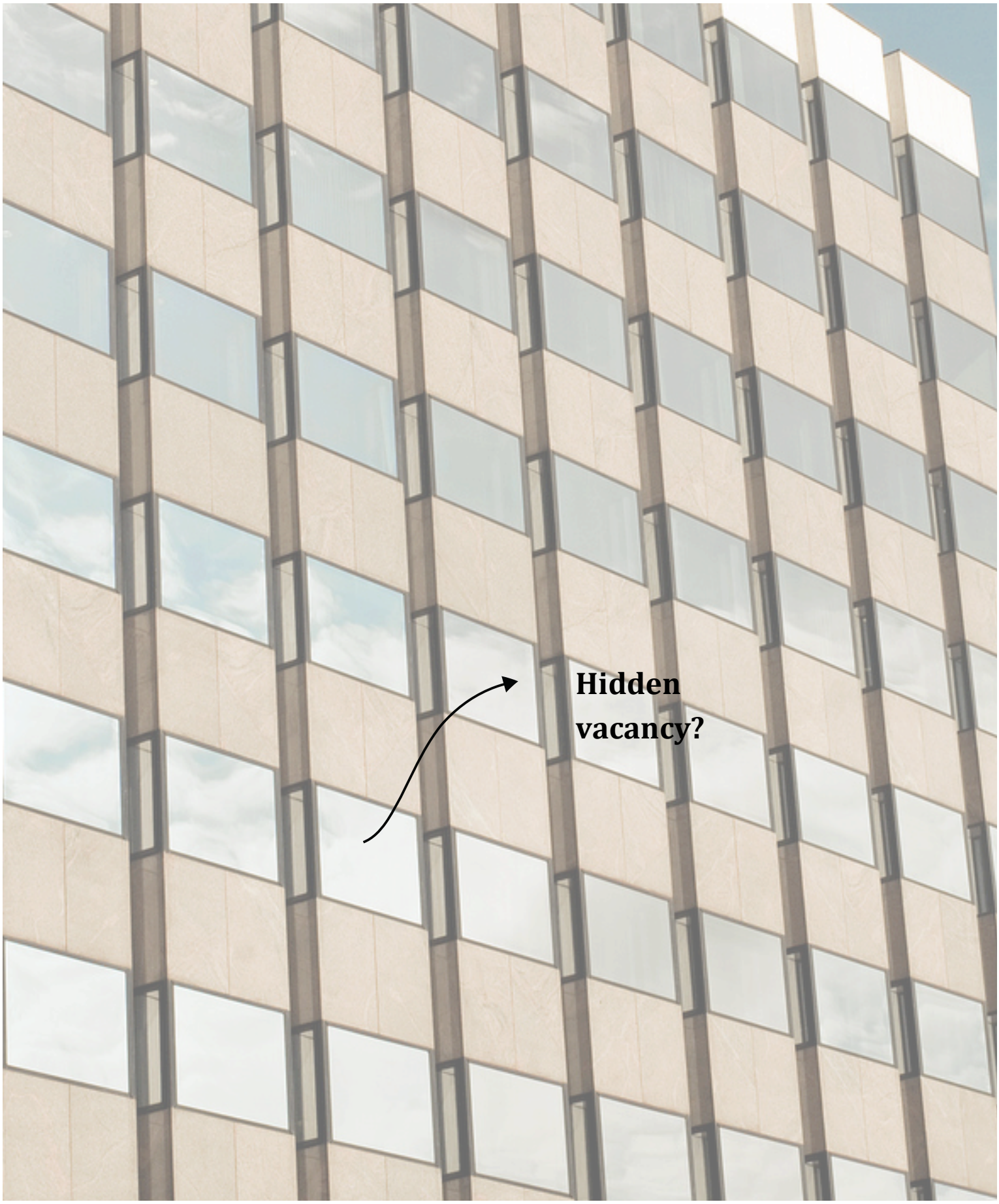
Hidden vacancy

The occurrence, causes and consequences



Colofon

Master Thesis
Hidden vacancy

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Preface

This thesis report is the final result of the Master of Science graduation project of the Real Estate & Housing specialization study program at the Faculty of Architecture of the Delft University of Technology. The study is performed in the domain Real Estate Management.

This study has been carried out with the help of the Delft University of Technology and the research department of Savills. I would like to thank both organizations for offering me the opportunity to conduct this study.

Many people helped and supported me during this project. In this preface I want to pay tribute to them. My first sincere words of gratitude go to my supervisors Hilde Remøy and Philip Koppels of the Delft University of Technology and to Jeroen Jansen of Savills Amsterdam. Without the mentoring of their side the result of this thesis would not have been the same. They supported me with critical remarks on the structure and setup of the research during the several stages. In addition they took the time to read the thesis several times. It was a pleasure to work with you.

A second word of thanks goes to the people that supported me at different stages of my thesis. Thanks Clementine Lokhorst, Rens Oosthoek, Piet Honig and Naomi Evers for reading parts of this thesis and for checking the spelling and grammar. I also want to thank the many friends that supported me during the thesis process and kept me motivated.

At last I want to thank my family and friends for all the support and encouragement during my study and the entire graduation process.

I hope you enjoy reading " Hidden Vacancy"!

Joëlle Lokhorst

Delft, 12 April 2013

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Executive summary

"The art of life is a constant readjustment to our surroudings" (Kakuzo Okakaura)

The Dutch office market is characterized by a large supply of office space and a high vacancy of 14,6 per cent (DTZ, 2013) due to a structural mismatch between supply and demand. On top of the normal and extended vacancy there is also an unregistered vacancy created by tenants and user-owners (NFC, 2011). This so-called hidden vacancy in the office market could be larger than the office owners register now. Tenants face a hidden oversupply of square meters in the market once the leases come to an end (Jongsma, 2011). Current space consumption reflects past demand which depends on past rental rates and past expectations of required space during the course of the contract. It does not reflect the current rental rates and current need of space (Gunnelin, 2005). This research has focused on the difference between the current office space occupancy and the actual current space demand at the prevailing market rent.

Methodology

Quantitative data about hidden vacancy are scarce. Experience, intuition and other qualitative information are equally important for studying hidden vacancy especially as in changing markets (US-Census-bureau, 2005). Therefore a combination of quantitative research and qualitative research is applied in this research.

The quantative part of this research is based on a survey completed by a total of 104 office users. The survey consisted of questions about lettable floor area (LFA), full-time equivalent (FTE), office concept and contract duration. These data were gathered at two different moments in time, at the start of the contract (past), and at the moment the survey was filled out (2012). For 2012, data were required for the current demand and supply. This current demand was defined as the number of square meters the respondents needed if the contract were to end or the office would be sold that very moment. The qualitative part of the research consisted of interviews about a wide range of topics concerning housing management. A total of thirteen interviews, six unstructured expert interviews and seven in-depth interviews, were recorded..

Results

The survey data show a significant difference between hidden vacancy among large and small companies. The different rates for hidden vacancy per size group are shown in Figure 1. The percentage of the companies indicating oversupply or undersupply of office space is presented in Figure 2. 93 per cent of the companies with more than 1000 employees indicate that they have hidden vacancy compared to 30 percent of the companies with 10 till 50 employees. There is no significant difference between hidden vacancy among sectors.

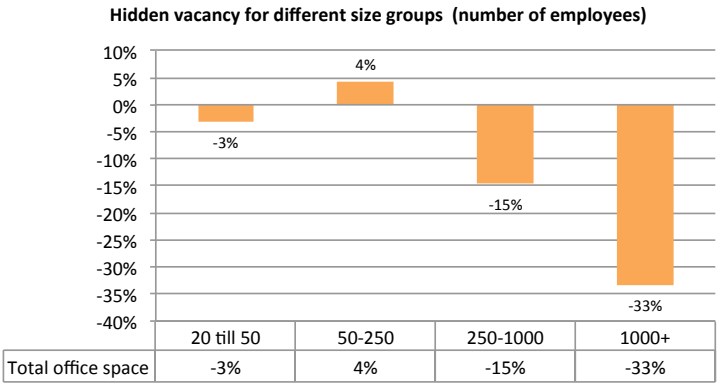


Figure 1: Hidden vacancy for different company sizes

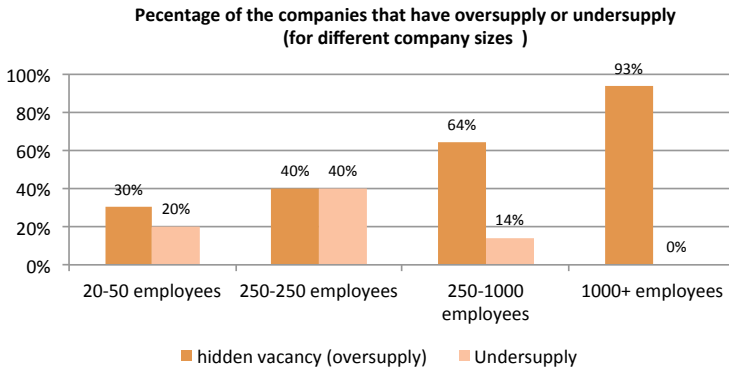


Figure 2: Percentage of the companies that have oversupply or undersupply for the different company sizes

Only 2% of the total number of companies with more than 20 employees in the Netherlands consists of companies with more than 1000 employees. To be able to draw conclusions about the total office market the data from the survey have been divided according to the CBS data (CBS, 2012). The different values per size group are shown in Table 1. This table also illustrates that the use of space per full-time equivalent is more efficient in larger companies than in smaller ones. The figures even show a future increase of this difference.

Categories	Current office stock					Differences supply-demand		
Employees	**Freq***	**N.**	**Total LFA**	**Total FTE**	**LFA/FTE**	**LFA**	**FTE**	**LFA/FTE**
20 till 50	55%*	10,000	9,590,000	306,000	31	-3%	10%	-12%
50-250	35%*	6,400	15,610,000	684,000	23	4%	19%	-12%
250-1000	7%*	1,300	11,870,000	617,000	19	-15%	5%	-18%
1000+	2%*	360	11,760,000	690,000	17	-33%	-9%	-27%

*Table 1: Differences per group * (CBS, 2012)*

The main cause for hidden vacancy in the office market are new ways of working. In average companies the open office concept will increase with an average of 26 per cent. The number of cellular office concept will decrease over the next years with an average of 25 per cent per company.

The results of the survey illustrate a clear tendency towards a more efficient use of office space, but this is not a rapid development. The interview analyses show that new ways of working often depend on top-down decision making. The fact that the public sector is gradually using office space more efficiently (Rijksoverheid, 2011) indicates that even more conservative companies will apply the new ways of working although it is mainly a big company affair.
The total hidden vacancy in the office market in the Netherlands varies between 6 and 16 per cent of the total office stock among companies with more than 20 employees (Table 2).

Categories	Office space per employee		Differences supply-demand office space	
Employees	**LFA/FTE 2012**	**LFA/FTE demand**	**LFA bandwidth 1**	**LFA bandwidth 2**
Total	21.0 sqm	18,7-16,6 sqm	-6%	-16%

Table 2: Total hidden vacancy * (CBS, 2012)

It is necessary to calculate of the effects of this hidden vacancy on the total future vacancy rate information at the time leasing contracts are ended. The survey data show that 80 per cent of the office users' leasing contracts end before 2019. Apart from this, DO research states the total of newly built offices is around 400,000 square meters in 2013 (DO, 2013). For the period of 2014 till 2017 the same amount of newly built office space is assumed. Bak data have been used for the extraction of the office stock per year (Bak, 2012). In 2010, the extraction figures of offices consisted of 244,000 square meters. Because of government initiatives, an extraction of 300,000 square meters per year is predicted. In total, the office stock will increase by 500,000 square meters till 2018.

Not all companies will be able to prevent any oversupply of office space at the end of their leasing contract by means of subleasing. Some are limited to specific locations because of their history, core business or the influence of employees on their policy. If 75 per cent of the office users are able to prevent hidden vacancy at the end of their contracts the vacancy rate will increase to between 19 and 24 per cent of the total office stock in 2018. This means that the vacancy rate of 14.6 per cent in 2012 will increase by 28 to 63 per cent in the next five years.

In Figure 3 the vacancy rates till 2018 are shown for a current hidden vacancy rate of 6 and 16 per cent based on the same calculation.

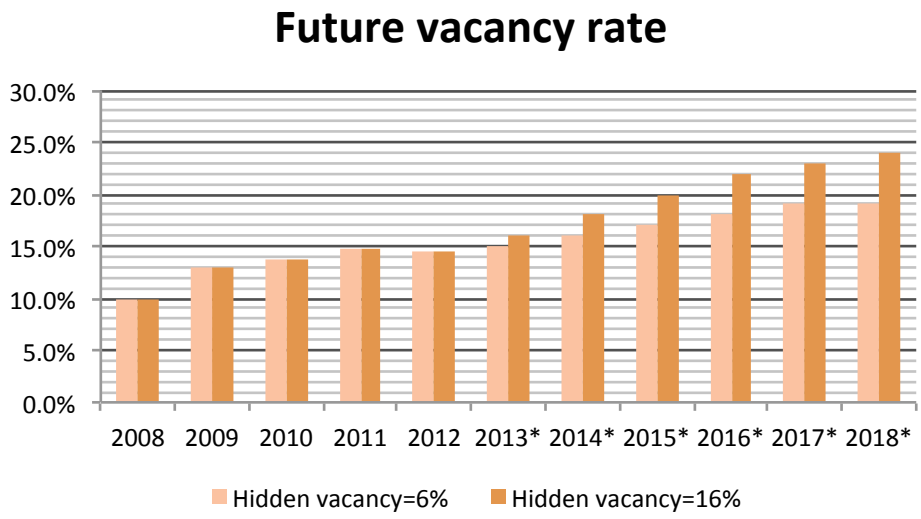


*Figure 3: Expected future vacancy rate (for 2008-2012 (Bak, 2012)) *expectation*

The vacancy rate will increase most during the next three years and its growth will level off after 2018 as the majority of leasing contracts will be ended by that time. However, if the demand for more efficient use of space per employee increases, the vacancy rate will continue to grow after 2018. Because by that time the new leasing contracts will also reach their end.

Conclusion

The vacancy rate will grow to between 19 and 24 per cent of the office stock in 2018 because of the momentary oversupply of office space among users. The most important cause for this decrease is the demand for more efficient use of office space. Even companies short of office

space want to bring down their average office space per employee. This is due to new working concepts which influence the demand for space.

The vacancy rate can be minimized if relocation in the office market grows whereas the number of newly built offices will decrease to a minimum. Renewal is still recommended with a continuously changing demand in offices. There is a growing demand for flexible offices for multi-tenant use.

1 Research Setup

In this chapter the set up of research will be discussed. The introduction outlined the topic of this research to the reader. This chapter presents the outline of the research. The topics discussed in this chapter are: the definition (chapter 1.1), the problem of the study (chapter 1.2), the research questions of the study (chapter 1.3), the relevance of the study (chapter 1.4) and the conceptual model of the study (chapter 1.5).

1.1 HIDDEN VACANCY?

Figure 4: Newspaper articles about office vacancy in 2010 (Steinmaier, 2011)

The office market is characterized by a very large supply and a high vacancy rate (Figure 4). Figures from DTZ Zadelhoff (DTZ, 2013) show that there is a vacancy rate of 14,6 % of the total supply of 49 million square meters office space in the Netherlands in 2012. There is a structural mismatch between supply and demand. Since 2001 this structural mismatch of office space has risen to unprecedented levels. Because of the decrease of labor force and the impact of the new way of working DTZ expects that less office space will be used in the future.

The oversupply of office space by the tenant and user-owner that is not registered as vacancy in the office market is called hidden vacancy (NFC, 2011). The expectation is that the termination of the lease-contracts of the hidden vacancy will lead to a growth in the registered vacancy. This is next to the effect of new buildings minus the extraction of the stock because of absorption, transformation and demolition. The hidden vacancy on the office market may be larger than the landlords register now. Tenants face a hidden oversupply on square meters in the market once the leases come to a end (Jongsma, 2011). Thus current space consumption reflects past demand which depends on past rental rates

and past expectations of space need over the course of the contract rather than on the current rent and current need of space (Gunnelin, 2005). This report focuses on this hidden phenomenon and its effects.

There are several definitions and causes of hidden vacancy being formulated in the literature:

- "Hidden vacancy" is the difference between space occupancy and demand at the current lease rate (Gunnelin, 2005).
- Hidden vacancy is empty office space not on the market; unavailable vacancy (Doornaerdt, 2009).
- Hidden vacancy is workplaces of companies and organizations which is unoccupied (DTZ, 2011). The hidden vacancy estimates DTZ on circa 2 million square meters.
- Hidden vacancy are the leased square meters which are not in use, because of the decrease of office jobs. DTZ estimated that 600.000 square meters is hidden vacant which is 1,5 per cent of the office space (Ginkel, 2010).
- Shadow office space is office area leased by tenants but which is neither being used nor marketed for sublease. It occurs when companies lay off workers faster than they can downsize their space (Hersler, 2010).

The definition of hidden vacancy has to be measurable to make research applicable to relevance and occasion. Furthermore it has to say something about the current mismatch in the office market in the Netherlands. This makes it possible to map the effects of hidden vacancy on the office market. The chosen definition is related to definitions in literature. As a result people from the field recognize it and have a clear idea about what hidden vacancy means. Hidden vacancy can be seen as a mismatch between demand and supply. This research seeks to investigate this mismatch. The definition of hidden vacancy used in this research is most related to the definition formulated in the report of Gunnelin (Gunnelin, 2005). In his definition all the important aspects are incorporated

Hidden vacancy: the difference between the current office space occupancy and current space demand at the prevailing market rent.

The definition used in this report is schematically shown in Figure 5**.**

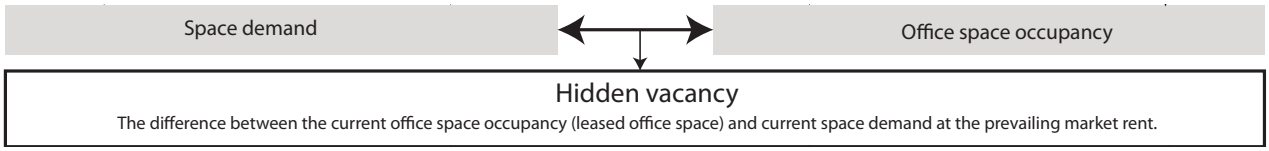


Figure 5: Definition of hidden vacancy

1.2 PROBLEM

Problem Definition: There are big changes going on in organizations and in the office market. Examples are concentration of businesses, changing working force and the new way of working. There is less demand for office space. This is visible in the total amount of regristered vacancy but also in the amount of hidden vacancy. This hidden vacancy can cause even higher vacancy rates then are regristered at the moment. Also the absortion pattern will be delayed when there is an upcoming of the economy.

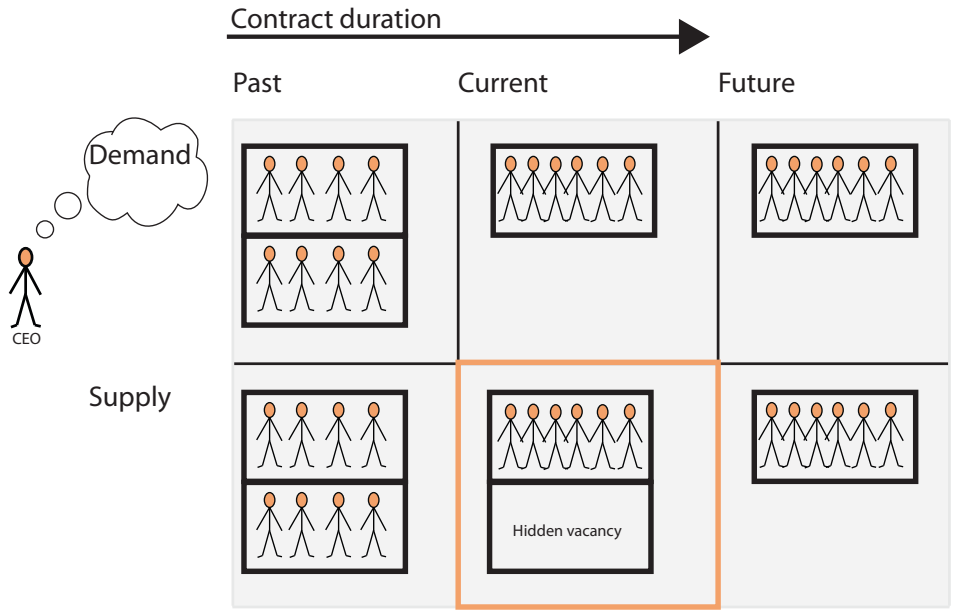
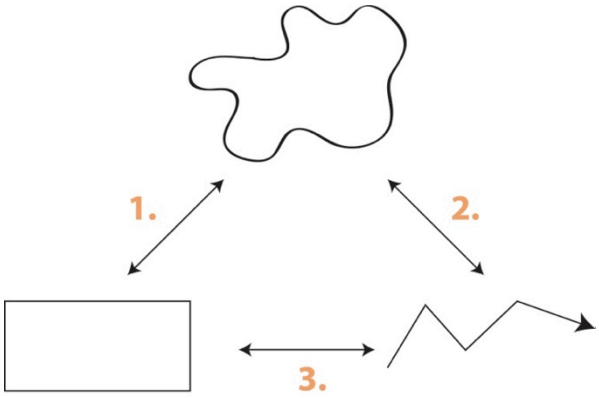


Figure 6 Problem definition

Hidden vacancy can result in future vacancy when the office user will avert their oversupply in new rental contracts or when the organization moves to a new office (Figure 6). This will influence all the actors in the office market. The office user and the owner play the major roles in this process.

Office market, building and organization

A distinction is made between building, organization and the office market (economy) to image the involved stakeholders. The mutual relationship is essential to explore hidden vacancy in the office market (Figure 7). A changing behavior of one of the three variables can result in a mismatch between supply and demand.



1. Building – Organization -> Alternative working strategies
2. Office market – Organization -> New Economy - number of employees
3. Building – Office market -> New economy – rent prices & vacancy

Figure 7: Stakeholder Scheme

DESTEP analysis

A tool to identify external trends and developments is the so-called DESTEP analysis. DESTEP stands for demographic, economic, socio-cultural, technological, ecological, and political. On the basis of the six DESTEP factors it is possible to get a picture of the current and future environment. This serves as input for the determination of the demand in the medium and long term. With this analysis the problem can be mapped.

Demographic	Economic	Political (& Legal)	Technologic	Social (& Cultural)	Ecological
Changing working force	Office vacancy rate	New government	New way of working	New generation	Sustainable use of space
Shrinkage	Economic crisis	Contract	Social media		
Globalization			Mobility		
Total number of FTE	Uncertainty	Flexible rental contracts	Flexible working	Goal orientated working	Space per FTE
Outsourcing	Price elasticity		Space per FTE	Flexible working	
	Less investments				

Table 3: DESTEP Anaysis

Conceptual model

DAS Frame

The conceptual model in Figure 8 is linked to the DAS Frame, the Designing an Accommodation Strategy model (Jonge, Arkensteijn et al., 2008). It is possible to show the current and future demand and the current and future supply in one model with this method. This model encourages to make the mismatches clear and to visualize the ultimate future supply. In the different parts of this study this model will return with different contents suitable to the corresponding (sub) study.

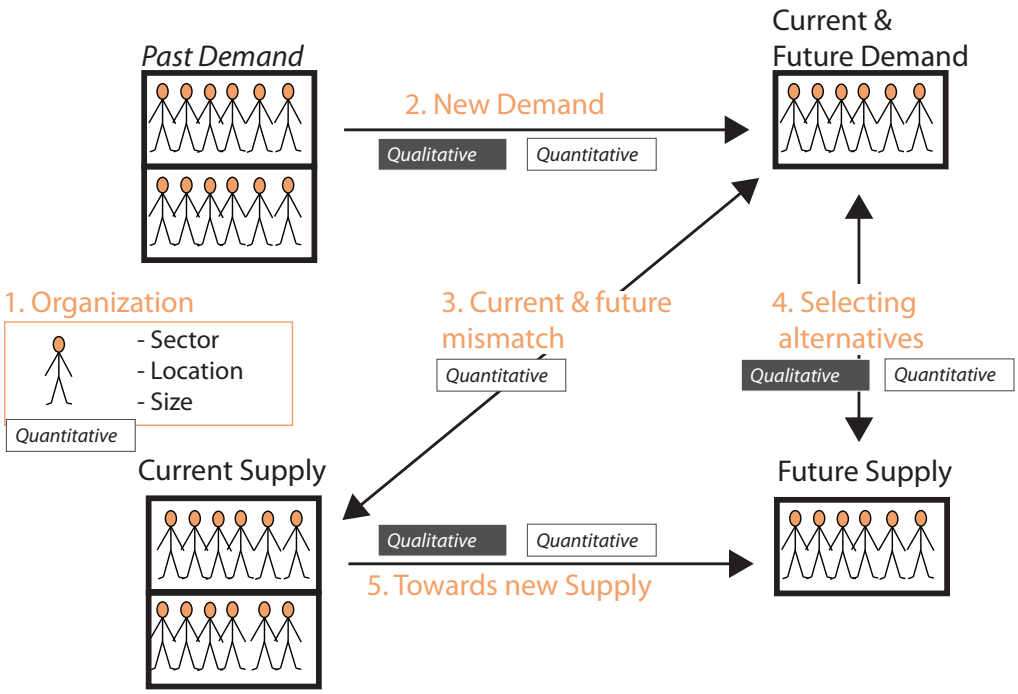


Figure 8: Conceptual model, adapted DAS-Frame (Jonge, Arkensteijn et al., 2008)

1.3 RESEARCH QUESTIONS

The objective for this research is to explore the hidden vacancy in the office market in the Netherlands and to explore what the effects can be for the end-user and on the office market.

The main research question is: ***What are the opportunities and threats of hidden vacancy for the office market in the Netherlands?***

The Research question will be answered with the following questions:
1. In what way do type of characteristics (size, location and sector) differ significantly in their quantitative demand for office space?

2. In what way has the new way of working and the new economy influence on the demand for office space?
- Quantitative: Is the LFA/FTE and the number of FTE significant changed since the start of the contract?
- Qualitative: In what way does the new way of working and the new economy influence the organization?

3. What is the quantitative mismatch between the current office demand and the current office supply?

4. What are the alternatives in which the office supply can react on the changing office demand?
- Quantitative: In what extent do office users in the Netherlands use alternatives (subleasing and moving) in which the office supply can react on the changing office demand?

- Qualitative: What are the pros and cons of the several alternatives in which the office supply can react on the changing demand?

5. What are the restrictions and influences on the steps towards a new office supply?
- Quantitative: What are quantitative restrictions and influences on the steps towards a new office supply?
- Qualitative: What are the restrictions and influences on the steps towards a new office supply?

1.4 RELEVANCE

Academic relevance

This study links with several graduation theses. Of interest is the study of Hendrikx (2012) on the moving motives of office users. This study is related to the study of Yassine Zaghdoud. He studies to the moving motives of office users related to previous researches. Furthermore Hegeman (2011) describes in his study the match of housing preferences with different users. The study of Mees Besselaar (2011) describes the determinants of structural vacancy in the office market in Amsterdam.
Much research is done on issues concerning structural vacancy and moving motives of users in the office market. So far there is not much research available about the occurrence, causes and consequences of hidden vacancy. The emergence of unutilized shadow space accumulates out of view of the vacancy statistics. Meanwhile it can have serious effects on the future office market and the future office user. The studies on office user preference are useful for this research. This study combines studies of office user preference and descriptive research to hidden vacancy. It seeks to map the effects of hidden vacancy for the office market and end user in a scientific way.

Social relevance

Vacancy has social influence on an area. Remoy (2010) states in a PhdD report that office users assume that a concentration of structurally vacant offices results in an impoverishment of an area. It will give the environment a negative image. Next to this vacancy can cause a negative image on the establishment climate of an office market and can deteriorate the (international) competitive position as an attractive office location (Zuideman, 2010). A study of Koppels, Remoy and Messaki (Koppels, Remøy et al., 2011) shows that the rents of used office buildings decline in areas with increasing structural vacancy rates. An increase of a structural vacancy of 10,000 square meters results in a decline of 1,6 per cent of the rental price in the radius of 500 meters. This could create a negative spiral that results in a less attractive business location. Moreover the returns (of for instance pension funds) will decrease incredible which will lead to a huge social problem (Jong, 2012). The problem of the negative image of the neigbourhood is a local social problem.

Utility for practice

The worth of the total registered vacant office space is estimated to be more than 80 thousand million euro, of which nearly 50 thousand million euro is in the hands of investors (Steinmaier, 2011). 42 per cent of the office investments is performed by Dutch and foreigner pension funds and other institutional investors. Stock funds like NSI and Vastned

O/I, have big Dutch Office portfolios. But also private investors are active on the office market. Developments on the Dutch office market touch the savings and pension assets of the average Dutchman.
Thus the office market is important, not only for the investors, but also for developers and builders. In recent years, 500.000 till 1 million square meters office space is developed each year. This represents around 2.500 million euro production annually (Steinmaier, 2011).
There are two main trends that are shown in the office market, the expected decline of working force and the possible declining of the office use per employee. In what way these trends will be continued is unsure (Wijntuin, 2012). With making the hidden vacancy more visible, it is possible to get a better image of these trends.
Further, Due to the presence of hidden space, reported vacancy rates understate the true number of total effective vacancy. Instead of expanding into new space and decreasing the vacancy as hiring picks up, tenants holding onto shadow space can simply absorb their own needs within their existing spaces. This will dampen the demand for space that job gains would otherwise generate, which delaying the market tightening required to drive rent growth recovery. While this phenomenon is not unique to this cycle, more hidden space has accumulated since 2007 than occurred during the dot-com bust (Hersler, 2010).

The worth of the total registered vacant office space is estimated to be more than 80 thousand million euro of which nearly 50 thousand million euro is in the hands of investors (Steinmaier, 2011). Dutch and foreigner pension funds and other institutional investors are involved in 42 per cent of the office investments. Stock funds like NSI and Vastned O/I have big Dutch Office portfolios. But also private investors are active on the office market. Developments on the Dutch office market touch the savings and pension assets of the average Dutchman.
Thus the office market is of a major importance not only for the investors but also for developers and builders. In recent years 500.000 to 1 million square meters office space is developed each year. This represents around 2.500 million euro production annually (Steinmaier, 2011).
Two main trends are shown in the office market: the expected decline of working force and the possible declining of the office use per employee. In what way these trends will be continued is unsure (Wijntuin, 2012). It is possible to get a better image of these trends when the hidden vacancy is made more visible.
Furthermore the presence of hidden space leads to underestimation of the true number of total effective vacancy. As explained above the reported vacancy is not to low. As hiring expands tenants that hold on shadow space instead of expand into new space can simply absorb their own needs within their existing spaces. This development will dampen the demand for space that job gains would otherwise generate. This in turn tightens the market required to drive rent growth recovery. While this phenomenon is not unique to this cycle more hidden space has accumulated since 2007 than occurred during the dot-com bust.

1.5 RESEARCH ORGANIZATION

In Figure 9 the research organization is shown. There are not many studies done on hidden vacancy. However there is research about the office market, alternative working strategies (the new way of working) and office user preferences. These will be used for the theoretical research (Chapter 2). Current developments, trends and researches that are already

conducted can give a good idea about the causes and effects of the mismatch on the office market, organization and building and will form the conceptual model of hidden vacancy.
More information about the occurrence and effect of hidden vacancy can be obtained by doing an empirical research. This empirical research is divided into two parts; in a quantitative study and in a qualitative study.
In the quantitative part a survey will be made. The conclusions of the theoretical study in which the office market will be examined support this survey. The main objective is to get an idea about the occurrence of hidden vacancy in the office market in the Netherlands. The qualitative part is a study specifically orientated on several different end-users. The effects of hidden vacancy will be studied in more detail. Also some solutions are formulated. In the end conclusions of both studies are be made and will be reflected.

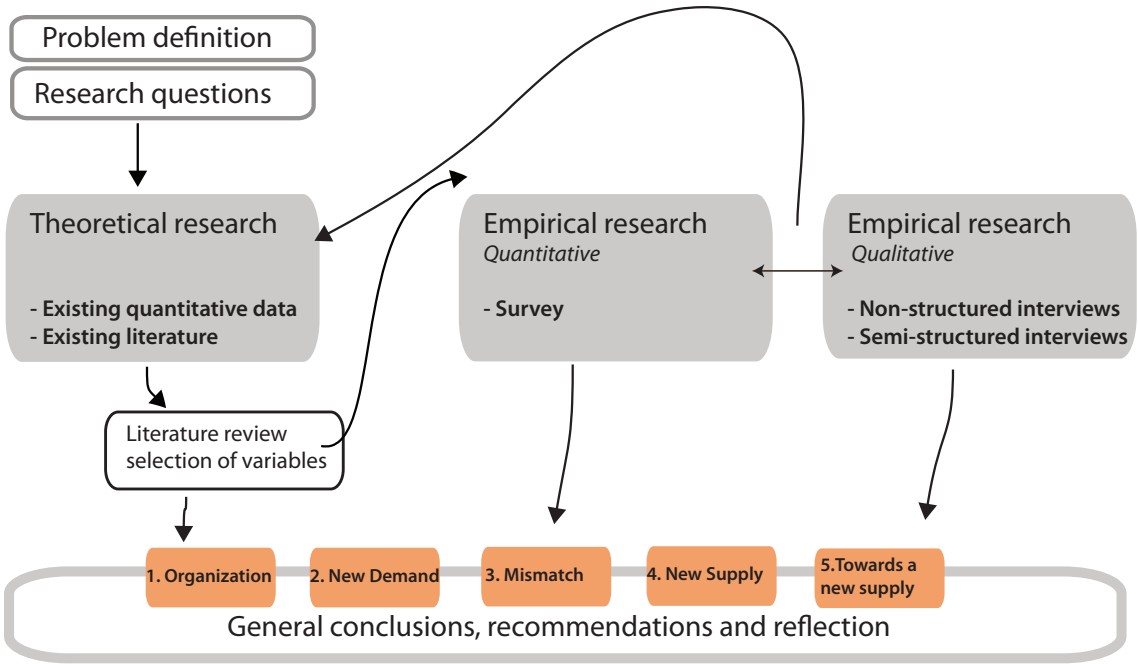


Figure 9: Research organization & general planning

2 Theoretical exploration

This chapter presents the theoretical exploration. The conceptual model (Figure 10) is adjusted to the theoretical research. The topics discussed in this chapter are; the organization (chapter 2.1), the new demand, where the new economy and the new way of working will be described (chapter 2.2), the future supply, where subleasing and moving motives will be discussed, (chapter 2.3) and themes concerning the steps towards a new supply as forecasting, building-user relations, facility management and contracts (chapter 2.4).

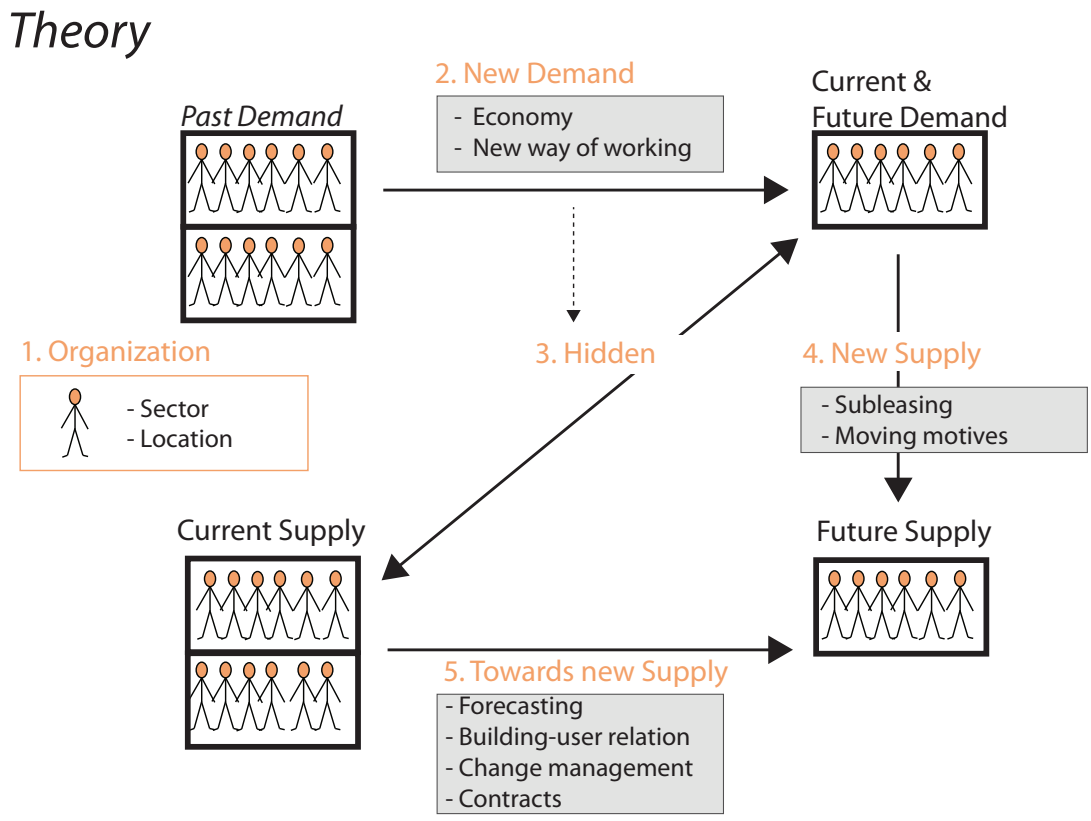


Figure 10: Conceptual model Theory

In the following table the subtopics which will be described in the theoretical chapters are related to the causes of hidden vacancy.

Theme	Subtheme	Space demand		Space supply	
		1.Organization	2.New demand	4.New supply	5.Towards future supply
Macro developments	Globalization		2.2.1		
	Sustainability		2.2.2		
Economy	Price elasticity				2.4.3
	Costs reduction		2.2.2		
	Absorption pattern				2.4.3
Contracts	Ownership vs lease				2.4.3
	Flexible contracts				2.4.3
Subleasing	Subleasing			2.3.1	
Location/building	Building type				2.4.2
	Consolidation of accommodation	2.1.2			
	Lifespan of building				2.4.2
	Mobility	2.1.1	2.2.2		
Flexibility	New way of working		2.2.2		
	New technologies		2.2.2		
	Building-user relationship				2.4.2
	Building flexibility				2.4.2
Employees	Demographics		2.2.1		
	Shrinkage		2.2.1		
	Working force		2.2.1		
	New generation		2.2.2		
	Employee satisfaction		2.2.2		
Housing management	Facility management				2.4.3
	Accommodation strategy				2.4.3

Table 4: Themes which are described in the theoretical framework

2.1 ORGANIZATION

2.1.1 Sector

There are several sectors that have different office space absorption and job growth rate caused by the economic cycles (Steinmaier, 2011). These different sectors are shown in figure 8.

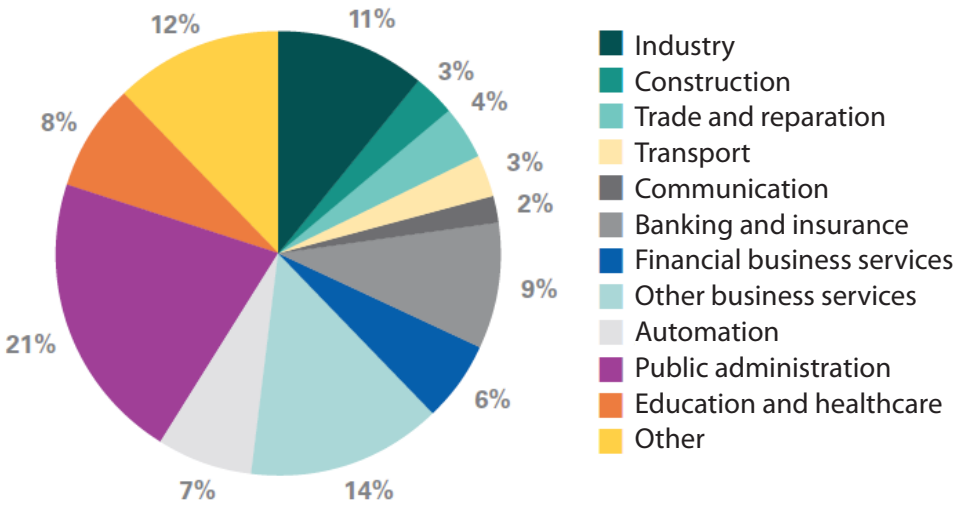


Figure 11: Absorption office space 2002-2009 to sectors in percentage (Steinmaier, 2011)

2.1.2 Location

Jones Lang Lasalle (JLL, 2008) conducted a research on space characteristics of eight global companies and their own portfolio. This survey concerned in total a quantity of nearly 4 million gross square meters of corporate office space across the globe. These were located in a total of 583 buildings ranging from about 93 square meters to over 140.000 square meter. It appears that space use density varied dramatically when measured by location and building type. City building occupants have an averaged of 24,8 square meters per person and 20,5 square meters per seat. Suburban workers fill roughly 50 per cent more space i.e. 38,9 square meters per person and 30,1 square meters per seat. Clearly there is less hidden vacancy and more efficient office layouts in downtown locations. Also density space savings are much greater in high-rise versus low-rise buildings i.e. 30,1 square meters per person and 22,7 square meters per seat in high-rises, compared to 38,0 square meters per person and 29,2 square meters per seat in low-rise buildings.
These facts can have influence when a company moves from a low-rise building or downtown location to a high-rise building or a suburban location.

Several studies like a study focusing on structural vacancy in the Dutch national context (Sprakel and Vink, 2007) and another study aimed at the situation in Amsterdam show a concentration of structural vacancy in both monofunctional office locations and in office locations with a mix of distribution and industrial functions (Remoy, 2010). The accessibility by car as well as the status and accessibility of the public transport seems to be more important for the preference of office users. The status and the level of facilities of the location are more important characteristics for explaining structural vacancy. Location characteristics however were found to have less effect than building characteristics using logistic regressions to study the effect of physical characteristics on the odds of structural vacancy (Remoy, 2010). The research of Koppels (Koppels et al. 2007; Koppels et al. 2009 cited in Remoy 2010) reveals that location characteristics have highest influence on the rent level. Hence as location characteristics explain to a great extent the rent level, office organizations select a suitable location on the building characteristics that are found to be best suitable for the organization after selecting a market segment and location. In summary, location characteristics that increase the odds of structural vacancy are:

- Monofunctionality
- Lack of status
- Lack of facilities

In the study of Hesler (Hersler, 2010) it is shown that strong locations have less hidden vacancy. In general, metros having low proportions of hidden vacancy relative to total inventory coincide with those having stronger outlooks in market fundamentals during the recovery, examples which are named are Boston, New York, San Francisco and Washington DC, these areas are driven by the technology and finance sectors. Those with the highest ratios of hidden vacancy to inventory are those where housing and construction hit deepest leaving market fundamentals more out of line such as Atlanta, Fort Lauderdale, Oakland, Phoenix and Sacramento. Hersler concluded that in general, the impact of hidden vacancy is of less concern in stronger metros than weaker ones and typically parallels overall market fundamentals strength (Hersler, 2010).

There is a change of office location between 1999 and 2009 as described in the office supply figures of Bak (Bak, 2011). In 2009 34 per cent of the office supply is located in an office area while this was 29 per cent in 1999. Furthermore a pull out of the central locations in the city is shown. In 1999 32 per cent of the office supply was located in the city center whereas this percentage was 28 in 2009. More office parks were realized between 1999 and 2009. This trend is also visible when the figures of newly built offices in the office parks are considered. This is a declining line since 2006, while the declining line for central locations started in 2007/2008.

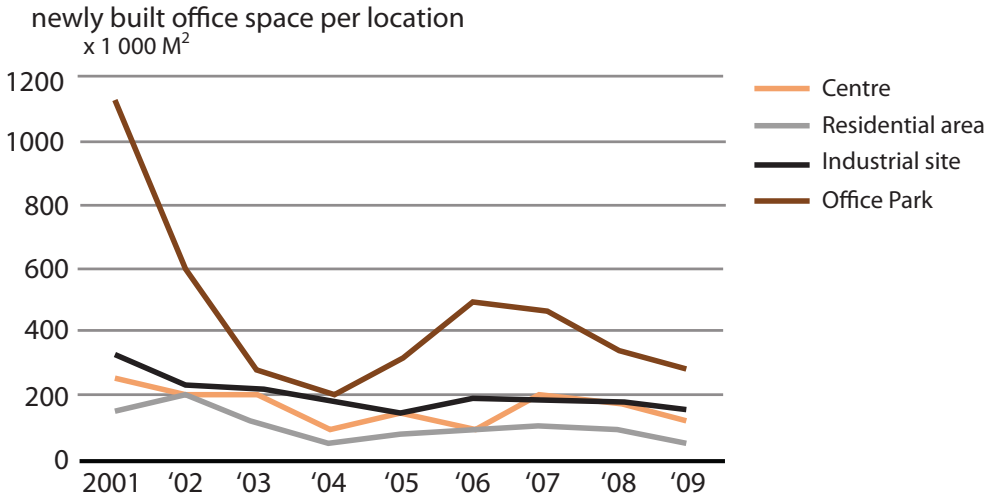


Figure 12 newly built office space per location (Bak, 2011)

The use of office space in A-, B- and C-locations is shown in the figure below. For A-locations (public transport location in a city center, nearby central station, less accessible with car) there is an upward trend since 2009. Since 2008 there is a steep decline of office use in B-locations (mixed public transport location and car location, nearby a suburb train station or close to a node with high quality public transport, fast connection with the main road network and has good parking possibilities). The use of office space in C-locations (a car location on the edge of the city with a direct connection to the main road network, most of the time less connectable with public transport) is rising since 2006 (Bak, 2011) (Figure 13).

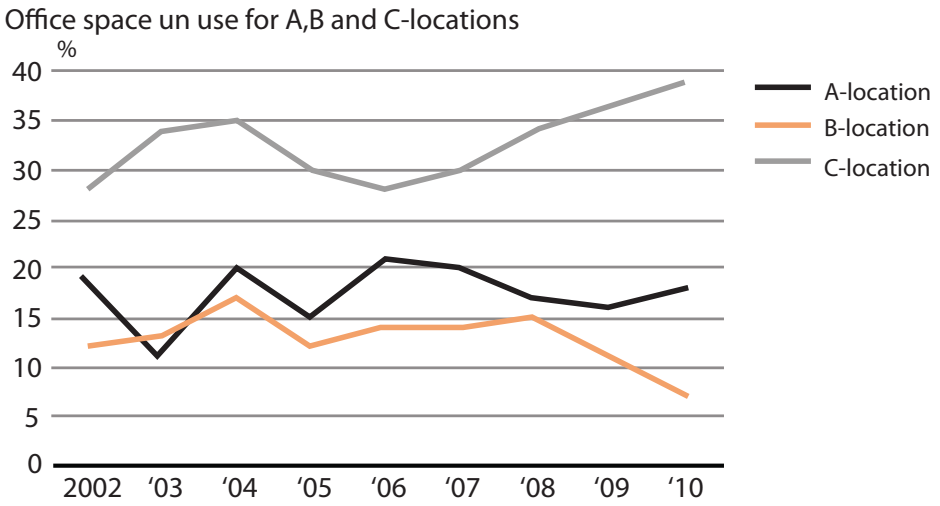


Figure 13: Office space in use for A, B and C-location (Bak, 2011)

Remarkable is the development on the leasing rent. The rent of business locations is nearly doubled between 1995 and 2001 partly as a result of the restrictive policy in this period. This policy was released in 2001. The strong underlying working force growth and the created scarcity in the market resulted in a process of building new offices on a big scale (Zuideman, 2010). The broad market has an impact on the office rents that strongly decreased after the peak in 2001 and did not reach that high level anymore to date (Zuideman, 2010)

2.2 NEW DEMAND

2.2.1 New economy

The market mechanism

Respect for the influence of the market mechanism dates back to the classical economists. They emphasized how prices and wages continually adjust to keep the general levels of supply and demand in balance. Adam Smith was one of the founding fathers of economics (cited in Myers 2011). He stated that a market-based economy could be regarded as a product of natural order since market prices act as signals that guide human endeavour.

Derived demand emphasizes that commercial property is rented or purchased not because it gives satisfaction, but because the property can be used to produce goods or services that can be sold at a profit.
Investments in commercial property depends therefore on the expectation that the users (the occupiers) will make profits in the future. If business confidence is low investment will not take place. This is the case even when there is current demand for an increase in production or sales. The factors affecting demand for commercial buildings are largely dependent on the state of the economy and the business expectations concerning output and profit (US-Census-bureau, 2005). In other words, because demand is derived, it is dependent on many things other than price.

As might be expected fluctuations in construction output and property markets share a similar pattern to the broader economy. They refer to respectively building and property

cycles. Economists have a long history of studying these specialized cycles in order to gain a better understanding of business fluctuations. However the symmetry between business fluctuations and building and property cycles is complicated by the following. Decrease in the economic development is usually associated with a shift from investment in new construction to spending on repair and maintenance. In other words as GDP increases the proportion of new construction work decreases. There is an inevitable decline in the share of construction in GDP as economies mature. In fact it has been observed that newly developing countries experience as much as double the rate of expenditure on construction than their more developed counterparts. Another notable comparison between the construction and property sectors and the rest of the economy is that building and property cycles have shown far greater amplitude than the equivalent cycles in general business activity. Therefore periods of decline and expansion are far more rapid in these markets than in the general economy. This can be seen in Figure 14 where the annual percentage change in construction is plotted against the annual percentage change in the whole economy. The comparison clarifies two points. Both the economy as the construction industry experienced positive rates of growth from 2000 to 2007. Furthermore the rate of change is far more volatile and direct responding in the construction sector than the general economy is. The general economy did not arrive at a negative position until the following year (US-Census-bureau, 2005). This is highlighted in figure 12 with the negative figure in 2008 for the construction industry.

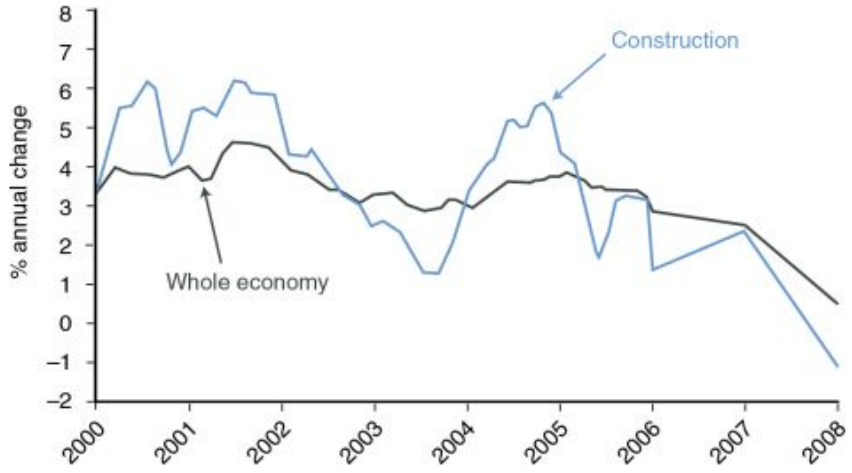


Figure 14: Changes in economic activity 2000-2008 (US-Census-bureau, 2005)

Office market and vacancy

The supply side of the construction market includes labor and production capacity, design, building, finance, maintain, know how and services. Free market conditions under European constraints do not guarantee that this supply side of the construction market matches well with changing demand characteristics (Figure 15). The latter are influenced by building for a changing society and economy, for modernization of the stock of buildings by replacement and renovation and for sustainability. Analysis and modeling of market development and market interdependencies provide for a better understanding of real estate in terms of economic context and past and future development (Ruddock, 2009).

At first this resulted in a period of restraint of the municipality, investors and project developers and scarcity. Followed by big scale initiatives to develop new offices 'on risk'. Around 80 per cent of the new offices were developed without a user in front (Bak, 2010,

cited in Hendrixk 2012). This can be explained by the growing working force in the service sector between 1990 and 2005. This growth resulted in an increase in demand for office space. The shift of working force to office-based activities resulted in sufficient filling of all the new buildings. When the economy went through a rapid growth in 2001 it took some time before the buildings still in development were in the market. This delay was caused by the long construction period that is characteristic for the real estate market and is part of the "pig cycle" (Figure 15).

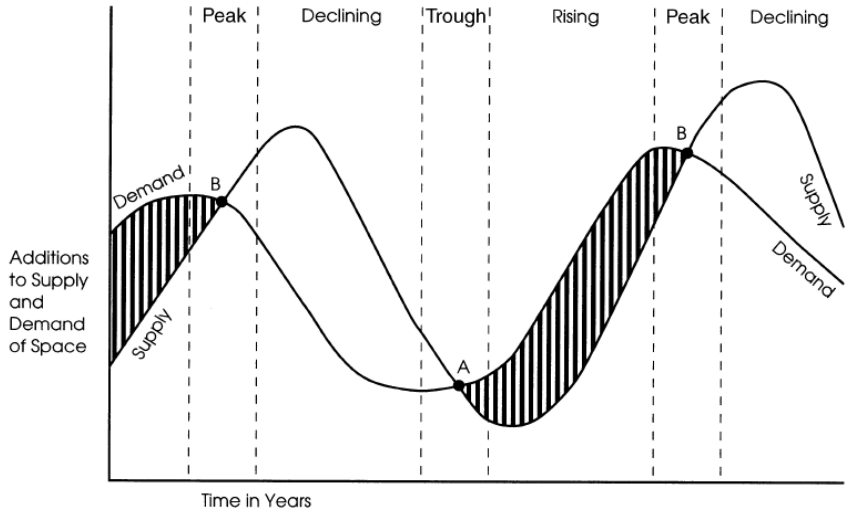


Figure 15 Phases of the real estate supply / demand cycle (Pyhrr, Roulac et al., 1999)

Offered office space on the market increased dramatically since 2009 from 4,8 million in 2008 to 6,2 million square meters in 2010 (Bak, 2011) (Figure 16).

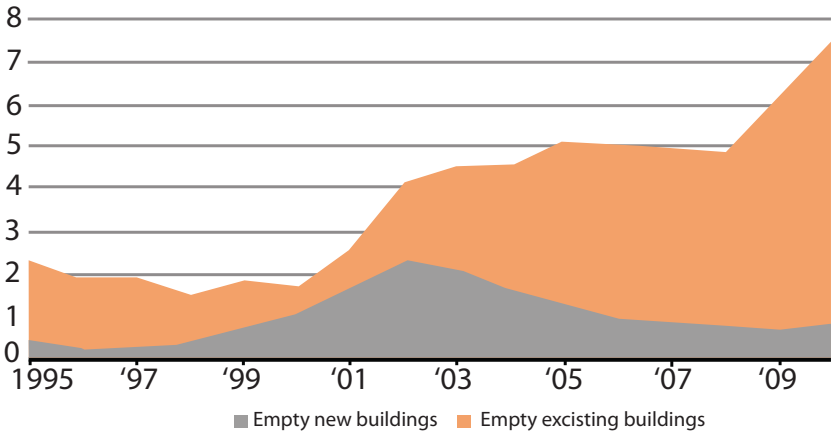


Figure 16 Vacant new buildings versus vacant existing buildings in million square meters in the Netherlands (Steinmaier, 2011)

The vacancy in the region of Amsterdam is for example high on the agenda of the policy makers (Zuideman, 2010). The spacious quality and livability in the outdated office locations are under pressure. Furthermore the high vacancy disturbs the dynamics of the market. Long term strong price competition from the oversupply can give pressure to the building plans for the Amsterdam South axis and the central station area. The spatial ambitions cannot be realized in these locations. This is a threat for the city Amsterdam as high quality business location and for the international competitive position of the Netherlands. The urgency of this situation is palpable and is discussed on superregional scale. On one hand the

constuction possibilities to prevent the vacancy are limited. On the other hand plans capacity is substantially cut in the soft construction plans. Also the hard construction plans are being reconsidered. Unwanted construction will be limited to prevent more vacancy. In the same time there will be more commitment in the direction of revitalization of outdated locations included the setting of an "office shed" (Zuideman, 2010). Still the need for modernization and relocation of the stock is evident. Soeter, Koppels and de Jong (Ruddock, 2009) state that it is important to look more systematically for re-use when the existing stock runs out of use and becomes vacant. Re-use of commercial real estate could be performed in its original or in a second function. Nevertheless the re-use of the existing stock also meets problems in terms of costs and benefits and in relation to location and negative externalities. The Dutch Office Market exemplifies the new to old segmentation in an extreme way (Ruddock, 2009).

Figure 16, Figure 18 and Table 5 show the division of the total supply and vacancy in new and second hand supply. After 2000, a lower absorption of offices, in combination with pipeline effects in new construction, leads to growing supply of new offices. The supply of new offices diminishes after 2002. Three shifts become manifest:

- from expansion to replacement of office stock.
- from vacancy in new buildings to (structural) vacancy in older buildings.
- from supply of new offices to secondhand supply (Ruddock, 2009).

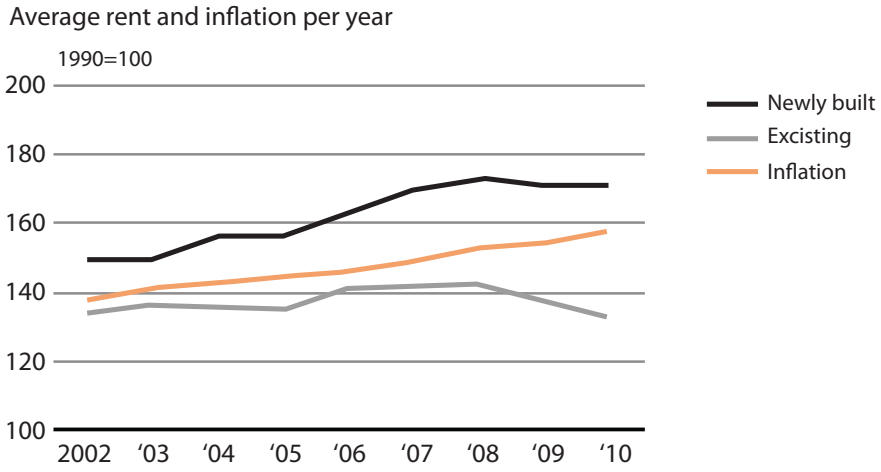


Figure 17: Average lease price and inflation (Bak, 2011)

In general over supply in the office space market leads to conditions for a buyer' s market. There is an over supply of old buildings but at the same time a shortage of modern buildings in the Netherlands. There are favored opportunities for improvement. Nevertheless users prefer replacement of old by modern buildings. As a result the office market is out of balance. This is also shown in Figure 17 in the difference in height of the rent of existing and old buildings (Ruddock, 2009).

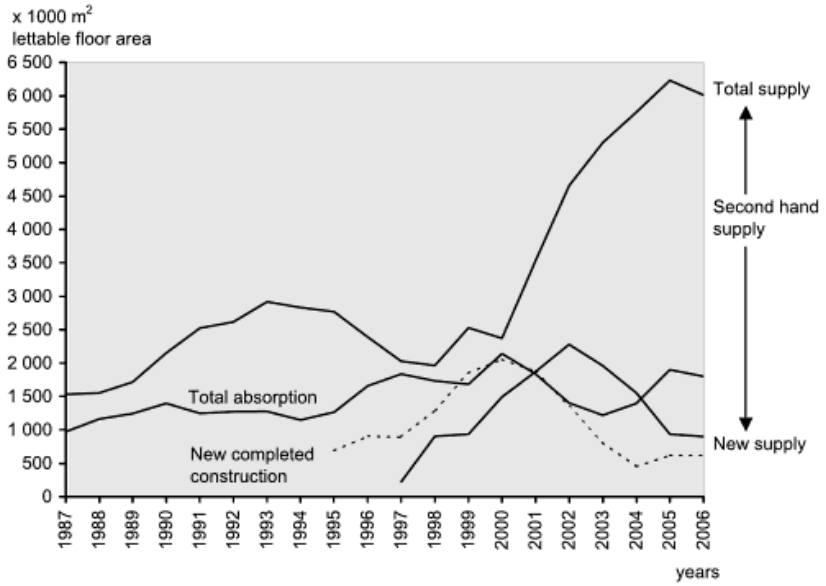


Figure 18 Supply and market absorption offices, unbalanced office market (Ruddock, 2009)

	Beginning of 2001	Beginning of 2007	2007 and after
Available stock	40.5	44	Recovery new construction
Stock in use	37.5	38	Further growth dependent on office employment growth
Total vacancy	3	6	Growing gap between available stock and stock in use
Vacancy (new buildings)	1.5	1	Less free development. More pre-contracts and more offices under construction (1 million m2)
Vacancy (old buildings)	1.5	5	Lack of alternative use

Table 5 Lettable office stock (Ruddock, 2009)

The trust of Dutch companies seems to stabilize. This is shown in the worldwide Regus Business Confidence Index (Regus, 2012). The index has declined with just 9 indexes to 90 points since September. This is a much smaller decrease than the decline between March and September 2011. The score of the Business Confidence Index is lower for small companies (85) than for medium companies (119). However the number of companies that reports a growing turnover is decreased to 39 per cent compared with 47 per cent 6 months before. The number of companies that report a profit growth (28 per cent) is also declined with 11 per cent (Regus, 2012). The European Commission expects that the Dutch economy will shrink with 0.9 per cent in 2012 (TheWallStreetJournal, 2012). So it is not remarkable that companies indicate that they seek refuge to cost reduction in their accommodation.

Price elasticity

When the numerical value of the price elasticity of supply calculation is greater than one, supply is said to be 'elastic'. This will always be the case when the percentage change in supply is larger than the percentage change in price. For example, if a 5 per cent rise in price leads to a 50 per cent increase in quantity supplied, the PES coefficient will be 10. In other words, a small change in price elicits a large response in supply. This would be unusual occurrence in the markets for construction or property, but not impossible (US-Census-bureau, 2005).

Several sources admit these price elasticity in the office market. According Hesler (Hersler, 2010), rent levels can have influence on the demand of space. For example, with office rents down more than 20 per cent from their peak, a tenant may still consider a renewal in existing space economical even with staff declines. Most of the variation in hidden vacancies over time is explained by the difference between demand at current and average rent on existing leases, which is calculate using data on contract lease length (Gunnelin, 2005).
To illustrate, if most space were leased under long-term contracts at earlier low rental rates, then current short-run demand would be higher than if all space were being leased at today's high current rents (Gunnelin, 2005).
EIB made an assumption of a price elasticity of 0,2. So if the rent is falling with 10 per cent there will be 2 per cent more demand for office space. This rate is based on the figures of the latest 20 years and based on a research of Brauenen (Appendix E2). In Figure 19 the space in use in Amsterdam doesn't changed that much comparable with the rent development. This indicates a low price elasticity. Contracted real rents are according Soeter et all. (Ruddock, 2009) downward inelastic. Investors prefer high contracted rents in combination with rent-free periods and incentives. Investors seem to neglect long-term risks. They are content with high capital returns (growth of capital values) and moderate income returns out of net rent. The development and construction market after 2001 became a difficult market. Development for the free market is diminishing, because of high risks.

Seen the graphic in Figure 17 it appears that the average rent of existing offices is declining since 2008. This can have influence on the demand for offices. In contrast the rent of newly built offices are since 2009 till 2010 stable (Figure 17). Moreover, the rents on top locations are also stable since 2006 (Bak, 2011). Top locations are areas in cities with highly developed urban economy and strongly diversified business services. There is a strong concentration of high quality office services located in these top locations. Since 2006 till 2010 the rents on top locations are stable in the cities Amsterdam, The Hague, Rotterdam and Utrecht. Concluded; if there is price elasticity, the effects will especially be shown in existing buildings outside the top locations.

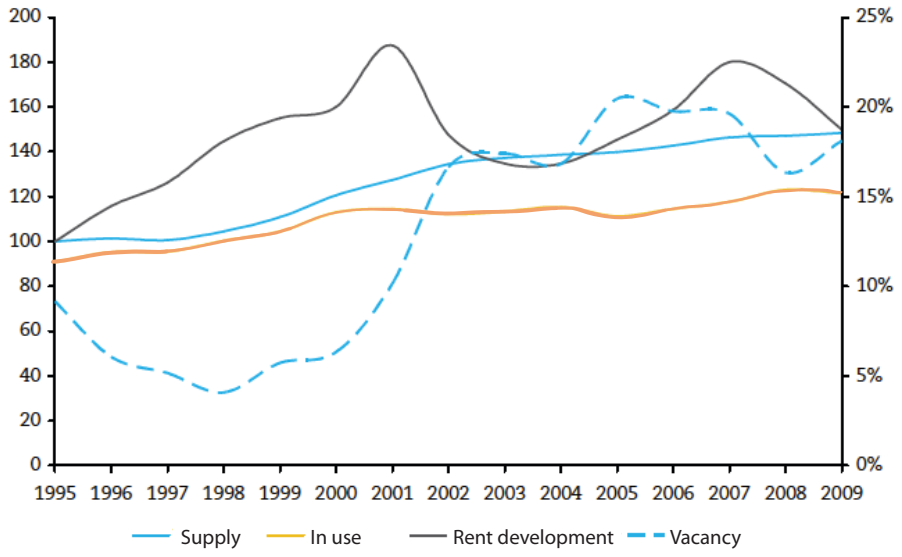


Figure 19 Development of the office market in Amsterdam (Zuideman, 2010)

Demographics

In Figure 20 the ageing of the population is shown plotted over time. The population in the Netherlands will shrink in 2025. This fact will have influence on the working force. However the working participation will grow as well which will reduce the effect of this development on the total of office jobs. Furthermore there is an ageing and dejuvenation effect shown which can have influence on the amount of office jobs and on the new way of working.

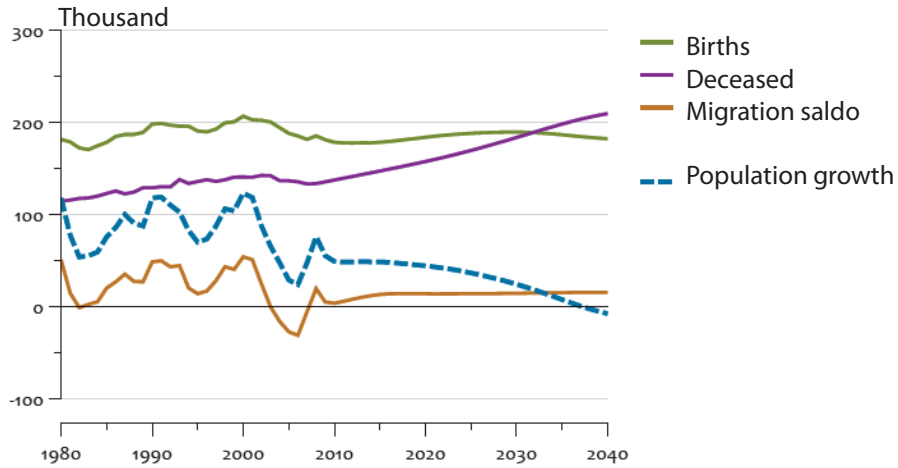


Figure 20: CBS Population prognosis 2008-2010 (2008); CBS Statline(2009) (Verwest, 2010)

According to a worldwide research executed by Intuit together with Emergent research (EmergentResearch, 2010) graying baby boomers will dominate the population of the industrialized world in the coming years. But in 2020 there will seen a new breed of senior citizens for which "unretirement" and active engagement are best describing their lifestyle choices. They are expected to continue working in their current professions or they will even opt to start new careers (EmergentResearch, 2010).

In addition the average age of the Dutch population will increase in the coming years. In about fiFTEen years one third of the population will be over fifty years old. Partly due to this change in the working force the pressure to search talent will grow. The experienced manager with a lot of knowledge eventually will leave the organization and newly hired high educated employees will be more scarce. The need for continuously schooling of employees is a development that plays in on he shortage of high educated employees (Gijsbers, 2008).

The recently adjusted population projections for Europe in 2030 and 2050 by the UN determine that there will be 45 million less 20-40 year-olds in the workplace by 2030 from today (Harrington, 2011). Conversely, there will be an additional 45 million 65+ year olds drawing a pension provided the retirement age remains at 65 years old (on average), although it seems more than likely to increase by at least two to three years (Figure 21.
Sandwiched in the middle, the 40-65 year olds, are set to remain almost constant at around 255 million persons over this 20 year period. In terms of impact, a declining working population forecast creates a base case scenario of a 10 per cent reduction in demand for commercial (office and industrial) space across Europe over the next 20 years (Harrington, 2011). This will be followed by a further 10 per cent diminution over the subsequent 20 years to 2050 according Harrington.

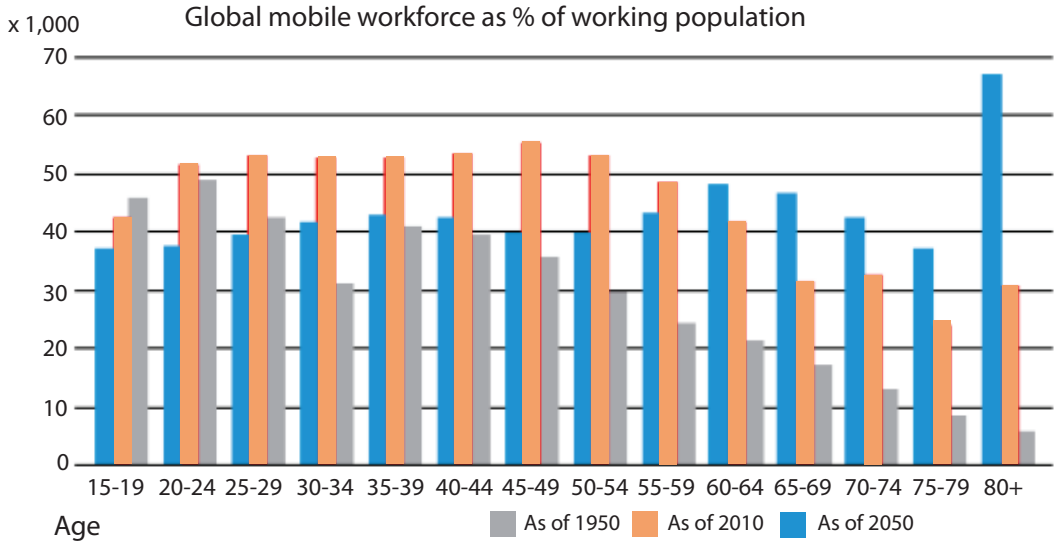


Figure 21: Europe population profile (Harrington, 2011)

Working force

An amount of 35 per cent of the respondents of the national office market research (Meer, 2010) indicates that the work force in the company has shrunk. The rest of the respondents indicated that the working force stayed stable. Also the users noted that in the period from 2010-2013 the working force in their company will shrink. Growth is not expected.

The relation between the office working force and the office supply has changed in the latest years (Figure 22). From 1992 till 2000 the office work force developed equally to the office supply. Around 2000 this development changed. The number of office jobs decreased, especially because of the burst of the internet bubble and the subsequent economic rebound. On the outside the development on the office supply seemed little concerned. The total square meters of office space still increased from 2000 steadily. Also in the dataset of NFC (NFC, 2011) there is a decrease of 4 per cent of the total FTE in 2010 compared to 2009. In the same time floor surface remained constant. This phenomenon can indicate hidden vacancy.

The cause for this supposed contrast lies in the past period. Especially from 1995 onwards there is talk of big shortage in the office market in the Netherlands. The economy is on steam while developers and the presented office space can hardly track the growth in demand. A lot of developments were applied with risks, the future tenant was not known when the development started. At the moment that these buildings were finally produced, the economic situation turned around. The expansion demand of the user has collapsed (Steinmaier, 2011).

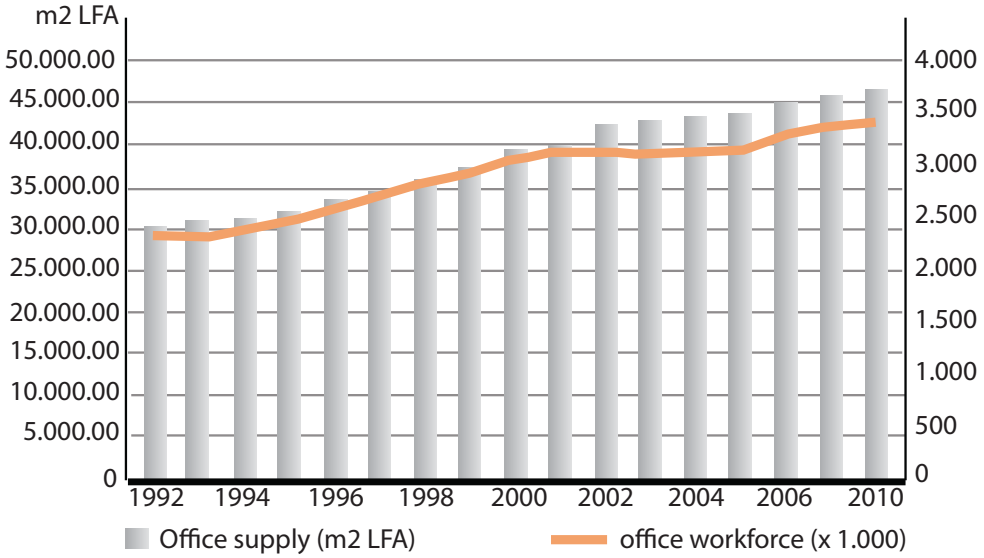


Figure 22: Supply of office space versus office work force (green: office supply (m2 lettable floor area) yellow: office work force (x 1.000)) (Steinmaier, 2011)

The number of office jobs has shrunk since 2009 (Figure 23). The job growth has had different patterns for different sectors. In Figure 24 this is visible for five sectors in the period of 1996 till 2011. In Table 6 the expected growth rate is shown in the period from 2010 till 2015. The sectors lose jobs are; communication, public administration, construction, banking & insurance and industry. These sectors also had the greatest absorption of office space during 2002 and 2009. Moreover the CPB expects that there will be a big shrinkage in the number of officials as a response to the plans of the government.

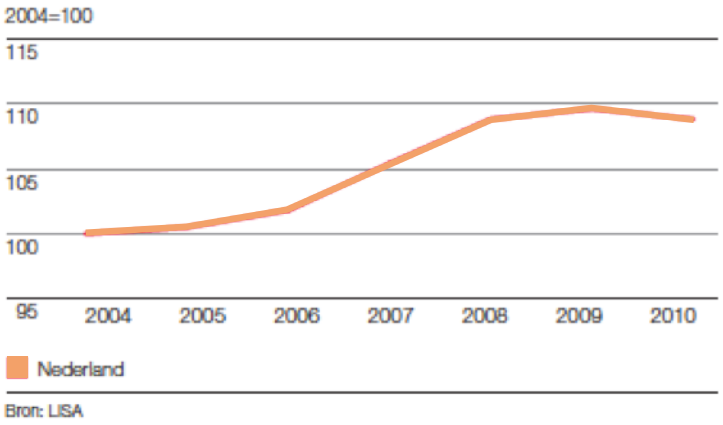


Figure 23: Index office jobs (DTZ, 2012)

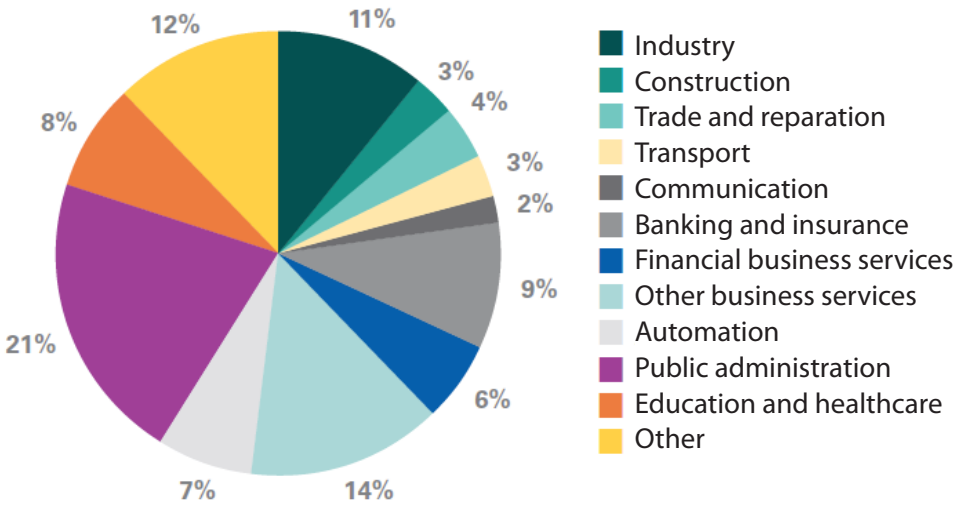


Figure 24: Absorption office space 2002-2009 to sectors in percentage (Steinmaier, 2011)

Yearly growth rate in the period 2010 – 2015	
Industry	-1,50%
Construction	-1,00%
Trade and reparation	0,00%
Transport	0,50%
Communication	-2,50%
Banking and insurance	-0,75%
Other financial services	1,00%
Automation	2,50%
Public administration	-2,75%
Education and health	2,00%
Other	0,00%
Average	-0,35%

Table 6: Expected office jobs, yearly growth rate in the period 2010-2015 (Steinmaier, 2011)

	2002-2020				**2021-2040**			
	SE	**TM**	**RC**	**GE**	**SE**	**TM**	**RC**	**GE**
1 *Agriculture*	*-3,0*	*-2,5*	*-3,0*	*-2,5*	*-2,1*	*-2,3*	*-2,1*	*-1,9*
2 *Industry*	*-0,8*	*-0,6*	*-1,5*	*-0,3*	*-1,3*	*-1,3*	*-2,0*	*-0,6*
3 *Logistics*	*0,4*	*1,0*	*0,2*	*1,3*	*0,2*	*-0,2*	*-0,5*	*0,6*
4 *(Consuming) services*	*0,1*	*0,4*	*-0,2*	*0,9*	*0,0*	*-0,6*	*-0,7*	*-0,3*
5 *Financial and business services*	*0,3*	*0,4*	*-0,3*	*1,1*	*-0,3*	*-0,4*	*-0,9*	*-0,2*
6 *Government and quaternary services*	*1,0*	*0,7*	*0,6*	*1,0*	*0,7*	*0,5*	*0,1*	*1,0*
Total	0,1	0,3	-0,3	0,7	-0,1	-0,3	-0,7	0,2

Table 7 Work force per sector for four scenarios, 2002-2020 and 2021-2040 (Arts, 2005)

Future scenarios are made for the working force of several sectors in 2002-2020 and in 2021-2040 (research of CPB, (Arts, 2005)) (Table 7). In this table a decrease of working force for most of the sectors is predicted. Striking is the fact that in the research of Steinmaier a decrease of expected office jobs is expected in the public administration while in the research of Arts there is a growth of working force in this sector. In this research however the sectors health and quaternary services are placed in the government and quaternary service sector which stabilised the effects of shrinkage in governmental working force.

There will be a small decline of 0,35 per cent office jobs in the period 2010-2015 as shown in the figures of Steinmaier (Table 6). The national office research that is performed by Twijnstra Gudde (Meer and Feijt, 2010) concludes that 53 per cent of the companies expect an decline in the number of office employees. Whereas just 9 per cent of the researched companies expects a growth of the number of employees in the coming three years.

In conclusion it can be said that from 2000 onwards there is more office space available than needed in relation to the office working force. In general the total number of office jobs seems show a small decline. However several sectors are expected to have a larger shrinkage in office jobs than others. These are the sectors working in communication, public administration, construction, banking and insurance and industry. They are most likely to meet high declines in office staff.

Shrinkage

The total population and the total number of households of municipalities and regions will decrease fastly from 2010 onwards. Moreover the potential working force will decrease as well because of an ageing population. More than a third of the municipalities in the Netherlands have to deal with a reduction of the population till 2040 according to the population and household prognosis of PBL and CBS (Verwest, 2010). There will be a reduction of the total number of households in around a tenth of the municipalities. The potential work force will decrease in nearly all the municipalities. The shrinkage is especially present in the municipalities at the edges of the country.

The shrinkage of the potential working force can have influence on the regional economics and on the development of the labor market. However it is not certain that this will happen. The decrease of potential working force can be compensated by an increase in the working participation rate. The influence of demographic shrinkage on company migration is still unclear. Often companies don't want to move to another location (except for short distances) due to the fact that they want to preserve the current employees (Verwest, 2010). The numbers of the Kamer van Koophandel show that the amount of company closures were not higher in the shrinkage areas than in the total average between 2001 and 2007 (Verwest, 2010). However the percentage of company start-ups is lower than average in the shrinkage areas in the same period. And the growth of the total jobs is lower as well. SER (SER, 2011) predicts that because of the mobility of the employees and adjustments of the wages the demand and supply of several sectors in the economy will be more in balance (SER, 2011).

Researchers of DTZ (DTZ, 2011) outlined the regional decrease and increase of the working force and mapped the size of the real estate investments in 2010. They described these developments in the Real Estate vision map of the research report "Van veel is te veel". In conclusion the investment, in 2010 were mainly focused on areas where the working force will increase in long term. Moreover a modest decrease of working force on national scale in 2030 can have a big impact on developments in regional scale. Finally the shrinkage will lead to less investments and less new companies in specific areas in the Netherland. However it is not expected that existing companies will shrink a lot in the size of the staff.

Globalization

The Dutch economy ranks the 8th place in the World Globalization Index (News, 2011). A report "Winning in a polycentric world" released by Ernst & Young in cooperation with the

Economist Intelligence Unit (EIU) shows that after a brief pause in 2009 and a modest rebound in 2010, the world's 60 largest economies will continue to globalize steadily between now and 2014. This development is driven by the continued global economic recovery, technological innovation and the rise of the emerging markets. This report measures and tracks the performance of the world's 60 largest economies according to 20 separate indicators that capture the key aspects of cross-border integration of business. The indicators fall into five broad categories: openness to trade, capital movements, exchange of technology and ideas, labor movements and cultural integration. The Netherlands scores particularly well on the first three criteria, the latter two are left behind compared to the other top ten countries (News, 2011). Globalization is very important for organizations and labor movements. The economy of the Netherlands shows that especially exchange of technology and ideas and openness to trade and capital movements are important for success in business. For the need of office space this will have a minimal effect. However this will change if employees and offices are moving to the emerging countries. The research of Intuit (EmergentResearch, 2010) on the 20 trends till 2020 shows that enhanced collaboration and video services will transform the new workplace. The new workplace will consist of distributed, virtual teams that meet regularly using these new technologies. Also the globalization of talent will continue. The information and communications technologies will enable globally distributed work in a better way and this will stimulate globalization (EmergentResearch, 2010). This globalization can influence the number of employees because it is easier to outsource work to employees from other countries as India etc. Secondly the globalization can result in moving offices to other countries and larger cities.

2.2.2 Alternative working strategies

The space per employee is changing rapidly last years. The biggest cause is the new way of working that becomes more and more visible nowadays. Related to the new way of working is sharing workplaces and the use of new technologic possibilities that suports working outside the office. Other important effects are costs reductions caused by for instance the economic recession. Also the ecologic footprint per employee can be lowered if less space per employee is required. Furthermore the location and the flexibility of the building has a relationship with the total space per employee. And lastly the employee has influence on the total space per employee. These trends indicate a decrease of space per employees now and in the future.

In research executed by Kluwer (Kluwer, 2011), is stated that more than half of the employees has the possibility to work place and time independent anno 2011. Another research fact is that 22 per cent of these employees work in average more than one day per week at home. The expectation is that most of the Dutch public and private organizations will introduce the new way of working in the coming 5 years (Jochems, 2010). The political parties GroenLinks and the CDA presented in February 2012 a law draft in which employees would have the power to decide to work at home and with flexible work times (Reijn, 2012).

Furthermore 60 per cent of the office users that joined the national office market research cut back on housing costs (Meer, 2010). This trend started already in 2002 and will also be visible in the coming years. Flexibility is named as well as an important way to cut the operational costs. This phenomenon finds its fundament both in the new way of working as well in the rejection of offices and the decrease of office space. From 2008 on office users are active with implementation programs on this new way of working and work together with

start ups that are active in this field (Meer 2010). Around 72 per cent of the respondents of a research done by Deloitte think that the new way of working will be the standard for office-based companies within 5 years (Jochems, 2010). In the World Regus Business Confidence Index (Regus, 2012) Dutch companies cite that expanding of flexible workplace (49 per cent), employee reduction (46 per cent) and intensive use of IT-applications (43 per cent) are the areas where companies can make savings without bringing their grow potentials in danger. The respondents of the researched companies argue that the factors working on distance (47 per cent) and more use of flexible workplace (39 per cent) offer the most stability as a basis for future growth. These companies see the benefits of flexible working and are prepared to implement the new office concepts to reduce costs. Striking is that of the 14 countries, Dutch companies named mostly reducing fixed workplaces (49 per cent) as top saving that will not undermine growth. Behind Dutch companies, Belgian companies (44 per cent) and South African companies (45 per cent) named this tool as well relative often. In contrast China (25 per cent), Germany (32 per cent) and Japan (29 per cent) are less convinced about reducing fixed office workplaces by implementing new wording concepts (Regus, 2012).

Also in a worldwide research of Intuit together with Emergent research (EmergentResearch, 2010) to the 20 trends till 2020 it shows that flexible working will be the standard. The brick-and-mortar office will be a thing of the past according Intuit (EmergentResearch, 2010), as the way how people work and do business will change due to emerging Internet cloud and mobile technologies. Working in the cloud will increasingly shift work lives away from corporate offices altogether and toward an in-my-own-place, on-my-own-time work regimen. Results are that Smartphones, tablets and other mobile computing devices will become the go-to computing devices for most of the world. Also, "Third places" for work will join the traditional office and home. The use of third places – public libraries, co-working facilities and rent-by-the-hour office suites – will continue to grow both in the U.S. and abroad, augmenting the already standard list of airports, cars and cafes. Further, enhanced collaboration and video services will transform the new workplace as distributed, virtual teams meet regularly using these new technologies.

Also, traditional employment will no longer be the norm, replaced by contingent workers such as freelancers and part-time workers. The long-term trend of hiring contingent workers will continue to accelerate with more than 80 per cent of large corporations planning to substantially increase their use of a flexible workforce. The number of contingent employees will increase worldwide. In the U.S. alone, contingent workers will exceed 40 per cent of the workforce by 2020 (EmergentResearch, 2010).

Next to costs reduction there are more reasons to introduce the new way of working. Twijnstra Gudde cite in the office market research (Meer and Feijt, 2010) that companies named the following effects of the new way of working; Savings on accommodation costs (24 per cent), increasing flexibility (22 per cent), driving back mobility costs (21 per cent), increasing productivity(21 per cent) and space savings (12 per cent). 53 per cent of the respondents think that the new way of working will lead to smaller offices.

Working concept

There is a distinction in several working concepts (Figure 25). In the figure these office concepts are shown. The several types are combined with a different office culture and need of space. This can also have influence on the amount of space per FTE.

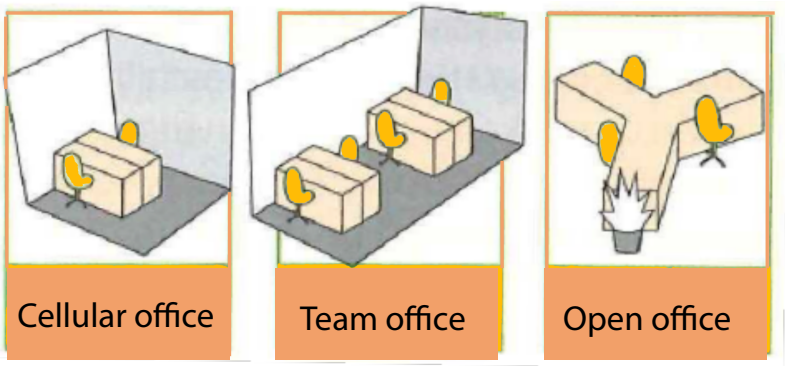


Figure 25: Working concept (Miller and Dingwall, 1997)

Consequences for amount of office space

With the new way of working tenants will need less gross floor area (GFA) per working space. The effect on the amount of square meters depends on the sector (Table 8).

		New way of working		
	Traditional	**Municipality**	**Institutions**	**Business services**
Flex rate	100%	70-80%	70-80%	50-70%
GFA / workplace	22 - 28	19 - 21	21 - 24	18 – 21
GFA office part / workplace	16 - 22	13 - 15	14- 18	12 – 16
Investing costs (m2 GFA)	3.100 – 4.200	3.500 – 4.500	3.300 – 4.500	3.700 – 5.200
Housing-related costs (m2 GFA)	300 - 350	330 - 370	310 - 370	400 – 450
GFA / employee	22 - 28	15 - 22	15 - 22	13 – 20
Housing –relating costs / empl /yr	6.000 – 7.800	4.400 – 5.200	4.200 – 5.200	4.000 – 4.900
Space are according to NEN 2580; invests according to NEN 2634; Housing-relating costs according to NEN 2748, workplaces = primary and secondary				

Table 8: Ratios of HNW organizations (Spijker, 2010)

It seems that shrinking organizations do away faster from their redundant workplaces than from their office space. Big companies, institutions and governments seek for more intensive use of their office space. Herewith less square meters are needed in the end. The number of square meters per working place decreases. Private and cellular offices disappear and the open office is moving back. Moreover one workplace can be used by more people. Laptops and mobile phones make the new way of working technically possible. This will result in less square meters per employee. Companies however wait very long before they move when oversupply is involved. In many cases they will wait till the needed surface shrinks to half the size (Dewulf and de Jonge, 1997). Disposal of released space seems difficult to realize in practice. There are different reasons that are stated below. Potential tenants for the released space would like to give identity to the existing space and this is difficult when a large organization moves in. The current market situation hinders releasing. Organizations mostly have a poor knowledge of real estate. Moving will be hindered because of associated high costs. Moreover organizations are often too optimistic about their growth potentials. As a result the shrinking organization delays moving as long as possible. The new building will be significant smaller than the former building. Growing companies are very optimistic. Organizations that have an increase in staff size move relative quickly to a greater building.

Shrinking organizations that move conclude that the absolute space saving is smaller than expected.

	Space changes after moving
With growth in staff size	+ 13m2 GFA per employee
With shrinkage in staff size	- 19m2 GFA per employee

Table 9 space change after moving (Dewulf and de Jonge, 1997)

The fixed workplace in a traditional office is just a third of the time occupied. Employees are on their way to a clients, are in meetings or have their holidays. The costs of a workplace is in average around 10.000 euro per year so great savings are possible (Jongsma, 2011). In theory is it possible to decrease the needed office space to 50 per cent (Vader, DHV, cited in (Jongsma, 2011). This will not happen. Vader expects that in coming years companies will shed a quarter to a third of their office space.
The average floorspace per workplace is an important variable for the costs of a workplace. After all when this prefix substantial increases or decreases, simultaneously the floorspace related costs will increase or decrease.

New way of working								
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Size workplace in m2	22,6	20,5	19,4	18,7	18,6	18,5	18,7	19,6
Index	100	91	86	83	82	82	83	87
Index of 87; 2003→2010=87%, from 2009→2010=105%								

Table 10: Development floorspace per workplace, in sqm lettable space (NFC, 2011)

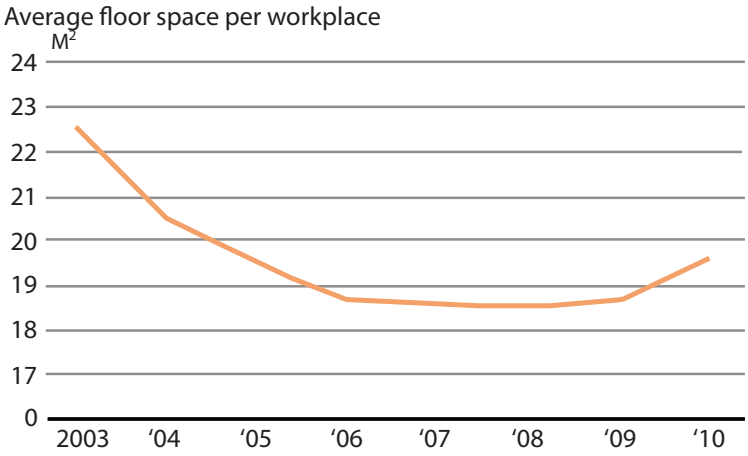


Figure 26: Average floor space per workplace (NFC index cited in Bak 2011)

Striking is that the lettable space per workplace was 19,6 m2 in 2010. This is an increase of 5 per cent compared to 2009 (Figure 26). This effect is dictated by the large vacancy of the tenants and user-owners on the market (NFC, 2011) (Bak, 2011). At the same time the median costs per workplace go down since 2009. Moreover the respondents of the NFC Index had a 4 per cent decrease in the number of FTE in 2009. These figures show that hidden vacancy is present (NFC, 2011).

Some organizations show an other development. Colliers shows in a study on the generation Y (Harrington, 2011) that the amount of offices will increase 2 per cent in Europe in the coming 20 years. This is a saldo of space planning decrease (+25/33 per cent), remote

working erosion (-15 per cent) and working population declines (-10 per cent). According Colliers, the modern approach is to provide more collaborative working areas where staff can easily come together informally to discuss business. More fun areas have also been introduced where staff can meet, chat and take a break from the daily routine. In addition, private, quiet areas have been incorporated where employees can make private phone calls and work undisturbed. Equally and just as importantly more space has been provided for all employees both at their desk area and in the office space in general. Even though the main office-based population is set to shrink with almost 25 per cent, the increase in the amount of space per person will mitigate against this erosion in office space demand. Overall Colliers does not necessarily believe that there will be a significant change (fall) in the amount of space required for traditional office use despite a fall in office-based employment. There will be a great deal of change however in how office space is used and configured. Given the effect on the bottom line of reducing rental outgoings there will be an increasing pressure to utilise technology and other flexible office solutions to cut the regular rent demand. This must be realized whilst keeping the core staff happy, motivated, productive and wanting to come to work. Having the right workplace strategy will be key to a company's future success amidst ever more competitive labour markets.

New technologies

The fast economic, technologic and social changes force organizations to adjust continuously and renew to stay ahead of competition. The life-cycle of products becomes much smaller so the ''time-to-market" will be shorter as well. The service of facility management which is offered must stay linked to the wishes of the client and to the core-business of the organization. Facility management companies can contribute significantly to the success of changing and renewing. They are able to design the facility services in a flexible and optimal way. The challenge is to control and utilize innovation systems and to keep working in the most efficient way. For instance the digitalization results in possibilities to work outside the office (Gijsbers, 2008). Rapid speed technologies innovations will have influence on the possibilities to work at several locations while keep updated with information and communication. Also the old fashioned calculation and drawing tables in computers, screens and laptops are renewed. This results in less space needed per employee.

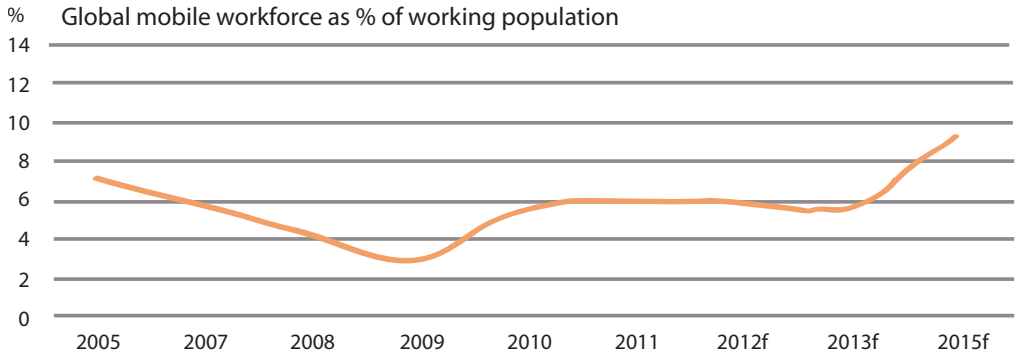


Figure 27: Global workforce as per cent of working force (Harrington, 2011)

Mobile working has been brought about by rapid changes and advancement in information technology. More workers will be able to work remotely as it becomes more accessible. Key factors to enabling a mobile workforce include:

> Quick, reliable access to the internet
> The cost of information communication technology (ICT)
> The ability to access company information and data outside of the office

> Increased use of mobile devices

Cost reduction & efficiency

Efficiency in the housing management is seen as more important in the current economic situation. A good example is the consolidation of the governmental accommodation. The government plans to establish their offices in 12 so-called 'consolidation locations' across the Netherlands (Rijksoverheid, 2011). A structural saving of 70 million euro will be realized by this. The government has a total of 4 million square meters office in use on 1800 different office locations in 130 places in 2011. The accommodation norms of the government are tightened and the number of employees shrinks so the demand for office space shrinks as well. This why a framework for 'the compact government' is made in which is strived for a consolidation of accommodation of office locations. This will cause a more efficient and flexible way to act with the available accommodation. Changes in demand can more easily be adapted than in a fragmented office environment. The offices will shrink in average 25 per cent in square meters during the coming 10 years (Rijksoverheid, 2011).

The World Regus Business Confidence Index states that Dutch companies appoint in retrospect the costs of redundant office space (49 per cent) as the most important reason for the real estate problems during the recession. The costs of lease contracts of non-residential buildings are the next factor (46 per cent) (Regus, 2012). Figures of the national office research executed by Twijnstra Gudde (Meer and Feijt, 2010) show that 60 per cent of the office users do cutbacks on their accommodation cost. Around 26 per cent of the users didn't save on accommodation costs and for 13 per cent of the users it is unknown. Furthermore 65 per cent expects a decline of their total office space and 35 per cent expects an equal amount of office space in the coming three years and no company expects a growth in the number of office space. The Dutch office-based organizations expect a great decline of the number of employees in the coming three years. The direct result is a decrease of the needed office space. This decrease will be strengthened by the more efficient way of accommodating. The total effect on the decrease of use surface is circa 12 per cent according the national office research of Twijnstra Gudde (Meer and Feijt, 2010).

The accommodation costs as percentage of the turnover in several sectors is visible in the figure below. For office users with activities that are comparable to the services industry the accommodation costs in 2008 were around 6 per cent of their turnover.

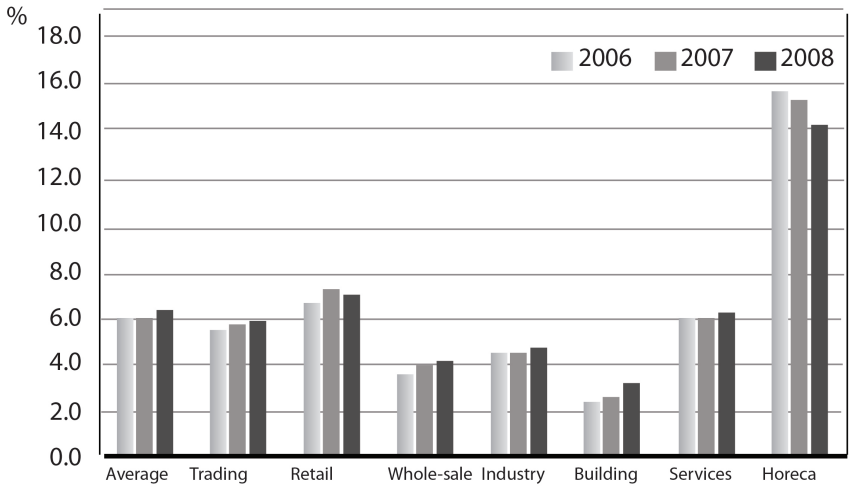


Figure 28: Accommodation costs as percentage of the turnover in several sectors in middle and small-sized companies (Miller and Dingwall, 1997)

Cost reductions in accommodation can have influence on the amount of office space which is available per FTE. It also can have influence on the decision to move to other locations with lower rent.

Sustainability

The term in which end users plan to be housed sustainable is nowadays longer than it was in 2008 according to the graduation thesis of Visser (Visser, 2010). This can be explained by the economic crisis and the increased knowledge on the implementation of sustainability. But sustainable accommodation still has become increasingly important. In 2008 only 38 per cent of the Dutch office users stated sustainable accommodation to be important. In 2010 this percentage is 70 per cent. This vision is likely to result in an increase in demand for a sustainable offices and will lead to an continuing increase in the coming five years.

In 2010 45 per cent of the end users implement their ambitions for sustainable accommodation and 55 per cent of the respondents think they will implement these in 2015. Besides this demand the end user is willing to pay a rent premium of 6 per cent. The concition is that advantages such as improvement of productivity or image improvement are obtained. Calculations using a fictive building are made to compare the willing to pay of end user on rent premium and green lease. End users seem to be over 5 times much more willing-to-pay for a rent premium excluding the service cost advantages. This would mean that end users are much more willing-to-pay for advantages such as image improvement and productivity increase of employees than they would be for energy savings (Visser, 2010). In second instance using new office concepts in which employees use less square meters per FTE will automatically result in less energy costs. In addition when flexible working is possible employees will travel less.

Investors want to focus on redevelopment instead of building new offices. This is due to the high vacancy with which the Dutch office market copes (IVBN,2009 cited in (Visser, 2010). 51 per cent of the respondents of Visser's research focuses on their own existing real estate and does not want to relocate. Office users like to refurbish their current housing and they do not want to move. When they want to move they will do so using newly built offices. Sustainable accommodation is important and is becoming even more important in the future. This fact can influence the motivation to start with new office concepts in the existing buildings. Eventually this development will have influence on the amount of new office space that will be needed in common years.

Employees

Sustainability, a representative building, location, an emotional link with the building and the image of the city seem to be important motives for the office end-users and employees to feel satisfied in their work. This according to the thesis of Hendrikx (Hendrikx, 2012).. These elements are rather luxurious and indicate that the quality level of the building sector in the Netherlands is on a high level. The quality level can be compared with the need pyramid of Maslow (Figure 29). It shows that the office user orients on the second highest level " need for respect and approval".

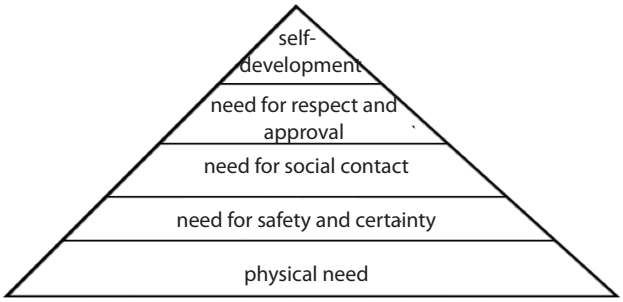


Figure 29: Need pyramid of Maslow (Maslow, 1943 cited in (Hendrikx, 2012)

The needs, expectations and composition of employees differ per generation. A big difference between employees of the young generation and older generation is that the young employees are more individual oriented and will complain earlier than their colleagues older generation. The older ones are in contrast relative loyal to the employer and to each other. Within this group there is also more solidarity according the managers (Maas, 2010).

Social generations are described often as a category people who are part of the same age group and are formed by events between their 15th and 25th year of their lives. So are baby boomers (1946 – 1964) formed by the increasing prosperity after the second world war and their study period in a turbulent period between 1965 and 1975. The generation X (1964 – 1982) is formed by the economic difficult 80ths. Generation Y (1982 – 1994) and Einstein (1994 – 2010) are formed by internet, MTV and the always online world. Whereby generation Y has only known the economic prosperity. Generation Einstein seems to get formed by the financial crisis in the recent years. The new generation edits at the same time his facebook profile, makes homework and watch television. This generation uses social media as network tool and doesn't make a distinction between work and private life.

Organizations will be forced to adjust if they want to bind the new generation. The old way of working doesn't fit in the lives of the employees of the new generation. Working from 9 till 5 doesn't fit if work and private life cross each other continuously. In a research from Peil.nl (2010) it appears that 62 per cent of the companies stimulate mobile working. In a research of Robert Half in March 2013 (Huijbregts, 2013) , 83% of the managers in the Netherlands works regular beyond working hours. 77% of the respondents also indicate that they work more outside the working hours now compared to one year ago. Work and private life is becoming more and more integrated.

An international researchproject of Oxygenz (Miller and Dingwall, 1997) has some data about the people of generation Y. The research states that generation Y has the following thoughts about the office accommodation:

- Location: a combination of work and living in walking distance is preferable.
- Flexibility: there is a preference for a flexible working environment plus possibilities to work mobile on distance.
- Social working environment of the office: is lengthening their homes. Business- and private activities and contacts are mixed. This will ask for relax and meeting spaces.
- Sustainability: 96 per cent of the generation Y prefers a sustainable office provided that these is comfortable and atmospheric.
- Design and technology: the generation expects high-designed offices with the newest technology in it.

The importance for organizations to adjust to the wishes of the new generation is of more importance than in is thought of in first instance. Ageing and dejuvenation will cause a scarcity for new talent.

The worldwide research of Intuit together with Emergent research (EmergentResearch, 2010) shows that the new generation comes with changes. Generation Y will mature and will continue to be fast adopters of new technology. They will focus on careers, families, home ownership and high-tech living. Generation Z will enter their teen years, natively fluent in both mobile and social platforms, as the global grid is their toy, their inspiration and their education (EmergentResearch, 2010). Generation Y will continue to focus on getting the job done more than on physically spending time at a job site. Meanwhile they will show a continued commitment to work-life balance. The connection through the cloud will allow Generation Y to succeed on the move. That way they will realize the work/life balance they desire.

The new generation will influence the accommodation needs is the conclusion of different researches. Especially in combination with the fact that their knowledge is scarse. When flexible working will be the standard in common years this can have influence on the amount of office space that is needed. This development will also influence the motives of an organization to move or renovate its buildings with the goals to meet the demands of new and young employee.

The work-life balance is a significant source of motivation. The need for flexibility suits the demands of family and social life and is a major factor driving employment choices. It pushes organizations towards offering flexible alternative working strategies. This does not mean that the workplace will become redundant. The opposite will occur. Given the pressure on companies to attract Generation Y staff it is important that the workplace has the right blend of social/fun space with which Generation Y can positively identify with the organization. This dynamic is likely to be even more pronounced when there is real pressure on housing in terms of cost/choice. This stimulates the requirement for companies to ensure staff have their own 'private space' at work (Miller and Dingwall, 1997).

2.3 FUTURE SUPPLY

2.3.1 Subleasing

Despite having oversupply tenants do not always put the space on the sublease market at the pace suggested by layoffs. There are a variety of reasons for not subleasing the space at any given time (Hersler, 2010). Such as the dim prospects for finding sublease tenants, a short remaining lease term, high cost of reconfiguring the space or optimism that the space can be held for potential future re-hires. In addition accounting rules require corporations to write off the loss incurred by a sublease which may act as a disincentive for some companies to take this action. Another reason is a restriction in the contract.

2.4 TOWARDS NEW SUPPLY

2.4.1 Forecasting

This report tempts to rule on the future demand and the corresponding future supply. “Is it possible to forecast the future office market?” Understandably it is difficult to accurately predict the behavior of millions of consumers and businesses in the last detail. Economic forecasts often have a margin of error. In fact the Bank of England recently coined the term ‘data uncertainty’ to describe the difficulty of making policy judgments. They use statistical indicators that are subject to change (US-Census-bureau, 2005).. Furthermore forecasts are limited since they rely on assumptions about policies that may need to change owing to sudden events or revised statistics. There are also problems relating to time-lags since it often takes years for a specific monetary or fiscal instrument to fully work through an economic system. The important point is the message conveyed by the forecast. The trend does not have to be 100 per cent accurate. Forecasting models are no different from any other economic model in that they attempt to simplify reality. The case of the economy is a complex reality. A forecasting model only measures and monitors the key variables. However understanding half of the picture is better than not seeing any of it at all.

The collection of official statistics in the UK is based on a history and consensus of conventions. Many of these conventions have been agreed internationally. For example the various statistical series of macroeconomic data referred to above have been comprehensively measured since the Second World War. In contrast the collection of property data is still a relatively young science. The Estates Gazette commented that the property research as we know it today is not yet 30 years old (US-Census-bureau, 2005).. Specific information relating to property is nowhere near as comprehensive. Indeed data relating to commercial property, rents and capital returns are reliant on confidential private records. Some of these will be publiced into the public domain via e-sources as “vastgoedmarkt” and “propertyNL”.

There is another problem that is commonly attributed to all types of economic forecasting aside from the complexities of certain statistical relationships. This is the inevitable dilemma of the need to look backwards to look forward (US-Census-bureau, 2005). If statistics allow us to be confident of what has happened in the past can we forecast the future through extrapolation with equal confidence? The accepted answer is that statistics alone are not enough (US-Census-bureau, 2005). Experience, intuition and other qualitative information are equally important especially as things change. No two cycles are the same. History does not repeat itself. Any serious property forecast therefore combines both statistical analysis and judgmental, reflective personal knowledge of experts in the marketplace. When doing a forecast it is important that several sources en research methods are used.

2.4.2 Building user relationship

Building user relationship model

There is a dialectic relationship between the occupying organization (the users) and the building. Blakstad (Blakstad, 2001) calls this the Building–User Relationship, BUR. The BUR consists of two subsystems: the building and the user organization. The two subsystems are dialectically interconnected. When studying the office and the relationship between the

organizations and their building, two factors have to be distinguished. The needs (requirements posed by the organisation) and the physical structures which are supposed to answer to those needs (the building / the facilities). Often this is the demand side and the supply side.

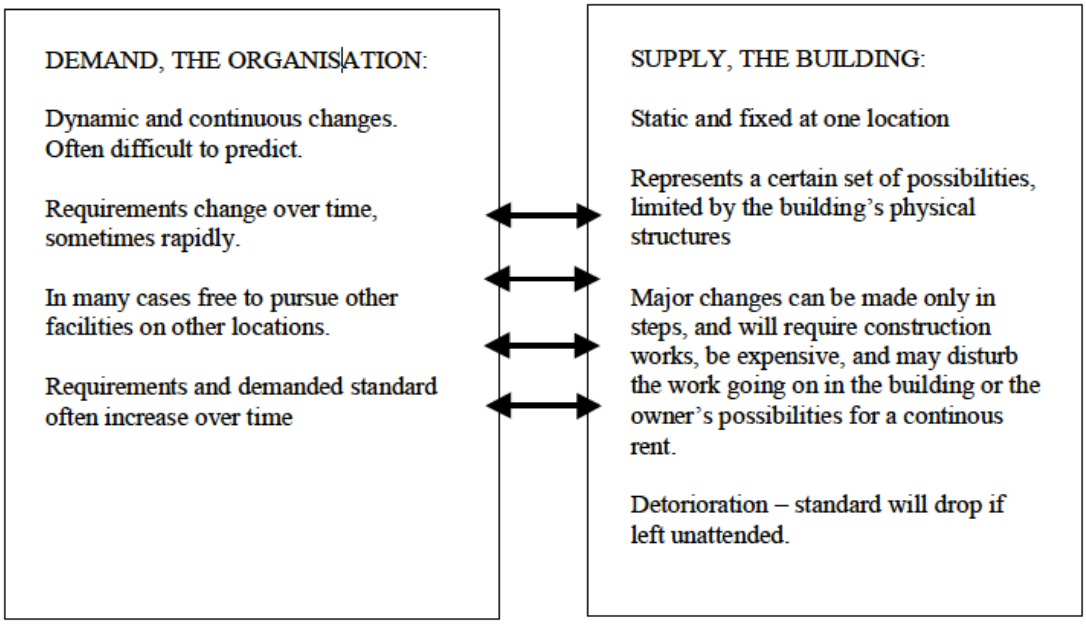


Figure 30: BUR, the Building - User Relationship. The User organisation (demand side), the Building (supply side), and the connection between the two, together make up the BUR model. The demand and the supply side have different characteristics; e.g. dynamic – static, etc. (Blakstad, 2001)

Figure 30 shows the different characteristics of the two subsystems. The organization is constantly changing, while the building has a certain set of possibilities, which are defined during design and construction.

The primary cause of hidden vacancy is that the leased office space does not adapt to the current office space demand of the user. In accordance to Blakstad (Blakstad, 2001) adaptability is described as "the ability to change as a result of internal or external influence, and is regarded as a strategic "from the top approach" .
Almost no buildings adapt well. They are designed not to adapt. Also budgeted and financed not to, constructed not to, administered not to, maintained not to, regulated and taxed not to, even remodelled not to. But all buildings ... adapt anyway, however poorly, because of the usage in and around them are changing constantly. Quote Stewart Brand (Brand, 1994 cited in Blakstad, 2001).
In this quote Stewart Brand explains the complexity of this problem. It involves all stages of the building's life cycle and the different actors and different activities at the different stages. He also points out that the pressure for change comes from within the building (users and organisations) or from the environment (society, new regulations, users' expectations, fashion, etc.).

Adaptability is a common term for the aspects flexibility, generality and elasticity (Arge, Landstad 2002 cited in (Jensø, 2004);

- Generality means the buildings ability of meeting changing functional demands without changing characteristics i.e. the ability of meeting different functional needs without doing considerable changes in the building.
- Flexibility means the buildings ability of meeting changing functional demands through changing characteristics i.e. the possibility of doing changes in the building and technical structure at minimal costs and abruptions in operation, without increasing the buildings area.
- Elasticity means the possibility of growth (increasing usable area) or partition of the area in a building (decreasing area of use).

In the book "How buildings learn. What happens after they're built?", Brand (1994 cited in Jensø, 2004) describes a model for stratification related to adaptability in buildings. Buildings are discussed as a set of layers functioning in a totality where the layers are adjusted due to specific use and framework. Maximum adaptability is gained when the different layers can be changed independently or with few consequences for the other layers due to technical lifetime, new claims and needs. Understanding the totality and the interdependence between the systems and layers are decisive due to the design and adjustment of a building for a specific purpose and use (Brand 1994 cited in Jensø, 2004).

Building flexibility

A flexible office floor is a floor that is able to change within the existing main structure. This can be achieved when the floor plan is able to have different space planning options. The most contradictory space planning options are the cellular office and the open office plan. Maximal flexibility can be obtained when the floor can be used for both the office concepts. Organizations with a flexible office floor can accommodate their changing requirements over the years more easily, which discourage unused space (Smit, 2012).

Nico Riedijk - director of the Dutch association for project developers and construction firms - sees possibilities to prevent hidden vacancy by building in a flexible way (Ginkel 2010). He came up with the idea to built more modular and demountable especially intended for offices, education buildings and care institutions. The new way of building can adapt multiple user possibilities and solve vacancy and hidden vacancy. Hidden vanancy can be prevented by transforming building space in an easy way. Former offices can easily be changed in student housing for instance. Also Ciska Bakema (head facility of Hanzehogeschool Groningen) and Maarten Sanders (Architect and parner Olll architects) are very positive about this way of building and see lots of possibilities (Ginkel, 2010).

The real estate developer Annexium also sees possiblilities in the flexible way of building (Jong, 2012). They have performed several experiments with ready-made offices where tenants can use the building directly and where their changing needs can be directly translated in a changing supply.

There is a significant relation between the building flexibility and structural vacancy. The outcome of the thesis of Smit (Smit, 2012) proved that when all conditions (indicators) are the same an office building which is more flexible experiences less vacancy during its life span than a less flexible office building (Smit, 2012).

A flexible office building will lead to less unused or inefficient extra space. This will result in less space per employee and per workplace. Building more flexible is a trend nowadays.

However the developing market is changed into a redeveloping market. It is more difficult to make a existing used building flexible then to built a new flexible building.

On the supply side the accommodation is influenced by moving possibilities and location. The supply companies can choose to move or to change the current use of the building when they experience a price pressure or when the demand does not fit with the accomodation. The location of the office building also has a relation with hidden vacancy. In office areas that are popular with the users a lower hidden vacancy is visible.

Lifespan of the office building and quality

A building is seen as a cyclical process according to the lifecycle perspective on buildings (Remøy,2010). At some point further adaptions are not economically feasible. Mostly because of the structural constraints of the building obsolescence will occur over time. If the investo of the building cannot find another user the building may be demolished (Smit, 2012). According to Heijer en Voordt (2004) the lifespan of buildings can be subdivided in a functional, technical and economic lifespan. According to Dobbelsteen (2004, cited in Smit, 2012) the technical lifespan is 'the expected time-span within which the building meets the technical performance criteria in a given maintenance strategy". It is therefore the maximum possible lifetime of a product within that maintenance strategy". Heijer and Voordt (2004 cited in Smit 2012) define the functional life span of a building as "the period during which the building meets the functional requirements of the user". An office building has to support the organization's processes. Therefore a building needs to have a certain functional quality. However this required quality will change over time because of the changing legislation and the changing expectations and requirements of office users. Dobbelsteen (2004) defines the economic lifespan of a building "as the expected timespan within which the building meets the return on investment criteria". According to Soeter (2004) it is "the moment after which the net present value of all future costs become equal to or greater than that of all future benefits". Therefore it is the time-span after which further use or maintenance of the product becomes economically irresponsible. The lifespan of the building can be on influence on the motive to move.

2.4.3 Chancing management

Corporate Real Estate Management, the stakeholders

There are several specializations in the subject real estate management. Portfolio management is also referred to as real estate management (real estate management by investors). Corporate real estate management is real estate management by or on the instruction of private organizations or businesses. Public real estate management is real estate management by or on the instruction of public parties.

The domains of corporate real estate management, general management, asset management, facility management and project management (Figure 31) represents disciplines that share the same goal. This goal is "optimally attune corporate accommodation to organizational performance" adding value to corporate goals and indirectly generating income. This differs from the real estate investor's perspective who has a more specific view striving for a return on investments in real estate directly generating income from real estate (Jonge, Arkensteijn et al., 2008).

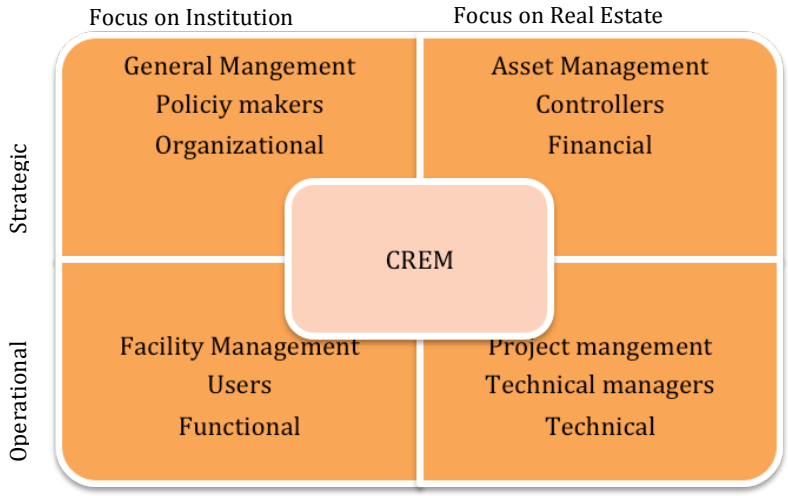


Figure 31: (Jonge, Arkensteijn et al., 2008)

The tension between the different domains can be explained by their focus on demand or on supply and their operational versus strategic view. For instance if the user has an oversupply of office space he would like to rent less office space to fit the current demand. However the asset manager can decide to stay in the same amount of space because if he can not find an other user the building is more worth and attractive with hidden vacancy than with registered vacancy. This tension between user and owner is important to take into account.

Owner

It is important to understand the different types of owners of real estate to take the tension between the owner and the user into account. Table 11 will explain these different owners of real estate.

Type of owner	Examples	Objective of real estate	Time horizon
Owner-occupier	TU Delft, Philips, Unilever, ABN AMRO	Economic objective Real estate to facilitate the business process and as a means of corporate identity.	Long-term
Public party	Central government, provinces	Economic and social objective Real Estate to facilitate the business process and as a means of social objectives	Long-term
Project developer	NEPROM, HBG bouw and Real Estate	Financial objective Real Estate as response to demand from the market and as a means of economic gains	Short-term, until sale
Housing corporation	Stadswonen, Patrimonium, DUWO	Financial and social objective Real Estate as a means of housing occupants to contribute to the quality of life in neighborhoods	Long-term
Investor	Pension fund, banks, insurance	Financial objective Real Estate as an investment and a means of making profit	Short-term and long-term

Table 11: Types of owner and their objective for real estate (Jonge, Arkensteijn et al., 2008)

In this research, the owner-occupier, the public party and investor will play a role in the existing office supply.

Facility management

Facility management is often seen as the management of operational services. With the introduction of the added value concept the focus of the FM shifts to the performance of the organization. This lifts FM on a higher strategic level. More and more the tradition approach where the emphasis lies on cost control makes place for an integral approach with attention both for the costs and for the benefits. This strengthened role of the FM as a strategic management tool that ensures alignment between the strategic objectives of the organization, the work processes and the physical environment (Prevosth, 2011).

Accommodation strategy

The mismatch between supply and demand can be handled in either a reactive or a proactive way. The reactive approach corrects the mismatch as soon as it occurs. The proactive approach intends to prevent the mismatch by reflecting on long-term changes in real estate demand and supply. As real estate is expensive, complex to change and characterized by long delivery times, the reactive approach has serious disadvantages. However not all organizations have a real estate strategy (Jonge, Arkensteijn et al., 2008). A continuous matching process is needed to match the dynamic demand and the static supply and to prevent mismatches. Forethought requires a vision on future accommodation needs, a set of strategic choices and assumptions. In this chapter the accommodation strategy will be investigated.

The added value of the accommodation strategy is visible on several topics. Every company has its own strategy concerning accommodation and facility management. Some different focus areas are: marketing, culture, flexibility, real estate value, risks, costs and productivity.

Housing generate only added value for an organization if the housing performance contribute to the realization of the strategic goals of the organization (Figure 32) (Miller and Dingwall, 1997).

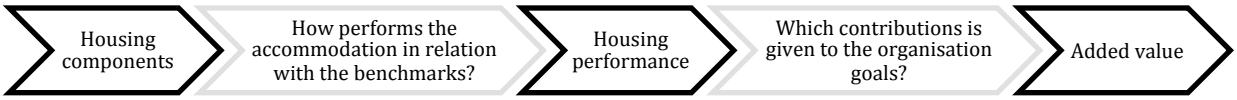


Figure 32: Distinction between and coherence of the added value, accommodation performance and accommodation components (Miller and Dingwall, 1997)

Insight in accommodation performances exists by comparison of generic and organization dependent benchmarks. These are often numbers based on the performance between the peer group of comparable organizations. While added value always is related to specific goals of the involved organization (Miller and Dingwall, 1997). Thus the link between the accommodation strategy and the organizational strategy is essential.

2.4.4 Contracts

Flexible contracts

The vacancy of office space increases. This sounds as good news for the tenants. Never before the prices are so under pressure as now. However vacancy can work in a resersive way as examples of tenants show. For some tenants the current situation causes only higher costs. This is partly caused by the fixed contracts with a long duration. Most of the time a lease period of 5 or 10 years is applicable. For the ones that signed a contract in 2007 the

growing vacancy will hurt a lot. They paid and still pay more than they would pay now. However the contracts are not interim terminable (Jong, 2012). So one of the reasons why occupied space may deviate from the demand at the current rent level is the fact that many tenants are locked into old contracts. In the absence of default these tenants can only adjust their space consumption as their contracts expire (Gunnelin, 2005). Therefore the contract durations are under pressure. As long the rents decreases the tenants do not longer want to be restricted to a certain price. Moreover they are in doubt if they will need the same amount of office space in the future as they have now. These doubts are according are caused by both the economic situation and the new way of working (Jongsma, 2011).

Several parties are researching other possibilities. Real Estate developer Annexum for instance wants to get rid of its long lasting contracts that are still usual in the real estate sector (Jong, 2012). According to the director of Annexum short term leases will result in better results for the real estate investor. 'Tenants are willing to paid more for more flexibility'. Tenants of Annexum can terminate their contract every month. When needed Annexum will search for other tenants for the space that is not used by the organization. 'At the moment there is more positive result when renting out smaller office spaces than by waiting for one big tenant for the whole building' (Jong, 2012). According to Gerben van Dijk, program manager of SBR, short leasing will gain more market share in the office market (Brinks, 2012).
According to Schiffers in the newspaper "het Financiële Dagblad" (Schiffers, 2012), short term flexible contracts are not the solution against vacancy in its total. There are simply to many square meters office space in the Netherlands and the oversupply will even grow.

Ownership vs rental

In 1999 60 per cent of the office supply was leased and 40 per cent was in ownership, till 2009 this figure changed to 63 per cent leased and 37 per cent of ownership. With new built offices, the number of rental new built office was in 2001 around 1,6 million square meter, in 2009 this decreased to a number of 0,3 million per year. The selling market has a different course, this trend is more stable around the 0,3 million newly built square meters office space every year in 2001 till 2009 (Bak, 2011).

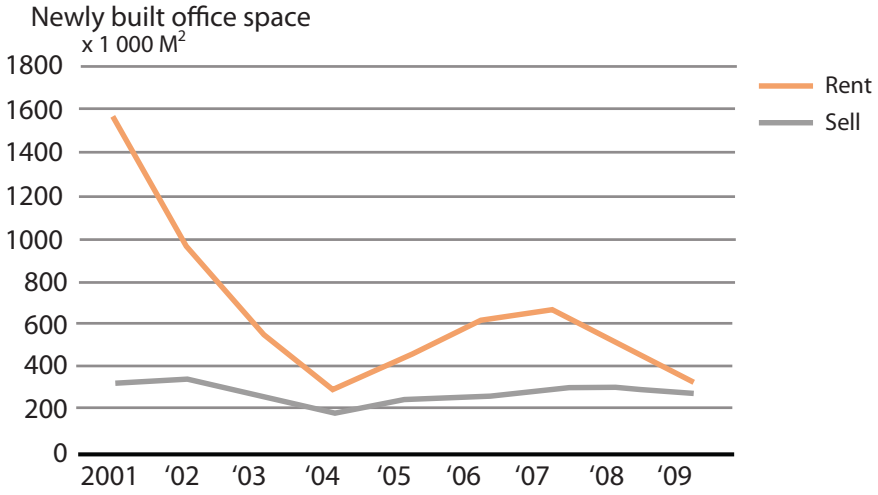


Figure 33 Newly built office space

Absorption pattern

According the researches of DTZ (VEB, 2010) there will be a delay in the market recovery because of the hidden vacancy. Companies who have shrunk don't use a certain part of their office space. When companies will grow firstly, they will need to backfill their hidden vacancy before expanding to a larger space (VEB, 2010). Thus, hidden will create a drag on future leasing as companies, backfilling just the hidden space could cause more than half of the demand growth arising from job recovery. As a result, the recovery absorption pattern are more to comparable to the troubled 1993 to 1999 expansion than to the more robust 2004 to 2007 recovery. The drag on net absorption caused by hidden vacancy, which will likely delay rent recovery, highlights the risk protection provided by properties with long-term leases in place. Areas with sounder outlooks in market fundamentals generally contain less shadow inventory, making their expected future performance all the more attractive for core office investments compared with lagging recovery markets (Hersler, 2010).

A further complication is that the push of absorption moves out of job growth, such that in an environment of declining employment, positive net absorption typically endures for some time, with a similar delay on the upswing. This delay is around six months (Hersler, 2010). However, during 1991 to 1992 net absorption never became negative. In the dot-com bust, negative absorption followed the market downturn quickly, starting in first quarter 2001. By comparison, absorption following the December 2007 start of the recession took a full year to post negative numbers. This irregular lag makes it challenging to assess which points in time are relevant for capturing the effects of shadow space in the data.
The effort on net absorption caused by hidden vacancy, which will likely delay rent recovery, highlights the benefit of risk protection provided by properties with long-term leases in place. From a location perspective, markets with stronger fundamentals and outlooks generally contain less exposure to hidden vacancy than weaker ones (Hersler, 2010), which reinforces focusing on these areas for core office investment strategies.

2.5 CONCLUSION

Organization

In what way do type of characteristics (size, location and sector) differ significantly in their quantitative demand for office space?

According (Steinmaier, 2011) there are several sectors that have different office space absorption and job growth rate caused by the economic cycles (Steinmaier, 2011). This is visible for five sectors in the period of 1996 till 2011. The sectors that lose jobs are; communication, public administration, construction, banking & insurance and industry. These sectors also had the greatest absorption of office space during 2002 and 2009.

In a research of Jones Lang Lasalle (JLL, 2008) It appears that space use density varied dramatically when measured by location and building type. There is less hidden vacancy and more efficient office layouts in downtown locations. Also density space savings are much greater in high-rise versus low-rise buildings. These facts can have influence when a company moves from a low-rise building or downtown location to a high-rise building or a suburban location. In the study of Hesler (Hersler, 2010) it is shown that strong locations have less hidden vacancy. Hersler concluded that in general, the impact of hidden vacancy is

of less concern in stronger metros than weaker ones and typically parallels overall market fundamentals strength (Hersler, 2010).

Location characteristics however were found to have less effect than building characteristics (Remoy, 2010). In the research of Koppels (Koppels et al. 2007; Koppels et al. 2009 cited in Remoy 2010) location characteristics that increase the odds of structural vacancy are: Monofunctionality, Lack of status and Lack of facilities.

New demand

In what way has the new way of working and the new economy influence on the demand for office space?

New economy

As might be expected fluctuations in construction output and property markets share a similar pattern to the broader economy. They refer to respectively building and property cycles. Decrease in the economic development is usually associated with a shift from investment in new construction to spending on repair and maintenance.

There is an over supply of old buildings but at the same time a shortage of modern buildings in the Netherlands. There are favored opportunities for improvement. Nevertheless users prefer replacement of old by modern buildings. As a result the office market is out of balance (Ruddock, 2009).

The number of companies that reports a growing turnover is decreased to 39 per cent compared with 47 per cent 6 months before. The number of companies that report a profit growth (28 per cent) is also declined with 11 per cent (Regus, 2012).

Workforce

The total population and the total number of households of municipalities and regions will decrease fastly from 2010 onwards. Moreover the potential working force will decrease as well because of an ageing population. More than a third of the municipalities in the Netherlands have to deal with a reduction of the population till 2040 according to the population and household prognosis of PBL and CBS (Verwest, 2010). There will be a small decline of 0,35 per cent office jobs in the period 2010-2015 as shown in the figures of Steinmaier (Table 6).

New way of working

The space per employee is changing rapidly last years. The biggest cause is the new way of working that becomes more and more visible nowadays. The expectation is that most of the Dutch public and private organizations will introduce the new way of working in the coming 5 years (Jochems, 2010). Related to the new way of working is sharing workplaces and the use of new technologic possibilities that supports working outside the office. Other important effects are costs reductions caused by for instance the economic recession. Also the ecologic footprint per employee can be lowered if less space per employee is required. Furthermore the location and the flexibility of the building has a relationship with the total space per employee. And lastly the employee has influence on the total space per employee. These trends indicate a decrease of space per employees now and in the future.

Employees

Sustainability, a representative building, location, an emotional link with the building and the image of the city seem to be important motives for the office end-users and employees to feel satisfied in their work. These needs, expectations and composition of employees differ per generation (Maas, 2010). Organizations will be forced to adjust if they want to bind the new generation. The old way of working doesn't fit in the lives of the employees of the new generation. In a research from the importance for organizations to adjust to the wishes of the new generation is of more importance than in is thought of in first instance. Ageing and dejuvenation will cause a scarcity for new talent.

Globalization

The Dutch economy ranks the 8th place in the World Globalization Index (News, 2011). The research of Intuit. The information and communications technologies will enable globally distributed work in a better way and this will stimulate globalization (EmergentResearch, 2010).

Future supply

What are the alternatives in which the office supply can react on the changing office demand?

Subleasing

Despite having oversupply tenants do not always put the space on the sublease market at the pace suggested by layoffs. There are a variety of reasons for not subleasing the space at any given time (Hersler, 2010). Such as the dim prospects for finding sublease tenants, a short remaining lease term, high cost of reconfiguring the space or optimism that the space can be held for potential future re-hires. In addition accounting rules require corporations to write off the loss incurred by a sublease which may act as a disincentive for some companies to take this action.

Towards new supply

What are the restrictions and influences on the steps towards a new office supply?

Building user relationship model

There is a dialectic relationship between the occupying organization (the users) and the building. Blakstad (Blakstad, 2001) calls this the Building–User Relationship, BUR. The BUR consists of two subsystems: the building and the user organization. The two subsystems are dialectically interconnected. Also, there is a significant relation between the building flexibility and structural vacancy. The outcome of the thesis of Smit (Smit, 2012) proved that when all conditions (indicators) are the same an office building which is more flexible experiences less vacancy during its life span than a less flexible office building.

Accommodation strategy

A continuous matching process is needed to match the dynamic demand and the static supply and to prevent mismatches. Forethought requires a vision on future accommodation needs, a set of strategic choices and assumptions (Jonge, Arkensteijn et al., 2008). More and more the tradition approach where the emphasis lies on cost control makes place for an integral approach with attention both for the costs and for the benefits. This strengthened role of the facility manager as a strategic management tool that ensures alignment between

the strategic objectives of the organization, the work processes and the physical environment (Prevosth, 2011).

Contracts

One of the reasons why occupied space may deviate from the demand at the current rent level is the fact that many tenants are locked into old contracts (Jong, 2012). In the absence of default these tenants can only adjust their space consumption as their contracts expire (Gunnelin, 2005). Therefore the contract durations are under pressure.

Several parties are researching other possibilities. Real Estate developer Annexum for instance wants to get rid of its long lasting contracts that are still usual in the real estate sector (Jong, 2012). According to Gerben van Dijk, program manager of SBR, short leasing will gain more market share in the office market (Brinks, 2012).

3 Research Design

This chapter will describe how the methodology of the research is translated into the structure of the interviews and the set up of the survey. A thorough preparation of the interviews and the survey is very important. A proper interview and survey setup will lead to a clear and result oriented outcome. The choices that had to be made to design the research will be discussed in this chapter. The following topics will be described: the use of the quantitative versus the qualitative research method (chapter 3.1), the research type and research method per research question (chapter 3.2), the research outline of the survey (chapter 3.3) and the research outline of the interview (chapter 3.4) and the conclusion (chapter 3.5).

3.1 QUANTITATIVE VERSUS QUALITATIVE RESEARCH

The choice that has to be made between the quantitative and qualitative research method can depend upon quite pragmatic matters. But the researcher has to bear in mind that these research methods are often evaluated in a different way. The following table gives terms used by speakers at a conference on research methods in the late 1970s. It shows how imprecise evaluative considerations come into play when researches describe qualitative and quantitative methods (Miller and Dingwall, 1997).

Qualitative	**Quantitative**
soft	Hard
Flexible	fixed
subjective	Objective
political	Value-free
Case study	survey
specultative	Hypothesis-testing
grounded	Abstract

Table 12: Clamed features of qualitative and quantitative methods (Halfpenny, 1979 cited in Miller,1997)

The issues of this research can be divided in qualitative and quantitative questions. Therefore a mix of both research methods is chosen. The focus however lies on the quantitative part. The qualitative measurements are used to formulate a hypothesis and to do in-depth research. Only qualitative research would have resulted in a limited generalizability. Therefore quantitative research is performed to generalize the outcomes. Herein a significant relation will be shown between the demand and supply side. The in depth interviews will help to explain the results of the survey with qualitative arguments and to relate the quantitative results with the everyday practice. In Figure 34 the empirical research design is shown.

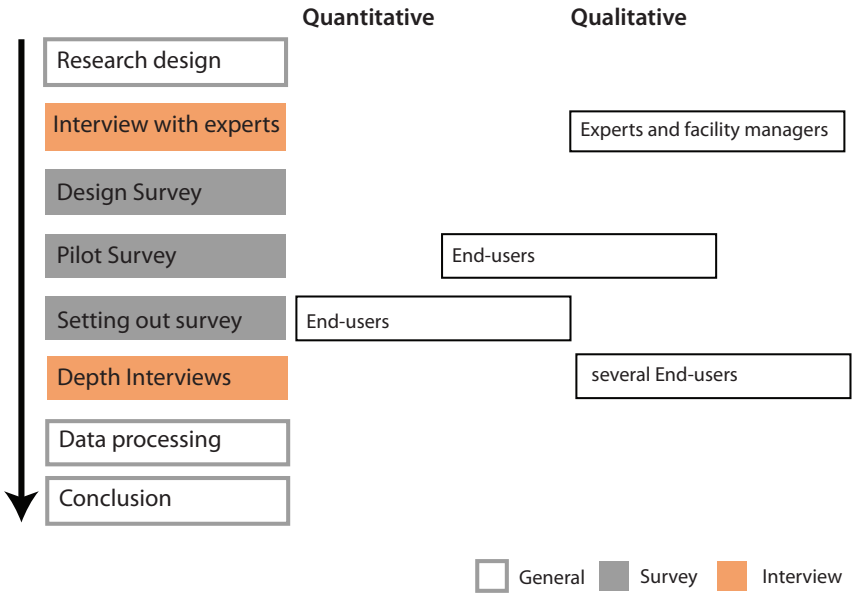


Figure 34: Empirical research designs

3.2 RESEARCH TYPE AND RESEARCH METHOD

There are several types of researches such as: descriptive research, explorative research and testing research (Cho and Trincia, 2012). Furthermore there are various research methods that can be used such as: surveys, interviews, case studies and experiments. Table 13 shows the chosen research design for each sub question. The chosen research types and methods will be explained in the next paragraph.

Sub questions	1	2	3	4	5
Topic	**Organization**	**New demand**	**Mismatch**	**New supply**	**Towards new supply**
Research types					
Descriptive					
Testing					
Explorative					
Research methods					
Structured Interviews					
Unstructured interviews					
(Quantitative) survey					
Experiment					
Case-study					
Theory					

Table 13: Research types and methods

3.2.1 Sub question 1: Organization

In what way do type of characteristics (size, location and sector) differ significantly in their quantitative demand for office space?

1.1 In what way do different **sectors** differ significantly in their demand for office space?

1.2 In what way do different **sizes** of companies differ significantly in their demand for office space?
1.3 In what way do different organizations on different **locations** differ significantly in their demand for office space?

Research type

The question can be defined as a "what is going on?" question. Therefore the descriptive research method is best applicable. The main focus of this question lies on the description and organization of the characteristics of the research units. A predefined systematic structure is used to support this question (Baarda and de Goede 1990).

Research method

There is not much information known in the beginning. A minimum of hypothesis or theory can be tested. This makes an open approach necessary to obtain new information about the way organizations differ in their current demand. Theory and earlier research can predict the differences of job prognoses and preferred locations. But the specific answer on this research question about the influence of characteristics on their quantitative office demand will lie in the results of the survey. The differences between user-groups will be compared with the help of statistics.

3.2.2 Sub question 2: New demand

In which extend is the office demand changed since the start of the office contracts of the organizations?

2.1 In what way does the **Economy** influence the demand for office space?
- Quantitative: What is the difference between the demanded amount of FTE and the actual number of FTE in 2012?
- Qualitative: In what way has the current market condition influence on the housing demand?

2.2 In what way does **the new of working** influences the demand for office space?
- Quantitative: What is the difference between the LFA per FTE demanded and the LFA per FTE in 2012?
- Qualitative: In what way do companies apply alternative working strategies and how does this influence the organization and the demand for space?

Research type

The question can be expressed as a "what is going on?" and a "What is the cause and why?" question. There is no predefined theory but there are some hypotheses described. Explorative research is focused on the development of theory and sharply described formulation of hypotheses (Baarda and de Goede 1990). Explorative research will search for an answer on how the new economy and the new way of working will influence the new demand. And will lead to the answer of the question to which extent these developments will influence the new demand.

Research method

This question will be answered both with qualitative and quantitative research approach and with theoretic research. The theory part will discuss all the themes related to the new way of working and the new economy. Their quantitative and qualitative effects on the office demand is described. In the quantitative part the effects of the new way of working and the

new economy will be quantified with the results of the survey. The results of the interviews describe the debates on the changing office demand.

3.2.3 Sub question 3: Mismatch

What is the quantitative mismatch between the current office demand and the current office supply?

3.1 What is the quantitative difference between the current demand for **office space** and the current supply?
3.2 What is the quantitative difference between the current demand **of employees** and the actual number of employees that work in the organization at the moment?
3.3 What is the quantitative difference between the current demand for **office space per employee** and the actual office space per employee?
3.4 What is the quantitative difference between the current demand of the **office concept** correspond and the current office concept?
3.5 What is the quantitative difference between the current demand for **contract duration** and the actual contract duration?

Research type

This question is a descriptive question. There is no predefined theory but there are some described hypotheses. Explorative research is focused on the development of theory and sharply described formulation of hypotheses (Baarda and de Goede 1990). Explorative research will search for an answer on how the new economy and the new way of working will influence the new demand. Furthermore in which extent these developments will influence the new demand.

Research method

A quantitative approach is needed to formulate the quantitative mismatch between the current office demand and the current office supply. To relate the quantitative results with practice, the interviews will help to explain the results of the survey with qualitative arguments.

3.2.4 Sub question 4: Alternatives

What are the alternatives in which the office supply can react on the changing office demand?

4.1 To which extent is **subleasing** a solution for office-users?
- Quantitative: How many per cent of of the office-users handle subleasing and for how much office space ?
- Qualitative: What are the cons and pros of subleasing ?

4.2 To which extent are office-users open for **movemen**t?
- Quantitative: How many per cent of the users have moved their office in the last 5 years?
- Quantitative: if the lease contract would end at this moment would the user go to a new building or stay at the current building?
- Qualitative: What are the pros and cons for moving versus not-moving the office?

Research type

The question is an explorative question. There is no predefined systematic which will be evaluated by the interviewees. There are some general hypothesis.

Research method

This question will be answered in both a quantitative and a qualitative way. Data are available that show to which extent the office users apply sublease. Also it is known when they have moved their office. So the quantitative questions can be answered. The qualitative questions will be answered with arguments and opinions. Office-users will explain why they use subleasing or why they do not use it. Furthermore, why they want to move or why not. This study will be done with interviews.

3.2.5 Sub question 5: Towards a new supply

To what extend do housing management, location restriction and contracts have influence on the steps towards a new office supply?

5.1 How is the **housing management** organized in companies?

Qualitative: What kind of housing management is present ?

Qualitative: What aspects are important in this workfield?

5.2 To what extent is the organization **location restricted**?

Quantitative: If the lease contract would end at this moment would the office-user go to a new building or stay at the current building?

Qualitative: What are the reasons that some office users stay at the same location. What factors play a role?

5.3 To what extent are **contracts** restricted currently and in the future?

Quantitative: What is the requested contract duration?

Qualitative: Do office users prefer flexible and short term contracts and why?

Qualitative: In what way do existing contracts restrict office users?

Research type

The question is an explorative question. There is no predefined system that can be evaluated by the interviewees. On the other hand, there are some general hypotheses.

Research method

This question will be answered in both a quantitative and a qualitative way. A more in-depth answer is expected by means of the use of interviews. The quantitative data will give clear and objective results.

3.3 THE SURVEY

3.3.1 Technique

Sekaran (2003) illustrates the principles of survey design (Figure 35) when choosing for a questionnaire. This diagram shows the aspects of a survey and served as a guideline for the

present survey. First step is the principle of wording, next step is the principle of measurement and the last step is the general "getup". A distinction Breidert (Breidert, Hahsler, & Reutterer, 2006) makes is the one between either stated or revealed preference. Revealed preference is a data collection method that is based on actual or simulated data whereas stated preference utilizes surveying techniques.
The data used for revealed preference can be obtained from market data or can be generated from performing experiments. These data are the actual responses. Stated preference collects its data from either direct or indirect surveys. Stated preferences describe not the actual transactions but more about what people and organizations state they would do in that circumstances. These answers of the interviewees could be biased. What the respondents say they would do, does not automatically mean that they would act accordingly in a real situation. Therefore a revealed preference method would be the most valid one. However when revealed preferences are researched, the necessary data are not always at hand (Breidert et all, 2006). To use this method a database that contains building characteristics of the organizations and of the offices is needed. Remoy et all. provides such a database. However these data miss information to calculate the hidden vacancy. An option is to gather this information through personal fieldwork. On the other hand this would take too much time. Therefore the choice was made to use stated preferences and not revealed preferences. To make the response as valuable as possible the quantitative survey method is applied. In the case that the respondent has no access to the information requested he or she is not obligated to answer. This brings the occurrence of fictitious data to a minimum.

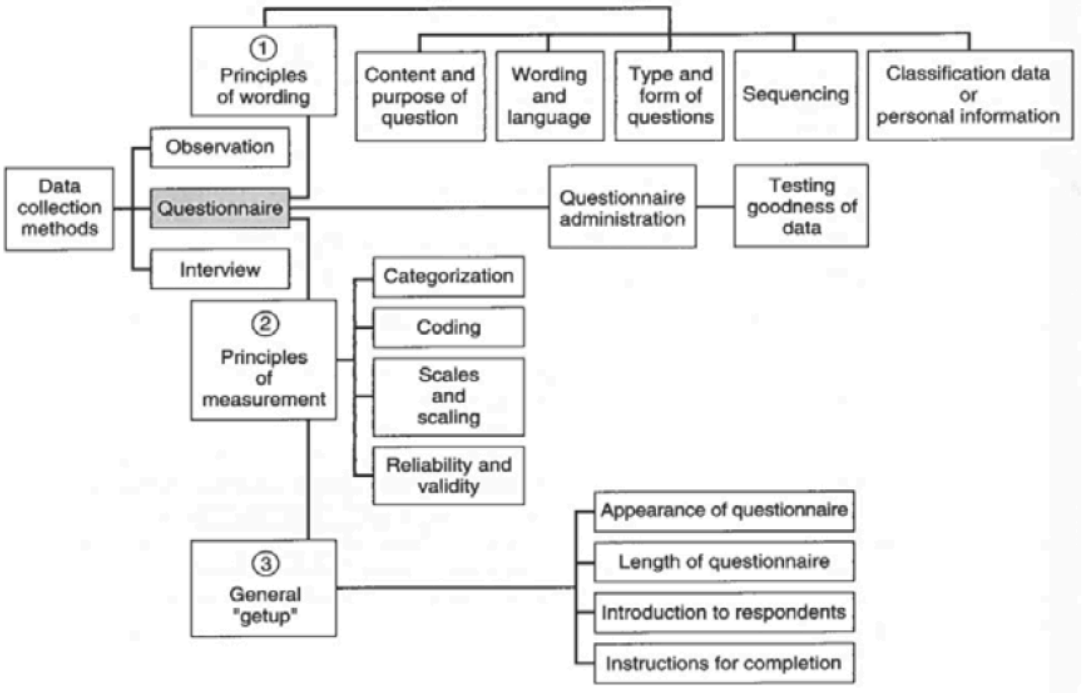


Figure 35: Principles of survey design (Sekaran 2003 cited in (Visser, 2010).

Within stated preferences Breidert and colleques (2006) make distinction between direct and indirect surveys**.** Respondents are directly asked how much hidden vacancy they have. When indirect surveys are used respondents are asked to give a ranking or rating to state their preference for a certain product. Ranking or rating of a product has the advantage that desired behavior is reduced. An indirect survey takes more time than a direct survey. This can be a disadvantage. Using an indirect survey is preferable in this research as there are

several definitions for hidden vacancy. Also the danger with direct questions can be that hidden vacancy has a negative image what can influence the answer.

The final step, according to Breidert and collegues (2006), is choosing between expert judgments and customer surveys. An expert has knowledge about the consumer need and is therefore more time-efficient than interviewing customers themselves. Experts can provide biased answers because their personal objectives might conflict with the survey's objectives. Expert judgment is best applicable in markets with few customers (Breidert et al., 2006). The Dutch office user is a large market with a lot of sectors and therefore unsuitable for Breidert and collegues' expert judgements.

The outcome of a survey can be biased or difficult to interpret in a correct way. Triangulation is used to reduce this effect. According to Jick (1979), triangulation is the use of two or more methods to check the results. The survey will be used together with interviews in this study to obtain triangulation. The type of triangulation used here is sequential triangulation since the interviews are based on the results of the survey (Jick, 1979) (Figure 35).

3.3.2 Data collection

After choosing the methodology that will be in this study it is essential to have a proper setup for the survey. This setup will be explained in the following paragraphs.

Survey lay out

The content and purpose of the questions are divided into three categories. Each category of the survey will be briefly discussed in this paragraph. The variables are determined with the help of literature and interviews. These variables are translated in a Dutch survey. The survey is firstly checked with a pilot on independency and reliability. The survey is shown in Appendix B.

The survey consists of three parts. Part 1 contains questions about the accommodation data in one particular office. Part 2 is describes moving motives. Part 3 gives general information about the company as a whole. In Table 15 the variables are shown per part and per question.

Part 1: Accommodation data

Quantitative data about the particular office are asked in the first part. In Table 14 the most important variables are shown.

Variable	Start contract (past)	2012 (current supply)	Demand (current demand)	In 5 years (future)		Leased	owned
Total LFA							
Number of FTE							
Office concept							
Contract duration							
Subleasing							
Size							
Location							

Table 14: Survey variable for accommodation data

Part 2: movement reasons

This part of the survey is written by Zaghdoud. He currently does a research on the moving motives of office users in The Netherlands. One of the questions that will be used is the following. Have you moved in the last 5 years or have you or have you been in a moving process? The answer on this question indicates how many companies of the sample were in a moving process in the last 5 years. The outcome of these questions indicates the location restriction. The rest of the questions of Zaghoud categorize the pull, push, keep, reject factors. The factor that is related to this study is the pull factor 'organizational'. It is however very vaque as it doesn't explain which organizational factor is meant. For this reason the 'organizational" factor is not used in this report.

Part 3: general information

Respondents would normally expect that general information would be asked in the first questions of the questionnaire. Eric Louw of OTB however considers in an interview to ask these questions at the end of the survey. When a survey starts with the most important questions the answers on these questions will be less sensitive to respondents that stop during the survey. If needed general information can be obtained via another source.
Characteristics of the respondents and their organizations are asked to receive background information. This information is necessary to determine patterns from different types of characteristics of respondents and organizations.
Also the respondents have the opportunity to indicate if they are open for an personal interview which makes it easier to reach professionals that want to participate in the study.

In the following table the variables and the output of the questions are shown.

N	Category	Question	Variable
	1. Accommodation data		
1	1.1. General	1	postcode
		3	rent/ownership/partly
		3	Registered vacancy
2	1.2. Data 2012	4,5,6	number of employees
			FTE
			Work spaces
			LFA
			sublease
			Occupation
			year end and start lease contract (if lease)
			year start owning (if owned)
			office concept
3		7	Office concept and sharing workplaces
4		8	hypothese lease/own in current/new site
6		9,10,11	demand: employees
			demand: FTE
			demand: workplaces
			demand: VVO
			demand: office concept
			Demand: lease duration (if lease)
7		12	fit organization-building
8	1.3 Data past	13	year measurement
			total employees
			total FTE
			total workplaces

			total LFA
			total sublease
9	2. Movement reasons	14	pull factors
			Push factors
			reject factors
			keep factors
13	3. General	15	number of offices
14		16	number FTE total organization
			number of LFA total organization
15		17	Size organization
16		18	sector
17		19	function

Table 15: Survey variables (Appendix C)

Variables

The following variables are used in the research. As is shown most variables have a ration scale, hence the mean will be used.

Topic			Variables	N.	Mean	Median	Scale
Total LFA	Past	Sqm	LFA_p	76	5128	1280	Ratio
	2012	Sqm	LFA_2012	86	8337	2147	Ratio
	Demand	Sqm	LFA_f	92	6017	2000	Ratio
	Hidden vacancy	%	Perc_diff_LFA_f	81	0.007	-0.01	Ratio
	Total company 2012	Sqm	LFA_2012_totaal	26	107,528	11,000	Ratio
	Total company demand	Sqm	LFA_f_totaal	26	104,500	6,875	Ratio
Number of FTE	Past	sqm	FTE_p	74	212	50	Ratio
	2012	Sqm	FTE_2012	91	452	110	Ratio
	Demand	sqm	FTE_f	91	396	110	Ratio
	Mismatch	%	Perc_diff_FTE_f	89	0.11	0.00	Ratio
	Total company 2012	Sqm	FTE_2012_totaal	35	3,350	800	Ratio
	Total company demand	Sqm	FTE_f_totaal	35	2,979	900	Ratio
LFA/FTE	Mismatch	Sqm	Diff_LFA_FTE_f	75	-5.2	-1.4	Ratio
Office concept	% of total office 2012	%	OO_2012	94	43	40	Ratio
	% of total office 2012	%	TO_2012	94	26	20	Ratio
	% of total office 2012	%	CO_2012	96	30	20	Ratio
	% of total office demand	%	OO_f	96	54	50	Ratio
	% of total office demand	%	TO_f	96	26	20	Ratio
	% of total office demand	%	CO_f	96	21	10	Ratio
	Mismatch open office	%	Diff_OO_f	91	12	0	Ratio
Contract duration	Demand	years	CD_f	74	5.2	5	Ratio
Sector	7 sectors	1-7	Sector_new	102	4.2	4	Nominal
Size	Dependent on the number employees	1-3	Size_EMP	95	2	2	Ordinal

Table 16: the main variables used in the research

Scale type		Permissible statistics
Nominal (categorical)	Categories	Mode, Chi-squared
Ordinal	Describes order	Median, percentile
Interval	Celcius scale	Mean
Ratio	Absolute zero	Mean

Table 17 : Scale types

Excluded variables

The variable current contract term is not used in the analyses. In the survey is asked for the start date of the rental contract of the respondents. However there is no distinction made in the relevant question between the date of the start of the contract and the date of the extension of the contract. So no conclusion could be made on with these results. Research of the the data shows that the average contract duration is 9,6 years. The contract duration is defined as date of the end of the contract minus the date of the start. For example for some companies this could be 5 years extended with another 5 and for others 10 years in a row. The different data are not comparable to each other and therefore not usable. Also the variable occupation rate is not used in the study. The interviews revealed that the occupation of the buildings varies widely during the week. So the occupation rate is not valuable to use. Further, the number of workplaces is not included in the study. The definition of workplace appeared to be very vague for office users what makes it hard to use this variable.

Excluded respondents

Some respondents didn't fill out all the information, shown in Table 18. The total FTE is more often filled in than the LFA. There were some restrictions in the data. The current LFA had to be as least 100 square meters and the total current FTE had to be at least 5 FTE.

Variable	N.	NrMissing	Per cent NRMissing
Postcode	102	0	0%
LFA 2012 f	81	21	21%
FTE 2012 f	89	13	13%
LFA/FTE 2012 and f	75	27	26%
Office concept 2012 and office concept f	91	11	11%
Contract duration f	75	27	26%
Subleasing	18	84	82%
Size (employees 2012)	95	7	7%

Table 18:NRMissing (for LFA, FTE, LFA/FTE, office concept if the variables are given for demand and for 2012

Method

The program IBM Statistics 19.0 has been used to analyse the collected data. The level of significance chosen is $p < 0,05$. This implies that the effects are considered as significant in case of a significance value lower than 0.05 and a deviation from normality. The theory about the analyses being used and the transcript and output is described in the Appendix G apart from this report.

3.3.3 The panel

Target group

Correlation coefficients fluctuate from sample to sample. This occurs more in small samples than in large samples. The reliability of factor analysis therefore is also dependent on the sample size (Field, 2009).

It is recommended to have a population as big as possible to get a good idea of the hidden vacancy in the office market. A population of at least n=100 is preferable seen the time period and the average response rate. A large scope is important to get this amount of

respondents. There is around 1.8 million square meters occupied office space in the Netherlands (DTZ 2012). The average office transaction is 920 square meters in 2012 described in a research of Dynamis (2013). If this is valid for the total stock there are around 45.000 office users in the Netherlands. For a population of 18,000 a sample size of 100, a confidence level of 95 per cent and a percentage of 50 per cent the confidence interval is 9.55. This leads to the standard deviation of 9.8 per cent.

The housing managers are the target group of the survey. The information needed for this survey is in hands of the employees of the companies that are responsible for the accommodation. Housing professionals are experts in the field of real estate and/or facilities. They advise the decision makers and have the lead in the processes of mutations and exploitations. In practice there is a great diversity of roles and functions that require different skills. For example a housing professional can be a specialist in facility, financial, managerial or technical aspects He or she can also be are a generalist that knows how to integrate all aspects. His or her role can focus on counselling and or (project-) management. He/she can be an employee of the organization or he/she can be a consultant of an external company (Miller and Dingwall, 1997).

It turned out to be important to reach a large population to obtain at least 100 respondents. The response rate of the respondents that completed the survey versus the visted respondents that did not is 34 per cent. The survey has been online for in total 138 days. It took more time to reach the number of at least 100 filled in surveys.

It was predicted that completing the survey would take just 15 to 20 minutes of the time of respondents. However some respondents indicated that it took around 30 minutes. This suggests that it took more energy and time to collect all the information that was required for the survey.

A lot of organizations and people are reached in the survey by e-mails, phone calls, website, social media and newsletters. The invitation mail is shown in Appendix A. The mail has been sent with the help of the website MailChimp. As indicated in Table 19 3000 people are reached for the survey. Just 3,5 per cent filled out the total survey which is remarkable low.

	Members		Reminder?
CoreNet	150	E-mail	Yes
Savills	150	E-mail	Yes
FMN	1000	E-mail & E-magazine	Yes
MKB Ijmond	500	Website, newsletter	No
MKB Haarlemmermeer-Schiphol	500	Website, newsletter	No
Contactgroep Bedrijven Consultants	85	E-mail	No
IBEV	140	E-mail	No
Family, friends, linkedin contacts	Around 300	E-mail & phone	Yes
6 linkedin groups, Twitter & facebook	unknown	Social media	No
Contacts from	Unknown	E-mail	Unknown

teachers	
Total	Around 3000

Table 19: all the parties that are reached

Excluded respondents

In total 105 respondents filled out the survey. Three respondents were excluded for the analyses. The response rate regarding the respondents that completed the survey was 91.6 per cent. Two respondents turned out to be the same (postcode 56CX and 1081 KM). The zip codes were similar and the total LFA, FTE and sector as well. Another respondent was also excluded because the surface that was subleased in fact was the total lettable floor area. Furthermore the number of FTE wasn't filled in.

Selection bias

The main target group consisted of the facility or housing managers. However, smaller companies don't have facility managers due to their smaller offices. In that case the director was the person that filled in the survey. In Table 20 the jobs of the respondents is shown. 65.7 per cent of the respondents is director or housing/facility manager. Which means that 34,3 per cent are not in the target group, whereof 9,8 per cent is other.

Job	Frequency	Per cent
Advisor	14	13.7%
Director	33	32.4%
Housing/facility manager	34	33.3%
Policy officer	6	5.9%
Administration/supportive	5	4.9%
Other	10	9,8%
Total	102	100%

Table 20 : Frequencies function respondent (Appendix G)

It was expected on forehand that most of the respondents would be member of Facility Management Nederland (FMN) and CoreNet. Therefore these organizations invited their members to participate in the survey. However just 39.2 per cent of the respondents turned out to be member of FMN and 6.9 per cent of the respondents was member of CoreNet.

Organization	Frequencies member	Per cent member
Facility Management Nederland	40	39.2%
CoreNet	7	6.9%

Table 21: Frequencies member of an organization (Appendix G)

3.4 INTERVIEWS

3.4.1 Technique

Observations and interviews have to be recorded in to become research data. This can be realized through field notes or pre-coded schedules. More detailed are transcripts of recorded talk. Studies like questionnaires, interviews, observations and diaries may suffer from two problems:

- The assumption of a stable reality or context to which people respond.
- The gap between beliefs and action and between what people say and what they do (Miller and Dingwall, 1997) .

So even though data from interviews contribute to a great understanding of how organizations function its observations may be based upon a taken-for-granted version of the setting in question (Miller and Dingwall, 1997)
The data of this research must be conducted in a transparent and clear manner with an analytical basis to obtain reliable scientific results. Therefore it is important to establish in advance what type of features of the interviewing data are searched for and what approach lies behind this search.

This research started with one or two almost totally unstructured discussions and a handful of interviews at the earliest stage of the qualitative work. A very broad topic guide was used with just a few direct questions for these discussions. This method was chosen to encourage respondents to do the talking. With this as the basis it was possible to formulate clearer ideas about the content of a more detailed guide for further qualitative work. The qualitative data were used to stimulate the ideas and to devise a viable soundly based framework for the study (Hoinville and Jowell, 1978).

According to Hoinville and Jowell (1978) a first step in the structuring may be to identify distinct groups. In the subsequent quantification stage the characteristics and attitudes of these groups can be compared. A second step towards structuring is to use the qualitative data to formulate a hypothesis on which information would belong to one or the other group.

This study used two kinds of interviews, a non-structured- and a semi-structured interview.

Earl Babbie's explains these types of interviews in the book 'The practice of social research' (2007);
• Structured interviews: the interviewer asks questions and the interviewee is to answer the questions without wandering off from the question. It leaves little room for the interviewee, but major control for the interviewer.
• Non-structured interviews: the interviewer sets guidelines for topics to discuss. The primary goal is to come to a discussion rather than answer predetermined questions. It leaves a large amount of space for the interviewee to talk about a certain topic, however, the interviewer has fewer guidelines.
• Semi-structured: the interviewer asks questions as well as allowing room to deviate from a set structure (Babbie, 2007). Semi-structured interviews are the most suitable option since the desire was to both ask questions as well as starting a discussion.

In the beginning of this study some unstructured interviews were conducted. The research design will be based on the outcome of the non-structured interviews and the theory as input. Also the qualitative and quantitative framework is created in this way. This is an important step before handing out the survey and doing the semi-structured interviews. Later on this list is explorated in more depth in more structured interviews. In a structured interview the question formulations are written out on beforehand. When the unstructered interview is performed the schedules will be in the hand of the interviewer. The main advantage of an unstructured schedule is that the way of asking questions can be adapted to the person and the situation of the interviewee. Besides the widest possible exploration of views is allowed when an unstructured and flexible approach is used. The disadvantage of this unstructered interview is that it opens the door for uncontrolled influence from the interviewee by the interviewer. This results in a so-called interview variance that lesd to differences between the outcome of the interviews. These are due to the differences between

the interviewers instead of differences between the interviewees (Emans, 2002). This can be minimized by staying as professional as possible. Furthermore the interviewer needs to have insight in the goals of every question. This is especially true when the interviewer takes care of the formulation of the questions. In addition the interviewee also needs to know what is expected when it comes to interrogation (Emans, 2002).

Interviewing is more than just asking questions. There are a lot of steps relevant for the interview schedule. For instance instructions for the introduction, notifications, how to terminate the interview, the way of rephrasing the question and the evaluation of the answers (Emans, 2002).

In Figure 36 the ten steps of Emans (2002) are shown to design the interview schedule for the semi-structured interviews. This scheme is indispensable when multiple interviews are used. This has to be the central control so that all the interviews are being held in same manner. The interview schedule is shown in Appendix D.

1. The goal of the study and the research questions are formulated. The goal of the interview is to get information about the housing management which results in answers on the research questions.

2. The themes of the interview will be collected by unstructured interviews and theory.

3. The methods are determined.

4. The goals of the interview has influence on the raw variables which will be used.

5. The raw variable that will be the fundament of the study are formulated.

6. The manner hoe to formulate the answers will be decided.

7. The instructions for asking questions will be related from theory and interviews with experts.

8. The questions will be categorized in a order.

9. The lay-out will be formed. How does the interview will be start and ended?

10. The first pilot will be done, in this case a pilot is performed with some unstructured interviews.

11. The definitive scheme for the semi-structured interview is made.

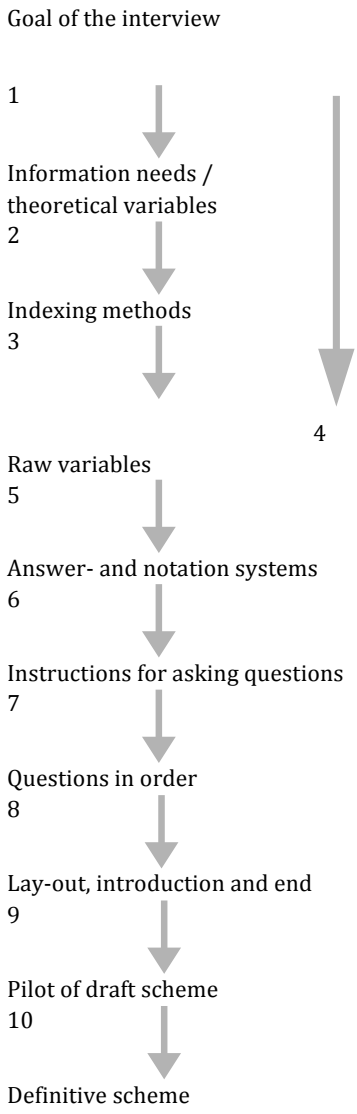


Figure 36: *The ten steps in the construction of a interview schedule (Emans, 2002)*

3.4.2 Data collection

On beforehand the interviewees completed the questions of the survey about one office. In this way a small case-study will be made for each company.

For processing the data it is important to code the interviews. The first level of coding is to identify themes; units of meaning (words, sentences) as the person express them. These themes are shown in Table 22. The second level coding is the formulation into theoretical words. This is done with the help of the unstructured interviews and the theory. The third level of coding is analyzing. By making a model of understanding by look for coherence, difference, hierarchical structures etc. This table is shown in Appendix F. This table is the fundament for the analyses of the interviews.

Themes	Organization	New demand	New supply	Towards new supply
Housing mangement				Facility management
Shared workplaces		New way of working		
The new way of working		New way of working		
Employee satisfaction		New way of working		Location restriction
Mobility		New way of working		Location restriction
Workforce	Size			
Moving motives	Location		Moving	
Lease/rent			Subleasing & selling	Contracts
Contract duration				Contracts
Sublease			Subleasing & selling	
Acommodation costs		New way of working	Moving	
Sustainability		New way of working		

Table 22: Variables of the interviews

3.4.3 The panel

Non-structured interviews

For the non-structured interviews the panel consists of experts with knowledge of facility management, hidden vacancy or research. The design of the research and survey is made in this way. Also general discussions about the topic have been made. In Table 23 the job positions of the respondents of the unstructured interviews are shown. Five of seven interviewees are researcher and the last two are facility managers. Most contacts were obtained via the university and mentors.

N.	Interview	Function	Sector
A		Senior researcher	University
1	Appendix E1	Senior researcher	Public sector
2	Appendix E2	Manager Research	Institute
3	Appendix E3	Advisor and manager	Consultant
4	Appendix E4	Research director	Broker
5	Appendix E5	Director group facility services	Insurance
7	Appendix E7	Leading professional Real Estate & Facility Management	Business services

Table 23: Respondents of the unstructured interviews

Semi-structured interviews

The scope of the research is large. The research question is aimed at all the office users in the Netherlands. The aim of the semi-structured interviews is to get an idea of the housing management of different companies in the Netherlands. Further, it is important that the interviewee have knowledge of the housing management of the organization.

In the following table the companies are shown that were interviewed. By the selection of the companies the aim was to interview companies that are different on the following aspects;

- Size company
- Office space expectation
- Sector
- Location

In this way it is possible to connect the conclusions of the interviews to the results of the survey. To identify how organizations deal with hidden vacancy most companies that are interviewed have an oversupply of office space. Company 12 was the only example where the current office was too small.

Company	**Location**	**Sector**	**Size company**	**LFA expectation**
Company 6	Rijswijk	Oil & energy	Big	↘
Company 8	Amsterdam	Wholesale	Medium	↘
Company 9	Utrecht	Banking	Big	→
Company 10	Woerden	Market research	Very Small	↘
Company 11	Baarn	Management consultancy	Small	→
Company 12	Amsterdam	Internet	Small	↗
Company 13	Dordrecht/Rotterdam	Logistics & supply chain	Medium	↘

Table 24: Characteristics of the companies that were interviewed

In the survey, the respondent was asked if they are open for an interview. Some of these companies were contacted. Further some were contacted because they are family or friends. Also Savills had some clients that could be reached for an interview.

3.5 CONCLUSION

Quantitative versus qualitative research

The issues of this research can be divided in qualitative and quantitative questions. Therefore a mix of both research methods is chosen. The focus however lies on the

quantitative part. The qualitative measurements are used to formulate a hypothesis and to do in-depth research.

Research type and research method

There are several types of researches such as: descriptive research, explorative research and testing research (Cho and Trincia, 2012). Furthermore there are various research methods that can be used such as: surveys, interviews, case studies and experiments. Each sub question has a chosen research design.

The survey

Technique

Sekaran (2003) illustrates the principles of survey design when choosing for a questionnaire. This diagram shows the aspects of a survey and served as a guideline for the survey used in this study.

Within stated preferences Breidert and colleques (2006) make a distinction between direct and indirect surveys**.** Using an indirect survey is preferable in this study. Further is chosen between expert judgments and customer surveys. The Dutch office user is a large market with a lot of sectors and therefore unsuitable for Breidert and collegues' expert judgments. The survey will be used together with interviews in this study to obtain triangulation.

Data collection

After choosing the methodology that will be used in this study it is essential to have a proper setup for the survey. The survey consists of three parts. Part 1 contains questions about the accommodation data in one particular office. Part 2 describes moving motives. And part 3 gives general information about the company as a whole.

Variables

The variables; current contract term, occupation and workplaces are not used in the analyses. The respondents didn't fill out all the information, for most variables the response rate was lower than 102.

Method

The program IBM Statistics 19.0 has been used to analyze the collected data. The level of significance chosen is $p < 0,05$.

The panel

A population of at least n=100 is preferable seen the time period and the average response rate. However, it took more time to reach the number of at least 100 filled in surveys than though, the response rate was very small. The housing managers are the target group of the survey.

In total 105 respondents filled out the survey. Three respondents were excluded for the analyses.

Interviews

Technique

This research started with one or two almost totally unstructured discussions and a handful of interviews at the earliest stage of the qualitative work. A very broad topic guide with just a few direct questions was used for these discussions.

This study used two ways of interviewing, a non-structured and a semi-structured interview.

Interviewing is more than just asking questions. There are a lot of steps relevant for the interview schedule. For instance; instructions for the introduction, notifications, how to terminate the interview, the way of rephrasing the question and the evaluation of the answers (Emans, 2002).

The ten steps of Emans (2002) are used to design the interview schedule for the semi-structured interviews. This scheme is indispensable when multiple interviews are used. This has to be the central control so that all the interviews are being held in same manner.

Data collection

On beforehand the interviewees completed the questions of the survey about one office. In this way a small case-study will be made for each company. For processing the data the interviews were coded.

The panel

For the non-structured interviews the panel consists of experts with knowledge of facility management, hidden vacancy or research.

The scope of the research is large. The research question is aimed at all the office users in the Netherlands. The aim of the semi-structured interviews is to get an idea of the housing management of different companies in the Netherlands. Further, it is important that the interviewee have knowledge of the housing management of the organization.


RESULTS

4 Quantitative study - the survey

In this chapter the results of the quantitative study will be discussed. In the conceptual model the chapter specific topics are shown (Figure 37). The topics discussed in this chapter are; the sample distribution (chapter 4.1), the organization (chapter 4.2), the mismatch (chapter 4.3) the steps towards a new supply (chapter 4.4) and the conclusion (chapter 4.5). The main goal of the survey is to explore the mismatch between the current and future demand of the office user and the current supply. The survey lay out is shown in appendix C.

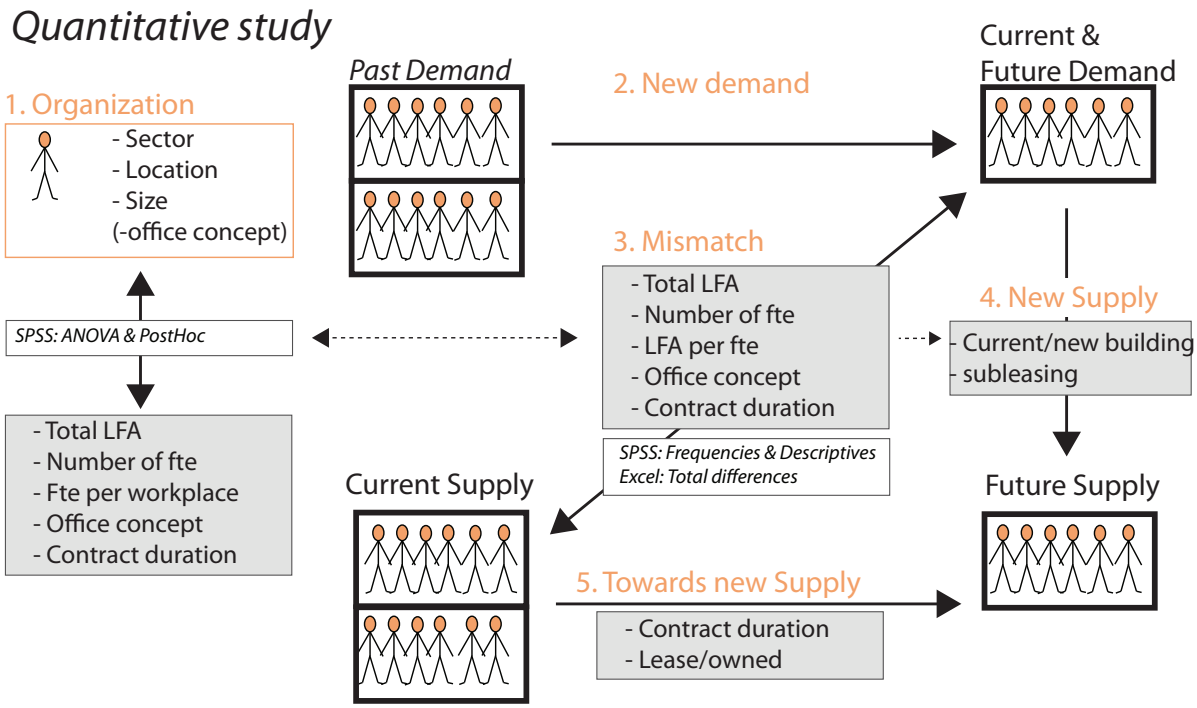


Figure 37: Conceptual model survey

4.1 SAMPLE DISTRIBUTION

Before making any statement about the total population, the Dutch office market, the sample will be compared to the population to test its validity. Some known facts about the office market will be compared to the sample.

4.1.1 Location

The respondents were asked for the postcode of the ffice. With this information, the total square meters per province is determined. The sample contains less square meters in Noord-Holland. On the other hand there is more office space in Gelderland, Friesland and Utrecht compared to the Dutch office stock.

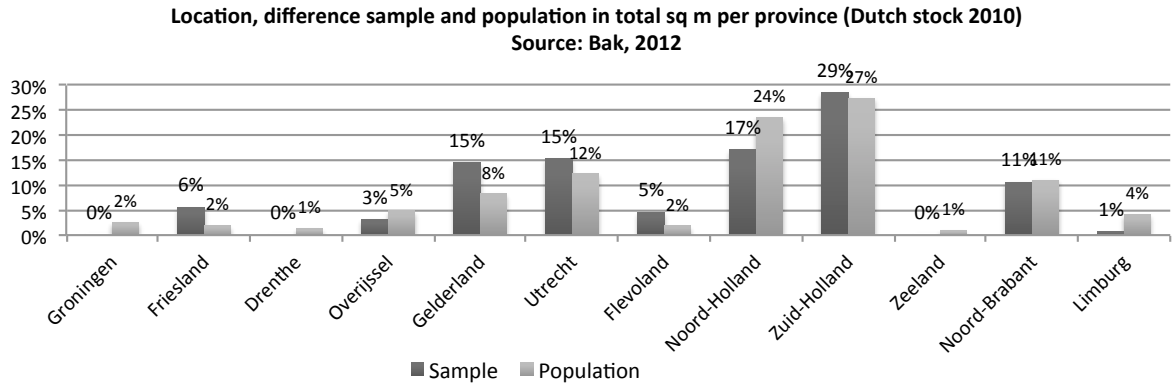


Figure 38: Office stock in Sample (N=102) and Population in 2010 (Bak, 2011)

4.1.2 Size

In the following graph, the difference between the sample and the population are shown concerning their size in total employees. Data from CBS is used about the number of employees and companies in the office market in the Netherlands. The sample contains in size, more larger companies compared to the office market and in percentage less companies with 50 employees or less.

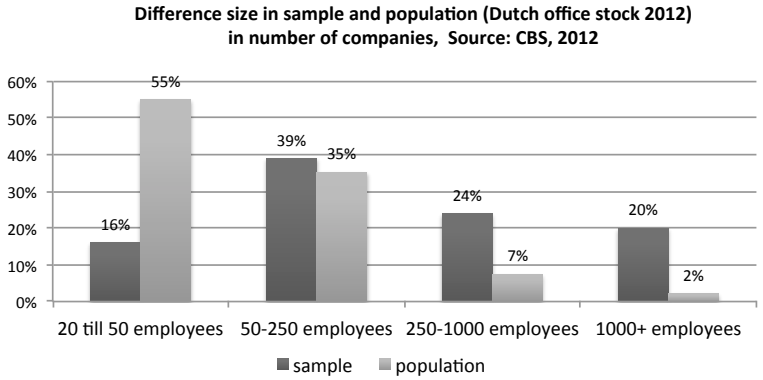


Figure 39: Total stock difference in size of employees and

Concluded, it is recommended to adjust the results of the survey to a division that match with the office market because of the big differences.

4.1.3 Sector

NFC rated its data to the office market with a ratio exposed in Figure 40 (NFC, 2011). The source of their data is the rapport from ABN AMRO (Steinmaier, 2011). It appeared that these percentages are the take-up figures between 2002-2009, they do not represent the stock. However, they give an idea about the division of sectors of the office stock in square meters in the Netherlands. The sample has clearly less office space in the public sector, in the manufactory & industry sector and in the communication and automation sector. Further, the sample contains more office space in the financial & insurance sector.

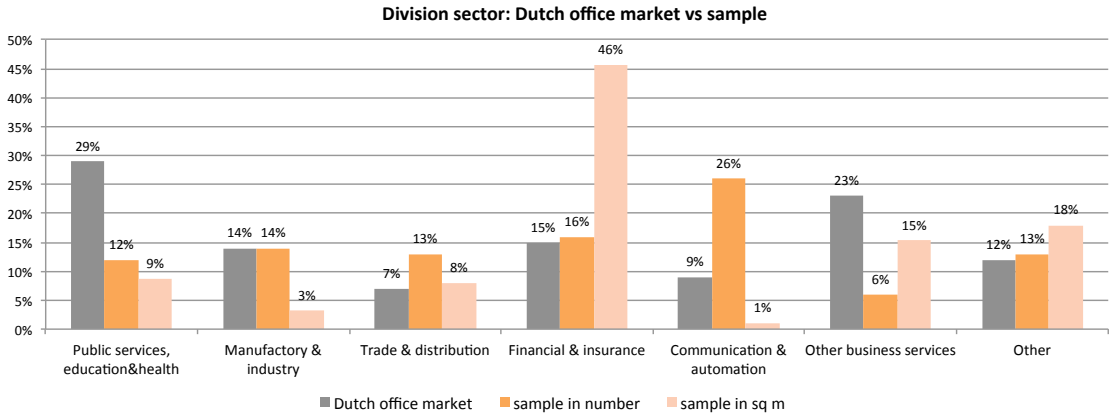


Figure 40: Differences between sectors in the Dutch office market (NFC, 2011) and the sample

It is difficult to state conclusions because a division is made with the take-up in 2002-2009 instead of the current total stock. Still it is shown, that the sectors financial & insurance is dominated in the sample. The sectors manufactory & industry and communication & automation are clearly recessive in the sample.

4.1.4 Rental/own

In the sample, 70 per cent of the respondents leases and 27 per cent owns. Further, there some offices that are partly owned and leased. In the sample there are slightly more offices that are leased compared to the total Dutch office stock.

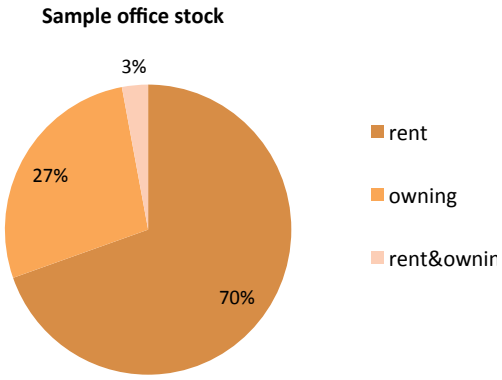


Figure 41: Sample of the research (N=102)

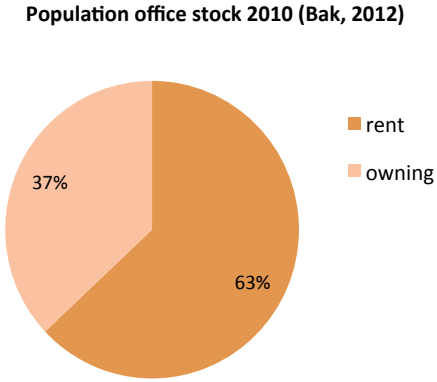


Figure 42: Total Dutch office stock 2010 (Bak, 2012)

4.1.5 Conclusion

The biggest differences between the sample and population concerning size, location, sector and rental or owned are:

- The sample contains more companies with more than 250 employees and less companies with less than 50 employees compared to the office market.
- The sample has less square meters in Noord-Holland and more in Gelderland, Friesland and Utrecht compared to the population.
- The sector financial & insurance is dominated in the sample.

- The sectors manufactory & industry and communication & automation are recessive in the sample.

4.2 ORGANIZATION

4.2.1 Sector

In the survey there is being asked to the sector of the company. Below, the sectors are shown in number of offices. Most companies are categorized in other businesses. Also, "other" contains quit a lot of numbers.

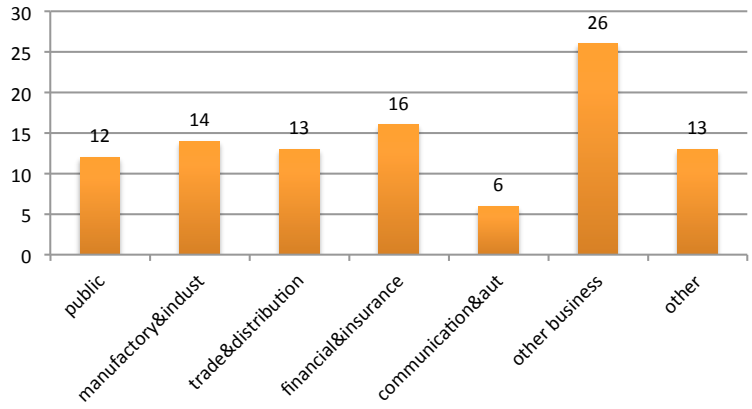


Figure 43: sector of the sample (N=100)

4.2.2 Location

The respondents were asked to fill out the postcode of their office. The offices are categorized by province and location. The sample does not have information about the offices in Drenthe, Groningen and Zeeland.

City	Number	Percentage
Amsterdam	22	22%
Den Haag	6	6%
Rotterdam	11	11%
Utrecht	5	5%

Table 25: Biggest cities with number and percentage of the sample

Figure 44: Map with locations of the respondents

4.2.3 Size

In the survey, one question is asked to the size of the company. Three categories are made:

1. Small (less than 50 employees and less than 10 million euro turnover)
2. Medium (between 51 and 250 employees, between 10 and 50 million turnover)
3. Large (more than 250 employees and less than 50 million turnover)

To get more detailed and clear data, a new scale is made. The size of the company is depended on the number of employees. The following pie's show the two categories. The second will be used in later stages to compare the data with each other.

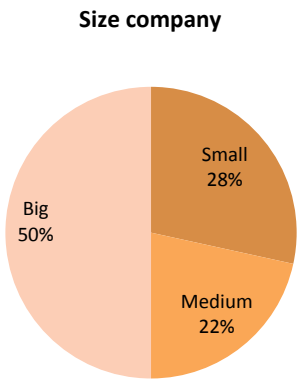


Figure 45: Size company (N=102)

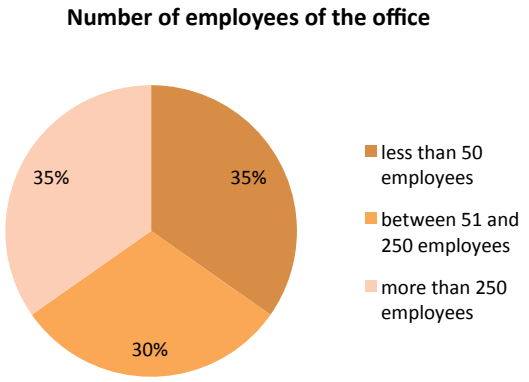


Figure 46: Size of companies dependant on number of employees (N=102)

4.3 MISMATCH (P, NOW & DEMAND)

4.3.1 Total LFA

In this subchapter the mismatch between the current and future demand and the current supply is examined.

Hypothesis: The current and future demand for office space is smaller than the current supply.

Different assumptions are present in previous researches:

- DTZ (DTZ, 2011) estimated the hidden vacancy on circa 2 million square meters, which is around 5 per cent of the total occupied stock.
- Vader cited in Jongsma (Jongsma, 2011) expect that in coming years companies get rid of a quarter to a third of their office space.
- The total effect on the decrease of use surface because of new economics and the new way of working is circa 12 per cent according the national office research of Twijnstra Gudde (Meer and Feijt, 2010).
- The amount of office will increase 2 per cent in Europe in the next 20 years. This is a saldo of space planning decrease (+25/33 per cent), remote working erosion (-15 per cent) and working population declines (-10 per cent). The figures show different numbers. This is because of a different scope or other research design of the researches. Still, the expectation is in most cases that the office space will decrease because of a changing demand.

Current demand versus current and past supply

The total lettable floor area (LFA) is shown for the following moments:

- Past: The start of the rental or buying contract.
- 2012: At the moment the survey if filled out (between November 2012 and February 2013)
- Demand: If the contract would end at the moment the survey is filled out what would de office user want?

From all the respondents, 66 completed all the three components for the total lettable floor space area. This is 65 per cent of the total number of respondents. For a lot of respondents it was not possible to fill everything in. 81 respondents filled in the total LFA for 2012 and demand. This is 79 per cent of the total number of respondents.
The respondents, who filled in all the components, count for 414,000 square meters in 2012. This is 8 per cent more than before the start of their contract. Here, the demand is 15 per cent lower than the current supply.

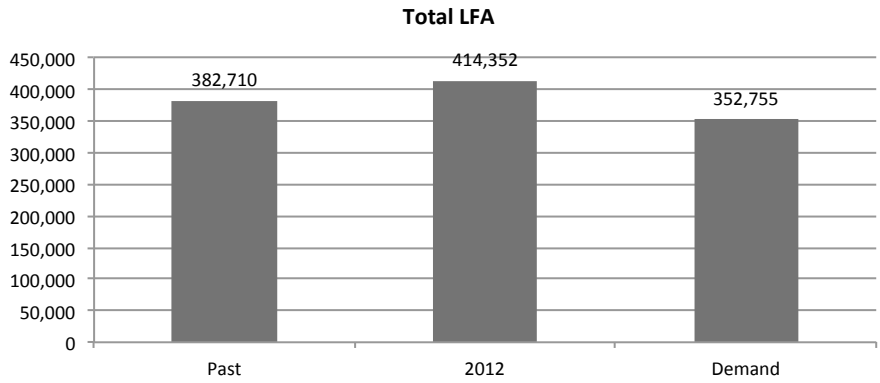


Figure 47: The development of LFA for respondents who filled out all the three figures (N=66) (Appendix G & Excel)

The respondents (N=81) who filled in at least two components count for 710,000 square meters in 2012, which is around 2 per cent of the total occupied office stock in the Netherlands. The demand is 23 per cent lower than the current supply. Because of the higher amount of respondents and office space, this figure is more reliable than the previous one. However, the amount of larger offices in this sample is more than in the total office stock.

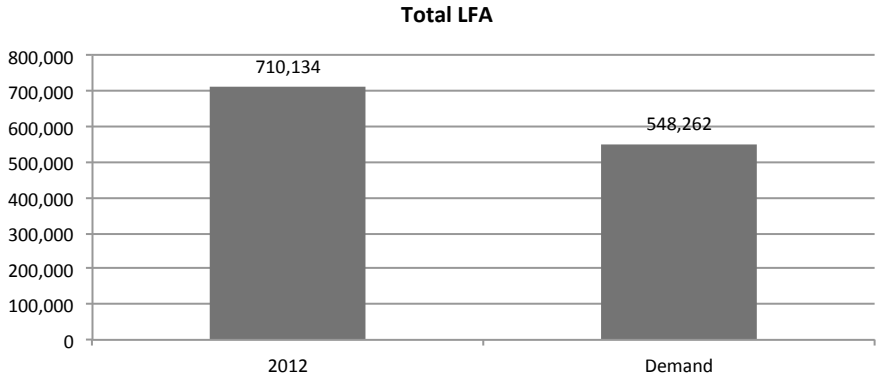


Figure 48: The development of LFA for respondents who filled out all the two figures (N=81) (Appendix G & Excel)

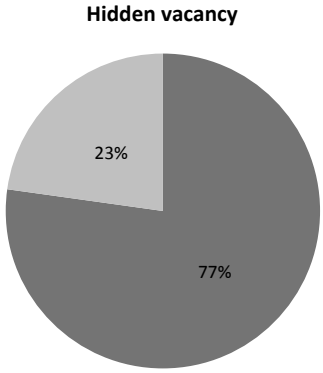


Figure 49: Hidden vacancy: (LFA_2012-LFA_demand)/LFA_2012 N=81 (Excel)

Future demand versus current supply

The companies that have more than two offices were being asked what they expect for the total LFA of the company for the next five years. Fiftynine companies have more than 1 office. They were being asked what their expectation is for the coming five years; stable, growth, shrinkage or unknow. Seven respondents didn't know the expectation for the coming five years. For the other 52 respondents, 67 per cent expects shrinkage of the total LFA, 10 per cent expect growth and 23 per cent thinks they will stay stable (Figure 50). If the respondent indicated growth or shrinkage, the next question asked more information about the specific percentage.

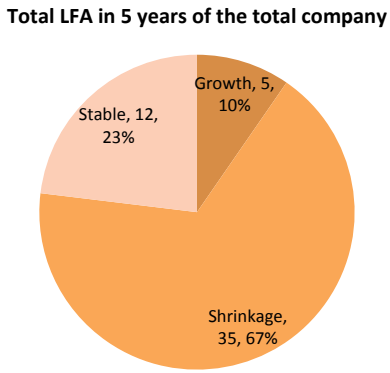


Figure 50: Total LFA for in the next five years for companies with more than 1 office (N=52) in the Netherlands

In the following graph, the total square meters is shown if the respondent indicated that they will grow, stay stable or shrink and included a percentage (in the case of shrinking or growing). The hidden vacancy is larger than the other graphs show, namely 33 per cent. The total square meters is 2,676,000 which is 6 per cent of the total office stock. Some big companies have a big influence on this number for example one company in the public sector that contains 1,000,000 square meters and who indicates that they will have a shrinkage of 30 per cent in the coming 5 years. The amount of larger companies in this sample is disproportional compared to the total office market. So, this per cent hidden vacancy is not representing the total office market.

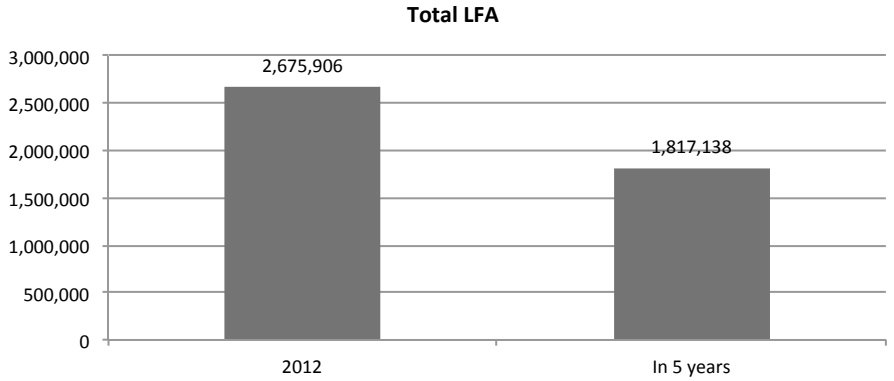


Figure 51: Total LFA for coming 5 years for companies with more than 1 office (N=24) in the Netherlands (Appendix G)

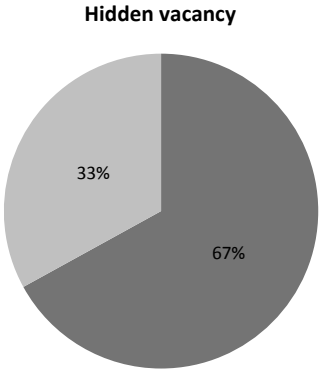


Figure 52: Hidden vacancy N=24 (Excel)

Hidden vacancy compared to size

Hypothesis: The hidden vacancy is larger in larger companies than it is in smaller companies.

In Table 26 the means of hidden vacancy for the three sizes is shown Namely, 1.00 is 50 employees and smaller, 2.00 is between 50 and 250 employees, 3.00 is more than 250 employees. Hidden vacancy is negative; it is the difference between demand and supply divided by the current supply. The offices with more than 250 employees (M=-0.21, SE=0.06) have an average hidden vacancy of 21 per cent while offices between 50 and 250 employees (M=0.1696, SE=0.15) have an average shortage of 17 per cent of space. The standard error for the smaller offices is much bigger than for larger companies. The 95 per cent Confidence Interval for mean for companies with more than 250 employees contains only negatives

figures, which means hidden vacancy for at least 95 per cent of the companies in the third scale of the sample.

Hidden vacancy (LFA_f-LFA_2012)/LFA_2012/100

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	25	.0777	.59635	.11927	-.1685	.3239	-.79	2.00
2.00	25	.1696	.76403	.15281	-.1458	.4850	-.62	3.22
3.00	29	-.2115	.30589	.05680	-.3279	-.0952	-.95	.45
Total	79	.0006	.59196	.06660	-.1320	.1332	-.95	3.22

Table 26: Hidden vacancy compared to size (1.00= 50 employees and smaller, 2.00= between 50 and 250 employees, 3.00=more than 250 employees) (Appendix G)

With the Levene test the homogeneity of variances is shown this is with a significance of p=0.104 not significant. The variances are significant different. The ANOVA test state that the group mean is not useful for the whole group as these is significant (F(2,76) = 2,330,p=0,043,p<.05) (Appendix G).

Because the sample sizes are quietly different, the Gabriel Post Hoc test is used. There is only a slightly significant difference between medium sized offices and big offices (p=0.051) (Appendix G).

To test the hypothesis that larger companies (more than 250 employees) have more hidden vacancy than smaller companies (less than 250 companies) a planned comparison is performed. Planned contrasts revealed that having a big office significantly increased the hidden vacancy compared to having a smaller offices (with less than 250 employees) , t (76) = 2.50, p=0008 < .05 (1-tailed). The hypothesis, that the more employees offices have the higher the hidden vacancy is, is not significant (76) = -.246, p =0.403 > .05 (1-tailed) (Appendix G).

The more employees, the more hidden vacancy is shown. Expected, the more offices the more hidden vacancy as the total number of FTE increases when a company has more offices. Table 27 show the contrary for offices with more than 250 employees while the number of employees is larger for the companies with more than 1 office. The more offices the company has, the lower the hidden vacancy.

LFA differences demand-supply (not significant different)	1 offices	-19%
	2 or more offices	-12%
Average employees per office (significant different)	1 offices	735 employees
	2 or more offices	3350 employees

Table 27: Group statistics with a minimum of 250 employees

Hidden vacancy compared to sector

Hypothesis: The hidden vacancy has a different rate in different sectors.

The expected job growth in the Netherlands is researched by ABN AMRO (Steinmaier, 2011). In the table below the expectation of hidden vacancy per sector is shown by these figures. This information will be used by a Planned contrast in SPSS (Appendix G).

Number	Sector	Office Jobs rate (Steinmaier, 2011)		Expected hidden vacancy & FTE	Planned Contract
1	Public	Education & Health, 2,00%	Public administration, -2,75%	↘	-2
2	Manufactory industry	Industry, -1,50%	Construction, -1,00%	→	1
3	Transport & trade	Transport, 0,50%	Trade & reparation, 0,00%	→	1
4	Financial & Insurance	Banking and insurance -0,75%	Other financial services 1,00%	↘	-1
5	Communicatie & automation	Commmunication -2,50%	Automation 2,50%	→	1
6	Other business services	Other, 0,00%		→	0
7	Other	Other, 0,00%		→	0

Table 28: Office job rate per sector (Steinmaier, 2011) with expected hidden vacancy

Seen the descriptives in the following table, the average mean for hidden vacancy is large in the public companies (M=-0.12, SE=0.10) and Financial & Insurance companies (M=-0.26, SE=0.07). The communication and automation exposed highest shortage of space (M=0.56, SE=0.07), the standard error is very high which indicates on big differences in this group.

perc_diff_LFA_f

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Public	5	-.1189	.22087	.09878	-.3931	.1554	-.44	.10
Manufactory industry	12	.1145	.42587	.12294	-.1560	.3851	-.79	.68
Transport & trade	12	.0664	.52494	.15154	-.2672	.3999	-.62	1.00
Financial & Insurance	15	-.2593	.27410	.07077	-.4111	-.1076	-.80	.09
Communicatie & automation	5	.5464	1.49905	.67039	-1.3149	2.4077	-.35	3.22
Other business services	21	.0462	.58735	.12817	-.2212	.3136	-.73	2.00
Other	11	-.0720	.52401	.15799	-.4240	.2800	-.95	1.22
Total	81	.0074	.58935	.06548	-.1230	.1377	-.95	3.22

Table 29: ANOVA descriptives Hidden vacancy versus sector

To test the hypothesis that some sectors will have more vacancy than others (Table 28) a planned comparison is performed. Planned contrasts revealed that Public and financial & insurance sectors have not significant a higher hidden vacancy than the other sectors whereby other business services and other were not included. t (5.5) = 1.68, p=.074 > .05 (1-tailed) (Appendix G).

4.3.2 Number of full-time equivalent (FTE)

In this subchapter the mismatch between the current and future demand in number of FTE's and the current number of FTE is studied.

Concluded from theory, the number of office jobs will shrink is short time and in the long time it will shrink a little bit or will stay stable. In one hand some workforce will be outsourced and on the other hand the workforce will increase by the increase of knowledge work and automation and high employee participation. The number of freelancers and

entrepreneurs will increase. Also there is a difference between different sectors. This means that there will be a movement of FTE by companies. This will result in a demand for other accommodation.
In terms of impact, a declining working population forecast creates a base case scenario of a 10 per cent reduction in demand for commercial (office and industrial) space across Europe over the next 20 years. This will be followed by a further 10 per cent diminution over the subsequent 20 years to 2050 (Harrington, 2011).. In Western- Europe the working population will diminish 5 per cent according the research of Colliers.

Hypothesis: The current and future demand for the number of FTE is smaller than the current number of FTE.

Current demand versus current and past number of FTE

In this paragraph the the total lettable floor area (LFA) is shown for the past, 2012 and for the demand.

In total, 64 respondents completed all the three components for the total number of FTE. This is 63 per cent of the total number of respondents. For a lot of respondents it was not possible to fill everything in. At least 89 respondents completed the LFA for 2012 and demand, this is 87 per cent of the total number of respondents.

The respondents, who filled in all the components, count for 20,000 FTE in 2012. This is 22 per cent more than before the start of their contract. The demand is 6 per cent higher than the current number of FTE.

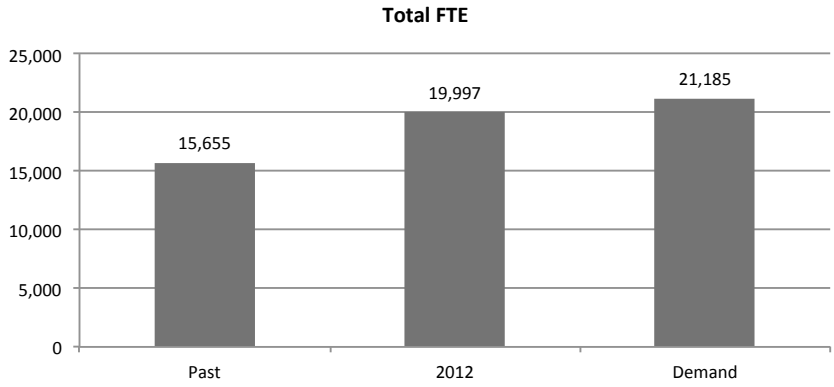


Figure 53: The development of FTE for respondents who filled out all the three figures (N=64) (Appendix G & Excel)

The respondents (N=89) who filled in at least two components count for 38,000 FTE in 2012 which is around 2 per cent of the total FTE in the Netherlands (the calculation is shown in SPS Book). The demand is 6 per cent lower than the current number of FTE. Because of the higher amount of respondents and number of FTE this figure is more reliable than the previous one. Remarkable, is the difference between Figure 53 and Figure 54. In the first graph, a growth in number of FTE is shown while in the second graph shrinkage is exposed.

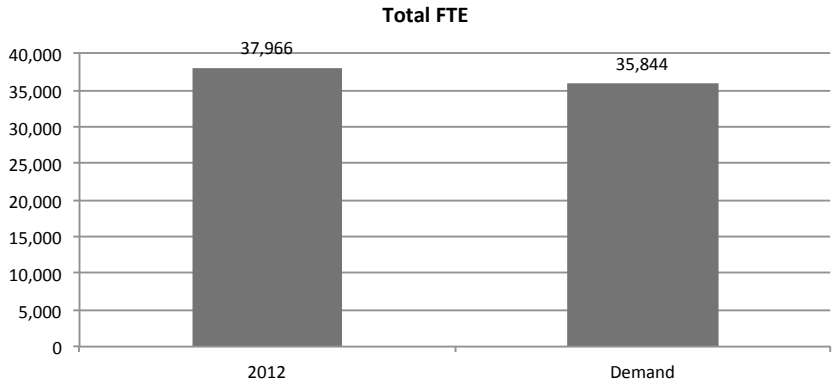


Figure 54: The development of LFA for respondents who filled out all the two figures (N=81) (Appendix G & Excel)

Future demand versus current number of FTE

To the companies that have more than two offices is being asked what they expect for the total FTE of the company for the next five years. In total, 59 companies filled in that they have more than one office. They were being asked what their expectation is for the coming five years; stable, growth, shrinkage or unknown. A group of 19 respondents did not know the expectation. For the other 52 respondents, 55 per cent expects shrinkage of the total LFA, 25 per cent expect growth and 20 per cent thinks they will stay stable (Figure 50). It is remarkable that 55 per cent indicated shrinkage in the total FTE but the total mismatch is very small for the offices. This can be due to the difference between the current demand and future demand. For the previous paragraphs the respondents were asked for the total FTE if the leasing contract would end now (or the building would be sold now). With the question about what the expectations are for the coming five years, a better image of the demand for FTE in the future is expected.

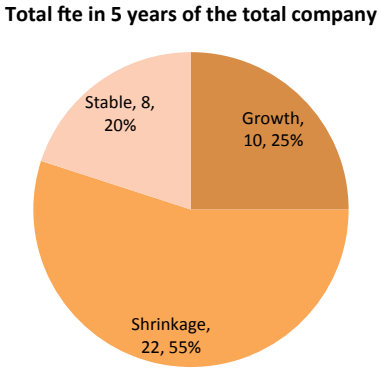


Figure 55: Total FTE for coming 5 years in the Netherlands for companies with more than 1 office (N=52)

If the respondent indicated growth or shrinkage for the coming five years, the next question asked more information about the specific percentage. In the following graph, the total FTE is shown if the respondent indicated that they will grow, stay stable or shrink and included a percentage (in the case of shrinking or growing). The shrinkage of number of FTE in coming year is larger than the other graphs show, namely 11 per cent. The total FTE in 2012 is 117,300 which is 6 per cent of the total number of FTE in the Netherlands.

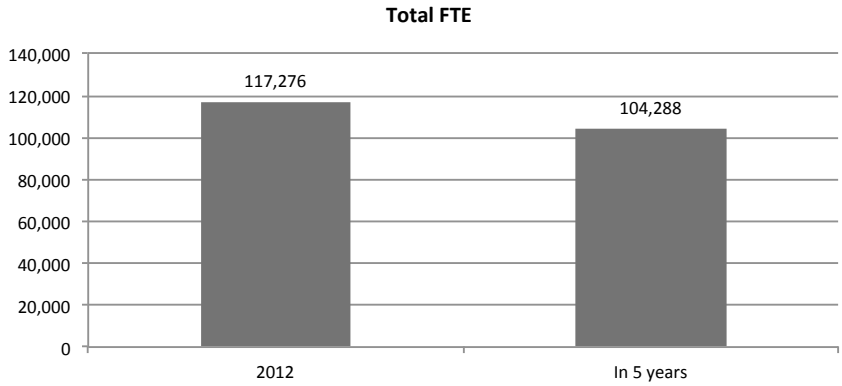


Figure 56: Total FTE for coming 5 years in the Netherlands for companies with more than 1 office (N=35) (Appendix G)

Difference in FTE compared to size

There is no clear hypothesis shown in the theory about the relation of shrinkage of FTE and size of the company. The companies who have financial problems would expect a shrinkage of FTE, but this is difficult to link with the size of the company.

Again, the means of the different group sizes are related to the difference in FTE. The mean is the difference between the demand and the current number of FTE divided by the current number of FTE. The offices with more than 250 employees (M=-0.11, SE=0.05) have an average shrinkage of 11 per cent for the number of FTE while office between 50 and 250 employees (M=0.19, SE=0.08) have an average increase of 19 per cent of FTE. The standard error is higher in the medium sized companies. Striking, is that in the 95 per cent Confidence Interval for the mean for companies with less than 250 employees does not consist of companies that are shrinking.

perc_diff_FTE_f, Perc_diff_FTE_f= (FTE_f-FTE_2012)/FTE_2012/100

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
1.00	29	.1644	.28367	.05268	.0565	.2723	-.44	.83
2.00	28	.1870	.41716	.07884	.0252	.3487	-.31	2.00
3.00	31	-.0106	.30553	.05487	-.1226	.1015	-.97	.95
Total	88	.1099	.34665	.03695	.0365	.1834	-.97	2.00

Table 30: Difference between demand and current FTE compared to size (1.00= 50 employees and smaller, 2.00= between 50 and 250 employees, 3.00=more than 250 employees) (Appendix G)

The sample sizes are quietly different so the Gabriel Post Hoc test is used. There is only a small significant difference between medium sized companies and big companies (p=0.081) (Appendix G).

The hypothesis, that larger companies have more shrinkage in total number of FTE than smaller companies with less than 250 employees, will be tested with a planned comparison. The planned contrasts exposed a big office significantly difference in changing demand of the number of FTE compared to smaller offices; t (85) = 2.46, p=0.016 < .05 (2-tailed). The hypothesis, that office with more employees have an higher hidden vacancy, is not significant (85) = -.55, p =0.58 > .05 (1-tailed) (Appendix G).

Hidden vacancy compared to sector

Hypothesis: The difference between current FTE and demand has a different rate in different sectors.

ABN AMRO have researched the expected job growth in the Netherlands (Steinmaier, 2011). Using these figures, the expectation of FTE per sector is visible in Table 28. This information will be used with a Planned contrast in SPSS (Appendix G).

Seen the descriptives in the following table, the average mean for the difference in number of FTE is negative for the sectors public (M=-0.01, SE=0.03) and Financial & Insurance (M=-0.05, SE=0.13) companies. The highest increase of FTE is in the sectors other businesses (M=0.21, SE=0.07) and communication and automation (M=0.39, SE=0.33), the standard error is very high for communication and automation which indicates on big differences in this group.

perc_diff_FTE_f, Perc_diff_FTE_f= (FTE_f-FTE_2012)/FTE_2012/100

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Public	11	-.0130	.08499	.02563	-.0701	.0441	-.17	.17
Manufactory industry	12	.1540	.24282	.07010	-.0003	.3083	-.40	.45
Transport & trade	12	.1000	.29752	.08589	-.0891	.2890	-.31	.57
Financial & Insurance	13	-.0477	.12511	.03470	-.1233	.0280	-.35	.20
Communicatie & automation	6	.3889	.80046	.32679	-.4511	1.2289	.00	2.00
Other business services	23	.2117	.33838	.07056	.0654	.3581	-.44	.95
Other	12	.0284	.37571	.10846	-.2103	.2671	-.97	.59
Total	89	.1104	.34471	.03654	.0378	.1831	-.97	2.00

Table 31: ANOVA descriptives differences in FTE vs sector

The Public and financial & insurance sectors have significantly greater shrinkage in FTE than the other sectors, stated by the planned comparison, whereby other business services and other were not included. t (6.6) = 2.0, p=.04 <.05 (1-tailed) (Appendix G).

4.3.3 LFA/FTE

In this subchapter the mismatch between the current and future demand in FTE/workplace and the current LFA/FTE is studied.

The space per FTE will decrease. This have several causes. On one hand the number of FTE per workplace will shrink and other the other hand the space per workplace will decrease. The alternative working strategies can cause a space decrease of 50 to 70 per cent compared to a traditional work concept (Spijker, 2010). Seen the trend of the alternative working strategies this will have a big influence on the demand for space. More than half of the employees have already the possibility to work location- and time independent (Kluwer, 2011) This is yet not visible in the current supply numbers, which can indicates the hidden vacancy which relates to a delay in the match between the demand and the supply.

Moreover, in the previous two chapter it is shown that the total LFA is decreasing much more in the demand than in the total FTE. This is shown in the underneath graph. This means that the demand contains less LFA/FTE.

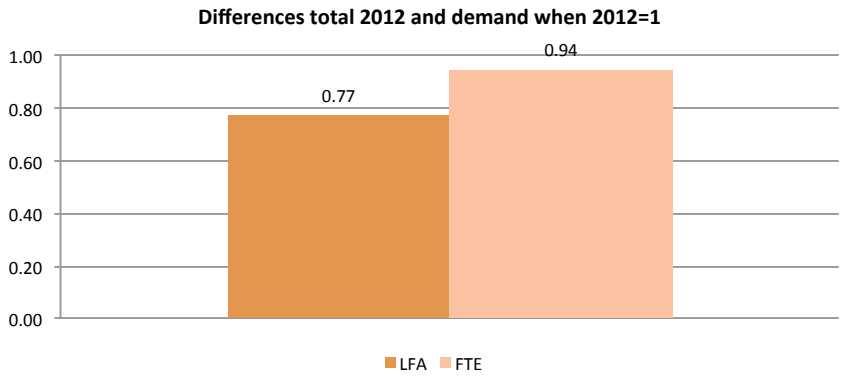


Figure 57: Differences of the total supply 2012 and the demand for FTE and LFA when 2012=1

Hypothesis: The current and future demand for the LFA/FTE is smaller than the current LFA/FTE figure.

Current demand versus current and past LFA/FTE

The total lettable floor area per FTE (LFA/FTE) is also shown for the past, 2012 and for the demand.

Of the 102 respondents, 57 respondents filled in the total LFA and the number of FTE for all the three moments representing 56 per cent of the total number of respondents. Further, 75 respondents, 74 per cent, completed the LFA and the number of FTE for 2012 and demand.

The respondents, who filled in all the components, have at the moment 19.5 square meters per FTE. This is the total LFA of all offices divided by the total number of FTE. This is 19 per cent less than before the start of their contract. The demand is 20 per cent less than the current LFA/FTE.

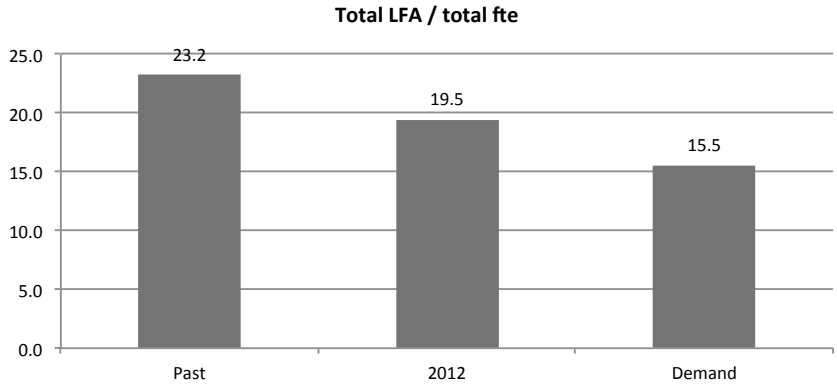


Figure 58: The development of FTE for respondents who filled out all the three figures (N=57) (Appendix G & Excel)

The respondents, (N=75) who filled in at least the LFA and FTE for 2012 and for demand have an average of 18.4 square meters per FTE in 2012. The demand is 15 per cent less than the current LFA/FTE.

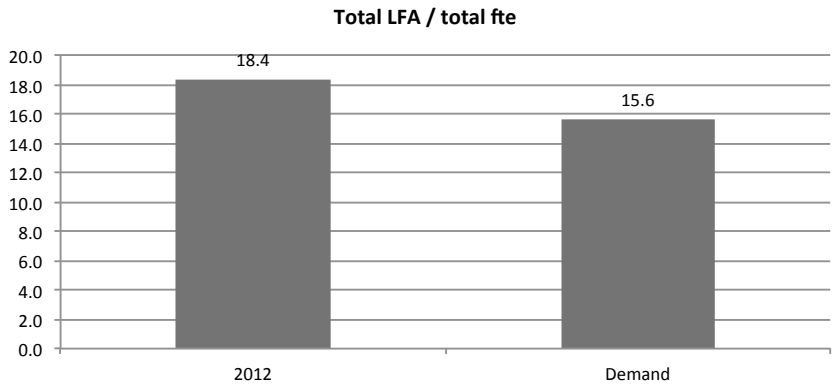


Figure 59: The development of LFA/FTE for respondents who filled out all the four figures (N=75) (Appendix G & Excel)

Future demand versus current LFA/FTE

The companies that have more than two offices were asked what they expect for the total FTE and LFA of the company for the next five years. There are 59 companies that has two offices or more. There are 20 companies who have written their expectation for the coming fiveyears for both the number of FTE and the total LFA.

Figure 60 show the total LFA/FTE when the respondent specified their percentage that they will grow, stay stable or shrink in FTE and LFA. The total LFA/FTE is 48.4 square meters per FTE what is much higher than Figure 58 and Figure 59. This figure is derived from 19 companies with a total current office space of 2,430,000 square meters and 58,600 FTE. The reason for this difference could be that the total LFA of the whole company includes space what is not office related or the total bruto surface is used instead of the lettable floor area. Also, there is a difference between the future expectation and the current demand. Because of the high governmental protection of tenants, firing employees is not easy.

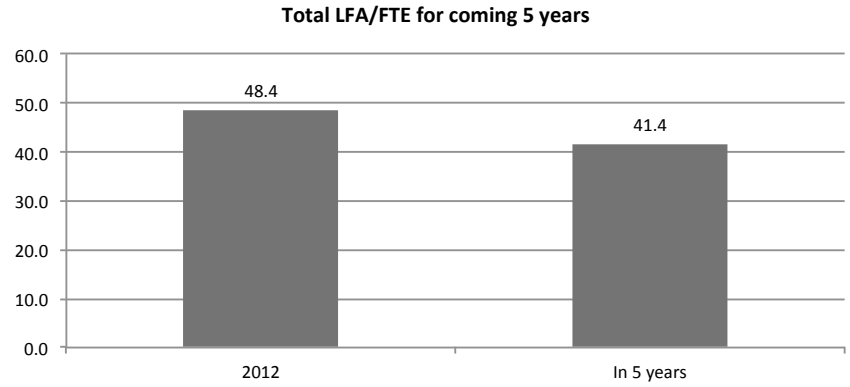


Figure 60: Total LFA/total FTE for coming 5 years in the Netherlands for companies with more than 1 office (N=20) (Appendix G)

Difference in LFA/FTE compared to size

There is no clear hypothesis shown in the theory about a more efficient use of space per FTE related to the size of the office in employees.

In underneath table, the differences between the current and demanded LFA/FTE per size category is shown. The total LFA in 2012 divided by the total FTE in 2012 minus the total

demand for LFA divided by the demanded FTE of the office results in the mean LFA/FTE. The mean of the large offices with more than 250 employees (M=-4.6, SE=1.4) is much lower than the mean of the small offices (M=8.2, SE=5.2). The standard error is much higher in the small sized companies. Striking, is that all the sizes show a decrease of the total mean LFA/FTE.

diff_LFA_FTE_f = LFA_FTE_f-LFA_FTE_2012

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	22	-8.2222	24.22627	5.16506	-18.9635	2.5191	-102.50	12.50
2.00	25	-3.0404	8.91227	1.78245	-6.7192	.6384	-34.17	8.46
3.00	27	-4.5606	7.27618	1.40030	-7.4390	-1.6823	-25.87	5.90
Total	74	-5.1356	14.77513	1.71757	-8.5587	-1.7125	-102.50	12.50

Table 32: Difference between LFA/FTE demanded and supply compared to size (1.00= 50 employees and smaller, 2.00= between 50 and 250 employees, 3.00=more than 250 employees) (Appendix G)

The Robust test of equality of means state that the means are not significant different between size groups (Appendix G). There is no significant difference in the total office space per FTE between smaller companies (less than 50 employees) and larger companies (more than 50 companies). In the planned comparison there is no significance shown, t (71) = 1.17, p=0.25 < .05 (2-tailed) (Appendix G).

LFA/FTE in relation to sector

There is no hypothesis from theory which sector will apply, more efficient office space per FTE than others.

The descriptives in the following table show that the average mean for the difference in LFA/FTE is most negative for the sector other businesses (M=-10.3, SE=5.4), transport & trade (M=-7.5, SE=4.5) and Financial & Insurance (M=-4.6, SE=1.9).

diff_LFA_FTE_f

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Public	5	-1.4649	6.79393	3.03834	-9.9007	6.9709	-12.56	4.67
Manufactory industry	11	.0500	6.94430	2.09378	-4.6152	4.7153	-12.12	12.50
Transport & trade	11	-7.4826	14.98999	4.51965	-17.5530	2.5878	-37.14	7.52
Financial & Insurance	13	-4.6322	6.69661	1.85731	-8.6789	-.5855	-16.89	3.33
Communicatie & automation	5	-1.2953	4.73009	2.11536	-7.1685	4.5778	-8.00	4.81
Other business services	20	-10.3239	24.09364	5.38750	-21.6000	.9523	-102.50	10.61
Other	10	-2.4543	5.34131	1.68907	-6.2753	1.3666	-8.99	8.46
Total	75	-5.1573	14.67616	1.69466	-8.5340	-1.7806	-102.50	12.50

Table 33: ANOVA descriptives differences in LFA/FTE vs sector

There are no significant differences between the sectors with the Post Hoc test and ANOVA. Planned contrasts disclosed that public and financial & insurance have no significant a different shrinkage in LFA/FTE than the other sectors (other business services and other were not included); t (68) = -0.07, p=.94 <.05 (2-tailed) (Appendix G).

4.3.4 Office concept

In this subchapter the mismatch between the current and future demand in office concept and the current LFA/FTE is set out. The need for space can differ for each office concept.

Hypothesis: More offices will have an open office concept.

Hypothesis: An open office concept contains less space per FTE compared to team office and cellular office

Current demand versus current and past LFA/FTE

The office concept is shown for the following moments:

- 2012: At the moment the survey if filled out (between November 2012 and February 2013)
- Demand: If the contract would end at the moment the survey is filled out what would de office user want?

In total, 74 respondents filled in the percentage per office concept for both 2012 and demand. Also referred to as 73 per cent of the total number of respondents. These respondents have in total 638,500 square meters office space in 2012. The graphs show an increase in open office space of the demand compared to 2012 from respectively 57 per cent to 77 per cent.. The team office and cellular office decrease in surface compared to 2012.

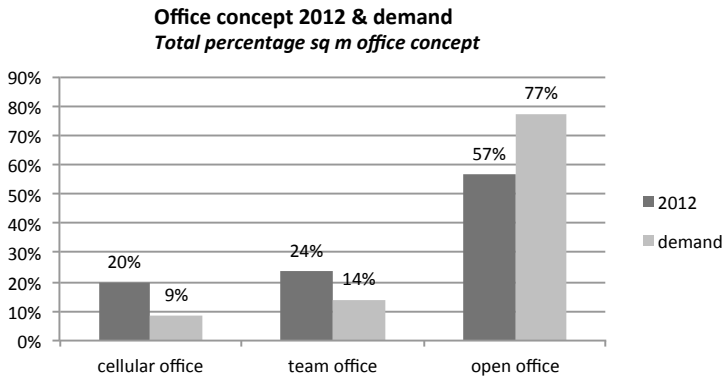


Figure 61: The percentage of LFA per office concept total square meters in 2012 = 638,500 square meters (N=74) (Appendix G & Excel)

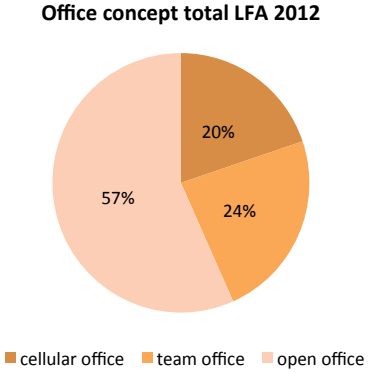


Figure 62: The total office concept of total LFA in 2012

In the following graphs the average office concept is visible. The percentage team office and cellular office are clearly larger in the average office concept. This can be due to large offices that have an open office as a office of 150 square meters and of 10,000 square meters are being counted both once in the averages.

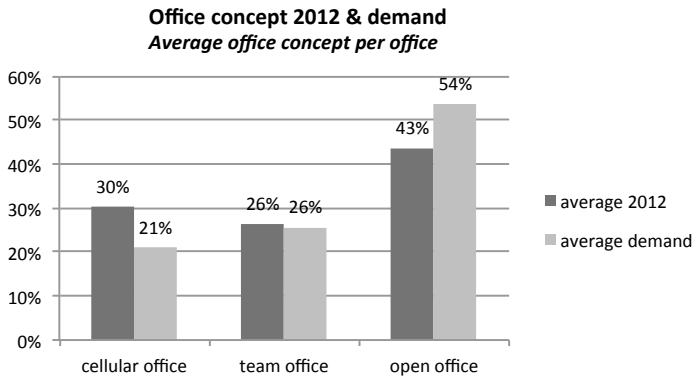


Figure 63: The average of offices per office concept (N=94) (Appendix G & Excel)

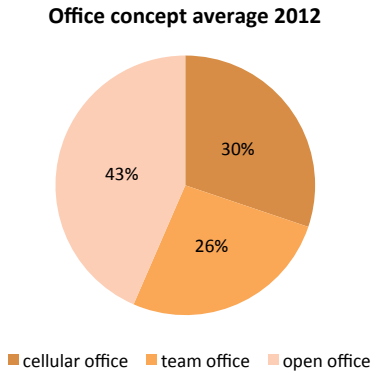


Figure 64: The total office concept of total LFA in 2012 (N=94)

Office concept in relation to LFA/FTE

According the hypothesis, LFA/FTE is influenced by the office concept. If there is a high percentage of open office, a lower LFA/FTE is expected. The team office is predicted in between. In opposite, if there is a high percentage of cellular office a lower LFA/FTE is expected.

First the open office space will be related to the current LFA/FTE with a linear regression. The correlations are not significant with p<.05 between the variables OO_2012, TO_2012, CO_2012 and LFA_FTE_2012. Also the linear regression is not significant with p<.05. In model 1, where only the variable Open office is placed, the significance is 0.12. If the percentage open office goes up with 1 per cent, the LFA/FTE will go down 0.091 square meters in this model (*Appendix G*).

Next, the difference between the current and the demanded office concept is related to the difference of the current LFA divided by the current number of FTE and the demanded LFA divided by the demanded number of FTE. The open office percentage and the total LFA/FTE is negative correlated with a significance of p=.022<.05, which is shown in Table 34. The team office is positive related to LFA/FTE, but is not significant (p=.196>.05). The cellular office is also positive related to LFA/FTE, but is also not significant (p=.06>.05) *(Appendix G).*

Correlations

		diff_LFA_FTE_f	diff_OO_f	diff_TO_f	diff_CO_f
Pearson Correlation	diff_LFA_FTE_f	1.000	-.246	.105	.189
	diff_OO_f	-.246	1.000	-.535	-.673
	diff_TO_f	.105	-.535	1.000	-.264
	diff_CO_f	.189	-.673	-.264	1.000
Sig. (1-tailed)	diff_LFA_FTE_f	.	.022	.196	.062
	diff_OO_f	.022	.	.000	.000
	diff_TO_f	.196	.000	.	.015
	diff_CO_f	.062	.000	.015	.
N	diff_LFA_FTE_f	68	68	68	68
	diff_OO_f	68	68	68	68
	diff_TO_f	68	68	68	68
	diff_CO_f	68	68	68	68

Table 34: Correlation changing office concept and changing LFA/FTE.

In the model, it is shown that if the percentage open office will increase with one per cent, the average LFA/FTE will decrease with 0.16 square meters. So if an office will transfer from a zero per cent open office into a 100 per cent open office it will shrink 16 square meters per FTE. However, there is a 95,0 per cent confidence interval between -0.31 and -0.005 square meters per FTE. This model is significant, (p=0.043<0.05)

T

	Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B	
Model	B	Std. Error	Beta	t	Sig.	Lower Bound	Upper Bound
1(Constant)	-2.346	2.057		-1.140	.258	-6.453	1.762
diff_OO_f	-.159	.077	-.246	-2.062	.043	-.313	-.005

35: Correlation between office concept and changing LFA/FTE

The other models with cellular office and team office were excluded.

Difference in open office compared to size

The focus will lie on the open office, as the hypothesis emphasis that this office concept has a lower meterage per FTE.

The differences between the current open office percentage and the demand for open office are exposed for the three sizes; 50 employees and smaller, between 50 and 250 employees and more than 250 employees. The difference open office space is the distinction of percentage open office in the total LFA in 2012 and demanded. Offices with more than 250 employees (M=13.0, SE=4.9) have an average increase of open office concept with 17,5 per cent. Offices with less than 50 employees (M=4.8, SE=2.8) have an average increase of 4,8 per cent. The standard error of larger companies is remarkable higher than smaller offices.

diff_OO_f=OO_f-OO_2012

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	30	4.8333	15.56318	2.84144	-.9781	10.6447	-20.00	70.00
2.00	25	13.0000	19.84313	3.96863	4.8092	21.1908	-10.00	60.00
3.00	30	17.5333	26.94405	4.91929	7.4723	27.5944	-20.00	80.00
Total	85	11.7176	21.82321	2.36706	7.0105	16.4248	-20.00	80.00

Table 36: Difference between percentage open office in the total LFA of the office in relation to to size (1.00= 50 employees and smaller, 2.00= between 50 and 250 employees, 3.00=more than 250 employees) (Appendix G)

Larger companies, more than 50 employees, want significant ($p<.05$) larger open office area's versus smaller companies, with less than 250 companies. A planned comparison is performed; $t(78,5) = 2.45$, $p=0.013 < .05$ (1-tailed) (Appendix G).

Open office compared to sector

In the following table, the descriptives are shown for the different sectors. The average mean for the difference percentage open office space is most positive for the sector financial & insurance (M=20.7, SE=8.0) and the sector public (M=-17.4, SE=8.5). The average office in the sector financial & insurance wants to increase with 20,7 per cent. In the other hand, the sectors with the smallest difference in open office space is transport & trade (M=5.5, SE=5.2) and manufactory industry (M=7.9, SE=3.8).

diff_OO_f= OO_f-OO_2012

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Public	11	17.3636	28.25694	8.51979	-1.6196	36.3469	.00	76.00
Manufactory industry	12	7.9167	13.04857	3.76680	-.3740	16.2073	-5.00	30.00
Transport & trade	10	5.5000	16.40630	5.18813	-6.2364	17.2364	-10.00	40.00
Financial & Insurance	15	20.6667	30.87224	7.97118	3.5702	37.7631	-10.00	80.00
Communicatie & automation	6	8.3333	14.71960	6.00925	-7.1139	23.7806	-10.00	30.00
Other business services	25	9.4000	20.98214	4.19643	.7390	18.0610	-20.00	70.00
Other	12	14.5833	24.06982	6.94836	-.7099	29.8766	-10.00	60.00
Total	91	12.2088	22.61687	2.37089	7.4986	16.9190	-20.00	80.00

Table 37: ANOVA descriptives differences in LFA/FTE vs sector

The variances are not significant different according the Levene test ($p=0.05$). Also the Robust test of equalty of means explains that the means are not significant different between sectors (Appendix G).

To test the hypothesis that some sectors will increase more in open office space than others (Table 28) a planned comparison is performed. The planned contrasts show that public and financial & insurance have a significant different increase in open office space than the other sectors whereby other business services and other were not included; t (20.5) = -1.6, p=.05 =.05 (1-tailed) (Appendix G).

4.3.5 Contract duration

As is written in the research design the variable contract duration in 2012 is not valid. This is because it is not clear if the extending of the rental contract in included in the contract duration. It could be a ten year contract or a five plus five years contract. This makes it difficult to compare it with the demanded contract duration respondents filled in. However, in Figure 65 and Figure 66 differences of the current contract duration (incl extended contracts) and the demanded contract duration are exposed.

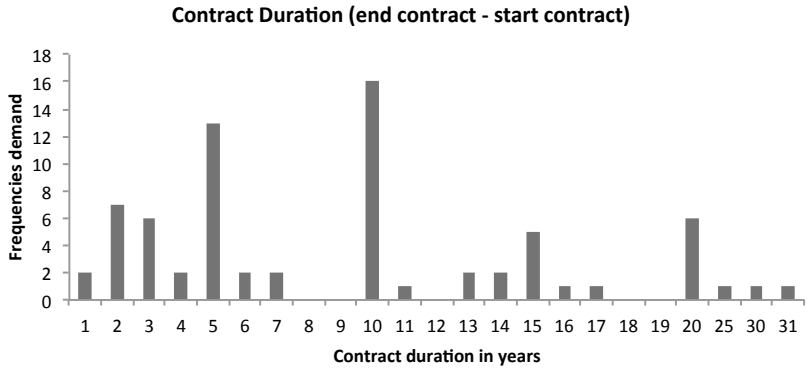


Figure 65: current contract duration (end current contract – start current contract or extending year) N=71

Instead of the difference between the demand and current contract duration, only the demand for contract duration will be related to size and sector in this paragraph. In the following graph, the demand for the number of years of a contract duration is shown. Noticeable, is the number of respondents who filled out five years. The average is 5.2 years. Further, 28 per cent of the respondents filled out one, two or three years. In total, 52 per cent of the respondents wants to have a contract duration of 5 years.

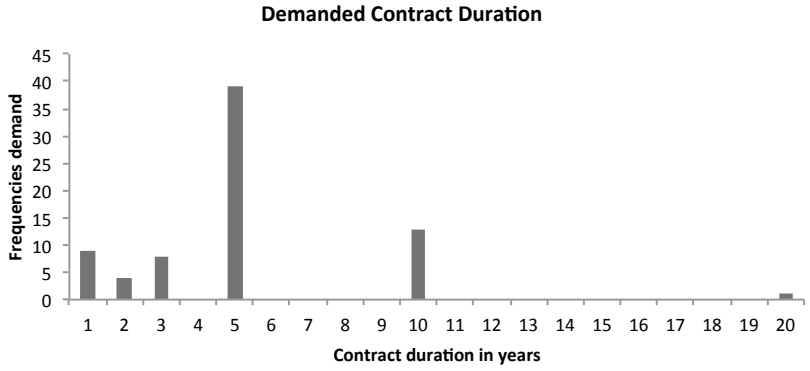


Figure 66: demanded contract duration (N=74).

Demand in contract duration compared to size

In Table 38, the demand for the total contract duration is exposed for the three sizes. The mean the average contract duration companies demanded for. The offices with more than 250 employees (M=7.4, SE=4.0) have a higher average than offices with less than 250 employees (M=3.5, SE=2.1). However, the standard error is different in the larger sized companies.

CD_f

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
1.00	26	3.5000	2.08327	.40856	2.6586	4.3414	1.00	10.00
2.00	24	5.5417	2.26465	.46227	4.5854	6.4979	1.00	10.00
3.00	21	7.3810	3.99345	.87144	5.5632	9.1987	2.00	20.00
Total	71	5.3380	3.21134	.38112	4.5779	6.0981	1.00	20.00

Table 38: Demand for contract duration in relation to size (1.00= 50 employees and smaller, 2.00= between 50 and 250 employees, 3.00=more than 250 employees) (Appendix G)

With a significance of p=0.003, the Levene test is significant. This means that the variances are not significant different. In opposite the Welch test and the Brown-Forsythe test show a significance of p=0.000 which is significant; Welch test F(2,40.54) = 10.52, Brown-Forsythe F(2,40.54) = 10.16. For these test there is a significant difference in the means of the different groups (Appendix G).

To test if smaller companies (less than 50 companies) have a difference contract duration than larger companies (more than 50 employees) a planned comparison is executed. They are significant different, t (4.6) = 5.9, p=0.000 < .05 (2-tailed). Also the difference between small, medium and larger companies are studied, the larger the company, the higher the contract duration. This hypothesis is also significant, t (-2.7) = -7.6, p=0.012 < .05 (2-tailed) (Appendix G).

Demanded contract duration in relation to sector

The sectors transport and trade (M=6.3, SE=1.9) and financial and insurance (M=6.2, SE=0.9) have the highest demanded contract duration and the sectors communication and automation (M=3.5, SE=1.0) and manufactory industry (M=3.5, SE=0.5) have the lowest.

CD_f

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Public	6	5.5000	2.34521	.95743	3.0389	7.9611	3.00	10.00
Manufactory industry	12	3.5000	1.88294	.54356	2.3036	4.6964	1.00	5.00
Transport & trade	9	6.3333	5.67891	1.89297	1.9681	10.6985	1.00	20.00
Financial & Insurance	10	6.2000	2.78089	.87939	4.2107	8.1893	2.00	10.00
Communicatie & automation	4	3.5000	1.91485	.95743	.4530	6.5470	1.00	5.00
Other business services	23	5.3043	3.22539	.67254	3.9096	6.6991	1.00	10.00
Other	10	5.6000	2.45855	.77746	3.8413	7.3587	3.00	10.00
Total	74	5.2162	3.22350	.37472	4.4694	5.9630	1.00	20.00

Table 39: Descriptives demanded contract duration per sector

With the Levene test the homogeneity of variances is shown, with a significance of p=0.22 the leven test is not significant. In other words, the variances are thus significant different. The Post Hoc test with Hochberg shows as well no significant difference between specific sectors (Appendix G).

To test the hypothesis that some sectors will have a higher contract duration than others (Table 28) a planned comparison is performed. Planned contrasts conclude that public and financial & insurance have no significant different contract duration than the other sectors whereby other business services and other were not included. t (18.3) = -1.3, p=0.22 >.05 (2-tailed) (Appendix G).

4.4 TOWARDS NEW SUPPLY AND NEW SUPPLY

Subleasing and moving are actions to prevent hidden vacancy. 18 per cent of the office users in the survey sample sublease with an average of 1000 square meters. Further, 38.2 per cent of the office users in the sample declare that they prefer to go to a new building if the leasing contract would end now or if they can sell the building now (N=102) (Appendix G).

Further, 9 per cent of the companies of the sample has been in a moving process in the last five years and decided to stay. Another restrictions are the contracts and rents (Appendix G).

4.5 CONCLUSION

4.5.1 Sample distribution

The sample is in some aspects comparable with the total office market. The key figures of the research sample were compared with the data from CBS and Bak to verify this. The distribution of the research sample over the Netherlands is similar. The sample has more square meters in Gelderland (15 per cent vs 8 per cent), Utrecht (15 per cent vs 12 per cent) and Friesland (6 per cent vs 2 per cent) compared to the office market in general. Furthermore the sample consists of less square meters office space in Noord-Holland (17 per cent vs 24 per cent) and Limburg (1 per cent vs 4 per cent).

The companies in the research sample have more employees than in the office market. The sample has substantial more companies with 250 employees or more related to the total population (44 per cent vs 9 per cent).

The distribution of the sample on different sectors was compared with the take-up of office space in the period from 2002 to 2009. It is shown that the sector financial & insurance dominates the sample (46 per cent of the total office space in square meters vs 15 per cent in the take-up figures). The sectors public services, education & health (9 per cent vs 29 per cent), manufactory & industry (3 per cent vs 14 per cent) and communication & automation (1 per cent vs 9 per cent) are clearly less present in the sample. Finally, the number leased office are slightly larger in proportion with the Bak database (70 per cent of the offices vs 63).

4.5.2 Organization

In what way do type of characteristics (size and sector) differ significantly in their quantitative demand for office space?

In the following table, the changing demand for each sector and size is shown for the variables LFA, FTE, LFA/FTE, percentage open offices and demanded contract duration. The table show the means and the significant differences between the variables with the help of the grey and orange colour.

	Size			Sector						
	small	medium	Big	Public	Manufactory & Industry	Transport & Trade	Financial & Insurance	Communication & automation	Other businesses	Other
LFA	+7%	17%	-21%	-12%	+11%	+7%	-26%	+55%	+5%	-7%
FTE	+16%	19%	-1%	-1%	+15%	+10%	-5%	+38%	+21%	+3%
LFA/FTE (in sqm)	-8.2	-3,0	-4,6	-1,5	+0,1	-7,5	-4,6	-1,3	-10,3	-2,5
Open office	+5%	+13%	+17%	+17%	+8%	+6%	+21%	+8%	+9%	+15%
Contract duration (demand)	3.5	5.5	7.4	5.5	3.5	6.3	6.2	3.5	5.3	5.6

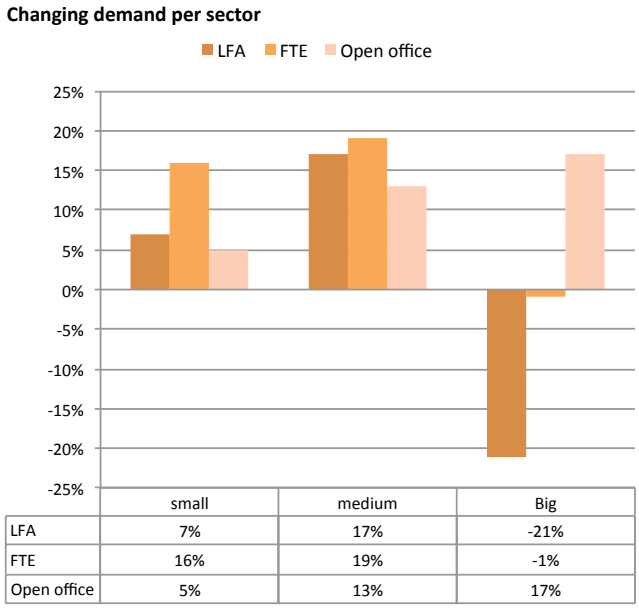
Significant different mean (ANOVA) (p<.5)
Significant differences between variables (Post Hoc or planned comparison) (p<.5)

Table 40: summary changing demand for size and sector

The hidden vacancy is only significant different in size and not in sector. Furthermore, the LFA per FTE rate is not significant different for size and sector. The percentage "open office" show some differences in size and sector in a planned comparison. Also the contract duration show significant differences for all the sizes in a Post Hoc test.

Size related

In the following graph, the differences in LFA, FTE and open office is shown per size. All the differences are significant (Table 40).



	small	medium	Big
LFA	7%	17%	-21%
FTE	16%	19%	-1%
Open office	5%	13%	17%

Table 41: Changing demand related to size (small= less than 50 employees, medum= 50-250 employees, big=larger than 250 employees) (differences are significant p<.05)Table 40)

Hidden vacancy

The hidden vacancy is significant (>.05) different per size of the office. Also medium (M=0,17, SE=0.15) have significant lower hidden vacancy than large offices (M=-0.21, SE=0.31).

FTE

The difference in FTE is significant different for different sizes. F(2,87) = 3,06,p=0,052,p=.05. With a significance of 0.081, the medium sized offices differ with the larger offices (M=-0.01, SE=0.04). Planned contrasts revealed that having a big office significantly differ in number of FTE compared to having smaller offices (with less than 250 employees), t (85) = 2.46, p=0.016 < .05 (2-tailed). The hypothesis, that offices with more employees have a higher vacancy is not significant; (85) = -.55, p =0.58 > .05 (1-tailed).

Open office

The large offices (M=13.0, SE=4.9) have an average increase of the open office concept of 17,5 per cent. Offices with less than 50 employees (M=4.8, SE=2.8) show an average increase of 4,8 per cent. The standard error is much higher than in companies of a larger size.

To test the hypothesis that larger companies (more than 250 employees) have a higher amount of "open office" space than smaller companies (less than 250 employees) a planned comparison is performed. The outcome is that the difference is significant, t (78,5) = 2.45, p=0.013 < .05 (1-tailed).

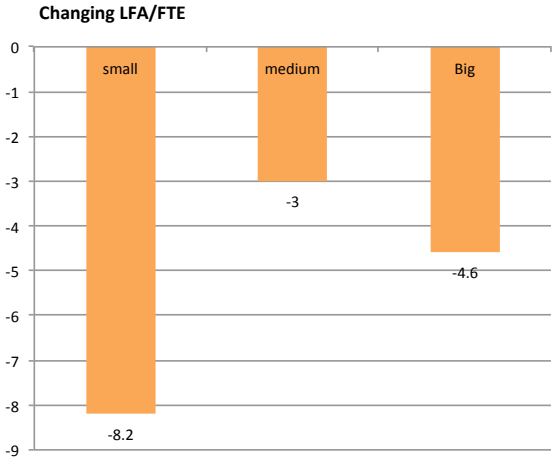


Table 42: Changing LFA/FTE in relation to size (not significant different p>.05)

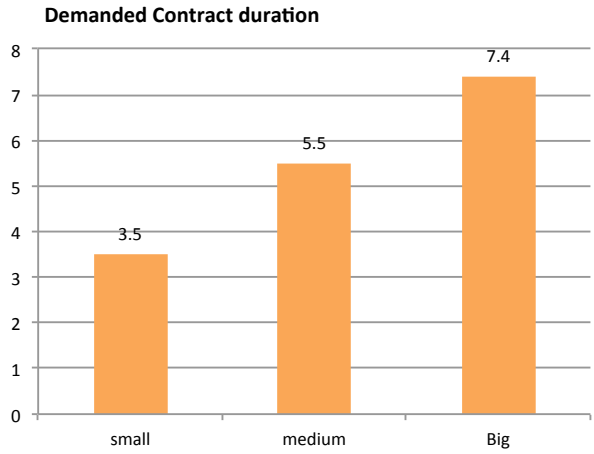


Table 43: Demanded contract duration in relation to size (significant different p<.05)

LFA/FTE

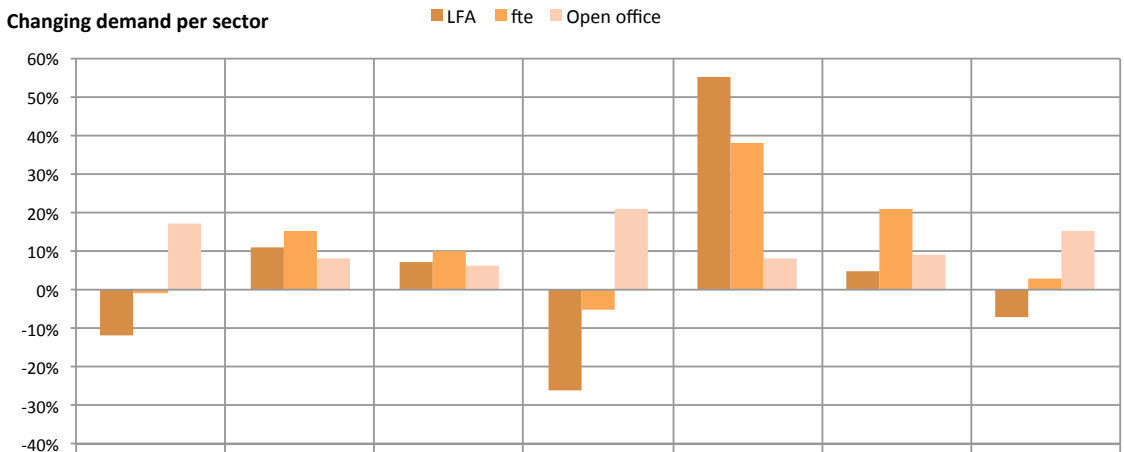
The larger offices (M=-4.6, SE=1.4) have an average shrinkage of 4.5 square meters per FTE while offices with less than 50 employees (M=8.2, SE=5.2) have an average shrinkage of 8.2 square meters per FTE. The standard error is much higher in the small sized companies. It is striking that offices of all sizes show a decrease of the total LFA/FTE. The variable is not significant different between the groups.

Contract duration.

The large offices (M=7.4, SE=4.0) have an average contract duration of 7.4 years. Offices with less than 50 employees (M=3.5, SE=2.1) demanded for average contract duration of 3.5 years. The standard error is much higher in the larger sized companies. The variances are not significant different. On the other hand the Welch test and the Brown-Forsythe test show a

significance of p=0.0 which is significant with p<.05. (Welch test F(2,40.54) = 10.52, Brown-Forsythe F(2,40.54) = 10.16). The larger offices are significant different; t (4.6) = 5.9, p=0.000 < .05 (2-tailed). When the difference between small, medium and larger companies is studied, the following conclusion can be drawn. The larger the company, the longer the contract duration. This hypothesis is also significant; t (-2.7) = -7.6, p=0.012 < .05 (2-tailed).

Sector related



	Public	Manufactory & Industry	Transport & Trade	Financial & Insurance	Communication & automation	Other businesses	Other
LFA	-12%	11%	7%	-26%	55%	5%	-7%
fte	-1%	15%	10%	-5%	38%	21%	3%
Open office	17%	8%	6%	21%	8%	9%	15%

Figure 67: Changing demand related to sector (differences are not always significant Table 40)

LFA

The average hidden vacancy is the greatest in the sector financial & insurance sector and in the public sector (M=-0.12, SE=0.10). The highest shortage of space is in the sector communication & automation (M=-0.26, SE=0.67) and in the manufactory & industry sector (M=0.11, SE=0.12). The difference expressed in means are quite large. Nevertheless, the differences in the ANOVA test are not significant (p>.05). Further, the average hidden vacancy is smaller for companies with more than 1 office than for companies with one office.

FTE

The largest shrinkage in the average number of FTE is in the sectors public (M=-0.01, SE=0.03) and financial & insurance companies (M=-0.05, SE=0.13). The highest increase in the number of FTE is in the sectors other businesses (M=0.21, SE=0.07) and communication and automation (M=0.39, SE=0.33). Planned contrasts revealed that public and financial & insurance show significantly more shrinkage in FTE than the other sectors. Other business services and other sectors were not included in this. t (6.6) = 2.0, p=.04 <.05 (1-tailed).

Open office

The average mean for the different percentage open office space is most positive for the sector financial & insurance (M=20.7, SE=8.0) and the sector public (M=-17.4, SE=8.5). In the other hand, the sectors with the smallest difference in open office space are transport & trade (M=5.5, SE=5.2) and manufactory industry (M=7.9, SE=3.8).

Planned contrasts revealed that public and financial & insurance have a significant higher increase in open office space than the other sectors whereby other business services and "other" were not included. t (20.5) = -1.6, p=.05 =.05 (1-tailed)

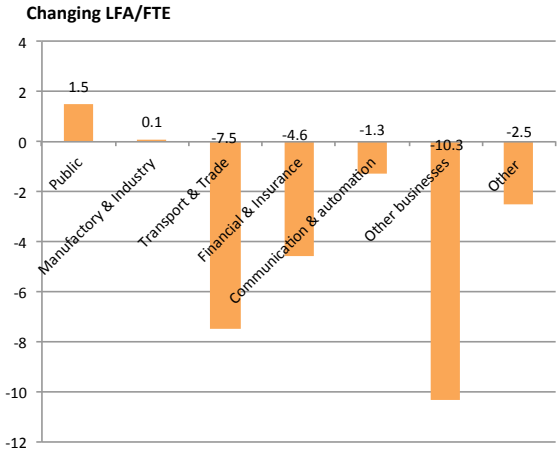


Figure 68: Changing LFA/FTE (not significant different p>.05)

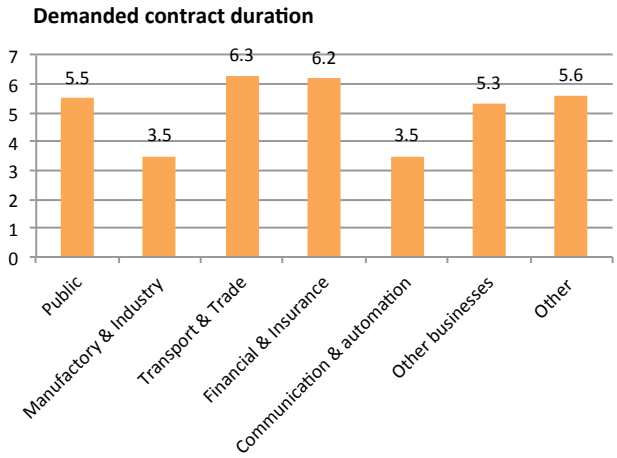


Figure 69: Demanded contract duration (not significant different p>.05)

LFA/FTE

The sectors other businesses (M=-10.3, SE=5.4) and transport & trade (M=-7.5, SE=4.5) show the largest shrinkage in LFA/FTE. The sector manufactory & industry has a positive average mean of 0.05 square meters (SE=2.1). Also the communication & automation sector does not shrink very much in total LFA/FTE (M=-1.3, SE=2.1). There are no significant differences between the group with the Post Hoc test and ANOVA. Planned contrasts revealed that the sectors public and financial & insurance have no significantly greater shrinkage in FTE than the other sectors whereby other business services and "other" were not included t (68) = -0.07, p=.94 <.05 (2-tailed).

Contract duration

The average mean for the demanded contract duration is highest in the sectors transport and trade (M=6.3, SE=1.9) and financial & insurance (M=6.2, SE=0.9) and the lowest for communication and automation (M=3.5, SE=1.0) and manufactory industry (M=3.5, SE=0.5). The Post Hoc test with Hochberg show no significant differences between specific sectors.

4.5.3 Current demand

In what way has the new way of working and the new economy influence on the demand for office space?

In the study it revealed that the demand for office space is mainly changing due to the new economy and the new way of working. Firstly due to shrinkage the number of full-time equivalent (FTE) will slightly decrease with 6 per cent in the research sample. Secondly, the new way of working cause a decrease of the office space per FTE with 18 per cent what results in a hidden vacancy of 23 per cent for the sample of the study (Figure 70). Still these two influences, the new way of working and the new economy, have a connection and are not strictly separated.

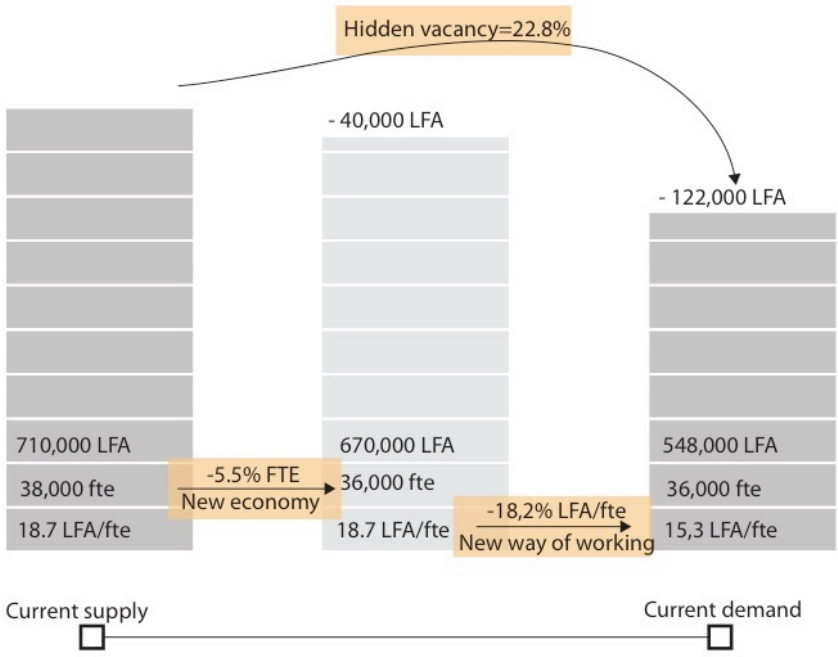


Figure 70: Influence of the new economy and the new way of working on total hidden vacancy of the sample (N=81 with in total 710,000 square meter)

4.5.4 Differences between the total current supply and total demand

What is the quantitative mismatch between the current office demand and the current office supply in the research sample?

Topic	Total difference	Expectation in 5 years
LFA (hidden vacancy)	-23%	-33%
Number of FTE	-6%	-11%
LFA/FTE	-2,8 sq m	-7,0 sq m
Open office	+35%	
Contract duration (demand)	5.2 years	

Table 44: Total differences between current supply and the current and future demand in the research sample

Hidden vacancy

The total hidden vacancy in the sample is 441,100 square meters which is equivalent of 23 per cent (N=81) of the research sample. A total of 24 respondents expressed their expectations for the coming five years. This expectation means a decrease of the total LFA from 2,676,000 (6 per cent of the total office stock in use) to 1,817,000 square meter. This decrease corresponds -33 per cent (N=24).

Number of Full-time equivalent (FTE)

The difference between the current number of FTE and the demanded number of FTE is in the sample 6 per cent. The sample has now 38,000 FTE, which is two per cent of the total FTE in the Netherlands, and they want to have 35,800 FTE at the moment of the filling out the survey. In total 35 respondents filled in their expectation for the coming five years. The total number of FTE will shrink from 117,300, which is six per cent of the total number of FTE in the Netherlands, to 104,300 square meters that correspond with minus eleven per cent (N=35).

LFA/FTE

The changing Lettable Floor Area (LFA) per FTE is the difference between, on one hand, the current lettable floor area divided by the total current FTE and, on the other hand, the requested lettable floor area divided by the requested number of FTE. The current average LFA/FTE is 18,4 square meter, the requested is 15,6 square meters which is 15 per cent less square meters per FTE (N=75).

Office concept

The respondents were asked to filled out the distribution of office concepts in their offices for 2012 and for what they request. There is an increase in the percentage "open office" for the total square meters of the sample, from 57 per cent to 77 per cent, and a decrease in "team office", from 24 per cent to 14 per cent and a decrease in "cellular office", from 20 per cent to 9 per cent. The open office is significant ($p<.05$) negative correlated to LFA/FTE. The percentage open offices has influence on the total LFA/FTE. If the number of open offices will increase with 1 percentage, the LFA/FTE will decrease on average with 0.16 square meters ($p<0.05$)

Contract duration

The average demanded contract duration is 5,2 years whereby 28 per cent of the respondents wants to have a contract duration of 1,2 or 3 years and 52 per cent of the respondents wants to have a contract duration of 5 years.

5 Qualitative study – interviews

In this chapter the results of the qualitative study will be discussed. The topics discussed in this chapter are; the organization (chapter 5.1), the new demand (chapter 5.2), hidden vacancy (chapter 5.3), the new supply (chapter 5.4), towards the new supply (chapter 5.5) and the conclusion (chapter 5.6).

In Figure 71 the conceptual model for the interview analysis is shown. This conceptual model is adjusted to this chapter.

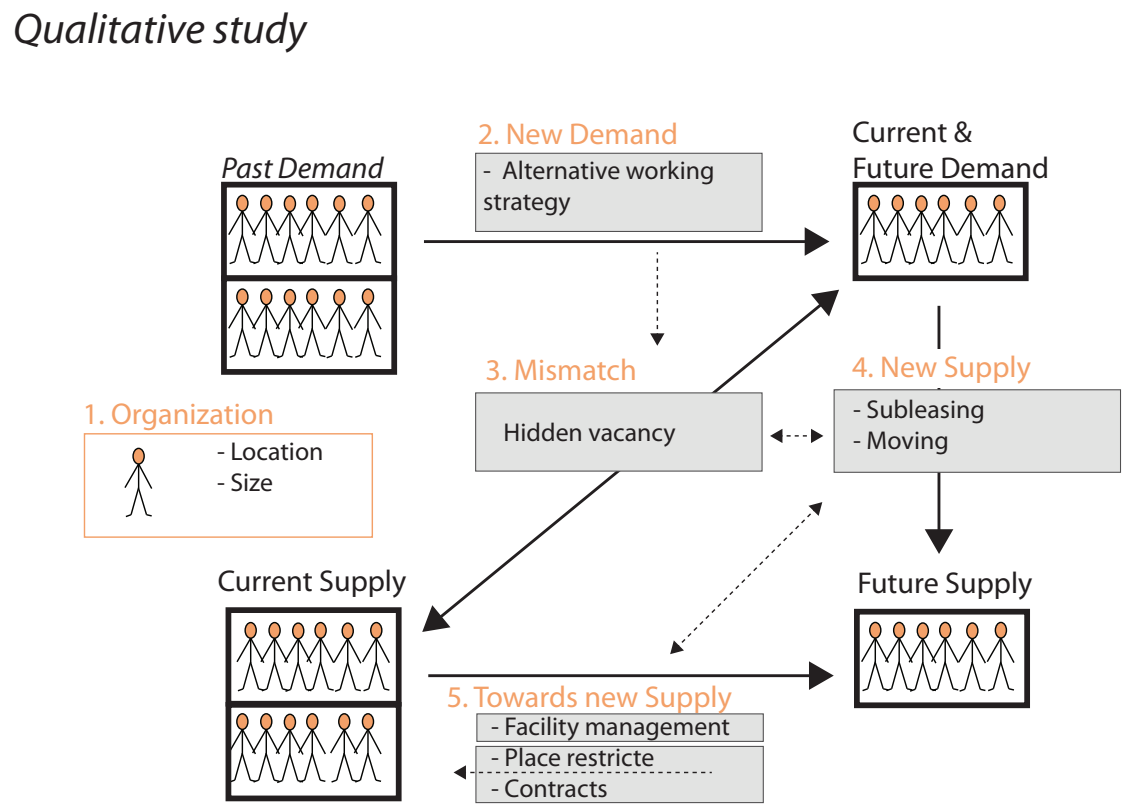


Figure 71: Conceptual model Interview

5.1 ORGANIZATION

To relate the findings from the survey to practice, the companies that are interviewed have different sectors, locations and sizes.

N.	Interview	Location	Sector	N. FTE	FTE	LFA	LFA/WP	sharing WP
6	Appendix E6	Rijswijk	Oil & energy	2850	↗	↘	→	↗
8	Appendix E8	Amsterdam	Wholesale	300	↘	↘	→	→
9	Appendix E9	Utrecht	Banking	1100	↗	→	→	↗
10	Appendix E10	Woerden	Market research	12	→	↘	↘	↗
11	Appendix E11	Baarn	Management consultancy	45	↗	→	↘	→
12	Appendix E12	Amsterdam	Internet	70	↗	↗	→	→
13	Appendix E13	Rotterdam	Logistics & supply chain	450	↗	↘	↘	↗

Table 45: Respondents of the interviews

5.1.1 Location

According expert 3, there is a pull towards central locations. This concentration is shown in the vacancy figures. The highest vacancy is shown in the periphery. It is mainly the satellite towns where shrinkage take place, these office locations have no services and there isn't a good connection with the city. Also looking from an economic theory view, urban agglomeration is becoming more and more important. This is also due to shrinkage (expert 3). Nonetheless, there are a lot of variables present why some locations are more preferred than others. For instance, company 11 explained that the appearance of the office is important for impressing their clients. This is one of the main reasons why they choice for the particular location and the building. They wanted to have a classy high-end location in a nice area.

5.1.2 Size

As is exposed in the figures of the interviewees, only one respondent thinks that the company (appendix E8) will shrink in number of employees. This company will go through reorganization in the common years. The rest of the company's mentioned that they will shrink or will stay constant. Three experts (Appendix E42 E4 and E5) have thoughts about the workforce and office jobs in coming years. According expert 4, the working force will decline, but the office working force will increase (Appendix E4). Analyses of EIB (Appendix E2) remark that the amount of office jobs will be constant in the period 2012-2020. However, this can differ between sectors. Expert 5 forecasted that the working force will increase a bit common years and then it will repel off (Appendix E5).

5.2 New demand

5.2.1 Quantitative data

The data in Table 46 shows the differences between the past and 2012 and the mismatches between 2012 and the demand. Companies 6, 8, 10 and 12 have big mismatches between the current LFA and the demanded LFA. Further, only company 8 wants to shrink in their total number of FTE. Company 6, 10 and 13 want to use more efficient their office space with a large decreases in the total LFA/FTE according to the figures and highly increasing number of FTE per workplaces.

	Past	Difference	-> 2012	Mismatch	-> Demand
Appendix E6					
LFA	71,500	-6%	67,300	-24%	51,000
FTE	2,700	+6%	2,850	+16%	3,300
LFA/FTE	26.48	-11%	23.61	-34%	15.56
FTE/workplace			1.10	+111%	2.32
LFA/workplace			25.88	+39%	36.07
Appendix E8					
LFA	6,800	-32%	4,600	-35%	3,000
FTE	300	-	300	-33%	200
LFA/FTE	22.67	-35%	14.84	+1%	15.00
FTE/workplace	1.00	+3%	1.03	-3%	1.00
LFA/workplace	22.67	-32%	15.33	-2%	15.00
Appendix E9					
LFA	17,959	-	17,959	-	17,959
FTE	1,100	+46%	1,611	-	1,611
LFA/FTE	16.33	-32%	11.15	-	11.15
FTE/workplace	0.92	+52%	1.40	-	1.40
LFA/workplace	14.97	+4%	15.64	-	15.64
Appendix E10					
LFA	440	-	440	-55%	200
FTE	18.4	-39%	11.2	-	11.2
LFA/FTE	23.9	+64%	39.3	-54%	17.9
FTE/workplace	0.8	-	0.8	+16%	0.93
LFA/workplace	19.1	+64%	31.4	-47%	16.7
Appendix E11					
LFA	1200	-	1200	-	1200
FTE	25	+80%	45	-	45
LFA/FTE	48.0	-44%	26.7	-	26.7
FTE/workplace	1,9	-5%	1.8	-	1.8
LFA/workplace	92.3	-48%	48.0	-	48.0
Appendix E12					
LFA	700	+71%	1200	+25%	1500
FTE	20	+250%	69.9	+29%	89.9
LFA/FTE	35.0	-51%	17.2	-3%	16.7
FTE/workplace	1.0	-21%	0.79	+4%	0.82
LFA/workplace	35.0	-61%	13.5	+1%	13.6
Appendix E13					
LFA	12,823	-	12,823	-12%	11,300
FTE	450	-	450	+16%	520
LFA/FTE	28.50	-	28.50	-24%	21.73
FTE/workplace	1.00	-	1.00	+16%	1.16
LFA/workplace	28.50	-	28.50	-12%	25.11

Table 46: Details of the office space of the respondents

5.2.2 Alternative working strategies

The main reasons that are mentioned during the interviews to implement sharing workplaces are liveliness, internal communication and costs reductions. Only company 9 stated that employee satisfaction as the main cause for applying a new working strategy. They realize this together with a social plan what will result in a better work efficiency. Nevertheless, also for this company, the costs are decisive. Since the alternative working strategy will save office space, it is feasible to implement. The accommodation costs per

square meter increased but the accommodation costs per employee went down. Before, the costs were around 10,000/15,000 euro per workplace for company 9. After implementing the alternative working strategy, the housing costs decreased to 8,500 euro per workplace.

Of the 8 companies that were interviewed, three have flex workplaces (7, 9 & 11), three are planning to implement flex workplaces (6, 10 & 13) and two companies are not intending to implement flex workplaces (12 & 8). Professional 12 indicates an increase of costs by implementing flexible workplaces. Particularly for smaller companies the implementing costs are high compared to the saving office space. Also, if the company have a 9 till 5 culture wherein employees work 5 days a week at office, the alternative working strategy will not be effective to implement according professional 12 (Appendix E12). This is the case at company 2, where they have fixed workplaces. "This will never change according expert 2". This is due to all the paper work, dossiers, paper and personal material that employees have. According expert 2, it will differ for each company if the new way of working is suitable. Expert 5 argues that there are two reasons for companies to apply the new way of working, or cost reduction with less office space per person or as another way of working with no reduction of office space per employee. "*Companies like CapGemini or Rijksgebouwendienst show a big decrease in office space that suggest a cost reduction. If this is the case, this argument will play a weaker role if space will be cheaper. While, for instance, big consultants have implemented the new way of working a long time ago as a method of working that fits the company. This alternative working method is absorbed in their culture. This will not change if office space will get cheaper. "* (Appendix E5) The experts (2 & 5) argue that conservative companies, as the government are also switching to new working forms. This doesn't sound with the image that the employees give and the culture of the company what indicate that costs reduction is the goal. It should not be forgotten that by implementing an alternative working strategy, the culture of a company will change.

Office concept

Company 12 will avert one building of their two offices, mainly because of efficiency. This automatically will result in a 100 per cent open office plan with shared workplaces instead of a mixed office concept with fixed cellular workplaces for the board.
Costs reduction, as the argument for a new working strategy play mostly a role for company 8 and 10. For company 13, the communication between different teams and the cost reduction are the main drivers to switch to alternative working strategies (appendix E13).

Remarkable is the trend towards an open office plan. Of the 8 companies, 4 have an open office concept and the other 4 wants to implement an open office concept in the future. Company 8 is a good example of the move towards an open office plan. According professional 8 this has several positive and negative consequences. "*The positive argument is the efficient use of space and the liveliness in the office. People meet each other easier. The downside is the noise disturbance and the lack of private work and meeting places."* (Appendix E8) Also company 13 moves towards 100 per cent open office. They are centralizing their offices, whereby an open office fits in the reorganization. The company becomes more efficient and open (Appendix E13).

Towards new way of working

There are several options when choosing for an alternative working strategy. Company 9 has realized an activity-based housing plan. There are different workplaces and interiors for different activities. Professional 9; "*Nevertheless, people are not sitting were their activity fits but they are sitting where their team sits.*" Further, everything is paperless. They are lockers,

but 80 per cent of the time these are empty. The next time professional 9 would make the workplaces more understandable for the employees. There are now three different meeting locations for specific activities and it is not understandable in what way they differ.

Company 6 will also have an activity-based floor plan but in another manner. Every floor will have several rooms in an open office plan; namely huddle rooms (coming together for a small meeting), phone booths (small rooms where phone calls can be made) and project rooms (flatscreen, official meetings). The rooms are not able to reserve in forehand. For every department they can decide which division of rooms they want (Appendix E6).

Also company 10 will switch to the new way of working. In the new situation they will have 12 workplaces for 15 people. Director 10 is enthusiastic about the new way of working because of successful examples and masterclasses he joined. This is one of the reasons to apply an alternative working form together with the fact that the leasing contract ended. Also cost reduction is a reason for a new way of working. By working at home and sharing workplaces, transport costs and housing costs will go down. They introduced technologies to work at home, but these still need to be improved. For instance a transition to optical fiber and chatting are technologies that can be added.

Remarkable, most companies that are intended to or already have implied new alternative working strategies (companies 6, 8, 10, 11 & 13) argue that the changing management is a very important aspect. Employees are most of the time not involved in the discussion making process (company 6, 7, 8, 9, 12 and 13) and are most of the times, particularly in the beginning, not satisfied with the new alternative working strategies (company 7, 6, 12 & 13). Professional 6; "*The employees are responsible for 30 billion profit, they don't see the need for a saving of 4/5 million on housing costs*."(Appendix E6) Company 8 have switched to an open office plan with fixed workplaces instead of the former cellular office. Professional 8 explains that this was a big conversion for a lot of employees. Especially the noise and lack of privacy are the main complaints. The facility management is too afraid to involve the employees in the housing decisions because of expecting resistance. Also company 12 does not involves employees in the decision process, there are for instance no questions about the accommodation in the employee satisfaction researches.

The employees are more involved with the working concept in the consultant business 11 were everyone works very flexible. The employees agree to the flexible way of working. According to director 11, it is important that the employees feel happy. The employees have as minimum constraints as possible, but the performance has to be good. The mentality is that employees can work where and how they want. Furthermore, there are 4-days contracts. But if they are busy they can work for 7 days in a week. If they want a holiday of 6 weeks, this is also possible. It is their own choice to work as hard as you like. Nevertheless, this mentality is present since the start of the firm.

Working from home

Some employees from company 10 work also from home, it depends on the living place of the employee. In the beginning it was a big modification for the employees to get used to performance orientated working instead of time orientated working. There are employees who work two days a week at home, what makes it for instance possible to run in the morning. Director 10; "*Trust is very important with this new way of working."*

New generation

There are several opinions about the demand of the new generation employees. In a small research from company 9 it appeared that young employees prefer to work at the office to learn a lot and to put them in the picture (Appendix E9). Contrary, professional 3 and 11 think that the new generation prefers more variety and challenge. Expert 3; "*There will be more demand for flexibility and collaborations and self-employers will seek each other to work together for a job".*

Sustainability

All companies, expect for company 7, indicate that sustainability doesn't influence the housing management. The accommodation strategy is not dependent on sustainability.

5.3 HIDDEN VACANCY

The figures in Table 46 show the current hidden vacancy. Because of new alternative strategies the companies need less space per employee. The figures of EIB show that there is no trend exposed in the office space per employer (for instance company 10). Quoting professional 1; "*The alternative working strategies have a big role in the hidden vacancy".* In the past the Rijksgebouwendienst counted around 30/32 square meters GFA per FTE. Nowadays they calculate 24,5 square meters GFA per FTE into account. When the client applies the new way of working the total needed office space will be divided by 0,9 and in the case of a new building or a big renovation this factor will be 0.7. This has big consequences for the amount of space that is required (Appendix E1).
New buildings are expected to be more efficient. But in general, when companies moved they use more space, with an expectation of growth according expert 2 (Appendix E2).

5.4 NEW SUPPLY

5.4.1 Subleasing

Three companies are subleasing (3, 9 & 13) and one will sublease itself (10). For company 13 they subleased one floor in Rotterdam. Professional 13; "*This is a separated floor and was signed for 10/15 years. This is just a fact and is not a burden"* (Appendix E13). One part of the building, 8,000 square meters, of company 9 is subleased to the Rijksgebouwendienst.

Also company 3 has one wing of the building subleased to a charity funding. This subleasing is self-organized; a former employee is now director of the specific charity fund. Expert 3; "*The sublease is more complicated than though, you have to think about security, the building has to meet the preferences and the building and the organization has to adjust the multi-tenancy*" (Appendix E3).
For the clients of the Rijksgebouwendienst it is hard to have subleases, this is because the restrictions the Rijksgebouwendienst have. They can only lease their buildings for governmental purpose (appendix E1).

Company 9 likes to be responsible for their possible oversupply of space and not the owner. In almost every leasing contract it is stated that company 9 can independently look for external parties. At the moment, they are making a strategic plan for subleasing because they

do not have expertise on facilitating external lease. In their most preferable way a national party takes the subleasing task over from company 9 as a commercial exportation of their space.

According expert 7, in a lot of new buildings a shared shell is made were everyone can make us of. This makes it easier to have a multitenant building and to make use of subleasing.

5.4.2 Moving

Moving motives

According to expert 2, office users are price sensitive. When this is true it is possible to considerate several locations (Appendix E2). However, there are more aspects that have influence on moving and relocation of offices reflecting the answers of the respondents.

Four (companies 8, 10,12 & 13) of the seven companies that are interviewed want to move or is moving and two companies (companies 9 & 12) are having a refurbishment to apply alternative working strategies in their current office.
Company 12 wants to expand; they are becoming too big for their current office. They like to move internally because they are located at a creative lively surrounding in Amsterdam, secondly the building was a former parking building what result in an accessible building for cars and lastly because it is located next to a train station and high-way. They prospect that one of the neighbors will move. However, the building is very popular which makes it hard to grow in the building. 10 new employees have been adopted in the last year. And the expectation is that this will even grow. Even with flexible workplaces the main office will be too small. This was the reason to choice for an expansion on the other side of the street. 35 employees moved last year to this location. This is an in-between solution. Company 10 is moving because of the end of their leasing contract and their search for a better agreement.

Some larger companies show a trend towards a consolidation of businesses. Four interviewed companies have been or will be centralized (companies 6, 7, 9 and 13). Company 6 had seven separate leased offices, which were very inefficient and costly. They choose to bundle the departments in one building (Appendix E6). Also company 9 will bundle 24 locations into 3 head locations. On one side these are efficiency improvements and on the other side this is a possibility to look on another way to their processes. Also, the company is shrinking.
Company 9 has a lot of offices spread around the region, some locations are very distant from everything. These will be centralized in Rotterdam. They are at the moment of the interview in the middle of this process. The office in Dordrecht will move to this location. The division offices will be centralized because of communication improvements and efficiency. It is important that employees connect with other divisions and participate throughout the organization and not only in their own role. In the same time they will introduce shared workplaces. Most managers will keep an own room. But the rest will work in an open office space in Rotterdam. Especially for the people who are on the move, flexible spaces are required in contrast to the current cellular offices.

Mobility

Mobility is for 6 of the 7 interviewees a very important topic concerning housing management and location. The accessibility with the car is crucial. Public transport is also a key for companies 6, 8 and 9. Only company 13 is not convinced that mobility plays a big role, the main driver for choosing a location for this company is the closeness of the containers

where the core business of the company is located. Further the consultant (company 11) indicates that mobility is not an issue as they work place and time independent. The employees live all over the Netherlands. For company 8, an office location nearby public transport is a key; around half of the employees travel with public transport. They also need a lot of parking places, which makes a site next to the highway necessary. All the offices of company 9 are located next to train stations. Around half of the employees are using public transport. Still, according professional 9; *"It is not only about where the office is located but also where the employees are located".* For company 10 it is more important to be close to the highway than to the train station.

5.5 TOWARDS NEW SUPPLY

5.5.1 Housing management

The companies, that are interviewed, have different approaches about how they manage their housing. Clearly is that larger companies have a more professional approach towards facility management. They have most of the time a facility company who is responsible for strategic portfolio management and facility management. "*In this way, it can be organized centrally and efficiently"* (Professional 6). Professional 13 explains that these internal facility companies are something "new" and are becoming more important seen the economic situation and the demand for efficient use of money and space. In smaller companies the board or director is responsible for the decisions concerning housing most of the time.

Just two companies of the seven don't measures the occupation rate of the desks. Some companies have card systems which makes it easy to measure the occupation continuously. A problem that were issued a couple of times, was the large differences of the occupation during the week. Professionals 3 and 9 argue that because some days are more popular than others the positive elements of the alternative working strategies are weakened. The facility manager of company 9, explains that they discourage employees to work on the popular days by making the restaurant and parking possibilities for a maximum amount of people. In this way people prefer to work on the more quiet days. They also stimulate employees to work at home by giving for instance compensation for tea, workplace and food when staying home for a day (Appendix E9).

5.5.2 Location restricted

Company 8 & 13 are location restricting concerning company based activities nearby. One is a big retailer, they want to be located nearby their biggest Flag-ship store. This makes it is easier to test new concepts and to be close to their "product". The other company is active in the logistics and supply chain. They like to be positioned close to their terminals. The company also has a big history in the region what makes the company location restricted (Appendix E13).

Professional 9 debates that with the new way of working, you can work location and time independent so you would think that the location wouldn't matter. Though, it is important for the company what location they choose. For company 9 is history predominant, especially because of their insurance background. Accessibility with public transport and

with the car is essential too. The services in the neighborhood are not of high priority for company 9.

Also employees cause location restriction. For company 2, the biggest reason why they didn't chose to leave was because 80 per cent of the employees wanted to stay. Also company 10 indicate that the only connection they have with the area is that a lot of employees live there.

5.5.3 Contracts

Price elasticity

EIB assumed that the price elasticity in the office market is 0,2 per cent, in the housing market this is 0,4 per cent (Appendix E2). This means if the prices are going down with 1 per cent the demand for office space will go up with 0,2 per cent. Seen the current rent declining, an increase in office space is expected. However, expert 5 state that the rents are still high because of the static contracts.

Company 2 had at the end of their contract, the choice to move to a better location. There are now located in Sloterdijk If they would move to the Zuidas they will get for the same rent half the space. Company 2 choose to stay in their current office. They have shrunk 50 per cent in employees, so actually they would need half the office space they have. But the owner offered the office space for the same price as they would leased half the space that they actually need. This is an example of price elasticity.

Contract duration

From the five companies that are leasing, three have 5+5 years contracts (companies 6, 10 & 11). Further, one firm has a long-term contract of 14 years (company 9) and one has a 4 years contract (company 10).
The contract duration of company 9 is 14 years. The reason behind this long duration is the high investment costs with high quality installations. This is one of the reasons why they have a secure long term contract. "*If they have long-term sustainable locations why would they choose for a short term lease contract?"* (Appendix E9) Good agreements with the owner are necessary to stay flexible according professional 9. Also company 5 has currently a long-term contract of 20 years, what they will not do ever again. They also prefer to shorten the contract durations. They would never lease for periods like a year, as this is unpayable. If company 5 would start a lease contract now, this would be for 5 a 10 years.

Company 6 has a rental contract with breaking options. Because of uncertainty about the number of office space they will need, they decided to pay a bit more rent for this contract 5 years ago. Because of this, they can avert some floors before the end of the contract. Professional 6 indicate that they always need rental contracts, to avoid vacancy. They also have rental contracts with 5+5+5 years. Professional 9 is very satisfied about the contract with breaking options and would choice for this contract again.

The current contract of company 10 is 3+3 years. They will sublease for the last 4 years of the contract of their neighbor. Director 10: "*4 years is the perfect contract duration"* (Appendix E10). For company 11 and 8 a 5-year contract is the perfect duration.

The public building service ("Rijksgebouwensdienst") switches to flexible contracts where short term leases of 2-years will be applied instead of the usable 5-, 10- or 15-year contracts. They also will concentrate several departments on the same location that makes the use of

space more flexible (Appendix E1). Company 3 would also prefer short contracts as it is a cyclical organization who would benefit from flexible leases and good communication with the owner.

The flexible contracts are clearly under attention at the moment. Especially for small companies flexible leases are very interesting cited by expert 4. Expert 3 explains that in the past the lease duration was in general 5 to 10 years. At the moment the contracts are more customized for the user. Still, the contract durations are mainly 5 or 10 years but there are more options possible and negotiable. There is a shift from a supply market to a demand market. However, the investor still wants contract duration of 5 till 10 year to minimize the risks.

Lease/sell

Company 13 leases most from their offices from the holding. Company 6, 7, 8 and 9 have a combination of leased and owned office space. Company 10, 11 and 12 are only leasing. The figures indicate as if larger firms have more owned buildings than the smaller ones.

Company 11 opted a rental contract instead of buying the office. Director 11; "*We want to invest in people and not in stones"*. That is their philosophy. Besides, because of the current economic conditions, they could arrange a good offer for the rent. They had good negotiations possibilities during their contract extension last year. They pay around 120 euro square meters per year for the current 1000 square meters office space instead of the former 150 euro square meters per year. They also got a free new heating system (Appendix E11). In the other hand company 5 prefers owned buildings as this makes the organization flexible. They are free to do what they want with the building.
The larger company 9 is for 30 per cent owner of the building in a partnership with a funding (they get 30 per cent of the rent back). It is part of their investment portfolio. In another city they are owner of the building because they want to stay there for a long period.

In the end of the leasing contract of company 10, they searched for a new office. They decided to sublease from their neighbor in the same building. The neighbor wants to switch to the new way of working and they have 200 square meters office space that they could sublease. In this way, they save a lot in the total rent. The extra income for the first year will go the equipment of the office.

The office of company 8 is a 5 year lease (with an option for 5 years more) this is an in-between solution, because they want to build a new office next to their flag-ship store. However, there are problems with the municipality to receive planning permissions. New developments are difficult at the moment to realize.

5.6 CONCLUSION

Organization

In what way do type of characteristics (size, location and sector) differ significantly in their quantitative demand for office space?

Location

Analysis of the vacancy rates shows an appeal of central locations. This trend is however not directly confirmed in the interviews.

Size

Three experts have an opinion on the forecast of the number of office jobs in the future. In general the experts think that the demand for office jobs will stay stable in the long-term.

New demand

In what way has the new way of working and the new economy influence on the demand for office space?

New way of working

The main reasons for implementing an alternative working strategy are costs reduction and improved internal communication. The factors liveliness and efficiency were also mentioned in the interviews. The larger companies that are interviewed call cost reduction the main reason to implement the new working strategies.

The new way of working consists of different elements. A trend towards an open office plan is shown. Furthermore two companies that introduced the new way of working have implemented or will implement activity-based floor plans with different rooms for particular activities. Also working from home is a trend that becomes more normal in the companies that are interviewed.

An important aspect during the implementation of another working strategy is the need to change the management style. The process of change is hard and takes a long time for the employees. Remarkable is that in most cases the employees are not involved within the decision-making process on housing. For example in the majority of the organizations surveyed, the employees are not always satisfied about flex working. It can be concluded that the housing decisions are made top-down with out good communication with the employees.

It is assumed that the new generation has a more flexible working attitude. Research done by one of the companies shows that the youngers don't prefer flexible work times. They prefer to bring themselves in the picture and they want to learn from the seniors. This is more difficult working at home.

Mobility

Mobility is a very important factor. One would expect mobility would be less important for work that is time and place-independent. However accessibility with car and public transport is still very important for the companies.

Sustainability

Unexpected, sustainability doesn't influence the accommodation strategy. Just one company indicates that flexibility plays a role in the housing management.

Hidden vacancy

What is the quantitative mismatch between the current office demand and the current office supply?

Because of the demand for alternative working strategies, the hidden vacancy is expected to be higher.

New supply

What are the alternatives in which the office supply can react on the changing office demand?

Subleasing

Subleasing is not rare. New buildings have more often shared cells what makes it on one side easier to lease it to multiple tenants and on the other side it is easier to sublease the office space. One big party indicates the importance of knowledge about subleasing. They are looking for an advisor who assists in subleasing.

Moving / selling

The decision to sell, extend or move is partly price sensitive. Alternative-working strategies can stimulate to move. However, if the company is satisfied about their surrounding it appears that they prefer to stay. In this case they move internally or they refurbishing their office.

Another movement is the consildations of big companies. There is a movement from small distant offices towards big accessible and flexible offices.

Towards new supply

What are the restrictions and influences on the steps towards a new office supply?

Location restricted

If the company is location restricting the company has a relation with the environment. Two companies indicate that they prefer to be nearby their core business. Further, history can play a big role. Also employees cause a location restriction. Employees can live nearby what makes it undesirable to move.

Contract

Some larger companies lease their offices from the holding. Other companies lease rather than buy because they prefer to invest in people instead of in stones. Moreover because of the current market conditions it is possible to negotiate about the rent. On the other hand one company argues that buying gives more flexibility.

The price elasticity is estimated on 0,2 per cent. If the prices go down, the demand for office space will go up. Seen the current market situation this can attract office users to use more office space.

Contract duration

Most of the companies have 5+5 year contracts. One company implies that they have breaking options in their leasing contract whereby it is possible to avert floors during the contract. In contrary, some respondent explains that if the company has long-term sustainable locations, they could also have long-term contracts.

In general flexible contracts are interesting for smaller companies and cyclical companies who are not able to look far away in the future. However, because building an office is a long-term investment, short-term contracts are difficult to realize.

Housing management

Housing management is becoming more important and more professional, especially for the larger companies that are interviewed. By measuring the occupation rate, the occupation throughout the week can be measured which gives valuable data about the office need of a company. With the new way of working it can be hard to manage employees to work spread through the week without large peaks.

6 Conclusion

In this study a theoretical exploration, 13 interviews and 102 respondents to a digital survey answer the central question about ***the opportunities and threats of hidden vacancy for the office market in the Netherlands.***

This chapter not only summarizes the main findings of the study (chapter 6.1), it also deals with some recommendations (chapter 6.2) and it reviews the research methods and the design (chapter 6.3).

6.1 HIDDEN VACANCY

6.1.1 Types of office users

This paragraph answers the sub-question; how different of characteristics (size and sector) differ significantly in their quantitative demand for office space

The research suggests big differences between the several office users. Hidden vacancy is significantly different within different size-groups of companies or offices. The larger the company, the more hidden vacancy is present (Figure 72 and Figure 73).

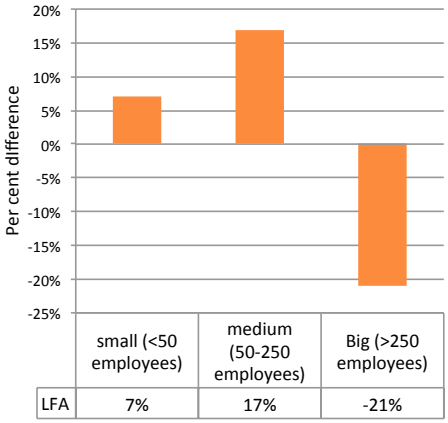


Figure 72: Hidden vacancy for three different size-groups

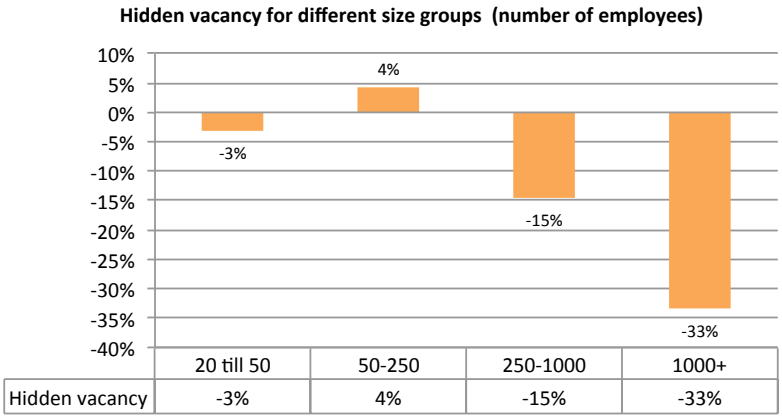
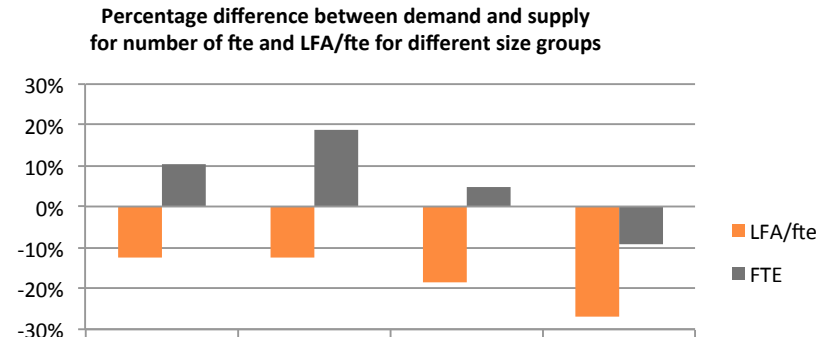


Figure 73: Hidden vacancy for four different size-groups

In Appendix G the hidden vacancy of the different employee groups is shown in more detail. The cause of this big difference is partly due to increasing efficiency in the use of space in combination with decreasing numbers of employees in larger companies. Figure 74 illustrates this difference and it shows a decrease in space per full-time equivalent for the bigger companies and a falling number of full-time equivalents.



	20 till 50	50-250	250-1000	1000+
LFA/fte	-12%	-12%	-18%	-27%
FTE	10%	19%	5%	-9%

Figure 74: Percentage difference between demand and supply for number of FTE and LFA/FTE for different size-groups

Generally larger offices have more professional facility management. According to the interviews (Appendix E) it is clear that the facility managers are more aware of the saving opportunities of their real estate. In smaller companies with an absence of facility managers, the strategic real estate decisions are less professional and have low priority.

Another cause for higher hidden vacancy rates in larger companies is the economic crisis. In April 2013 Dutch newspaper "Volkskrant" explained in an article that the number of unemployed people increased per bankrupt company (Voogt, 2013) whereas the profits of the greatest stock listed companies in the Netherlands decreased with 31% in 2012 (Volkskrant, 2013).

Nevertheless, the larger companies with more than 250 employees only make up just 9 per cent of the companies in the office market, excluding companies with less than 20 employees (CBS, 2012). In Figure 49 the figures of the total office market are shown per category.

Categories	Sample	Current office stock					Differences supply-demand		
Employees	**Freq**	**Freq***	**N.**	**Total LFA**	**Total FTE**	**LFA/FTE**	**LFA**	**FTE**	**LFA/FTE**
20 till 50	16%	55%*	10,000	9,590,000	306,000	31	-3%	10%	-12%
50-250	39%	35%*	6,400	15,610,000	684,000	23	4%	19%	-12%
250-1000	24%	7%*	1,300	11,870,000	617,000	19	-15%	5%	-18%
1000+	20%	2%*	360	11,760,000	690,000	17	-33%	-9%	-27%

Table 47: Differences per group * (CBS, 2012)

The survey results do not show significant relations between particular sectors. More indepth research into these relations requires a larger sample. The only significant difference is prominent in the finance & insurance sector and the public sector which are expected to show a larger decrease in employees and office space than the other sectors.

All in all, there are big differences between companies' demand for office space. Within the four groups, the differences are still very big. Further, most office space is in use by companies with less than 250 employees. For these smaller companies the hidden vacancy rates are smaller or even negative.

6.1.2 New way of working

The second sub question answered in this chapter is: How do new ways of working influence the demand for office space?

New technologies make it possible to adjust alternative working strategies according to interviews and theory. Employees increasingly work more outside their office and outside working hours compared to a couple of years ago (Appendix E, Jochems, 2010). Cost reductions and consolidation of offices are also important reasons why companies reduce the total lettable floor area per full-time equivalent. Table 48 shows that in all size categories the total office space per employee is decreasing. In total, a reduction of 16 per cent of office space per full-time equivalent is demonstrated. If the total number of FTE did not change the hidden vacancy would be even higher. Eventually companies are more willing to apply alternative working strategies to decrease the office space per employee.

Categories	Differences supply-demand		
Employees	**LFA**	**FTE**	**LFA/FTE**
20 till 50	-3%	10%	-12%
50-250	4%	19%	-12%
250-1000	-15%	5%	-18%
1000+	-33%	-9%	-27%
Total	-10.9%	5.5%	-16%

Table 48: Total hidden vacancy * (CBS, 2012)

This conclusion is also supported by theory and interviews. Still, some people hold different views. Yahoo's CEO Marissa Mayer for example decided that the employees who work at home will have to return to the office (Spijkerman, 2013). However, this is a company where some employees work at home 4 days a week which is not comparable with the total Dutch office market.

Theory, the survey and the interviews show that employees and employers' demand for office space is changing as the tendency to work from several locations, new technologies and sharing workplaces clearly demonstrates. Meeting places are becoming more important. Concepts like Spaces and Seats2meet will grow with this new demand.

The main cause for hidden vacancy in the office market are these new ways of working. The results of the survey clearly show a trend towards more efficient use of office space but it is not a rapid development. The interview analyses show that new ways of working are often depend on top-down decision making. The fact that the public sector is gradually using office space more efficiently (Rijksoverheid, 2011) shows that even more conservative companies will apply the new ways of working although this development is mainly a big company affair. New ways of working have already been developing for a long time, primarily among consultancy companies with large numbers of consultants being on the road for most of their time. Over the next five years it is expected that new ways of working will spread to all sorts of companies.

6.1.3 (Hidden) vacancy

In this paragraph the hidden vacancy of the total office market will be formulated in an attempt to explain the question of the quantitative mismatch between the current office demand and the current office supply

As is shown in the first research question, the office market has different office users with different demands. Especially the office size significantly influences the total hidden office vacancy. The more employees and the larger the company, the larger the hidden vacancy.

The total hidden vacancy is calculated to 10.9 per cent (Table 49). This figure is not valid as the sample does not represent the total office market. The hidden vacancy in the Dutch office market is between 6 and 16 per cent.

Categories	Sample	Current office stock				Differences supply-demand	
Employees	**Freq**	**Freq***	**Total LFA**	**Total FTE**	**LFA/FTE**	**LFA bandwidth 1**	**LFA bandwidth 2**
Total	100%	100%	48,800,000	2,300,000	21.0	-6%	-16%

Table 49: Total hidden vacancy * (CBS, 2012)

6.1.4 Influences on the future supply

This paragraph deals with the final two subquestions.

Which alternative ways are there to respond to changes in office demand?

Hidden vacancy can be prevented by subleasing and moving office. 18 per cent of the office users in the survey sample sublease with an average of 1000 square meters. Especially larger companies with an average of 1900 employees make use of subleasing. Analyses of the interviews show that subleasing is not rare in larger companies with easily partitioned units. In newly built buildings shared cells often stimulate flexible and multi-tenant use. Internal subleasing provides an alternative approach to a changing demand especially suitable for the increasing number of self employed professionals.

Moving office is another option to deal with superfluous office space. 38.2 per cent of the office users in the sample declare they would prefer to go to a new building if the leasing contract ended straight away or if they could sell the building (N=102). Larger companies prefer to stay in their building more often than smaller companies at the end of their lease contract. This could be caused by the fact that smaller companies are more flexible movers. The interview analyses show that the decision to sell, sublease or move is also partly price sensitive. The rents are going down which may stimulate moving. Also a trend towards the consolidation of large companies is shown. There is a movement from small distant offices towards big accessible and flexible offices.

Which restrictions and influences determine the steps towards a new office supply?

Facility management, location restriction and leasing contracts can delay the steps towards a new supply that corresponds with the new demand for office space. 9 per cent of the companies in the sample have been in a moving process in the past five years and decided to

stay. The interview analysis also indicates restrictions and encouragement towards a new supply. Firstly, the company can have a location restriction related to its core business. Secondly the history of the company can determine the choice to stay in a particular location. Lastly, some employees live near the office which makes it undesirable for them to move. Other restrictions are determined by contracts and rent. Although shorter contract durations are demanded, the average contract lasts 5,5 years, and lower rent rates may increase the demand for space. Facility and change management are becoming important departments in companies. Without well organized housing management it is difficult to improve the match between the demand and supply of the office user.
Another remarkable result from the interview analyses is that sustainability has no or minimal impact on the accommodation strategy of office companies while the opposite was expected.

6.1.5 Opportunities and threats of the hidden vacancy

The answers to the sub questions pave the road for an answer to the main research question of the opportunities and threats of hidden vacancy for the office market in the Netherlands.

The results of this research do provide much insight into the opportunities of hidden vacancy for the office market. Still, there are opportunities for users in the office markets as the recommendations will show.

The biggest threat of hidden vacancy is a higher vacancy rate. At the moment, there is already a big oversupply of office space in the Netherlands. If hidden vacancy is going to be exposed by ending leasing contracts, the registered vacancy will increase. This will affect rent rates and investment in office space, which are already under pressure.

With the information about hidden vacancy in the office market it is possible to make assumptions about the total office vacancy in the Dutch office market in the next few years. Firstly, it is important to know when the leasing contracts will end. 80 per cent of the respondents in the research indicate their contracts will end before 2019 (Appendix G). So 80 per cent of hidden vacancy can be changed into vacancy. However, some companies are location restricted or building restricted. An assumption is made that 75% of the respondents will avert their hidden vacancy by the end of their contracts.

Apart from this, according to DO research, the total of newly built office space will comprise around 400,000 square meters in 2013 (DO, 2013). For the period of 2014 till 2017 the same amount of newly built office space is predicted. Bak data were used for the removal statistics (Bak, 2012). In 2010, the removal was 244,000 square meters. The total rate of removal is expected to increase to 300,000 square meters a year considering government initiatives.

Vacancy 2018			
Office stock 2012*	sqm	49,000,000	
Vacancy 2012*	%	14.60%	
Vacancy 2012	sqm	7,154,000	
In use 2012	sqm	41,846,000	
		Bandwidth-1	Bandwidth-2

Bandwidth hidden vacancy ^	%	6.0%	16.0%
Bandwidth hidden vacancy	sqm	2,510,760	6,695,360
End of contract before 2019^	%	80%	
Other restrictions	%	75%	
		per year	2013-2017
Removal 2013-2017**	sqm	-300,000	-1,500,000
New buildings 2013-2017***	sqm	400,000	2,000,000
Total		200,000	500,000
Growth office stock 2017	%	101%	
Office stock 2018	sqm	49,500,000	
		Bandwidth-1	Bandwidth-2
Growth of vacancy till 2018	%	128%	163%
Total vacancy 2018	sqm	9,200,000	11,700,000
Total vacancy 2018	%	19%	24%

*Table 50: Calculation vacancy 2018 *(DTZ, 2013) **(Bak,2012) ***(Do,2013) ^survey results*

Table 50 shows the calculation for the total of vacant office space in 2018. According to this table current office vacancy will increase from between 28 and 63 per cent to a vacancy rate of between 19 and 24 per cent in 2018.

In Figure 75 the expected vacancy rate is shown for the period between 2013 and 2018. Data from the survey are used to determine when hidden vacancy will be transformed into vacancy.
If the new ways of working and globalization increase between now and 2018 this vacancy rate will be even higher. The vacancy rate will probably decrease from 2018 onwards. But this is only possible if the number of removals exceeds the newly built offices and if the future demand is higher or the same as the future supply.

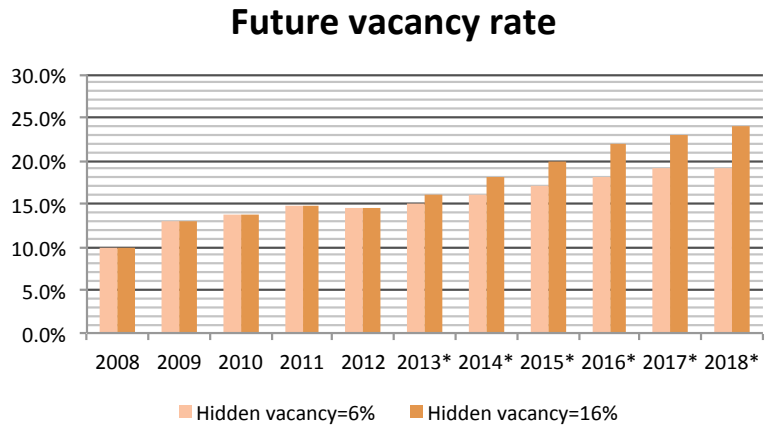


*Figure 75: Expected future vacancy rate (for 2008-2012 (Bak, 2012)) *expectation*

6.2 RECOMMENDATION FOR THE OFFICE MARKET

In addition to the threats of the hidden vacancy there are also opportunities available. If the office market can manage to minimize the registered vacancy rate, it can act on the new demand for alternative working strategies and for flexible office space. A large part of the office stock is outdated. The actors who act on the new demand will have a lot of openings.

Recommendation for the office market

The vacancy rate in the office market in the Netherlands will increase. This may even increase to 24 per cent on the basis of the calculations. To prevent the increasing vacancy the total extraction of office space should be at least 800,000 square meters each year. Assumption for this number is that the hidden vacancy is 6 per cent and the office market adds 400,000 new office square meters each year. The extraction of office space was 244,000 square meter in 2010 (Bak, 2012). This development had no significant on the impact of the office market.

Recommendations for the owner

When the owner is not the user of the building he must make the office and its facilities distinctive. The chance that a company will move is smaller when the employees, the board and the clients are satisfied about the building, its facilities and the environment. By facilitating the office user in his/her demands hidden vacancy will come less. In this, good quality is essential. It is recommended to change single-tenant buildings into flexible multi-tenant buildings with shared services. Another recommendation can be to facilitate the user with the opportunity of subleasing. This will also minimise the risks that the user will move or shrink in square meters. Finally it is recommended to make the hidden vacancy visible with the aid of a close relationship to the user by understanding his/her demands. In this way big surprises are avoided.

Recommendations for the real estate advisor

A lot of companies want to switch to alternative work strategies. This is a long term process and requires specific knowledge. Especially smaller companies do not have housing managers that can lead this process. Also the demand for subleases grows. These developments are opportunities for real estate advisors.
Furthermore it is recommended to the brokers to lease or sell large offices to multiple tenants and to research the possibilities of flexible leases.

Recommendations for the user

The office user is recommended to centralise the oversupply of space. In this way subleases are possible. Because of the growing group self-employers it is also possible to sublease a desk. If the company is not location or contract restricted, this could be the moment to negotiate about a new building, location or contract. Flexible contracts and buildings are recommended.
Finally facility management plays an important role in the organization. It is recommended to invest in knowledge on housing management. Especially when a new generation comes with a demand for location- and time independent way of working.

6.3 REFLECTION OF THE STUDY

6.3.1 Reflection

In this paragraph results are reflected and discussed. The research design is elaborated more in-depth in chapter 3.

Reflection of the survey analyses

Variables

Some variables turned out to be not useful. Examples are the questions on contract duration and the occupation rate. The way questions were formulated made it possible to answer them in different ways. Therefore some variables are not processed. For instance questions on the number of workplaces and the number of employees in the past and demanded in the future are not elaborated.

Respondents

The survey consisted of 102 respondents in correspondence with the minimum pre-conceived number of 100. Because of the division in size and sector some critical reflections can be made on the data. The division in sectors does not show significant differences. Only the insurance & financial companies and the public sector are in some results significantly different than the rest. The differences in the means however are large. Some sectors like the sectors public and communication & automation do not have enough respondents (only five respondents each). It is hard to make statements about the total office market in these sectors with these numbers as a starting-point.

Also the percentage of respondents in the category of organizations with more than 250 employees is much more represented in the research sample with 44 per cent than it is in the total office market (with just 9 per cent).

75.7 per cent of the respondents are within the target group, director or facility manager. 4.9 per cent of the respondents are administrative or supportive.

Reflection of interview analyses

Variables

The variables were formulated in an early stage of the research. The variables map the housing management of the company. However still some variables are missing. The questions are most of the time focused on the current demand, the future demand is not explicit shown in the interview setup. This information could have resulted in more interesting data.

Respondents

In total 13 interviews were recorded of which 7 with an in-depth setup. This number is not enough to make statements about the total office market. However, they give an impression of issues and trends that are current in the office market.

Reflection on the statements concerning the total office market

In the calculation of the hidden vacancy a number of variables is assumed that are under discussion. For example, such a variable is the year in which the contract ends. The data of the survey are used to get an idea at what point in time the hidden vacancy will be transformed into registered vacancy. However, it is not certain whether the data represent the total office market. Also, the assumption is made that 75 per cent of the organizations will avert the hidden vacancy at the end of their leasing contract. Companies that own the office are less flexible to avert their oversupply. They have possibilities for subleasing and selling.

Reflection of the research process

There were some problems concerning the subject choice at the start of the research. The search for an actual and interesting topic was hard. Also, the choice of a mentor also revealed to be important. Discussions with various people and article research lead to the study topic hidden vacancy. Both the theory and the first interviews were useful for structuring the vague term hidden vacancy into a concrete research subject.

The choice for a mix of a quantitative and qualitative study was a good one. On one hand it was possible to make the survey very quantitative. On the other hand the first unstructured interviews were a good preparation for the set-up of the survey. Finally the results of the survey were directly evaluated in the in-depth interviews.

Reaching the predefined number of respondents was more difficult than expected. The survey proofed to be too long and it took a lot of energy of the respondents to complete it. This made it hard to reach the predetermined number of 100 respondents. In forehand, there was a high expectation of setting out the survey by CoreNet and Facility Management Nederland since together these organizations have 1200 members. Unfortunately, there was too little response. With the help of linked-in contacts, family, friends and social media the total respondent number at last reached the number of 100 respondents.

6.3.2 Recommendations for further research

Recommendation for researchers

Because of the length and the difficulty of the survey it was very hard to collect at least 100 respondents. The response rate via e-mail was very low. Respondents are “tired” of filling out digital surveys. It is recommended to start in an early stage with collecting a network with people that can act as ambassadors for the study. In this way, people are more motivated to filled out the survey. Especially this would take a lot of time.
Furthermore for research about the office market it is recommended to take also the smaller offices into account as they represent most of the office space in the Netherlands.

Recommendation for further study

There are some recommendations for further study:

The influence of costs reduction on applying the new way of working.

It seems that cost reduction is the main reason to implement the new way of working. Is this assumption true? This study asks the tenant nothing about the influence of the height of

rents and moving costs on the their office demand. It would be interesting if further investigation could be done.

The trend towards flexibility of contracts and the elaboration.

The flexibility of contracts is a little bit treated in this report. It could be interesting to elaborate more in-depth in what way flexible contracts can work and how these are used in practice. The risk for investors is lower if it turns out to be true that companies with short and flexible contracts eventually lease for a longer or equal period than they would have done with a long-term lease.

The role of third workplaces in the future

Because the new way of working becomes more common, third workplaces might become more and more popular. What is their role now and in the future?

7 Literature

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