

# Size and Nature of the Auckland Private Rented Sector – Implications for the Spread of Housing Options

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## Abstract

Housing scarcity and unaffordability in recent years has been a major concern in New Zealand's major cities, especially in Auckland. The need to accommodate New Zealand's growing population is a concern that is central to government housing policy, with attention having recently been focused on the capacity of the private rental sector to meet a range of housing needs. The objective of this research was to investigate the size and nature of the private rental housing sector in the Auckland region and to examine how the sector contributes to the spread of housing options in the region. Through the analysis of the existing data from five consecutive censuses, the research findings present a detailed analysis of the Auckland private rented sector, with a particular emphasis on the types of household it accommodates, their location within the region and the main housing typologies. These findings will assist various organisations and public authorities to establish priorities in their housing strategies in a way that best meets the demands of the current market, and also to clarify issues around the efficacy of existing policies relating to private renting.

**Keywords:** Housing, Private Rented Sector, New Zealand, Auckland

## 1. Introduction

Private renting is gradually becoming a reality as home ownership is increasingly difficult to attain in several major cities in New Zealand. The decision to own or rent a home is undoubtedly crucial for every household around the world including New Zealand. In recent years, New Zealand has experienced a substantial increase in the number of migrants in Auckland, which has subsequently led to a housing shortage and drastic increase in house prices, causing further housing pressure for low to medium income households. Many people will have some experience of renting privately during the course of their lives. Private renting offers a multitude of roles in housing biographies across the whole social spectrum, serving as a first port of call for new households, a 'bolt-hole' when housing circumstances change, a stopping-off point as people change jobs and move house, and for many households a long-term home.

The need to accommodate New Zealand's growing population is a concern that is central to government housing policy, with attention having recently been focused on the capacity of the private rental sector to meet a range of housing needs. The Productivity Commission (2012) considers it desirable for the housing market to maximise the options available for quality housing for everyone, regardless of income or tenure choice. As in other countries, disparities exist in the housing market in New Zealand. Sixty-four percent of low and middle income households in New Zealand reside in private rental homes and are likely to suffer from the effects of poor quality housing and unprofessional landlords (New Zealand Institute of Economic Research (NZIER ) 2014). Increasing population and projected growth in the private rental sector is a trend in a number of western countries and is a likely feature in New Zealand's property market. An understanding of the size and nature of the private rental sector is necessary in order to gain an understanding of housing typologies that need to be built, and the changes required to existing dwellings to accommodate these households. Moreover, it is important to understand the New Zealand private rental sector's capacity in order to determine how the sector's growth could be tailored to accommodate the country's rapidly growing urban population, particularly low and middle income households and specifically in Auckland. The key objective of this research is to examine the size and nature of the private rental sector, and the contribution it makes to the spread of housing options. The findings from this research will provide a reflection of Auckland's private rented sector, which is necessary to assist various organisations and public authorities to devise housing strategies and to re-establish their priorities according to the increasing population and housing demand.

## **2. Literature Review**

Housing affordability in New Zealand, particularly in Auckland, has been a topic of growing concern for policy-makers and researchers. There has been debate around: the causes of rapidly rising house prices; the increasing disconnect between income levels, rent increases and house prices; and the degree to which affordability is actually a significant problem. Bassett and Malpass (2013) attribute declining housing affordability to a range of factors, including changes in household size and composition, increased building costs, shifting government rules and local government regulations. The Productivity Commission (2012) in their *Housing Affordability Enquiry* noted a range of potential factors contributing to rising house prices ‘such as land supply restrictions, the problems with achieving scale in new house construction and inefficiencies, costs, and delays in regulatory processes’. They also highlighted concern around affordability for renters, although rents have not increased at the same rate as house prices, and noted ‘that the current approach to social housing in New Zealand will not provide sufficient support for those in need’. Auckland is not alone among large cities worldwide in experiencing affordability problems, as similar trends are available in the USA, where with high amenities, growing populations and physical constraints they have also experienced high rates of housing price growth (Cowan, Burrough et al. 2014). The private rental sector is growing in proportion to the decline of home ownership and the low base of state housing, so increasing numbers of people now rely on rental accommodation. Private rented accommodation as a tenure has long been associated with affordability, due to the sector’s perception of alternative housing for people who cannot afford owner-occupied homes (Bramley 2012). According to Rugg and Rhodes (2008), policy interventions that will change the private rented sector’s perception as a housing option that sits behind the preferred tenures of owner-occupation and social renting are important. The private rented sector has the capacity to deliver new and affordable property supply, if backed up with adequate planning and policy interventions (Rugg and Rhodes 2008).

## **3. The Private Rented Sector: A New Zealand Perspective**

New Zealand’s rental market is comprised of the private rented market, social housing and mixed rental housing. In the private market, the landlord is a private person and tenants pay market rent with no government assistance. Also the quality of homes may be actively managed (and achieve a very high standard, e.g. new apartments built to code) or not managed at all (with the resultant range of quality down to the very poorest accommodation options). In the social housing sector, the landlord is the local government and tenants are recognised as vulnerable and are supported by a range of government agencies – the house quality is managed by landlord asset management. In the mixed rental category, the landlord is a private person and the tenants pay market rent but

receive government accommodation assistance or support to supplement rent. Rental housing markets vary across the country, with Auckland under considerable pressure. The percentage of households renting privately in Auckland has increased, while the percentage renting from social housing or a local authority has reduced significantly. 76.9% of households in Auckland rented privately and 19.0% rented from the local authority. Elsewhere in New Zealand the trend is the same, with those renting privately making up 84.9% of renting households in 2013, compared with 79.0% in 2001 (Statistics New Zealand 2013).

The rental housing market is impacted by challenges faced by the housing market: affordability and supply. Generally, New Zealand has seen a significant decline in housing affordability as real house prices are accelerating faster than income. This decline in affordability make it harder for the renters who were hoping to rent only for a short time while saving to buy a home (Cowan, Burrough et al. 2014). Some parts of New Zealand have a shortage of homes as new house construction is below demand from population growth, household size change and migration (Cowan, Burrough et al. 2014). Demand for new housing is estimated to rise by more than 20,000 households per year and most of that growth is predicted for the Auckland region. An NZIER (2014) public discussion paper notes New Zealand has restrictive rental conditions when compared internationally. Tenure arrangements such as typical lease term, notice period for landlord, reasons a lease can be terminated, pet ownership and minor alterations (putting up pictures, painting, laying carpet) are more restrictive than in other countries such as Germany, France, The Netherlands and the UK. Such restrictive rental conditions makes rental housing a poor substitute for home ownership (NZIER, 2014). The insecurity of tenure is a clear barrier for tenants who might want to improve the condition of their rental home; it undermines renters approaching landlords to ask for repairs and maintenance, let alone performance upgrades (e.g. extractor fans, insulation) (Cowan, Burrough et al. 2014).

The private rental market might need to make significant adjustments in order to contribute to the demand growth in the face of not only reduced home ownership propensities, but also reduced government involvement in the provision of social housing. Also, the emergence of ever-increasing housing prices focused on the major cities such as Auckland and Christchurch, while some research by the Centre for Housing Research and Statistics New Zealand provides a valuable overview of the rental housing sector, but none of them are designed to offer the freedom of accessing specific information tailored to the private rented sector. An understanding of the current status of the private rented sector in terms of its size and nature is important to reveal multiple ways to approach the housing issues from several directions and provide relief for the overheated market.

## **4. Research Method**

A quantitative research method was adopted in this study. Pre-existing data from New Zealand's last five censuses conducted between the period of 1991 and 2013 sourced from Statistics New Zealand was used in this study. The data was analysed using a filtering and clustering analysis method. It involved filtering out irrelevant data and the division of the collected data into similar household groups. While there were other methods of analysis suited for investigating pre-gathered data, the chosen method was renowned for providing statistically valid results (Pearce 2013). To ensure result accuracy, only the total number of households who have stated their type of tenure was used as a basis of calculating the percentage of the group in each table. The households who have not stated their tenure have been excluded. The problem was that difficulty in data collection from apartment dwellers, which is known as 'no sign of life', negatively, affected the quality of the census data in 2006 and 2013.

## **5. Results: Size and Nature of Auckland Private Rented Sector**

This paper reports a part of the findings of an on-going research study at Massey University undertaken to determine the composition of the private rented sector and its implications for the spread of housing options in Auckland. This section provides answers to the research question posed in this study, through the analysis of existing data obtained from New Zealand's last five censuses available via Statistics New Zealand. Tables and charts are created and simplified where necessary to make the data easy to understand.

### **5.1 Tenure trends in the private rented sector across New Zealand**

The private rented sector is currently thriving in New Zealand. The research results showed that between 1991 and 2013 the total number of renting households across the country steadily increased at an average increase rate of 0.4% per annum to reach approximately one-third of the total number of households in New Zealand. The percentage of renting households across the country steadily increased over the 22-year period, with a tendency towards the continual growth of the private rented sector. The changing size of the private rented sector over the last two decades compared to households not renting (owner-occupied and social housing) is illustrated in

Figure 1. This continual increase in the growth of the private rented sector may be attributed to several factors that include shortage of housing supply and increasing unaffordability. Moreover, households may choose to rent because renting offers flexibility and it provides access to housing and locational services that would be costly. While for some renting is the tenure of choice, for many it may reflect an inability to access home ownership.

Figure 1. Percentage increase and proportion of total households who rent vs do not rent in New Zealand between 1991 and 2013



## 5.2 Regional distribution of renting households

There are considerable regional variations in both the size of the private rented sector and the extent of growth experienced across the regions in New Zealand. The renting population was the highest in Auckland out of all the regions of New Zealand (10.6%), followed by the Canterbury and Wellington regions (3.7%), and Waikato (3.1%), and the rest of the regions have an evenly distributed number of households (see Table 1 below). Auckland's significance at a national scale is illustrated by comparing its number of renting households with other major cities, indicating that approximately one-third of all renters in the country are located in this region.

Table 1. Distribution of renting households around New Zealand's major cities

Area	2013
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	Distribution of renting households		
	% against total number of all households nationwide	% against total number of renting households nationwide	Numbers
Otago	1.4%	4.6%	20,877
Manawatu-Wanganui	1.7%	5.4%	24,624
Bay of Plenty	2.0%	6.5%	29,280
Waikato	3.1%	9.8%	44,589
Wellington	3.7%	11.9%	53,931
Canterbury	3.7%	11.9%	54,084
<u>Auckland</u>	<b>10.6%</b>	<b>34.1%</b>	<b>154,347</b>
Others	4.9%	15.8%	71,403
Total households renting	31.2%	100.0%	453,135
Source: Statistics New Zealand (2015)			

The regional differences in the private rented sector across New Zealand could be related to the strength of the economy and the wider housing market in Auckland (Scanlon and Kochan 2011). In areas of relatively high economic performance such as Auckland, Wellington and Waikato, growth in the sector has been driven by high house prices, migration, housing supply shortages and high demand, and a relatively high proportion of mobile workers and students. Canterbury economic growth, however, could be attributed to the extent of post-construction activities and job opportunities, as well as the resettling of affected communities after the earthquake swarms in the region since 2010. By contrast, in areas of lower economic performance, growth is more often driven by a lack of supply of (and therefore access to) social housing. Besides, the number of households who rent in Auckland rose from 32% to 35% between 2006 and 2013, with no rise between 2001 and 2006 (see Table 2). This explains the beginning of an era of skyrocketing housing prices and the imbalance of housing supply and demand in Auckland, coupled with migration.

*Table 2. Number of households renting in Auckland vs total number of households in Auckland*

Area	Auckland region		
	2001	2006	2013
Tenure of household			
Households who rent	116,694	130,230	154,347
Total households stated	367,395	403,455	437,649
% of households who rent	32%	32%	35%

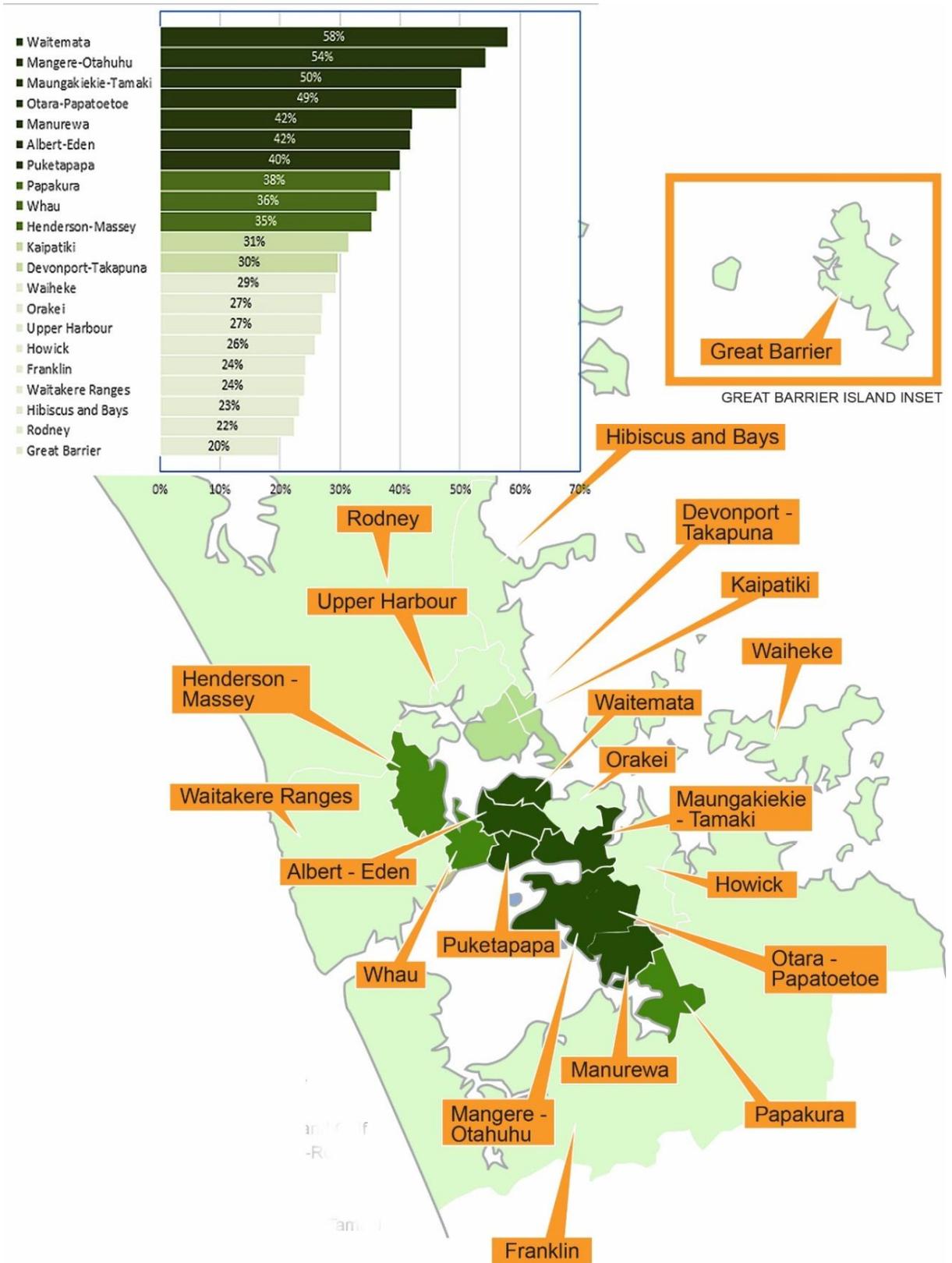
### **5.3 Households who rent**

All 21 local board areas (LBAs) within Auckland, other than Orakei, experienced an increase up to 8.0% in the proportion of renting households between 2001 and 2013. Waitemata and Mangere-Otahuhu LBAs had slightly more numbers of renting households than the households who owned their houses in 2013 and experienced the most rapid growth (6.3%) between 2006 and 2013, along with the Otara-Papatoetoe LBA (5.7%). As illustrated on the distribution map in Figure 2, most of the renting households were located close to housing, work and locational services. Furthermore, households who rented their home were most likely to be one-family households (63.3%) or one-person households (23.5%). These are households that contain a one family nucleus, which can be a couple, a couple with children, or one parent with children. Other people who do not form a family, and who can be related or unrelated to the family, may also be present in the household. One-person households were the second most common, making up 18.4% of renting households in Auckland, while other multi-person households (such as unrelated people flatting together) made up 9.3% of households who rented their home. Most households who rented were doing so from the private rented sector (83.7%), an increase from 81.8% in 2006 and 78.4% in 2001.

### **5.4 Predominant Rental House Typology**

In general, rental housing tended to have fewer bedrooms than housing that was owner-occupied homes. Of households who rented, 29.0% were in a two-bedroom home, compared with 13.8% of households who owned their home or held it in a family trust. Households who rented their home were less likely to be in a four-bedroom home (at 13.4%) than households who owned their home (28%). As illustrated in Table 3, most renting households consist of three-bedroom and two-bedroom dwellings. This is not much different when compared with the national and total Auckland average. In contrast, relatively high numbers of one-bedroom dwellings (41.0%) are located in the Waitemata area where the Auckland's CBD is located.

Figure 2. Percentage of renting households in each LBA in 2013



*Table 3. Renting households by number of bedrooms in Auckland LBAs in 2013*

Number of bedrooms	One bedroom		Two bedrooms		Three bedrooms		Four bedrooms		Five or more bedrooms		Total households stated
	No.	%	No.	%	No.	%	No.	%	No.	%	
Area	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Total New Zealand	54717	13	126171	29	176994	41	58452	13	17895	4	434229
Total Auckland	21168	14	45273	31	55029	37	19362	13	6537	4	147372
Rodney	477	12	1089	27	1548	38	684	17	258	6	4059
Hibiscus and Bays	729	10	1905	27	2859	40	1233	17	372	5	7092
Upper Harbour	453	11	996	23	1506	35	960	22	381	9	4296
Kaipatiki	840	10	2382	29	3603	44	984	12	357	4	8166
Devonport-Takapuna	726	13	2157	38	1899	34	657	12	189	3	5631
Henderson-Massey	708	7	2316	22	5607	53	1593	15	450	4	10671
Waitakere Ranges	492	14	849	24	1626	45	480	13	135	4	3579
Waiheke	189	20	348	36	330	34	81	8	21	2	963
Waitemata	6750	41	6306	38	2280	14	738	5	312	2	16386
Whau	1086	14	2154	28	3243	43	828	11	267	4	7575
Albert-Eden	2493	21	4938	41	2979	25	1182	10	504	4	12096
Puketapapa	690	12	1824	31	2268	39	792	14	279	5	5853
Orakei	1056	15	2688	37	2196	30	999	14	330	5	7269
Maungakiekie-Tamaki	1185	12	4317	42	3633	36	858	8	240	2	10230
Howick	711	7	2481	25	3972	40	2100	21	609	6	9873
Mangere-Otahuhu	687	9	2025	27	2985	40	1239	17	558	7	7494
Otara-Papatoetoe	708	9	2640	33	3519	44	840	10	357	4	8064
Manurewa	369	5	1554	20	4341	55	1230	15	450	6	7947
Papakura	312	6	1191	24	2382	48	858	17	219	4	4962
Franklin	489	10	1095	21	2238	44	1026	20	249	5	5094
Great Barrier	24	32	27	36	21	28	6	8	..		75

## 6. Discussion of Research Results

The private rented sector is currently increasing in absolute size and in terms of the proportion of households it accommodates. Attention has become focused on the capacity of the sector to meet a range of housing needs due to the unaffordability of owner-occupied homes and increasing demand for housing. The private rented sector currently accommodates approximately one-third of Auckland's households, with a projected increase to 42.3% by 2030. Moreover, the number of total rents based on private arrangements is expected to increase because of the government's recent attempt to reform the way state housing is managed, and it is highly likely that the volume

of the private rented sector will remain strong for more years to come, if not increase. Most of the households who are renting outside of the Auckland suburbs tend to live in three-bedroom multi-storey dwellings, whereas households in the CBD were mostly living in one-bedroom unit dwellings. Household types and predominant housing typology location identified through the analysis provided a good indication of where the government and investors can prioritise in their development planning.

The need to accommodate an increasing population in New Zealand is a concern to the government, and attention has been focused on the growth of the private rented sector capacity to help this. However, a lack of framework for providing new housing to the private rented sector may serve as a deterrent to the growth of sector. There is a need for planning regulations with specific targets and objectives that would actively require a certain amount of properties to be let on the rental market in order to meet the predicted demand for housing. For instance, the emergence of younger mobile households and their inability to buy or own homes increases the demand for the spread of universal regulation in the private rented sector across the country. It is possible that where the private rented sector is generating new property, it tends to be in sub-markets where a high-density build is appropriate. The lack of government interference or regulation in housing rental contracts in the private sector is seen by many as challenge that limits the rental market's potential to provide renters with multi-year or even permanent tenancy. When compared to the tenancy contracts of other countries, such as Germany, France, the USA and The Netherlands, New Zealand is one of the most restrictive rental jurisdictions in terms of making minor home alterations, owning pets, termination of lease etc (Gibson 2014). Although the regional-specific correlation between sufficient housing supply and the change in the numbers for rental housing and house ownership is not known, it is certain that enough housing supply will positively contribute to overcoming the current inequality spread in the market. There is a need to identify and map the private rented sector niche markets in order to understand how the market can be defined in terms of demand and supply characteristics, distinctive rental practices, and in some cases specific types of policy interventions that shape the way the market operates.

## **7. Conclusion**

The primary aim of this research was to investigate the structure and size of the Auckland private rented sector and its implications for the spread of housing options. The research results identified the different household types residing in Auckland's private rented sector, their location and predominant building typologies. These results indicated that the growth in the proportion of renting households, coupled with the rapid increase in the cost of rent, signified that housing

ownership in Auckland will become more challenging unless sufficient housing supply comes into action. Regardless of how significant the proportion of renting households becomes, it is crucial that more government intervention or regulatory requirements take place in order to provide sufficient housing options. An example can be creating mandatory minimum requirements for tenancy agreements in order to make renting a more ideal housing option for households.

It is important to note that while the chosen data collection method was best suited for the research topic, the range of data available from Statistics New Zealand and other organisations was not sufficient to carry out the in-depth research that was initially sought. Such a lack of information not only prevented identification of the target population's behaviour over a longer period, but it also discovered what their actual needs might be in terms of getting desirable housing. The availability of detailed information on the target provide opportunity to clarify the issues around the efficacy of existing policy relating to private renting, and the need for further intervention.

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# Payment discipline of public construction clients

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## Abstract

Public sector's payment discipline is said to have a significant impact on the private sector. German construction federations regularly run a comparison of payment practices between public construction clients and private clients amongst their members. The results of this investigation concerning the payment discipline of public construction clients often lead to criticism. Thus the present research project was started to examine independently and representatively the payment discipline of public construction clients. A survey provided the necessary empirical data. Using a standardized questionnaire based on both literature review and expert knowledge, more than 100 public construction clients were interviewed and their answers statistically evaluated. The project results can be summarized in the following categories: Description of payment transactions (partial and final invoices), causes of delayed payments (with different causes found on both sides) and first solution approaches. In conclusion, results show that payment discipline of public construction clients is better than it is said, but still has potential to be optimized.

**Keywords:** public sector, payment discipline, delay, survey, Germany

# 1. Introduction

The decline in construction volume in Germany since 1995 (minus 17%, minus €45 billion) led to the consolidation of the construction industry; especially in the field of public procurement (minus 28%, minus €10 billion) a continuously declining trend can be observed until today; all other areas (residential, commercial, etc.) show a constant level since the turn of the millennium (Statistisches Bundesamt 2012). In addition, reputation of the public construction clients has suffered on the timely payment of construction services provided (BWI-Bau 2008). In Germany, the payment periods for partial and final invoices are defined in the VOB Part B §16 (DIN 2010). Delays in the payment of already delivered goods and services usually cause additional costs in the form of interest, and these costs are to be reimbursed by those causing the delay. As a result, public sector's payment discipline has a significant impact on the private sector, as Checherita-Westphal et al. (2016) and Flynn et al. (2014) point out.

Surveys carried out by a private construction federation amongst its members (BWI-Bau 2008) are inherently a subjective representation of the situation. In order to understand the real extent and the causes of delays in payment by public construction clients, an independent and representative survey was necessary.

The research project was to investigate the allegations on the part of private construction federations with respect to the payment behavior of public construction clients. This included the identification of payment transactions with non-adherence to the agreed deadlines, finding the cause of the delays in payment and – in the end – the development of solutions or "remedies".

## 2. Research method

A questionnaire was developed based on literature review and in cooperation with experts using guided workshops. In addition to the reasons for delays in payments, the questionnaire also asked for recommendations on how these delays can be reduced in the future.

Parallel to the preparation of questionnaires, contacts for the interviews were randomly selected out of the population, in our case the public construction clients in Germany. The conduction of the survey followed a uniform pattern: the interviewees received a web link for the online-questionnaire and were additionally introduced to the questionnaire by telephone.

The analysis of the survey results was carried out by electronic means. After the quantification of the payment delay, influence factors responsible for the delay were identified by comparing the average and median values (descriptive statistics). And in the end, first solutions to improve the current situation have been compiled.

### 3. Data

#### 3.1 Population and selection of sample

The objective of the research project was to investigate the payment behavior of public construction clients on a representative basis and on all administrative levels. Consequently, the population of the survey were the public construction clients of Germany. The representativeness of the sample was ensured by a nonspecific and random selection of the sample.

*Table 1: Comparison of population and sample: federal states*

	Population		Sample		Deviation
	Quantity	Portion	Quantity	Portion	
01 Schleswig-Holstein	1,299	8%	36	8%	0%
02 Hamburg	4	0%	-	0%	0%
03 Lower Saxony	1,520	9%	42	9%	0%
04 Bremen	7	0%	-	0%	0%
05 Northrhine-Westphalia	850	5%	28	6%	1%
06 Hesse	890	5%	24	5%	0%
07 Rhineland Palatinate	2,556	16%	76	17%	1%
08 Baden-Württemberg	1,626	10%	55	12%	2%
09 Bavaria	3,629	22%	91	20%	-2%
10 Saarland	111	1%	-	0%	-1%
11 Berlin	4	0%	-	0%	0%
12 Brandenburg	638	4%	13	3%	-1%
13 Mecklenburg Western Pomerania	909	6%	25	6%	0%
14 Saxony	772	5%	26	6%	1%
15 Saxony-Anhalt	362	2%	8	2%	0%
16 Thuringia	1,132	7%	26	6%	-1%
TOTAL	16,309	100%	450	100%	0%

*Table 2: Comparison of population and sample: administrative levels*

	Population		Sample		Deviation
	Quantity	Portion	Quantity	Portion	
Federal state	16	0.1%	0	0.0%	-0.1%
Region	29	0.2%	0	0.0%	-0.2%
„Region“ (only in Baden-Württemberg)	12	0.1%	0	0.0%	-0.1%
District	402	2.5%	4	0.9%	-1.6%
Associated communities	4,581	28.1%	127	28.2%	0.1%
Community	11,269	69.1%	319	70.9%	1.8%
TOTAL	16,309	100%	450	100%	0.0%

### 3.2 Description of data base

#### 3.2.1 Public construction clients

The data base was obtained by surveys. 450 people (the sample) were contacted by letter and by phone, which led to a return of N = 103 or a return rate of about 23%. The survey results show predominantly "communal projects (city, less than 100,000 people)" as public construction clients (see Figure 1); this reflects the population.

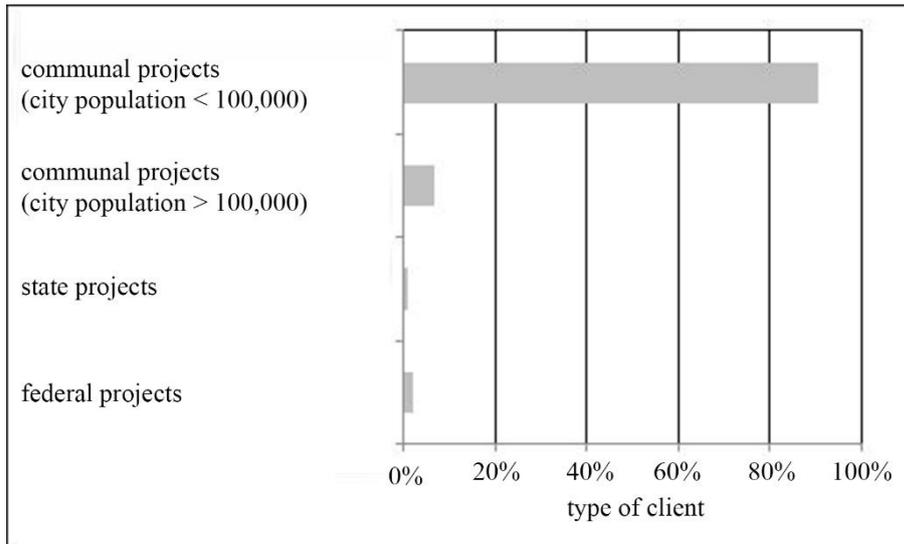


Figure 1: public construction clients per administrative level (N = 104, multiple answers possible)

Another characteristic of the sample was the question of the "specialized auditor". At only about 30% of the responding public construction clients, inspection took place by internal accounting.

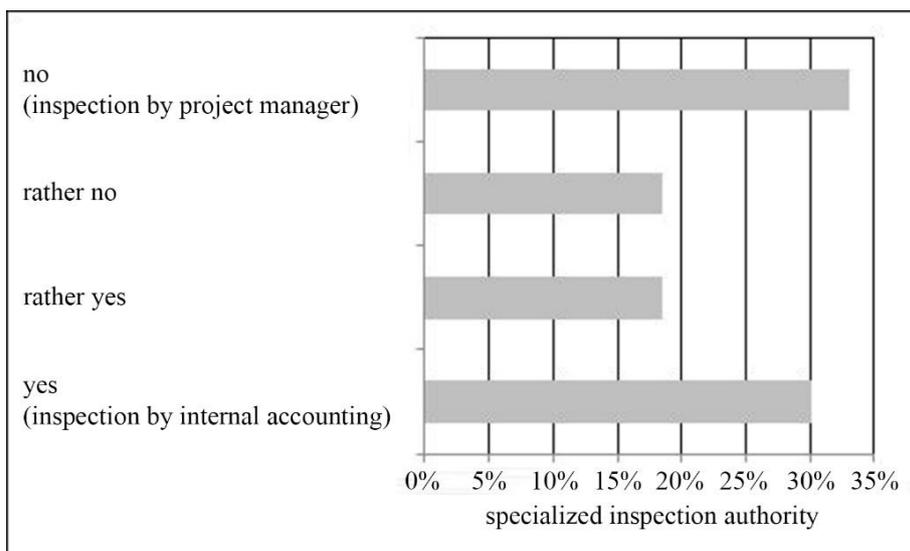


Figure 2: Specialized auditor (N = 103)

When looking at the distribution of project types, the sample shows a concentration of building and traffic construction projects. Moreover, it became clear that only two projects per year and per project type (building or traffic construction) were handled per public construction client (see Figure 3).

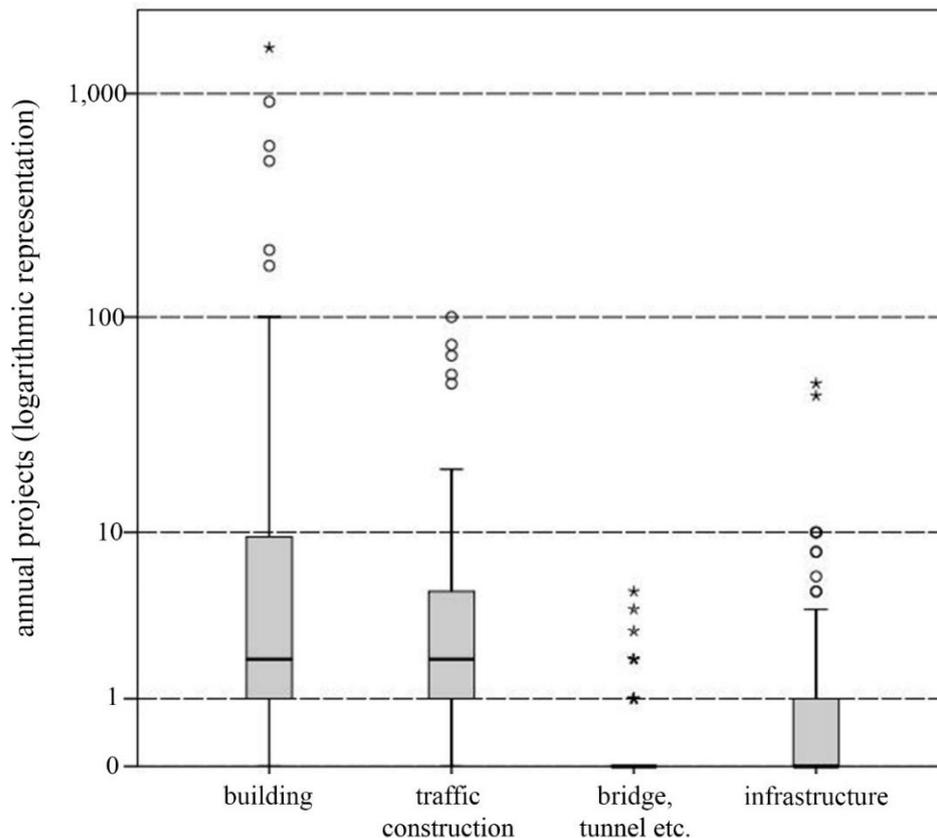


Figure 3: Number of annual projects per project type (logarithmic representation)

Another aspect of the sample is the ratio of 1 project with new building construction compared to 5 projects with or in existing building construction (extension, alteration, improvement, repair and maintenance). The size of the projects was approximately equally distributed on projects up to 10,000 € with a median of 20%, projects from 10,000 to 100,000 € with a median of 30% and projects from 100,000 to 2,000,000 € with a median of 20%. Projects amounting to more than € 2 million were barely represented in the sample, which is plausible for the observed population.

### 3.2.2 Invoices

The examined invoices can be differentiated between type of the order and type of invoice. Type of the order has been distinguished in the survey between the main order and supplementary orders, with 95% (median) on the main order. The invoices due to a supplementary order were generally of minor importance. The type of invoice was distinguished between partial and final invoices. The amount of partial invoices was approximately twice the amount of final invoices, the surveyed public construction clients indicated that they have worked on average on 60 partial and on 30 final invoices per year.

## 4. Results

### 4.1 Auditability of invoices

In Germany, there is a fundamental difference between partial and final invoices when it comes to their different payment periods allowed in accordance with VOB 2009 (Ingenstau 2010). In addition, it should be noted that this period only starts when the invoice is auditable; this date is not necessarily the date of the invoice or the date of delivery of the invoice. The survey results show that 5% (median) of the partial and final invoices were not auditable, while significant variations can be observed. The reasons for non-auditability of invoices based on the survey are displayed in Figure 4. It turns out that especially “error-containing documentation” repeatedly represents a reason for non-auditability.

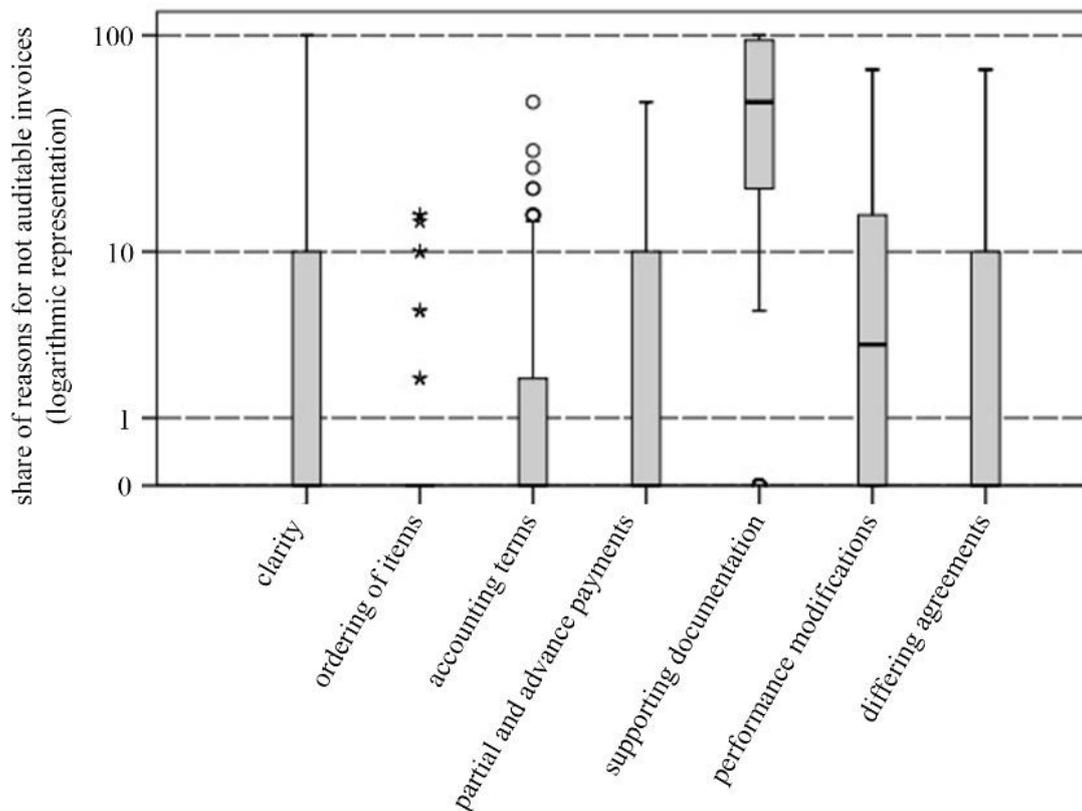


Figure 4: Percentage of reasons for not auditable invoices (logarithmic representation)

## 4.2 Payment behaviour in case of auditable partial invoices

With regard to the auditable partial invoices, the survey results show that according to the public construction clients, a median of 96% of the invoices were paid on time. The distribution is shown in Figure 5. In two cases, public construction clients stated that they paid the invoices on time in 50 % and 60% of cases.

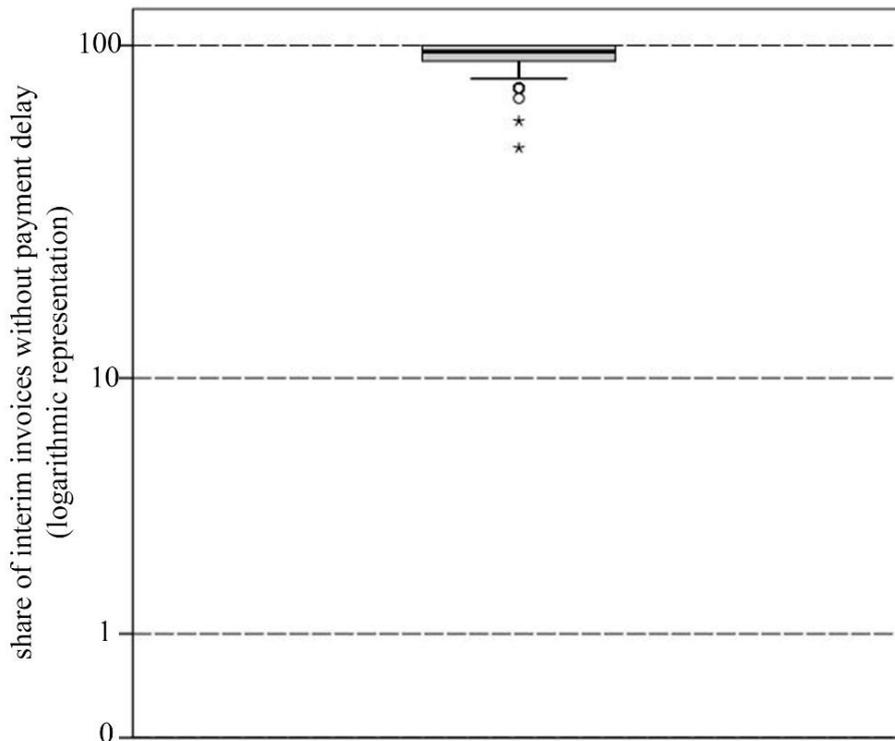


Figure 5: Percentage of partial invoices without payment delay (logarithmic representation)

This result is confirmed by the control question on the percentage of late payments with more than 18 days in accordance with VOB 2009; answers provide a median of 4%, which is the difference to the above 96%.

In addition to the proportion of the partial invoices paid within time or with late payments, the survey results also provide information on the extent of late payments. The survey distinguishes between the delay time and the average invoice amount. For the auditable partial invoices with late payments the following picture emerges: The delay time is 5 days (median) after the end of VOB period of 18 working days (lower and upper quartile at 5 and 10 days). The average invoice amount (median) is 10,000 € (lower and upper quartile at 5,000 € and 15,000 €). It should be noted that this is valid only for auditable partial invoices with payment delays. The partial invoices without payment delays are not included in the evaluation.

### 4.3 Payment behavior in case of auditable final invoices

Similar to the partial invoices, the auditable final invoices show that a large share of the invoices is handled without late payments. According to the public construction clients, they are paid on time with a median of 100% according to VOB (2009) with a given a period of 2 months. Only the lower quartile shows that 95% of the auditable final invoices are paid in due time (see Figure 6). In three cases, public construction clients stated that they paid the invoices on time only in 30, 40 or 50% of cases.

This result is confirmed by the control question on the percentage of late payments showing a median of 0% (lower quartile 5%), confirming the difference to the above 100% (lower quartile 95%).

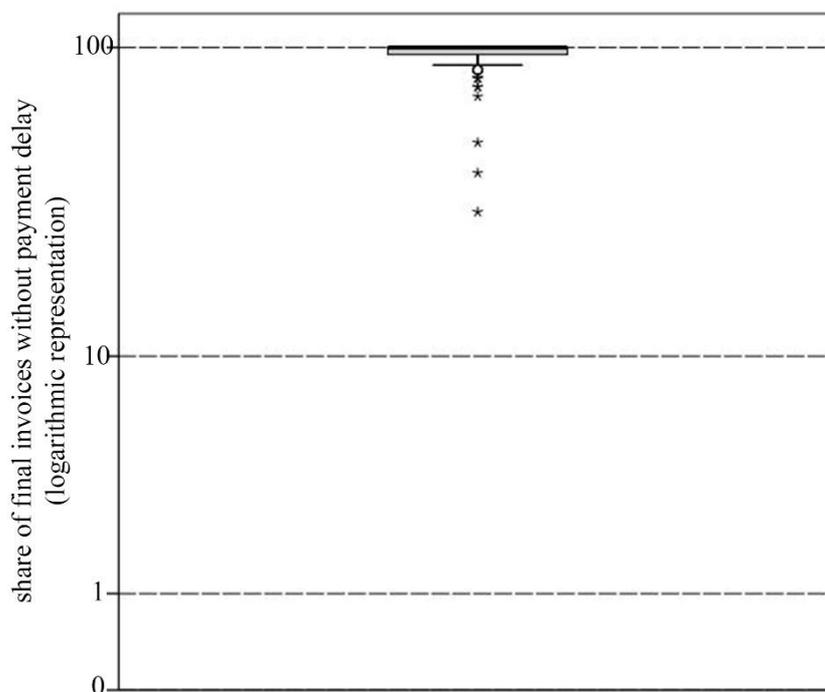


Figure 6: Percentage of final invoices without payment delay (logarithmic representation)

In addition to the proportion of the final invoices paid within time or with late payments, the survey results also provide information on the extent of late payments. Again, the survey differentiates between the delay time and the average invoice amount. For the auditable final invoices with late payments the following picture emerges: The delay time is 10 days (median) after the end of VOB period of 2 months (lower and upper quartile at 10 and 15 days). The average invoice amount (median) is 10,000 € (lower and upper quartile at 6,875 and 20,000 €). It should be noted that this is valid only for auditable final invoices with payment delays. The final invoices without payment delays are not included in the evaluation.

## 5. Discussion

### 5.1 Causes for payment delays

In addition to the detection and evaluation of payment transactions, there was another set of questions in the survey of this project, asking for responsible causes for delays in the payment of invoices. The public construction clients who indicated delays in paying the invoices, explained the backgrounds and named the causes, too. The interviewees could choose of a list of possible causes (as well as add their own) and rate each of these causes from their perspective (distribution of 100% on the respective causes). Within this context, the following causes can be described as relevant, with the specified sequence corresponding to the encountered ranking (see Figure 7): audit by external planning office too long (1<sup>st</sup>), increased work load on the part of auditors, vacation / illness of the auditor, incomplete, unsystematic quantity survey (all 2<sup>nd</sup>). It is thus clear that there are causes that can be found on the part of public construction clients, but also on the part of the other project participants. The public construction client has to deal especially with a limited staff capacity, as "increased workload of invoice auditor" and "vacation / illness of invoice auditor" show. With regard to the other project participants should be noted that some causes (e.g. "incomplete, unsystematic quantity survey") are attributable to the author of the invoice, as well as to other planning offices ("audit by external planning office too long"). The additional mentioned causes for late payments mainly points to the so called "Ortsbürgermeister", a non-professional mayor in villages or small towns, in many cases with lack of time, co-workers and/or experience in public construction projects.

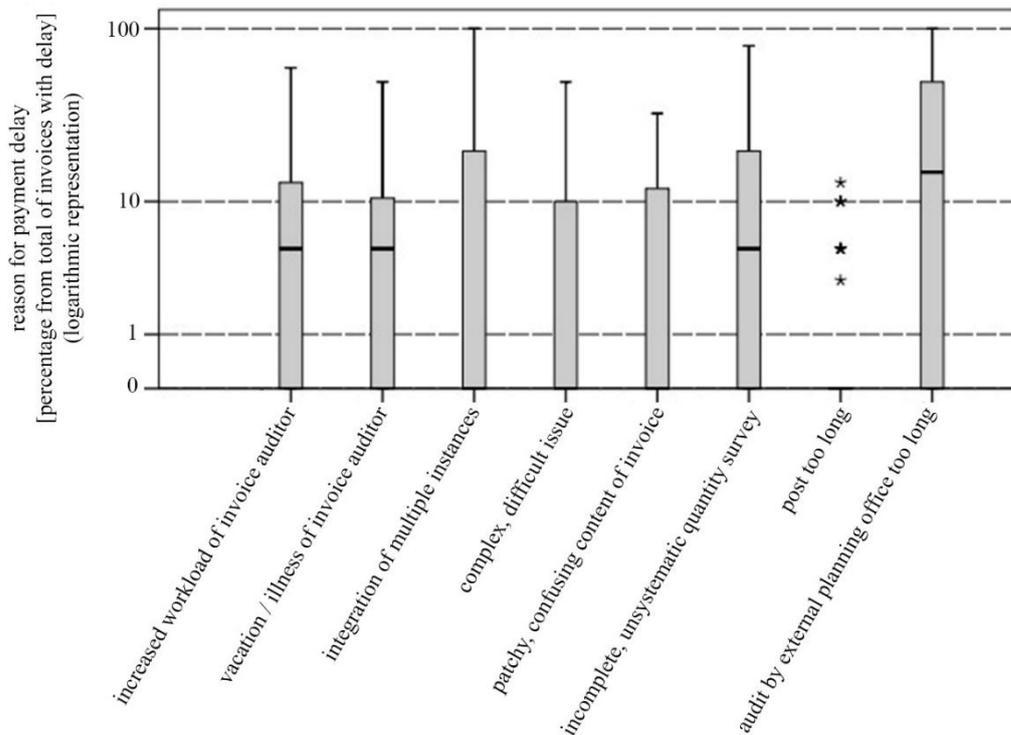


Figure 7: Reasons for late payments (logarithmic representation)

## 5.2 Possible approaches for solutions

Based on the above mentioned reasons for violation of payment deadlines, first guesses can be deduced to tell which solutions might be suitable. The survey also covers this issue, too. In terms of solutions or "remedies" to ensure compliance with the contractually agreed payment terms, the survey shows the following ranking (see Figure 8): early examination of quantity survey (1<sup>st</sup>), increase of internal staffing (2<sup>nd</sup>), clear rules on representation for holidays and disease; in addition, the contractor should be informed about the planned vacation (3<sup>rd</sup>), raising awareness of the public construction client and the laboratory with regard to the problem of late payment eg. by means of events, brochures, etc. (4<sup>th</sup>).

Besides the increase in personnel capacities on the part of public construction clients (2<sup>nd</sup>), there are mainly organizational aspects that seem to offer a solution approach to the problem of late payments in accordance with the survey results (1<sup>st</sup>), (3<sup>rd</sup>) and (4<sup>th</sup>). These organizational aspects are to be found on both sides of the client and the other project partners, and a special focus lies on the "early examination of quantity survey".

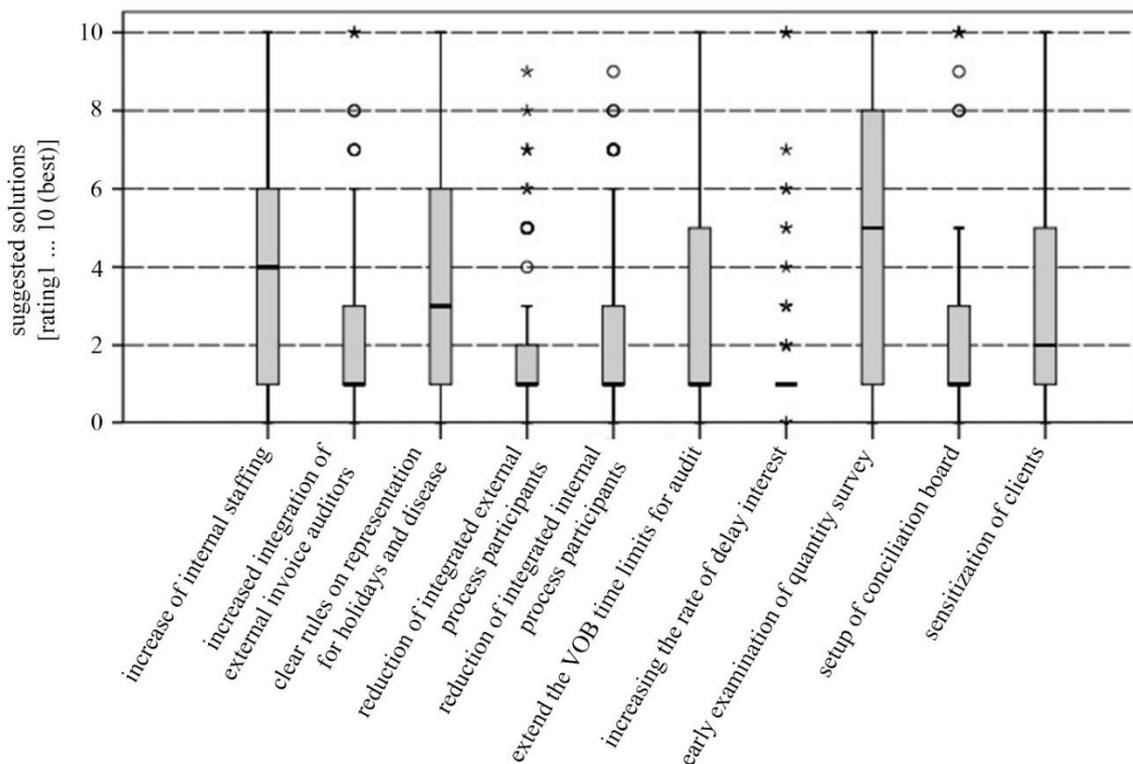


Figure 8: "Where do you see potential to ensure compliance with the payment deadlines?"

## 6. Conclusions

### 6.1 Overview

The results of the research can be summarized by the following points, which in turn represent responses to the initial research questions:

Acquisition and analysis of payment transactions, in particular the sizes and periods between receipt of the auditable invoice and the payment by the public construction client:

Auditable partial invoices show that a median of 96% was paid on time. If it comes to late payments, the delay time was 5 days (median) after the VOB period of 18 working days (lower and upper quartile of 5 and 10 days). The average invoice amount of late payment was 10,000 € (median) (lower and upper quartile of 5,000 € and 15,000 €). Auditable final invoices show that a median of 100% was paid on time. Only in the lower quartile a reduced figure of 95% of the auditable final invoices can be seen. If it comes to late payments, the delay time was 10 days (median) after VOB period of 2 months (lower and upper quartile of 10 and 15 days). The average invoice amount of late payment was 10,000 € (median) (lower and upper quartile of 6,875 € and 20,000 €).

Identification of the causes of delays in payment on the part of the public construction client and on the part of other project participants:

According to the findings of this research project, the causes for late payments lie on the part of the public construction client but also on the part of other project participants. The public construction client has to deal especially with a limited staff capacity, as mentioned by "increased workload on the part of auditors" and "vacation / illness of the auditor". With regard to the project participants, it should be noted that at least two causes are attributable to the author of the invoice ("incomplete, unsystematic quantity survey") and the external planning offices involved in the audit ("control by external planning office too long").

Development and presentation of possible solutions to ensure future compliance with the contractually agreed payment terms:

Besides the increase in personnel capacities on the part of the public construction client (2<sup>nd</sup>), there are mainly organizational aspects that can offer a solution to the problem of late payments in accordance with the survey results (1<sup>st</sup>, 3<sup>rd</sup> and 4<sup>th</sup>). These organizational aspects are to be found on both sides of the client and the other project partners, with a special focus on the early examination of quantity surveys.

Due to the methodological approach - in particular, the random selection of the sample and the unified survey – the present results can be qualified as representative and are transferable to the population (mainly to the administrative levels: "community" and "associated communities").

## 6.2 Outlook

Public sector's payment discipline has a significant impact on the private sector, as Checherita-Westphal et al. (2016) and Flynn et al. (2014) point out. Based on the present study results, the expected continued high relevance of the considered research questions and in addition to the implementation of the outlined "corrective measures" it is recommended to carry out at least one new survey in the medium term to better understand the long term development of the topic (including the initial effects of introduced "corrective actions").

In a new survey, the concept of the actual survey does not necessarily have to be changed fundamentally since it has proved to be viable. However, if the questions should be extended to how the respective results depend on the "type of public construction client", the "state", the "type of invoice auditor" and so on, the sample of the currently about 100 responses would have to be largely extended, too. In any case, the selection of the sample (project construction clients to be interviewed) should be randomly again in order to get a representative picture of the population.

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