

---

# Office buildings in the conflict of interests of employees - results of an empirical survey of German office workers

---

Andreas Pfnür, Martin Christian Höcker

---



TECHNISCHE  
UNIVERSITÄT  
DARMSTADT

Forschungszentrum Betriebliche  
Immobilienwirtschaft  FBI

Prof. Dr. Andreas Pfnür (Hrsg.)  
Institut für Betriebswirtschaftslehre  
Fachgebiet Immobilienwirtschaft  
und Baubetriebswirtschaftslehre  
[www.immobilien-forschung.de](http://www.immobilien-forschung.de)

**Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis,  
Band Nr. 47, July 2023, slightly extended and revised 2nd ed.**

---

**Cite as:**

Andreas Pfnür, Martin Christian Höcker (2023): Office buildings in the conflict of interests of employees - results of an empirical survey of German office workers. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 47, Technische Universität Darmstadt.

**Authors:**

**Prof Dr Andreas Pfnür**, Head of the Department of Real Estate Management and Construction Management at Darmstadt University of Technology and founder of the Research Centre for Real Estate Management. pfnuer@bwl.tu-darmstadt.de

**Martin Christian Höcker**, M. Sc., Research assistant and doctoral candidate at the Department of Real Estate Management and Construction Management at Darmstadt University of Technology. hoecker@bwl.tu-darmstadt.de

**Other participants in the study concept:**

**Christian Holthaus**, Managing Director of Coventury GmbH  
christian.holthaus@coventury.de

---

---

The following study was supported by:



**Contact:**

Marie de Vries

Communications Manager

marie.devries@swisslife-am.com

The work reflects the view of the authors.

Forschungcenter Betriebliche  
Immobilienwirtschaft 

Imprint (v.i.S.d.P.):

Prof Dr Andreas Pfnür

Fachgebiet Immobilienwirtschaft und Baubetriebswirtschaftslehre

Fachbereich Rechts- und Wirtschaftswissenschaften

Technische Universität Darmstadt

Hochschulstr. 1

64289 Darmstadt

Phone +49 (0) 6151 / 16 – 24510

Fax +49 (0) 6151 / 16 – 24519

E-Mail office-bwl9@bwl.tu-darmstadt.de

Homepage www.immobilien-forschung.de

ISSN-Nr. 1862-2291

---

---

---

## Management Summary

---

Office properties face a far-reaching transformation in the face of the most massive structural change in the post-war era. Restructuring the working world with work-from-home and the ‘war for talent’ require the use-related adaptation of space. Increased environmental awareness highlights the high ecological footprint of corporate real estate in terms of construction, operation and utilisation. At the same time, office properties should continue to fulfil their function in the capital market in the future. Office properties are therefore exposed to a complex, sometimes divergent set of interests. The discussion about the transformation of office real estate is currently still being conducted in very academic circles. So far, the voice of those most directly affected, the office workers, has been neglected. The end users of the space, as a part of society interested in climate protection, and as small investors investing in products tied to office real estate, have all three perspectives on office real estate. This working paper aims to investigate the perception of office real estate from the different perspectives of use, environmental sustainability and investment by office workers as well as possible conflicts between the perspectives and their resolution. For this purpose, 1,000 German office workers were interviewed in a representative survey.

The results show that office workers perceive office properties from all three perspectives. From the user perspective, office properties have lost their exclusivity as a place for office work while work-from-home and coworking spaces are consolidating their importance for office workers. At the same time, office properties are enjoying high popularity from an investment perspective. From the perspective of environmental sustainability, the role of office properties in the fight against climate change is still underestimated by those surveyed. The transformation of office properties must therefore consider the quality of use as well as the investment and ecological quality. It is important to the respondents that their concerns are included in the transformation. They agree that sustainable transformation can only succeed through the interaction of all stakeholders.

For office workers and their employee representatives, the results mean that they must also represent their requirements for the transformation of office properties to employers. Corporate real estate management must be more employee-centric than ever before and enable mobile working at home and in coworking spaces. Real estate investors must align their actions with the changing demand of corporates. In addition, the need for new forms of employee participation in the investment success of office properties and the demand for coworking spaces are expanding the business areas. Politics must secure that the transformation of office real estate aligns with the interests of employees to maintain the competitiveness of companies in global competition and rethink with regard to the ecological transformation: Office workers as part of the solution, not just polluters.

---

**Keywords:** Structural change, office real estate, user requirements, real estate investment, environmental sustainability

Gender disclaimer: In the preparation of this working paper, care has been taken to use gender-neutral wording. If this is not possible in places, the simultaneous use of the language forms masculine, feminine and diverse is dispensed with for reasons of better readability. All references to persons apply equally to all genders. This abbreviated form of language does not represent any valuation.

---

---

---

## Table of contents

---

Management Summary .....	I
Table of contents.....	III
Table of Figures.....	IV
List of Tables.....	VI
1 Background of the study and survey objective.....	1
1.1 Competing interests regarding office real estate .....	1
1.2 Digression: The multifaceted importance of office real estate for office workers .....	2
1.3 Aim of the study .....	7
2 Scientific procedure and presentation of the sample.....	8
2.1 The study procedure .....	8
2.2 Composition of the sample.....	10
3 German office workers' perception of office real estate.....	18
3.1 Respondents' trade-offs between user, sustainability and investment perspectives.....	19
3.2 Perception of office properties from the user's perspective .....	23
3.3 Perception of office properties from a sustainability perspective .....	27
3.4 Perception of office real estate from an investment perspective .....	30
3.5 Intermediate conclusion.....	32
4 The identified need for adaptation and the resolution of conflicting goals.....	34
4.1 The need for adaptation of office properties identified by respondents.....	34
4.2 Resolving the conflicting goals between the requirements .....	36
4.3 Intermediate conclusion.....	40
5 Implications of the results for the future of office real estate .....	42
Bibliography.....	49

---

---

## Table of Figures

---

Figure 1: Indirect real estate investment vehicles, own illustration according to Trübstein (2012) .....	4
Figure 2: Course of study .....	8
Figure 3: Personal characteristics of the respondents .....	12
Figure 4: Household-related characteristics of the respondents .....	14
Figure 5: Occupational characteristics of the respondents .....	15
Figure 6: Geographical distribution of respondents .....	16
Figure 7: Aggregation of response attributes into top/bottom-3-box values (scheme) .....	16
Figure 8: Perceived influence of office real estate on different areas of life .....	18
Figure 9: Importance of office property requirements from a user, investment and sustainability perspective .....	20
Figure 10: Correlations between selected personality traits and the importance of office property requirements from a user, investment and sustainability perspective ..	21
Figure 11: Importance weights of the requirements from the user, investment and sustainability perspective .....	22
Figure 12: Comparison of the importance weights of the requirements from both analyses .....	23
Figure 13: Satisfaction with the office workplace and competition from other workplaces .....	24
Figure 14: Comparison of office properties and coworking spaces in terms of work success factors .....	25
Figure 15: Comparison of office real estate and the home office with regard to work success factors .....	26
Figure 16: Distribution of desired working time across different workplaces in 2020 (Pfnür et al., 2021) and today .....	27
Figure 17: Respondents' concern about the environmental impact of office real estate .....	29
Figure 18: Perceived environmental impact of office properties compared to other sectors and residential properties .....	30
Figure 19: Respondents' investment consideration and perceived attractiveness of the office property asset class .....	31
Figure 20: Perceived attractiveness of office property compared to other investment products .....	32
Figure 21: Use-related need for adaptation of office properties .....	34
Figure 22: Need for environmental adaptation of office buildings .....	35
Figure 23: Investment-related adjustment needs of office properties .....	36
Figure 24: Need to resolve conflicting goals and take into account the concerns of office workers .....	37
Figure 25: Responsibility of individual actors for the adaptation of office properties	38

---

Figure 26: Instruments for resolving conflicting goals that arise between the requirements of office properties .....39

Figure 27: Willingness to spend less time working in higher-quality office space .....40



---

---

## List of Tables

---

Table 1: Indicative calculation of the office real estate assets of various indirect investment vehicles .....	6
Table 2: Overview of the interviews conducted with experts (average duration: approx. 48 min) .....	9
Table 3: Components of the questionnaire .....	9

---

## 1 Background of the study and survey objective

---

### 1.1 Competing interests regarding office real estate

Office real estate is in the spotlight as rarely before. In the transformation of companies, office properties are being changed to an unprecedented extent in one of the most significant structural changes of the last century: In the next ten years alone, around 60 percent of space will have to be adapted to new usage requirements through project development and market transactions (Pfnür, 2020). On the one hand, this offers enormous design options; on the other hand, there is currently great uncertainty as to how to react to future changes. Real estate management finds itself in a constantly intensifying conflict of interests:

1. Megatrends such as digitalisation, rising environmental awareness, sociodemographic change, increasing globalisation, growing geopolitical government intervention and urbanisation are changing user-related requirements for office properties (Pfnür & Wagner, 2018). The shortage of skilled workers makes attractive physical work environments one of the toughest employer brand currencies in the war for talent and strengthens employees' bargaining power to assert their interests (Maier et al., 2022).

2. Buildings are a major contributor to global greenhouse gas emissions (UNEP, 2020). Thus, to achieve set climate protection targets, nearly CO<sub>2</sub>-neutral real estate is essential (Bürger et al., 2017). Therefore, the inclusion of office properties in the sustainability efforts of corporates is also necessary to achieve their own sustainability goals.

3. At the same time, office real estate performs an important anchor function for the national economy (Just et al., 2017) and is an important asset class in the capital markets (Delfim & Hoesli, 2019; Chun et al., 2004). Office real estate should continue to fulfil these functions in the future.

In short, the target systems and strategies for operational real estate are increasingly overdetermined in the conflict of interest that is currently surging. Adjustments or changes to office real estate in one of the three perspectives inevitably impact the remaining two. Higher costs for space quality and environmental protection, for example, necessarily lead to effects from an investment perspective; after all, higher rents must inevitably be enforced. Therefore, the transformation of office properties must consider all three perspectives.

Many owners, users and real estate service providers are looking for orientation in this dynamic phase. What is striking here is that the discussion that is currently ensuing is traditionally conducted largely by experts within the respective disciplines in a very academic manner. What has been neglected so far is the situation of those affected on the ground,

---

which are substantially served by real estate as a living space and take a correspondingly holistic view of real estate, neighbourhoods and regions. The most affected group in society is the group of employees. Their interests and perceptions have not yet been investigated in any study known to the authors.

On closer examination, however, the group of office workers has clearly formulated interests that will determine the future transformation of office real estate and its functions in the economy and society. It is to be expected that employees will formulate very different requirements for the transformation of office real estate, depending on the role and the associated perspective in which they currently perceive themselves. Because the resolution of conflicting goals must also find acceptance, meaning that a generally accepted transformation path must be followed, those directly affected by the changes, the office employees, will have their say in this study.

## **1.2 Digression: The multifaceted importance of office real estate for office workers**

Office workers approach office real estate from various angles: as end users of office space, as individuals within society concerned about upholding people's livelihoods amidst climate change, as investors and as contributors to private or corporate retirement plans.

### **Office property as a place of work**

As end users, office workers spend large portions of their lives in office real estate, which serves as their place of work and communication. At around 37%, office workers account for a significant share of the workforce (Hammermann & Voigtländer, 2020). With an average of 34.7 hours of work per week (Destatis, 2022f), office workers also spend large portions of their waking hours in office properties today (Pfnür, 2019). Despite the transformation of working life with regard to digitalisation and mobile working, office workers still want to spend an average of two days a week in the company office in the future (Pfnür et al., 2021). Finally, they perceive that workplace design influences their satisfaction at work (Rubin et al., 2020) and their productivity (IBA, 2017). For instance, office workers report an average 14% increase in productivity in the home office and suggest that 60% of work could be done from home (Pfnür et al., 2021). Thus, office real estate seems to have lost its exclusivity as a workplace for office workers. Apparently, office planning in the past was not geared enough to meet the needs of end users. This implies massive changes and an immense need for revitalization. In times of increasing bottlenecks in the labour-related factor markets, real estate is gaining increasing weight in the development of corporate strategies in the context of employer branding (Höcker et al., 2022).

### **The importance of office real estate in the fight against climate change**

---

Office buildings affect the livelihoods of all people through land sealing and the associated impairment of biodiversity, resource consumption and waste generated, final energy consumption, water consumption and water pollution as well as through greenhouse gas emissions and air pollution from particulate matter during the life cycle phases of construction, operation and recycling (BBSR & BBR, 2020; UNEP, 2020). As human individuals and part of society, office workers thus have a stake in the ecological transformation of the land stock in the fight against climate change. Residential and non-residential buildings are responsible for around 40% of greenhouse gas emissions globally and in Germany (UNEP, 2020; Lennerts et al., 2021). Office buildings play a unique role here due to their disproportionately large share of these emissions: In Germany, there are over 300,000 office buildings with a usable office space of around 456 million square metres (Henger et al., 2016; Hörner et al., 2021). Non-residential buildings, in general, are responsible for 37% of the final energy consumption of all buildings (Dena 2018). At the same time, the share of GEG-relevant non-residential buildings in the total building stock is only 10% (Dena, 2022). Office buildings, in turn, account for around 16% of all non-residential buildings (Hörner et al., 2021) and are responsible for 20% of the heat consumption of all non-residential buildings (Henger et al., 2016). If this share is also assumed for electricity consumption, then this rough calculation shows that 2% of all GEG-relevant buildings are responsible for around 7% of emissions from building operations. The construction of residential and non-residential buildings is also responsible for around 7% of all greenhouse gas emissions in Germany (BBSR & BBR, 2020). The share of office buildings in these emissions is likely disproportionately high due to the building materials used. After all, compared to other residential and non-residential buildings, the emission-intensive building materials steel and concrete are used much more frequently in the construction of office buildings and wood, for example, is used much less frequently (Destatis, 2022a). Therefore, the consideration of office buildings in efforts to combat climate change is essential.

### **Office real estate as an investment asset**

Real estate in general plays a significant role in the wealth accumulation and pension provision of private German households. Owner-occupied residential property alone accounts for an average of 58% of the individual net assets of private households. In addition, other directly held real estate (19%) and real estate-backed investment products are part of the financial assets of private households (Halbmeier & Grabka, 2021): Household financial assets include, among other things, shares and other equity rights, shares in investment funds as well as insurance and pension claims (Bundesbank, 2023b), the values of which in turn

have property-backed shares. Figure 1 provides an overview of the indirect investment vehicles available for asset formation and old-age provision.

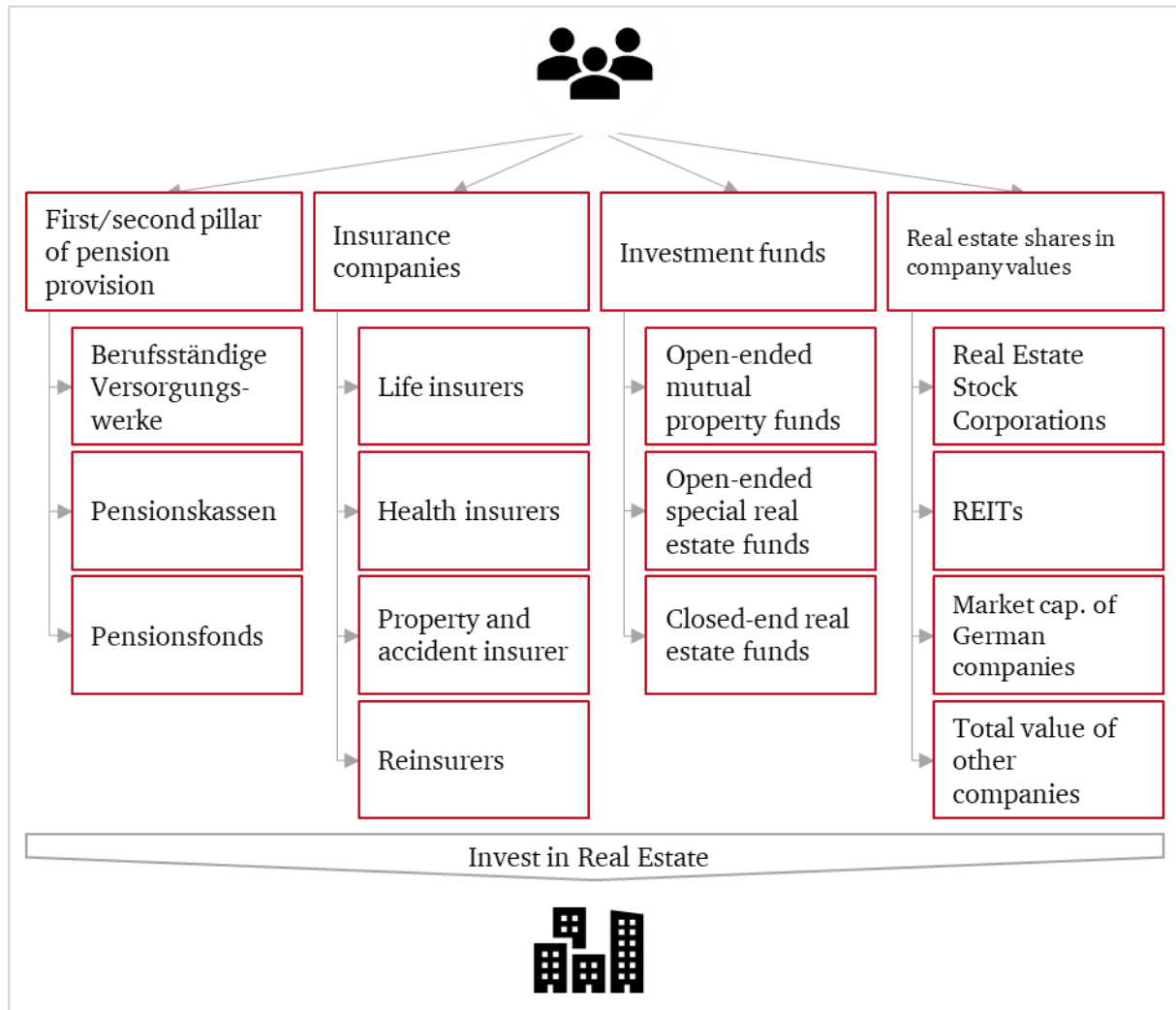


Figure 1: Indirect real estate investment vehicles, own illustration according to Trübstein (2012)

From the perspective of capital investment and retirement provision, office properties are thus part of all three pillars of retirement provision in Germany: Occupational pension schemes (Berufsständige Versorgungswerke) from the first pillar of retirement provision invest in commercial properties in general and office properties in particular, as do the players in occupational retirement provision, pension schemes (Pensionskassen) and pension funds (Pensionsfonds), from the second pillar. Insurance companies, to which private households have claims from private pension or life insurance policies, for example, invest at least parts of their capital in real estate, as do investment funds, real estate stock corporations and REITs. Investments in shares and share funds of non-property companies also go hand in hand with investments in real estate: real estate assets account for up to 20% of the corporate values of listed companies in Germany (Pfnür, 2011). A large part of this is in turn accounted

---

for by office properties. From the point of view of retail investors, these forms of investment are originally to be assigned to the third pillar of old-age provision, although pension funds and pension schemes also invest in such investment products.

A rough calculation shown in Table 1 estimates the capital invested indirectly in German office property from the perspective of small investors. Occupational pension schemes invest around 20% of their assets in real estate (ABV, 2022). The players in occupational pension provision (pension schemes and funds) invest around 14% of their investment volume in the asset class (BAI 2021). The various insurance companies invest between 4.3% and 5.1% in real estate (GDV, 2023). Office property accounts for around 27% of the real estate allocation in the portfolios of the investors mentioned (BAI, 2021). In this context, it should be noted, as already mentioned and as shown later, that the investments of the aforementioned capital collection points in shares and equity funds also have real estate-backed shares, which are neglected in this calculation.

The share of offices in the portfolios of open- and closed-end real estate funds is between 52% and 55% (BVI, 2023; Bundesbank, 2023a). Real estate companies and REITs are left out of this calculation due to their subordinate importance in Germany, particularly in comparison to the overall stock market, and are only taken into account in the context of the consideration of the market capitalisation of all German listed companies. Real estate accounts for up to 20% of the total value of listed companies (Pfnür, 2011). Office properties in turn account for 35% of these real estate values (Pfnür, 2019). The values of non-listed companies, some of which are also attributable to German private households, also include real estate assets held by them. In total, the capital invested indirectly by retail investors in German office real estate is estimated at around €620 billion based on this conservative estimate.

**Table 1: Indicative calculation of the office real estate assets of various indirect investment vehicles**

	Asset value (€ billion)	Thereof real estate (%)	Value of real estate (billion €)	Thereof office (%)	Value of office properties (€ bil-
First/second pillar of old-age provision					
Berufsständige Versorgungswerke	256.65	19.9 <sup>1</sup>	51.13 <sup>1</sup>	27.0 <sup>2</sup>	13.80
Pensionskassen	195.10 <sup>3</sup>	13.9 <sup>2</sup>	27.12	27.0 <sup>2</sup>	7.32
Pensionsfonds	57.39 <sup>3</sup>	13.9 <sup>2</sup>	7.98	27.0 <sup>2</sup>	2.15
Insurance companies					
Life insurers	1,028.50 <sup>4</sup>	4.3 <sup>4</sup>	44.23	27.0 <sup>2</sup>	11.94
Health insurers	332.30 <sup>4</sup>	5.1 <sup>4</sup>	16.95	27.0 <sup>2</sup>	4.58
Property and accident insurer	189.80 <sup>4</sup>	5.1 <sup>4</sup>	9.68	27.0 <sup>2</sup>	2.61
Reinsurers	260.40 <sup>4</sup>	4.6 <sup>5</sup>	11.90	27.0 <sup>2</sup>	3.21
Investment funds					
Open-ended mutual property funds			132.67 <sup>6</sup>	55.0 <sup>7</sup>	72.97
Open-ended special real estate funds			176.56 <sup>6</sup>	55.0 <sup>7</sup>	97.11
Closed-end real estate funds			87.65 <sup>6</sup>	52.0 <sup>8</sup>	45.58
Real estate shares in company values					
Real estate stock corporations <sup>9</sup>					
REITs <sup>9</sup>					
Market cap. of German companies	2,055.69 <sup>10</sup>	20.0 <sup>11</sup>	411.14	35.0 <sup>12</sup>	143.90
Total value of other companies	3,100.00 <sup>13</sup>	20.0 <sup>11</sup>	620.00	35.0 <sup>12</sup>	217.00
<b>Sum</b>			<b>1,596.98</b>		<b>622.17</b>

<sup>1</sup> ABV, 2022

<sup>2</sup> BAI, 2021

<sup>3</sup> BaFin, 2022

<sup>4</sup> GDV, 2023

<sup>5</sup> Weighted average property ratio of primary insurers

<sup>6</sup> Bundesbank, 2023c

<sup>7</sup> BVI, 2023

<sup>8</sup> Bundesbank, 2023a

<sup>9</sup> Simplified included in market capitalisation of German listed companies

<sup>10</sup> World Bank Group, 2023; Exchange rate: 1 USD = 0.9 EUR

<sup>11</sup> Pfnür, 2011

<sup>12</sup> Pfnür, 2019

<sup>13</sup> Demary et al., 2021

---

In addition to approximating the value of German office property via the investment vehicles available to German households for investing in office property, it is also possible to estimate the value of commercial property in Germany and the share of office property in this. The total value of German office real estate assets is therefore estimated at around €1.3 trillion based on Pfnür (2019). Differences in the results obtained from the two estimates can be attributed to the inclusion of public-sector properties in the estimate of the value of corporate real estate or to the shares of foreign capital pools not taken into account in the rough calculation shown in Table 1, in whose investments, in turn, German households also participate.

Despite the transformation of the world of work, the players expect the importance of office real estate from an investment perspective to increase in the future (EY, 2022), also against the background of the future need for private old-age provision. As retail investors in investment products backed by office property, office workers will therefore continue to have an interest in the stable performance of real estate markets in the future.

It can therefore be seen that office workers perceive office properties from different perspectives and place perspective-specific demands on the transformation of office buildings.

### **1.3 Aim of the study**

Employees, in particular, are affected by the real estate transformation in all of the perspectives described above. Corporate real estate serves them as an essential living space. As such, they experience the real estate transformation first-hand. From a real estate perspective, the following questions for employees are of particular interest and will be answered in this study:

- How are the different functions of office real estate actually perceived from the perspective of the stakeholders?
- How do employees rate the office real estate situation in Germany and their respective companies?
- What changes do employees expect from the real estate industry players in the future?
- How would employees resolve any conflicting goals between space utilisation, sustainability requirements and investment success?

We hope that answering these questions will provide important impulses for the transformation of office properties that will be necessary in the future.



2.1 The study procedure

The present study systematically follows the procedure shown in Figure 2.

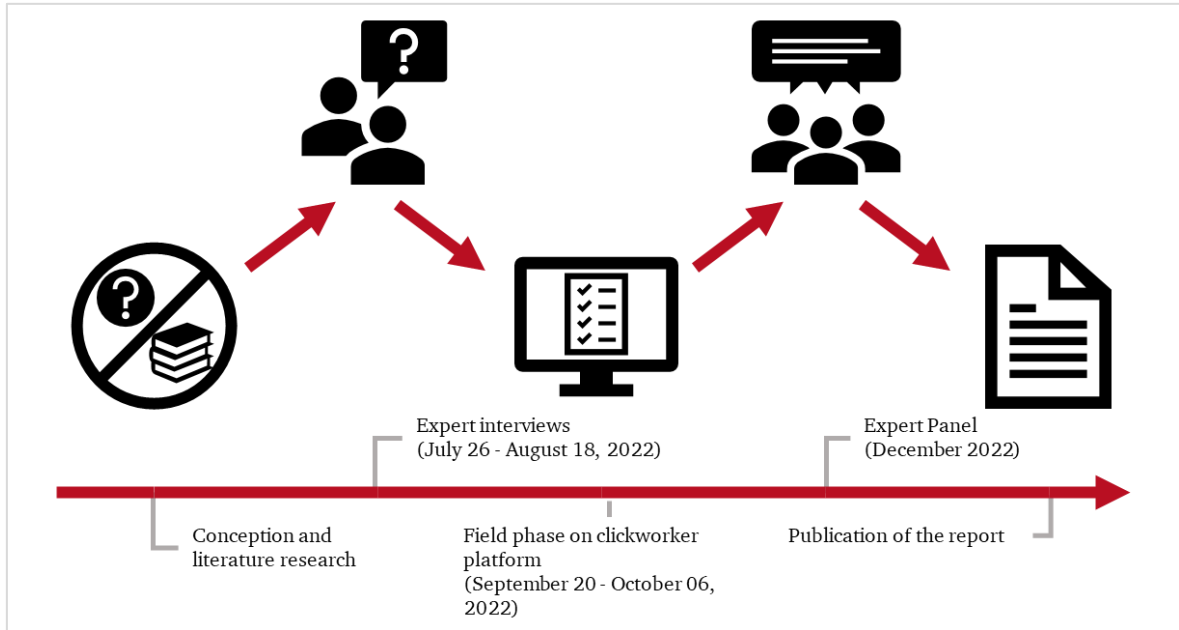


Figure 2: Course of study

Scientific literature and current reports were extensively searched to create a semi-structured interview guideline. Thirteen expert interviews were conducted via Zoom between July 26 and August 18, 2022, with decision-makers and opinion leaders from relevant stakeholder groups. Table 1 provides an overview of the interviews from the perspectives of utilisation, environmental sustainability and investment.

**Table 2: Overview of the interviews conducted with experts (average duration: approx. 48 min)**

No.	Company	Position	Length
1	International real estate service provider	Department head	39 Min
2	Consumer Protection Association	Customer service	26 Min
3	International real estate service provider	Department head	55 Min
4	Environmental Protection Association	Speaker	49 Min
5	International real estate service provider	Department head	42 Min
6	International architecture firm	Department head	58 Min
7	International architecture firm	Department head	58 Min
8	Real estate fund management	Management	52 Min
9	Corporate	Department head CREM	38 Min
10	Environmental Protection Association	Management	38 Min
11	Corporate	Works council member	79 Min
12	Environmental Protection Association	Speaker	58 Min
13	Real estate fund management	Department head	26 Min

The survey questionnaire for office workers in the field phase is based on literature research and interview findings. It consists of five parts (Table 2). The first part asks for socio-demographic information such as gender, age and income. The second part asks respondents about their perceptions of office real estate from three perspectives. The third part consists of a conjoint analysis. The fourth part asks participants about possible mechanisms for resolving conflicting goals and which actors they see as responsible. The last part surveys moderator variables such as environmental awareness, capital market affinity or personalities according to the five-factor model (Rammstedt et al., 2014).

**Table 3: Components of the questionnaire**

I	Socio-demographic data
II	Perception of office properties from different perspectives
III	Conjoint analysis on the importance of the requirements from the perspectives
IV	Conflicts of objectives and trade-offs between perspectives
V	Personality traits and moderators

#### Method box

The questions are answered mainly on a seven-point Likert scale (“strongly disagree” to “strongly agree” and for investment-related questions, “not at all attractive” to “very attractive”). This measurement instrument is easy for respondents to understand and to

---

---

answer quickly and has high sensitivity, reliability and validity (Moosbrugger & Brandt, 2020). The programming of questionnaire blocks 1, 2, 4 and 5 was done in SoSci Survey, a German provider for data protection compliant and barrier-free implementation of online surveys (SoSciSurvey, 2022). Questionnaire block 3, which includes conjoint analysis, was administered in Dynamic Intelligent Survey Engine (DISE). DISE is a web-based tool for developing new methods of measuring consumer preferences. In addition, it offers the possibility of applying various survey methods, for example, choice-based conjoint analysis, in online surveys via its own platform (Schlereth & Skiera, 2012). A redirection connects both platforms. Using a transferred matching variable, the datasets obtained on the platforms can be merged and the survey results assigned anonymously to individual respondents.

After a pretest, data was collected between September 20 and October 06, 2022, via a crowdsourcing online platform. This type has established itself as a valid and quickly available alternative to conventional data collection forms (Behrend et al., 2011).

#### Method box

According to its own information, the clickworker.de platform used in this study has around 500,000 German-speaking clickworkers. They have registered on the platform, providing socio-demographic information, and have completed various tests and training courses to ensure quality on the part of the provider (clickworker.de, 2022). Control questions during the questionnaire also ensure the quality of the answers specifically for this study, for example, to exclude bots and automated answers from the survey. The platform has already proven suitable in previous scientific studies (for example, Bergman et al., 2020; Pfnür et al., 2021; Gottschewski et al., 2022; Pfnür et al., 2022). The incentive for participation was 5.00 euros per survey participant.

After analysing the survey results, they were discussed by an expert panel consisting of 15 experts. The panel consisted of interviewees from the expert interviews and other experts.

## 2.2 Composition of the sample

The survey was aimed at German office workers. At around 37%, they comprise a significant proportion of all employees in Germany (Hammermann & Voigtländer, 2020). A total of 1,000 German office workers were surveyed. The answer sheets of the respondents who did

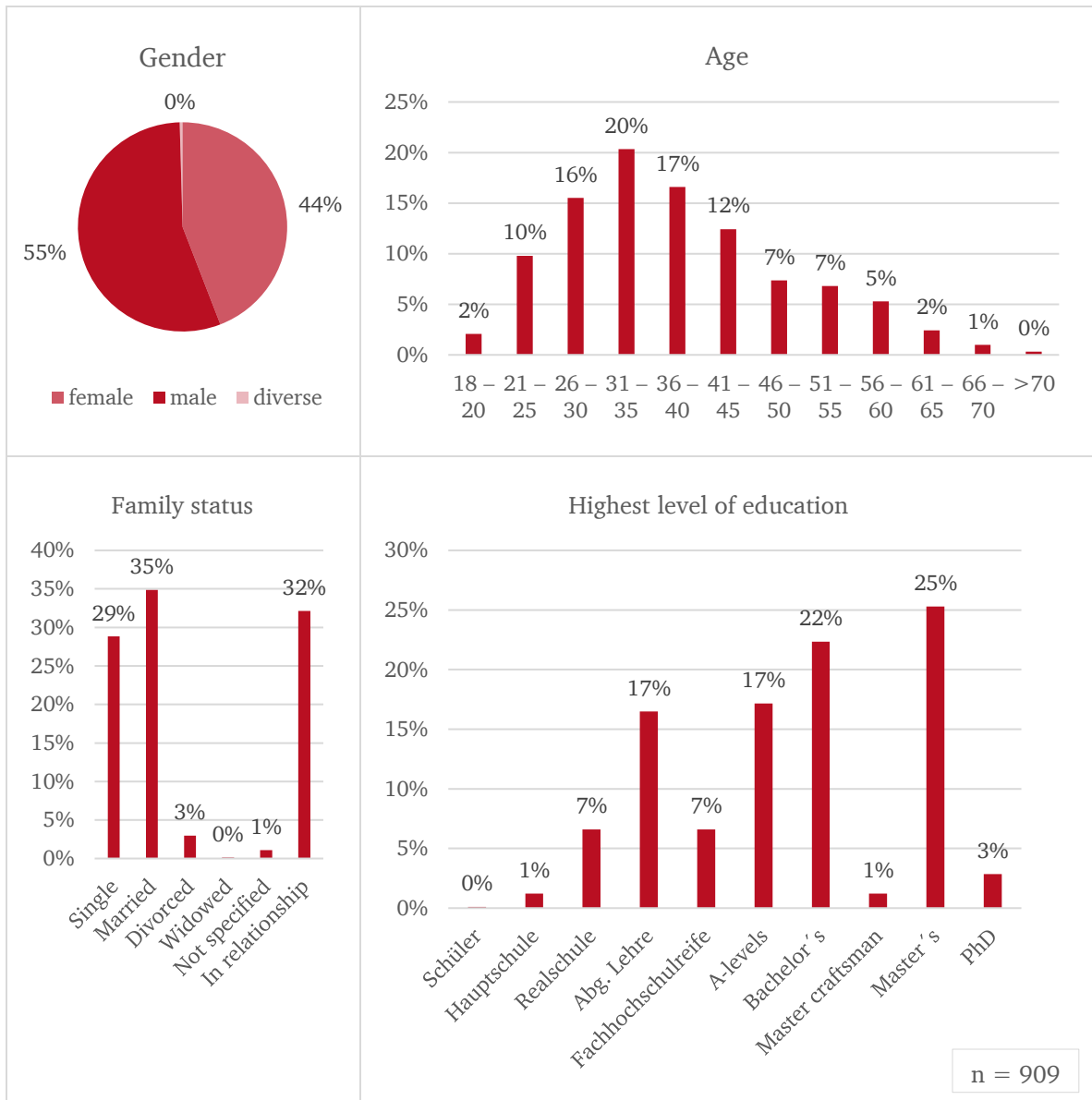
---

not pass the attention checks or showed conspicuous answering behaviour were eliminated. In the end, a net sample size of 909 records remained for further analysis. The remaining respondents' personal, household and occupational characteristics are presented below.

A sociodemographic survey of German office workers is not yet available. Therefore, in the following section, comparisons are repeatedly made with the total of all employed persons in Germany and a classification is made of how the representativeness compares with the total of German office workers. The sample consists of around 55.5% male and 44.0% female respondents. Thus, the sample also roughly reflects the gender distribution within the population of employed persons in Germany (53.3% male, 46.7% female, Destatis, 2022c). The youngest person in the sample is 18 years old while the oldest is 75. The average age of the sample is 37.9 years (standard deviation: 11.2 years). The respondents' age distribution can be seen in Figure 3<sup>14</sup>. The sample tends to be younger than the average age of the employed population in Germany. Deviations from the mean occur concerning the share of the 26–40-year-old and 51–65-year-old groups (Destatis, 2022c). The distribution of respondents in terms of their highest level of education (Figure 3) indicates a relatively high school and academic sample (Destatis, 2022b). However, the bias towards a younger and better-educated sample can be considered representative of the basic population of office workers in Germany. This can be explained by the survey via clickworker.de because primarily young employees use the platform. Sixty-seven percent of the respondents live in a relationship or are married (Figure 3).

---

<sup>14</sup> Figures that do not sum to 100% are due to rounding inaccuracies.

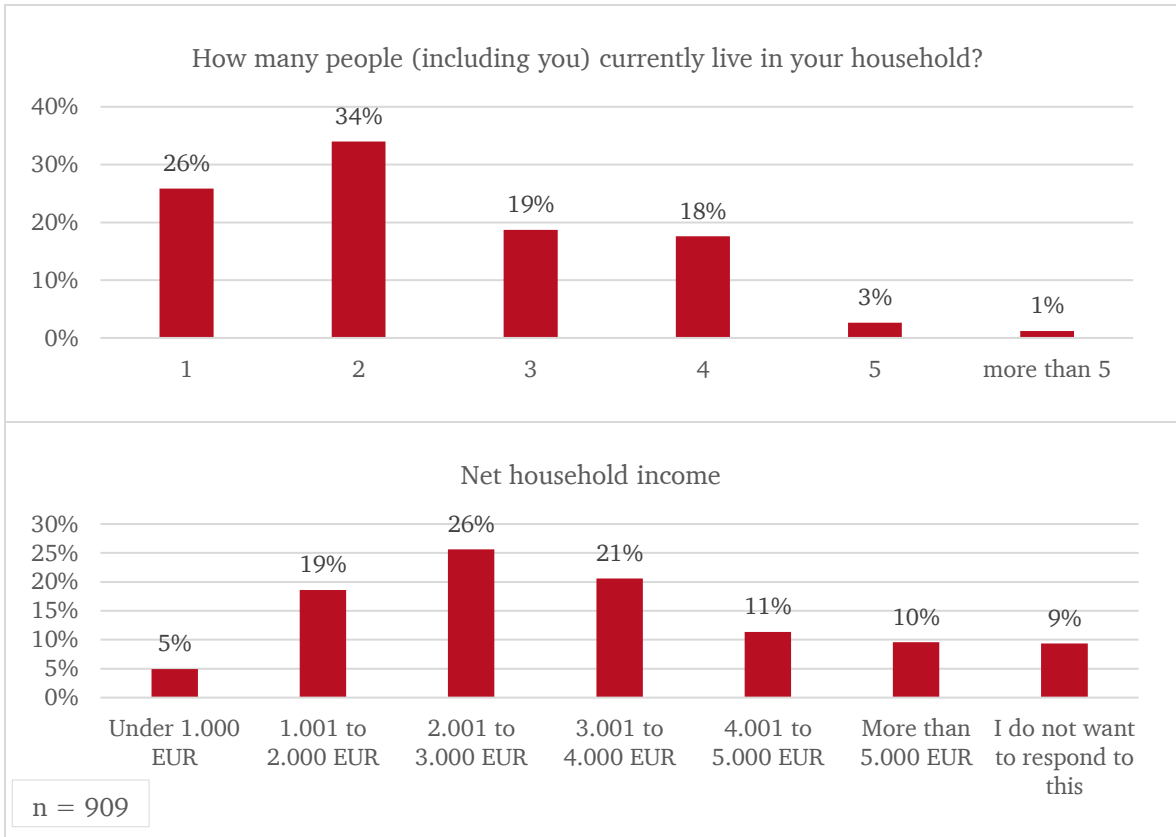


**Figure 3: Personal characteristics of the respondents**

Respondents live in households with an average size of 2.4 persons (standard deviation: 1.2), including 0.5 children (standard deviation: 0.8). Most often, respondents live in two-person households (Figure 4). Compared to the national average, single-person households are underrepresented at the expense of three- and four-person households (Destatis, 2022d). Compared to the national average, single-person households are underrepresented at the expense of three- and four-person households (Destatis, 2022d). The net household income of respondents is also shown in Figure 4. About a quarter of respondents (26%) receive between 2,001 and 3,000 euros per month, the most frequently cited income range. The median net household income reported by respondents is between 3,001 and 4,000 euros. This also roughly reflects Germany's average net household income of 3,661 euros per month (Destatis, 2022e). Due to the young age of the sample, which can be assumed to be

---

representative of the population, these personal characteristics can also be assumed to be representative of the population.



**Figure 4: Household-related characteristics of the respondents**

The chart in Figure 5 displays the distribution of professional experience. On average, the respondents have 14.3 years of professional experience, with a standard deviation of 10.7 years. The respondents work an average of 35.2 hours per week ( $n = 417$ ), which is similar to the average weekly working time of all employed persons in Germany at 34.7 hours per week (Destatis, 2022f). Approximately 13.7% of the respondents hold half-day positions. Respondents work across various sectors, with a focus on the public sector, administration and the IT services industry. Out of ten respondents, six (59%) consider themselves employees rather than management, executives or students while 30% report having management responsibilities for other employees (Figure 5).

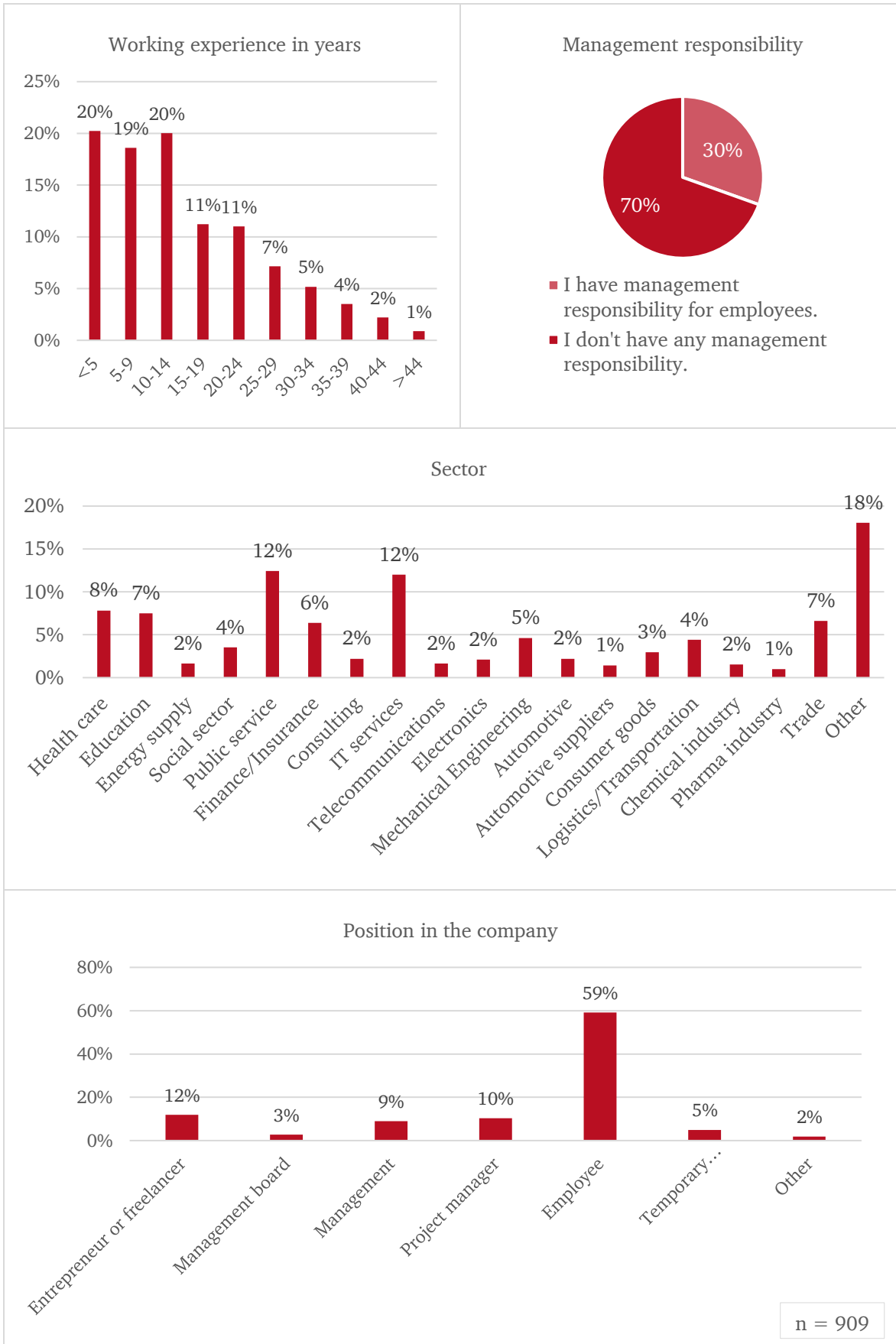


Figure 5: Occupational characteristics of the respondents



Figure 6 shows the distribution of respondents according to their place of residence in Germany. The focus is on Berlin (6.7% of respondents), Munich (3.1%), Hamburg (2.5%) and Dresden (2.2%). The slight concentration of respondents in large cities corresponds to the population distribution (Hammermann & Voigtländer, 2020).

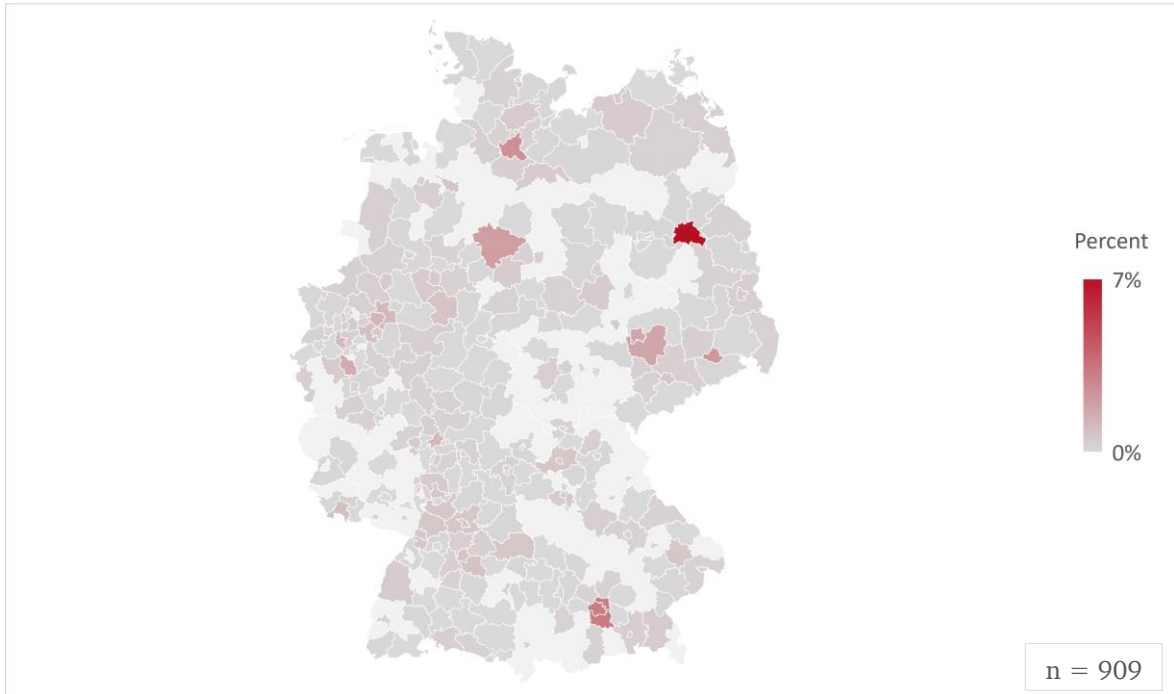


Figure 6: Geographical distribution of respondents

### Methodological approach for data evaluation

The present study uses univariate, descriptive, bivariate and occasionally multivariate data analyses. The implementation and processing are primarily done in IBM SPSS and Microsoft Excel. Most of the items in the questionnaire were asked on a 7-point Likert scale. For better interpretation, respondents' answers to individual items are combined into top/bottom 3-box values as shown in Figure 7. Bottom-3-box values are interpreted as disagreement and top-3-box values as agreement (Morgan & Rego, 2006).

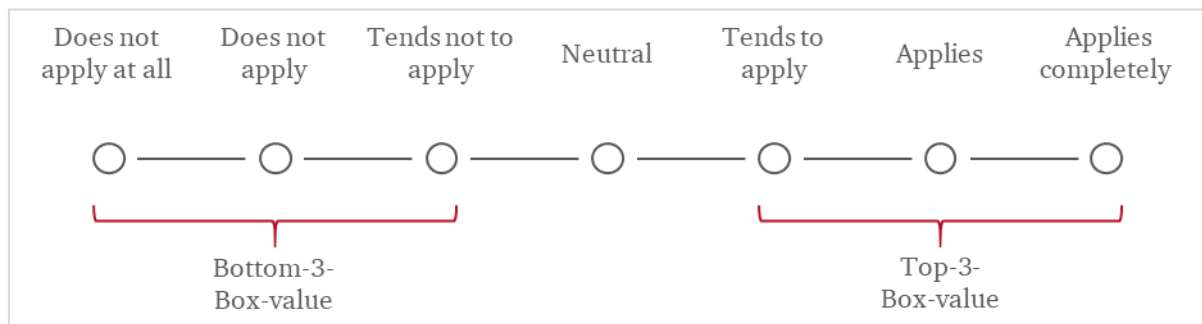


Figure 7: Aggregation of response attributes into top/bottom-3-box values (scheme)

---

If individual items are merged for better interpretability, then this is only done after checking the suitability for merging by testing the reliability (see also method box in 3.3). Occasional correlations describe the linear relationship between two items (Backhaus et al., 2021).

### 3 German office workers' perception of office real estate

The presentation of the survey results is divided into two chapters. Chapter 3 presents office workers' general perceptions of office real estate and from different perspectives. To gain a better understanding of these perceptions, the survey also asked respondents to provide a comparative assessment of office real estate. Chapter 4 focuses on the need for adjustment that respondents identify from the different perspectives and how they would resolve any conflicting goals between the perspectives. Unless otherwise noted, the results presented always include all respondents. Where consideration of only a subset of respondents seems appropriate, this is indicated.

#### Office workers perceive the strongest influence of office real estate on their working lives

First, the extent to which office real estate is perceived from various perspectives is examined. To this end, respondents were asked to indicate whether they perceive a strong influence of office real estate on their working lives, their environment and quality of life and their personal finances. The strongest agreement was found concerning the influence on the working life of the respondents, with 75% perceiving a strong influence. Thirty-eight percent of respondents perceive a substantial impact on their environment and quality of life and 19% on their personal finances (Figure 8).

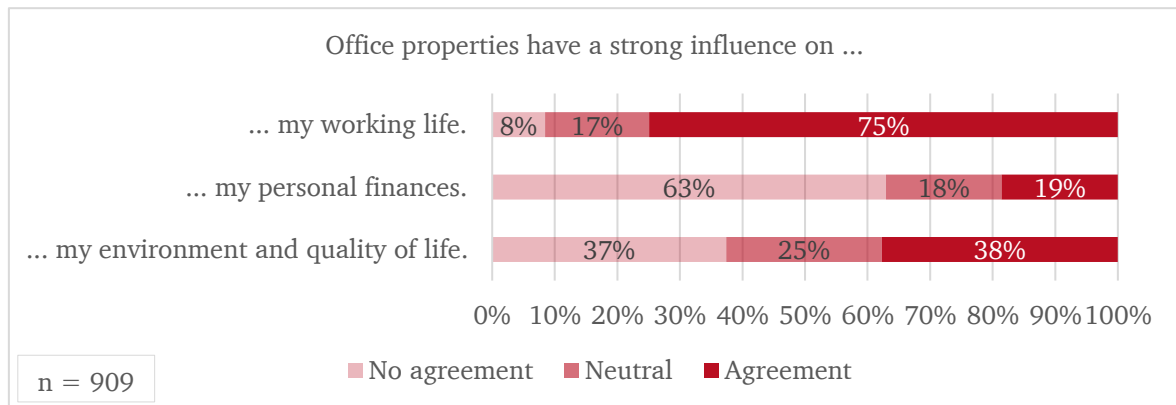


Figure 8: Perceived influence of office real estate on different areas of life

The approval ratings for affectedness in the various perspectives show that all three perspectives have importance for the respondents. In particular, the perceived influence on working life is high, with only 8% of respondents denying the influence. From the Corporate Real Estate Management (CREM) perspective, this can be seen as a clear sign of increased consideration of users in planning and evaluation. However, the perception of influence on personal finances is also surprisingly high given the dilution of disposition rights usually

---

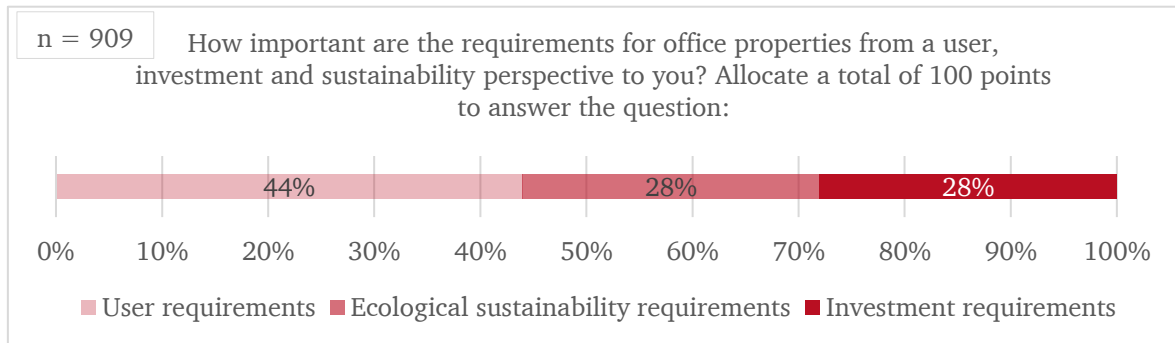
associated with office real estate investments and the generally only indirect influence of retail investors from an investment perspective. Apparently, respondents perceive that there seems to be a connection between office real estate and their own financial situation, whether through their own investments or possibly the role of office real estate as a component of the overall real estate market and its role in terms of financial market stability. Surprisingly low is agreement on the influence of office real estate on one's environment and quality of life. Possibly, the environmental impact of office real estate is underestimated due to ignorance, the fact that it has "always been there anyway", or a failure to address the issue. Nevertheless, the low impact that respondents perceive on their quality of life is surprising. The level of agreement is low given that office workers spend much of their waking hours in the office, even in the face of work-from-home and third work locations. On the one hand, this could indicate that the focus of office workers, in particular, needs to be strengthened for the effect of the working environment of office properties. On the other hand, however, this could also be a sign that the respondents have realised that they can influence the impact of (bad) office properties on their quality of life more and more by choosing where to work and thus avoiding staying in unpleasant offices. Here, too, a mandate for the future development of office properties can be read off; after all, the demand for the properties cannot be perceived as neutral or even negative for the users' environment and quality of life.

### **3.1 Respondents' trade-offs between user, sustainability and investment perspectives**

After the respondents had been asked about their perception of how their areas of life are affected by office real estate, the aim was also to determine the perceived importance of the various requirements for office real estate from the three perspectives. In the first step, the respondents were asked to distribute 100 points among the three different areas according to their importance to the respondents.

**The user perspective as well as the sustainability and investment perspective are of great importance to the respondents**

As shown in Figure 9, the respondents assign the highest importance to user requirements at 44%. The investment and sustainability requirements are rated at 28% each.



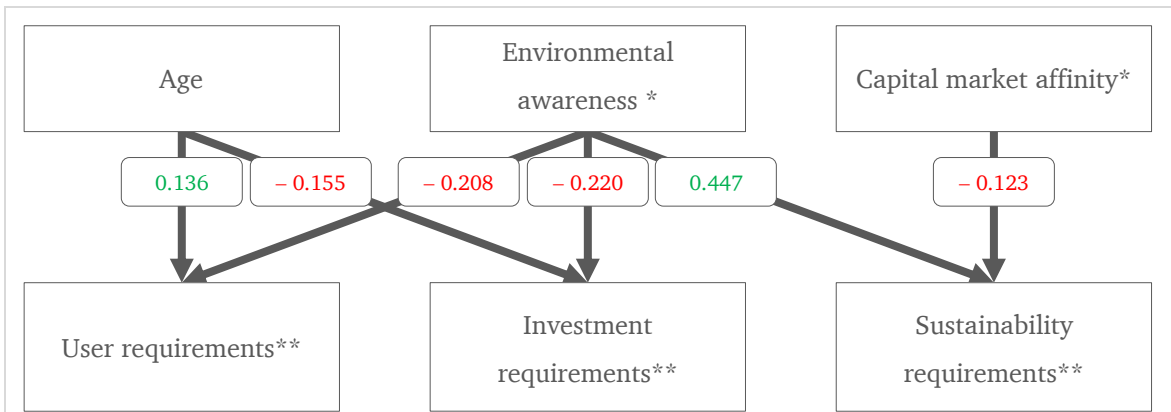
**Figure 9: Importance of office property requirements from a user, investment and sustainability perspective**

These results already show that the respondents attach great importance to the requirements from all three perspectives and that, in their opinion, every perspective should be addressed. Even if office properties appear at first glance to be primarily a place of work, the respondents name the importance for their retirement provision and their own investment success, as well as the need to consider office properties from the perspective of climate protection. The results represent a clear mandate to office developers to consider all three perspectives when designing and redesigning office space.

There are parallels here between the vote on the importance of the requirements from the different perspectives and the perceived influence on one's areas of life (Figure 8); thus, a high level of influence on working life by office buildings is perceived and a high level of importance is attributed to user requirements.

### **The degree of environmental awareness has the strongest influence on the requirements of office buildings compared to other personality traits**

To develop a better understanding of the importance of the requirements from the different perspectives, the following is an examination of the dependence between the importance of the requirements for the respondents with selected personality traits. The higher the environmental awareness of the individual respondents the lower they rate the importance of the benefit and investment requirements in favour of the environmental sustainability requirements. With increasing age, the requirements from the investment perspective decrease while the benefit requirements increase. Capital market affinity has the sole effect on sustainability requirements. They become lower as capital market affinity increases (Figure 10).



\* “Environmental awareness” was measured with the 23 items of the Geiger and Holzhauser (2020) scale. “Capital market affinity” was determined with 14 questions on financial socialisation and education according to Knoll and Houts (2012) (German adaptation according to Kaiser (2017)).

\*\* Cf. Figure 9

Only statistically significant correlations are shown. 2-sided significance level: 0.01

**Figure 10: Correlations between selected personality traits and the importance of office property requirements from a user, investment and sustainability perspective**

An initial analysis of the correlation between the importance of office property requirements and selected personality traits thus reveals that environmental awareness has the greatest influence on the importance of individual perspectives. If office workers are particularly environmentally conscious, the benefit and investment requirements take a back seat to the sustainability requirements. The increasing importance of the benefit requirements for older office workers could be explained by perhaps a greater need for ergonomic office furniture, for example. The decreasing importance of the investment function in old age can be explained by a decreasing investment horizon or disappointing past experiences with office real estate investments. In sum, this first analysis already shows that the evaluation of office real estate from various perspectives depends to a large extent on the personality traits of the respondents.

The results of the question about the importance of requirements from the user, investment and sustainability perspectives were also examined in more detail using a selection-based conjoint analysis (see method-box).

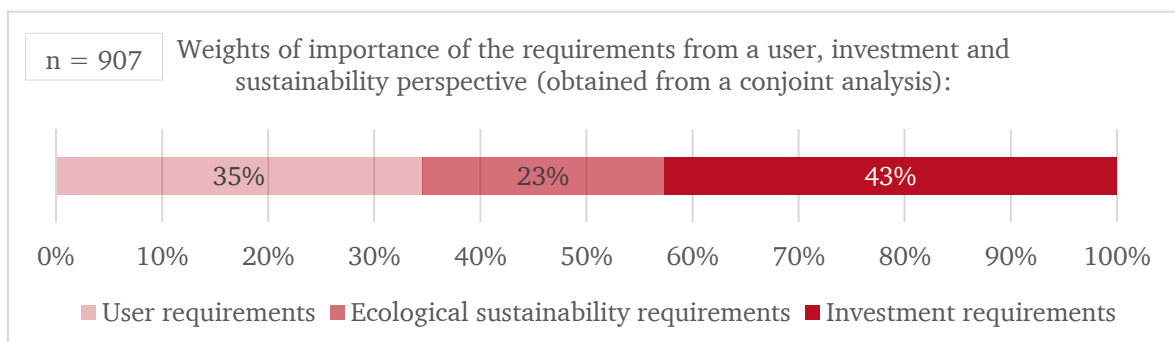
Method box

Conjoint analyses comprise various methods for determining the preferences of respondents with regard to the object under investigation and its characteristics. The instrument is also particularly used in market research in order to be able to take into account the preferences of customers for certain product properties when designing products. The underlying assumption is that the total utility of an object or product (so-called 'stimuli') consists of the partial utilities of its properties. The observed total utility of the stimulus is used to infer the partial utilities of its properties.

**Choice-Based Conjoint Analysis (CBCA)** is a realistic development of the classical conjoint analysis. While respondents' preference in classical conjoint analysis is derived by ranking or rating different stimuli, in CBCAs, respondents choose their preferred stimulus in a decision experiment. For this purpose, respondents are presented with different stimuli and select the preferred one. The objects consist of different characteristics (here: sustainability level, building layout, expected return per year) with staggered characteristic values (e.g. building layout: single, group or open-plan office).

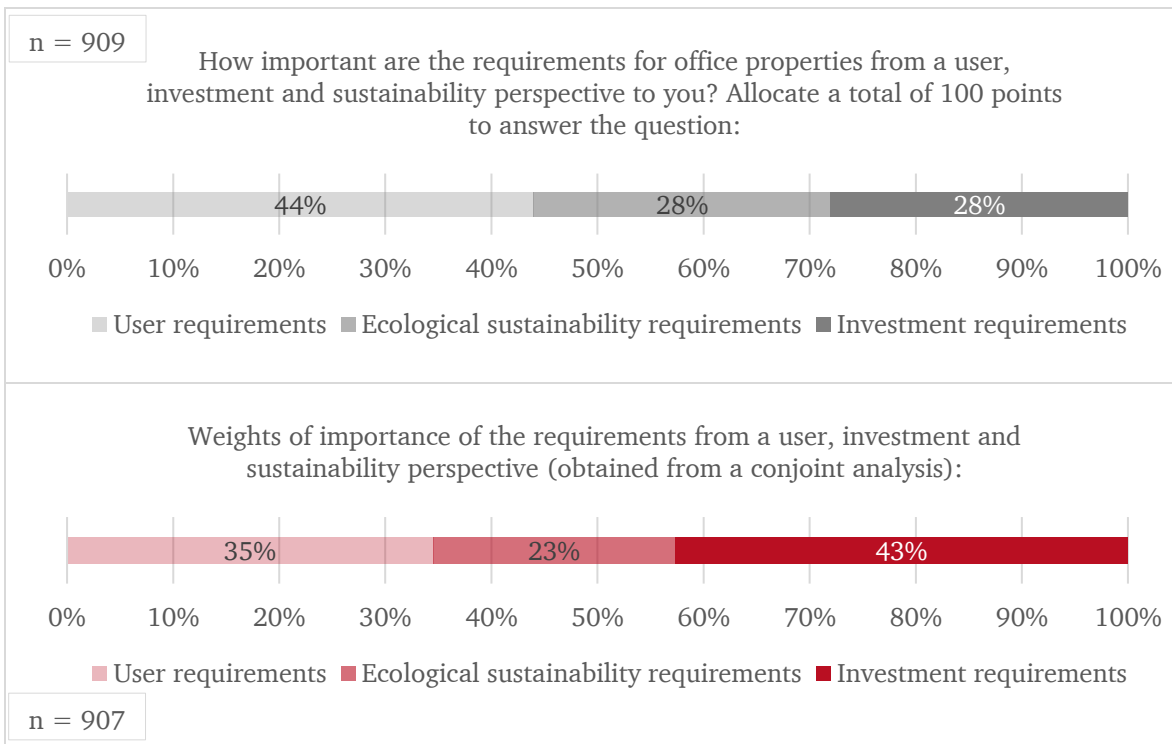
By analysing the selection decisions, partial benefits of the property characteristics and weighting of the individual properties are determined (Backhaus et al., 2015).

According to the initial results of the choice-based conjoint analysis, the average importance weights are 35% for user requirements, 23% for sustainability requirements and 43% for investment requirements (Figure 11).



**Figure 11: Importance weights of the requirements from the user, investment and sustainability perspective**

The survey results thus confirm that office workers assign significant importance to the requirements from all three perspectives. However, the more realistic study also reveals the fundamental importance of the investment function: now the benefit requirements are no longer in the foreground, but the investment requirements are gaining importance and come first in the respondents' evaluation (compare also Figure 12).



**Figure 12: Comparison of the importance weights of the requirements from both analyses**

The more sophisticated survey method reveals the actual preference of the respondents. Respondents document a long-term interest in real estate’s capital-preserving and wealth-building function. Short-term interests, such as an attractive job, are still weighted highly but are losing relative weight. Nevertheless, the weighting of 35% corresponds to what would be expected if all requirements were equal. The loss of importance is even more pronounced for ecological requirements. They are still important but only rank third in the respondents’ favour. The investment requirements, which have an importance weight of 43% and thus benefit at the expense of the ecological requirements. Socially desirable response behaviour is apparently eliminated by the conjoint analysis.

Given the current debates on the transformation of office properties, this underlines that the capital market function of office properties must be addressed despite all efforts to protect the climate and user-friendliness. All three perspectives must be considered and a balance must be struck among them. The present analysis provides the blueprint of how employees would weigh the requirements. Future studies at the Technical University of Darmstadt will further illuminate the underlying relationships.

### 3.2 Perception of office properties from the user’s perspective

After the respondents had indicated the perceived influence of office properties on their areas of life and the relative importance of the requirements of the perspectives, the perception



of office properties was examined more closely in the second step. For this purpose, the survey participants were asked about their perception of office properties from the user, sustainability and investment perspectives.

### Office workers are satisfied with their workplace in office properties

Regarding the perception of user perspective, the respondents were asked to indicate their satisfaction with the place of work. Seventy-three percent of the respondents state that they are satisfied with the workplace in their corporate office and only 11 % disagree. This is also in line with the results of other studies (e.g. IBA, 2017). However, more than half of the respondents also stated that office properties are only one place among many that can serve as a workplace (54%). This shows that the office is increasingly competing with other places of work (Figure 13).

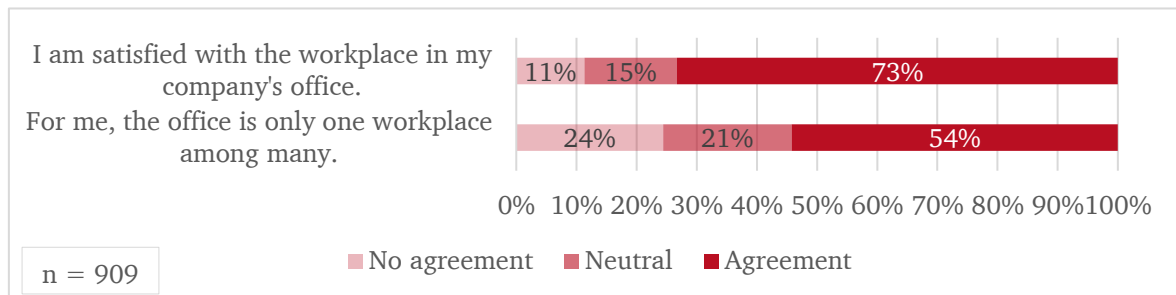


Figure 13: Satisfaction with the office workplace and competition from other workplaces

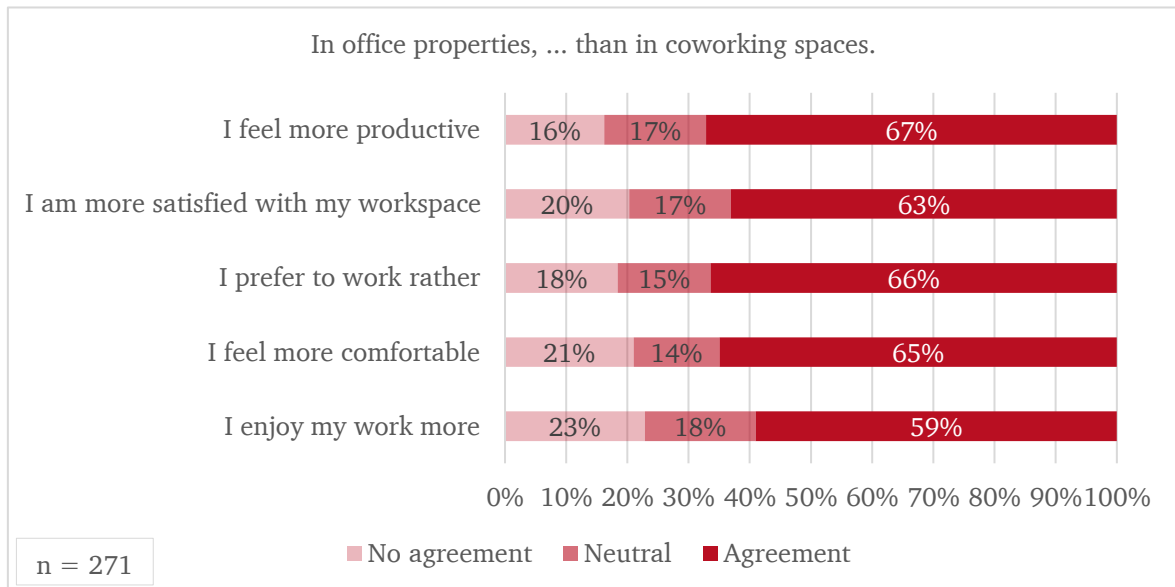
Although office property is only one of several workplaces for many respondents, they are apparently satisfied with the time they spend on the company’s premises at first glance.

To better understand how office properties are perceived and obtain a more differentiated assessment of the respondents, they were next asked to assess the work success at the office workplace compared to coworking spaces and the home office.

### Coworking spaces are increasingly becoming an attractive alternative to the office

For this purpose, the respondents were asked to compare their productivity as well as various expressions of satisfaction at the two places of work. The information presented below regarding the comparison between the corporate office and coworking spaces only considers respondents who stated that they had experience working in coworking spaces. This restriction appears to be appropriate to obtain reliable results in terms of content. With 271 respondents, the sample subgroup still comprises a suitable number of respondents for statistical evaluation. Among these respondents, a significant 67% affirm that their productivity is notably higher within a traditional office environment compared to coworking spaces.

Additionally, a substantial percentage ranging from 59% to 66% report experiencing elevated job satisfaction within the confines of their office workspace (Figure 14).

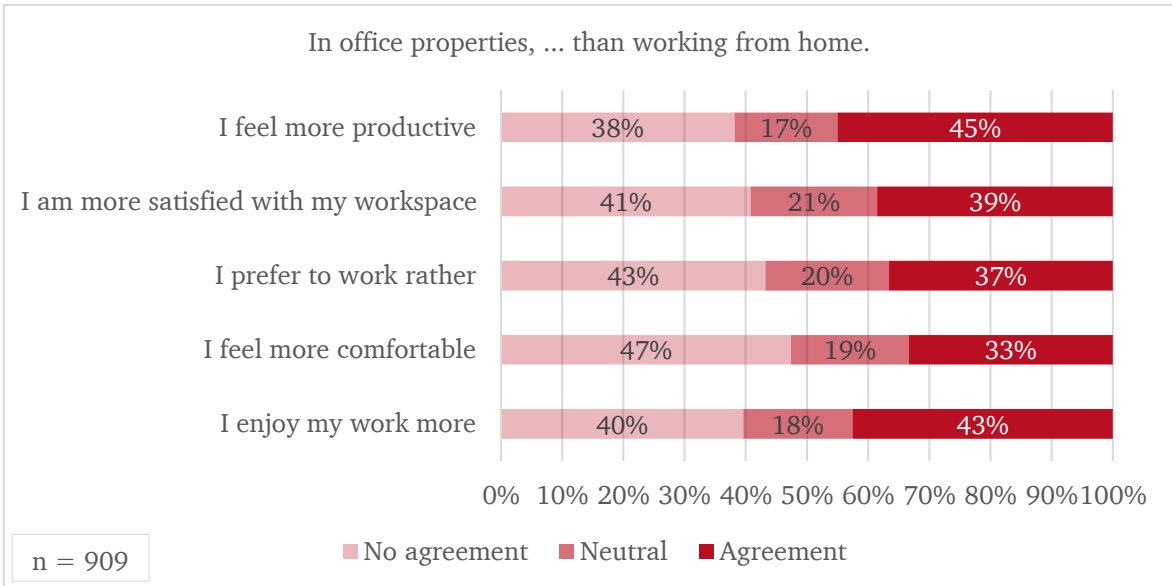


**Figure 14: Comparison of office properties and coworking spaces in terms of work success factors**

Compared to the supply of coworking spaces, the 20% or so of respondents across the individual questions who consider coworking spaces to be more attractive than corporate offices in terms of work success factors (“no agreement”) probably represent a demand that can hardly be met at present even if the proportion is put in relation to all 909 respondents. Apparently, coworking is increasingly becoming an alternative to the office or working from home in Germany. Possibly bad experiences with working from home do not drive office workers back to the office as will be shown later, but rather to other places that promise work success.

**Compared to the home office, office properties are not convincing in terms of work success factors**

Compared to the home office, the picture is divided. Forty-five percent of respondents say they work more productively in the office while 38% see productivity advantages in the home office. Also, regarding satisfaction at the two work locations, between 40% and 47% prefer the home office to the company office (33% to 43%) (Figure 15).



**Figure 15: Comparison of office real estate and the home office with regard to work success factors**

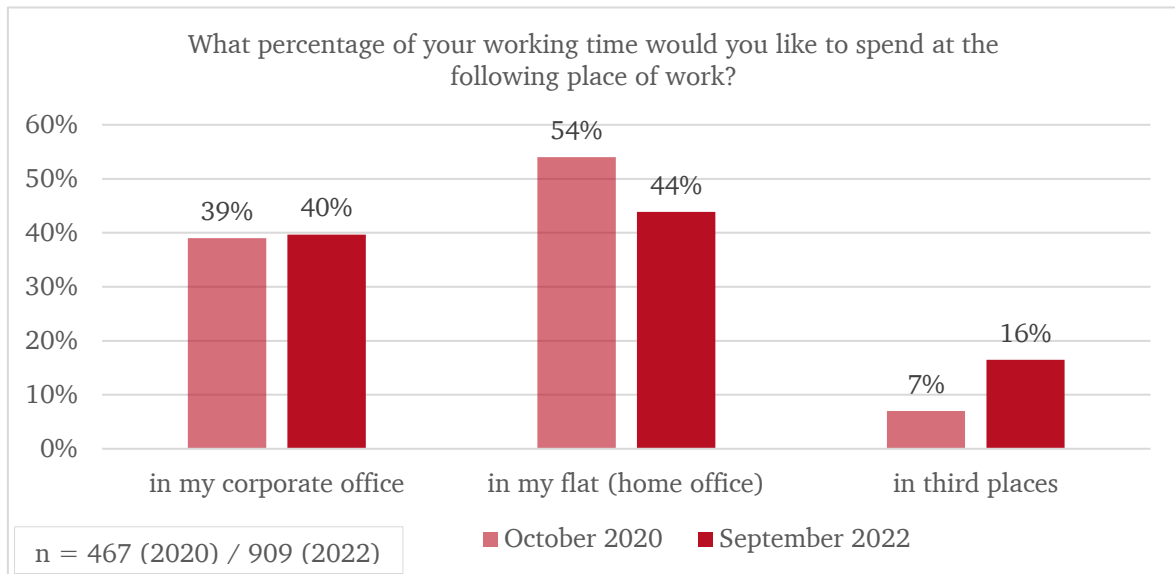
In a direct comparison with the home office, office properties cannot convince many respondents. The latter is perceived as equal in terms of work success factors. Work-from-home is here to stay. Office properties have to become more attractive to be able to stand up to comparison with other places of work. Otherwise, from the user's point of view, poorly rated properties could be threatened with stranding because office workers avoid the property and, in the worst case, 'vote with their feet'. This is a clear mandate for the development of office properties but also for the corporates, who must ensure that suitable properties are made available from the user's point of view; i.e. properties in which employees want to stay and that meet their requirements for getting work done. The results show that the actors have often failed to meet users' requirements in the past and that there is a great need for revitalisation. A possible adaptation could lie in the goal of increasing well-being, which the respondents seem to find primarily in the home office.

Against the background of the results shown in Figure 13, the comparison of work locations also makes it clear that many respondents have difficulties directly assessing the suitability of a work location for their work success. Reliable results emerge only by broadening the perspective and comparing it with the alternatives available.

**Pressure on office space from home offices and third locations: changes in the modal split of work are becoming permanent**

The user-side pressure on the office property as a workplace can also be seen in the proportions of time respondents would like to spend in the various work locations in the future. The respondents want to spend 40% of their working time in the company office in the

future, with 44% spent in the home office and 16% in third work locations such as cafés, lounges at railway stations or airports and coworking spaces (Figure 16).



**Figure 16: Distribution of desired working time across different workplaces in 2020 (Pfnür et al., 2021) and today**

Thus, compared to a previous survey from 2020 (Pfnür et al., 2021), the home office will continue to be the most popular workplace for office workers in the future. With third work locations, office workers would like to spend 3 out of 5 working days per week away from their original office work location. Many office properties cannot keep up with the attractiveness of mobile working; working environments shaped by transformation, digitalisation and demographic changes enable and favour such development. However, a self-selection process accompanied by the demystification of the home office is taking place. The desire to work in a home office is decreasing, possibly due to negative experiences with working from home, and the respondents are recognising which work location is suitable for which purpose. Third places of work can benefit because office workers attribute to them an increasing share of the modal split of work. They do not want to return to what they see as unsuitable office properties. For office planning, this again clearly shows that it is not a question of ‘home office or office’ but that all three locations are increasingly competing. Office properties as a workplace are experiencing competition from two sides thanks to coworking spaces gaining momentum in the respondents’ favour.

### 3.3 Perception of office properties from a sustainability perspective

After assessing the situation of office properties from the user’s point of view, the respondents were asked about their evaluation of office properties from a sustainability point of view.

---

## The majority of respondents are not overly concerned about the environmental impact of office buildings

Asked whether respondents are concerned about the environmental impact of building and operating office properties, 42% answered in the affirmative. Likewise, about 40% are not concerned about their own quality of life or future generations. The assessment shown in Figure 17 consists of two separately collected items merged by averaging after testing the reliability (see method box). This procedure is used in the course of the study whenever the combination of items with similar content into constructs is possible according to statistical criteria and the complexity can be reduced by the reduction and the understanding thereby increased.

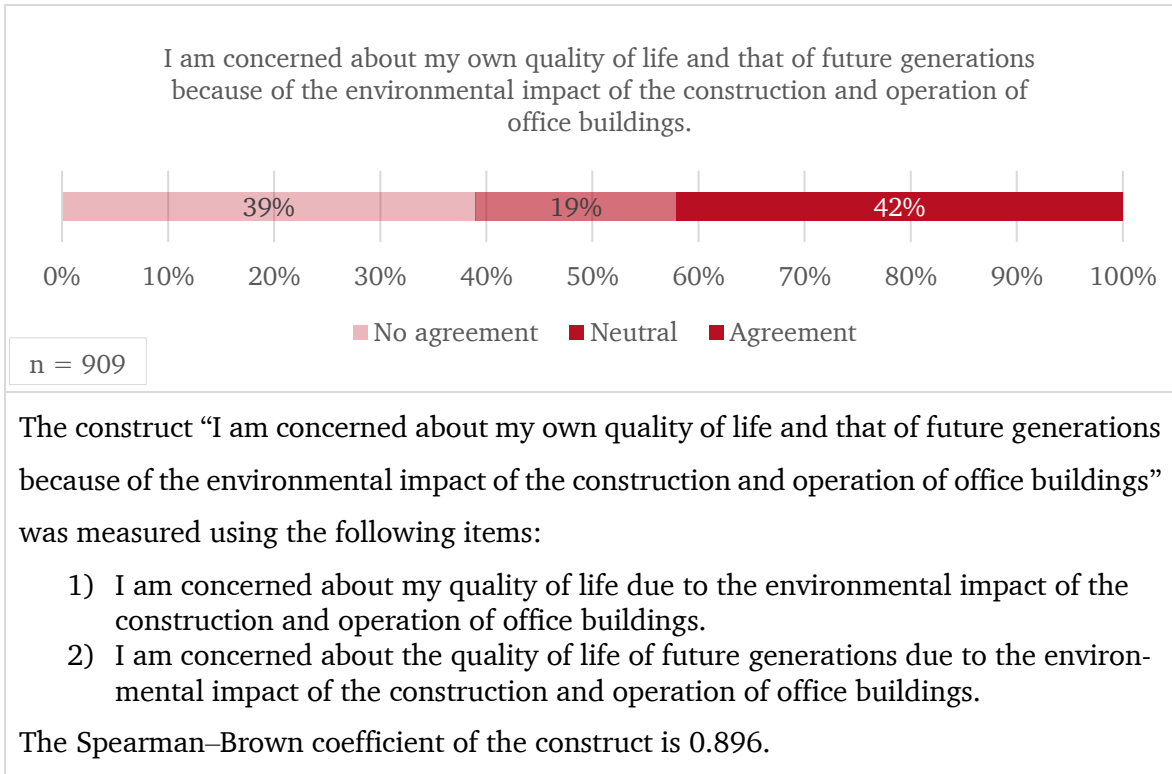
### Method box

If individual items are to be merged into a construct, then the measurement accuracy of the construct must be determined. The reliability of the construct indicates whether the included items measure the same construct.

A widely used coefficient for determining the reliability of a construct consisting of different items is **Cronbach's alpha**. It is calculated by including the variance and covariance of the items as well as the variance of the construct. Under certain conditions, the coefficient can be interpreted as the lower reliability bound (Gäde et al., 2020).

Another key figure for measuring the reliability of a construct is the **Spearman–Brown coefficient**. Compared to Cronbach's alpha, it provides a more suitable reliability estimate for constructs that consist of only two items (Eisinga et al., 2013).

The coefficients for measuring reliability are scaled in the value range from 0 to 1. A reliability of 0.7 or more is considered sufficient and 0.8 or more is considered good (Danner, 2015).

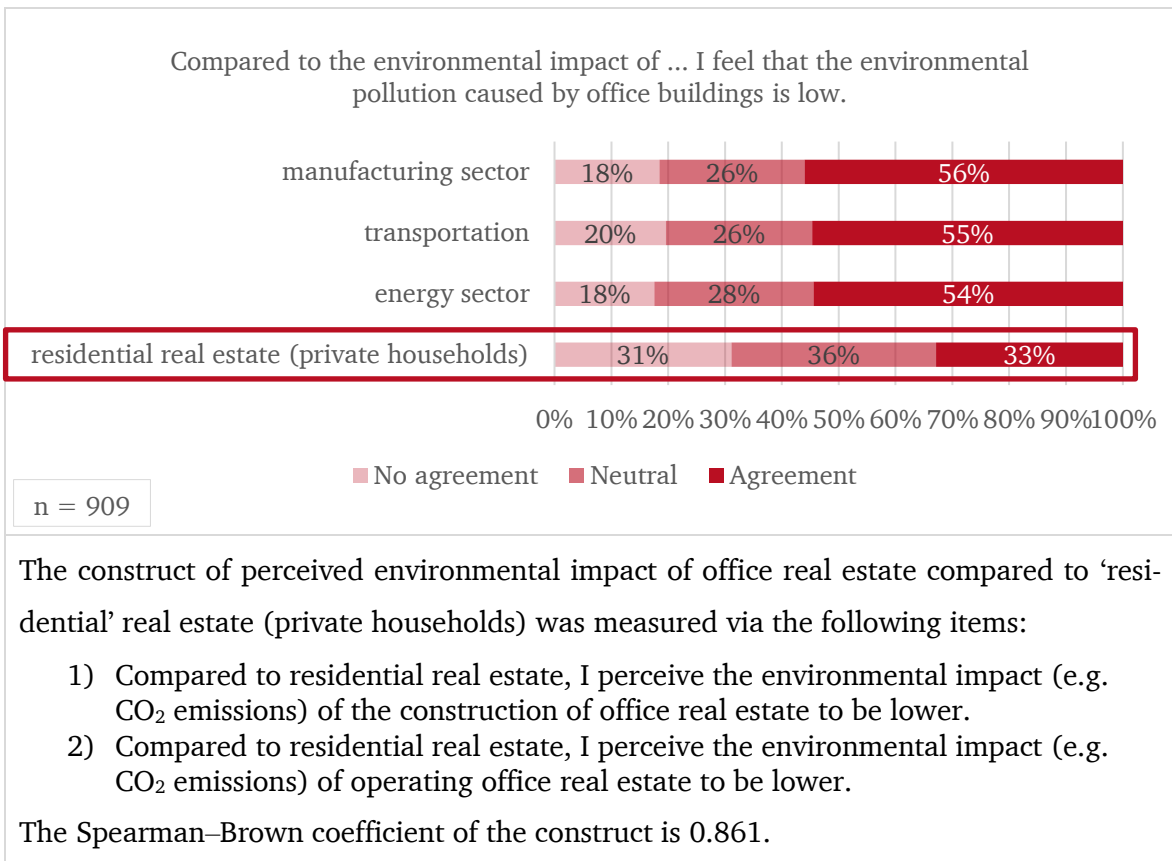


**Figure 17: Respondents’ concern about the environmental impact of office real estate**

The majority of respondents do not perceive an excessive threat to their own quality of life or future generations due to the environmental impact of office buildings. Overall, the respondents indicate a neutral attitude towards the perceived environmental impact. They thus document a low awareness of the actual importance of office buildings for climate protection. In this case, people are the cause and thus part of the problem and apparently still need to be sensitised to the environmental impact. Currently, many of the respondents are still shirking their responsibility. In order to take responsibility for the environmental impact of office buildings, a cultural change and a collective awareness of the impact of office buildings on the environment is needed.

### **Office real estate is perceived as less environmentally damaging than other sectors**

In the relative survey compared to different sectors according to the German Federal Environmental Agency definition, around 55% of the respondents in each case state that they perceive the environmental impact of office property as low. Compared to residential real estate, there is no clear perception of office real estate as more or less environmentally damaging or environmentally friendly (Figure 18).



**Figure 18: Perceived environmental impact of office properties compared to other sectors and residential properties**

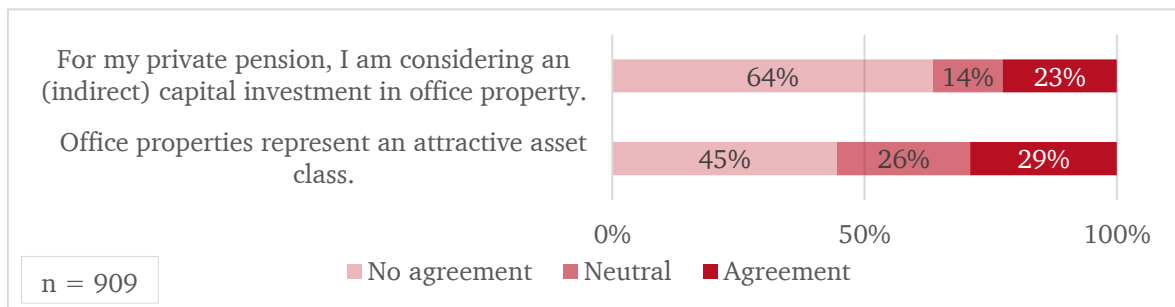
A differentiated perception of the different environmental impacts of real estate types is absent. The respondents perceive the manufacturing industry, the transport sector and the energy sector as being much more harmful to the environment. On the one hand, this confirms that office workers seem to have a low awareness of the environmental impact of office buildings. On the other hand, the results also show that the question of the environmental impact of office buildings is an expert question that the respondents lack the necessary know-how to answer, or that office workers do not seem to be concerned with. Office buildings are “there anyway”; the hurdle to actively deal with the impact on the environment and climate seems comparatively high for many. Prominent discussions about the environmental impact of road traffic, fossil energy production or the decarbonisation of industry have ensured a sensitisation of the population in these areas. With regard to buildings in general and office buildings in particular, this debate has yet to take place.

### 3.4 Perception of office real estate from an investment perspective

Finally, the respondents were asked to state how they assess the situation of office real estate from an investment perspective.

## Office real estate plays a decisive role in the investment considerations of the respondents

Twenty-three percent of respondents considered investing in office property as a retirement investment. Less than half of the respondents (45%) state that office property is not an attractive asset class for them (Figure 19). This means that the approval ratings are even higher than the proportion of respondents who stated that they had directly or indirectly invested capital in office property (19%).



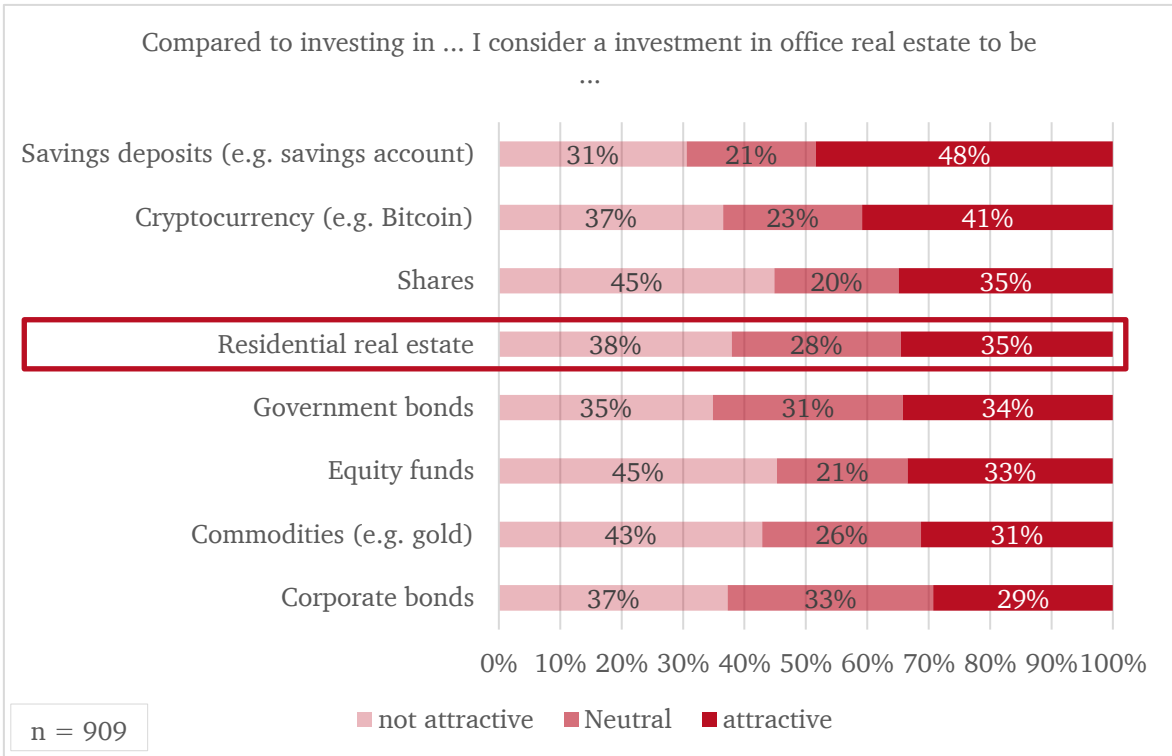
**Figure 19: Respondents' investment consideration and perceived attractiveness of the office property asset class**

Compared to office property assets and the financial assets of private households in Germany (Deutsche Bundesbank, 2022a), this potential demand appears to be almost impossible to meet, which underlines the general attractiveness of the asset class. Also, with regard to the perception of office property from an investment perspective, the respondents were next asked to assess the attractiveness of the asset class in comparison to other investment products in order to derive a more accurate understanding of the investment attractiveness perceived by the respondents through the relative comparison.

### Office property also shows high attractiveness compared to other asset classes.

The respondents were asked to assess the attractiveness of office property as an asset class compared to eight other asset classes. Compared to savings deposits, office real estate has the highest attractiveness: 48% of respondents prefer office real estate. Office property is the least attractive compared to corporate bonds. However, 29% of respondents still indicated a preference for office property (Figure 20).





**Figure 20: Perceived attractiveness of office property compared to other investment products**

Across all investment products usually traded on the capital market, the respondents thus indicate, on average, a higher attractiveness of office property as an asset class than in the answer to the question shown in Figure 19. The direct comparison with other investment classes thus underlines the surprisingly high attractiveness of office property as an investment class for the respondents and the potential importance that office property could have for private old-age provision. From this alone, a mandate can be derived to maintain the attractiveness of office real estate and the values of private households secured in it in order to offer a long-term perspective for private old-age provision.

Even in comparison with residential real estate, which in the form of owner-occupied homes continues to be one of the most popular retirement provision instruments for many private households (Hertweck, 2017), office real estate performs well. Here, no clear preference of the respondents for one or the other form of provision in ‘concrete gold’ can be discerned.

### 3.5 Intermediate conclusion

The first part of the survey makes it clear: office workers are aware of the impact of office properties in the various perspectives from which office properties must be viewed, and they also attach importance to all three perspectives. A pure focus on utility optimisation or environmental protection does not meet their requirements. The elimination of socially desirable

---

response behaviour also reveals the great importance of office properties for the capital investment of office workers. They attach the highest weight to these requirements, even ahead of user requirements. They still attach importance to the requirements of environmental sustainability. Still, relative to the user and investment perspective, they are only in third place in favour of the investment requirements.

From a user perspective, office properties are under pressure from two sides. Coworking spaces are becoming more and more of an alternative in Germany, too, and the potential demand already exceeds the supply of this form of workspace. The home office is still the favoured place of work for German office workers. The share of office alternatives in the modal split of work is steadily increasing. Even if a demystification of work-from-home seems to be taking place, the respondents do not want to return to the traditional office buildings but are turning to coworking spaces. Office properties have to adapt and face this competition if they want to defend their role in the world of work. All too often in the past, the conception of office space was oriented away from the user's interests; there is a strong need for revitalisation here.

Furthermore, the sustainability perspective must be addressed. In the perception of the respondents, buildings in general and office buildings in particular do comparatively well, but this is a misperception: too few respondents are concerned about an ecological transformation given the actual environmental impact and assess the importance of office buildings from the point of view of climate protection as too low. Apparently, a change in awareness is necessary here, although today, with increasing environmental awareness, the ecologically sustainable design of properties is already moving into the centre of consideration.

From an investment point of view, the respondents indicate a high significance of office property as an asset class for capital investment and retirement provision. Not only are about one-fifth of the respondents considering an investment in office property or have already done so, but the respondents also confirm a surprisingly high attractiveness of office property as an investment compared to other investment products. This attractiveness is to be maintained and the invested capital secured.

## 4 The identified need for adaptation and the resolution of conflicting goals

After a detailed presentation of office workers' perceptions of office real estate in Chapter 3, Chapter 4 will examine the need for adaptation identified by the respondents as well as indications for resolving the conflicting goals between the perspectives.

### 4.1 The need for adaptation of office properties identified by respondents

First, the respondents were asked about the need for adaptation from different perspectives. The answers indicate how office properties should be designed in the future.

#### Office workers expect real estate to maximise benefits for their time in the office

Eighty-eight percent of the respondents agree that a utility-maximising workplace should be available in the office. Only 2% deny the desire to maximise workplace benefits (Figure 21).

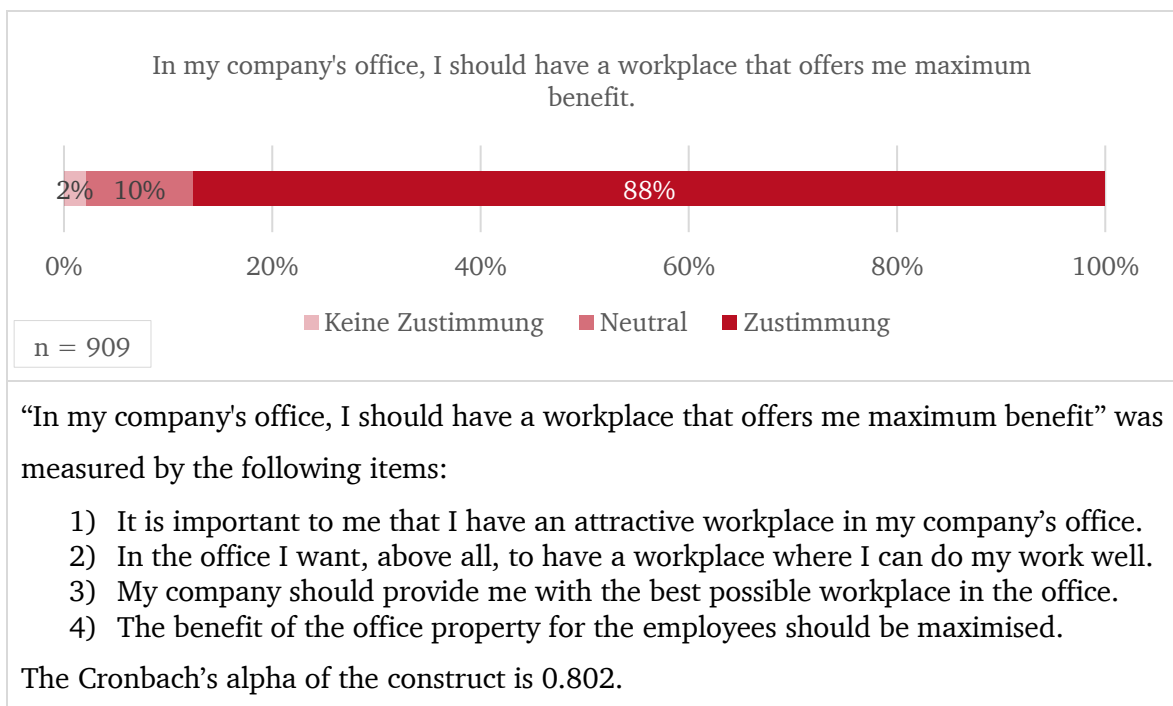


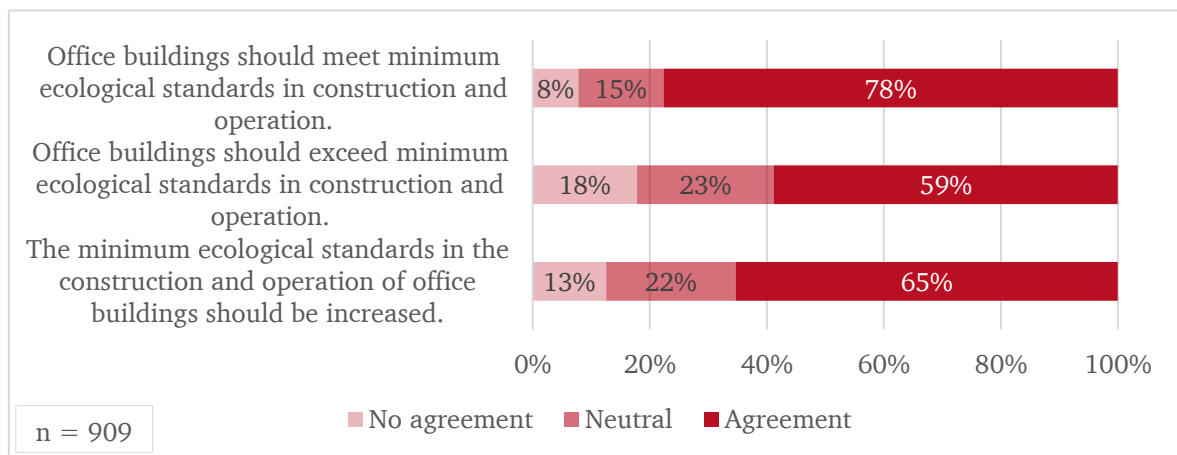
Figure 21: Use-related need for adaptation of office properties

In line with the high importance of office space from the user's point of view (cf. 3.1), respondents want to maximise the benefits that can be obtained from it. When they spend time in the corporate space, they expect an optimally equipped workplace where they can do their work efficiently. More research is needed on what exactly constitutes a utility-maximised property. An initial survey of employees indicates that factors relating to the indoor climate are rated as important. The fact that the indoor climate in the office can only be influenced to a limited extent may also explain the home office's popularity, in which the working environment can be individually designed. Further studies at the Technical University of Darmstadt will shed more light on the determinants of attractive office properties from the

employee's point of view. To maximise the benefits, these factors should be considered in the future from the employees' point of view.

**The majority of respondents want green office properties**

Regarding the regulation of the environmental impact of office buildings, it was decided not to merge the items shown in Figure 22, despite their possible statistical suitability, due to content considerations: the majority of respondents (78%) agree that office buildings should meet minimum ecological standards. However, the agreement that the standards should be exceeded is around 20 percentage points lower; indeed, 18% of respondents disagree with this statement. On the other hand, there is greater agreement with the statement that the minimum standards should be increased (65%, Figure 22).

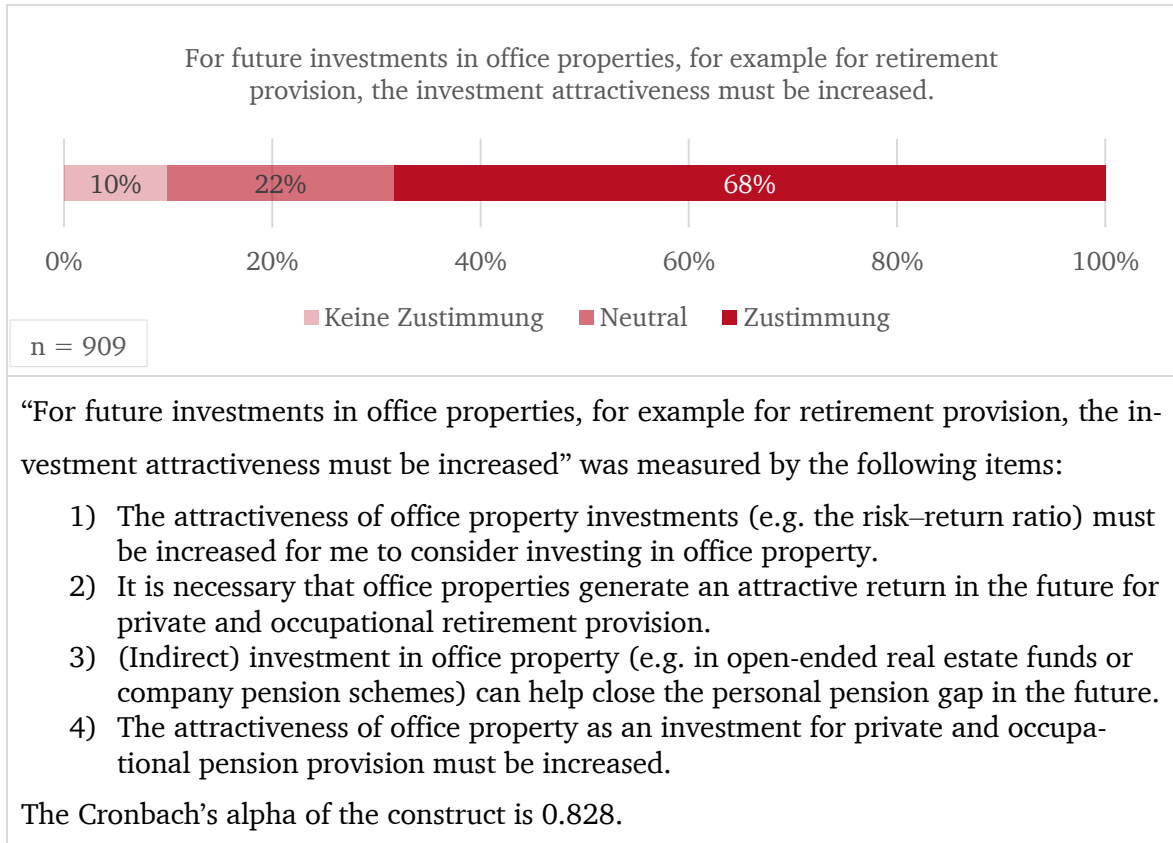


**Figure 22: Need for environmental adaptation of office buildings**

The majority of respondents, therefore, see the need for more significant consideration of office real estate in the fight against climate change and preserving the natural basis of life for all. The real estate industry players are expected to comply with the ecological standards applied to them. Although the standards are perceived as too low, there is some disagreement about whether they should be met or exceeded. The respondents seem to see the legislator as having a duty to set fair and appropriate standards. Here again, the respondents document a low sensitivity for the importance of office buildings in environmental protection, expressed in the far-reaching rejection of self-responsibility for office buildings and their emissions. In their opinion, the state should first adapt the rules before the actors have to align themselves with them.

**The majority of office workers would like to see an increase in the attractiveness of office property as an asset class**

Regarding the investment perspective, about two-thirds of the respondents agree that the attractiveness of office real estate for future investments needs to be increased. Only one in ten respondents disagrees (Figure 23). The average required minimum return on any investment is 6.69% per year ( $n = 543$ ).



**Figure 23: Investment-related adjustment needs of office properties**

The majority of respondents recognise the need to increase investment quality against the backdrop of socio-demographic change and the associated challenges for social security systems as well as the associated need for private old-age provision and capital investment. For the respondents, increasing the quality of investments for their own finances is a basic prerequisite for increased involvement in the asset class.

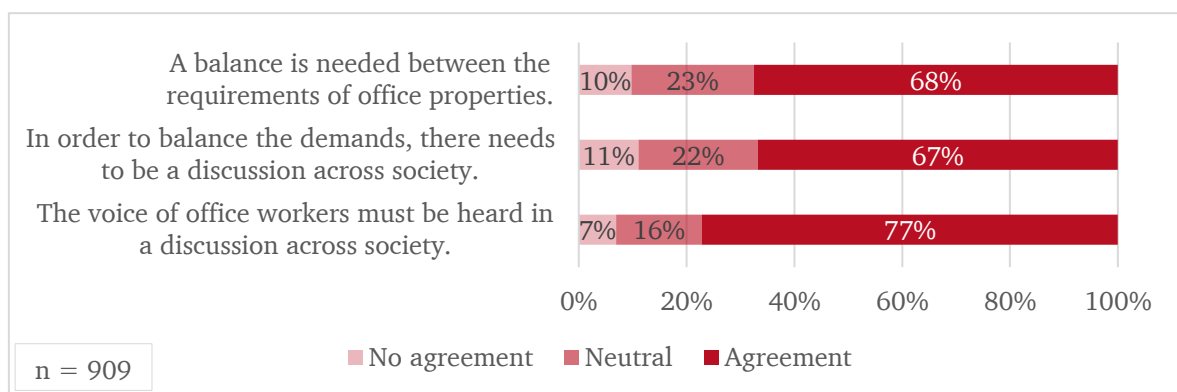
#### **4.2 Resolving the conflicting goals between the requirements**

After the need for adaptation of office properties had been discussed from different perspectives, the respondents were asked about resolving the conflicting goals between the different requirements from the individual perspectives. The first indications for the resolution have already been presented in 3.1, the balancing between the perspectives. This weighting of the requirements from different perspectives can be a valuable indication for the sufficient consideration of individual requirements in future office developments. In the following, it will be shown whether the respondents recognise the necessity of mediating between the

requirements, which actors the respondents see as obligated to implement the adaptation of office properties and which instruments come into question for this, in their opinion.

**Office workers want to be considered in the process of resolving conflicting goals**

Sixty-eight percent of the respondents recognise the need to balance the different demands while only 10% disagree. About the same proportion of respondents see the need for a society-wide discussion to resolve conflicts that arise. Seventy-seven percent of respondents agree that office workers’ concerns must be considered in the debate on balancing demands (Figure 24).

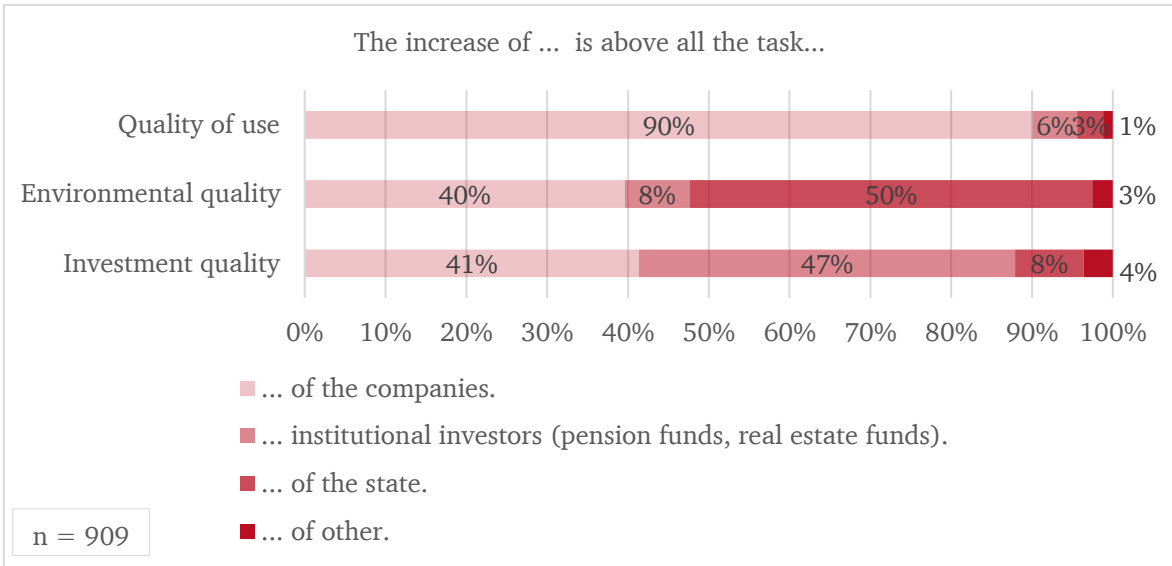


**Figure 24: Need to resolve conflicting goals and take into account the concerns of office workers**

The majority of office workers thus recognise the need for mediation between the different demands on office real estate and would like to see a debate in society as a whole around this concern. It is important that they and their interests are not lost in the resolution of the conflicts. After all, it is also the wishes they articulate that must be reconciled. The high level of agreement can also be interpreted as a mandate to the representatives of their concerns to do more to promote their articulated interests.

**Corporate Real Estate Management (CREM) has a duty: The respondents see the companies in particular as responsible for an all-round transformation of office real estate**

The respondents were then asked to indicate which actor is responsible in their eyes for increasing the quality of use, investment and environment. Ninety percent of the respondents hold the companies accountable for increasing the quality of use. According to the respondents, the investment quality lies mainly with institutional investors (47%) and again with the companies (41%). Half of the respondents hold the state responsible for environmental quality (50%). Here, too, companies are held responsible by 40% of respondents (Figure 25).



**Figure 25: Responsibility of individual actors for the adaptation of office properties**

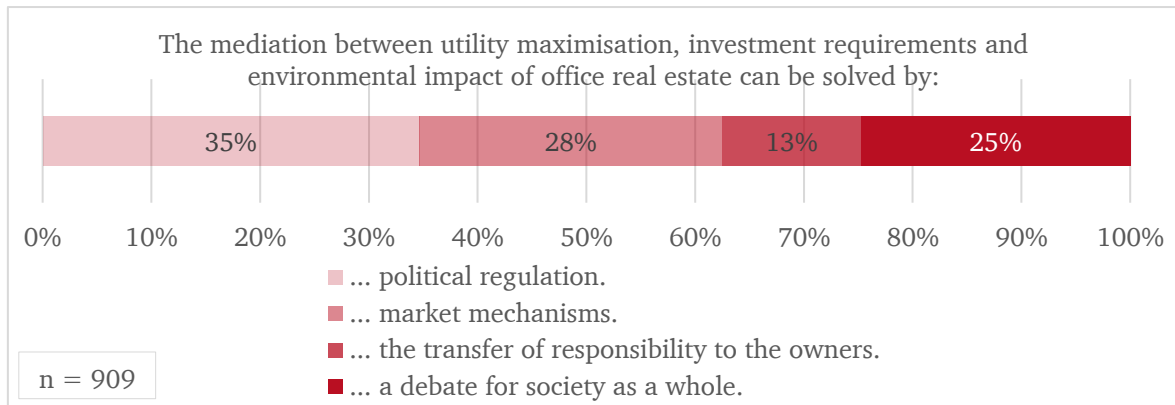
The tasks are thus transferred to actors who, at first glance, appear to be the most suitable. On the other hand, the respondents also clearly communicate, particularly concerning environmental quality, that they see the state as the regulator with the duty to formulate rules. Although CREM is seen as responsible by as many as 40% of respondents, this contrasts the ‘polluter pays’ principle. Also, the fact that the financial actors are taken out of the responsibility underlines the negation of personal responsibility for office real estate assumed in 4.1 concerning the environmental adjustment. However, the fact that a large part of the responsibility has been assigned to the state could also be a consequence of the fact that capital interests have prevailed too often in the past. It is possible that the financial players are not trusted to take sufficient account of ecological concerns, for example.

With regard to addressing the responsibility for investment quality, it is also doubtful that the respondents answered in their own interest. In view of the far-reaching financial regulation, which primarily also serves consumer protection, a small share of 8% of respondents who see the state as having a responsibility seems extremely low.

CREM is held accountable by respondents in all three dimensions. The results represent the clear mandate of the employees for CREM to get involved and take responsibility in all three perspectives. From a management perspective, according to the results, CREM must be given a strong mandate in order to be able to meet the demands. There is also a strong lever for companies to position themselves favourably towards employees, especially in the war for talent.

### **Conflicts can only be resolved if the players work together**

When asked about the instrument that can be used to resolve the conflicts between the various requirements, 35% of respondents voted for political regulation, 28% for market mechanisms, 25% for a debate involving society as a whole and 13% for transferring responsibility to the owners (Figure 26).



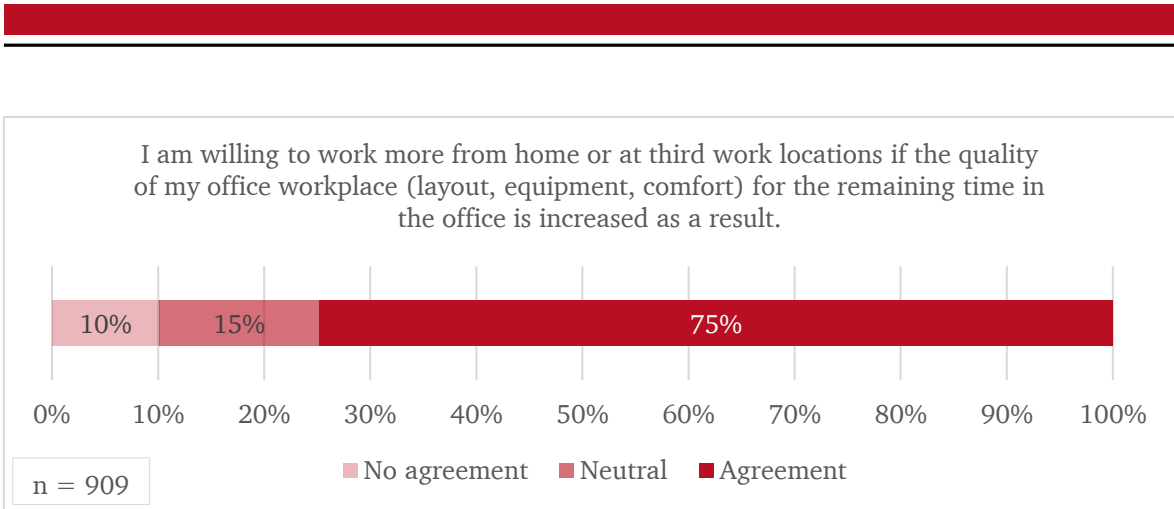
**Figure 26: Instruments for resolving conflicting goals that arise between the requirements of office properties**

Concerning the choice of instrument for resolving the conflicts, the picture is thus mixed. All actors are assigned responsibility for participating in the process, whether through regulation, market mechanisms or delegation of the task to the owners. This underscores the necessity for a collective effort among all stakeholders to reshape the landscape of office real estate. From the perspective of office workers, each participant bears a responsibility in this transformation endeavour. Managing sustainability through financial flows, i.e. delegating responsibility to owners, is seen by respondents as only part of the solution, not a panacea. The interviewees may recognise here that the actors are pursuing divergent particular interests and that conflict resolution can, therefore, only succeed in the long term by working together.

### **Quality before quantity: respondents are willing to spend less time in better offices in return**

After it was shown in 3.1 that offices are no longer the exclusive workplace for knowledge work and that they increasingly have to face competition from home offices and third locations, and as described in 4.1, there is a demand for maximising the benefits of office buildings for everyday working life, the study participants were then asked whether they would be prepared to spend less time working in office buildings in return for higher-quality space. Seventy-five percent of respondents agree with this notional offer and only 10% would reject it (Figure 27).





**Figure 27: Willingness to spend less time working in higher-quality office space**

It is particularly important to the respondents that attractive, high-quality space is available to them during the time they will spend in office properties in the future. In return, the majority of them are prepared to work more frequently at other locations such as their home office or third locations. For the real estate industry players, this means that what is needed is quality, not quantity.

**4.3 Intermediate conclusion**

The second part of the evaluation provides important impulses for the transformation of office properties: The respondents describe the need for adaptations they have identified and provide information on how to resolve the conflicting goals.

From the user’s point of view, respondents’ suggest maximising the benefits of office buildings for their everyday work. Concerning the ecological transformation of office buildings, the respondents largely agree that standards must be met and even raised. However, they do not rely on the individual responsibility of commercial real estate users or owners but rely first and foremost on the state, which they see as having a duty to take responsibility for the task. In addition, a large proportion of respondents recognises the need for private old-age provisions and would like to see the investment quality of office properties increased for future capital investment.

Office workers believe that companies are responsible for maximising office real estate benefits as well as investment quality and environmental transformation. The increase in investment quality lies primarily with financial companies and the importance of the state for regulation is underestimated.

The majority of respondents recognise the need to resolve conflicting objectives. Their concerns should be taken into account. They see all players in the real estate industry as responsible for the transformation of office properties and that all players should also participate

---

in resolving the conflicting goals. One possible solution accepted by the respondents is to promote multi-local working with less presence in the office and to offer higher-quality space for the time remaining in the office.

### Summary of key findings

This study provides the first overview of office workers' concerns in the transformation of office real estate.

The results illustrate that office workers perceive all three perspectives on office real estate and also attach importance to the requirements from all three perspectives. Focusing solely on the requirements of one perspective, such as utility maximisation, is not in the interest of office workers. In particular, the role of office properties for investment and retirement provision must be considered in the transformation: The significant weight of investment requirements of 43% speaks for itself (Chapter 3.1).

A comparison of work locations clearly shows that office properties have probably lost their exclusivity for office workers for good (Chapter 3.2). The home office remains the most popular work location among respondents. Disappointments with work-from-home do not increase office shares (in the future, still two working-days per week) in the modal split of work locations, but increase the attractiveness of coworking spaces (16% of working time). Office properties must face this competition from two sides and be adapted to the wishes of the users in order to continue to be perceived as attractive places to work in the future.

It is also clear that office workers still have too little understanding of the environmental impact of office buildings. Not only are surprisingly few office workers concerned about the impact of office buildings on the environment, but the role of office buildings in climate protection is also apparently vastly underestimated (Chapter 3.3).

From an investment perspective, respondents documented a strong interest in office real estate as an asset class. For 29% of office workers, office real estate represents an attractive asset class for capital investment. Compared to other financial investment products, the attractiveness is always even higher. The potential interest in attractive investment products exceeds the potential supply of German office properties (Chapter 3.4).

Office workers demand the multi-perspective optimisation of office properties (Chapter 4.1): They would like to see the utility endowment maximised (88%), widely agree that office properties need to become greener and would like to see an increase in investment attractiveness and quality for future investment, including for private retirement provision (68%).

Around 70% of respondents recognise the need to resolve any conflicting goals that arise between requirements and wish to be included in this debate. Office employees see corporate real estate management, in particular, as having a duty to assume responsibility: For 90% of

---

respondents, companies are called upon to improve the quality of use and around 40% each also see corporates as having a duty to optimise the environment and investment. In addition, they see institutional investors as responsible for ensuring the investment quality of office properties (47%) and the state as responsible for ensuring environmental sustainability (50%). Here, the respondents negate the personal responsibility of the other actors for the environmental impact of office buildings. Concerning the process of resolving the conflicts, the respondents again see all actors as having a duty to work on joint solutions. One solution accepted by the respondents (75% agreement): the quantitative reduction of occupancy through mobile working in areas of higher quality in return (Chapter 4.2).

### **Significance of the results for the future of office real estate**

The results presented document a comprehensive need for transformation of office real estate from the employees' point of view. The increasing bargaining power of employees in the war for talent makes it necessary for other stakeholders to align themselves with their needs. Therefore, the results have important implications for the different stakeholders of office real estate.

### **Lessons learned for office workers and their employee representatives**

For the first time, the stakeholders themselves, the office workers, have been asked about the transformation of office real estate. They articulate requirements and want their voices to be heard in subsequent discussions. With pressure from the war for talent, office workers have the leverage to press their demands. Why stay with an employer who stops modern forms of working from home or third locations? But employee representatives could also give more voice to concerns.

Despite the importance of sustainability and investment success, the quality of use of the space remains an important criterion for the respondents. The approval of maximising use strongly documents the desire for optimal office space. But the desire for mobile working and working in coworking spaces also proves the need for utility-maximising workplaces. For employee representatives, this means a mandate to ensure mobile working for employees and to enable work in coworking spaces.

From the point of view of climate protection, the results also represent the mandate to represent ecological sustainability requirements to the employer. The respondents are concerned about climate protection and their negotiating position in the war for talent gives them the leverage to press this demand and urge employers to act more sustainably. Employees and their representatives, on the other hand, must develop the ambition to become part of the solution to the problems.

---

The pension plan limits this demand. The role of office real estate, which is perceived as most important by those surveyed, must be given more significant consideration in the future and accorded the appropriate status, for example, in collective negotiations. Possibilities of direct participation in the investment success of the surfaces used as final users by coworker participation programmes for the pension provision could experience a revival.

All three perspectives on office real estate are essential. Being able to work in a healthy and sheltered manner must be reconciled with the desire for climate protection and, above all, capital accumulation. Employee representatives must represent precisely this triad of requirements.

### **Lessons learned for Corporate Real Estate Management**

Corporate real estate management (CREM) has a unique role to play. Not only is it seen as having the greatest responsibility by the respondents compared to the players, but CREM also has its own motivation for employee recruitment, sustainability optimisation and financial success, combining all the requirements and mediating between them.

Companies face the challenge of attracting and retaining the right employees. Because these are oriented to attractive corporate cultures in which office real estate can also serve as a conveyor of culture, corporates need to provide attractive space. Without attractive office space, it will be difficult to recruit the best employees in the future, given the respondents' documented demand for space that maximises benefits. For corporate real estate management, the results mean a call to increase the quality of the workplaces offered to employees. Office buildings must be generously designed, have the optimum room climate and be in good locations. The high satisfaction of office workers at home workplaces, as documented in other studies (Pfnür et al., 2021), indicates the need to create an office workspace that feels "like home" and offers the appropriate amenities. At the same time, it is clear for the time being that mobile working in the home office or other locations is here to stay. This must be made possible for employees in order to survive in the battle for the best talent. At this intersection, coworking spaces are gaining importance. The results document that office workers will increasingly want to work in this location in the future. They may have unsuitable space in their home office, desire social exchange that is not fulfilled at home or want to avoid long journeys to the company office by going to a coworking space close to home for climate protection reasons. The reasons the respondents want to spend 16% of their working time in coworking spaces in the future can be varied, but they cannot be ignored. The implication for CREM is that it will have to make it easier to work in this third location in the future. At the same time, however, this work location also represents an opportunity

---

to increase the space efficiency of office properties and thus to operate them more sustainably. Raising this potential is, therefore, also a task of corporate real estate management. Overall, the results show that corporate real estate management will have to cope with higher costs in the future. However, because the potential savings in terms of real estate costs in the companies can be assumed as minor compared to the threat of corporate discontent, untapped productivity potential and employee migration, the results represent a clear mandate for corporate real estate management to take money in hand and invest indirectly in its employees through attractive workplaces.

With regard to sustainability transformation, companies must take their employees with them and listen to them: Respondents articulate climate protection requirements and document a certain understanding of the problem. Employees want to work in green offices in the future and, for corporate real estate management, this means only providing sustainable buildings in the future. This is also in line with the regulatory requirements placed on companies.

Concerning the respondents' desire to increase investment quality, corporate real estate management must emphasise new aspects. Respondents want greater participation in the investment success of office properties and are asking for the necessary products to achieve this. The possibility of participation through pension funds or direct participation in the financing of office real estate through employee programmes offers attractive investment options without dilution of the rights of disposal through opaque fund structures with possibly, from the point of view of small investors, incorrectly set incentives for the fund management. In the war for talent, this offering can also sharpen perceptions as an attractive employer and increase employee loyalty to the company.

### **Lessons learned for investors**

From the investors' point of view, the surprisingly positive perception of office real estate as an investment asset by office employees is worth highlighting. Apparently, office workers have a sustained interest in investing in office properties precisely because the investment is also attractive for younger people. This represents a positive outlook for the retail business of fund providers.

However, it can also be seen that the demand for office space is changing. The quality of office properties will increase and, in the future, will be defined even more by the user of the space. Low-quality office properties unattractive to users and in poor locations are threatened with stranding because companies can no longer afford to expose their employees to unattractive space. For the owners of the office space stock, this gives rise to the task of

---

working with the space users to make the existing stock attractive and plan newly built space in line with user requirements.

Office real estate investments are becoming greener. Not only because ESG regulations require capital investment in green real estate but also because the demands of employees will force companies to rent green space. Thus, only ecologically sustainable space will be in demand sooner or later. Therefore, a second chain of effects is created, with capital steered into green real estate. Here, the abstract steering by ESG is supplemented by specific requirements of the tenants. Differences in the definition of a green property may occur. However, because the definition of green real estate demanded by employees meets with broad approval, this definition could prove to be more resilient. Thus, for long-term real estate investors, only environmentally sustainable real estate will be considered for investment due to regulatory and market operating mechanisms based on the interests of office workers.

Due to uncertain demand from corporates, future planning for returns will be more difficult. In addition, office properties will become more expensive due to increasing quality and sustainability requirements and not only due to the general increase in construction costs. Rents will, therefore, inevitably also have to rise and be enforced on the market. Although there will be a certain willingness to pay for attractive space on the part of tenants, this will all present investors with challenges for their business models, which will have to be compensated for by developing new businesses. In addition to the challenges arising from user-centredness and sustainability optimisation of portfolios, the results of this study also introduce opportunities for investors in office real estate. New products for participation by opening up the financing of office real estate to employees must be launched in cooperation with other players. The design of more efficient financing chains and the financing of less diluted rights of disposal offer opportunities for new business models. In addition, the growing interest in coworking spaces is making this form of office real estate increasingly attractive for capital investment. Investors are tasked with offering suitable space to coworking space operators. In addition, the demand of corporates for flexibility wants to be met. Therefore, the transformation of office real estate is giving rise to ample potential for new business models, with niche products coming to the fore, and offering a wide range of opportunities for investors.

### **Lessons learned for policymakers**

From a political perspective, increasing the quality of use of office properties is not an objective in itself. Increasing the attractiveness of office properties as a workplace helps companies attract and retain the best talent. Improving the level of usage is crucial for German

---

companies to maintain their competitiveness among their employees and in the global market. This is vital for the national economy and must be considered in legislation. It is not only urban development and environmental protection that must be promoted. The high dynamics of structural change in the economy, on the one hand, which is also driven by global competition and socio-demographic change, for example, meets with the inertia of the real estate markets and lengthy adaptation processes. For companies to tackle the conversion of their areas with the necessary speed, approval processes must be accelerated and land must be made available.

Regarding reducing the environmental impact of office buildings, this study provides indications for enforcing climate protection interests. According to the findings, shifting responsibility to property owners, as is currently occurring through ESG regulation, is only part of the solution. While the role of buildings in the fight against climate change is sometimes underestimated, for example, the study of the influence of environmental awareness on the importance of the requirements from different perspectives already shows the potential for adaptation of policy strategies for environmental protection. The results show that environmental protection also seems to be important to the respondents in the real estate sector and that they are willing to support measures that serve this purpose. By involving employees more in the processes and creating an awareness of the importance of office buildings in climate protection, further pressure can be generated to reduce greenhouse gas emissions. If office workers are made responsible, then the pressure on corporates to pay attention to office space environmental sustainability increases as does acceptance of climate protection measures. As contributors to emissions, employees can, therefore, not only be part of the problem but also part of the solution.

Against the backdrop of safeguarding the competitiveness of German companies, policymakers are tasked with ensuring that the transformation can be financed. Policymakers must also consider the investment function of office properties for retirement provision: Because of the pension gap and the associated need for private retirement provision, the opportunities for private retirement provision in office real estate must be strengthened. Financial incentives, as well as incentives and support for private old-age provision, must be harmonised by utilising appropriate programmes.

### **Who bears the costs?**

Overall, increasing quality of use and ecological sustainability is associated with higher costs. In addition, office buildings are expected to contribute to retirement provisions. Companies in Germany cannot avoid bearing the costs of these diverse requirements. As a result of their



---

strong negotiating position in the war for talent, employees are assigning corporates the responsibility of creating office properties that maximise benefits, are environmentally friendly and attractive for investment. The cost to corporations of not taking on this responsibility appears to be much greater.

Office real estate will continue to be a fixture in the workplace. Against this backdrop, it must also be considered that office properties have always been subject to change in the past. Transformation is, therefore, not a new phenomenon that the stakeholders of office real estate have to deal with. Overall, a balance between the various requirements is necessary. In the short term and immediately, the quality of office space needs to be enhanced so that office workers find a utility-maximising workspace in the office. Through the war for talent and mobile working, they have the necessary levers to enforce this demand. However, they demand more than utility maximisation. Therefore, investment quality and ecological adaptation must not be neglected. This study provides information on what the respondents want from the players in the real estate industry. Only in this way can the transformation of office properties succeed. At the same time, the study shows sustainable social and ecological transformation paths that meet with broad acceptance.

#### **Outlook for further research needs**

The results presented represent the first comparative study on office real estate from the three perspectives of use, investment and ecological sustainability as well as on the resolution of any conflicting goals that may arise from the perspective of the office workers. Accordingly, the study is characterised by a highly exploratory nature.

Against this background, the present study and the derived findings form the basis for further subsequent analyses. As described above, the subject of investigation could be the connection between the respondents' personality traits and their requirements for office properties, the weighing of the respondents between the requirements from the different perspectives or the determinants of attractive office properties from the user's point of view.

---

## Bibliography

---

- Arbeitsgemeinschaft berufsständischer Versorgungseinrichtungen e. V. (ABV) (2022):** Daten und Fakten – Nachhaltige Geldanlage. Available online: <https://www.abv.de/nachhaltige-geldanlage.html>, accessed: 25.07.2023.
- Backhaus, K.; Erichson, B.; Gensler, S.; Weiber, R.; Weiber, T. (2021):** Regressionsanalyse, in: *Multivariate Analysemethoden*, 16. Aufl., S. 61 – 160, Springer Gabler, Wiesbaden.
- Backhaus, K.; Erichson, B.; Weiber, R. (2015):** Auswahlbasierte Conjoint-Analyse, in: *Fortgeschrittene Multivariate Analysemethoden*, 3. Aufl., S. 175 – 292, Springer Gabler, Wiesbaden.
- Behrend, T. S.; Sharek, D. J.; Meade, A. W.; Wiebe, E. N. (2011):** The viability of crowdsourcing for survey research, in: *Behavior Research Methods*, 43. Jg., Artikel 800.
- Bergman, B.G.; Wu, W.; Marsch, L. A.; Crosier, B. S.; DeLise, T. C.; Hassanpour, S. (2020):** Associations Between Substance Use and Instagram Participation to Inform Social Network–Based Screening Models: Multimodal Cross-Sectional Study, in: *Journal of Medical Internet Research*, 22. Jg., Heft 9.
- Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) (2022):** Statistik der BaFin - Erstversicherungsunternehmen 2021. Available online: [https://www.bafin.de/DE/PublikationenDaten/Statistiken/Erstversicherung/erstversicherung\\_artikel.html](https://www.bafin.de/DE/PublikationenDaten/Statistiken/Erstversicherung/erstversicherung_artikel.html), accessed: 25.07.2023.
- Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen und Raumordnung (BBR) (Hrsg.) (2020):** Umweltfußabdruck von Gebäuden in Deutschland. Kurzstudie zu sektorübergreifenden Wirkungen des Handlungsfelds „Errichtung und Nutzung von Hochbauten“ auf Klima und Umwelt. BBSR-Online-Publikation 17/2020, Bonn.
- Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbraucherschutz (BMUV) (2022):** Treibhausgasemissionen stiegen 2021 um 4,5 Prozent. Available online: <https://www.umweltbundesamt.de/presse/pressemitteilungen/treibhausgasemissionen-stiegen-2021-um-45-prozent>, accessed: 29.12.2022.
- Bürger, V.; Hesse, T.; Palzer, A.; Köhler, B.; Herkel, S.; Engelmann, P. (2017):** Klimaneutraler Gebäudebestand 2050. Online verfügbar unter: [https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2017-11-06\\_climate-change\\_26-2017\\_klimaneutraler-gebaeudebestand-ii.pdf](https://www.umweltbundesamt.de/sites/default/files/medien/1410/publikationen/2017-11-06_climate-change_26-2017_klimaneutraler-gebaeudebestand-ii.pdf), accessed: 30.12.2022.
- Bundesverband Alternative Investments e.V. (BAI) (2022):** Fact Sheet - Real Estate. Available online: <https://www.bvai.de/fileadmin/Veroeffentlichungen/>

---

BAI\_Publikationen/BAI\_Fact\_Sheets/Fact\_Sheet\_-\_Real\_Estate\_FINAL\_12\_04\_22\_.pdf.pdf?utm\_source=pocket\_saves, accessed: 30.12.2022.

**Bundesverband Investment und Asset Management e.V. (BVI) (2023):** Auswertung der offenen Immobilien-Publikumsfonds. Available online: [https://www.bvi.de/fileadmin/user\\_upload/Statistik/31\\_03\\_2023\\_Quartalsauswertung\\_f%C3%BCr\\_offene\\_Immobilienfonds.pdf](https://www.bvi.de/fileadmin/user_upload/Statistik/31_03_2023_Quartalsauswertung_f%C3%BCr_offene_Immobilienfonds.pdf), accessed: 25.07.2023.

**Chun, G. H.; Sa-Aadu, J.; Shilling, J. D. (2004):** The Role of Real Estate in an Institutional Investor's Portfolio Revisited, in: The Journal of Real Estate Finance and Economics, 29. Jg., Heft 3, S. 295-320.

**clickworker.de (2022):** <https://www.clickworker.de/>, accessed: 28.11.2022.

**Danner, D. (2015):** Reliabilität – die Genauigkeit einer Messung. In: GESIS Leibniz-Institut für Sozialwissenschaften (Hrsg.): GESIS Survey Guidelines.

**Delfim, J.-C.; Hoesli, M. (2019):** Real Estate in Mixed-Asset Portfolios for Various Investment Horizons, in: The Journal of Portfolio Management, 45. Jg., Heft 7, S. 141 - 158.

**Denmary, M.; Hentze, T.; Kauder, B.; Niehues, J. (2021):** Die Rolle der Betriebsvermögen in der Vermögensverteilung. Stiftung Familienunternehmen (Hrsg.), München.

**Deutsche Energie-Agentur (dena) (hHsg.) (2018):** dena-Gebäudereport kompakt 2018. Statistiken und Analysen zur Energieeffizienz im Gebäudebestand. Available online: [https://www.dena.de/fileadmin/dena/Dokumente/Pdf/9254\\_Gebaeudereport\\_dena\\_kompakt\\_2018.pdf](https://www.dena.de/fileadmin/dena/Dokumente/Pdf/9254_Gebaeudereport_dena_kompakt_2018.pdf), accessed: 30.12.2022.

**Deutsche Energie-Agentur (dena) (Hrsg.) (2022):** dena-Gebäudereport 2023. Zahlen, Daten, Fakten zum Klimaschutz im Gebäudebestand. Available online: [https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2022/dena\\_Gebaeudereport\\_2023.pdf](https://www.dena.de/fileadmin/dena/Publikationen/PDFs/2022/dena_Gebaeudereport_2023.pdf)

**Deutsche Bundesbank (2023a):** Faktenblatt über geschlossene inländische Investmentvermögen. Available online: <https://www.bundesbank.de/resource/blob/848714/9b30c70ce279db8c787d85114bfb7e44/mL/faktenblatt-geschlossene-inlaendische-investmentfonds-data.pdf>, accessed: 25.07.2023.

**Deutsche Bundesbank (2023b):** Geldvermögensbildung und Außenfinanzierung in Deutschland im vierten Quartal 2022. Available online: <https://www.bundesbank.de/de/presse/presenotizen/geldvermoegensbildung-und-aussenfinanzierung-in-deutschland-im-vierten-quartal-2022-908106>, accessed: 25.07.2023.

**Deutsche Bundesbank (2023c):** Investmentfondsstatistik. Available online: <https://www.bundesbank.de/resource/blob/804052/862cf92d5d49488c0ab1b9850f64a7af/mL/0-investmentsfondsstatistik-data.pdf>, accessed: 25.07.2023.

- 
- Eisinga, R.; te Grotenhuis, M.; Pelzer, B. (2013):** The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown?, in: *International Journal of Public Health*, 58. Jg., S. 637 - 642.
- EY (2022):** Trendbarometer Immobilienanlagen der Assekuranz 2022. Available online: [https://assets.ey.com/content/dam/ey-sites/ey-com/de\\_de/news/2022/07/ey-trendbarometer-immobilienanlagen-2022.pdf](https://assets.ey.com/content/dam/ey-sites/ey-com/de_de/news/2022/07/ey-trendbarometer-immobilienanlagen-2022.pdf), accessed: 30.12.2022.
- Gäde, J. C.; Schermelleh-Engel, K.; Werner, C. S. (2020):** Klassische Methoden der Reliabilitätsschätzung, in: Moosbrugger, H.; Kelava, A. (Hrsg.): *Testtheorie und Fragebogenkonstruktion*, Springer, Berlin Heidelberg, S. 305 - 334.
- Geiger, S. M.; Holzhauer, B. (2020):** Weiterentwicklung einer Skala zur Messung von zentralen Kenngrößen des Umweltbewusstseins. Dessau-Roßlau: Umweltbundesamt.
- Gesamtverband der Deutschen Versicherungswirtschaft e.V. (GDV) (2023):** Kapitalanlagenbestand nach Versicherungssparten. Available online: <https://www.gdv.de/gdv/medien/zahlen-und-daten/kapitalanlagen#die-kapitalanlagen-im-vergleich>, accessed: 25.07.2023.
- Gottschewski, P. O.; Auf der Landwehr, M.; von Viebahn, C.; Staritz, J. (2022):** Decreasing Shopping Duration by Altering Choice Environments? An Empirical Investigation of Individual and Hybrid Nudges in the Context of e-Grocery, in: *Wirtschaftsinformatik 2022 Proceedings*. Available online: <https://aisel.aisnet.org/wi2022/hci/hci/18>.
- Halbmeier, C.; Grabka, M. M. (2021):** Zusammensetzung des Vermögens. Available online: <https://www.bpb.de/kurz-knapp/zahlen-und-fakten/datenreport-2021/private-haushalte-einkommen-und-konsum/329964/zusammensetzung-des-vermoegens/>, accessed: 25.07.2023.
- Hammermann, A.; Voigtländer, M. (2020):** Bürobeschäftigte in Deutschland, in: *IW-Trends-Vierteljahresschrift zur empirischen Wirtschaftsforschung*, 47. Jg., Heft 3, S. 61 - 78.
- Henger, R.; Deschermeier, P.; Hude, M.; Seipelt, B.; Voigtländer, M. (2016):** Energieeffizienz bei Büroimmobilien. dena-Analyse über den Gebäudebestand und seine energetische Situation. Available online: [https://effizienzgebäude.dena.de/fileadmin/dena/Dokumente/Pdf/9143\\_dena-Analyse\\_Energieeffizienz\\_bei\\_Bueroimmobilien.pdf](https://effizienzgebäude.dena.de/fileadmin/dena/Dokumente/Pdf/9143_dena-Analyse_Energieeffizienz_bei_Bueroimmobilien.pdf), accessed: 30.12.2022.
- Hertweck, B. (2017):** Immobilien und Altersvorsorge, in: Arnold, D.; Rottke, N. B.; Winter, R. (Hrsg.): *Wohnimmobilien*, S. 221 - 252, Springer Gabler, Wiesbaden.
- Höcker, M. C.; Bachtal, Y.; Pfnür, A. (2022):** Work from home: bane or blessing? Implications for corporate real estate strategies, in: *Zeitschrift für Immobilienökonomie*, 8. Jg., Heft 2, S. 101 - 137.

- 
- Hörner, M.; Rodenfels, M.; Cischinsky, H. (2021):** 6. Energieforschungsprogramm der Bundesregierung. Forschungsdatenbank Nichtwohngebäude. Primärdatenerhebung zur Erfassung der Struktur und der energetischen Qualität des Nichtwohngebäudebestands in Deutschland: Der Bestand der Nichtwohngebäude in Deutschland ist vermessen. Institut Wohnen und Umwelt GmbH (Hrsg.), Darmstadt.
- Industrieverband Büro und Arbeitswelt (IBA) (2017):** IBA-Studie 2017. Wohlbefinden im Büro. Available online: [https://iba.online/knowledge/site/assets/files/3939/iba-studie\\_2017\\_web.pdf](https://iba.online/knowledge/site/assets/files/3939/iba-studie_2017_web.pdf), accessed: 06.12.2022.
- Just, T.; Voigtländer, M.; Eisfeld, R.; Henger, R.; Hesse, M.; Toschka, A. (2017):** Wirtschaftsfaktor Immobilien 2017. In: IREBS (Hrsg.): Beiträge zur Immobilienwirtschaft, Heft 19, Universität Regensburg.
- Kaiser, T. (2017):** Finanzielle Sozialisation und finanzielles Wissen, in: Vierteljahrshefte zur Wirtschaftsforschung, 86. Jg., Heft 4, S. 17 - 30.
- Knoll, M. A. Z.; Houts, C. R. (2012):** The Financial Knowledge Scale: An Application of Item Response Theory to the Assessment of Financial Literacy, in: The Journal of Consumer Affairs, 46. Jg., Heft 3, S. 381 - 410.
- Lennerts, K.; Kropp, T.; Zak, J.; Fisch, M. N.; Wilken, T.; Kley, C.; Marx, S. (2021):** Verantwortung übernehmen – Der Gebäudebereich auf dem Weg zur Klimaneutralität.
- Maier, L.; Baccarella, C. V.; Wagner, T. F.; Meinel, M.; Eismann, T.; Voigt, K.-I. (2022):** Saw the office, want the job: The effect of creative workspace design on organizational attractiveness, in: Journal of Environmental Psychology, 80. Jg, Artikel 101773.
- Moosbrugger, H.; Brandt, H. (2020):** Antwortformate und Itemtypen, in: Moosbrugger, H.; Kelava, A. (Hrsg.): Testtheorie und Fragebogenkonstruktion, 3. Aufl., S. 91-118, Springer, Berlin Heidelberg.
- Morgan, N. A.; Rego, L. L. (2006):** The Value of Different Customer Satisfaction and Loyalty Metrics in Predicting Business Performance, in: Marketing Science, 25. Jg., Heft 5, S. 426-439.
- Pfnür, A. (2011):** Modernes Immobilienmanagement. 3. Aufl., Springer, Heidelberg.
- Pfnür, A. (2019):** Herausforderungen des Corporate Real Estate Managements im Strukturwandel. Zentraler Immobilien Ausschuss ZIA e.V (Hrsg.), Berlin.
- Pfnür, A. (2020):** ZIA-CREM-Studie 2020 - Die Rolle der öffentlichen Hand in der immobilienwirtschaftlichen Transformation deutscher Unternehmen. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 40, Technische Universität Darmstadt.
- Pfnür, A.; Bachtal, Y.; Voll, K.; Gauger, F. (2022):** Die ökonomische Trendwende in Richtung Energiesouveränität in der Wohnungswirtschaft – Eine empirische Befragung

---

deutscher Haushalte. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 45, Technische Universität Darmstadt.

**Pfnür, A.; Gauger, F.; Bachtal, Y.; Wagner, B. (2021):** Homeoffice im Interessenkonflikt. Ergebnisbericht einer empirischen Studie. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 41, Technische Universität Darmstadt.

**Pfnür, A.; Wagner, B. (2018):** Transformation der Immobilienwirtschaft - Eine empirische Studie deutscher immobilienwirtschaftlicher Akteure. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 37, Technische Universität Darmstadt.

**Rammstedt, B.; Kemper, C.; Klein, M. C.; Beierlein, C.; Kovaleva, A. (2014):** Big Five Inventory 10 (BFI-10). Zusammenstellung sozialwissenschaftlicher Items und Skalen (ZIS).

**Rubin, O.; Nikolaeva, A.; Nello-Deakin, S.; te Brömmelstroet, M.; (2020):** What can we learn from the COVID-19 pandemic about how people experience working from home and commuting? Centre for Urban Studies, University of Amsterdam (Hrsg.), Amsterdam.

**Schlereth, C.; Skiera, B. (2012):** DISE: Dynamic Intelligent Survey Engine, in: Diamantopoulos, A.; Fritz, W.; Hildebrandt, L. (Hrsg.): Quantitative Marketing and Marketing Management. Marketing Models and Methods in Theory and Practice, S. 225-243, Springer Gabler, Wiesbaden.

**SoSciSurvey (2022):** <https://www.soscisurvey.de/>, accessed: 28.11.2022.

**Statistisches Bundesamt (Destatis) (2022a):** Baugenehmigungen von Wohn- und Nichtwohngebäuden nach überwiegend verwendetem Baustoff Lange Reihen z. T. ab 1980 Available online: [https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Bauen/Publikationen/Downloads-Bautaetigkeit/baugenehmigungen-baustoff-pdf-5311107.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/DE/Themen/Branchen-Unternehmen/Bauen/Publikationen/Downloads-Bautaetigkeit/baugenehmigungen-baustoff-pdf-5311107.pdf?__blob=publicationFile), accessed 06.12.2022.

**Statistisches Bundesamt (Destatis) (2022b):** Bevölkerung (ab 15 Jahren): Deutschland, Jahre (bis 2019), Geschlecht, Altersgruppen, Beruflicher Bildungsabschluss. Available online: <https://www-genesis.destatis.de/genesis/online?operation=abrufabelleBearbeiten&levelindex=1&levelid=1671810347661&auswahloperation=abrufabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsstruktur&auswahlziel=werteabruf&code=12211-9013&auswahltext=&werteabruf=Werteabruf#abreadcrumb>, accessed 23.12.2022.

**Statistisches Bundesamt (Destatis) (2022c):** Bevölkerung und Erwerbstätigkeit: Erwerbsbeteiligung der Bevölkerung. Ergebnisse des Mikrozensus zum Arbeitsmarkt (Endgültige Ergebnisse). Available online:

---

[https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Erwerbstaetigkeit/Publicationen/Downloads-Erwerbstaetigkeit/erwerbsbeteiligung-bevoelkung-endergebnisse-2010410207004.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Erwerbstaetigkeit/Publicationen/Downloads-Erwerbstaetigkeit/erwerbsbeteiligung-bevoelkung-endergebnisse-2010410207004.pdf?__blob=publicationFile), accessed 23.12.2022.

**Statistisches Bundesamt (Destatis) (2022d):** Bevölkerung und Erwerbstätigkeit: Haushalte und Familien. Ergebnisse des Mikrozensus. Available online:

[https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Haushalte-Familien/Publicationen/Downloads-Haushalte/haushalte-familien-2010300217004.pdf?\\_\\_blob=publicationFile](https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Bevoelkerung/Haushalte-Familien/Publicationen/Downloads-Haushalte/haushalte-familien-2010300217004.pdf?__blob=publicationFile), accessed 23.12.2022.

**Statistisches Bundesamt (Destatis) (2022e):** Einkommen, Einnahmen und Ausgaben: Einkommen, Einnahmen und Ausgaben in den Gebietsständen. Available online:

<https://www.destatis.de/DE/Themen/Gesellschaft-Umwelt/Einkommen-Konsum-Lebensbedingungen/Einkommen-Einnahmen-Ausgaben/Tabellen/liste-gebietsstaende.html#>, accessed 23.12.2022.

**Statistisches Bundesamt (Destatis) (2022f):** Qualität der Arbeit: Wöchentliche Arbeitszeit. Available online: <https://www.destatis.de/DE/Themen/Arbeit/Arbeitsmarkt/Qualitaet-Arbeit/Dimension-3/woechentliche-arbeitszeitl.html>, accessed 23.12.2022.

**Trübstein, M. (2012):** Immobilieninvestoren und -anlageprodukte in Deutschland und Österreich, in: Trübstein, M. (Hrsg.): Praxishandbuch Immobilieninvestments, S. 17-, 44, Gabler, Wiesbaden.

**United Nations Environment Programme (UNEP) (2020):** 2020 Global Status Report for Buildings and Construction: Towards a Zero-emission, Efficient and Resilient Buildings and Construction Sector. Nairobi.

**World Bank Group (2023):** Market capitalization of listed domestic companies (current US\$). Available online: <https://data.worldbank.org/indicator/CM.MKT.LCAP.CD>, accessed: 25.07.2023.

---

---

## Previously published in this series

---

**Alexander Herrmann (2005):** Analyse der Anfangsrenditen in Frankfurt, Paris, London & New York. Ein Beitrag zur Vergleichbarkeit von Immobilienrenditen. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 1.

**Alexander Bräscher (2005):** Real Estate Private Equity (REPE) im Spannungsfeld von Entwickler, Kreditinstitut und Private-Equity-Gesellschaft. Ergebnisbericht zur empirischen Untersuchung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 2.

**Nadine Hainbuch (2006):** Status Quo und Perspektiven immobilienwirtschaftlicher PPPs. PPP im öffentlichen Hochbau in Deutschland aus Sicht des privaten Investors. Ergebnisse einer empirischen Analyse. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 3.

**Arbeitskreis PPP im Management öffentlicher Immobilien im BPPP e.V. (2006):** Risiken immobilienwirtschaftlicher PPPs aus Sicht der beteiligten Akteure. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 4.

**Sebastian Kühlmann (2006):** Systematik und Abgrenzung von PPP-Modellen und Begriffen. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 5.

**Dirk Krupper (2006):** Target Costing für die Projektentwicklung von Immobilien als Instrument im Building Performance Evaluation Framework. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 6.

**Moritz Lohse (2006):** Die wirtschaftliche Situation deutscher Wohnungsunternehmen – eine empirische Untersuchung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 7.

**Andreas Pfnür, Patricia Egres, Klaus Hirt (2007):** Ganzheitliche Wirtschaftlichkeitsanalyse bei PPP Projekten dargestellt am Beispiel des Schulprojekts im Kreis Offenbach. Ergebnisbericht zur empirischen Untersuchung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 8.

**Arbeitskreis PPP im Management öffentlicher Immobilien im BPPP e.V. (2007):** Optimierung von Wirtschaftlichkeitsuntersuchungen in immobilienwirtschaftlichen PPPs. Ein Thesenpapier. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 9.

**Steffen Hartmann, Moritz Lohse, Andreas Pfnür (2007):** 15 Jahre Corporate Real Estate Management in Deutschland: Entwicklungsstand und Perspektiven der Bündelung immobilienwirtschaftlicher Aufgaben bei ausgewählten Unternehmen. In: Andreas



---

Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 10.

**Henning Schöbener, Christoph Schetter, Andreas Pfnür (2007):** Reliability of Public Private Partnership Projects under Assumptions of Cash Flow Volatility. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 11.

**Moritz Lohse, Andreas Pfnür (2008):** EWOWI zwanzig zehn – Erfolgspotenziale der Wohnungswirtschaft 2010. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 12.

**Arbeitskreis PPP im Management öffentlicher Immobilien im BPPP e.V. (2009):** Optimierung von Transaktionskosten öffentlicher Immobilieninvestitionen. Ein Thesenpapier. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 13.

**Annette Kämpf-Dern, Andreas Pfnür (2009):** Grundkonzept des Immobilienmanagements. Ein Vorschlag zur Strukturierung immobilienwirtschaftlicher Managementaufgaben. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 14.

**Annette Kämpf-Dern (2009):** Immobilienwirtschaftliche Managementebenen und -aufgaben. Definitions- und Leistungskatalog des Immobilienmanagements. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 15.

**Sonja Weiland, Andreas Pfnür (2009):** Empirische Untersuchung der Nutzenwirkungen von PPP Projekten auf den Schulbetrieb am Beispiel der Schulen im Kreis Offenbach. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 16.

**Sigrun Wonneberger (2009):** Die Auswahl von Propertymanagement Dienstleistern – Ergebnisbericht zur empirischen Untersuchung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 17.

**Andreas Pfnür, Nikolas Müller, Sonja Weiland (2009):** Wirtschaftlichkeitsberechnungen von Klimaschutzinvestitionen in der Wohnungswirtschaft – Clusteranalyse und 25 Szenariofälle. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 18.

**Andreas Pfnür, Wulf Reclam, Fabian Heyden, Friedemann Kuppler, Julian Thiel (2010):** Status quo der Kernkompetenzen und Outsourcing-Aktivitäten in der deutschen Wohnungswirtschaft. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 19.

- 
- Michael G. Müller (2010):** Komparative Untersuchung der EU-REIT-Regime. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 20.
- Andreas Pfnür, Sonja Weiland (2010):** CREM 2010: Welche Rolle spielt der Nutzer? In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 21.
- Stephanie Heitel (2010):** Stadttrendite durch Wohnungsunternehmen – Analyse der Komponenten und Quantifizierungsmethoden. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 22.
- Arbeitskreis PPP im Management öffentlicher Immobilien im BPPP e.V. (2010):** Arbeitspapier und Handlungsempfehlungen – Qualität als kritischer Erfolgsfaktor der Wirtschaftlichkeit von Immobilien. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 23.
- Stephanie Heitel, Moritz Lohse, Michael Zahn, Andreas Pfnür, Manuela Damianakis (2011):** Wohnungswirtschaft im Wandel: Möglichkeiten und Grenzen öffentlicher Finanzierung in der Wohnraumversorgung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 24.
- Dirk Krupper (2011):** Immobilienproduktivität: Der Einfluss von Büroimmobilien auf Nutzerzufriedenheit und Produktivität. Eine empirische Studie am Beispiel ausgewählter Bürogebäude der TU Darmstadt. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 25.
- Damir Janßen-Tapken (2011):** Einsatz und Nutzen von ERP-Systemen im CREM – Eine empirische Studie am Beispiel des SAP ERP-Systems. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 26.
- Stephanie Heitel, Annette Kämpf-Dern, Andreas Pfnür (2012):** Nachhaltiges Management von Stakeholderbeziehungen kommunaler Wohnungsunternehmen. Eine empirische Untersuchung am Beispiel der bauverein AG Darmstadt. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 27.
- Andreas Pfnür, Nikolas Müller (2013):** Energetische Gebäudesanierung in Deutschland, Studie Teil II: Prognose der Kosten alternativer Sanierungsfahrpläne und Analyse der finanziellen Belastungen für Eigentümer und Mieter bis 2050. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 28.
- Sigrun Lüttringhaus (2014):** Outsourcing des Propertymanagements als Professional Service. Zusammenfassung der Ergebnisse der empirischen Untersuchung. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 29.

- 
- Kevin Meyer, Andreas Pfnür (2015):** Kognitive verzerrte Entscheidungen als Ursache für Ineffizienzen in der Immobilienprojektentwicklung. Managementorientierte Fassung der Ergebnisse einer empirischen Studie. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 30.
- Tobias Just, Andreas Pfnür, Christian Braun (2016):** Aurelis-Praxisstudie: Wie Corporates die Märkte und das Management für produktionsnahe Immobilien einschätzen. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 31.
- Nikolas D. Müller, Andreas Pfnür (2016):** Wirtschaftlichkeitsberechnungen bei verschärften energetischen Standards für Wohnungsneubauten aus den Perspektiven von Eigentümern und Mietern – Methodisches Vorgehen und Fallbeispiel. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 32.
- Andreas Pfnür, Bernadetta Winiewska, Bettina Mailach, Bert Oschatz (2016):** Dezentrale vs. zentrale Wärmeversorgung im deutschen Wärmemarkt – Vergleichende Studie aus energetischer und ökonomischer Sicht. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 33.
- Nikolas D. Müller, Andreas Pfnür (2017):** Konzeptionelle Ansätze zur Umsetzung der Energiewende im Gebäudesektor – Systematisierung und Diskussion alternativer Steuerungsindikatoren für die Energie- und Klimapolitik im Gebäudesektor. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 34.
- Andreas Pfnür, Julian Seger (2017):** Produktionsnahe Immobilien. Herausforderungen und Entwicklungsperspektiven aus Sicht von Corporates, Investoren und Dienstleistern. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 35.
- Wenke Bengtsson, Andreas Pfnür (2018):** Unrealistic optimism in the financing of large infrastructure projects in Europe - Results of a survey among private investors, public investors, and lenders. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 36.
- Andreas Pfnür, Benjamin Wagner (2018):** Transformation der Immobilienwirtschaft - Eine empirische Studie deutscher immobilienwirtschaftlicher Akteure. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 37.
- Anne Dörr, Andreas Pfnür (2019):** Auswahlprozess für eine Abwicklungsform bei Neubauten durch Non-Property Companies - Eine empirische Studie zu den Entscheidungskriterien und deren Gewichtung bei deutschen Unternehmen In: Andreas Pfnür

---

(Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 38.

**Felix Gauger, Andreas Pfnür, Jan Skarabi (2020):** Arbeitswelten im Wandel: Coworking Spaces - Eine empirische Befragung der Eigenschaften und Nutzerpräferenzen von Coworking Spaces In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 39.

**Andreas Pfnür (2020):** ZIA-CREM-Studie 2020 - Die Rolle der öffentlichen Hand in der immobilienwirtschaftlichen Transformation deutscher Unternehmen. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 40.

**Andreas Pfnür, Felix Gauger, Yassien Bachtal und Benjamin Wagner (2021):** Home-office im Interessenkonflikt. Ergebnisbericht einer empirischen Studie. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 41.

**Yassien Bachtal (2021):** Work organization and work psychology theories and models in the context of Work from Home – A literature-based overview. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 42.

**Benjamin Wagner (2021):** Strukturelle Veränderungen und Unternehmensanpassungen in der strategischen Managementforschung – Eine literaturbasierte Herleitung eines forschungsleitenden Begriffsverständnisses der immobilienwirtschaftlichen Transformation. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 43, Technische Universität Darmstadt.

**Klarissa Klotschke, Benjamin Wagner, Andreas Pfnür (2022):** Potentials and challenges of agile project management in real estate development. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 44, Technische Universität Darmstadt.

**Andreas Pfnür, Yassien Bachtal, Kyra Voll und Felix Gauger (2022):** Die ökonomische Trendwende in Richtung Energiesouveränität in der Wohnungswirtschaft – Eine empirische Befragung deutscher Haushalte. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 45, Technische Universität Darmstadt.

**Andreas Pfnür, Kyra Voll, Yassien Bachtal und Fabian Lachenmayer (2023):** So wohnen wir in Zukunft: Wie die Digitalisierung das Wohnen verändert – Empirische Studie bei privaten Haushalten. In: Andreas Pfnür (Hrsg.), Arbeitspapiere zur immobilienwirtschaftlichen Forschung und Praxis, Band Nr. 46, Technische Universität Darmstadt.