporate real estate, companies' real estate assets in Germany amount to 2.1 trillion euros. Thus, German companies attach extraordinary importance to their real estate property. The average ownership rate of large German corporations represents about two-thirds of the real estate they use. For their part, small and medium-sized German companies own three-quarters of the facilities they use. In the U.S. and in Asia, the ownership rate in corporate real estate are much lower, at 20% and 30% respectively. From the point of view of company funding, there are serious arguments against real estate ownership. Furthermore, empirical studies conducted in the U.S. impressively demonstrate that the capital market does not reward listed companies' investments into corporate real estate. Conversely, divestment from corporate real estate positively correlates with stock prices. Moreover, it seems problematic that only about half of German companies attach a return on investment target to capital tied up in real estate, submitting it to financial controlling.

In the German real estate capital market, corporate real estate is only of a very selective importance

Unlike the situation in the U.S. and Asia, the capital market culture in the German corporate real estate market is weak. Consequently, of the approx. 3,000 billion euros worth of corporate real estate, only a negligible 46 billion was held by closed-end funds and 37 billion by open-end funds. In order for German companies to reduce their ownership rates, they need partners in the real estate capital markets. However, these partners are not available to them. The real estate stock obviously does not suit the traditional preferences of the leading institutional real estate investors in Germany in terms of location, type of use, or usage concept. For instance, just under two-thirds of CRE office space is located outside of office centers. Instead of funding companies' real estate assets through specifically targeted real estate investment vehicles, these assets are funded through companies' balance sheets. Consequently, the book value of the real estate owned by DAX companies averages 20% of their market capitalization.

Mathematically speaking, one in 11 employees deals with the provision of real estate resources

German companies are important market partners of the construction and real estate industries. For every ten employees working for German companies, there is one employee who deals with the provision of corporate real estate. Over the last 11 years, the provision of corporate real estate has caused annual investments of around 16 billion euros into new buildings. Based on an employment multiplier of 2.6, this led to an average aggregate demand of 43 billion euros per year.

Corporate real estate has a significant co-responsibility for companies' ecological footprint

Corporate real estate usage amounts to approximately 10% of the German residential and transportation area. Likewise, the operations of corporate real estate are responsible for around 10% of German energy consumption. Because data concerning the energy consumption of commercial real estate is generally scant, the previous estimate is only a rough initial approximation. If this estimate were to be confirmed, it would mean that approximately one fifth of companies' energy consumption is caused by the operation of their buildings. Thus, there is a great potential for the reduction of companies' energy consumption.

Level of corporate real estate management by German companies quite limited

The efforts undertaken and the success achieved so far in establishing corporate real estate management in German companies have been quite diverse. While advanced structures can be found in the possession of about half the major German corporations and a third of the small and medium-sized enterprises, most companies still have to catch up significantly. The greatest potential can be found in systems to control the use of space by companies' various departments, in the structural involvement of real estate management in the company's organization (in particular the bundling of real estate tasks and competences), and in the optimization of the cooperation between the real estate department and the users of the space in order to solve problems concerning the physical organization of work processes. The potential for efficiency improvement in real estate management is significant. Studies show that the introduction of better practices in corporate real estate management has allowed companies to reduce their real estate costs by an average of 30%.

The intensification of corporate real estate management as a great challenge for companies, the real estate industry, and politics

It is hard to understand why companies, capital markets, politics, and public administrations have neglected corporate real estate so much. It is probably due to the complex systemic interdependencies and simultaneous multifaceted stakeholder interests, which this report attempts to disentangle and clarify, that the agents involved have the impression that they cannot make a real difference. Furthermore, although real estate used by companies is always part of their business, it is not usually perceived as performing a crucial function, except in cases such as hotels or retail outlets. This report will show that lack of information, lethargy, and low prioritization in handling corporate real estate result in major inefficiency, both in micro- and macroeconomic terms. Consequently, there is a significant success potential for companies in the more deliberate use of corporate real estate. Changing work environments in the context of further developments in information and communication technology will lead to an increase in international competition. In this increasingly competitive environment, the optimization of real estate resources still holds great potential for the betterment of labor productivity, which will benefit both companies and the German economy as a whole. The evolution of real estate management will be decisive for the success of businesses in the future. Without the appropriate real estate concepts, companies will not be able to implement more deeply networked and regionally decentralized economic processes with places of work near employees' residences. Only companies operating in countries that can adjust their space usage and stock of real estate rapidly to the changing work conditions will be competitive in the future. The necessary optimization processes should lead to increased value creation by the real estate industry, thereby resulting in more employment in the construction and real estate industry – Germany's largest industry. This value creation will at least partially re-finance the necessary investments on a macroeconomic scale. If companies increase their focus on their real estate resources, it will offer the German real estate industry an opportunity to prove its innovative strength through new products, processes, and business models. Such innovative energy has not been apparent in this industry in the recent past.

In terms of environmental policy, corporate real estate offers great potential for the reduction of land and energy consumption. The implementation of energy-saving measures, in particular, has focused little attention on the potential offered by commercially or industrially used real estate compared to

the attention it has given to residential property. By way of conclusion, it must be said that companies, the real estate industry, and politics and administration should dedicate much more attention to corporate real estate in order to leverage its potential for sustainable and successful economic development.

1 INTRODUCTION

Real estate is the physical precondition for any type of production. Whether it is a plant construction firm that manufactures a machine, an author who writes a book, or an online bank that manages an account – no economic activity is conceivable without a physical place to perform the job. Real estate is not only a fundamental precondition, but it is often also a success and competitive factor leading to success.

In the case of hotels and in retail trade, it is obvious that the business performed in the building depends substantially on the location, usage concept, and quality of the property. However, this link is probably much more indirect and definitely less obvious in the case of server farms and online banks. The aggregation of the studies analyzed in this paper shows that awareness of the importance of real estate as a performance resource for companies has been significantly increasing since the 1990s. At the same time, it shows that real estate resources are managed at very diverse levels of professionalism in companies, independently of their importance for these companies' performance.¹ In particular, small and medium-sized companies in Germany have given the matter hardly any consideration.² All in all, a picture emerges in which German companies have given low priority to the management of real estate as an active resource in the production of their goods and services. As the following study shows, although these observations can be readily explained, it is clear that companies neglect a significant potential for productivity improvement. This potential has an impact on the competitiveness of Germany as a business location. Thus, the question arises of how companies can focus the potential of real estate management more appropriately in the future, both in macro- and microeconomic terms.

This study is targeted at the following addressees and has the following objectives:

- 1. For the top management level in German companies, the objective is to increase awareness of company real estate as a resource that has a crucial influence on business success. In addition, this study will expose the status quo and the fundamental opportunities for and limits to optimization of company-related real estate management.**
- 2. For institutional real estate investors and real estate service providers – both acting as market partners of the corporations – the aim is to provide a better understanding of real estate management by companies and an indication of the market potentials and of the changes in demand to be expected in the future.**

- 3. For stakeholders in politics and public administration, I will try to indicate the social, economic, and ecological relevance of corporate real estate and to show the potential that its more intensive inclusion in the various areas of policy-making offers.**

Another objective of this study is to provide fundamental facts and figures concerning real estate in companies that do not have real estate management as their core business (non-property companies) and concerning corporate real estate management in Germany generally. The study's validity is limited by the relative lack of information pertaining to real estate used by companies in general, and corporate real estate management in particular. A large part of the knowledge base concerning this management function refers to property used for offices, logistics, and retail. At the same time, the level of knowledge concerning production and similar types of usage is very low. As no primary research was conducted in the context of this study, it cannot cover production facilities and similar real estate as thoroughly as would really be required. This deficit is deplorable and overcoming it should be the prime object of subsequent research as soon as possible.

In chapters 2 to 6, the study delineates the status quo of corporate real estate management in Germany. These chapters are informed by existing literature sources, published studies, lecture documentation, and detailed interviews with pertinent experts. As this study aims to provide the most comprehensive overview possible, it cannot at the same time hope to be very detailed. For more detailed information, I provide numerous references pointing to more in-depth analyses. As mentioned previously, I have not performed any field research for this study. Instead, I have identified areas where available data seems to be poor and indicated possible approaches for further research.

In chapter 7, I have deduced the consequent need for future action and made some basic recommendations. My statements are divided in three separate sections. A first section, directed at the top management of German companies, in-

¹See Pfür/Weiland (2010).

²See Pfür et al (2008).

dicates the possibilities of optimizing corporate real estate management. The second section sketches possible developments towards a more intensive cooperation of German companies with the real estate industry. The third section follows with suggestions of ways in which corporate real estate can be used for greater effect in the implementation of political objectives. These three sections in chapter 7 were written in a way to make them readily understandable even to readers who have not read the previous chapters on the fundamentals.

2 CORPORATE REAL ESTATE AS PART OF THE GERMAN ECONOMY

2.1 Definition and particularities of real estate resources

In economic research, real estate has always been considered as an indispensable part of a company's production factors.³ Real estate resources are facilities that constitute a potential factor. In other words, it means that they do not become part of the product in the production process. Contrary to mobile resources, real estate resources are stationary and, at least as far as the land is concerned, hardly subject to wear or destruction. In publications that follow the "resource-based view of the firm,"⁴ real estate is considered to be part of a company's physical resources, which, together with the intangible, financial, and organizational resources, constitute the entirety of the factors any company is endowed with. The resource-based theory of enterprises assumes that it is not market potential, but unique specific resources that ensure a company's success. From the point of view of the resource-based theory of enterprises, real estate is usually seen as a unique resource. Compared to other production factors, it wears slowly and is often hard to emulate or substitute. According to this theory, real estate is highly specific, giving rise, to a large extent, to a company's success and by extension, its existence.⁵ A company's stock of real estate resources is thus elementary.

It has never been questioned whether real estate should be considered part of a company's resources. Nevertheless, it is difficult to find a widespread and concrete definition of the term real estate. In Germany, the physical delineation and ownership of property are established via land registration. "Real estate is an asset in the form of land or rights equivalent to real property, buildings and appurtenances whose cost and benefit have – in the course of time – an influence on the achievement of targets by economic subjects (AP: here, companies). Depending on their potential economic usages, real estate resources can be either a subset or a group of premises, rights equivalent to real property, or a material component thereof within the meaning of the German civil code."⁶

Corporate real estate

Both in common usage and in general business economics, corporate real estate refers to all real estate as defined above that serves as a resource to produce goods or services. A generally accepted definition does not exist, as there are various usages of corporate real estate in practice, particularly to create individual market segments. For instance, the market research company BulwienGesa and Wikipedia define corporate real estate *strictu sensu* as a special type of usage of real estate, i.e. any real estate used partially for production purposes, partially for logistics purposes, partially for office purposes, or other mixed-use commercial property. They define corporate real estate *sensu largo* as "... all the real estate used for operations."⁷ Against the background of my earlier statements and in particular for the sake of compatibility with general economic knowledge, I will use the latter definition.

Organizational real estate

If we considered not only the resources of companies, but also those of not-for-profit organizations such as public service institutions, it would be more correct to speak of organizational real estate.⁸ However, this term is not very common in Germany.⁹ Because of the special governance structures of not-for-profit organizations, such as the state or the Churches, their management has a different scope of action, which results in specific problems regarding their real estate. Public service accounting principles, for instance, entail specific problems for value-oriented real estate management. I will not deal with the problems particular to public real estate management or to other not-for-profit organizations in detail. Nevertheless, the real estate used by not-for-profit organizations also requires the functions of real estate management to be dispensed. I have therefore included such real estate in the body of data at the basis of this study and in the calculations contained therein.

³ See Gutenberg (1983), p. 71 ff.

⁴ For the resource-based view see Penrose (1959).

⁵ Pfñür (2002), p. 35 f.

⁶ Pfñür (2002), p. 9.

⁷ Wikipedia (2013), <http://de.wikipedia.org/wiki/Unternehmensimmobilie>, accessed on June 25th, 2013.

⁸ For the difference between the terms company and organization, see Schierenbeck (2003), p. 23.

⁹ There is, however, an entry to the same effect in Wikipedia: <http://de.wikipedia.org/wiki/Betriebsimmobilie>. Accessed on August 8th, 2013.

Commercial real estate

In common usage, the term commercial property refers to all real estate that serves as a physical place for the production of goods or services, thus meaning that it is explicitly non-residential. If the properties used as a body of experience for this study are separated by type of usage, they will initially encompass all commercial real estate. Additionally, many companies also have residential properties on their balance sheet, considering them at least partially necessary for their operations. This may be the case for instance if sufficient human resources cannot be obtained at a certain location unless residential space is made available, or if the janitor must have his residence on the company's premises for operational reasons. These instances, however, are rather rare in the market. For the sake of simplification, I have not considered residential properties in the present study. Nevertheless, it is essential to remember that companies may be owners of large stocks of residential property. Yet, the acquisition of these stocks of residential properties is not directly operationally motivated; instead, it serves other objectives such as capital investment or corporate responsibility. These residential properties are therefore not part of the real estate necessary for the company's operations.

Operator properties

A crucial characteristic of commercially used real estate is that it constitutes one of a company's many resources and usually has no significant influence on the company's business model. From the point of view of a company's Porter's cluster, real estate management is a secondary process.¹⁰ However, in cases such as in retail shops, in parts of logistics, the hospitality industry (hotels, restaurants, leisure establishments, etc.), and the health system, real estate management assumes much greater importance, as does finding a way to control systems directly geared to the optimization of real estate productivity. While this type of real estate, often referred to as operator properties, is clearly part of commercially used real estate, its management usually entails specific problems that are less relevant for this study. I will only consider these specific problems in passing. Nevertheless, even operator property requires that general real estate management tasks be performed. I have therefore included it in the body of data used in this study.

Corporate Real Estate

Contrary to industry reports in which employees, companies, or revenues may or may not be included in calculations depending on the studies' design,¹¹ it is possible to define the subject of investigation clearly and unambiguously here. The

more difficult task is to find the right, unambiguous term for this definition. In order to avoid terminological confusion and to find an easily understandable term, I will speak neither of "corporate real estate sensu largo" nor of "organizational real estate" nor of "commercial real estate." Instead, I will use the term corporate real estate. In the field, there is a distinction between public and corporate real estate. This distinction may make sense in the context of the problems particular to real estate owned by public institutions. However, I have included public real estate properties in corporate real estate in this study as the problems addressed here pertain to public real estate properties as well. In the U.S., the term corporate real estate is used in the same way as in this study.¹² I will use the terms corporate real estate and real estate used by companies interchangeably.

In this study, the term "corporate real estate" will be used to refer to any real estate directly used by companies for the production of goods or services, or at least acquired for this purpose. This definition will not include residential property, as it is at best indirectly used to produce goods or services.

2.2 Economic functions of corporate real estate

As indicated in the previous section, real estate has always been considered a potential factor in the production factor system, which is also subsumed under the term assets. In the facility management literature, however, real estate has always played a surprisingly small role at first glance.¹³ Yet, upon closer scrutiny, it becomes apparent that real estate properties as economic entities are sufficiently unique to necessitate a special type of management that is different from classical asset management. In economics, real estate has three purposes. First, it is an investment for investors. Traditionally, this is how the real estate industry primarily sees the buying of properties. Second, built-up commercial property and services are also the result of goods and services produced by the construction and real estate service industries. Third, commercial property, as indicated above, is a production factor in the process of producing goods and services. Thus, every property has three functions to fulfill as an economic asset – one extra function compared to nearly all similar assets. Real estate serves the purposes of capital investors first, of producers in the construction and real estate service industry second, and of operative business divisions and administrative units using it as a resource third. By contrast, in the case of durable assets such as passenger cars, only the interests of the producer/service provider of the asset and of its

¹⁰ See Porter (1996).

¹¹ Without any comment on its quality being implied, this is a problem that, for example, the FM industry report 2010 on the macroeconomic importance of the facility management industry has; see Tomzik et al. (2010), p. 15.

¹² See Brown et al. (1992).

¹³ See e.g. Männel (1968) etc.

users usually need to be considered. This difference is mainly due to the fact that an independent capital investment interest normally does need to be considered. Other assets, which serve primarily for capital investment purposes, such as gold, are subject to investors' and producers' interests, not users'.

A problematic aspect of real estate is that it is the target of the interests of three equally important parties: the investors, the users, and the producers. Consequently, the complexity of the management of corporate real estate is much higher than that of mobile assets or of non-real estate investments in practice. It always requires interdisciplinary abilities, including real estate-related investment management, the ability to plan, build, and operate the property, and to manage real estate resources. All of this is required for a single property, which must always be managed in a way that balances all three parties' interests. The coordinating mechanisms used for such balancing often span several markets at the same time, such as real estate space markets and real estate investment markets (see Figure 1).

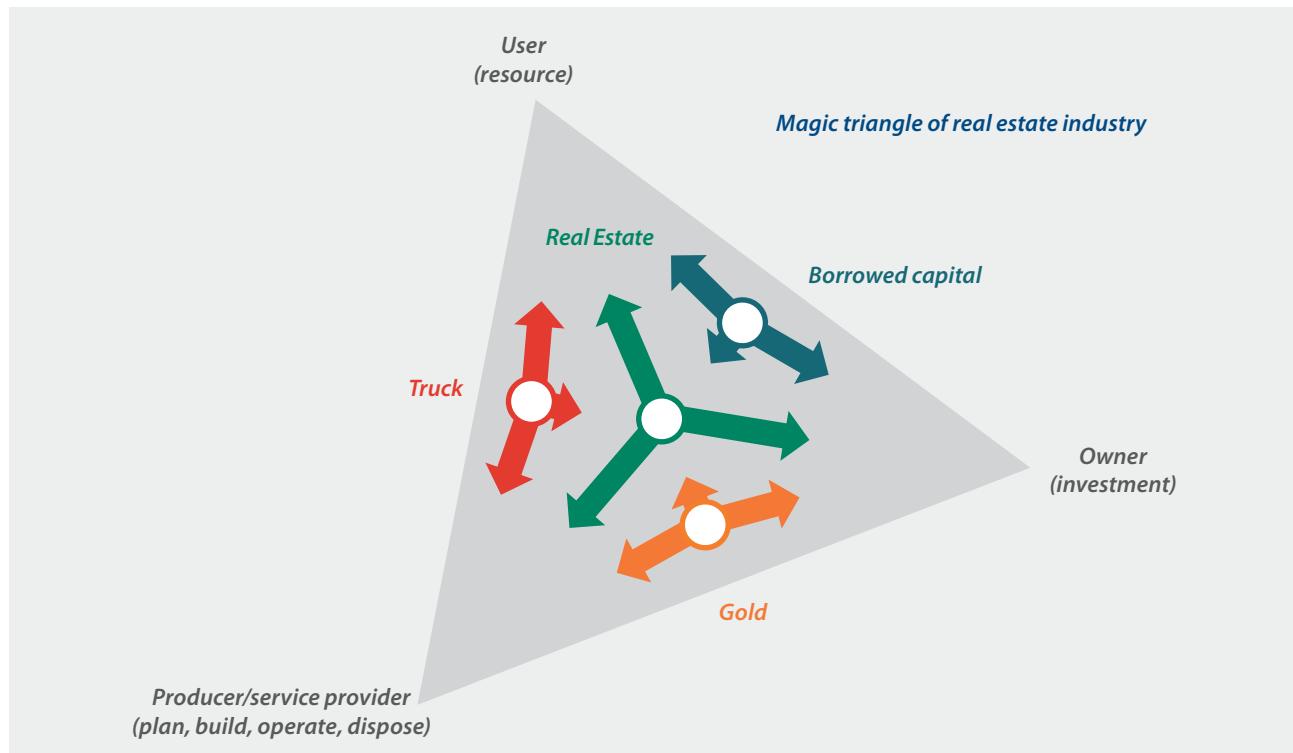
By way of summary, it can be said that in the economic process, corporate real estate must be viewed from three perspectives: the user's, the producer's, and the owner's. These three perspectives must be balanced through a management process.

2.3 Importance of corporate real estate in the real estate industry

If we consider the real estate industry as encompassing all companies dealing with the use of real estate according to economic principles, then it is the job of this industry to ensure a sustainable balancing of the interests of all vested parties. In both economic theory and practice, it is striking that commercial real estate is viewed first as a capital investment, and second as the outcome of a production process – both globally, but particularly so in Germany. This view is particularly evident in the following examples:

1. Where the term "residential and real estate industry" is used in official sources, it refers in particular to "... the management of real estate. This is in particular the letting, leasing, administration, and brokerage of real estate."¹⁴ While this definition may be suitable for many purposes, it is not indicative of a holistic view of the real estate industry. As long as the perspective of property usage is not taken into consideration, this definition reckons without tenant-users.
2. An analysis of the contents of all relevant real estate research conferences of the last decade shows that only 6% of all research projects dealt directly with user issues and 16% dealt with further issues that referred to problems that also affect users. On the other hand, 70% of all

Figure 1: Functions of real estate as an economic asset



Source: Kämper-Dern/Pfünfner/Roulac (2013).

¹⁴ See BMVBS (2013), *Bundestagsdrucksache 17/11200* and the classification of industries (Wirtschaftszweigklassifikation) published by German Federal Office of Statistics (Statistisches Bundesamt).

studies dealt with problems affecting investors.¹⁵

3. The only real estate training courses that teach students to specifically consider real estate resources from the user's perspective are the intensive training course **Corporate Real Estate Management** at the International Real Estate Business School (IREBS) and the **Master of Corporate Real Estate**. Within the 140 courses of study listed in the study guide of the Society of Property Researchers, Germany (gif), content regarding real estate issues from the user's perspective generally accounts for the very low proportion of 5–10% of the curriculum.¹⁶ The vast majority of topics in the curriculum concern problems viewed from the investors' perspective.
4. In terms of the level of organization and representation of groups with interests in the economic process of the real estate industry, we find again that real estate investors and producers are represented in various associations and networks. Financers, for instance, are represented by RICS, the Federal Association Investment and Asset Management e.V. (BVI), the Federal Association Fixed Assets and Investment Capital (BSI, formerly VGF) and the German Property Federation (ZIA), in which the vast majority of members are still real estate investors. The producers of real estate and of real estate services are represented, for example, by the Main Association of the German Construction Industry, the Central Association of the German Construction Industry (ZDB), and the German Facility Management Association (GEFMA). By comparison, the representation of users of corporate real estate vis-à-vis the industry, society, public administration and politics is relatively weak. There is only one network specifically targeted at this clientele: CoreNet Global Central Europe, which focuses on the joint representation of interests.

In chapter 3, I will try to determine whether this lopsided view of corporate real estate in the economic process is actually justified or whether it should be adjusted.

2.4 Definition of the term corporate real estate management

Globally, the term corporate real estate management (CREM) is currently somewhere between a buzzword and a concept. For the purposes of this study, we will use the following definition:

"Corporate real estate management (CREM) shall denote all real estate activities of a company whose core business is not in real estate. CREM is concerned with the economic procurement, administration and

utilization of real estate of production, trading, and service businesses in the context of their company strategy. The real estate is used for the implementation and support of the core activities."¹⁷

In addition to this definition, there are a number of other definitions that are comparable in principle and deviate only marginally from each other.¹⁸ Based on the particularities of real estate as a resource involved in companies' production processes, corporate real estate management also requires a three-perspective approach. For CREM, real estate always involves the user's, the owner's, and the producer's perspectives (see Figure 2).

These various perspectives highlight the multifaceted network of CREM when it comes to handling real estate tasks. By definition, the user perspective should constitute a core element of any CREM unit. Intensive cooperation with the business units and the corporate functions of a company is required. Dispensation of the tasks from the investor's perspective requires intensive cooperation with the company's corporate finance department, particularly when a substantial share of the company's capital is tied up in real estate. Finally, the tasks in the field of real estate production and real estate services demand close cooperation with the company's construction units, real estate departments, and facility management, as well as with its numerous market partners in this area. The CREM's *raison d'être* is to achieve the most effective balancing of interests possible between the three perspectives' often competing targets and to ensure efficient real estate management implementation.¹⁹

2.5 Approach to an empirical survey of corporate real estate

There are no official statistics on the quantities of real estate used by companies in Germany. The Federal Statistics Office only distinguishes between residential and non-residential property and in essence only subjects the first to in-depth analyses. Other institutions that usually collect real estate-related market data have not directly researched non-residential property either. Consequently, the following statements are only approximations obtained through projections and estimates.

2.5.1 Total area of corporate real estate

Currently, there is only scant information regarding non-residential buildings in the Federal Republic of Germany – this being the official terminology used by the German public administration. On the commission of the Federal Transport Ministry (BMVBS),²⁰ Dirlich et al. made the first attempt to collate the existing data and to provide an initial overview.

¹⁵ See Pfür (2013).

¹⁶ For real estate courses of study, see the gif homepage: <https://www.gif-ev.de/studienfuehrer.209/index/>, accessed on July 30th, 2013.

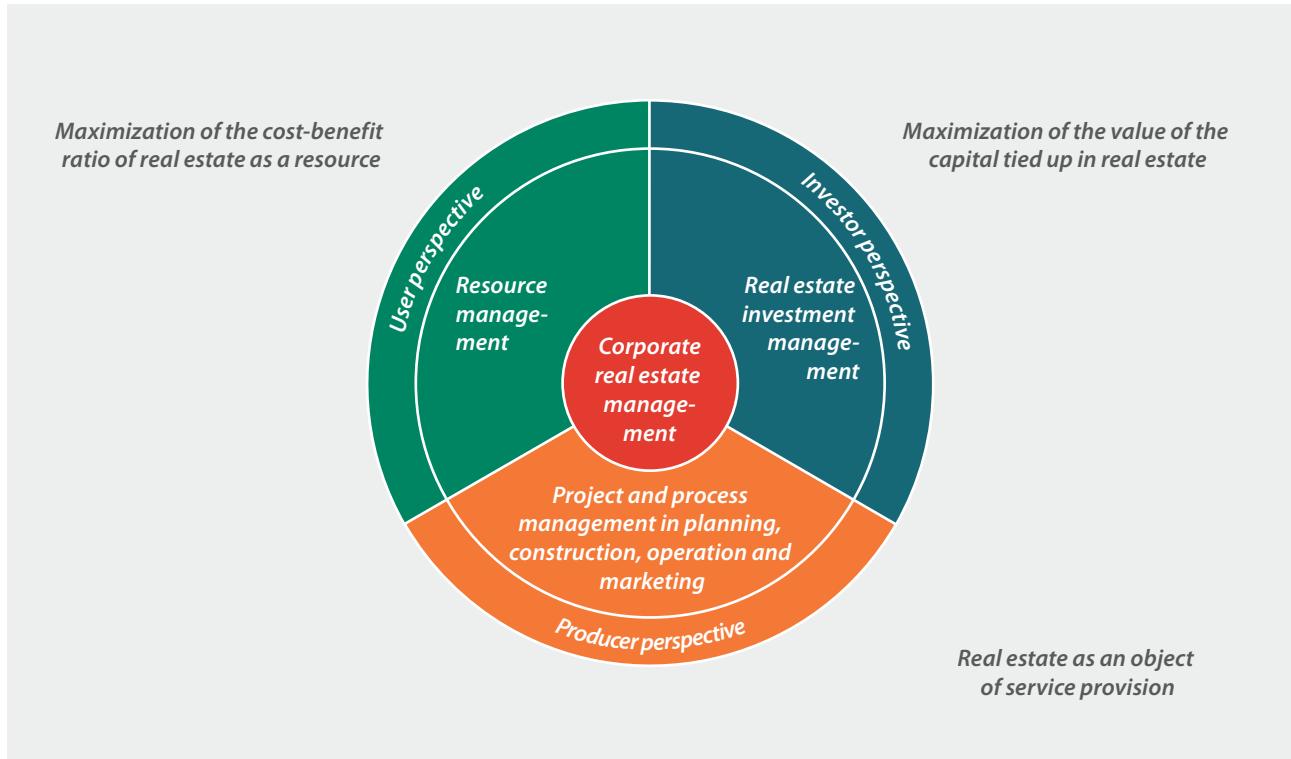
¹⁷ Pfür (2011).

¹⁸ For an overview, see Hartmann (2011), pp. 49 ff.

¹⁹ See Pfür (2011), pp. 23 ff.

²⁰ See BMVBS (2011).

Figure 2: Perspectives model of CREM



Source: Based on Pfniür (2011), p. 24.

I must admit, however, that the data available is still very rough and must be treated very carefully. For instance, different approaches to projections of floor space and authors' different estimates lead to markedly different results. The stock of office and administrative buildings varies between 200 and 470 MM square meters. With factory and workshop buildings, the range is from 400 to 746 MM square meters and with trading and warehousing buildings, it is from 600 to 1,269 MM square meters.²¹ This study makes it quite clear that there is no really reliable source of information concerning the quantitative stock of corporate real estate available.

Table 1: Projection of stock of non-residential buildings based on new build activity

Type of non-residential building	Floor space [MM sqm]	Number of buildings [MM buildings]
Institutional buildings	172	0.067
Office and administrative buildings	470	0.28
Agricultural buildings	604	1.009
Non-agricultural buildings	2,367	2.038
– factory and workshop buildings	746	0.539
– trading and warehousing buildings	1,269	0.96
– Hotels and restaurants	71	0.074
Other non-residential buildings	299	0.349
Non-residential buildings total	3,913	3.742

Source: The author's compilation based on figures by BMVBS (2011), p. 106.

2.5.2 The share of corporate real estate in the economy's total assets

There are several ways to estimate the total value of corporate real estate in Germany. Even the authors of the study commissioned by BMVBS (2011) mentioned above use real estate values as a basis for their calculation in order to approximate quantitative floor spaces. Three alternative approaches will be explained below.

1. National account

The first approach is via national accounts,²² which show the net value of non-residential property on an annual basis. In order to calculate the value of fixed assets, the national account approach accumulates the construction investments made in the past. This calculation does not include land value. To give the most realistic value and make values comparable over time, investments are valued at replacement prices. The net valuation decreases investment values by the amount of depreciation. Contrary to gross valuation, net valuation accounts for the devaluation of buildings over time. Because the net valuation should be closer to the market value of properties, it seems to be more suit-

²¹ See BMVBS (2011), p. 112.

²² See Statistisches Bundesamt (2007), pp. 17 ff.

able for the purposes of this study. The net replacement value of non-residential buildings was of 2,919 bn euros at the end of 2012. The value of the land on which non-residential buildings are built must be added to this amount. According to estimates made by Voigtländer et al., the land value of built-up premises was 2.7 trillion euros as of 2012.²³ According to further estimates by Voigtländer et al. (2009), approx. 25% of this amount (or 675 bn euros worth of land) are built up with non-residential buildings.²⁴

To determine the value of the corporate real estate, it is necessary to consider all non-residential buildings and their land, minus those properties that are not dedicated to CREM usages. A ball-point estimate would be that this represents about

half the “other buildings” category in addition to the educational, health system, and leisure buildings and their land (approx. 20% of the non-residential stock). For 2012, this results in a net investment value of corporate real estate at replacement prices of 2,875 bn euros. I will now introduce further approaches of calculating CRE assets in order to calculate the value in 2013 prices. For purposes of comparison, an inflation rate of 3% can be assumed. The resulting CRE value for 2013 is 2,961 bn euros. The calculation is illustrated in Table 2 below.

Table 2: Approach to corporate real estate values by national account method (price basis 2013)

Item	Bn Euro
Net investment value non-residential buildings at replacement prices (2012)	2,919
Value of land attributable to non-residential buildings (2012)	675
Value non-residential buildings incl. non-residential buildings (2012)	3,594
Share of non-CRE usage in non-residential usages (estimated approx. 20%) (2012)	719
Total value corporate real estate (excluding agriculture) (2012)	2,875
Total value corporate real estate (excluding agriculture) (2013)	2,961

Sources: www.destatis.de (2013), Voigtländer et al. (2009), Voigtländer et al. (2013).

Assuming that companies own on average 70% of the real estate they use,²⁵ the real estate assets of companies based on the national account calculation amounts to 2,073 bn euros. Companies lease 888 bn. euros worth of additional real estate.

2. Ratable value

In 2003,²⁶ the “Rat der Immobilienweisen” (Council of Real Estate Experts) determined the value of real estate assets in the German economy by means of ratable values. Looking at the

value of corporate real estate as a subset of the total value, the following picture emerges:

Table 3: Ratable values of commercial real estate

Usage	Number	Average value per unit in euros	Bn Euro
Office Space in sqm	335,000,000	1,500	503
Retail space in sqm	107,500,000	1,500	161
Hotel rooms	590,000	50,000	30
Commercial space and others acc. to Federal Statistics Office	1,870,000,000	500	935
Total value of buildings with CRE usage in 2003			1,628
Market value in 2013 (3% inflation)			2,188
Land value			556
Total value of corporate real estate			2,744

Source: The author's calculation based on information provided by Rat der Immobilienweisen (2003), p.21.

Adding the pro-rata land value amounting to 556 bn euros,²⁷ the resulting total value of real estate used by German companies is approx. 2.7 trillion euros.

3. Book values

In his rough calculation of the value of real estate owned by German companies based on balance sheet data from 2003, Roland Berger arrives at a total value of 2 trillion euros. Assuming an inflation rate of 3%, the expected total value of

real estate assets on companies' balance sheets for 2013 amounts to 2.7 trillion euros.²⁸ The 2003 balance sheets used as a reference here only show the property owned by companies. Following the earlier assumption that companies own 70% of the real estate they use, it is possible to infer that the total value of space they lease amounts to 1.1 trillion euros. The total value of corporate real estate in 2013 prices calculated amounts to 3.8 trillion euros according to this calculation.

This approach to calculate the total value of CRE in Germany is more problematic than the two previous methods presented above. It ignores the fact that German companies' balance sheets include real estate held abroad and that foreigners also own German real estate. German companies probably have more foreign property in their balance sheets than the amount of property owned by foreigners in Germany, so Berger's figure of 3.8 trillion is likely to be an overestimate.

²³ See Voigtländer et al. (2013), p. 18.

²⁴ See Voigtländer et al. (2009), p. IV.

²⁵ For computation of ownership rate, see pp. 35 ff.

²⁶ See Rat der Immobilienweisen (2003), pp. 17 ff.

²⁷ The original source does not indicate how to handle pro-rata land values. For calculation of land values see Table 2. The land assets attributable to non-residential buildings amounts to 675 bn euros. Of these, 80% or 540 bn euros can be attributed to some type of corporate real estate usage. The projection for total land values for the year 2013 (inflation rate 3%) is 556 bn euros.

²⁸ See Henzelmann (2005).

However, this computation method, like any other computation based on balance sheet data, probably significantly underestimates the actual real estate assets held by companies as balance sheet items contain hidden reserves.

4. Interim results

Overall, the different approaches presented above yield a pretty uniform picture of the value of corporate real estate. Nevertheless, all of these methods only provide rough approximations. At this stage, there is no summation of the value of corporate real estate in Germany that is anywhere near reliable by scientific standards. Adding up all real estate used operationally by both business and public administrations in the narrow sense of the word, the gross investment value including land amounts to approximately 3 trillion euros. The value determined by the Wirtschaftsweisen based on the ratable values adds up to 2.7 trillion euros, and the value based on balance sheet data to 8 trillion euros. Based on the overall picture derived from these three calculations, I will assume for the purposes of this study that the value of corporate real estate in Germany as of 2013 amounts to 3 trillion euros, of which 500 billion are attributable to pro-rata land values.

2.5.3 Corporate real estate values by property usage type

Real estate assets differ substantially according to how they are used, either as office property, retail property, logistics property, production property, research and development property, hotel property, leisure property, or other property. There is no register of commercial real estate that indicates the quantity or value of properties according to their use. All information on stocks are either estimates or are based on more or less precise interpolations performed by market players and observers.²⁹

A comparatively systematic approach that is not only based on estimates is the determination of the stock of real estate on the basis of statistics regarding the construction completion of non-residential buildings by the Federal Statistics Office.³⁰ These statistics cover the period from 2000–2011. Over these 11 years, an average of 21 bn euros were invested annually in the creation of new buildings, excluding the investment in land.

The following picture emerges when computing the total corporate real estate building assets based on the relative values of construction completion by usage, as shown in Table 4, and

Table 4: Construction completion of non-residential buildings by type of use in 2000–2010

Usage	Completions 2000–2010 in M euros	% of total
Office and administrative buildings	47,136,454	20%
Factory and workshop buildings	35,772,377	15%
Trading and warehousing buildings	56,569,769	25%
Hotels and restaurants	7,052,117	3%
Institutional buildings	21,065,032	9%
Agricultural buildings	13,970,277	6%
Other non-residential buildings	34,121,289	15%
Non-residential buildings total	230,889,076	100%

Source: Statistisches Bundesamt (2012), the author's calculations.

ignoring institutional and agricultural buildings and half the "other non-residential buildings", (see Figure 3):

Assuming that the total value of CRE buildings is of 2.5 trillion euros, as determined in the previous section, trading and warehousing buildings have the largest share at about 865 bn euros. They are followed by office and administrative buildings at 720 bn euros, factory and workshop buildings at 547 bn euros, other buildings at 260 bn euros, and hotels and restaurants at 108 bn euros.

2.5.4 Regional distribution of corporate real estate

Real estate used for a company's operations is naturally situated at that company's location. However, large differences become apparent when comparing the regional distribution of gross domestic product generation with the locations where institutional real investors invest in property. While real estate investors focus on the internationally visible submarkets of Berlin, Dresden, Düsseldorf, Frankfurt, Hamburg, Cologne, Leipzig, Munich and Stuttgart,³¹ economic added value and by extension the stock of real estate is much more widely distributed. Generally speaking, information regarding the regional distribution of commercial real estate markets is available only for selected submarkets, and even in those cases it is limited. There is no general overview of the distribution of commercial real estate in Germany. A very instructive estimate, however, can be found in the regional rental office space survey conducted by Voigtländer et al., which differentiates the 311 MM sqm net floor space (380 MM sqm gross floor space) and the 13 MM office workers by county (see Figure 4).³²

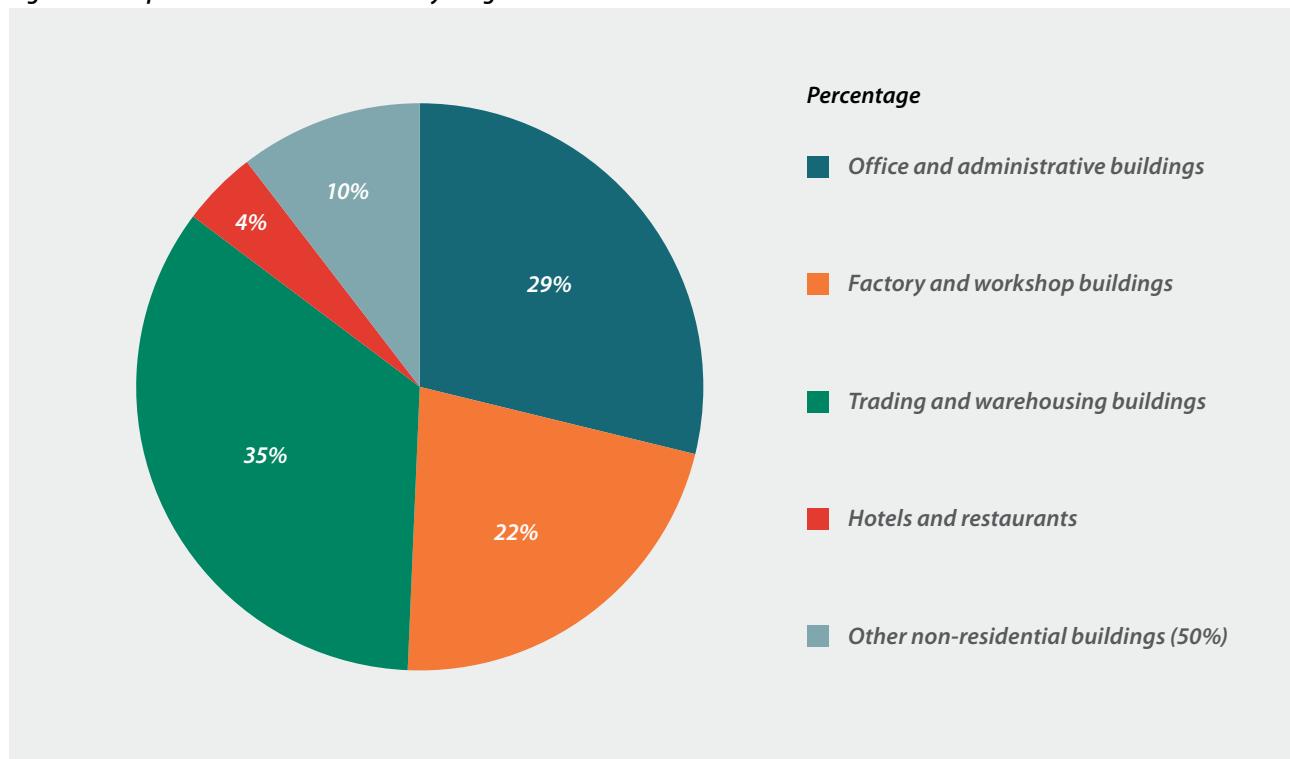
²⁹ See BulwienGesa (2013a), pp. 1 f.

³⁰ In addition to the asset values shown here there are also figures based on floor space.

³¹ See the real estate market reports published by international brokerage firms.

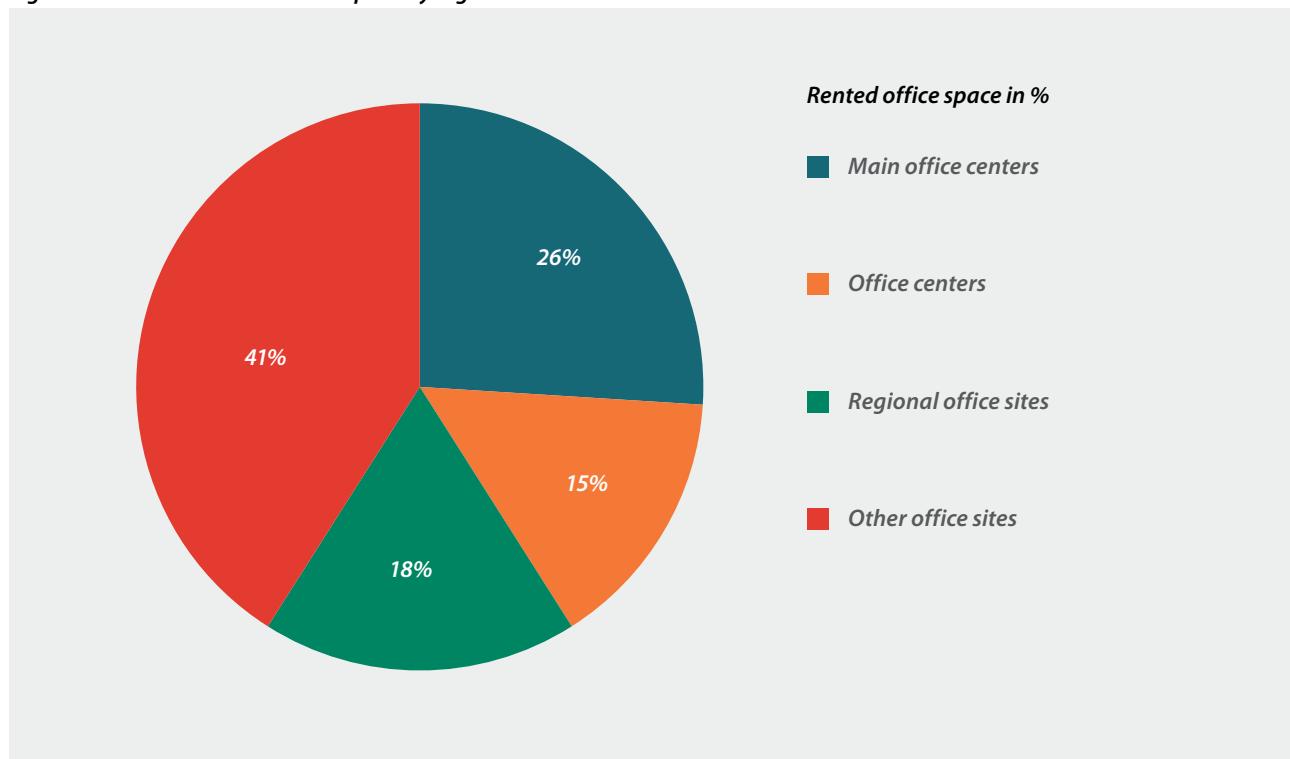
³² There is no agreement on the number of office workers in Germany. Studies commissioned by Deutsches Büromöbelforum (DBMF, German Office Furniture Forum), for example, assume 16.3 MM office workers are employed at professional office workstations. See http://www.buero-forum.de/fileadmin/archiv/archiv_2004/05_2004/, accessed on July 8th, 2013.

Figure 3: Computation total stock of CRE by usage



Source: Statistisches Bundesamt (2012), the author's computations.

Figure 4: Estimate of rental office space by region



Source: Voigtländer et al. (2009), p. 27.

2.6 Interim results

The following insert summarizes this chapter's most important results.

- In this study, the term 'corporate real estate' will be used to refer to any real estate directly used by companies for the production of goods or services, or at least acquired for this purpose. This definition will not include residential property, as it is at best indirectly used to produce goods or services.
- Real estate resources are in a constant conflict of interest between:
 1. the users, who optimize them according to efficiency criteria governed by their individual production processes;
 2. the owners, who wish to maximize the value of the capital they invested in the property; and
 3. the producers of buildings and real estate services, whose objective is the maximization of their sales.
- Efficiently solving the economic conflict of interest that arises within companies between the business units and corporate functions first, the finance department second, and the construction and property unit and facility management third, is the main purpose of corporate real estate management.
- "Corporate real estate management" (CREM) shall denote all real estate activities of a company whose core business is not real estate. CREM is concerned with the economic procurement, administration and utilization of real estate of production, trading, and service businesses in the context of their company strategy. The real estate is used for the implementation and support of the company's core activities.

- No reliable statement can be made concerning the quantitative distribution of corporate real estate in Germany. According to studies commissioned by the BMVBS, the stock of office and administrative buildings varies between 200 and 470 MM square meters. With factory and workshop buildings, the range is from 400 to 746 MM square meters and with trading and warehousing buildings, from 600 to 1,269 MM square meters. This wide variation is particularly problematic for political questions, such as energy improvement of buildings or the German energy turnaround, as there is evidently no reliable source of data currently available.
- According to rough calculations, the value of corporate real estate in Germany as of 2013 amounts to 3,000 bn euros, of which 500 billion are attributable to pro rata land values. These figures are rough estimates. As with floor space, better data concerning real estate values is urgently needed.
- The hypothesis claiming that corporate real estate is dominated by production proves to be incorrect when tested. Instead, trading and warehousing property constitute the lion's share of areas held by CRE at 35%. These are followed by office and administrative buildings at 29%, factory and workshop buildings at 22%, other buildings at 10%, and hotels and restaurants at 4%.
- Geographically, corporate real estate is decentralized and, to a large extent, located outside the important real estate markets. For instance, just under two thirds of CRE office space is outside of office centers.

3 IMPORTANCE OF CORPORATE REAL ESTATE FROM THE USER'S POINT OF VIEW

3.1 Interdependence between corporate real estate and business success

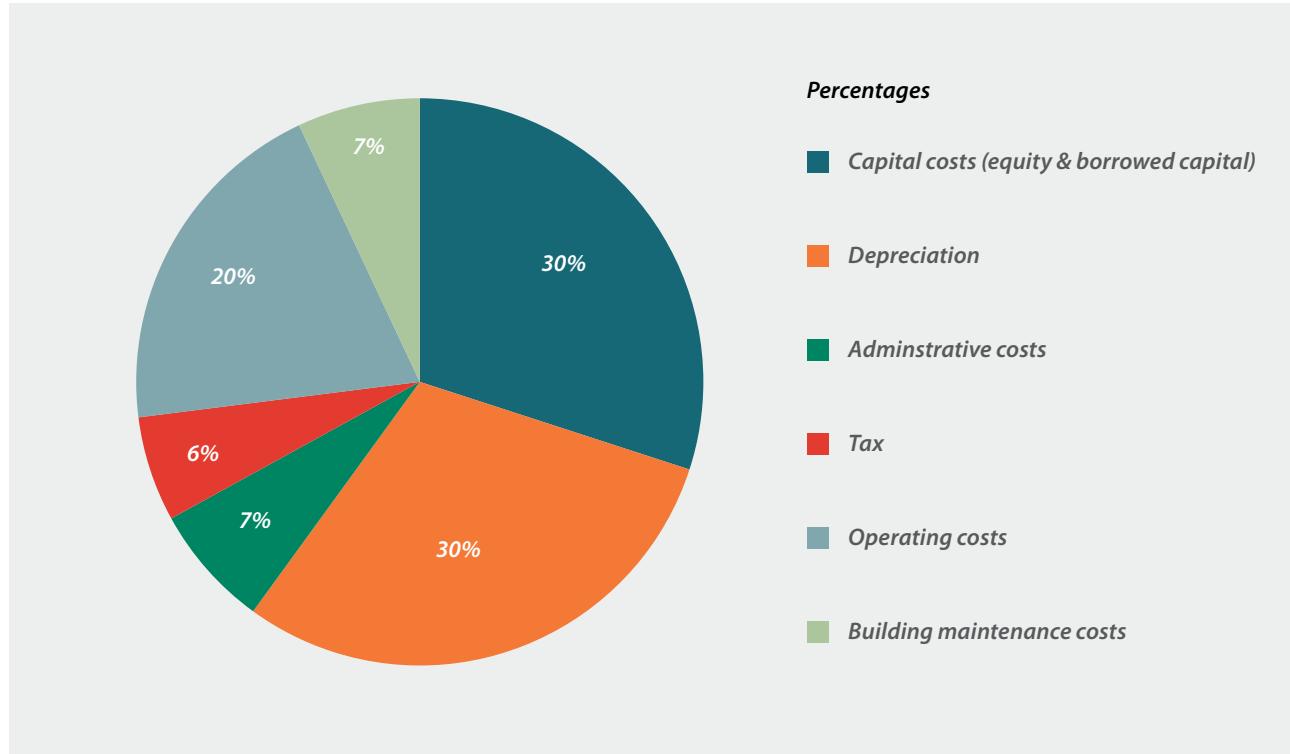
As there can be no real estate industry without its users, it is not necessary to question their relevance. It is, however, essential to discuss to what extent real estate is important for users.³³ Corporate real estate directly generates costs for the planning, provision, operation, and use of real estate resources. These costs are called real estate costs. They can usually be determined and attributed to their causal agent with relative ease and precision based on companies' accounts. Real estate costs have a direct impact on a company's business success.

In addition to real estate costs, corporate real estate management also has an indirect influence on business success, as it has an impact on the success of the operative business units and central functions utilizing the space. The first impact of real estate resources is on the cost of the units using the space.

For example, the physical layout of production facilities bears on their logistics process and concomitant costs, and the quality of office space has an influence on employee absenteeism, hence on personnel costs. Corporate real estate management also influences the performance of space users. For example, an attractive location and good architecture often contribute to making a company more attractive to capable staff and a particularly low-dust production environment may increase the quality of electronic components.

The contribution of corporate real estate management is to maximize user efficiency and minimize costs by optimizing real estate resources. Real estate resources characteristically have manifold, mostly quantitative effects on the costs and benefits of the space's user. However, these costs and benefits are often hard to measure and quantify. Indeed, the cost of real estate is usually known with comparative precision,

Figure 5: Break down by cost type according to DIN 18960 (cost of usage)



Source: The author's compilation based on Pfür's figures (1998a).

³³ Ignoring purely tax-motivated real estate investments e.g. after German reunification

while the indirect effect of corporate real estate management on the user's business success is hard to evaluate. In addition, corporate real estate management is responsible for the costs and benefits directly caused by real estate, which may occur for example in the form of lease agreements for subleases or value changes of real estate.

3.2 Corporate real estate as a source of costs

3.2.1 Share of real estate costs and quantity of costs by type

Depending on a company's industry and business model, its real estate costs amount to approx. 10–20% of its total costs.³⁴ In knowledge-intensive companies, they usually constitute the second-largest pool of costs after human resources.

The costs generated by real estate vary widely depending on the type of building – its quality, location, intensity of use, financing structure, size, management quality, and maintenance condition.³⁵ Figure 5 presents a rough average overview of the costs generated by companies' use of real estate, obtained by means of weighting.³⁶

At just under two thirds of the overall cost, the financially managed cost types "capital costs" and "depreciation" represent the lion's share of the usage cost of a building, according to DIN 18960. In the case of leased property, this would represent the bulk of the rental fee. It is amazing that the cost of operation – including cleaning, sewage, water, heating, cooling, electricity, handling, maintenance, inspection, transportation and green areas, as well as other costs – only constitutes about 20% of the total cost. Even when adding the cost of building maintenance and administration, the operation of the building does not even represent one third of the overall cost. Thus, it is clear that the bulk of the cost of corporate real estate is generated by the financial, rather than technical, aspects of facility management and facility services.³⁷

3.2.2 Costs generated during the lifecycle

A particularly important aspect that must be considered is the fluctuation of costs over a property's lifecycle. Usually, only about 20% of costs arise in the planning and construction phase, while 80% of costs arise in the utilization phase. Cost planning, however, is mostly performed during the planning and construction phase. Thus, only a small part of the costs can be controlled in the subsequent utilization phase. In the case of intensive-use buildings, utilization costs may represent an even greater proportion of total costs over a property's lifecycle. The Bayrische Staatsbauverwaltung (Bavarian State Building Administration Authority), for instance, gives

the following ratio between cost of construction and annual cost of utilization (according to DIN 18960):³⁸

- schools and kindergartens: 31%
- hospitals: 26%
- indoor swimming pools: 21%
- gymnasiums: 17%
- open-air swimming pools: 15%
- traffic installations: 10%
- production buildings: 10%
- office and administrative buildings: 8.5%

Thus, over a property's lifecycle, the cost of utilization is always a multiple of the cost of construction. From the companies' point of view, as they must evaluate the provision of real estate resources on the basis of the total cost generated by its use, the running cost of utilization is usually the most important decision making criterion.

3.2.3 Costs at the level of the workplace (office)

The level of information available concerning the costs of workplaces in Germany is quite varied. Although individual companies have recorded and made available comprehensive data, it is hardly possible to infer anything that would apply to all of Germany. This absence of uniformity in the data is due in part to the continuing lack of generally applicable standardization of cost structure, different terms of reference (e.g. definition of spaces), incomparability of the initial situation (e.g. intensity of utilization), and problems related to data capturing (e.g. different levels of precision).³⁹ Most studies concerning real estate costs per workplace in Germany so far have dealt with office workplaces. There is almost no data available for other types of property usage. Appendix I shows the results of the most common benchmark studies and of other market reports in more detail. Below, I summarized some of the most important points of the studies listed in Appendix I.

- According to the full cost account of the OSCAR study, the workplace cost per square meter total net area amounted to an average 19.07 euros in air-conditioned buildings and to 15.45 euros in non-air-conditioned buildings.⁴⁰
- According to a survey conducted by CREIS, the average space occupied per workplace in self-used office buildings is 33.9 square meters total net area. However, the values vary widely from company to company.⁴¹
- According to a study conducted by CREIS, the annual cost per office workplace amounts to 11,261 euros. Again, this value can vary widely between companies. Moreover, it is necessary to take into consideration the definition of the office workplace costs stated in the study design when interpreting these values.⁴²

³⁴ See Pfür (1998), Krupper (2013).

³⁵ See Pfarr (1977).

³⁶ See Pfür (1998a), for different overviews see also: Franke (2012), Oscar (2012).

³⁷ See Pfür (2002), pp. 46 ff.

³⁸ Unpublished data by Bayrische Staatsbauverwaltung.

³⁹ See Pfür (2002), pp. 150 f.

⁴⁰ See Appendix I and especially JLL/CREIS (2012).

⁴¹ See Appendix I and especially CREIS (2010).

⁴² See CREIS (2010).

- According to a study conducted by DTZ, the cost of an office workplace varies widely depending on the property's location within Germany. In a global comprehensive study, DTZ determined the total occupancy costs of office workplaces per year.⁴³ The results list, for instance, costs of 8,770 euros for Hamburg and 12,600 euros for Frankfurt.⁴⁴

Some market players vehemently criticize studies on the cost of office workplaces. These studies are obviously open to such criticism because they are sometimes insufficiently representative of the market. On the one hand, the study results are insufficiently differentiated, and on the other hand they are hard to compare because they use different definitions of cost types and other terms of reference. Yet, despite these methodological and informational problems, the study results are essentially accepted in the market as initial indications. Even though they are only rarely used as a concrete basis for decision making, they still often serve as a rough indication that allows market players to estimate workplace costs.

3.3 Benefits of corporate real estate

The core precondition for real estate activities is the provision of some benefit, the resulting added value, and consequently, the user's willingness to pay. This willingness crucially depends on the user's expectation that the real estate resources will contribute to his business success. The connection between corporate real estate and business success is highly

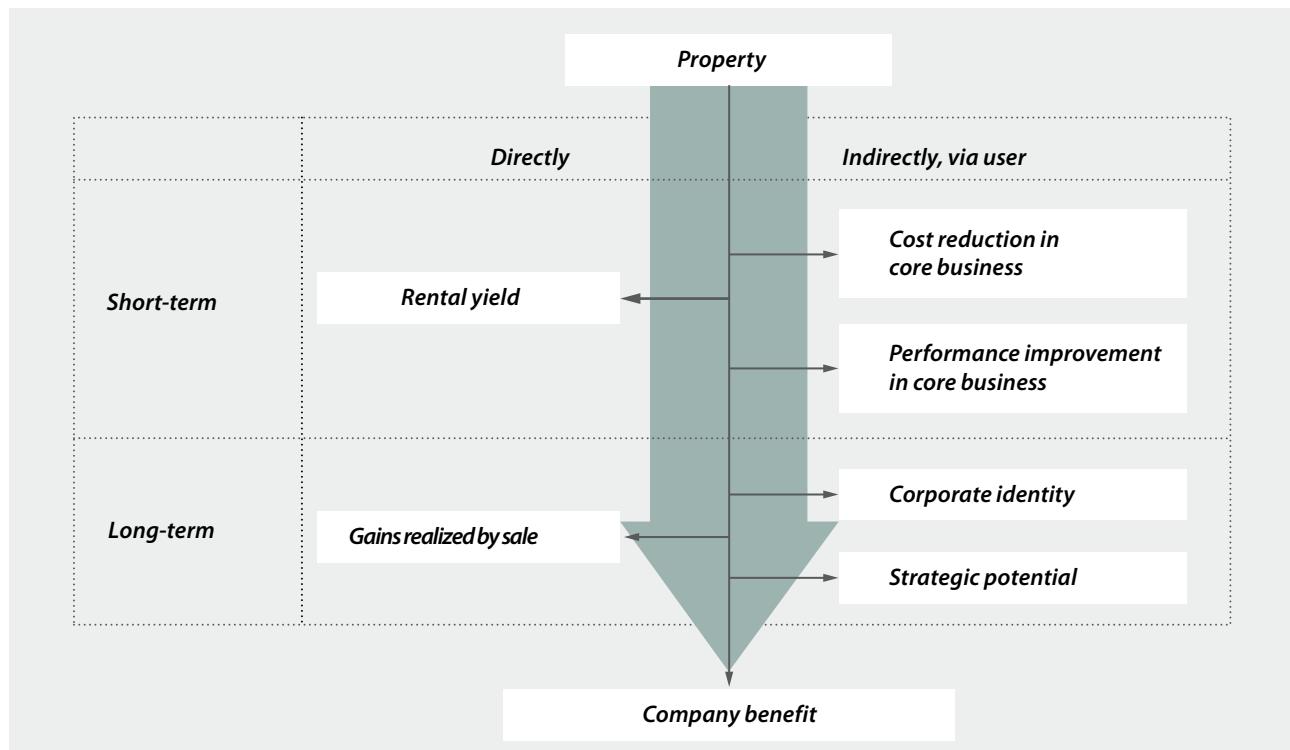
complex and has been only (at best) rudimentarily described in scientific terms so far.⁴⁵ As of now, only very little is known about the functional chains and the extent to which corporate real estate and the quality of real estate management impinge on a company's success. While the costs and concomitant risks generated by corporate real estate can be described comprehensively and underpinned with empirical data,⁴⁶ the theoretical and conceptual explanation and empirical evaluation of the interdependence between stock of real estate and benefits for companies are still quite problematic (see Figure 6).

Real estate leased to third parties generates a benefit directly in the form of lease agreements and potential sale gains. By contrast, a property used by its owner yields an indirect benefit to its user in more a complex causal relationship. The range of potential benefits is very wide and multifaceted.

3.3.1 Design parameters for the implementation of a corporate identity

The possibility to develop a corporate identity through the design of a corresponding physical environment is limited, particularly in the case of industries that provide services instead of material products. With its vehicle fleet and letterhead, real estate is often one of the few possibilities for a company to acquire an identity in the real world.⁴⁷ Real estate then becomes a symbol of the values for which a company stands.⁴⁸

Figure 6: Benefits of commercial real estate



Source: Pfür (2002), p. 35.

⁴³ Due to partially divergent definition of costs, these results are only comparable with results of workplace costs found in the CREIS study, to a certain extent.

⁴⁴ See Appendix I and especially DTZ (2012).

⁴⁵ See Nourse/Roulac (1993), Manning/Roulac (1996), Roulac (1997), Pfür (2002).

⁴⁶ See Pfür (2002).

⁴⁷ See West/Wind (2007), Appel-Meulenbroek et al. (2010), Congdon/Gall (2012).

⁴⁸ See Pfür (2002), pp. 170 ff.

The tailoring of real estate resources to a company's ethos is always necessary if important stakeholders expect the company to take a stance regarding urgent social concerns. Here are some examples:

- **Companies' employee orientation**

The most recent prominent example is the lavish Vodafone campus in Dusseldorf. The company's website states that "important findings on the design of modern working environments have been incorporated into the design of the building. This means first and foremost that employee needs have been taken into consideration."⁴⁹

- **Companies' responsibility for townscape and building culture**

For example, SAP was the first company to move into its own office property in Hamburg Hafencity. Another current example is BMW, which has made a very noted architectural contribution to urban design with its BMW Welt in Munich.

- Companies' contribution to climate protection and the German energy turnaround

Office buildings can, for example, be designed to minimize energy consumption, such as the Deutsche Bank headquarters in Frankfurt.

- **Companies' general ecological orientation**

For instance, companies can decide to use no tropical woods in their buildings (e.g. Gruner & Jahr headquarters in Hamburg) or to obtain numerous green building certifications of corporate real estate.

- **Companies' statement of their economic prosperity and stability**

At the time of their construction, the banks' skyscrapers in Frankfurt, such as the Commerzbank headquarters, were an unmistakable sign of their economic prowess and stability. During a crisis, Hamburg's shipping company Hapag Lloyd was obliged to sell its building in the city's prestigious Binnenalster area. Once the crisis was over, the company bought back the building in 2010 to demonstrate its return to its former strength. Hapag Lloyd's CEO commented on this transaction as follows: "This is a clear sign that Hapag-Lloyd has returned to its former strength and will use its opportunities for profitable growth."⁵⁰

- **Companies' statement of their innovative strength and flexibility**

Even values such as companies' innovative strength and flexibility can be expressed in the architecture and usage concept of their real estate. An example of this is the Sony Center at Berlin's Potsdamer Platz.

Measures designed to shape a company's corporate identity through real estate are generally characterized by their qualitative nature. Their impact is hard to quantify, as it develops indirectly via various interactions and sometimes over long periods of time. Correspondingly, I do not know of any broad studies measuring and evaluating the benefits of such measures. It would be rash to conclude from this lack of information that these measures are of limited value to companies. After all, the examples mentioned above often required investments of several hundred million euros, which companies will certainly not have made without good reasons. Furthermore, the list of examples where real estate is used to tailor a company's environment to its values can be extended indefinitely.

3.3.2 Creation of strategic options and their implementation

The examples above underline the effective impact of real estate on corporate identity, thereby highlighting the fundamental features of real estate's strategic potential. An analysis of the scientific literature⁵¹ and of concrete applications in entrepreneurial practice reveals a very wide range of strategic options. The connection is particularly obvious in retail shops or in logistics, where real estate locations and usage concepts are often the basis giving an identity to business models.⁵²

Independently of its strategic role, corporate real estate holds some strategic potential in all industries, even the internet industry, which works largely in cyberspace. The following are some examples that illustrate this point – they all refer to different bottlenecks in the company's environment as special challenges to their specific business strategies:

- **„Bestemployer“**

Many companies have been competing to hire the best employees for some years. This is true particularly in the case of companies operating in the fields of new media and telecommunications. The example of Google illustrates quite clearly that this competition for the title of "best employer" significantly carries over to the physical organization of work environments. At its various locations, Google offers its employees an office environment that is strongly driven by staff requirements. The upshot is that the offices hardly resemble offices anymore; instead, they are trendy, design-driven and contain individual spaces inviting employees to linger. In addition to the design of the workplace, the architecture and usage concept of the building and, in particular, its location impinge on a company's attractiveness for its employees.

⁴⁹ http://www.vodafone-campus.de/public/#/de/Vodafone_Campus/Campus, accessed on July 8th, 2012.
⁵⁰ <http://www.abendblatt.de/wirtschaft/article1726829/Hapag-Lloyd-kauft-zehn-Schiffe-und-das-Ballinhaus-zurueck.html>, accessed on July 30th, 2013.

⁵¹ For an overview, see Pfür (2002), pp. 198 ff. The two globally leading journals – "Journal of Corporate Real Estate" (Emerald Group Publishing) and "Corporate Real Estate Journal" (Henry Stewart Publications) – have published dozens of case studies on the strategic importance of corporate real estate in several industries.

⁵² See Pfür/Elbert (2007).

• Cost and quality competition

Traditionally, generic company strategies have been targeted at cost or quality leadership. From the point of view of both strategic orientations, there are numerous examples in which the target position cannot be achieved without corresponding real estate or at least without real estate that supports the strategic process in a meaningful way.⁵³ Table 5 below illustrates numerous approaches in which real estate plays a significant role.⁵⁴

The elasticity of the stock of real estate is always of particular importance for the chosen strategy. The elasticity of real estate corresponds to its ability to adjust as fast as possible to new competitive situations. In the event of a company merger, such as the merger between Commerzbank and Dresdner Bank, it is critical to unify the companies' stock of real estate as soon as possible. In the case of intensive time-to-market competition, as in the regenerative energies industry (particularly solar energy products), companies must have efficiency-increasing production and distribution locations on site in the sales markets as fast as possible. Even in cases in which

time does not play a major role, the availability of sites with the most diverse and comprehensive legal usage permits possible is often a strategically decisive precondition for German industries, particularly in densely populated areas. Numerous manufacturing companies have not sold their production sites in Germany despite having relocated their production to offshore locations in order to enable a return to their home sites. The reason for this is not only the legal licensing process, but also the availability of staff. Certain cluster regions are always characterized by the availability of staff with specific qualifications. Therefore, a suitable location is a prerequisite to gain access to pertinent labor markets.

3.3.3 Operative contribution to increase the company's productivity

Real estate's influence on the physical structure of a company and its operative processes gives it a direct influence on productivity.⁵⁵

Table 5: Possible significance of real estate for quality and cost advantages

Value-adding activity	Possible significance of real estate for quality advantages	Possible significance of real estate for cost advantages
Inbound logistics	<ul style="list-style-type: none"> Central location with a view to suppliers High-quality means of transport on the premises and in the buildings 	<ul style="list-style-type: none"> Access to low-cost transport (e.g. inland shipping)
Operations	<ul style="list-style-type: none"> Perfect air-conditioning of rooms Variability of building use Functionality of building use Spacious room design to motivate staff 	<ul style="list-style-type: none"> Sufficient space for mass production Safe production facilities to prevent downtimes due to accidents Locations with low wage costs
Outbound logistics	<ul style="list-style-type: none"> Central location with a view to customers 	<ul style="list-style-type: none"> Access to low-cost transport
Marketing and sales	<ul style="list-style-type: none"> Attractive, spacious sales areas Sales areas in excellent locations Improvement of customers' perception of the image of the company through impressive buildings Sufficient space to allow for packaging as a marketing tool 	<ul style="list-style-type: none"> Availability of space for outlet stores Long-term un-indexed lease contracts at low prices Retail space in low-cost peripheral locations
Customer services	<ul style="list-style-type: none"> Easy access to customer service 	<ul style="list-style-type: none"> Customer service locations at low-cost peripheral sites
Company infrastructure	<ul style="list-style-type: none"> Sophisticated building technology to support information of and communication between staff 	<ul style="list-style-type: none"> Installations enabling video-conferencing to save travel expenses
Human resources management	<ul style="list-style-type: none"> Increased attractiveness of the company for employees through attractive locations Improvement of employees' perception of the company through impressive buildings High-quality and spacious training rooms 	<ul style="list-style-type: none"> Provision of staff residences to reduce payroll
Technology development	<ul style="list-style-type: none"> Sophisticated air-conditioning systems 	<ul style="list-style-type: none"> Physical proximity to research institutions.
Procurement	<ul style="list-style-type: none"> Infrastructure enabling just-in-time concepts Improvement of suppliers' perception of the company through impressive buildings 	<ul style="list-style-type: none"> Sufficient warehousing space for large purchase batches Location with low price levels

Source: Pfñür (2002), pp. 205 f.

⁵³ For more detail and in particular for the possibilities of real estate-driven strategy planning along the value-added chain, see: Pfñür (2002), pp. 202 ff.

⁵⁴ For more examples, see Nourse/Roulac (1993), Roulac (1997).

⁵⁵ See Kalusche (1991).

- **Communication and transport distances**

A property's usage concept has an impact on distances within the building and thus on the communication, energy, and material flows within the company.

- **Environmental factors**

Environmental factors such as climate, air quality, lighting, noise, view, personal space, territoriality, density, and constriction create a complex web of causal relationships between a physical workplace and its productivity.

- **Flexibility of the building**

Numerous production and service processes require more or less frequent retooling or conversion of machines and workplaces. For instance, in the automotive industry it is very important for operative success that individual production lines can be modified for product series without having to interrupt the production of other series. In office spaces, the flexible and cost-efficient convertibility of different room functions affect labor productivity. The ideal space is an officescape that can always cater to its users' various requirements without needing to be refurbished.

- **Influence of damage**

Through physical characteristics such as the presence of various floors in combination with stairs, type of flooring, and fire protection, the design of buildings has an influence on the probability of work accidents and, by extension, on potential levels of damage caused by accidents.

The link between spatial organization and productivity has been largely demonstrated for production and logistics real estate.⁵⁶ For example, the impact of clean room technology on the reject rate in computer chip production or the effect of the removal of workplaces through in-house route planning models is understood relatively well. By contrast, much less is known about the interdependence between knowledge-intensive activities and their office environment.⁵⁷ Although the effects of office space conditions on socio-psychological factors such as job satisfaction, motivation, and stress are known, there is a lack of holistic studies concerning the details of these interrelationships and their monetary effects. In his very broadly conceived case study on public office buildings, Krupper states that in offices which would be considered of average standard in Germany, the labor productivity of staff can be increased by an average 20% through targeted modifications of individual environmental factors. Other important results in his study are:⁵⁸

- "The office environment has a significant effect on job satisfaction, efficiency, and health.
- User satisfaction increases with the level of possibilities to influence the environment.

⁵⁶ See Pfürn/Elbert (2007).

⁵⁷ For initial studies, see Muschiol (2007), Krupper (2013).

⁵⁸ Krupper (2013), pp. 298 f.

- In addition to the environmental conditions of light, noise, air, or indoor climate, the spatial conditions and the size of the workplace are at least as important for the appraisal of the office environment.

- Use of space available in the office increases with the load factor, defined by the ratio of theoretical to actual use of workplace area per person.
- Regardless of the user groups identified, employees' perception of the noise background, the space availability in the office, and the possibility to focus on their work plays a relatively high role for their evaluation of the office environment."

Krupper also arrived at the particularly thought-provoking result that management was not able to correctly reflect user evaluations. Obviously, managers across the board find it generally difficult to take the users' perspective into account when they evaluate office spaces. This lack of congruity becomes problematic whenever managers make decisions about the space made available, which is probably always the case.

However, Krupper's study design did not encompass the mid-to long-term impact of real estate on staff health and its financial consequences for companies and for the economy as a whole.⁵⁹ Against the background of an aging labor force and increasing levels of stress at work, the prevention of damage to health is becoming ever more important. As German law explicitly requires employers to prevent work-related health risks, employees' health is a major company responsibility. Since the start of obligatory coverage of in-company health promotion by the public health insurance schemes, company health reports, evaluation of occupational health examinations and risk assessments have become much more important.⁶⁰ The spatial organization of work can have a significant influence over employees' movement habits and stress management, in particular. Pilot studies performed at a German DAX-listed company show that employees' level of activity, which is very important for their health, can vary significantly depending on the design of their workplace. By moving to areas designed to incentivize activity, employees' lack of movement at work was successfully reduced by 35%.⁶¹

3.3.4 Initial approaches to a quantitative benefit assessment of corporate real estate

The previous paragraphs have made it clear that it is a long way to a quantitative assessment of mostly qualitative and multidimensional benefits. If we look at causal relationships as a black box, however, and only measure and assess outcomes, then we can find initial results based on estimates made by people responsible for real estate within German

⁵⁹ For a calculation of the cost of illness, see Kowalsky (2012).

⁶⁰ See GKV (2010).

⁶¹ See Eurocres (2013).

groups of companies. In a very comprehensive study, which must be considered to be representative of German corporations with more than 10,000 employees, people responsible for real estate management assess the influence of corporate real estate on business success, as depicted in Figure 7.

Even though the details of the interdependence of corporate real estate and business success are often still quite uncertain, the people responsible for corporate real estate have no doubt about the influence of real estate space and services and the resulting user satisfaction on business success.⁶²

- 82.5% of interviewees agreed with the hypothesis that users' productivity increases along with their satisfaction with their workplace;
- 78.4% of interviewees agreed with the hypothesis that high user satisfaction has a positive impact on soft factors of company success (e.g. employee identification with the company, employee motivation);
- 69.1% of interviewees agreed with the hypothesis that in their company, user expectations of real estate quality has increased in the past.

Although at this stage it seems impossible to find reliable quantifications of the benefits of real estate resources that would justify further action, studies confirm the approximate scale of this influence. In the previous section, I referred to a study by Krupper, which indi-

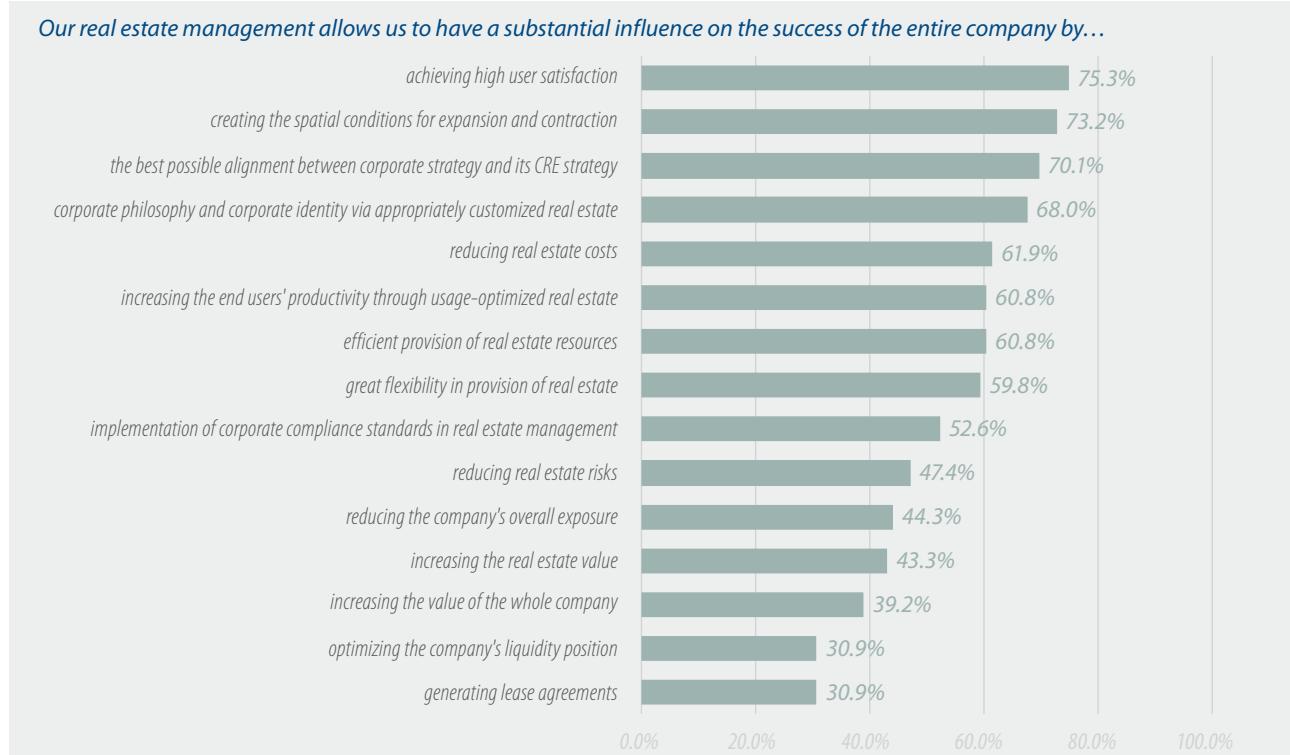
cates that the optimization of office space could achieve a potential increase in labor productivity of 20%. This study directly interviewed users. The study conducted by Pfñür/Weiland, for which the people responsible for real estate in major corporations were interviewed, yielded the results shown in Figure 8.

Pfñür/Weiland's estimate that real estate optimization could lead to a 13% increase potential in labor productivity is significantly lower than Krupper's 20% estimate. In order to assess the potential of real estate adequately, it must be borne in mind that in his study, Krupper showed that outsiders – including the people responsible for corporate real estate – cannot usually estimate the interdependence of real estate and business success correctly. Thus, it is probable that Pfñür/Weiland's figure of 13% is too low, as it was determined by interviewing people responsible for corporate real estate.⁶³ Nonetheless, if we assume an average productivity increase potential of 13% all the same in order to be on the conservative side, the following conclusions can be drawn:

1. Company's perspective

Assuming that a company's costs breakdown is of 10% real estate-related costs, 80% personnel costs, and 10% other costs, then the potential to be gained from the optimization of real estate's user functionality would amount to 10.4% of the company's total costs ($13\% \times 80\%$). In other

Figure 7: Influence of CREM on company success



Source: Pfñür/Weiland (2010), p. 19.

⁶² See Pfñür/Weiland (2010).

⁶³ See JLL (2013), pp. 11 ff.

words, optimizing real estate management would allow a company to reduce its costs by over 10% while preserving an identical output, or increase its output by more than 10% at identical costs. Considering the fact that this example assumes that the company's real estate related costs are only 10% of its total costs, it becomes immediately apparent that an investment in more effective real estate management is well worthwhile. In this very simplified example, which corresponds to the cost ratios of numerous German companies, even doubling the cost of real estate would still be efficient.

2. Macroeconomic perspective

If we multiply the 13% increase potential of labor productivity offered by corporate real estate with the total payroll of the German economy of 1.375 trillion euros, it is possible to estimate that optimized real estate offers productivity gains worth 178 bn euros per year. Assuming an average increase of labor productivity in Germany of 0.8% per year, as has been the case in the last 18 years,⁶⁴ the potential productivity gains offered by corporate real estate correspond to 16 years of cumulative gains.

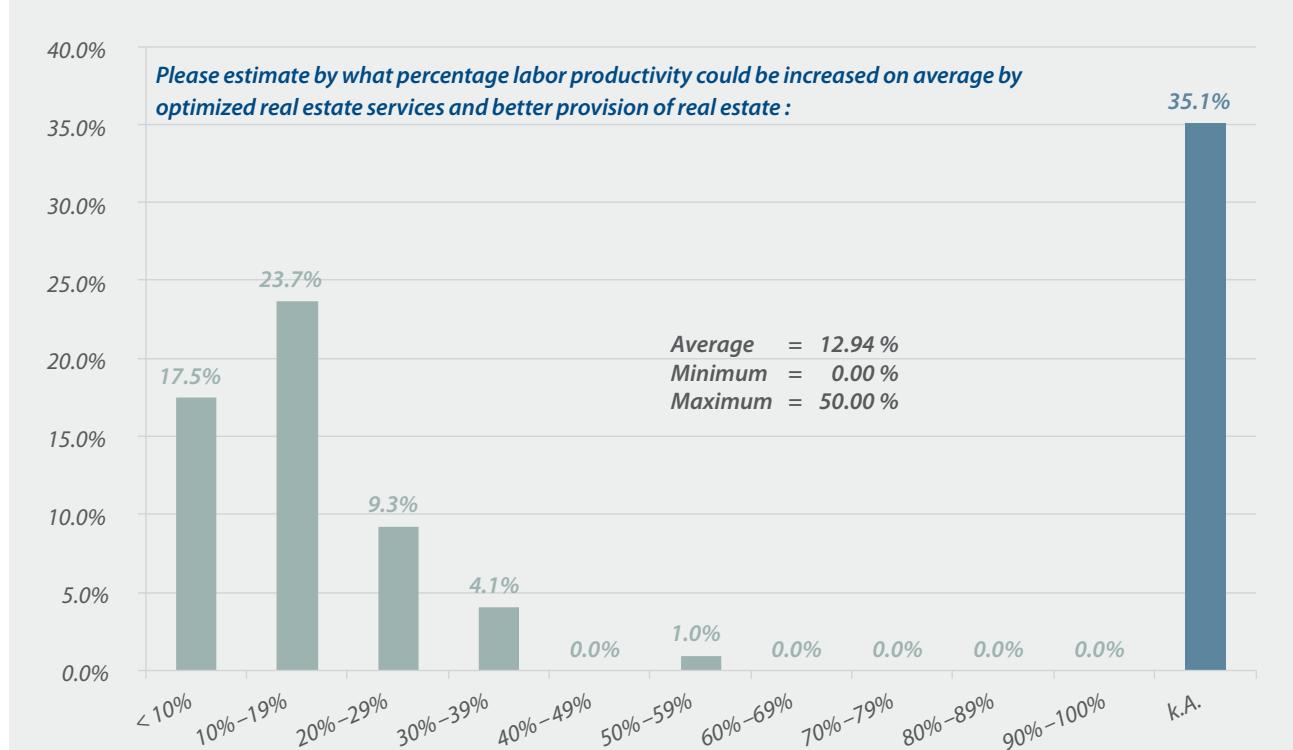
The potential is surprisingly high, from both the company's point of view and the macroeconomic perspective. It is necessary to point out that although the estimates are quite rudimentary, they are also quite conservative.

3.4 Interim results

The following insert summarizes this chapter's most important results.

- Depending on a company's industry and business model, its real estate costs represent, on average, approximately 10-20% of its total costs. In the particular case of knowledge-intensive companies, they usually constitute the second-largest pool of costs after human resources.
- At just under two thirds of the overall cost, the financially managed costs "capital costs" and "depreciation" represent the lion's share of the usage cost of a building (according to DIN 18960).
- For companies' cost management of real estate, the most important reference value is a buildings' life-cycle cost. The annual usage cost of a standard office building amounts to approx. 10% of its construction cost. In cases of highly intensive usage (e.g. in hospitals or educational institutions), the proportion of usage cost to construction cost can increase to a quarter or, in extreme cases, even to a third.

Figure 8: Influence of corporate real estate on labor productivity



Source: Pfñür/Weiland (2010).

⁶⁴ See average change from 1995 to 2012. Source: <https://www.destatis.de>, accessed on July 8th, 2013.

- The benefit of corporate real estate management is chiefly to increase the productivity of real estate, i.e. to increase the quality of task performance and to reduce the costs of operative business units and central services through the optimization of the real estate stock.
- According to empirical studies, three quarters of real estate users believe that the key to successful corporate real estate management is to enhance client orientation.
- According to empirical studies, approximately half the major corporations do not sufficiently use the strategic potential of their real estate resources to generate competitive advantages vis-à-vis the competition.
- In the current labor market, for example, real estate management offers good opportunities to succeed in the "war of talents" by designing attractive workplaces. Likewise, real estate resources used effectively are often a strategic cost source, as they can provide differentiation advantages.
- To the rest of the world, real estate can be a visible symbol of a company's economic prosperity and stability, as well as of its innovative strength and flexibility. A company's stock of real estate can significantly reflect its identity, establishing values, such as its ecological orientation, climate protection awareness, employee orientation, or cultural and social responsibility.
- Corporate real estate management often guarantees companies' competitiveness. A company's stock of real estate is often the precondition for different business units' strategic options. Through its high degree of specificity, real estate can often influence a company's competitive position, both in the procurement markets (in particular the labor market) and in the sales markets – independently of whether the business unit is in a situation of cost competition or quality competition.
- The effect of real estate resources on business success is highly complex and is not yet fully understood from either a scientific or practical point of view.

- A comprehensive study interviewing people responsible for CREM in German companies suggests that the optimization of real estate management can lead to an average increase of 13% in labor productivity.
- Assuming an average business cost structure, leveraging the 13% real estate-related potential for productivity increase would more than offset a doubling of real estate costs.
- For the German economy as a whole, the real estate-related potential corresponds to an increase in labor productivity worth 178 billion euros per year.

4 IMPORTANCE OF CORPORATE REAL ESTATE FROM THE POINT OF VIEW OF THE CAPITAL MARKET

4.1 Importance of corporate real estate from the owner-occupier's point of view

In this chapter, I will delineate the importance of corporate real estate from the investor's perspective. In the first part of the chapter, I will address the situation of owner-occupiers, and in the second part, I will provide the perspective of investors in corporate real estate operating in the capital market.

4.1.1 Relationship between real estate management and corporate finance

For companies, real estate does not only constitute a resource, but also an important capital investment. Around the turn of the millennium, major German corporations tended to see real estate as an investment (owner function) rather than as a resource (user function).⁶⁵ Companies' financially oriented strategic goal was to concentrate on their core business. The idea that a company's business portfolio had to be as diversified as possible and of real estate assets as "gold cast in concrete" and as assets of last resort has made way to a sharp definition of capital investments and to the corresponding focus of corporate strategies. Therefore, only a small number of German enterprises, such as Thyssen Krupp, have made real estate a division within their core business.

The idea was to maximize the shareholder value of the capital tied up in real estate through value-oriented corporate real estate management.⁶⁶ Real estate has an impact on a company's shareholder value in several respects:⁶⁷

- Real estate causes direct payments and receipts of money through purchase, operation, and sale.
- Real estate has an impact on a company's exposure and thus on its capital costs; in shareholder value models, it has an impact on the calculatory interest rate.
- Real estate is a company resource and as such it impacts on the payments and receipts of money, and on the risks of all internal users.

In the context of shareholder value-oriented management con-

cepts, the principles of corporate finance become part of real estate management. The objective of these concepts is to make risk/reward profiles of companies as sharp and transparent for capital market players as possible. The common value fluctuations of real estate assets make the profit potentials of non-property companies harder to plan and less transparent. The consequences of this are risk discounts in capital market evaluations. Across the world before the turn of the millennium, numerous unfriendly takeovers were made possible by the large stocks of real estate held by companies being taken over. In such takeovers, buyers would remove real estate assets from the company taken over by a sale-and-rent-back transaction in order to finance the deal. Studies from the U.S. show that corporate investments in real estate resulted in lower company valuations by Wall Street. These studies yielded the following results, among others:

- The bigger the real estate assets, the more likely an unfriendly takeover becomes.
Ambrose (1990)
- Companies that rent real estate rather than buy it are valued higher by the stock exchange.
Allen/Rutherford/Springer (1993)
- Purchasing real estate will not have a positive impact on stock prices. *Glascock/Davidson/Sirmans (1989)*
- Selling real estate will result in rising stock prices.
Glascock/Davidson/Sirmans (1991)
- Joint ventures in real estate are followed by a positive response from Wall Street.
Elayan (1993)
- Sale-lease-back transactions lead to significant increases in stock prices.
Slovin/Sushka/Polonchek (1990); Rutherford (1990)
- Disincorporation of real estate departments makes stock prices rise.
Ball/Rutherford/Shaw (1993)

Surprisingly, the stock exchange in Germany has hardly had similar reactions so far. Instead, capital markets in Germany have always considered that real estate constitutes an inner

⁶⁵ See Pfür/Hedden (2002).

⁶⁶ See Hens et al. (1999), Grünert (1999).

⁶⁷ See Pfür (2011), pp. 83 ff.

reserve and that the rights of disposal linked to ownership of real estate strengthen the company's competitive position, and thus its financial potential.⁶⁸ Real estate owned by the company and used in its operations is therefore rarely a major problem for CFOs in Germany, unlike in the U.S. or Asia. This difference is reflected in the substantial amount of real estate assets held by DAX-listed companies (see Table 6).

Table 6: Real estate assets of DAX-listed companies

Company	Total. Market cap.	Book value real estate	% of total market cap.
ADIDAS-SALOMON	6,495	291	4%
ALLIANZ	36,849	12,881	35%
ALTANA	5,675	532	9%
BASF	29,755	2,432	8%
BAY.HYPO-VEREINSBK	16,195	2,106	13%
BMW	24,205	3,387	14%
BAYER	20,216	3,284	16%
COMMERZBANK	10,733	762	7%
CONTINENTAL	8,699	725	8%
DAIMLERCHRYSLER	34,193	9,77	29%
DEUTSCHE BANK	35,857	4,756	13%
DEUTSCHE BOERSE	7,021	125	2%
DEUTSCHE POST	21,488	5,268	25%
DT.TELEKOM	65,107	9,602	15%
E.ON	51,519	6,713	13%
FRESEN.MED.CARE	4,932	493	10%
HENKEL	4,335	796	18%
INFINEON TECH	5,786	553	10%
LINDE	6,661	976	15%
LUFTHANSA	4,698	768	16%
MAN	4,828	2,154	45%
METRO	13,399	8,818	66%
MUENCH.RUECKVERS	20,203	9,046	45%
RWE	28,379	7,733	27%
SAP	45,85	666	1%
SCHERING	9,865	552	6%
SIEMENS	54,249	4,646	9%
THYSSENKRUPP	7,455	3,531	47%
TUI	3,691	480	13%
VOLKSWAGEN	12,328	7,078	57%
Total	600,667	112,024	19%

Source: UBS (2005).

The values in Table 6 reflect the situation in 2005. However, it must be mentioned that current data for some of the companies deviate significantly from this picture. Nevertheless, the year 2005 is a good reference base, as it saw no extreme situations either in the real estate or capital markets. Currently, many companies' stock prices are just shy of their all-time high.

A look at the scientific treatment of the link between ownership of real estate and business success, which is in parts very high-caliber, shows that from a theoretical point of view, there are other reasons beyond the shareholder value approach that speak against ownership of real estate in terms of company financing. Brounen and Eichholtz demonstrate, for instance, that the market risk of real estate investments is systematically underestimated in CREM.⁶⁹ In a much-noted publication, Tutzel also demonstrates that real estate causes high capital adjustment costs that have serious negative effects on business success in the event of fluctuations in staff levels.⁷⁰

The large real estate assets held by companies is contrasted with a generally quite low financial controlling of these assets.⁷¹ Empirical studies have shown that only about half of companies perform any financial controlling over the minimum profitability requirement of capital employed in real estate.⁷² The reasons why German companies own relatively large real estate assets will be explained in more detail in Chapter 7, which deals with the state of development of corporate real estate management in Germany.

4.1.2 Ownership rates

In comparison to international standards, German companies own a very high share of all commercial real estate. While in 2002 companies owned approx. 20% of real estate in Asia and approx. 30% in North America, they owned on average 75% of real estate in Germany across all corporate property usage types (Figure 9).

Ownership rates were very high in Germany in comparison to other countries, particularly in production, R&D, and engineering. Since 2002, German companies' real estate assets have decreased, but they still remain at a high level. In order to understand the very low Asian ownership proportion of 20%, it must be taken into consideration that the acquisition of real estate property by companies was and, in some cases, continues to be, severely regulated in many Asian countries. Figure 10 illustrates the develop-

⁶⁸ See Pfür (2002).

⁶⁹ See Brounen/Eichholtz (2005).

⁷⁰ See Tutzel (2010).

⁷¹ See Pfür/Hedden (2004), Pfür et al. (2008), Pfür/Weiland (2010).

⁷² See Pfür/Armonat (2003).

ment of German ownership rates over time up to 2010; it is unlikely that they have changed substantially since then.⁷³

While big corporations currently still own on average approximately two thirds of the property they use, small and medium-sized companies continue to own around three quarters of the property they use (see Figure 11).

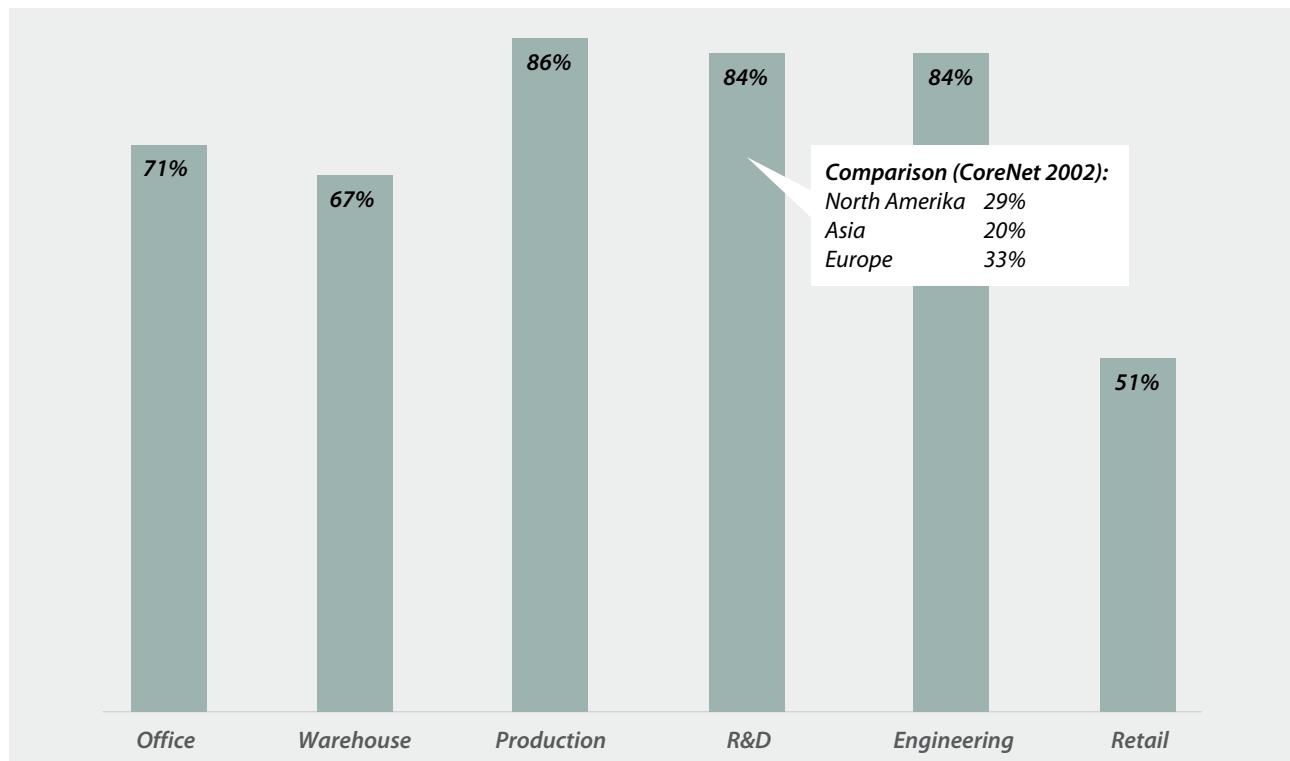
Assuming for the sake of simplicity that corporate real estate is split equally between small and medium-sized companies on the one hand, and major corporations on the other hand, then

we arrive at an average ownership rate of approximately 70%.⁷⁴

There is a difference between the stock of real estate of big corporations and of small and medium-sized companies not only in terms of ownership rates, but also in terms of the relative importance of various usages of properties (see Figure 12).⁷⁵

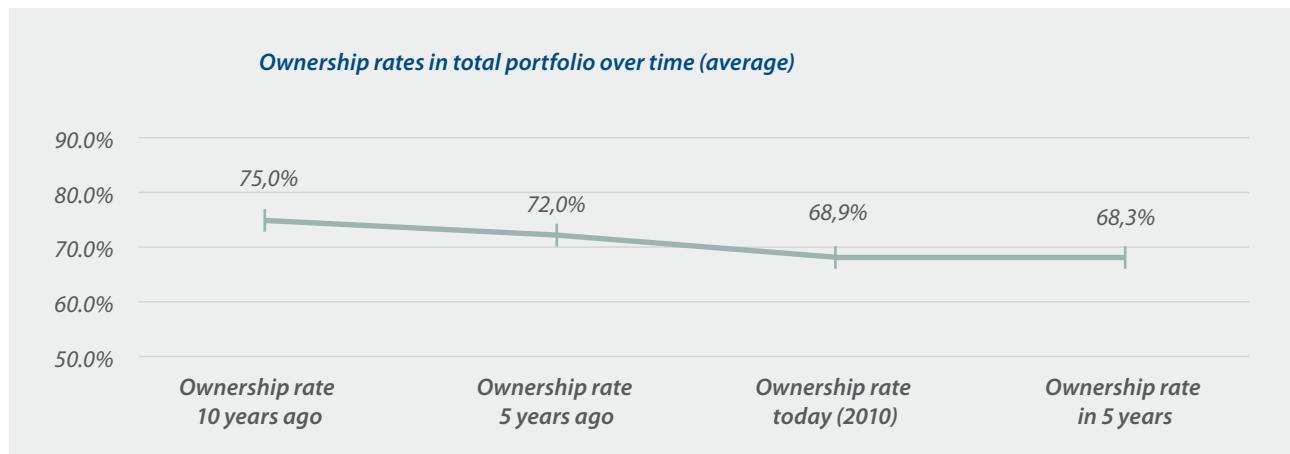
While the focus of big corporations' real estate portfolios is on offices and production, small and medium-sized companies in Germany traditionally dedicate large parts of their real estate portfolios to production and logistics. From a fiscal point of

Figure 9: Real estate ownership rates of major German corporations (as of 2002)



Source: Pfñür /Hedden (2002).

Figure 10: Ownership rates over time



Source: Pfñür/Weiland (2010).

⁷³ See Pfñür/Weiland (2010); population and actual interviewees vary slightly compared to the 2002 study.

⁷⁴ According to figures provided by the Bonner Institut für Mittelstandsforschung, German small and medium-sized companies generate about 50% of gross value added and employ 60% of the workforce. See <http://www.ifm-bonn.org/statistiken/mittelstand-im-ueberblick/#accordion=0&tab=0>, accessed on July 9th, 2013. Interviewees vary slightly compared to the 2002 study.

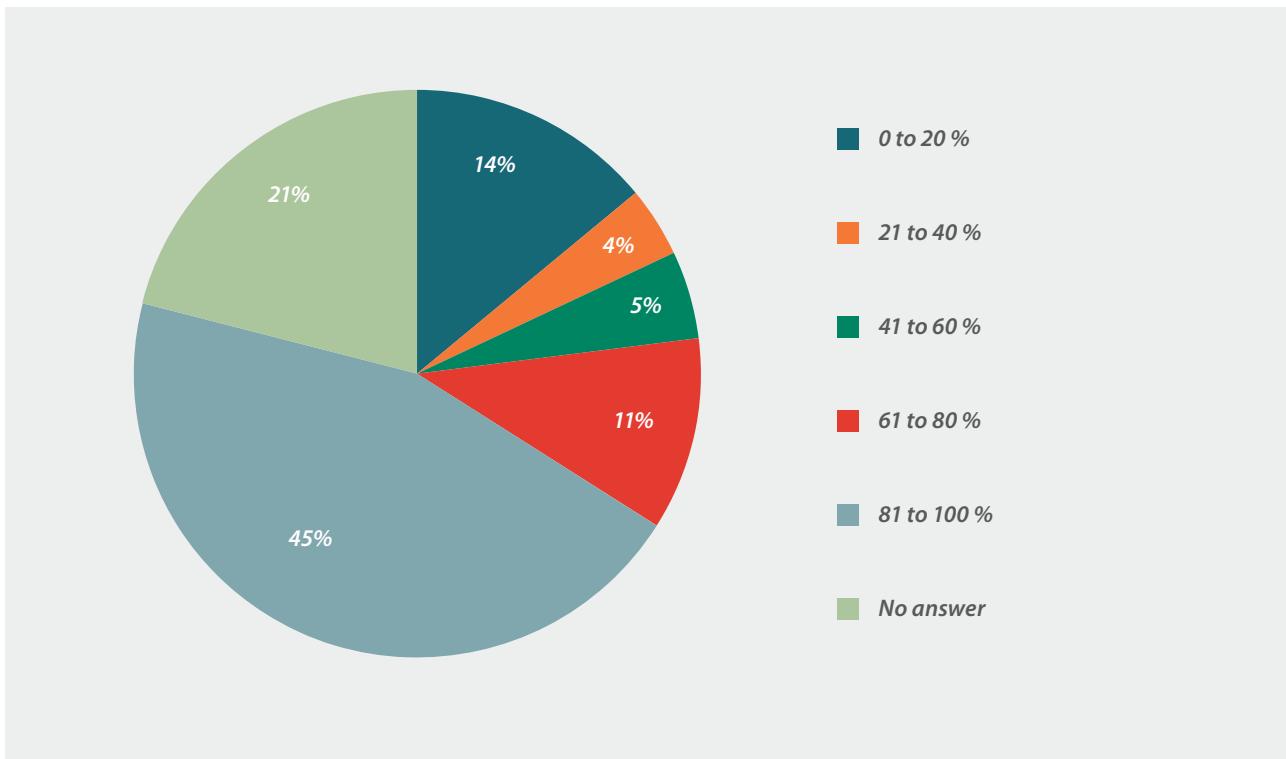
⁷⁵ These are two separate empirical studies. The study on small and medium-sized companies includes a "residential" category, which was absent from the study concerning big corporations. Corporations also own residential property. It is impossible to make a statement regarding its extent for lack of empirical data.

view, these are less fungible properties, which partially explains why small and medium-sized companies have high ownership rates.

4.1.3 Divestment of corporate real estate

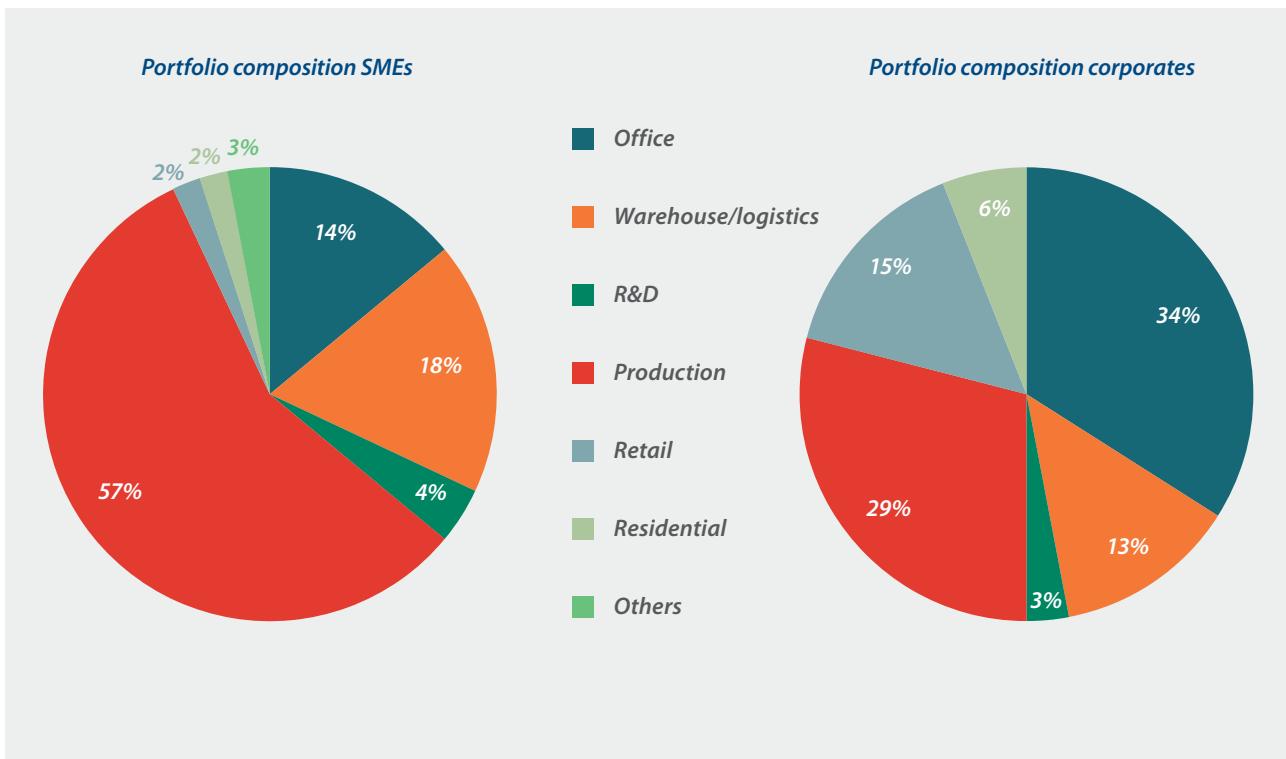
Following the introduction of value-driven management concepts in the real estate management of big corporations,

Figure 11: Ownership rates among small and medium-sized companies



See Pfñür/Weiland (2010); population and actual interviewees vary slightly compared to the 2002 study.

Figure 12: Portfolio comparison of big corporations and small and medium-sized companies



Sources: Pfñür et al. (2008), Pfñür/Weiland (2010).

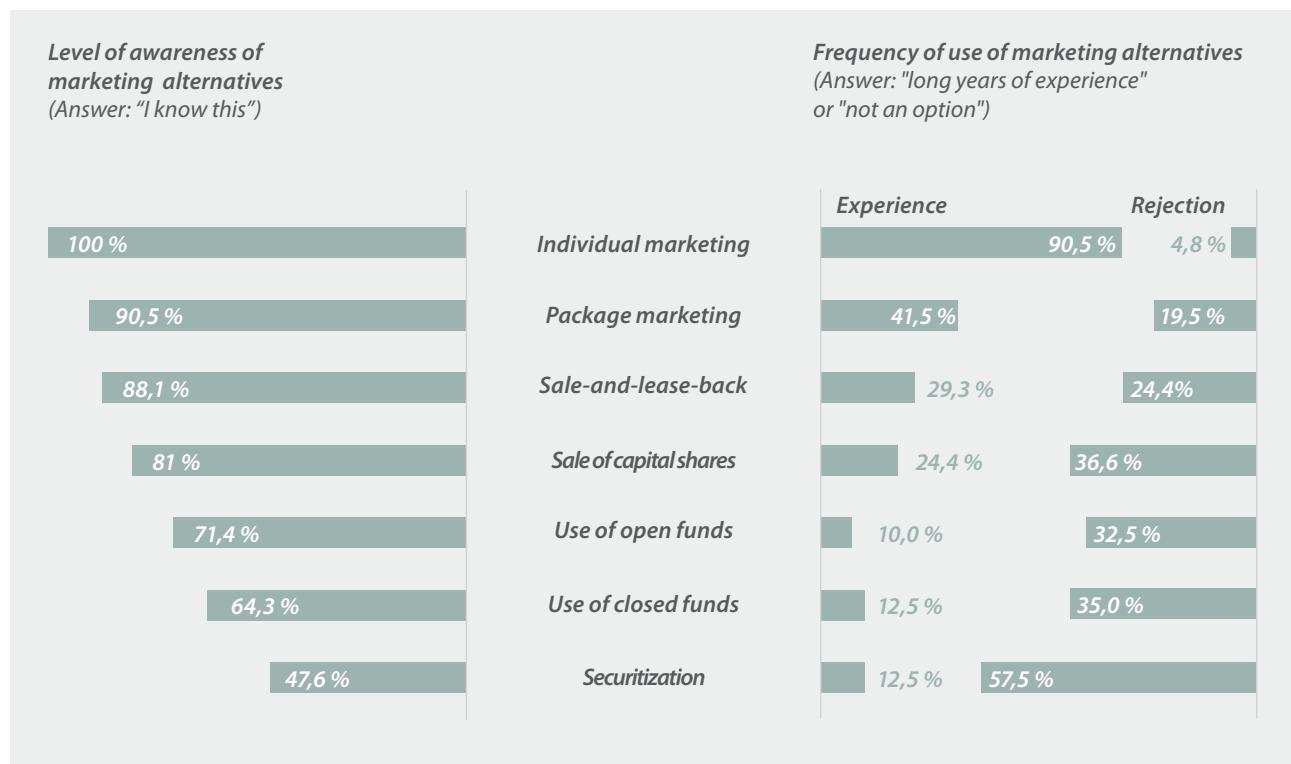
a wave of real estate divestment started around 1990 across German corporations. Empirical studies have shown that in this period, a total of approximately 50 bn. euros worth of real estate assets were sold by German corporations by 2004. A further 50 bn. euros worth of real estate assets were identified as being potentially part of the divestment portfolios of corporations, even if they were not marketed as such.⁷⁶ Although these figures date from 2004, they should still be relatively up to date, as corporations' divestment activities have been at a relatively low level ever since, and further divestment potentials have been added. In particular, the introduction of REITs in 2007 was initially expected to boost divestment of corporate real estate. A low and time-limited so-called exit tax was designed to allow corporations to liquidate their hidden real estate assets reserves, often without having to pay tax. Due to other aspects of the REIT, however, it was very little used. After 2007, the financial crisis prevented further divestment of corporate real estate. It became apparent to corporations that real estate is very hard to sell in times of crisis due to institutional investors' financing problems. It also became evident that any successful sale entailed significant discounts compared to the sales revenue originally expected. Since then, the traditional image of real estate as "gold cast in concrete" or as assets of last resort that can help a company overcome financial problems in times of crisis has been significantly

tarnished and corporations have a much more sober view of their real estate assets.

An analysis of empirical studies on divestment processes shows that corporations have as yet relatively little experience with strategically planned major market transactions with institutional investors. Instead, transactions so far have mostly been made at low volumes and with regionally active small and medium-sized investors and project developers.⁷⁷ They have very little experience with transactions in international capital markets and often see divestment via capital markets with very critical eyes (see Figure 13).

Empirical studies show that the first limit to divestment is the book values. Companies will rarely accept a sales price that is below the valuation shown on the balance sheet. Likewise, companies will want to preserve rights of disposal over properties according to a previously defined scope. Finally, companies fear that a sale of real estate might result in a deterioration of the relationship with their stakeholders. Indeed, workers' representatives and municipalities usually suspect that a sale of property is the first step towards the closing down of sites.⁷⁸

Figure 13: Transaction experience in CREM



Source: Pfür/Armonat (2004).

⁷⁶ See Pfür/Armonat (2004).

⁷⁷ See Pfür/Armonat (2004).

⁷⁸ See Pfür/Armonat (2004).

Small and medium-sized German companies' real estate portfolio is characterized in particular by a large share of production and production-related property in locations that real estate investors consider to be peripheral. In 2010, BulwienGesa published a comprehensive study on these investment potentials. This study evaluated that the monetary volume available to potential investors in appropriate locations through sale-and-rent-back transactions and the existing structures in place for small and medium-sized companies were valued at approximately €310 bn. for the mid-term. This volume is distributed among the various usage types as follows:⁷⁹

- production real estate: approx. €118 bn.
- logistics real estate: approx. €88 bn.
- office, retail, and others: €64 bn.
- transformation real estate: approx. €21 bn.
- R&D real estate: approx. €13 bn.
- multi-tenant real estate: approx. €6 bn.

The study ranked by investor type the most important groups of investors in this real estate investment market that is characterized by small and medium-sized companies: special funds, open-end funds, family offices, opportunity funds, real estate stock companies (excluding REITs), closed-end funds, insurances, and pension funds.⁸⁰

In summary, it can be said that in the course of the last decade, the divestment of corporate real estate has stalled to a large extent, despite the high ownership rates. Furthermore, there is great skepticism in many companies concerning capital market driven forms of divestment.

4.2 Importance of corporate real estate for institutional real estate investors

Although corporate real estate is generally owned by companies, a considerable share is rented in terms of expense. Assuming that the total stock of corporate real estate is worth €3 trillion and that the average ownership rate is of 70%, as calculated in Chapter 2, we arrive at a value of €2.1 trillion of owner-occupied real estate and €900 bn. in rented property. These results mean that rented real estate used for business represents approximately 10% of the total real estate assets of the German economy. To a large extent, this rented real estate is owned by institutional investors such as insurance companies, pension funds, open-end or closed-end real estate funds, or real estate stock companies. Determining exact figures is practically impossible. However, the following figures can be considered as reliable:

- BSI (previously VGF) keeps statistics for closed-end funds. According to these statistics, fund investors own domestic real estate assets totaling €46.3 bn.⁸¹ This amount represents 64% of the total assets invested in real estate, €72.1 bn.
- According to BVI, open-end funds invested approx. €37 bn. in Germany as of 2013, or about a third of the €120 bn. total funds invested in Europe (see Table 7).⁸²

Table 7: Open-end funds investments by location

Location	Percentage as of March 2013	Bn Euro
Rhine-Main area	6.4%	7.68
Rhine-Ruhr area	5.6%	6.72
Major German cities	13.3%	15.96
Other German towns	5.4%	6.48
Total Germany	30.7%	36.84
France	17.1%	20.52
Other Eurozone outside Germany	23.4%	28.08
United Kingdom	9.9%	11.88
Other European countries (outside Eurozone)	8.2%	9.84
ROW	10.8%	12.96
Total abroad	69.4%	83.28
Total in bn. euros (as of June 2013)		120

Source: BVI reporting as of March 2013 and June 2013.

Comparatively speaking, the return on investment in German corporate real estate is not very volatile. Considering the structural integrity of the German economy, it can be expected that the demand for real estate will remain high and that the prerequisite factors necessary for the continuation of this trend will remain in place.⁸³ In the past, investments in leased corporate real estate have been characterized by a positive risk-return ratio for conservative investors with a long-term investment horizon. Thus, they are particularly suitable investments for private pension schemes provided that their purchase price is reasonable.

These are general statements concerning the significance of corporate real estate for investors. Further evaluations of investments in corporate real estate require the differentiation of these investments according to building usage. In this regard, investors in Germany display a different behavior than investors in the U.S. (see Figure 14).

⁷⁹ See BulwienGesa (2010). In a follow-up study from 2013, the same authors give significantly different figures. This is probably due to a different classification of usage types.

⁸⁰ See BulwienGesa (2010), p. 63.

⁸¹ See http://www.vgf-online.de/fileadmin/VGF_Branchenzahlen_2012/VGF_Branchenzahlen_2012_Praesentation.pdf, accessed on August 13th, 2013.

⁸² See http://www.bvi.de/fileadmin/user_upload/Statistik/OIF_Quartalsauswertung_31032013.pdf, accessed on August 13th, 2013.

⁸³ See e.g. IVG (2013).

While office and retail properties clearly dominate the German investment markets, industrial and logistics properties amount to a sizable share of the total U.S. market at 21%. In Germany, industrial and logistics real estate is only given limited consideration in investors' portfolios. The same applies to properties outside the traditional real estate investment markets.⁸⁴

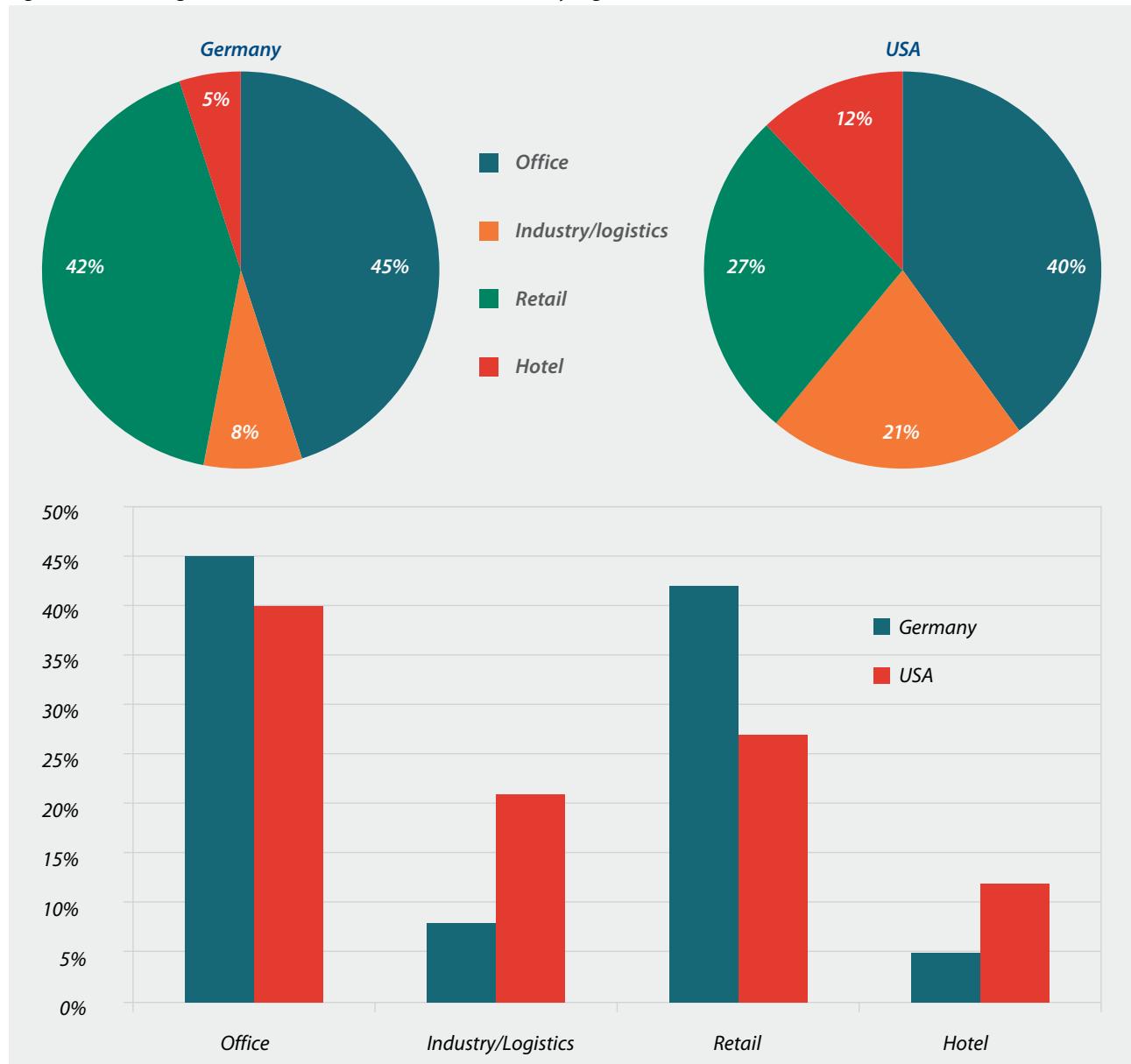
The investment profiles of corporate real estate differ substantially depending on property usage, location, and tenant structure. In comparison to the real estate investment targets currently customary in the capital market for office and retail in major cities, corporate real estate offers a much more heterogeneous structure with a very wide range of risk-reward profiles. All in all, from an investor's point of view, there has

been so far a remarkable lack of information on the breadth of investment alternatives in corporate real estate. Due to the poor quality of the information available, I will have to dispense with providing a breakdown of market alternatives, even though such a breakdown would be desirable. Instead, I can only present the few fragments of information available so far.

4.2.1 Centrality

20% of office workers and 26% of office space are located in the main office areas.⁸⁵ A large proportion of these spaces, at least as far as they are marketable, is likely to be owned by investors. Any further statement concerning the attractiveness of these submarkets would be made redundant against the back-

Figure 14: Percentages of commercial real estate investments by segments



Source: The author's compilation based on figures by BulwienGesa (2012), p. 1.

⁸⁴ See BulwienGesa (2012).

⁸⁵ See Voigtländer et al. (2009).

ground of the comprehensive information available on this matter. However, the rest of office space, amounting to nearly three quarters of the total stock, is distributed among Germany's manifold polycentric space usage structures. Even though there are no precise figures concerning this subject, decentralized office investments are likely to be relatively rare. In Germany, the companies that use the space are mostly its owners. According to studies conducted by Hamburg's HWWI, companies are increasingly looking for sites outside big cities, in towns of over 100,000 inhabitants. This trend makes towns like Augsburg, Regensburg and Ulm attractive to investors.⁸⁶

4.2.2 Risk-return profile

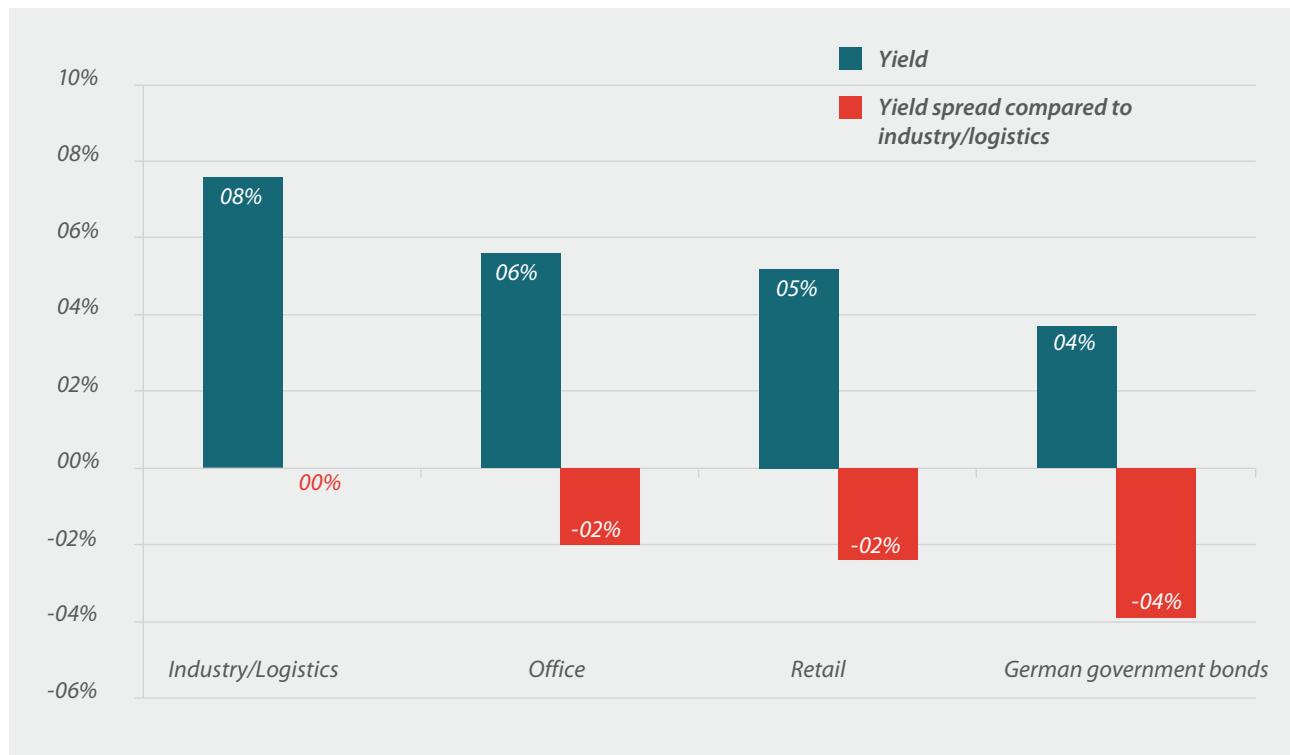
In Germany, production-related real estate represents only 8% of the investment market.⁸⁷ Compared to other countries, this type of real estate – composed largely of industrial, R&D, and logistics real estate – has been neglected by investors in Germany. As there is hardly any information available concerning return on investment for the various usages of corporate real estate in Germany, (except property used for logistics), I will use European data as an approximation (see Figure 15).

The 10-year yields of different property usage types outlined in Figure 15 show a clearly positive yield spread of production-related real estate, as opposed to office and retail properties or government bonds.

Another indication on the yield of production-related real estate usages is given by the classes Trade/Industry of the Deutscher Immobilienindex (DIX) and the German Property Index (GPI). In both indices trade properties are very poorly represented, relatively speaking. Hence the yield figures given by the indices should only be seen as an initial indication. The GPI overview of yields over time by usages shows that yields of trade properties have been characterized by a relatively low volatility.⁸⁸ Although it would appear to be problematic that this overview often commingles very different usages such as logistics, production, etc., a fundamental tendency towards a stable yield is nevertheless obvious. This is due to the fact that business cycles have less of an impact on the production-related usages of industry, R&D, and logistics. In principle, the usages of these types of real estate tend to be more reversible. With changing needs they can be adjusted quite fundamentally, all the way down to their usage.⁸⁹

Over time, the yield structure of trade properties is characterized by a relatively high and very stable cash flow yield of approx. 8% per year. Value fluctuations caused by the real estate investment market are comparatively lower than with other usages. This yield structure obviously confirms that this segment has not yet attracted the attention of a large number of investors. From the investors' point of view the usually higher cost of administration of production-related real estate in asset and property management must also be taken into consideration.⁹⁰

Figure 15: Yield spreads (10-year distribution yield) between types of property usage in Europe



Source: The author's compilation based on data provided by Prologis and quoted by BulwienGesa (2013b), p. 1.

⁸⁶ See Straubhaar (2013).

⁸⁷ See BulwienGesa (2012) and especially Figure 14.

⁸⁸ See BulwienGesa (2013b), p. 2.

⁸⁹ See BulwienGesa (2012).

⁹⁰ See BulwienGesa (2013).

4.2.3 Small and medium-sized enterprises as tenants

75% of the real estate used by small and medium-sized enterprises is owned by the users. Only a quarter of all space is leased.⁹¹ Assuming that half of the real estate is used by small and medium-sized enterprises, as estimated above, then SMEs are underrepresented as tenants in the German real estate investment markets.

From the investors' perspective, small and medium-sized enterprises are dramatically different as tenants from larger, usually multinational corporations. For instance, there is usually a very high number of potential users and thus a wide distribution of risk. Their market influence is intrinsically lower than that of international groups. Due to their production structures based on specialists and supplier relationships they can be considered to be more loyal to their traditional location and to be usually more focused on the long term in their utilization cycles. Compared to big corporations, though, their credit worthiness and cross-selling potential for investors is often lower.

4.3 Interim results

The following insert summarizes the most important results of this chapter.

- For companies, real estate does not only constitute a resource but also an important capital investment. German companies hold an average of 70% of the real estate used by them as their own property. Thus the real estate assets held by corporations in Germany amounts to 2.1 trillion euros.
- German companies attach extraordinary importance to real estate property. The average ownership rate of large German corporations is at about two thirds of the real estate used by them; with German small and medium-sized companies, the rate is three quarters. In the U.S. and in Asia, the ownership rates in corporate real estate are much lower at 20% resp. 30%.
- For DAX companies, the book value of corporate real estate amounts to approximately one fifth of their market valuation at the stock exchange.
- From a theory of company funding point of view there are serious arguments against real estate ownership. Also, empirical studies from the U.S. impressively show that the capital market does not reward investments into

corporate real estate by listed companies. Conversely, divestment from corporate real estate positively correlates with stock prices.

- Divestment from corporate real estate was largely limited to space no longer needed. After extensive sales in the past, divestment from corporate real estate is now stagnating.
- There is experience with sale-and-rent-back transactions. This mostly stems from individual cases with local market partners. By contrast, portfolio transactions are the exception in CREM. There is very little experience with transactions in international capital markets and divestment via capital markets is often seen very critically.
- The capital market culture in the German corporate real estate market is weak. Consequently, of the approx. 3,000 billion euros worth of corporate real estate only a negligible 46 billion were in the hands of closed-end funds and 37 billion in the hands of open-end funds.
- In the German real estate capital market production-related usages play a subordinate role. Currently 8% of the real estate investment market in Germany are invested in production-related usages such as logistics, production, and R&D. Regionally, investment cultures vary widely. In the U.S., for example, these usages make up 22% of portfolios.
- Production-related usages offer benefits to investment risk management that have not been widely discussed yet. For one thing, production-related properties can usually be switched over to a different usage without major expense. In addition, small and medium-sized enterprises as typical tenants of such real estate offer potential advantages over international groups as they have less market power, more loyalty to their location, often a better financial structure and high economic performance. Last but not least they are often more flexible when it comes to site selection and definition of contractual terms as they have no rigid property procurement guidelines.
- Due to the companies' site preferences, corporate real estate lacks market partners in the capital markets. For example, the lion's share of office space held by corporate real estate in Germany is outside the office centers; yet in these locations, investors are not very active.

⁹¹See Pfür et al. (2008) and especially Section 4.2.

5 IMPORTANCE OF CORPORATE REAL ESTATE FROM THE POINT OF VIEW OF THE BUILDING INDUSTRY AND OF REAL ESTATE SERVICES

5.1 Basis for the provision and operation of corporate real estate

Representing 18.6% of the German gross domestic product, the building and real estate industry is Germany's largest economic sector. The industry counts over 700,000 companies that employ 3.8 million people, or approximately 10% of the working population.⁹² Taking the value of real estate assets as a measure for employment intensity, it is possible to estimate that about a third of all employees in the real estate industry (ca. 1.3 million people) are concerned with the provision and operation of corporate real estate.⁹³ In fact, this figure is likely to be much higher because official statistics record employees as belonging to a given economic sector according to their company's classification. For example, Tomczyk et al. (2010) established a ratio of 2.2 million internal to 1.9 million external employees for the facility management industry segment.⁹⁴ Assuming that Tomczyk et al.'s definition of the scope of facility management comprises a large share of facility management staff who handle jobs in the field of real estate, the number of employees in the real estate industry would probably be significantly higher. Similar effects would, however, result in other industries, such as logistics and IT.

For example, if employees in a company part of the automotive industry regularly provide real estate services, that is to say participate in the management of the company's own property, official statistics count them as working in the automotive sector rather than in the building and real estate industry. Taking a closer look at this economic data and considering companies individually, it becomes clear that a ratio of 1:10 is the norm in many cases. In other words, in a company of 200,000 employees, about 20,000 employees ensure the provision and operations of the company's real estate resources. It is important to note that these employees may be employed by other employers via contractual relationships or joint ventures. The large number of companies in the real estate industry, 700,000, illustrates that this sector is very much dominated by SMEs and local structures. As the sector's level of mechanization is low, the building and real estate industry

has relatively high employment multipliers. Assuming an employment multiplier of 2.6, investments in construction trigger a demand factor of 1.6 on top of the construction proper.⁹⁵ These numbers mean that the 180 bn. euros (an average of 16 bn. euros per year) worth of construction in corporate real estate in the period from 2000 to 2010 translate into a GDP increase of approx. 470 bn. euros (an average of 43 bn. euros per year), excluding the employment resulting from real estate operation and use.⁹⁶ Investments in corporate real estate also have a notable impact on macroeconomic development because they significantly promote regional employment.

Twenty years ago, it would have been necessary to make a distinction here between the construction and real estate industries. Since then, however, the development of both industries has led to a de facto integration of the two sectors in many respects. What were once the biggest construction companies in the German market either no longer exist (e.g. Philipp Holzmann AG, Walter Bau AG, Maculan Holding) or generate more than half their revenue in services (e.g. Bilfinger SE, Hochtief AG, STRABAG AG), a large portion of which from the operation of real estate.

Despite the profound transformation of business models, the fundamental services and processes in the construction and real estate industry have changed relatively little over the last few decades. According to empirical studies, this sector's innovation intensity is relatively low.⁹⁷ In view of other industries' propensity to innovate and of simultaneously occurring profound changes in business and society, the traditionalism of this economic sector is quite surprising. After all, because it is part of the built environment, real estate should be exposed to changes in business and society and thus to numerous innovations, and it should keep abreast of these. Presumably, real estate's traditionalism is largely due to the fact that it has been based on a special customer-supplier relationship for a number of decades. This relationship includes a contract awarding procedure specifically developed for the construction industry and replete with its special legal basis (Construc-

⁹² For the exact figures, see the ZIA homepage, <http://www.zia-deutschland.de/daten-und-fakten/daten-der-immobilienwirtschaft>, accessed on August 12th, 2013.

⁹³ The total of real estate assets is valued at 9 bn. euros. Earlier, in Chapter 2, the value of capital tied up in corporate real estate was estimated at 3 bn. euros.

⁹⁴ See Tomczyk et al. (2010), pp. 64 f.

⁹⁵ An employment multiplier indicates the factor by which an initial investment triggers employment through downstream value-added steps. For investments in construction, see for example RWI (2010).

⁹⁶ See DESTATIS (2012).

⁹⁷ See Reichstein et al. (2005), Harty (2008), Rutten et al. (2009).

tion Tendering and Contract Regulations, VOB). The institutional separation of building planning, construction, and operation probably also contributes to this situation. The fragmentation of competences and responsibilities makes user integration so successfully used in the innovation process of other industries considerably more difficult in the building and real estate industry.⁹⁸

5.2 Provision of corporate real estate

I will use the term "provision of corporate real estate" to refer to all activities that are required to create real estate resources and to make them available for the first time after their "greenfield" development or after comprehensive refurbishment. Typically, the provision of corporate real estate encompasses a survey of requirements, project development, basic engineering, detailed engineering, project control, all construction works, and the handover and acceptance of the property, including the subsequent redressing of defects.⁹⁹ The Statistisches Bundesamt (German Federal Office of Statistics) compiled official statistics on building completion over the last 11 years that give an indication of the volume of the annual provision of real estate (see Table 8).

Since the turn of the millennium, after the conclusion of reconstruction in eastern Germany following the reunification, the level of building completion in corporate real estate has slightly decreased or, at best, remained relatively unchanged. While in 2010 office and administrative buildings worth approximately €1.5 bn. were completed, the value of factory and workshop buildings was of about €3.5 bn. The value of trading and warehousing buildings was of €6.8 bn.

According to data provided by Hauptverband der Deutschen Bauindustrie (Main Association of the German Construction Industry), the so-called commercial buildings represent 22% of all construction activities. Commercial civil engineering, for its part, represents 14%. Thus, a total of just under a third of all construction work is of a commercial nature. By comparison, the construction of residential buildings represents 34% of all construction activities and the construction of public buildings and civil engineering 30%.¹⁰⁰ A rough segmentation by turnover shares indicates that some 36% or 265,000 of the remaining 735,000 employees of the main construction trade are working on orders placed by private enterprises. This number must be added to the figures for corporate real estate management. Depending on the perspective taken, public clients would also have to be added, corresponding to about 43,000 employees (5.8% of employees in the main construction trade). Thus, it is possible to calculate that a total of 308,000 employees in the main construction trade deal with orders placed by corporate real estate management.¹⁰¹

5.3 Corporate real estate operations services

Corporate real estate operations encompass all activities that are required to make real estate available to companies as resources in a sustainable and efficient manner. These activities include technical, infrastructural, and administrative (legal-commercial) operations from both the users and the owners. There have been numerous attempts to develop organizational concepts to typify these tasks. Most of these have been published as facility or facilities management. In some market segments, the administrative jobs may also be referred to as property management, alongside the commercial term facility management.¹⁰² Any estimation of the macroeconomic importance of corporate real estate operations services always

Table 8: Statistics for the completion of non-residential buildings

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	39,314	35,436	32,687	28,855	28,029	25,827	26,799	27,258	28,524	26,458	26,990
Office and administrative buildings	3,515	3,172	2,897	2,454	2,046	1,827	1,869	1,784	1,859	1,742	1,533
Non-agricultural buildings	22,578	19,821	17,214	14,848	14,839	13,926	14,751	14,939	15,945	14,240	13,834
of which:											
Factory and workshop buildings	5,930	5,562	4,705	3,923	3,750	3,463	3,656	3,779	4,394	3,888	3,460
Trading and warehousing buildings	9,997	8,989	7,933	7,029	7,047	6,721	6,875	7,317	7,710	6,730	6,774
Hotels and restaurants	805	719	600	490	549	513	565	528	533	585	515
Other non-residential	3,497	3,203	3,173	2,809	2,756	2,573	2,584	2,447	2,508	2,444	2,795

Source: DESTATIS (2013).

⁹⁸ See von Hippel (1986).

⁹⁹ See Diederichs, C.J. (2005).

¹⁰⁰ See <http://www.bauindustrie.de/zahlen-fakten/statistik/struktur/umsatzstruktur/#>, accessed on July 12th, 2013.

¹⁰¹ These figures do not include the secondary and ancillary construction trades. See <http://www.bauindustrie.de/zahlen-fakten/...>, accessed on July 12th, 2013.

¹⁰² See Pfür (2011).

suffers from the fact that most available figures are incomparable to each other because of the diverging underlying definitions of the numerous concepts used in the market. For instance, activities in the fields of IT services, security services, fleets, etc. are accounted for in different ways. I can therefore only attempt to give an impression of general dimensions here.

Tomczyk et al.'s definition strictly limits the scope of facility management to real estate activities. Nevertheless, it encompasses about half of the buildings dedicated to education, health services, sports, culture and leisure, in addition to residential buildings – none of which are part of this study's subject matter. By subtracting the value of these building types from Tomczyk's initial values, it is possible to obtain at least an approximate overview of the importance of corporate real estate operations (initial values in parentheses):¹⁰³

- The FM industry's annual gross added value amounts to €56 bn (€112 bn.).
- The number of employees is 2MM (4.1MM), of which 1.1MM (2.2MM) are internal staff employed by users and 1MM (1.9MM) are external staff employed by service providers within the FM industry.

5.4 Share of corporate real estate in companies' ecological footprint

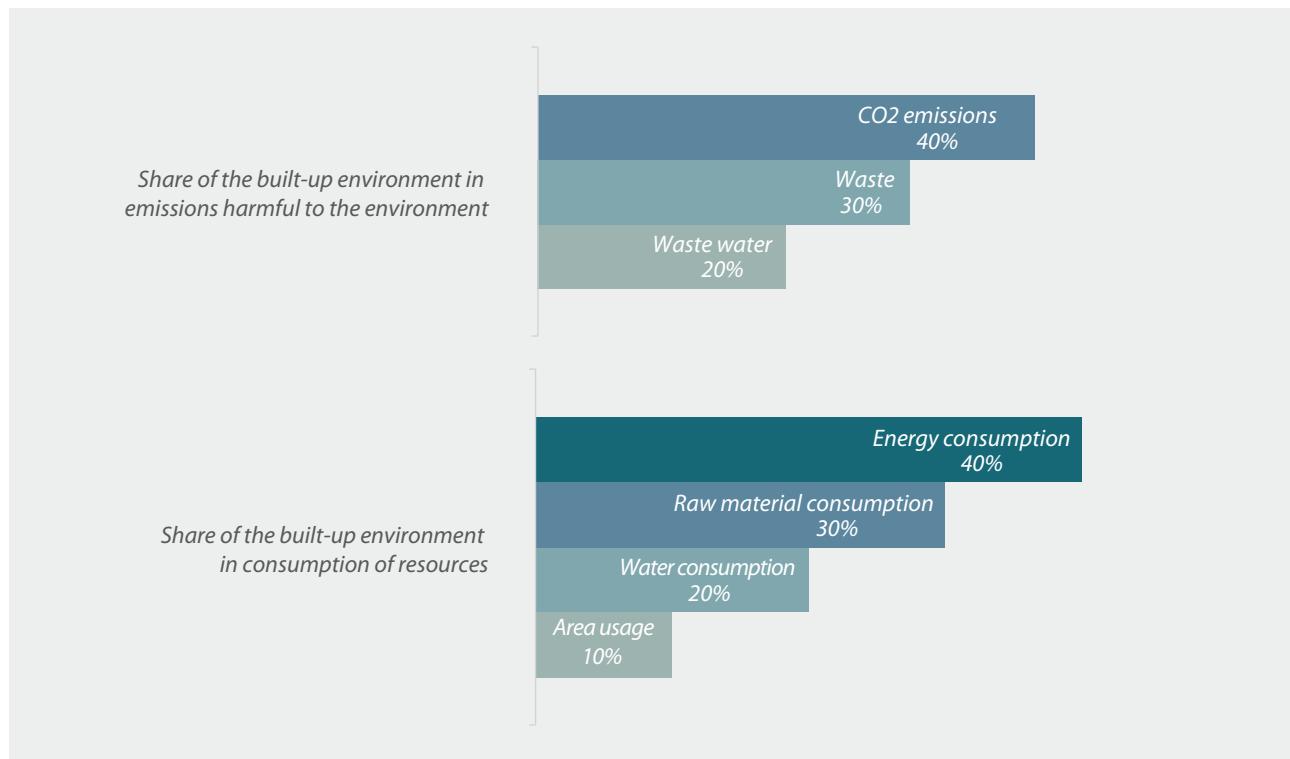
The provision and use of corporate real estate inherently entail the consumption of resources. Around the world, the built environment as a whole contributes significantly to the generation of environmentally harmful emissions and to the consumption of resources (Figure 16).¹⁰⁴

The figures compiled by the United Nations Environment Programme (UNEP) and illustrated in Figure 16 are a global estimate that encompass all buildings of the built environment. Adjusting the scope of these figures to reflect the real estate used by companies in Germany, we arrive at three main conclusions of current societal interest:

- Land consumption

In 2011, 13.4% of the total land area in Germany was used for settlement and transportation. This share is constantly growing. Table 9 shows land consumption by usage type. In order to approximate the amount of land occupied by corporate real estate, it is necessary to add the land used by the trade/industry (usage type 170), of buildings and open space, and of working area excluding mining areas (300 without 310). This calculation falls short, as it neglects the buildings and open spaces used for retail and services (140). It is impossible to take this category into account because

Figure 16: Share of built environment in the utilization of resources and in environmental degradation (globally)



Source: UNEP (2007).

¹⁰³ See Tomczyk et al. (2010).

¹⁰⁴ See (2007) http://www.unepfi.org/fileadmin/events/2006/paris_pwg/3unep_sbci.pdf, accessed on July 19th, 2013.

Table 9: Land use by type of building usage

Year	Total land area	Residential and transportation area	Buildings and open space	Residential	Trade and industry	Working areas excluding mining areas	Recreation area	Transportation area
	(999)		(100/200)	(130)	(170)	(300 ohne 310)	(400)	(500)
2008	357 111	47 137	24 416	11 732	3 229	787	3 787	17 790
2009	357 125	47 422	24 512	11 853	3 257	793	3 905	17 856
2010	357 127	47 702	24 589	12 060	3 260	837	3 985	17 931
2011	357 138	47 971	24 676	12 168	3 296	858	4 083	17 993

Source: Statistisches Bundesamt (2013).

of the lack of reliable data.¹⁰⁵ Nonetheless, it is possible to estimate roughly that corporate real estate uses approx. 10% of settlement and transportation areas.

- Energy consumption for air conditioning

Nearly 40% of energy consumption is caused by air conditioning. However, exact figures are not yet available, particularly concerning the energy consumption of commercial real estate. In its energy and climate protection plans, the German government is anticipating significant reductions in energy consumption caused by the air conditioning of buildings. In particular, the government aims to reduce energy consumption by 30% before 2020 and by 80% before 2050. In principle, it is possible to reach these very ambitious goals. However, in order to do so, every known building improvement measure will have to be used.¹⁰⁶ Yet, energy saving efforts have focused mostly on residential buildings so far. For example, under the heading energy efficiency/buildings, the Federal Ministry for the Environment's website only addresses private households.¹⁰⁷ At this stage, I am not aware of any calculations or in-depth estimates concerning the reduction potential of commercial real estate's primary energy consumption or CO₂ emissions. Considering the extensive efforts made to reduce residential properties' level of energy consumption, the poor level of information concerning commercial real estate is surprising. It is much harder to estimate potential energy savings and emission reductions in the operation of commercial real estate than in that of residential property. The biggest problem lies in the lack of data concerning existing buildings and their energy requirements. Even though the energy consumption of residential and commercial properties (types of energy used, air conditioning technologies, share of renewable energies, heating/cooling ratio, etc.) cannot in principle be compared for structural reasons, I will attempt to use comparative values in order to obtain a very rough estimate. It is necessary to point out, however, that this estimate will lack a solid empiri-

cal basis. Assuming that the average energy consumption of residential and commercial properties can be compared via the value of buildings and knowing that the value ratio between commercial and residential properties is €6 to 3 trillion, I may attempt to roughly estimate the share of commercial real estate energy consumption as follows. According to the Federal Ministry for Economic Affairs (BMWI), private households are responsible for 25% of Germany's total energy consumption.¹⁰⁸ 86% of this energy is used to heat rooms with hot water, which means that approximately one fifth of end-use energy consumption in Germany is caused by residential properties. Making the bold and partly unjustified assumption that the value ratios between property types inform their energy consumption ratios, then it is possible to conclude that commercial real estate is responsible for 10% of German end-use energy consumption. According to the BMWI data, the energy consumption of the sectors of trade, retail, services, and industry amounts to 46%. Therefore, we may deduce that about a fifth of companies' end-use energy consumption is caused by their buildings. Of course, it is important to keep in mind that the causal relationships are far more complex. The simplicity of the method I used and its results are only meant to provoke dissent and give food for thought. Overall, it can be concluded that the available data is currently insufficient for the government to enforce regulations concerning the energy consumption of corporate real estate. I urgently recommend thorough research before potential regulations are considered.

- Material consumption

The consumption of raw materials in the construction of buildings and the recovery of these materials (urban mining) are topics that have received little attention in Germany in the context of the closed cycle economy. Nevertheless, it is only a question of time before these issues become important in Germany, considering the growing shortage of precious metals such as copper.

¹⁰⁵ Source: Statistisches Bundesamt (2013).

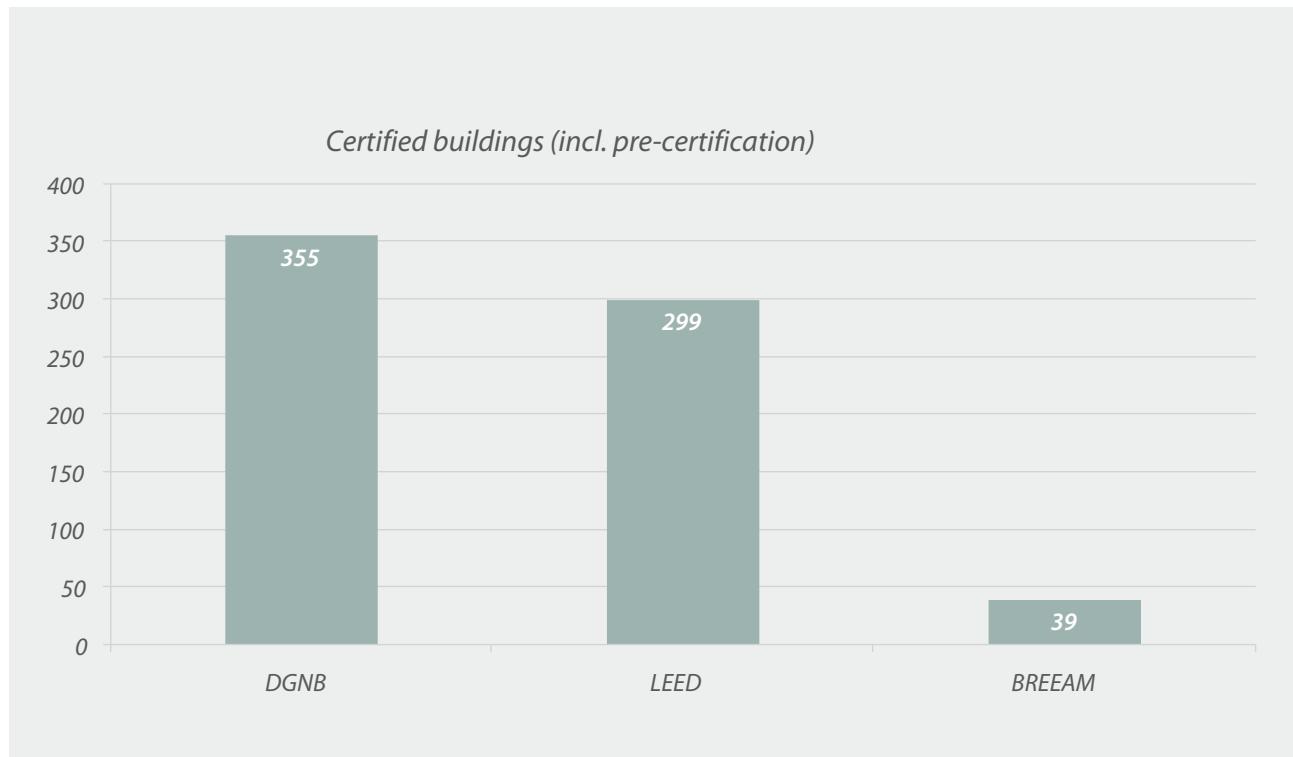
¹⁰⁶ Fraunhofer Institut (2013).

¹⁰⁷ See <http://www.bmu.de/themen/klima-energie/energieeffizienz/gebaeude/>, accessed on July 19th, 2013.

¹⁰⁸ See BMWI (2013).

In the context of building sustainability, discussions among scientists and practitioners usually lead to certification systems, particularly in the context of office buildings. Compared to the intensity of the debate among specialists, the empirical evidence for certifications in Germany is very scant. Of the 189,000 office buildings, only a few hundred have been certified under the customary systems of DGNB, LEED, or BREEAM so far (see Figure 17).

Figure 17: Number of certified office buildings



Source: The author's compilation based on figures by DFNI (08/13), DGNB (08/13), and LEED (05/13).¹⁰⁹

¹⁰⁹ See <http://www.difni.de/breeam-de/breeam.html>, accessed on August 12th, 2013; <http://www.dgnb-system.de/de/projekte/index.php>, accessed on August 12th, 2013; <http://www.sustainablebusiness.com/index.cfm/go/news.display/id/24937>, accessed on August 12th, 2013.

5.5 Interim results

The following insert summarizes this chapter's most important results.

- For every ten employees who work for German companies, there is one employee who deals with the provision of corporate real estate.
- Over the last 11 years, the provision of corporate real estate has led to annual investments of around 16 billion euros in new buildings. Based on an employment multiplier of 2.6, this amount resulted in an average aggregate demand of 43 billion euros per year.
- Corporate real estate is responsible for 42% of all orders placed in the main construction trade. As such, it creates jobs for 308,000 employees in this sector.
- The operation of corporate real estate generates a gross added value in facility management of buildings of approximately 56 bn euros per year. More than 2 million employees are active in this business segment.
- Empirical studies have demonstrated that the construction and real estate industry is much less prone to innovation than other industries, such as IT or logistics.
- Companies' real estate resources have a decisive impact on their ecological footprint. Companies use 10% of the total area dedicated for residential buildings or for traffic in Germany.
- The operation of corporate real estate is responsible for ca. 10% of German energy consumption. However, data concerning the energy consumption of commercial real estate is generally quite scant – this figure is only a rough initial estimate. If this estimate were to be confirmed, then companies would use approximately one fifth of their energy consumption for the operation of their buildings. Thus, there would be great potential for the reduction of their energy consumption.

6 STATUS OF DEVELOPMENT AND PERSPECTIVES FOR CORPORATE REAL ESTATE MANAGEMENT IN GERMANY

The objective of this chapter is to present a differentiated comprehensive survey of the status of development of corporate real estate management structures. Over the last two decades, a number of management concepts were developed across the globe under the heading of corporate real estate management (CREM). I will explain these concepts briefly and determine the degree to which they have been implemented in Germany.

6.1 Conceptual basis of corporate real estate management in Germany

Despite some significant differences in detail, scope, tasks, and institutionalization, concepts of corporate real estate management are relatively homogeneous. Since Brown et al. published a first study on this matter in 1992,¹¹⁰ a common understanding according to which CREM encompasses the following core elements has emerged both in Germany and globally (see Figure 18):¹¹¹

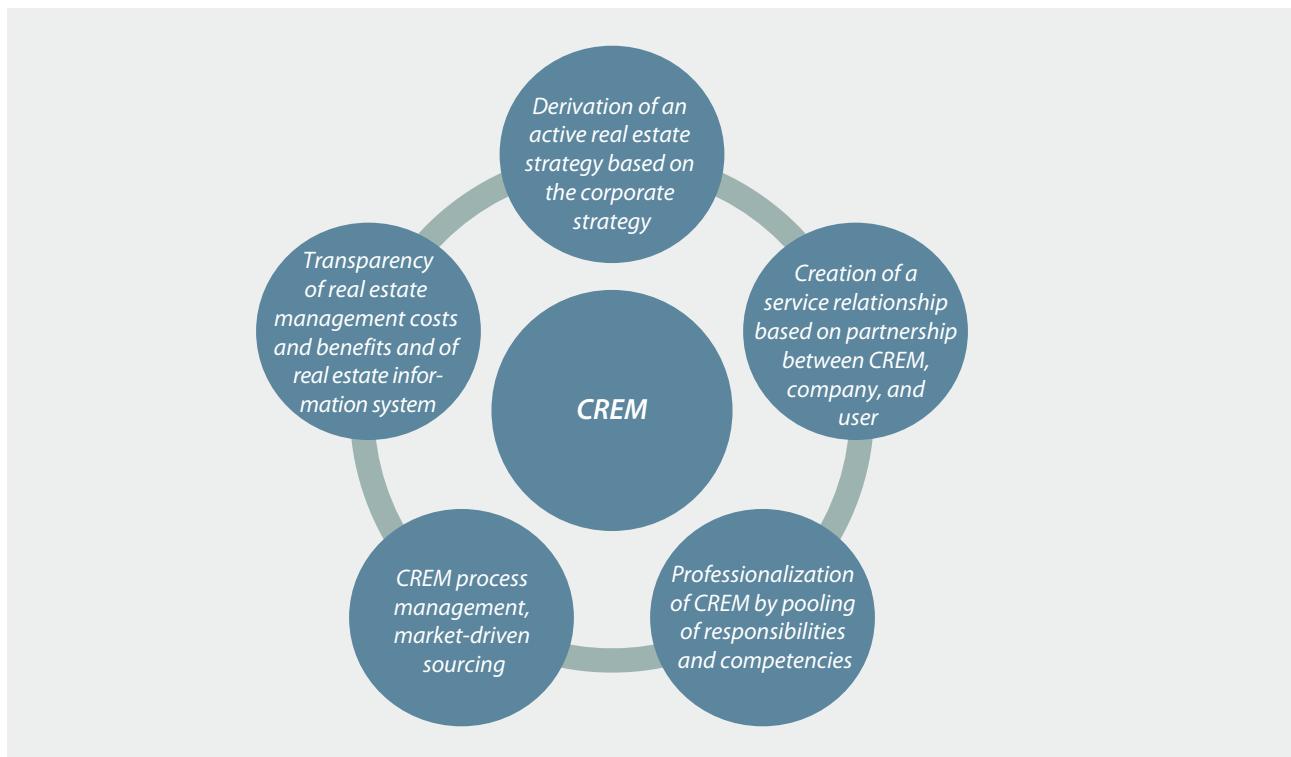
The most important prerequisite in order to make CREM efficient is to create transparency regarding the real estate itself and its benefits and cost factors. To maximize CREM's efficiency, it is necessary to consider real estate issues when designing a corporate strategy. As for non-real estate companies, where real estate management is not part of the core business, CREM must establish a business relationship with the

company's other departments as a service provider. In order to ensure that appropriate competencies are developed, real estate tasks should be pooled so that responsibilities can be defined and regulated under a strict management system. In the context of a management system focused on real estate processes, the operative implementation of strategies is geared towards efficiency. Once the processes have been defined and strengths/weaknesses and opportunities/risks identified, it is necessary to determine which real estate services should be performed in-house and which should be outsourced.

If a company is faced with the challenge of centralizing the management of its commercially used real estate assets in the context of CREM's institutionalization, the following areas (see Figure 19) need to be covered:

Empirical studies have shown that there is no "best model" to

Figure 18: Core elements of CREM



Source: Pfür (2011).

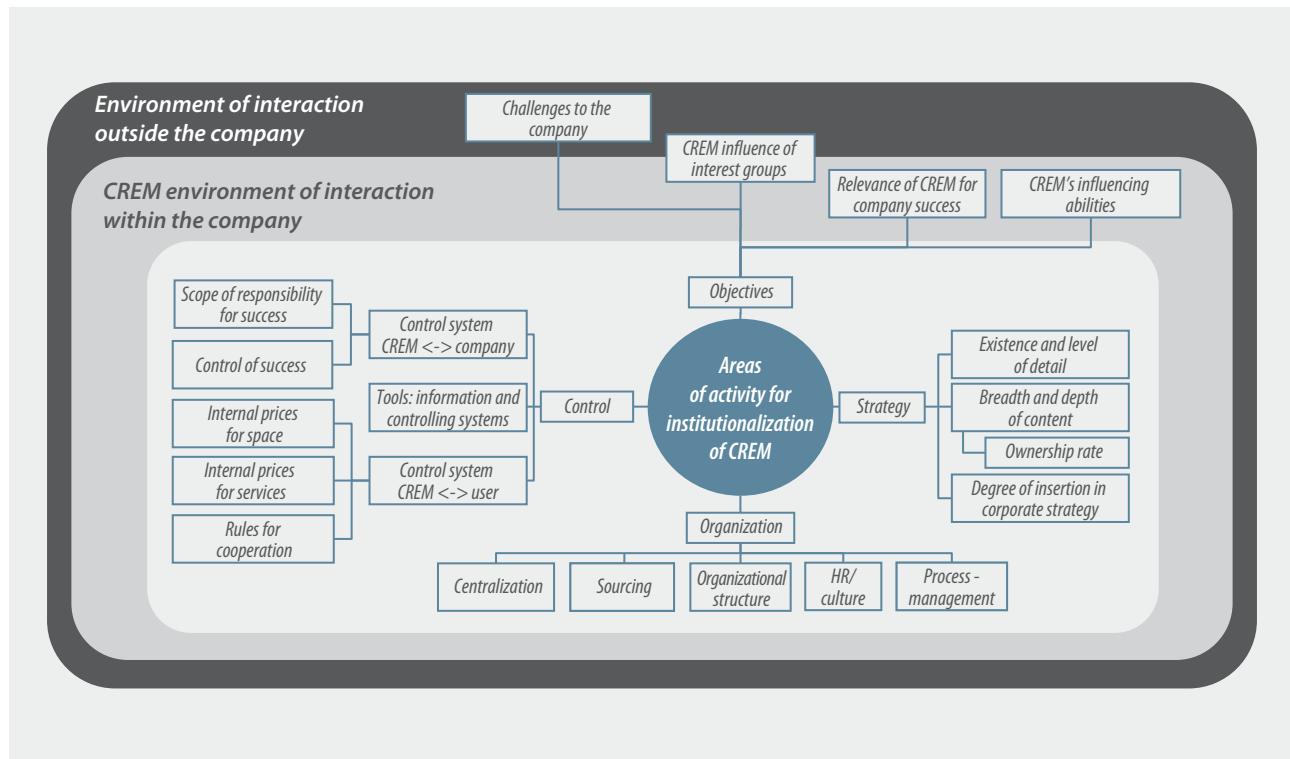
¹¹⁰ See Brown et al. (1992).

¹¹¹ See Pfür (2011).

approach this situation. Instead, the objectives, strategies, organization and steering concepts must be tailored to the specific real estate challenges posed by a company's environment

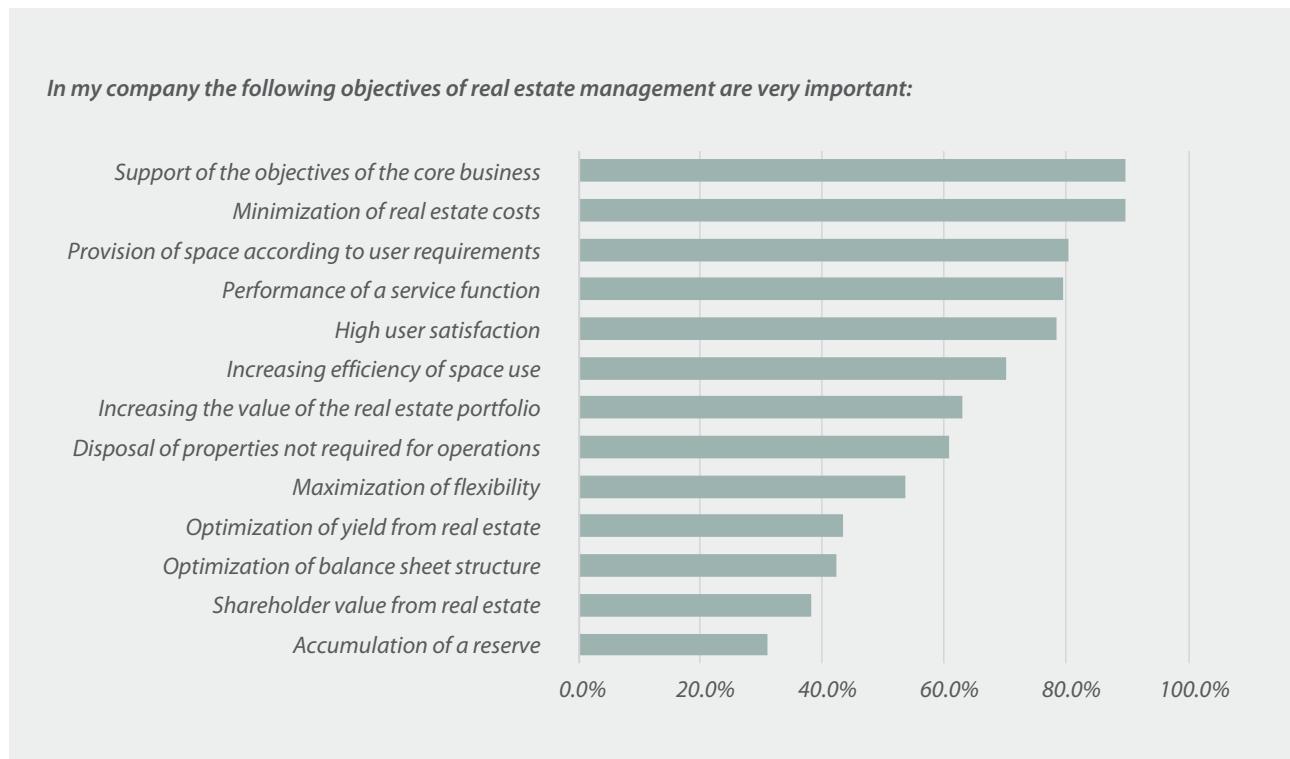
and the importance of individual real estate resources for this company.¹¹² Below, I outlined fundamental options and provided empirical evidence for their use in German companies.

Figure 19: CREM map



Source: Kämpf-Dern/Pfnür (2011).

Figure 20: Importance of alternative targets for CREM in German companies



Source: Pfnür/Weiland (2010).

¹¹² See Pfnür (2001), Hartmann, (2011), Kämpf-Dern/Pfnür (2013).

6.2 Target systems and real estate strategies in CREM

For a long time, German companies disagreed on whether real estate was a type of capital investment or a resource in the production process.¹¹³ Current studies show that this debate has been resolved in the vast majority of companies. In 90% of companies, real estate management is believed to be concerned with meeting the core business's space requirements in the most efficient manner possible (see Figure 20). In this context, companies no longer overwhelmingly believe that real estate solely serves investments and corporate finance targets.

It is interesting to notice that corporate real estate managers in German corporations see significant potential in their relationship with internal customers. Nonetheless, empirical studies show that the management of client relationships¹¹⁴ and the ability to recognize users' problems and to solve them cooperatively¹¹⁵ are still relatively weak in real estate management. For instance, only half of companies perform user satisfaction analyses. Administrators indicate that feedback on CREM denotes an excellent performance in just over 50% of cases. Users seem to be particularly unhappy with the office space made available to them.

In nearly half of companies, the employees responsible for CREM find that users have their own agenda when it comes to

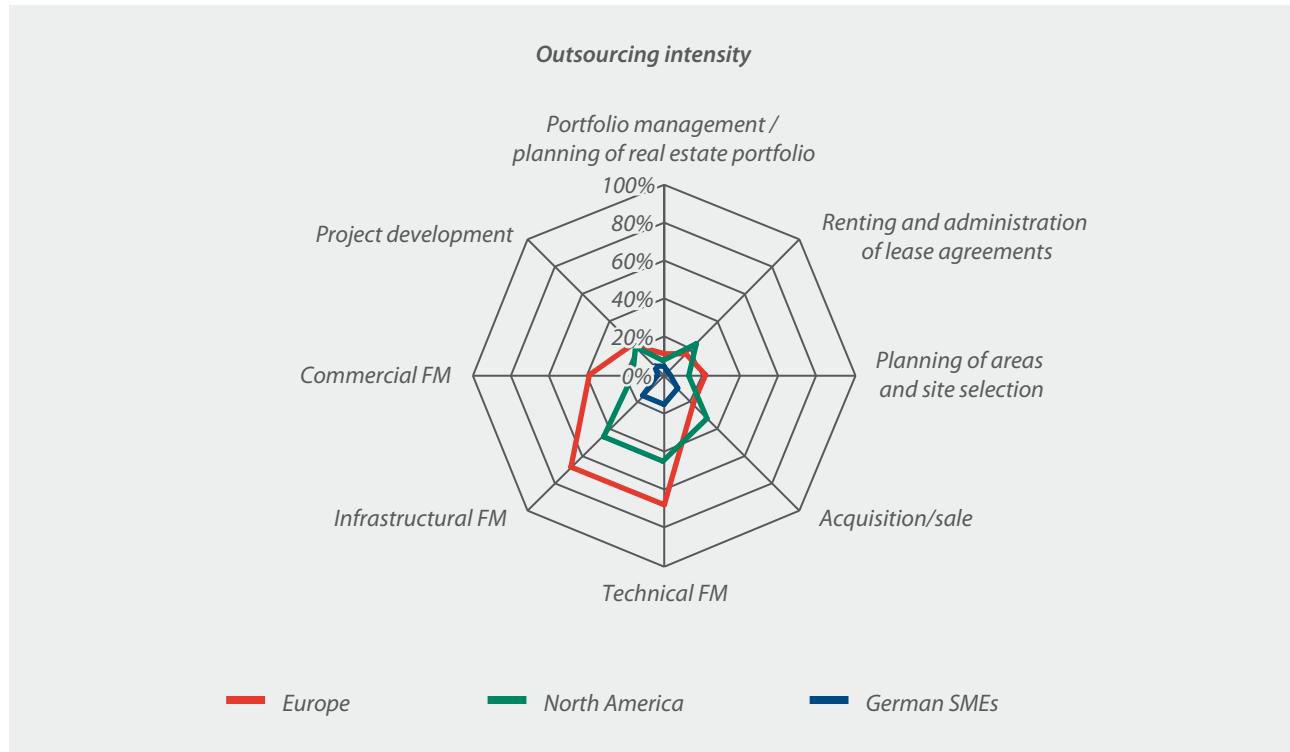
real estate. This agenda, in extreme cases, can be contradictory to the company's overall objectives. Users often try to bypass the real estate management organization in order to pursue their own agenda. Similarly, in nearly half of companies, users perceive CREM more as an executive branch of financial and cost management than as a service provider. The results of this survey expose a significant optimization potential for the companies concerned.¹¹⁶

6.3 Sourcing and organizational structure

German corporations already source a large share of real estate functions from external providers. So far, small and medium-sized companies have been much more restrained in this respect (see Figure 21). Figure 21 illustrates numbers for European companies in comparison to North American companies. The statistics for Europe are largely representative of the German market.

Although German corporations have already outsourced a large share of the operative, technical, and infrastructural aspects of their real estate functions, they are planning to outsource a further substantial amount in a selective way (see Figure 22). Overall, it transpires that progressively organized companies have very lean real estate departments consisting of relatively few staff members, usually no more than a few hundred.¹¹⁷ Their own real estate production intensity is very

Figure 21: Outsourcing of German CREM in comparison to the rest of the world



Source: Hartmann et al. (2008).

¹¹³ See Schäfers (1998), Pfür (2000).

¹¹⁴ See Pfür/Weiland (2010).

¹¹⁵ See Kämpf-Dern/Pfür (2013).

¹¹⁶ See Pfür/Weiland (2010).

¹¹⁷ See Pfür (1998).

low. In practice, companies' management of their real estate is essentially limited to strategic functions and operative control of service providers.¹¹⁸

Empirical studies highlight the fact that companies have recourse to outsourcing above all with the intention of reducing their costs (ca. 58% of companies).¹¹⁹ They also expect outsourcing to ease the burden on their management (42%) and to increase managerial flexibility (41%). Access to top quality is a lesser motivation to outsource real estate management (approx. 27%). The strategy to outsource aspects of real estate management is thus largely aimed at minimizing cost. The quality of real estate resources from the user's perspec-

tive and particularly their flexibility of use play a subordinate role only. Other results cited in this study confirm that in most companies, the activities of CREM departments are essentially geared to the minimization of real estate costs.

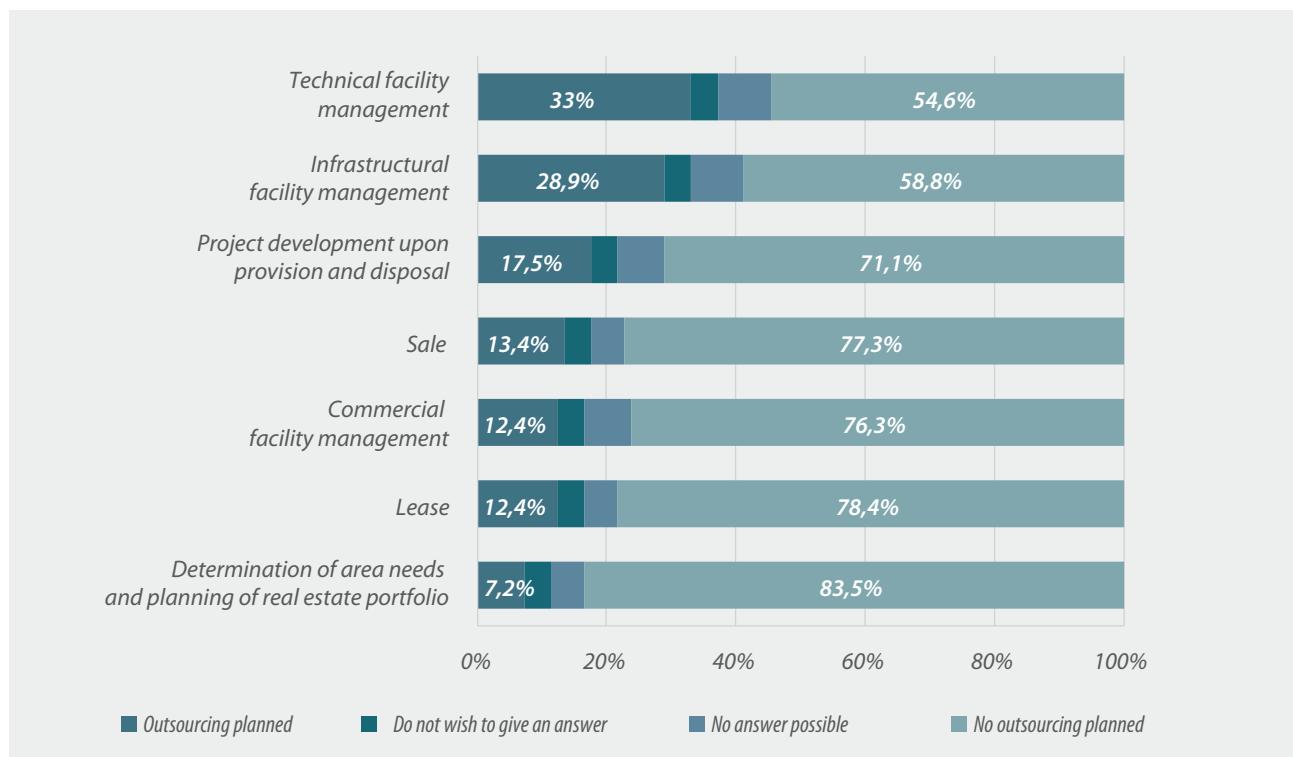
The dominance of cost minimization over quality optimization in real estate management strategies may very well be due in part to the way CREM departments are institutionally integrated in companies. Empirical studies indicate that real estate activities are slightly more often under the responsibility of the finance department, even though the spread of real estate responsibilities within the organization of German companies is quite widely distributed (see Figure 23).

Table 10: Management levels involved with real estate in German corporations

Departments	Group / holding	Department	Location	Not at all	None of the above / don't know
Portfolio management	54%	19%	9%	3%	15%
Area management	41%	30%	20%	3%	5%
Marketing	49%	29%	13%	6%	4%
Commercial FM	40%	29%	24%	1%	5%
Technical FM	43%	30%	19%	3%	5%
Infrastructural FM	43%	31%	17%	1%	7%
Project planning / construction	47%	27%	13%	3%	10%
Others	16%	14%	11%	21%	37%

Source: Pfür (1998b).

Figure 22: Planned outsourcing



Source: Pfür/Weiland (2010).

¹¹⁸ See Hartmann/Lohse/Pfür (2007).

¹¹⁹ See Pfür/Weiland (2010).

The large “others” category illustrated in Figure 23 includes, above all, support functions such as Organization and Human Resources.¹²⁰ Looking at the operative responsibility for task fulfillment, we can observe an increasing centralization since the mid-1990s. By 1998, important parts of CREM had already become part of the central functions of many companies (see Table 10).

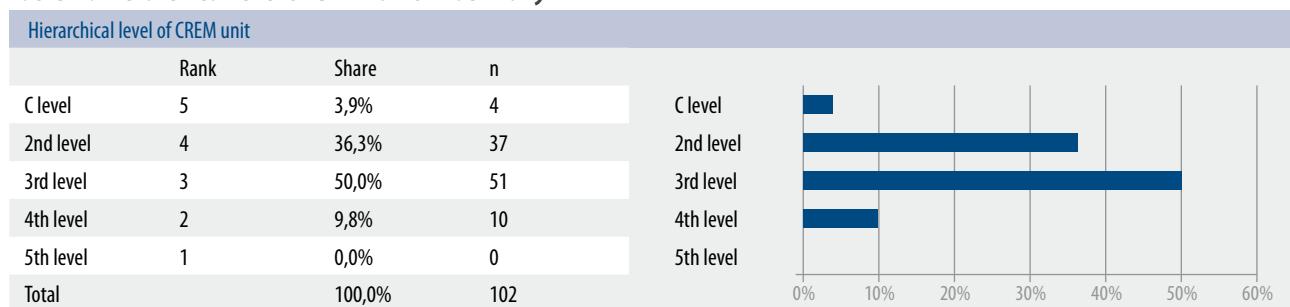
Since 1998, the responsibility for CREM has grown even more centralized in the majority of companies¹²¹ (see Table 11).

Empirical studies confirm that CREM departments in German corporations are mostly attached to hierarchy levels two and three, below the Board – usually with the finance department. One study pertaining to the structural insertion of CREM dis-

tinguishes four organizational models of integration of corporate real estate management into a company’s structure. The first is a hybrid model with central management and regional responsibility for core processes; the second is a central pooling of decision-making competence and business implementation competence; the third is a decentralized pooling of responsibilities in divisions; and the fourth is a model with variable organizational structures. The authors of this study assume that the hybrid model is the most common in practice. However, their analysis, which is based on case studies, does not provide reliable information on the relative popularity of the four organizational models.¹²²

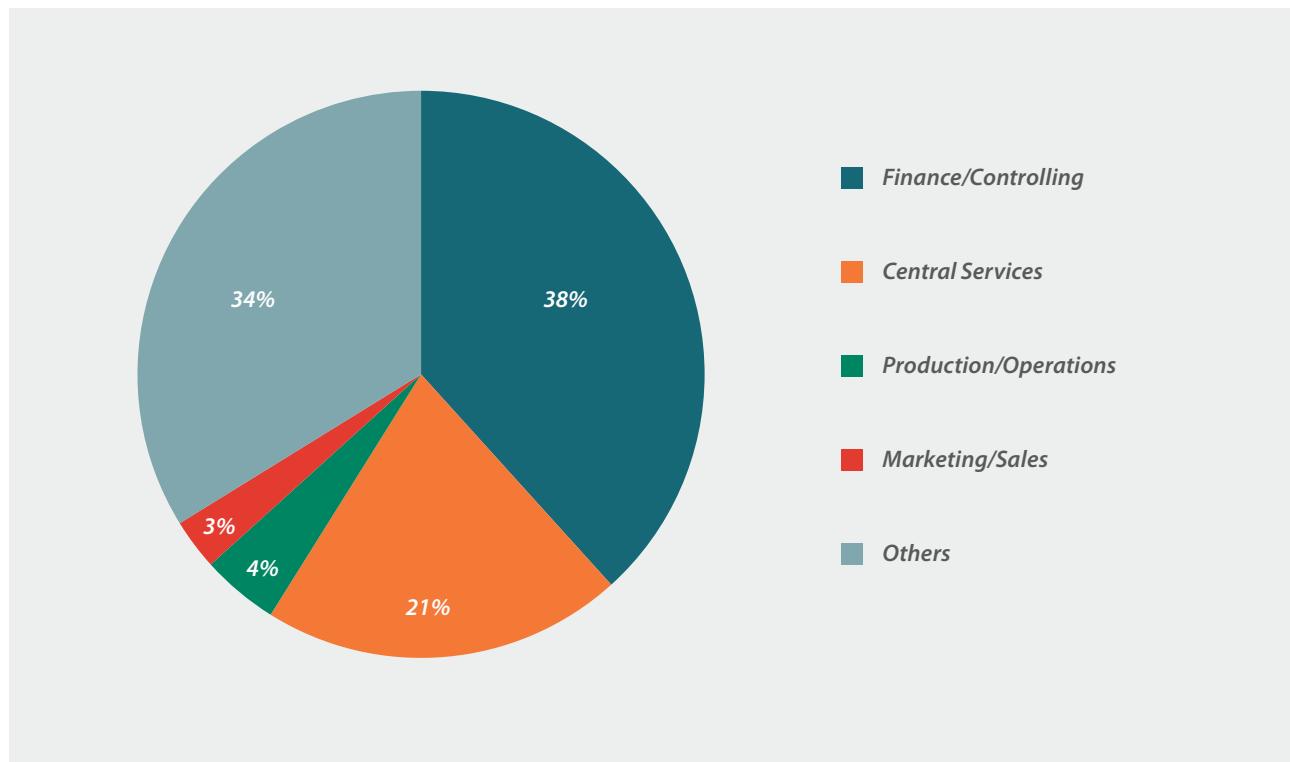
In addition to its structural organization, the organization of real estate management also encompasses the manage-

Table 11: Hierarchical level of CREM unit in Germany



Source: Hartmann (2011).

Figure 23: Departmental integration of CREM



Source: Pfñür (1998b).

¹²⁰ Later studies – albeit looking at a lesser number of companies – confirm this distribution of departmental allocation of CREM. See Pfñür/Hartmann/Lohse (2007), Kämpf-Dern/Pfñür (2011).

¹²¹ See Hartmann (2011).

¹²² See PwC (2013), pp. 17 ff.

ment of real estate processes. Heyden highlighted the fact that most German corporations have implemented numerous measures to optimize real estate management processes. The intensity and success of these measures differ hugely among companies. Nevertheless, it is clear that in the field of real estate processes, German non-real estate companies still have a significant optimization potential (see Figure 24).¹²³

Although their level of process management is much higher than in the public sector, non-real estate companies are far behind companies whose core business is real estate.

6.4 Controlling concepts

German companies' real estate management is either cost-driven or profit-driven. Most companies take the cost-driven approach. An important indicator to steer companies toward an optimization of their real estate management is the identification of the approach they favor (see Table 12).

In most cases where respondents chose "none of the above," there are no controls at all. Overall, financial control via indicators measurable in money only happens selectively in some companies.

For instance, capital tied up in real estate is only subject to an explicit profitability requirement in about half of German corporations. And even then, there rarely is a target profit tailor-made for real estate. Instead, the majority of companies require their real estate investments to have the same profitability as their core business. However, as real estate investments generally have a much lower return, this requirement makes investing in existing real estate assets or in new acquisitions more difficult.¹²⁴

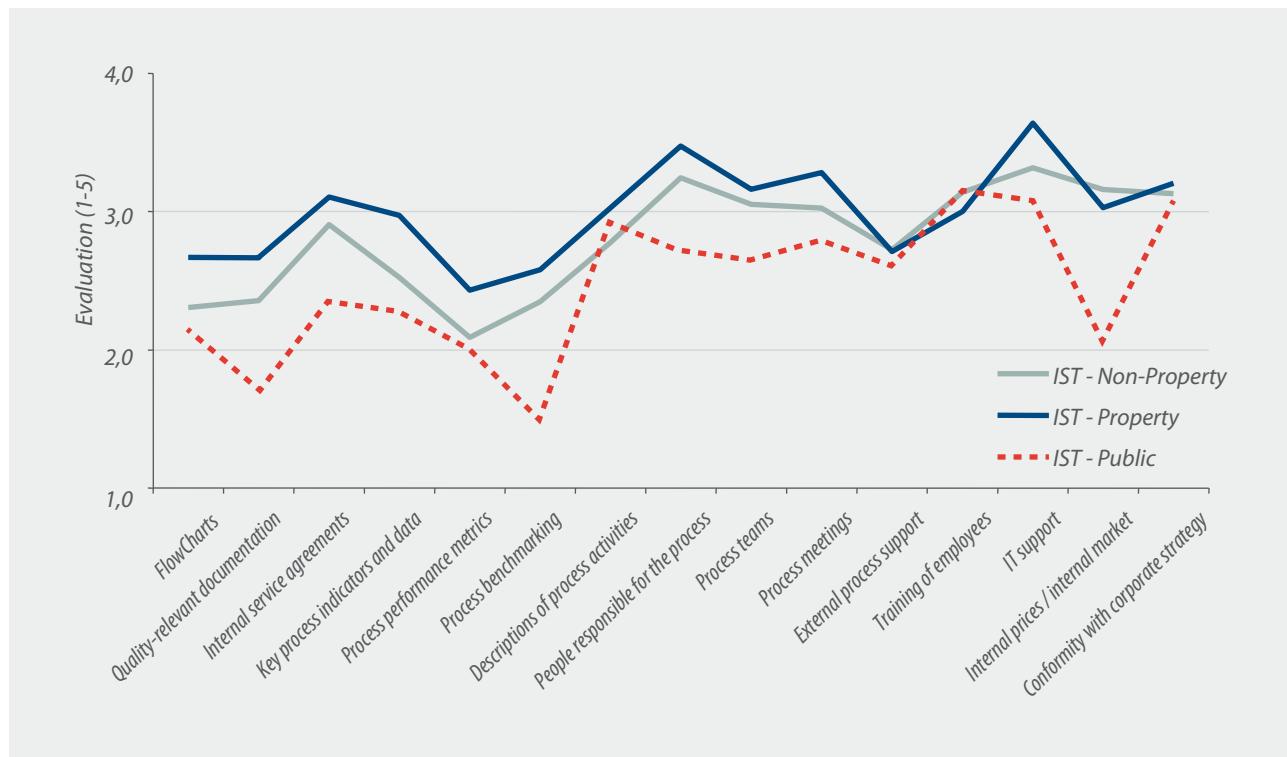
Control of area use by companies is determined by the relationship between real estate departments and real estate users. Again, it is possible to differentiate between cost-oriented and market-oriented control mechanisms. In German corpo-

Table 12: Use of CREM's controlling concepts

Departments	Cost center	Profit / investm. center	None of the above	Don't know / no answer
Portfolio management	37%	33%	23%	7%
Area management	51%	24%	24%	0%
Marketing	33%	35%	29%	2%
Commercial FM	49%	33%	19%	0%
Technical FM	50%	30%	20%	0%
Infrastructural FM	49%	30%	20%	1%
Project planning / construction	36%	33%	30%	1%

Source: Pfür/Hedden (2002).

Figure 24: Level of real estate process management



Source: UBS (2005).

¹²³ See Heyden (2005).

¹²⁴ See Pfür/Hedden (2002), Hartmann et al. (2008).

rations, internal accounting of area use is usually at cost price, which is invoiced to varying degrees as absorbed or marginal cost price (see Figure 25).

The results shown in Figure 25 are based on the self-assessment of corporate real estate managers, and therefore present a slightly overoptimistic image of their control over the use of space. Observations confirm that in about a quarter of German corporations, there are in effect no internal prices for real estate use at all.¹²⁵ In small and medium-sized German enterprises, control over area use is even more cost-driven. Only 18% of SMEs use market prices. In approximately one out of three SMEs, there is no internal invoicing at all.¹²⁶

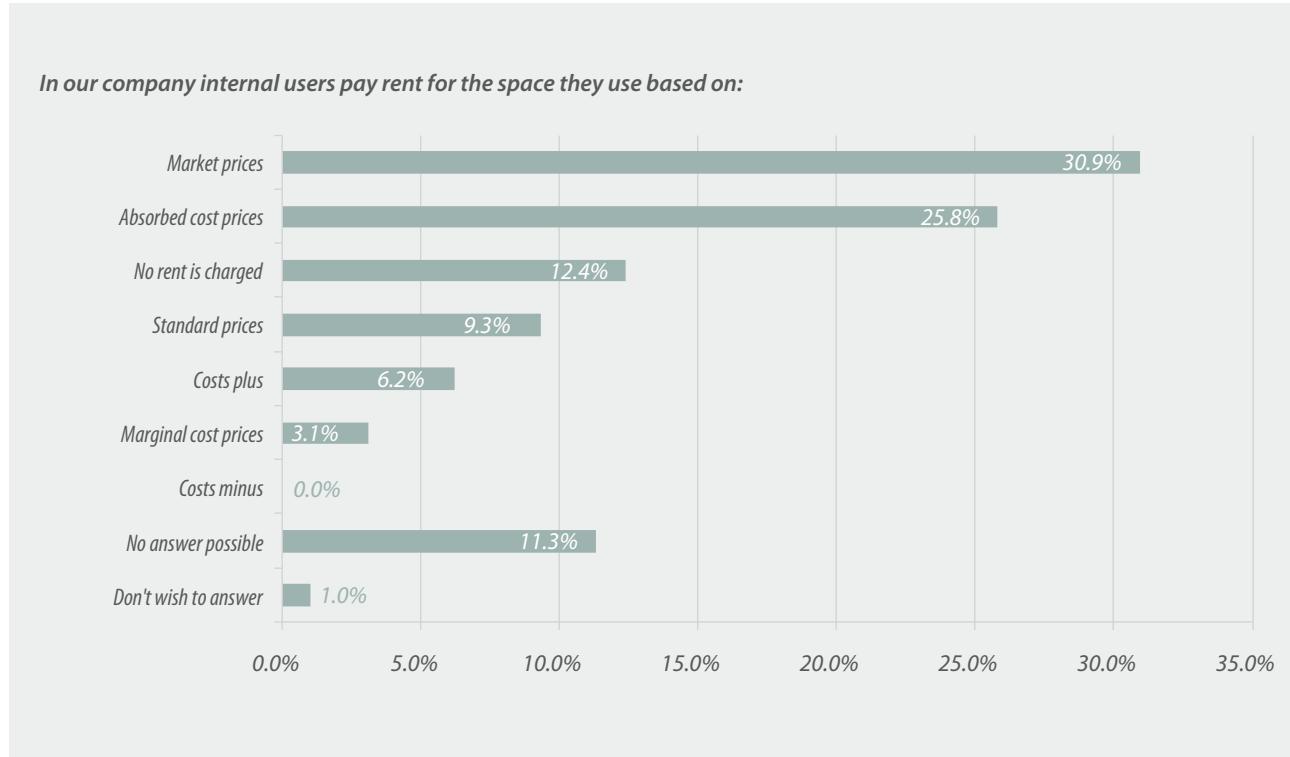
In addition to the provision of space, real estate departments regularly provide comprehensive real estate services to the space's users. Again, cost-driven internal prices predominate, both in corporations and in SMEs. In corporations, 15% of real estate departments charge market prices internally. In approximately one out of three companies, no price is charged at all.¹²⁷ Among SMEs, 13% charge market prices and about 40% charge nothing at all for these services.¹²⁸

6.5 CREM development path

In Germany, CREM has developed dynamically over the last three decades. In this process, however, there have been large differences between companies. It is impossible to discern a coherent pattern by industry, international activity, or any other criteria.¹²⁹ Pfünér et al. (2007) documented the possible achievements of the introduction of CREM in a best practice study. This study demonstrates that for greenfield approaches, where no special attention was given to real estate management beforehand, over 30% of real estate costs could usually be saved while simultaneously improving the quality of real estate services significantly.¹³⁰ The successful models investigated in this study, as in later studies, are designed differently depending on the starting situation in each case.¹³¹ All CREM models that are successful in practice have one thing in common: they found suitable configurations to deal with the action parameters in the CREM map (see Figure 19).¹³² Numerous case studies performed by Kämpf-Dern/Pfünér indicate that there is no single best CREM model, but there is a best CREM fit.¹³³

In 1993, Joroff et al. developed a much-noticed model that outlines the development stages of corporate real estate management. Even though it refers to conditions current among American companies at that time, it is relevant internationally and has a certain degree of timelessness (see Figure 26).

Figure 25: Transfer prices for real estate space



Source: Pfünér/Weiland (2010).

¹²⁵ It can therefore be assumed that "No answer possible/Don't wish to answer" is usually equivalent to "inexistent".

¹²⁶ See Pfünér et al. (2008), p. 37.

¹²⁷ See Pfünér/Weiland (2010).

¹²⁸ See Pfünér et al. (2008), p. 36.

¹²⁹ See Pfünér (1998), Pfünér et al. (2007), Hartmann (2011), Kämpf-Dern/Pfünér (2013).

¹³⁰ See Pfünér et al. (2007).

¹³¹ See in particular Kämpf-Dern/Pfünér (2013).

¹³² See Hartmann (2011).

¹³³ See Kämpf-Dern/Pfünér (2013). The results of this study are confirmed by the study conducted by PwC (2013).

CREM's development is slightly different in Germany due to companies' higher ownership rates and to the significantly higher strategic importance of real estate management in comparison to North American companies.¹³⁴

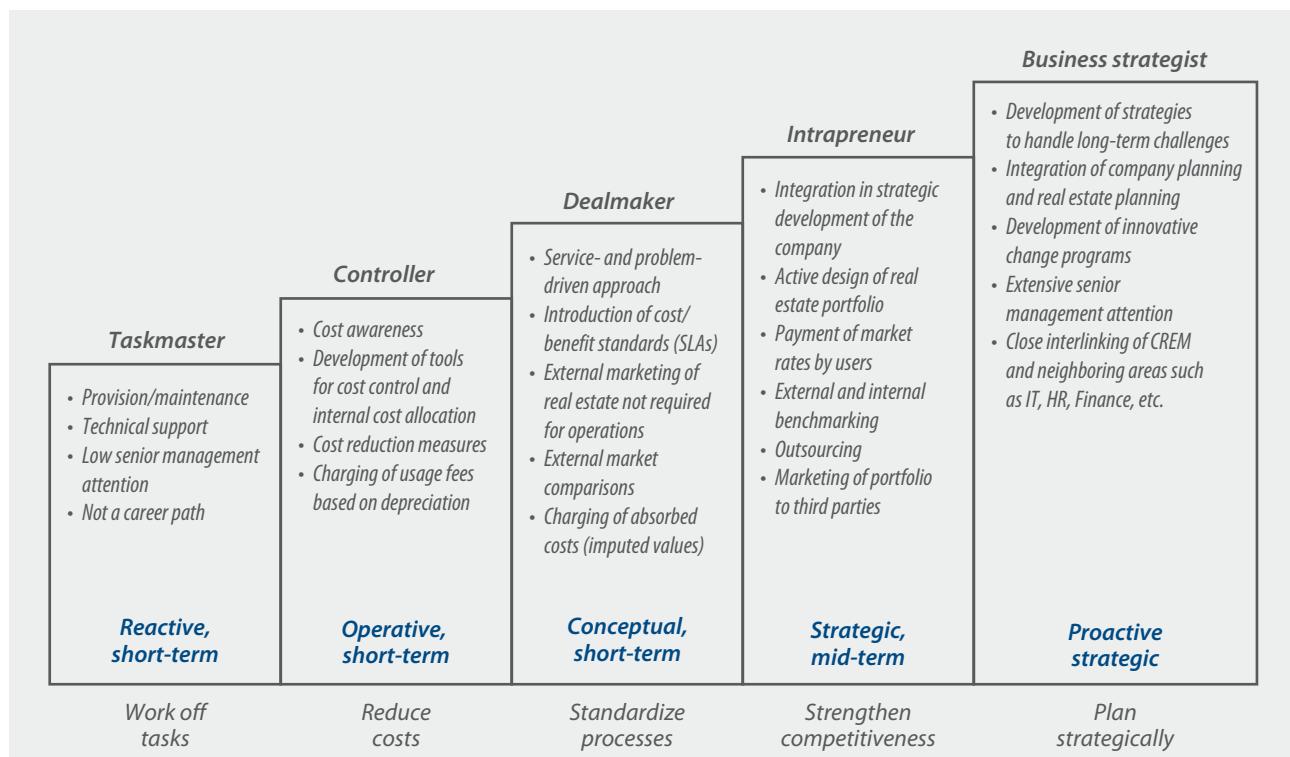
A simple maturity model of CREM in German companies shows four development stages (see Figure 27).

Before ca. 1995, nearly all companies in Germany had strongly decentralized real estate management structures that were mostly focused on the sale of unused property and the reduction of the cost of use of existing real estate assets. Construction and property units assumed responsibility for the mostly technical tasks involved in facility management. In about 1995, some companies started to establish central real estate departments that first expended huge operative effort on making real estate assets and costs transparent. Based on these real estate information systems, some corporations began to implement effective, strategic, and tactical real estate management from the turn of the millennium on, after having prepared this step for a long time. Efficient CREM requires first and foremost the synchronization of a company's overall strategy with its real estate strategy. It also requires the consistent implementation of market mechanisms whenever possible. In every case, it is indispensable to develop a consistent control system for the use of real estate resourc-

es and services, by users and for their sourcing in corporate real estate management. At the moment, the final stage turns CREM into a business partner whose job as a service provider is to solve all real estate problems of in-house users in an undogmatic way. Depending on the effectiveness of the financial and core business strategy, CREM may very well establish its own stock of real estate assets. The real estate business partner has lean structures and a profound understanding of changing usage conditions of real estate resources within all parts of the group of companies and within the local real estate markets. It acts proactively and with a view to maximize the productivity of real estate as a resource. To this end, it coordinates and assumes responsibility for real estate activities in an interdisciplinary way, combining the three perspectives of real estate use, real estate investment, and production of real estate services in planning, construction, and operation. The empirical data on the insertion of CREM departments in German companies within this classification is fragmentary. Based on experts' opinions and the experience of the study's authors, the following picture emerges for German corporations with over 10,000 employees:

- en route to a real estate business partner: 10–15%
- corporate real estate management: 30–35%
- management of stock of real estate: 30–40%
- property management: 20–30%

Figure 26: Stages of CREM development according to Joroff et al.

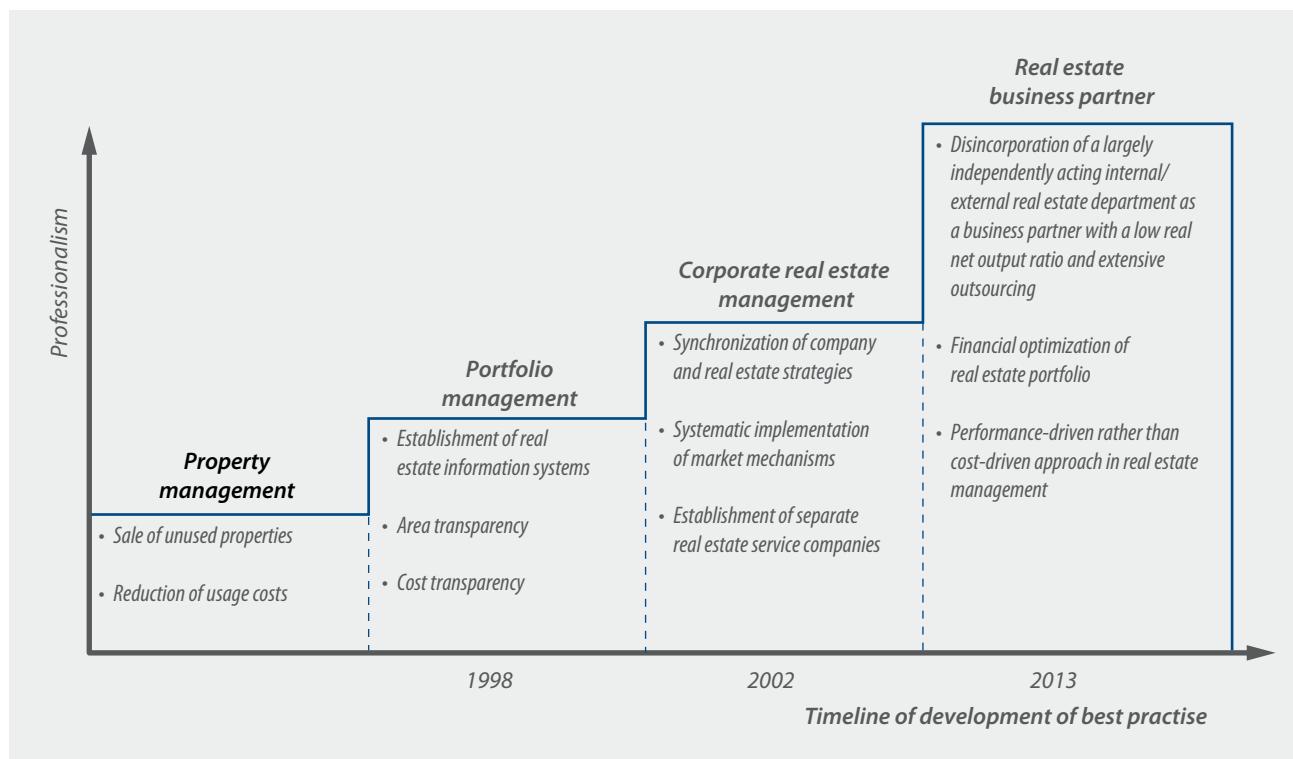


Source: Translation of Joroff et al. (1993).

¹³⁴ For a comparative CREM analysis between North America and Europe, see Hartman et al. (2008).

These numbers paint a very uneven picture of the level of professionalism in real estate management in German companies. Likewise, the level of professionalism of different companies within these four categories certainly warrants serious differentiation. Overall, all companies still have a very high professionalization potential. In particular, there is room to optimize the quality of the stock of real estate as a resource for the business units, and to improve cooperation with service providers in all companies, even the most progressive ones.

Figure 27: Maturity model of CREM in Germany



Source: based on Pfür (2011).

6.6 Interim results

The following insert summarizes this chapter's most important results.

- Over the last two decades, an approach to pool real estate tasks and responsibilities has been developed across the globe. By now, its fundamental structures have been greatly simplified. It is called corporate real estate management.
- Empirical studies have shown that there is no "best practice" for CREM, only a "best fit."
- The main targets of corporate real estate management in German companies are the support of the core business and the minimization of real estate costs.
- The outsourcing intensity of CREM in German corporations is comparatively high, especially in the areas of infrastructure and technical facility management where contractors provide approximately two thirds of services. According to empirical studies, small and medium-sized enterprises are much more likely to manage their real estate assets on their own.
- Outsourcing is mostly motivated by the desire to cut costs. According to empirical studies, other motives such as having access to better quality or easing the burden on management are less important in comparison.
- Empirical studies concerning the structural organization and sourcing of real estate management demonstrate that there is further outsourcing potential for nearly all companies. Moreover, they highlight the fact that concepts of service provider management need to be optimized in over half of companies.
- Around half the people responsible for CREM in Germany see significant potential for improvement in their relationship with the users of real estate resources and in their understanding of the problems associated with space usage.
- Structurally, CREM is usually attached to the financial department, even though this structure is not universal. In more than half of companies, CREM is attached to another department, such as Central Services or Production. CREM is usually a function of the second or third hierarchy level in a company.
- Control systems in CREM are cost-driven above all. The market's forces of coordination are often mistrusted. Only a third of German corporations use clearing systems driven by market prices in their use of real estate.

- Capital tied up in real estate is only subject to a profitability requirement in about half of German corporations.
- In approximately one third of corporations and over half of SMEs, real estate know-how and responsibility have not yet been pooled centrally. Although a central real estate management function has been introduced in many companies, this unit is often only responsible for part of the company's real estate assets. The rest is managed decentrally by the business units themselves, who often lack specialized real estate expertise.
- The success of real estate cost management varies widely from company to company. While individual best practice companies were able to reduce their real estate costs by an average of 30%, half of German corporations and two thirds of small and medium-sized German companies still have a significant cost reduction potential. Most of these companies must develop their real estate information and control systems further.
- Operatively, the interplay between real estate management and space users still offers great potential. For instance, less than half of companies engage in an intensive dialog of client relationship management with their users. In almost half of corporations, users still see CREM more as an executive organ that implements cost cutting measures for the benefit of the Board than as a partner that solves real estate problems.
- The level of development of corporate real estate management in German companies varies widely. Organizational benchmarking illustrates that the average level is far behind best practice cases.
- So far, approximately half of German corporations have dispensed with dedicated real estate management structures and control systems.

7 FUTURE NEED FOR ACTION AND RECOMMENDATIONS

In chapters 3 to 5, I gave a fact-based overview of corporate real estate management from the perspectives of the in-house user, the real estate investment, and the production of real estate and real estate services. My next objective is to deduce what need for future action there is based on the view of real estate as an asset and on the current status quo of corporate real estate management. To this end, I will summarize the results from the previous chapters – shown in gray boxes – in order to use them as basis to draw further conclusions.

I will perform this analysis in three separate sections, each dealing with one target group:

1. **for the top management of non-real estate German companies;**
2. **for the management of real estate investments and real estate services; and**
3. **for politics and public administration.**

7.1 Perspectives for companies' corporate real estate management

7.1.1 Discovery of the importance of corporate real estate for business success

The previous chapters dealing with the usage and cost effectiveness of real estate have confirmed that real estate resources have a significant impact on the success of companies.

- Depending on a company's industry and business model, its real estate costs represent, on average, approximately 10-20% of its total costs. In the particular case of knowledge-intensive companies, they usually constitute the second-largest pool of costs after human resources. (Chapter 3)

Real estate costs are particularly relevant from the point of view of business administration, as the capital is tied up for a long time. In the event of a decreasing headcount, there is a risk of extensive legacy costs and sunk costs, which may threaten the company's survival in a situation of crisis. The history of German industry offers a number of prominent examples of situations similar to this.

In addition to having a direct cost, corporate real estate has a significant indirect impact on the company's success via its assets and liabilities structure and its concomitant risk positions and capital costs.

- Real estate is not only a resource for companies, but also an important capital investment. On average, German companies own 70% of the real estate they use as their own property. Thus, companies own real estate assets in

Germany worth 2.1 trillion euros. (Chapter 4)

- German companies attach extraordinary importance to their real estate property. The average ownership rate of large German corporations is about two thirds of the real estate they use. Small and medium-sized German companies, for their part, own three quarters of the real estate they use. In the U.S. and in Asia, corporate real estate ownership rates are much lower, at 20% and 30% respectively. (Chapter 4)

Currently, corporate real estate's greatest potential for success lies in the optimization of the usage of real estate as a company resource.

- A comprehensive study interviewing people responsible for CREM in German companies suggests that the optimization of real estate management can lead to an average increase of 13% in labor productivity. (Chapter 3)
- Assuming an average business cost structure, leveraging the 13% of real estate-related potential for productivity increase would more than offset a doubling of real estate costs. (Chapter 3)
- Corporate real estate management often guarantees companies' competitiveness. A company's stock of real estate is often the precondition for different business units' strategic options. Through its high degree of specificity, real estate can often influence a company's competitive position, both in the procurement markets (in particular the labor market) and in the sales markets – independently of whether the business unit is in a situation of cost competition or quality competition. (Chapter 3)
- The effect of real estate resources on business success is highly complex and not yet fully understood from either a scientific or a practical point of view. (Chapter 3)

In Germany, empirical evidence confirms that nearly every company has the potential to realize substantial efficiency improvements through the optimization of its commercial real estate management, even though the individual success of various companies may vary widely. Considering this great

potential, it is very surprising how modestly research and practical real estate management have addressed this issue so far. Currently, beyond initial efforts, there are no conceptual or implementation-driven systems that measure and assess the mostly qualitative and systemic causal relationship between the physical organization of work and business success. It is necessary to act, both in theory and practice.

Beyond the merely operative impact of the usage and costs of real estate resources on business success, real estate offers unique design parameters for the implementation of a corporate identity through aspects of environmental design.

- To the rest of the world, real estate can be a visible symbol of a company's economic prosperity and stability, as well as of its innovative strength and flexibility. A company's stock of real estate can significantly reflect its identity-establishing values, such as its ecological orientation, climate protection awareness, employee orientation, or cultural and social responsibility (Chapter 3).

Due to its high degree of specificity, real estate is of great importance for a company's strategy, especially in the context of Penrose's "resource-based view of the firm." Real estate resources give companies an important and hardly replicable differentiation advantage vis-à-vis their competitors when they compete for top employees and for cost and quality.

7.1.2 Intensification of real estate management

Considering the great significance of corporate real estate as a cost factor and as a useful company resource with an important strategic potential, it is hard to understand why some German corporations and numerous small and medium-sized German companies have not yet recognized the importance of real estate resources for their success.

- Approximately half of German companies have dispensed with dedicated real estate management structures so far. (Chapter 6)
- The level of development of corporate real estate management in German companies varies widely. Organizational benchmarking confirms that the average level is far behind the best practice case. (Chapter 6)
- Capital tied up in real estate is only subject to a profitability requirement in about half of German corporations. (Chapter 6)

- In approximately one third of corporations and over half of SMEs, real estate know-how and responsibility have not yet been pooled centrally. Although a central real estate management function has been introduced in many companies, this unit is often only responsible for part of the company's real estate assets. The rest is managed decentrally by the business units themselves, who often lack specialized real estate expertise. (Chapter 6)

A particularly noteworthy aspect is the big discrepancy in the level of real estate management activity among otherwise comparable companies. The only explanation for this discrepancy is that the top levels of management feel that they lack a sufficient scope of action when it comes to strategic real estate decisions.¹³⁵ Their fear to commit severe mistakes is probably too big. After all, real estate is not only a company resource, but also the employees' habitat. Nearly all best practice examples underwent a radical change in the company's environment, such as financial crises, mergers, stock market launches, existential threat to the competitive position of the core business, etc. These threats required a radical intervention in the management of real estate resources, sometimes allowing for very professional structures. In the case of companies without such "burning platforms," we may presume that they have not had the right window of opportunity yet. In summary, it is clear that the majority of German companies have not yet discovered the potential of professional real estate management (or at least not assessed it realistically) and have not started to implement it through more intensive activities.

- The success of real estate cost management varies widely from company to company. While individual best practice companies were able to reduce their real estate costs by an average of 30%, half of German corporations and two thirds of small and medium-sized German companies still have a significant cost reduction potential. Most of these companies must develop their real estate information and control systems further (Chapter 6).

Cooperative relationships between clients and service providers, which are quite common in information and communication technology or in contract logistics in the form of value added partnerships, for example, are largely unknown in corporate real estate management. Although the public sector has already initiated over 100 successful Public Private Partnerships (PPPs) in the construction industry, the private sector has only started its first model trials.¹³⁶

¹³⁵ See Eversmann & Partner (2002), Offensive Corporate Real Estate. Hamburg.

¹³⁶ See Pfür/Meyer (2013).

Corporate real estate management offers a great development potential in the support of core business activities through the optimization of the stock of real estate resources.

- According to empirical studies, approximately half the major corporations do not sufficiently use the strategic potential of their real estate resources to generate competitive advantages vis-à-vis the competition. (Chapter 3)
- In the current labor market, for example, real estate management offers good opportunities to succeed in the “war of talents” by designing attractive workplaces. Likewise, real estate resources used effectively are often a strategic source of cost and differentiation benefits. (Chapter 3)
- Operatively, the interplay between real estate management and space users still offers great potential. For instance, less than half of companies engage in an intensive dialog of client relationship management with their users. In almost half of corporations, users still see CREM more as an executive organ that implements cost cutting measures for the benefit of the Board than as a partner that solves real estate problems. (Chapter 6)

In this context, it will be essential to ensure that corporate real estate management cooperates with the units using the space as a partner in their search for solutions to problems they may encounter. Depending on the situation, CREM may take either an executive role, implementing the legitimate decisions of the top management, or a service provider role, catering to users' needs.

Real estate is an essential resource in companies' production processes. In addition, the financial management of real estate assets is also very important for companies. However, this importance is not always matched by professional management structures.

- Real estate is not only a resource for companies, but also an important capital investment. On average, German companies own 70% of the real estate they use as their own property. Thus, companies own real estate assets in Germany worth 2.1 trillion euros. (Chapter 4)
- German companies attach extraordinary importance to their real estate property. The average ownership rate of large German corporations is about two thirds of the real estate they use, while it is three quarters for small and medium-sized German companies. In the U.S. and in Asia, corporate real estate ownership rates are much lower at

20% and 30% respectively. (Chapter 4)

- The book value of DAX companies' corporate real estate amounts to approximately one fifth of the companies' market valuation at the stock exchange. (Chapter 4)
- There are serious arguments against real estate ownership from the point of view of company funding. Furthermore, empirical studies conducted in the U.S. impressively demonstrate that the capital market does not reward listed companies' investments in corporate real estate. Conversely, corporate real estate divestment positively correlates with stock prices. (Chapter 5)
- Capital tied up in real estate is only subject to a profitability requirement in about half of German corporations. (Chapter 6)
- Control systems in CREM are cost-driven above all. The market's forces of coordination are often mistrusted. Only a third of German corporations use clearing systems driven by market prices in their use of real estate. (Chapter 6)
- In approximately one third of corporations and over half of SMEs, real estate know-how and responsibility have not yet been pooled centrally. Although a central real estate management department has been introduced in many companies, this unit is often only responsible for part of the company's real estate assets. The rest is managed decentrally by the business units themselves, who often lack specialized real estate expertise. (Chapter 6)

Considering the significant amount of capital tied up in real estate and the concomitant risk of change of value, it is surprising that there is no consistently centralized responsibility for real estate nor any financial controlling that measures the value of real estate against profitability targets. This lack of financial controlling partly explains why German companies still own such a large share of the real estate they use, while taking often largely uncalculated risks of change of value that may have a massive influence on their business success. Unlike in Germany, capital markets in the U.S. and Asia have ensured that companies purged the risks of the real estate they use from their balance sheets through sale-and-rent-back transactions in order to optimize their cost of capital.

In summary, the level of development of real estate management in German companies is uneven. The benefits of corporate real estate management have hardly been felt in about half of German corporations and two thirds of German small and medium-sized companies. Thus, corporate real estate management offers a substantial potential for optimization. Leveraging this potential could significantly improve the

competitive position of individual companies and of Germany more broadly as an attractive industrial location. In the future, companies will have to rethink their cooperation with their real estate service providers. Comparable support functions such as information and communication technology or logistics have seen creative service providers develop extensive business model innovations that allow companies to outsource support functions in order to reduce their costs and significantly improve their quality. However, a similar development has not yet occurred in real estate management.

7.1.3 Efficient resources instead of cost minimization

In summarizing the results on the importance and level of development of corporate real estate management in German companies it becomes apparent that there is a lack of understanding of real estate resources in over half of companies. These companies usually take the reductive view of real estate as a simple cost driver. Some companies see real estate as an asset that has a growth potential in value, an assumption that is questionable in light of the empirical evidence presented in Chapter 4. Such cost- or asset-driven approaches to CREM are indubitably a significant progress compared to the more passive approach to corporate real estate. However, these approaches are still far from best practice cases, which use CREM to maximize the productivity of real estate as a resource that participates in the production process. In these cases, CREM's target parameter is the ratio between benefits and the costs incurred by real estate resources.

- A comprehensive study interviewing people responsible for CREM in German companies suggests that the optimization of real estate management can lead to an average increase of 13% in labor productivity. (Chapter 3)
- According to empirical studies, approximately half the major corporations do not sufficiently use the strategic potential of their real estate resources to generate competitive advantages vis-à-vis the competition. (Chapter 3)

Empirical evidence confirms that this paradigm shift from cost efficiency to resource efficiency is very promising. However, additional investments will have to be made to optimize real estate services in order to leverage the potential to increase labor productivity and the strategic potential of real estate resources. These investments can reduce the success of companies in the short term. Thus, there are many challenges on the way towards a paradigm shift from cost-driven to productivity-driven management of commercially used real estate. Organizational benchmarking in CREM (see Section 7.5) implies that this paradigm shift requires a strong advocate in

the top management. Indeed, in groups of companies, the rights of disposition and decision-making regarding real estate resources cannot be restructured without the support of an influential administrator. Because real estate changes impinge upon the particular interests of numerous entities within a company, the protection of vested rights and "empire building" make it more difficult to innovate. In the case of best practice companies, it is usually "burning platforms" such as stock market launches or mergers that have led them to endow real estate management with the clout necessary to enable a paradigm shift. Users can only benefit from CREM's potential for productivity increases if the management has a very intensive relationship with its clients in order to become their business partner and work for their benefit. Real estate innovation requires an institutionally maintained partnership and cooperation between users and CREM. In the future, innovation in the management of real estate resources will be particularly important, as our knowledge of the causal relationship between the physical organization of labor and business success is still quite sketchy, both in theory and in practice. The deeper we delve in the analysis of the relevance of real estate resources on business success, the more complex the interrelationship becomes. Empirical experience demonstrates that the efficient management of real estate assets tailored to users' needs in a differentiated manner requires additional resources and, above all, extensive expertise. As real estate management is usually an ancillary activity rather than a company's core business, it is necessary to find new ways to source real estate services. Moreover, service providers responsible for outsourced tasks will have to strive less for cost reduction, and focus more on getting access to better resource quality and availability. In conclusion, it is clear that a paradigm shift from cost to resource efficiency is necessary for companies to benefit from the success potential offered by optimized real estate management.

7.1.4 Influence of real estate on the future of work

In the more distant past, the importance of real estate resources has always increased when the world of work underwent massive change. For instance, during the industrial revolution, the workplace moved from a home environment to factories. The subsequent increase of the tertiary sector was accompanied by the establishment of office and service centers in metropolitan regions and economic centers. Currently, we can observe signs of severe changes in the world of work. After a long period of relative stability in the use of office spaces, the internet will reduce the significance of fixed organizational structures through new technologies. This change will be felt, first in knowledge-intensive industries like the software

industry, then in administrations, and later presumably in the financial services sector. The boundaries of companies are becoming increasingly fluid. Former employees become cooperation partners. Companies coordinate their resources less through hierarchies and more via market relations, through custom-made cooperative internet platforms. These trends, whose beginnings can already be observed in the software and communication industries, will have a lasting impact on the importance of large, contiguous office spaces. On the one hand, this development will lead to the redundancy of a large number of office workplaces currently in the real estate portfolios of companies. On the other hand, experience indicates that the workforce will not go back to working from home, but will continue to value "going out to work" highly. The new role of work in our society requires the creation of spatial conditions accepted by the workforce and conducive to its productivity. Before companies can benefit from the potential of the "future of work," they must determine how to achieve an efficient spatial integration of work and society. It will not be enough to define different "work styles" along with their concomitant spatial requirements and to implement the necessary changes at the companies' traditional sites. In competing for the best talents, companies will have to participate in the redesign of the working environment beyond the boundaries of their own properties. This stage is when real estate finally changes from being a cost factor to being a productivity factor, as explained in the previous paragraph.

This development will not be limited to knowledge-intensive industries. In addition to the retail and logistics industries, which are already deeply involved today, the manufacturing industry will also be affected. The Maker Movement is in the process of transferring the idea of the future of intellectual work from the digital to the physical world. The basis of the Maker Movement is the use of digital fabrication technologies in order to allow innovators to share their product designs globally in digital form so as to have them produced as individual units or in series. New market places and business models are emerging around this movement and manufacturing becomes more decentralized as a result. It moves much closer to its sales markets and returns to major cities. Visionaries are speaking of an industrial revolution whose significance will rival the spread of personal computers.¹³⁷ In terms of real estate, we can expect that numerous smaller, distributed manufacturing sites will reduce the importance of larger industrial compounds. Although it is possible to estimate the impact of the Maker Movement on space use today, its future impact on real estate assets and corporate real estate management is still uncertain.

7.2 Future perspectives for the deeper integration of corporations and the real estate industry

7.2.1 Strengthening the capital market culture in real estate investments

From a perspective of company financing, it is necessary to critically assess investments in real estate by non-real estate companies. As the trend leans toward a reduction of real estate property, it is essential to find market partners in the real estate investment markets. These partners should assume ownership of companies' real estate assets and rent them back to their users without any significant restriction in terms of rights of disposition. German companies still have a lot of real estate assets that have unrestricted capital market viability, according to the standards of institutional real estate investors. In addition, only a small number of the production-oriented properties that have been traded in the capital markets so far provide evidence that this strategy would bring an extensive quantitative and qualitative growth of the real estate investment markets in Germany.

- Real estate is not only a resource for companies, but also an important capital investment. On average, German companies own 70% of the real estate they use as their own property. Thus, companies own real estate assets in Germany worth 2.1 trillion euros. (Chapter 4)
- In the German real estate capital market, properties used for production-related activities play a subordinate role. Currently, 8% of investments in the German real estate market are used to fund production-related properties, which are used for activities such as logistics, production, and R&D. Investment cultures vary widely by countries. In the U.S., for example, real estate dedicated to the production-related usages mentioned above makes up 22% of portfolios. (Chapter 4)
- Real estate used for production-related activities offers benefits to investment risk management that have not been widely discussed yet. For example, properties used for production-related activities can usually be switched over to a different usage without major expenses. In addition, the small and medium-sized enterprises that are the typical tenants of this type of real estate offer potential advantages over international groups, as they have less market power, more loyalty to their location, often a better financial structure, and a high economic performance. Last but not least, these enterprises are often more flexible when it comes to site selection and to defining contractual terms, as they do not follow rigid property procurement guidelines. (Chapter 4)

¹³⁷ See Buxmann/Hinz (2013).

- Due to companies' site preferences, corporate real estate lacks market partners in the capital markets. For example, the lion's share of office space held by corporate real estate in Germany is outside the main office centers, in locations where investors are not very active. (Chapter 4)

Potential opportunities beyond the traditional market structures come from alternative forms of property usage. Currently, the only production-oriented usage that constitutes a sizeable share of real estate investments is in logistics, even though it is limited to one twelfth of the German investment market. By contrast, production-related real estate represents nearly one quarter of real estate investments in the U.S. When they are asked to justify this discrepancy, market participants usually answer that there is no willingness to accept the higher management requirements of production-related property in Germany yet. Indeed, significant differences in facility management needs can be discerned according to the type of property usage.¹³⁸ In addition to alternative usages, corporate real estate offers investors different location options, which are mostly decentralized. Assuming that these alternative locations will see successful production in viable economic clusters in the future, as is still characteristic of small and medium-sized companies in Germany, the economic structures and the labor force will guarantee a low vacancy risk.

Currently, companies often reassess divesting corporate real estate via sale-and-rent-back transactions due to the impending modification of accounting principles for rental contracts.¹³⁹ In the future, obligations from market-based rental agreements and the concomitant right of use over space will have to be listed at cash value on companies' balance sheets. This change means that ownership and rental of real estate will be treated the same. Thus, off-balance designs are becoming significantly less attractive. Nevertheless, important arguments remain favoring a reduction of the high real estate ownership rates. To begin with, companies who own property often take substantial risks that have nothing to do with their core business. Furthermore, it is always questionable whether non-real estate companies' capital tied up in real estate is optimally invested.

- From the point of view of company funding, there are serious arguments against real estate ownership. Empirical studies conducted in the U.S. impressively show that the capital market does not reward listed companies' investments in corporate real estate. Conversely, corporate real estate divestment correlates positively with stock prices. (Chapter 4)

- Some instances of sale-and-rent-back transactions are observable. These instances mostly stem from individual cases with local market partners. By contrast, portfolio transactions are the exception rather than the norm in CREM. Empirical studies show that there are very few instances of transactions in international capital markets and divestment via capital markets is often seen with a very critical eye. (Chapter 4)
- Control systems in CREM are cost-driven above all. The market's forces of coordination are often mistrusted. Only a third of German corporations use clearing systems driven by market prices in their use of real estate. (Chapter 6)
- Capital tied up in real estate is only subject to a profitability requirement in about half of German corporations. (Chapter 6)
- In approximately one third of corporations and over half of SMEs, real estate know-how and responsibility have not yet been pooled centrally. Although a central real estate management department has been introduced in many companies, this unit is often only responsible for part of the company's real estate assets. The rest is managed decentrally by the business units themselves, who often lack specialized real estate expertise. (Chapter 6)

7.2.2 Of service relationships in real estate management and services

The real estate services market for corporate real estate management has been steadily growing over the last few years. Nevertheless, the self-provision of services is still relatively high for a secondary type of service.

- The outsourcing intensity of CREM in German corporations is comparatively high, especially in the areas of infrastructure and technical facility management where contractors provide approximately two thirds of services. According to empirical studies, small and medium-sized enterprises are much more likely to manage their real estate assets on their own. (Chapter 6)
- Outsourcing is mostly motivated by the desire to cut costs. According to empirical studies, other motives such as having access to better quality or easing the burden on management are less important in comparison. (Chapter 6)
- Empirical studies concerning the structural organization and sourcing of real estate management demonstrate that there is further outsourcing potential for nearly all companies. Moreover, they highlight the fact that concepts of service provider management can be optimized in over half of companies. (Chapter 6)

¹³⁸ See Glatte (2012).

¹³⁹ See Ernst & Young (2011), KPMG (2012), PWC (2012).

Empirical evidence highlights the fact that some German corporations and some small and medium-sized German enterprises are already taking advantage of real estate services. In many companies, the provision of real estate, which is a secondary process from their perspective, has a tremendous potential for additional outsourcing. Thus, new opportunities arise, in particular for companies in the classical construction industry. They may consider moving their business models out of high-risk building projects in order to focus their real estate competencies on the market segment of real estate services and to collaborate with non-real estate companies. Market investigations have shown that the outsourcing of real estate services is accompanied by a qualitative growth of value creation. As soon as service level agreements are in place, they tend to be imposed with more stringency vis-à-vis external market partners than vis-à-vis internal colleagues. The evidence concerning the motives and successes of outsourcing indicates that the qualitative aspects of outsourcing, like access to better quality, increased flexibility, or easing the burden on management in real estate matters, have been given too little attention so far. Companies have usually awarded contracts according to criteria of cost rather than of performance. Service providers have participated in this process; often, they have engaged in nearly cutthroat price competition in tenders. Sustainable customer relationships require an understanding of a realistic balance between service and consideration on both sides. A good starting point is the standardization of services across a range of quality levels. Despite the extensive and fruitful efforts of the service providers' associations, there is obviously a need for further action. In particular, the clients' and service providers' understanding of the services being provided require synchronization between both parties. Real estate service providers should face this challenge, which pertains to company culture, more than they have been doing until now.

7.2.3 User-orientation and fair value creation concepts

So far, my presentation of the status of development of corporate real estate management has highlighted the great importance to integrate real estate functions with the processes of the units using the space. In the future, real estate service providers (whether in-house or external market partners) will ideally play the role of problem-solvers and offer creative solutions.

- Empirical studies have demonstrated that the construction and real estate industry is much less prone to innovation than other industries, such as IT or logistics. (Chapter 5)
- Around half the people responsible for CREM in Germany see significant potential for improvement in their relationship with the users of real estate resources and in their understanding of the problems associated with space usage. (Chapter 5)
- Operatively, the interplay between real estate management and space users still offers great potential. For instance, less than half of companies engage in an intensive dialog of client relationship management with their users. In almost half of corporations, users still see CREM more as an executive organ that implements cost cutting measures for the benefit of the Board than as a partner that solves real estate problems. (Chapter 6)
- According to empirical studies, three quarters of real estate users believe that the key to successful corporate real estate management is to enhance client orientation. (Chapter 3)

Considering the empirical data currently available, it is clear that the real estate management industry has provided products and processes that are not exactly innovative. For example, it is evident that Germany has a relatively weak entrepreneurship and pioneering spirit in the real estate services industry, despite solid and continually increasing sales revenues. This observation is congruent with the level of client relationship management in the real estate services industry, which is very low in comparison to other industries. While catchphrases like Drucker's "It's the customer, stupid" or "The real estate industry doesn't know its customers" are platitudes, they also reflect experts' realistic market observations of the real estate services industry.¹⁴⁰ Without a profound understanding of the client's situation, the service provider cannot realize its full potential and its services fall short of their technical possibilities. Increasing customer benefits, in particular the benefits of the space's user, offers a significant growth potential for the quality of real estate services. This potential can be leveraged through a more cooperative relationship between users and CREM.

Industries such as the information and communication technology industry and the contract logistics industry have demonstrated that a targeted pooling of service packages and life cycle integration can be used to leverage synergy potentials. Public private partnerships (PPP) offer successful models of integrated turnkey solutions in the real estate industry. They provide an institutional framework for the procurement of a

¹⁴⁰ For an overview, see the articles in the reader "Handbook of Customer Relationship in Real Estate" published by Pfnür/Niesslein/Herzog in 2011.

wide range of buildings, such as town halls, courthouses, penal institutions, schools, hospitals, or sports facilities while offering integrated life cycle solutions through service providers. First attempts at transferring more complex forms of cooperation between real estate service providers and the industry as a whole have been initiated. For instance, construction companies offer integrated life cycle services encompassing the planning, construction, and operation of real estate for a fixed user fee. These first attempts are conceptually attractive, but are difficult to implement in practice. Clients still have misgivings regarding the fulfillment of their individual project requirements and there are continuing difficulties in the contract awarding process. Moreover, there is a deep-rooted, historically driven, mistrust of service providers because of which clients are afraid that services might be overpriced or that they might face additional charges in the end. First field trials have shown that value creation partnerships lead not only to a change in institutional sourcing concepts (organization, contract design, incentive mechanisms, etc.), but also to a profound change in the culture of the construction and real estate industry. These partnerships alter the relationship that unites parties on both sides of the market. In order to achieve the goals of innovation, synergies, and interface optimization, both sides of the market must cooperate intensively. Although the rights and obligations of partners are laid down contractually in great detail, there are significant differences compared to the traditional contractual and coordination structures of the construction and real estate industry.¹⁴¹ These market relationship modifications give the construction and real estate industry the opportunity to reform its intrinsically high-risk business model. Major construction firms have been moving their strategic focus away from the construction business for years, in an attempt to avoid the high risks arising from business cycle fluctuations and project business. By contrast, the real estate services business is becoming ever more important. Integrated life cycle value creation partnerships offer the opportunity to the construction industry and the real estate service providers to build long-term and consistently profitable customer relationships.¹⁴²

In addition to the service scope itself, PPPs also integrate project financing and post-delivery financing of real estate property. The early involvement of financing partners in value creation partnerships makes it possible to take their objectives and needs into consideration during the conceptual development stage. This cooperation results in the optimization of financing conditions and in the minimization of project costs for all parties involved. Through their risk management, the financing partners also exert an additional control function, in

particular regarding project and market risks. Both implementation partners and users benefit from this additional financial control.

7.3 Future perspectives for corporate real estate in selected policy areas

In recent years, politicians have increasingly noticed real estate management issues. However, the topics they discussed (such as energy-saving measures, affordable living, or demographic change of residential structures), were mostly exclusive to the field of residential real estate management. Political discussions focusing primarily on commercial real estate or property used for business operations have been much rarer. They mostly focused on technical rules, such as fire protection, or on the regulation of real estate capital investments. Even though these are incisive changes of working conditions for the industry, they are marginal issues for society as a whole. The political perception of real estate used for business operations starkly contrasts with its social, economic, and ecological importance in Germany:

1. Social importance of corporate real estate

Employees currently spend more than half their lives at their workplace, usually situated in properties used for business operations. In Germany, the average distance between a person's residence and workplace is increasing. Approximately half of commuters travel over 10km to go to work.¹⁴³ About 200 years ago, work and private life usually happened under one roof. Today, the spatial organization of work has a crucial influence on social life in our society. Thus, decisions concerning real estate concepts and locations have a significant impact on our social structures.

2. Economic importance of corporate real estate

At approximately 3 trillion euros, the value of real estate property used for business operations amounts to one third of the real estate assets in the German economy (see Section 2.5). From an economic perspective, this high proportion is absolutely decisive for capital investments, for economic value creation, and for the labor market. Real estate must be considered as an essential resource in the production process.

3. Ecological importance of corporate real estate

Companies' real estate resources have a decisive impact on their ecological footprint. Companies use 10% of the total area used for buildings or for traffic. The corporate real estate sector is responsible for approx. 10% of the German economy's energy consumption. Finally, the planning, construction, and operation of properties consume scarce resources to an extent as yet undetermined.

¹⁴¹ For concrete differences, see in particular the PPP literature (see e.g. Suhlhie 2010).

¹⁴² See Lünendonk (2012), pp. 6 ff.

¹⁴³ See Mikrozensus 2008, quoted in: Winkelmann (2010).

Considering the fundamental importance of real estate resources for our society, economy, and natural environment, we may wonder whether the lack of political intervention in this area leads to the neglecting of significant potentials. I will now present some initial indications of this issue with regards to selected policy areas.

7.3.1 Economic and social policy

The empirical evidence presented in Section 3.3 confirms that real estate resources are a decisive competitive factor for German companies. In addition to its positive impact on the "war for talents," corporate real estate often has a significant influence on the implementation of company strategies targeting cost or quality leadership. If corporate real estate has an impact on the competitiveness of individual companies, it also influences the international competitiveness of the German economy. While the debate on labor cost assumed existential traits over for long periods of time in the German economy, the cost reduction potentials offered by the optimization of real estate resources have hardly been discussed so far.

- Depending on a company's industry and business model, its real estate costs represent, on average, approximately 10–20% of its total costs. (Chapter 3)
- The success of real estate cost management varies widely from company to company. While individual best practice companies were able to reduce their real estate costs by an average of 30%, half of German corporations and two thirds of small and medium-sized German companies still have a significant cost reduction potential. (Chapter 5)
- A comprehensive study interviewing people responsible for CREM in German companies suggests that the optimization of real estate management can lead to an average increase of 13% in labor productivity. (Chapter 3)
- For the German economy as a whole, the real estate-related potential corresponds to an increase in labor productivity worth 178 billion euros per year. (Chapter 3)

Real estate usually represents a share of 10–20% of companies' total costs, which makes them the second largest pool of costs after human resources. Empirical studies demonstrate that real estate offers a quite substantial potential for cost reduction, due to the uneven level of development of corporate real estate management. In addition to indicating a cost reduction potential, empirical studies suggest that the optimization of the use of real estate resources offers an even greater potential. According to estimates made by people responsible for real estate in German corporations, the optimization of real estate resources can lead to a labor productivity

increase of 13% on average. Numerous case studies confirmed the dimension of this figure. If we multiply the potential for a productivity increase with the total payroll of the German economy, then we can estimate that the optimization of real estate resources could lead to an absolute productivity gain of 178 bn euros per year. For the sake of comparison, we may remember it took the German economy the past 16 years to realize the same productivity gains.¹⁴⁴

In summary, there is substantial potential for optimization of real estate assets in favor of the competitiveness of the German economy. This conclusion suggests that German companies should take coordinated action. It would be desirable if an economic policy initiative were put in place to address this need for action.

7.3.2 Urban development and regional policy

- Corporate real estate resources have an important impact on a company's ecological footprint. For instance, it is possible to estimate roughly that corporate real estate uses approx. 10% of settlement and transportation areas. (Chapter 5)

The share of land used by corporate real estate for its business activities in residential and transportation areas indicates that corporate real estate owners and users are important stakeholders in spatial development. At the same time, companies can contribute to the spatial and economic development of regions by releasing areas they no longer need. For example, we may think of the conversion of urban areas formerly used by the postal or railroad services, and of the urban reconfiguration of numerous commercially used industrial areas. In this way, or as private investors, companies can make an active contribution to town planning. In the past, downtown areas were the ones that benefited the most from this contribution. However, we must remember that companies often depend on political and administrative decisions regarding their spatial development. It can be observed that increasing regulations, their implementation, and the massive interventions led by interest groups are increasingly compounding the problems that arise in corporate real estate project development. The best known example of this in Germany is the project to modernize the railroad station in Stuttgart. The interests of companies and the project benefits for the region are often weighted unrealistically. In the future, it will be necessary to develop conceptual considerations in order to adequately take into account the interests of companies in regional planning processes. More intensive links and partner-

¹⁴⁴ See www.destatis.de, accessed on July 8th, 2013.

ships between regional land management concepts and companies' area management activities would increase the efficiency in using scarce residential and transportation areas.

Section 7.1.4 underlined the fact that German companies face the beginning of a new age in terms of work habits, in which employees no longer go to work, but work goes to them. Further developments in information and communication technology and, in particular, wider internet usage options, will create the technical preconditions to unravel the existing spatial structures of the world of work. Companies and the economy will benefit from this change in multiple ways. The cost of real estate will drop substantially, employees will be used in a more flexible way, and, above all, companies will gain access to employees who were formerly unreachable. In particular, companies will be able to hire employees with family commitments, who are older, and who live in remote regions, far from the company's sites. Considering that the lack of qualified personnel is likely to increase due to demographic change, the growing flexibility of the spatial aspects of work will be a very valuable development for companies.

In this context, we may expect a substantial change in living conditions and spatial use, particularly in major cities. Even now, some major German corporations are announcing that they will reduce their number of office workplaces by 50% over the next 15 years. In knowledge-intensive companies like IBM, this trend has already started. There is a threat of vacancy at sites where companies reduce their holdings. Although there are hardly any analyses on this topic today, it is obvious that this change will be focused on locations where knowledge-intensive industries with large shares of office workplaces are located. Politicians would be well-advised to proactively initiate space revitalization concept projects in these regions.

According to current research, it must be expected that companies will not necessarily reduce their number of employees in the context of the changing world of work. This is why we may wonder where people will work in the future. Part of the work volume will certainly be handled at home. However, experience confirms that the potential of working from home is limited. While employees appreciate the possibility to choose their place of work freely, social interactions at work and the spatial separation of work and private life offer many benefits. This is why we must assume that decentralized offices will emerge – according to the slogan, "benefit instead of ownership." These offices will not necessarily have to belong to individual companies anymore, but they will welcome employees

working for diverse companies who live in the area. This concept, which is currently being tested, is called an alternative office, corner office, village office, or co-working center.

Thus, the decentralization of workplaces offers not only risks, but also numerous opportunities for urban and regional development. For instance, commuter traffic could be reduced. Economically isolated regions that offer high living standards and lower cost of living and that currently lose population due to a lack of jobs might avoid further population losses. In summary, it is almost frightening to see how little of an impact the "future of work" currently has on urban and regional development.

7.3.3 Environmental policy

- Corporate real estate has a decisive share in a company's ecological footprint. Corporate real estate usage amounts to approximately 10% of the German residential and transportation area. (Chapter 5)
- The operations of corporate real estate are responsible for around 10% of the German energy consumption. Because data concerning the energy consumption of commercial real estate is generally scant, the previous estimate is only a rough initial approximation. If this estimate were to be confirmed, it would mean that approximately one fifth of companies' energy consumption is caused by the operation of their buildings. Thus, there is a great potential for the reduction of companies' energy consumption. (Chapter 5)

From an ecological perspective, commercial real estate has an impact on area usage first and foremost. Analyses have confirmed that real estate used for business operations occupies about 10% of the residential and transportation areas in Germany. Its current share, representing 13.4% of the total area, is constantly growing. Today (2008-2011) 81 additional hectares of land are used every day. In the context of its sustainability strategy, the German government is aiming to reduce this figure to 30 hectares per day by 2020. The current public debate on land consumption focuses mostly on land used for residential purposes. Although real estate used for business operations covers an area that represents between one third and half of the land used for residential purposes - depending on the definition of this type of real estate - it has been comparatively ignored by the debate so far. In view of constantly changing area requirements and of a certain dematerialization of production processes, the land consumption of corporate real estate should, in principle, offer valuable potential for the re-naturalization and rededication of land.

Corporate real estate management can make another contribution to German environmental policy by promoting climate protection and a better energy turnaround. The real estate industry held a very extensive debate on the contribution it can make to climate protection. However, the debate accorded surprisingly little attention to commercial real estate's potential to reduce its share of emissions. Numerous studies and policy drafts address the entire real estate industry in their titles and introductions. Yet, as soon as they define their concrete subject of investigation, it becomes clear that their content is only concerned with residential property. This lopsided perspective may be due to the predominantly residential expertise of stakeholders, the better availability of data for residential property, or the sectoral structuring of energy policy. Nevertheless, this oversight is illogical. It would be methodologically very difficult to provide a precise calculation of saving potentials given the poor data available. Indeed, the structure of commercial real estate's energy consumption and the amount of energy it consumes are not publicly known. I would very roughly estimate that the operation of commercial real estate represents approximately 10% of the country's total consumption. According to this estimate, it would be lower by one half than the energy consumption of residential property. Considering the potential for energy savings already leveraged in residential property, the potential of commercial real estate is definitely politically relevant. Furthermore, for companies the lever available to reduce their final energy consumption by making their real estate more energy-efficient is relatively big. Companies presumably use 20% of their final energy consumption to operate their buildings. Considering the substantial energy consumption of commercial real estate, it is absolutely necessary to take it into consideration when drafting climate protection policy and trying to improve the country's energy turnaround.

7.3.4 Capital market policy

- According to rough calculations, the value of corporate real estate in Germany as of 2013 amounts to 3,000 bn euros, of which 500 billion are attributable to pro rata land values. These figures are rough estimates. As with floor space, better data concerning real estate values is urgently needed. (Chapter 2)
- The capital market culture in the German corporate real estate market is weak. Consequently, of the approx. 3,000 billion euros worth of corporate real estate, only a negligible 46 billion were in the hands of closed-end funds and 37 billion in the hands of open-end funds. (Chapter 4)
- Real estate is not only a resource for companies, but also

an important capital investment. On average, German companies own 70% of the real estate they use as their own property. Thus, companies own real estate assets in Germany worth 2.1 trillion euros. (Chapter 4)

- In the U.S. and in Asia, ownership rates of corporate real estate are of 20% and 30% respectively. (Chapter 4)
- Capital tied up in real estate is only subject to a profitability requirement in about half of German corporations. (Chapter 6)
- From the point of view of company funding, there are serious arguments against real estate ownership. Empirical studies conducted in the U.S. impressively show that the capital market does not reward listed companies' investments in corporate real estate. Conversely, corporate real estate divestment correlates positively with stock prices. (Chapter 4)
- Real estate used for production-related activities offers risk management benefits that have not been widely discussed yet. For example, it is worth mentioning that properties used for production-related activities can usually be switched over to a different usage without major expenses. In addition, the small and medium-sized enterprises that are the typical tenants of this type of real estate offer potential advantages over international groups, as they have less market power, more loyalty to their location, often a better financial structure, and a high economic performance. Last but not least, these enterprises are often more flexible when it comes to site selection and to defining contractual terms, as they do not follow rigid property procurement guidelines. (Chapter 4)

Approximately one third of German real estate assets (3 trillion euros) is tied up in corporate real estate. A substantial share of the capital stock is invested in corporate real estate, either directly or indirectly. Around 70% of the real estate used for business operations is owned by the companies that use it. German companies own a much larger proportion of the real estate assets they use than companies in other countries. In North America, the average ownership rate is 30%, and in Asia, it is 20%. Real estate investments at the volume observed in Germany are inefficient, especially considering the poorly developed financial control systems in place in many companies and the limited options to manage real estate portfolios by investment criteria. This capital could be used more efficiently if it were invested in companies' core business. Indeed, studies conducted in the U.S. confirm that the capital market will not reward non-real estate companies' investments in real estate assets. Unlike in Germany, strong investment vehicles have been available in the North American and Asian capital markets for a long time:

the REITs, which have absorbed the real estate used for business operations through sale-and-rent-back transactions. German companies currently lack suitable partners in the capital market to reduce their real estate ownership rates to a more efficient level through divestment. Because of their legal and economic limits, open- and closed-end property funds are limited as potential market partners. Thus, politicians need to facilitate the creation of capital market vehicles that will fulfill this specific purpose. The German REIT might meet this need after appropriate review, as it was first intended.

From the point of view of investment horizon, return, and risk, real estate investments are indisputably one of the best investment options for private retirement plans. Households' increasing wealth means that there is a growing need for different investment options. In the last few years, large quantities of German capital has been invested abroad, presumably because of a relative lack of investment opportunities at home. For instance, 25.8 bn euros are invested in closed investment funds abroad.¹⁴⁵ Moreover, more than two thirds of assets of open-ended funds were invested abroad as of March 2013, totaling a value of approximately 83 bn. euros.¹⁴⁶ Considering the price bubbles in international markets and the simultaneous stability of German real estate markets, investing abroad seems risky and questionable from a macroeconomic perspective.

While residential property is already largely owned by households via direct investments or indirect real estate capital investments, corporate real estate still offers extensive potential for the capital market. Currently, 70% of this real estate is tied up in companies' balance sheets.¹⁴⁷ Companies' divestment of real estate assets offers a potential extension of domestic real estate capital investment products, which can meet the requirements of private retirement arrangements optimally. As I remarked in Section 5, it is small and medium-sized tenants, property outside traditional office locations, and industry-related usages that enable the creation of innovative and low-risk investment alternatives.¹⁴⁸ In terms of regional economy, this process makes additional capital available for the basic financing of private infrastructures, which leads to an increase in regional competitiveness. In summary, it is evident that a substantial share of German corporate real estate is currently inefficiently allocated. There would be clear advantages to the extension of a German real estate capital market, both for companies' financing structures and for private retirement arrangements. However, Germany does not possess the suitable vehicle structures or the appropriate historical investment culture to enable this change. Empirical evidence confirms that only a little more than €80 bn. from open and closed real es-

tate funds are invested in real estate used for business operations. This amount is even less than half of the total capital invested by real estate funds, which is of about €190 bn. Thus, the lion's share of the total capital investment is currently invested abroad. This is where politicians must act. A proactive review of the German REIT structures with the explicit objective to incentivize corporate real estate divestment could change the current state of affairs.

¹⁴⁵ See http://www.vgf-online.de/fileadmin/VGF_Branchenzahlen_2012/VGF_Branchenzahlen_2012_Praesentation.pdf, accessed on August 13th, 2013.

¹⁴⁶ See http://www.bvi.de/fileadmin/user_upload/Statistik/OIF_Quartalsauswertung_31032013.pdf and http://www.bvi.de/fileadmin/user_upload/Statistik/2013_06_OIF_Status_und_FV.pdf, accessed on August 13th, 2013.

¹⁴⁷ Thus, private households as shareholders are, strictly speaking, already the owners of this corporate real estate. However, the success of capital investments is determined by the companies' core business, which is influenced by the performance of real estate.

¹⁴⁸ It should be mentioned that companies also derive the above-mentioned benefits from a more clear-cut risk-return profile along their actual core business.

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Appendix I: Cost of Office Workstations

Depending on the definition of "office," anywhere between 12 and 18 million employees work in office workstations in Germany.¹⁴⁹ It is in particular with this form of employment that the cost of the workstation plays an important role. Regionally or globally active brokers and consulting firms conducted numerous studies that deal with the cost of workstations in office properties in different regions and real estate submarkets. Their findings often deviate substantially, largely because of their different study designs that use different definitions of cost types, spaces, and markets in particular.¹⁵⁰ Thus, the figures cited in this present document are meant to illustrate dimensions and relative differences rather than to be applied wholesale to concrete cases.

First, I will investigate the cost of workstations per square meter in detail. Then, I will examine the area use per employee in order to aggregate figures at the level of the workstation. This calculation will require the consideration of additional cost types.

Cost of workstations per square meter (sqm)

According to the full cost account presented in the 2012 OSCAR study, the workstation cost per square meter for the total net area amounts to an average of 19.07 euros in air-conditioned buildings and an average of 15.45 euros in non-air-conditioned buildings.¹⁵¹

The development of costs over time is inconsistent. In the long term, we must expect costs to rise, in particular due to the increased mechanization of buildings, new energy-saving measures, and higher construction costs.

The cost of building use naturally differs according to the quality of the building. For instance, OSCAR differentiates between three office space quality categories, as illustrated in Table 14: "basic," "medium," and "high."

Table 14: Average value of total costs according to DIN 18960 (€/sqm of net total area/month) by building quality

Building quality	Basic	Medium	High
Cost types			
Interest	7.34	8.91	11.08
Public charges/disposal	0.47	0.50	0.53
Insurance	0.12	0.13	0.13
Maintenance/repair/janitor	1.24	1.37	1.46
Power	0.62	0.65	0.76
Heating/cooling	0.54	0.59	0.61
Water/sewage	0.12	0.13	0.13
Cleaning/other services	0.71	0.83	0.91
Security	0.44	0.54	0.66
Administration	0.36	0.41	0.42
Write-down	2.23	2.48	3.18
Conservation of structure (refurbishment)	0.32	0.31	0.33
Total	14.51	16.85	20.20

Source: JLL/CREIS (2012), p. 16.

Table 13: Average values of all total costs according to DIN 18960 (€/sqm/month)

Cost types	2007 Euro	2008 Euro	2009 Euro	2010 Euro	2011 Euro	2012 Euro	2012 in%
Interest	11,57	11,64	11,93	11,26	10,22	10,33	54%
Public charges/disposal	0,56	0,54	0,50	0,50	0,53	0,52	3%
Insurance							
Maintenance/repair/janitor	1,27	1,31	1,25	1,41	1,38	1,43	7%
Power	0,62	0,62	0,65	0,70	0,70	0,73	4%
Heating/cooling	0,53	0,54	0,56	0,63	0,64	0,60	3%
Water/sewage	0,14	0,14	0,14	0,15	0,14	0,13	1%
Cleaning/other services	0,89	0,89	0,86	0,89	0,87	0,89	5%
Security	0,46	0,49	0,53	0,54	0,58	0,59	3%
Administration	0,47	0,43	0,46	0,45	0,41	0,41	2%
Write-down	3,86	3,79	3,85	3,77	3,17	2,99	16%
Conservation of structure (refurbishment)	0,42	0,44	0,42	0,47	0,44	0,32	2%
Total	20,93	20,98	21,28	20,93	19,22	19,07	100%

Source: The author's compilation based on data provided by JLL/CREIS (2012), p. 16.

¹⁴⁹ The real estate industry usually assumes 13 million employees. See ZIA as of December 31st, 2006, DESTATIS (2009).

¹⁵⁰ See CREIS (2010). For a comparative analysis, see Franke (2012).

¹⁵¹ See JLL/CREIS (2012), p. 16.

The CREIS data, at costs ranging from 14.51 euros per square meter per month for basic buildings to 20.20 euros for high-quality buildings, reflects a very heterogeneous cost structure. The decisive cost driver is the investment cost, which is reflected in the capital costs and the write-down as usage costs.

Office space per employee

According to a survey conducted by Jones Lang LaSalle in 2009, office workers - calculated as full time equivalents - have on average 33.2 sqm total net office space at their disposal. However, there are substantial differences depending on the region, time, and company.¹⁵² CREIS's slightly different findings on area consumption and distribution of office space per employee among companies are illustrated in Figure 28.

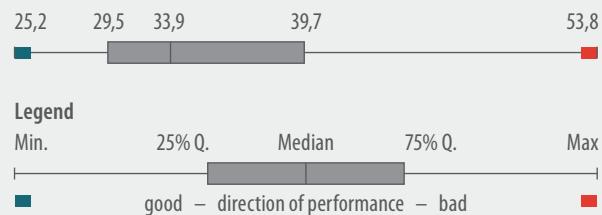
According to the CREIS study, the average area consumption of companies ranges from 25.2 square meters to 53.8 square meters – a spread of over 100%. Even the differences between the 25% and 75% quantiles ranging from 29.5 sqm to 39.7 sqm are still in excess of 10 sqm. The detailed results obtained in this study combined with direct observations in companies confirm that there are sometimes considerable differences in terms of area consumption per employee, even within individual industries and regions.

Costs per workstation per year

According to CREIS, the average cost of an office workstation in Germany was of 11,261 euros in 2010 (see Figure 29).

Figure 28: Distribution of office space per employee

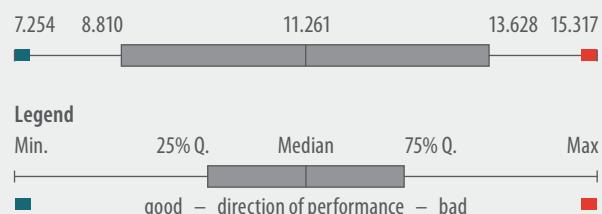
Area consumption per workstation in self-used office buildings in square meters of total net area



Source: CREIS (2010).

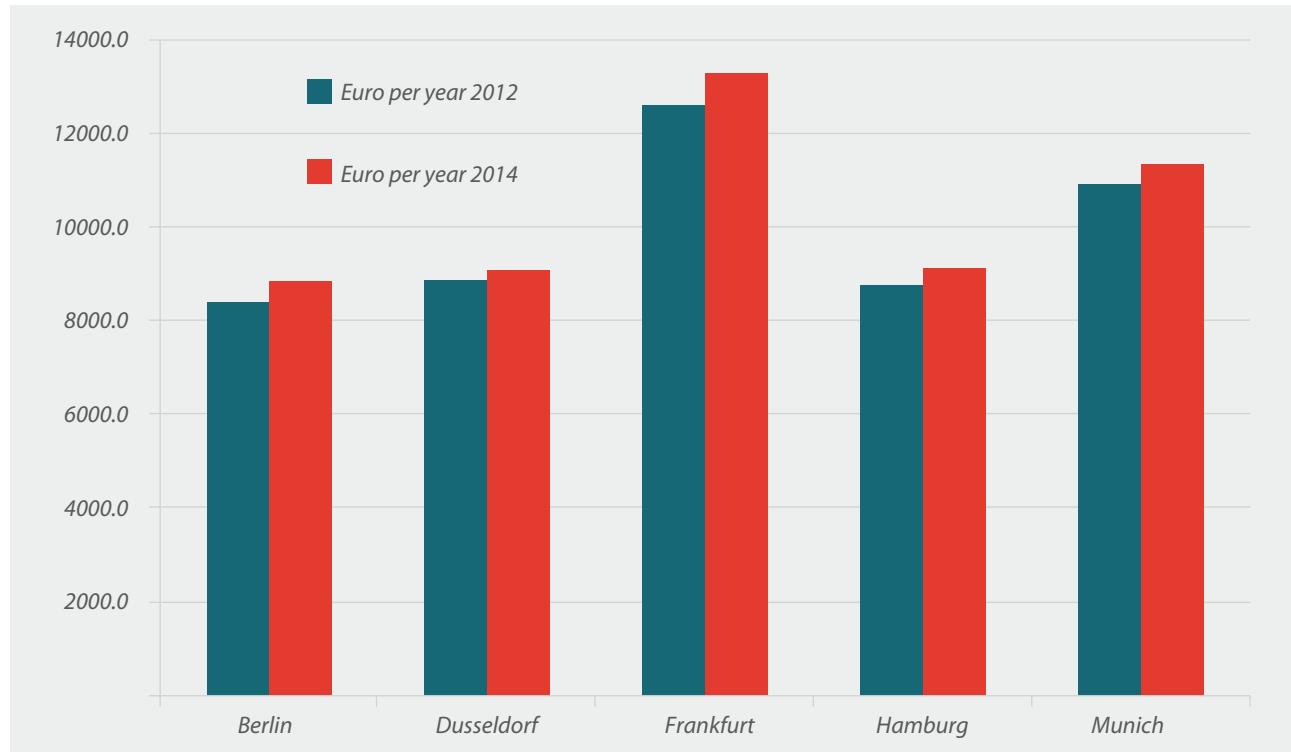
Figure 29: Annual cost of an office workstation

Workstation costs in Euro based on the SMA Statement 4 BB



Source: CREIS (2010).

Figure 30: Total workstation occupancy costs per year



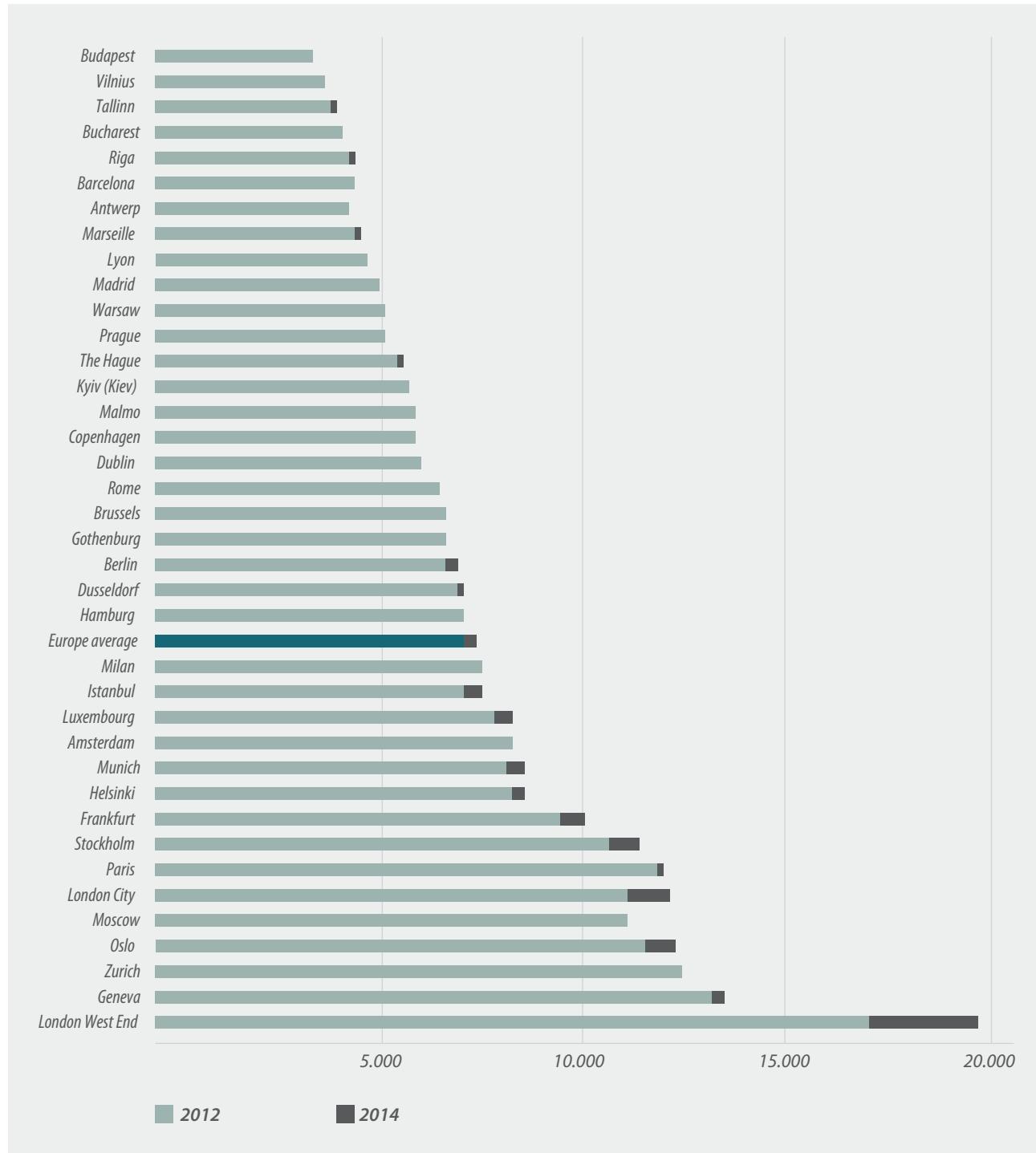
Source: DTZ (2012), p. 18.

¹⁵² See JLL (2009), JLL (2005).

According to the CREIS study, there are considerable differences in the average cost of companies' offices, corresponding to the wide ranging area consumption cost differences. There is a difference of more than 100% between the minimum cost, €7,254, and the maximum cost, €15,317.

The cost per workstation varies widely depending on location. Figure 30 illustrates the average cost of a workstation (total occupancy costs) in major German cities in 2012 and 2014, based on a study conducted by DTZ:

Figure 31: Total occupancy costs per workstation, end 2012 and 2014 – Europe (EUR p.a.)



Source: DTZ (2012), S. 11.

It is important to note that the definition of total occupancy costs (TOC) used in the DTZ study deviates from the definition used in the CREIS study. In particular, it should be mentioned that all user-side costs (e.g. cost of cleaning) are not included in the TOC.

By international standards, office workstations are comparatively expensive in Germany. German locations are among the most expensive, especially within Europe (see Figure 31).

The two different bar lengths for 2012 (dark) and 2014 (bright) show that the cost of workstations in Germany is stable in comparison to other locations, in particular London's West End.

a high share of capital costs which, together with the low liquidity of real estate investments, makes them especially rigid. In the event of changing real estate requirements, real estate costs are hard to adjust. Thus, real estate costs are usually characterized by high fixed costs. Considering the fact that real estate investments usually have a low degree of usability for other purposes and that the area demand of companies fluctuates, then we may conclude that real estate investments always entail the risk of sunk costs.¹⁵⁶

Relative importance of real estate costs compared to a company's total costs

Depending on a company's industry and business model, its real estate costs amount to approximately 10–20% of its total costs.¹⁵³ Real estate costs usually constitute a company's second-largest pool of costs after human resources. The following example, typical of the financial services industry, illustrates various ratios related to the costs of office work (Table 15):¹⁵⁴

Table 15: Exemplary cost structure of office work

Office space per employee (average banks, financial services)	33.3 sqm
Rent per year (rental price banking district Frankfurt, average price €22.4 per sqm)	269
Ancillary rental costs per year (ancillary costs Frankfurt, air-conditioned: €3.41 per sqm)	€41 per sqm
Total rental costs	€10,323
Furniture (cost of upscale office equipment: €3,300; calculated write-down period five years)	€660
Annual cost of IT (median for banking industry)	€8,157
Other costs (costs of consumption and apportionment for office material, electricity, reception, etc.)	€875
Total equipment costs	€9,692
Gross annual income (average financial and insurance services)	€64,047
Ancillary wage costs (relative to gross income)	28%
Total staff costs	€81,980

Source: Krupper (2013), p. 3.

According to empirical studies, real estate-related costs represent on average between 3 to 5% of a company's turnover, depending on the industry concerned.¹⁵⁵

In comparison to other costs incurred by companies, real estate costs have special characteristics that make cost management more difficult. Real estate costs are characterized by

¹⁵³ See Pfür (1998), Krupper (2013).

¹⁵⁴ See Krupper (2013), p. 3.

¹⁵⁵ See Pfür (2011).

¹⁵⁶ In business administration, legacy costs are costs that cannot be reduced in line with the headcount to match their increase when the headcount was initially increased. Sunk costs are costs that are not entirely recovered after they have been incurred. See Pfür (2002), pp. 48 ff.

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The paper reflects the author's opinion, not the clients'.

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