Towards an index for the rental sector: a model for the Flanders housing market

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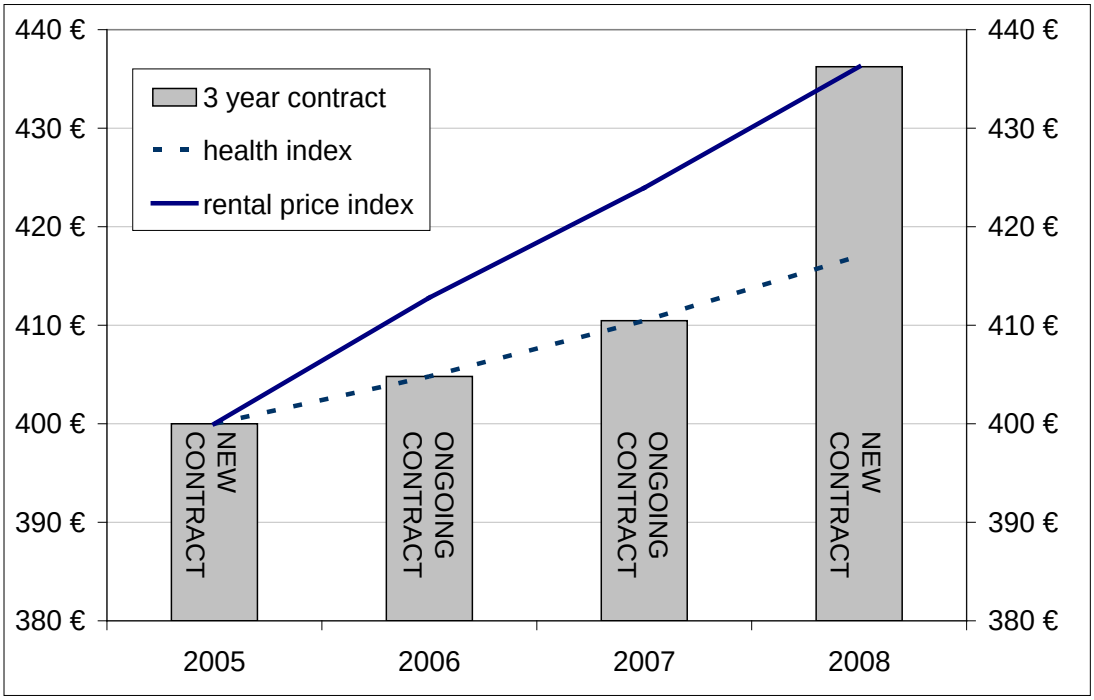
Abstract This paper describes the development of a rent index for Flanders, Belgium. This annual index, referred to as the *huurprijsindex* (rent index), is designed to detect changes in the rent of the overall stock of rental homes. We use the matched model methodology based upon repeat tenancy agreements, analogous to Case and Shiller's geometric repeat sales model, to estimate the rent index. We use recoded data on the tenancy agreements of nearly five hundred thousand rental homes; more than 30,000 representing repeat agreements between 1990 and 2010. The accuracy of the index is determined using the 95% confidence interval. Given our target (a geometric mean index value) and the characteristics of the dataset (large but without property characteristics) our repeat tenancy agreements method seems to be adequate for calculating a rent index for Flanders.

1. Introduction

There is a need for a rent index in Flanders, the Dutch speaking part of Belgium, as there is elsewhere. The goal of the index is to follow the mean rent development of renewed tenancy agreements of existing homes in the entire rental stock in Flanders. In Flanders, approximately 20 percent of the population live in a private rental house and another 5 percent live in the social rental sector; in total 25 percent of the Flanders population are tenants. The constructed rent index tracks the trend in prices for the private rental group. There is no reliable current information about the trend in rents. The general purpose of this research is to explore the possibility of basing a rent index on the available data.

Normal tenancy agreements in Flanders have a three or nine-year term, and this is the default where no specific contract term has been agreed. At the end of the tenancy agreement, the tenant and landlord are obliged to renegotiate the rent. It would appear in practice that the majority (53%) of tenancy agreements concluded have a contract term of three years or less. Despite the multiyear nature of lease agreements, rent may be revised in line with inflation during the

Figure 1
Schematic diagram how rent revise in line with inflation (health index) and the rental price index.



contract term Figure 1 depicts these steps schematically). The inflation factor used in Flanders is not the CPI but the health index. The health index follows more or less the same development as the CPI. We do not know for which percentage of the tenancy agreements that actually happens, but we assume that this is the case with the vast majority of tenancy agreements, although there are certain tenants who pay the same (nominal) rent every year. Under the rules of rent legislation, the rent of an ongoing rental contract may further be revised at the end of a contract period if both parties agree or a court decision is taken. The new agreed rent is generally more or less the same as the earlier rent plus the indexation by the health index.

There was no reliable information in the past about the trend in rents, because tenancy agreements were not registered[1]. However, this situation has changed recently. Since 2007 private landlords in Flanders have been obliged by law to register each tenancy agreement concluded. The register is maintained by the AAPD, which is a department of the Ministry of Finance. Agreements from earlier dates were also offered. The tenancy agreement contains little information about the property. There is only information about the rent and the length of the agreed period.

[1] There is only a survey result for 2005; mean rent €453,- per month.

Figure 2
Nominal rents and rents inflated by the health index, per year, 2000 - 2009

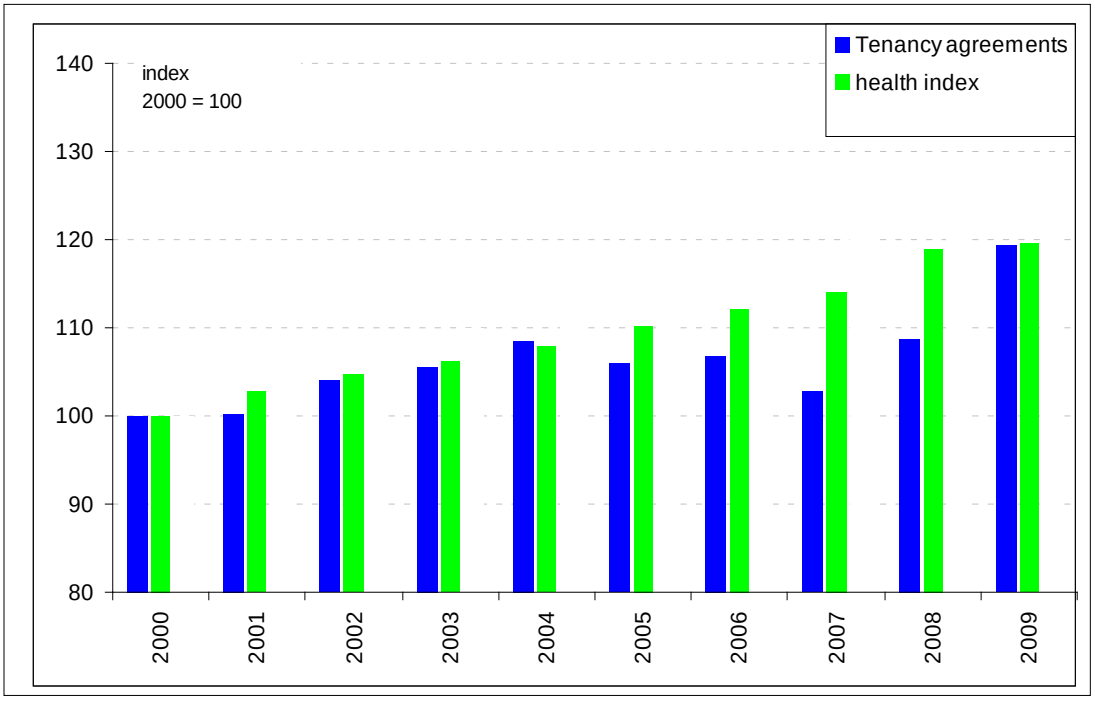


Table 1:

Median rent per year

Year of the contract	Median	% change
2000	457	
2001	458	0.22
2002	475	3.71
2003	482	1.47
2004	496	2.90
2005	484[2]	-2.42
2006	488	0.83
2007	470	-3.69
2008	497	5.74
2009	545	9.66
2010	550	0.92

Source: AAPD, Steunpunt Ruimte en Wonen (Tratsaert 2010)

The registered tenancy agreements have shed light on the trend in rents. Table 1 shows that the trend in median rent has sometimes been strong (2008, 2009) and sometimes even negative (2005, 2007). Futhermore, Figure 2 shows that the rents do not follows the health index as expected. The Flanders Policy Research Centre for Planning and Housing concluded in 2010 that the median is unsuitable for charting the trend in rents (Tratsaert 2010).

[2] Survey 2005: €453,-

We set out in this paper a more advanced method for establishing the trend in rents. We call this the repeat tenancy agreements method. The work discussed and data used in this paper are derived from a data register for tenancy agreements in the rental sector that was developed in 2007. Since 2007 landlords have been legally obliged to register every concluded lease agreement (including current ones), not only for main dwellings but also for second homes. The register contains less information about the property. There is only information about the rent and the length of the rental period.

2. Methods

The general purpose of this research was to examine the feasibility of sampling these records in an economical and efficient manner for estimating a rent index. Data obtained in this way are obviously important in the analysis of the development of the rental sector and in particular changes in the level and structure of rents over time. Therefore, a rent index is constructed. For the construction of the rent index, it was examined how a house price index is modelled in the owner-occupied sector.

Worldwide, the most frequently used methods for calculating house price indices are: 1) a summary measure of central tendency (e.g., mean, median); 2) hedonic models; 3) repeat sales models; and 4) variants on and hybrids of the latter two.

One intrinsic flaw in the summary methods is that they are not adjusted for quality. They are unable to distinguish between rent movements and changes in the composition of sold dwellings from one period to the next (Bourassa *et al.*, 2006). For example, if for some reason a disproportionate number of high-rented homes were contracted in a given month, the mean or median rent would still rise, even though not a single house had increased in rent (Case and Shiller, 1987). The shortcomings in the summary methods meant that an alternative method had to be found for calculating a rent index for Flanders. As stated above in the introduction, Katrien Tratsaert (2010) of the Flanders Policy Research Centre had already concluded that the median is unsuitable for charting the trend in rents.

The second option, hedonic regression analysis, is based on the principle that the rent of a house can be accurately estimated from its characteristics. The contract rent is regressed on a set of important qualitative variables, e.g., the number of rooms and lot size, and several variables for measuring time effects (Rosen, 1974). The regression coefficients can be interpreted as implicit rent attributes; for example, an extra room will push up the rent of the property by a specific amount. However, the challenge posed by this method is to compute a functionally correct mathematical model for the agreed rent. A correct set of explanatory variables must be specified and the relationships between them and the response variable must be correctly determined beforehand (Wang and Zorn, 1997). Due to a lack of house characteristics we cannot use the common hedonic method.

The repeat sales model (in our words: the repeat tenancy agreements model) checks quality characteristics by comparing the same house over time. It uses data on houses for which the contract rent was changed one or more times during the period in question. Following Bailey *et al.* (1963) we state that most of the difficulties with specifying and measuring quality characteristics can be avoided by basing the rent index on the tenancy agreements of the same house at different times. The greatest drawback of repeat modelling is that it wastes data by only using information on the repeat tenancy agreements model.

Finally, hybrid models avoid the inefficiency of the repeat models because they also use information from tenancy agreements that have yet to be adjusted. They might avoid the problem of misspecification to which the hedonic method is susceptible. However, like the hedonic method, hybrid models require a large database with a detailed set of property attributes. As stated above, there is a lack of detailed information for Flanders.

Data on all rental houses in Flanders have been recorded by the Federal authority since January 2007. However, as no details are recorded on house characteristics apart from type of dwelling, hedonic and hybrid methods cannot be applied. For these reasons, the repeat model seems a logical choice for a rent index for Flanders.

The repeat approach, developed by Case and Shiller (1987), is based on the assumption that house quality remains unchanged between two tenancy agreements; this can be accepted if we can consider that the overall house quality has not significantly changed. The choice of method for calculating an index depends on the 'target' (Wang and Zorn, 1997) and the characteristics of the available dataset (Abraham and Schauman, 1991). The target is the statistic that users of an index need to know regardless of the method (Wang and Zorn, 1997). Our target is the geometric mean index value – which matches well with the repeat sales model. Moreover, whereas the hedonic and hybrid methods can be used only if information is available on the characteristics of individual homes (e.g. number of rooms, lot size), the repeat model can be applied when the rent and the renewal dates of the tenancy agreements are known. One disadvantage of the repeat model is that it requires a large dataset. Fortunately, our dataset is quite large and contains all the tenancy agreements since January 2007 in Flanders (over 461,000 tenancy agreements, of which 34,769 are repeated[3]). This is why we opt for the repeat model as the method for calculating a rent index for Flanders. Our practical application of the repeat method is described in the following two sections.

[3] Because of the new registry, we can only follow the new contracts. The renewed contracts cannot be distinguished on this moment.

3. The repeat model

Our repeat model is actually a modified version of the repeat sales method, which is extensively addressed in the literature (see e.g., Bailey et al., 1963; Case and Shiller, 1987; Case and Shiller, 1989; Goetzmann, 1992; Calhoun, 1996; Jansen et al., 2008). Therefore, we believe that a brief description will suffice here. Although the repeat sales model is used mainly for tracking the trend of house prices in the owner-occupied sector, we expect the repeat method to be equally usable for repeat tenancy agreements.

Bailey, Muth, and Nourse (1963) were the first to develop a house price index based on the repeat sales model. Essentially, repeat sales uses a collection of the prices paid for single properties at different points in time to estimate a vector of numbers that 'best' explains the observed changes in price over the sample period (Abraham and Schauman, 1991). In practice, the repeat sales model uses ordinary least squares regression analysis in which the dependent variable is the logarithm of the price relative from the twice-sold property. The log price relatives are then regressed on a set of dummy variables corresponding with the time periods. A dummy variable is added for each period, except the first (base) period. The dummy variable for the first sale has the value '-1' and the dummy variable for the second sale has the value '+1'. All other dummy variables have the value '0'. There is no constant term in the analysis, the coefficients are estimated only on the basis of changes in house prices over time. The estimated coefficients represent the log of the cumulative price index for each period. The time dummy for the initial period is set at zero to normalize the index at 1. The regression equation is (Bailey, Muth, and Nourse, 1963):

$$r_{itt'} = \sum_{j=1}^{T} b_j x_j + u_{itt'}, \qquad (1)$$

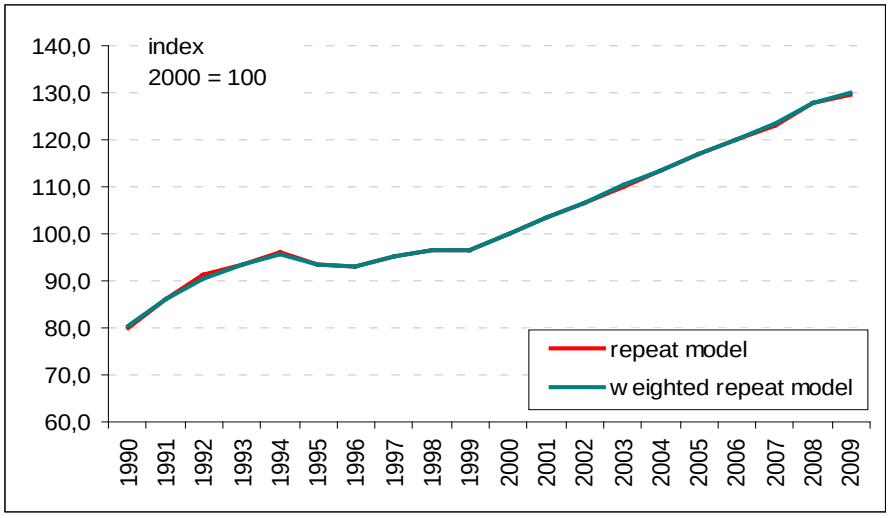
where $r_{itt'}$ is the log of the ratio of the final sales price in period *t'* to initial sales price in period *t* for the *i*-th pair of transactions with initial and final sales in these two periods, *b* is a column vector of unknown logarithms on the index numbers to be estimated, and *x* is an *n* X *T* matrix with values -1, 0, and 1, as explained above. Finally, $u_{itt'}$ are the residuals in log form with zero means, equal variances, and uncorrelated with each other.

We use the same methodology for the rent index. Analogous to the first and second sale, we use the rent in the first tenancy agreement and rent in the second tenancy agreement.

In 1987, Case and Shiller published an adapted version of the repeat sales model of Bailey *et al.* (1963): the *weighted* repeat sales method. Case and Shiller argued that the longer the time between transactions, the more variance there is in individual house price appreciation; for

Figure 3

Rent index, repeat model and weighted repeat model



example, because some houses are very well maintained whereas others are not maintained at all. As a result, the variance of the residuals will increase with the length of the holding period. This phenomenon – known as heteroscedasticity – undermines efficiency as the variance of the index values becomes too great (Wang and Zorn, 1997). This may not be a problem if the application relies solely on the indices themselves and are based on plentiful data (Wang and Zorn, 1997). To minimize the effect of heteroscedasticity, Case and Shiller (1987) proposed a three-step procedure. However, Jansen et al. (2008) conclude after several tests that there is a negative effect of holding period on the amount of variance. This is contradictory to the theory. These results call into question the suggested form of the diffusion of the variance of appreciation rates over time. Another argument against the current use of the second step of the weighted repeat sales procedure is her findings that the proposed heteroscedasticity cannot be conclusively demonstrated in the data. Tests show that heteroscedasticity seems to be present, but the amount of explained variance is less than one percent. Significant results may have been the result of the large sample size. Furthermore, they observed a problem with the weights necessary to correct for heteroscedasticity in the third step of the procedure.

The period between successive sales in the owner-occupied sector is far longer than the period between renewals of tenancy agreements. As stated above, 53% of the agreements have a term no longer than three years, which means that the probability of problems caused by heteroscedasticity is small. In anticipation of Section 5, where a choice is made for the final rent index, we show in Figure 3 the rent index profile based on the weighted and unweighted repeat tenancy agreements method. The two deviate from each other hardly at all. In conclusion, given

the characteristics of the available dataset and our target, the repeat sales model would appear to be an adequate method for calculating a rental house price index for Flanders.

4. Data

The database of the AAPD/Ministry of Finance comprises all tenancy agreements submitted for registration since 1 January 2007; the database includes contracts that were current on 1 January 2007. However, it should be noted that registration has been compulsory since 2007, but not before. The change is conspicuous in Table 2, with only 325 contracts concluded and revised before 2007. Nonetheless, information is available about 19,244 agreements concluded before 2007. In total, for the period from 1990 to the end of 2009, there were 34,791 usable pairs of repeat tenancy agreements.

As stated above, the database of the AAPD/Ministry of Finance shows that tenancy agreements are made for less than three years (53%), or more than three years (47%). However, in the repeat tenancy agreements database the proportion of tenancy agreements with a term of three years or less is 75.0% (Table 3, sample period 1990 – 2009). This suggests strong overrepresentation of tenancy agreements with a term of three years or less. It is expected that this overrepresentation will decline rapidly as long-term tenancy agreements are added to the database in increasing numbers. It would also appear from the information in Table 3 that a rent index that is estimated using the sample period 1990-2007 is based on ‘only’ 2,094 pairs. This number rises sharply when the years 2008 and 2009 are added. For the 1990-2009 period we ultimately have 34,791 pairs. We opted to estimate the rent for the 1990-2009 period.

5. Rent index

As stated in the introduction, the goal of our index is to follow the mean rent price development of an existing home in the entire stock of the rental sector in Flanders. One can imagine that houses with different rents will show different appreciation rates; however, the rent is not known until the actual tenancy agreement is registered. Therefore, a correction according to value is not possible. Another factor worth considering is that the rate at which rents appreciate may vary from region to region. Houses from different regions may not be represented in the repeat sample in the same proportion as in the overall stock. It is for these reasons that we decided to weigh the repeat sales sample by the five province in Flanders so that it resembles the registered data of 2009 of rental homes yearly as closely as possible.

Table 2: Number of repeat tenancy agreements

	start year		end year	
1990		37		
1991		65		
1992		63		1
1993		80		
1994		89		
1995		130		
1996		157		
1997		246		
1998	19244	287		1
1999		446	325	3
2000		519		2
2001		673		3
2002		941		5
2003		1357		7
2004		2420		14
2005		4391		74
2006		7343		215
2007		10698		1769
2008		4849		14892
2009				17805
Total		34791		34791

Table 3: Length of the tenancy agreements in years

Length in years	Sample period					
	1990			1990		
	2007	2008	2009	2007	2008	2009
	Percentage			*Number of tenancy agreements pairs*		
1,2,3	81.7	76.3	75.0	1711	12959	26095
more than 3	18.3	23.7	25.0	383	4027	8696
1	44.0	37.8	32.4	921	6416	11265
2	24.7	23.7	26.5	518	4030	9233
3	13.0	14.8	16.1	272	2513	5597
4	5.4	7.6	8.3	113	1286	2879
5	3.9	4.4	4.7	81	754	1634
6	2.1	3.0	3.1	44	509	1070
7	1.6	2.1	2.2	34	352	749
8	1.2	1.6	1.6	26	264	567
9	1.5	1.6	1.5	32	271	518
10	0.9	0.9	1.0	19	152	331
11	0.4	0.7	0.7	8	115	230
12	0.3	0.5	0.6	7	83	198
13	0.2	0.4	0.4	4	62	133
14	0.3	0.3	0.3	6	47	108
15	0.3	0.3	0.3	6	45	90
16	0.1	0.2	0.2	3	27	64
17	0.0	0.2	0.2	0	33	66
18		0.2	0.1	0	27	50
19			0.0	0	0	9
total	100.0	100.0	100.0	2094	16986	34791

Table 4 Weights based on province and year

	Antwerpen	Limburg	Oost-Vlaanderen	Vlaams Brabant	West Vlaanderen	Total
2005	0,42	9,00	2,63	0,47	5,67	1,00
2006	0,42	1,04	3,21	0,76	5,56	1,00
2007	0,79	1,60	1,22	0,62	1,17	1,00
2008	0,98	1,09	1,07	0,72	1,08	1,00
2009	1,00	1,00	1,00	1,00	1,00	1,00

In practice, the weighing procedure ensures that the distribution over the five provinces is reflected in the repeat sales sample. This procedure reduces the selection bias by down weighting observations from province that are sampled "too frequently" in the Repeat Sales sample. For example, in the analysis Antwerpen in 2005 have a weighing factor of 0.42, which indicates that Antwerpen is overrepresented in the repeat sales sample in comparison with the registered data in 2009. Conversely, West Vlaanderen is underrepresented (factor of 5.67) in the repeat sales sample. Higher weights indicate more impact in the regression analyses. Table 4 shows the resulting weights for the data from 2005 until 2009. Note that with every year of data, the weights are determined anew. Note further that the factors are 1 in 2009.

Furthermore, to eliminate random bias due to typing errors, for example, we omitted pairs of cases in which the logarithm of the price relative to the twice-sold property (i.e. the dependent variable in the regression analysis) was more than five standard deviations from the mean value. In the case of normally distributed data, the odds of that occurring are only about one in a million. However, these cases can distort the analyses since the sum of squares is being minimized in the regression analysis and these cases may obtain too much weight. In the national sample, about 0.5 percent of cases (n = 160) were deleted because they were outliers and 34,631 pairs of repeat tenancy agreements remained for use in the regression analyses.

Finally, Figure 4 shows that the median registered rents, the rents inflated by the health index and the rental index.

Confidence intervals and accuracy

The Repeat sales model requires a large number of repeat sales in a market segment to yield reliable estimates. Segmentation according to region, province and type of dwelling will reduce the number of repeat sales upon which the index is based. The accuracy of the measured estimates depends on the sample size, the distribution of the parameter scores in the population (standard error) and the level of confidence considered. A 95% confidence interval was used for the rent index, because it is the most commonly used value and because it offers the best

compromise between a high level of confidence on the one hand and a high level of accuracy on the other.

We determined the accuracy of an index on the basis of the 95%-confidence interval around the estimated index value. The estimated index value I_t is calculated as follows (Calhoun, 1996):

$$I_t = 100.e^{\hat{\hat{\beta}}_t} \tag{10}$$

in which $\hat{\hat{\beta}}_t$ is the estimated coefficient from the 'generalized least squares' regression analysis. The standard error of the index figures thus derived is calculated as follows (Calhoun, 1996):

$$\sigma_{I\,t} = I_t.\sigma_{\hat{\beta}_t} \tag{11}$$

in which $\sigma_{I\,t}$ is the standard error of the index figure for period t; I_t is the index figure for period t; and $\sigma_{\hat{\beta}_t}$ relates to the standard error of the estimated coefficient from the generalized least squares regression analysis.

The borders of the confidence interval (CI) can then be calculated by combining the standard error with the common procedure for obtaining the 95% confidence interval (Cohen, 2003).

$$Upper\,CI_t = I_t + (1.96 * \sigma_{I_t}) \tag{12}$$

$$Lower\,CI_t = I_t - (1.96 * \sigma_{I_t}) \tag{13}$$

The distance between the upper and lower border indicates the width of the confidence interval (W*ci*). To determine the accuracy per period, the width of the confidence interval for the rent index was then divided by the value of the index itself and multiplied by 100:

$$\text{Accuracy} = (Wci_t / I_t) * 100 \tag{14}$$

We found no indications in the literature on how narrow a confidence interval had to be in order to be described as 'accurate.' Nor was there any consensus on the minimum required accuracy of a sample. Figure 5 shows the index and the confidence interval and Figure 6 the accuracy of the index. The results show that the accuracy ranges between 8 and 10 percent, which we believe is acceptable.

Figure 5: Rent index and the confidence interval, 1990-2009

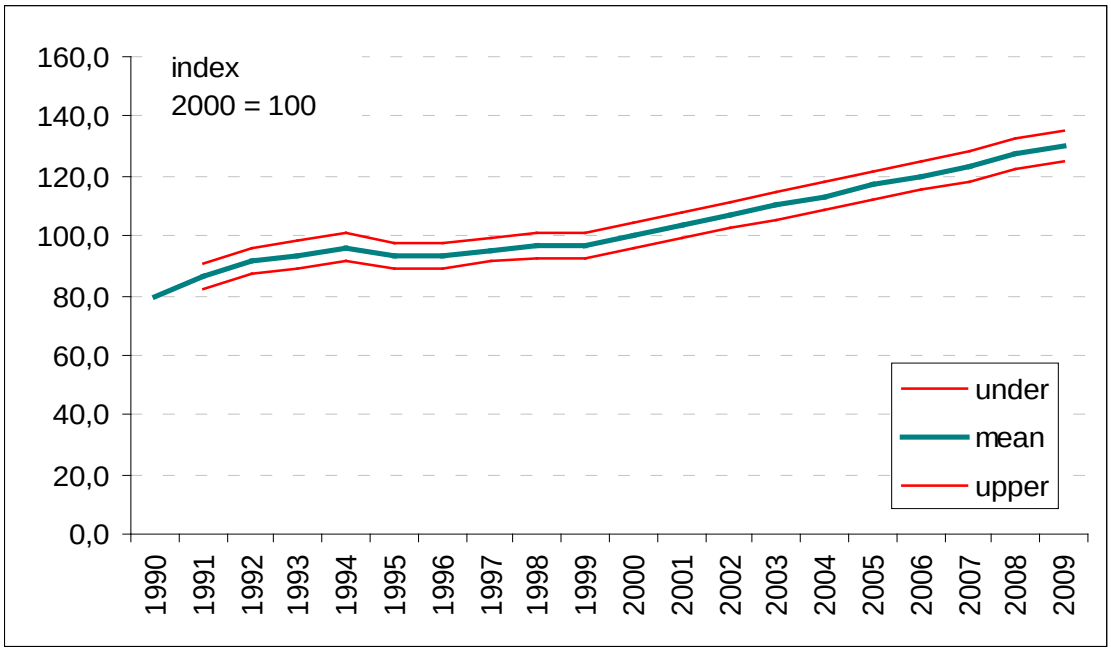
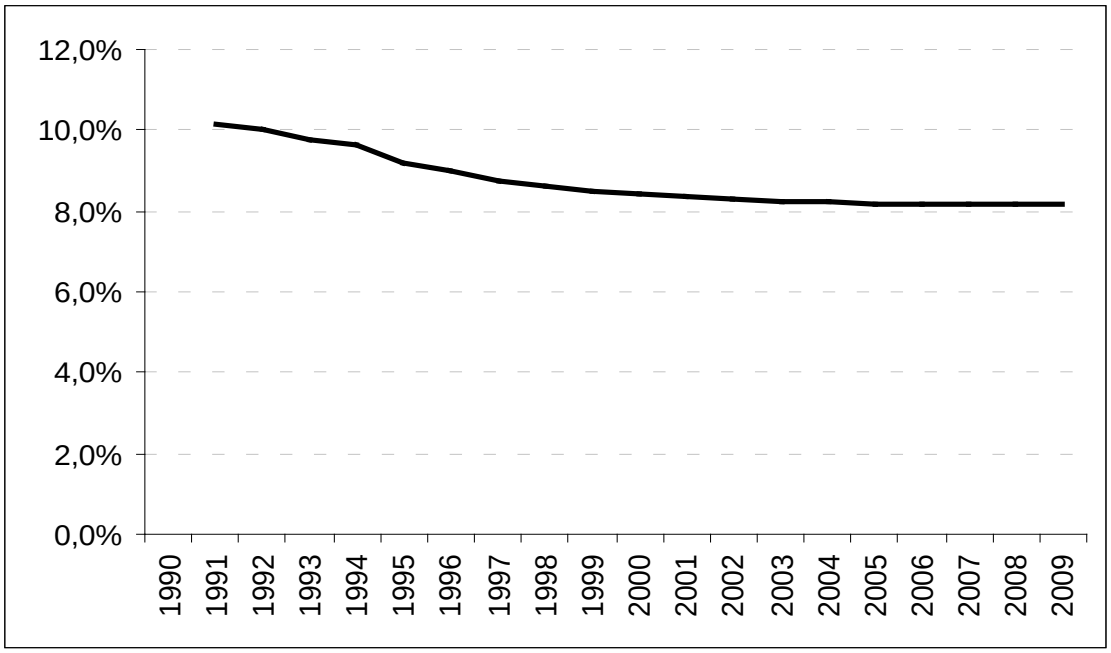


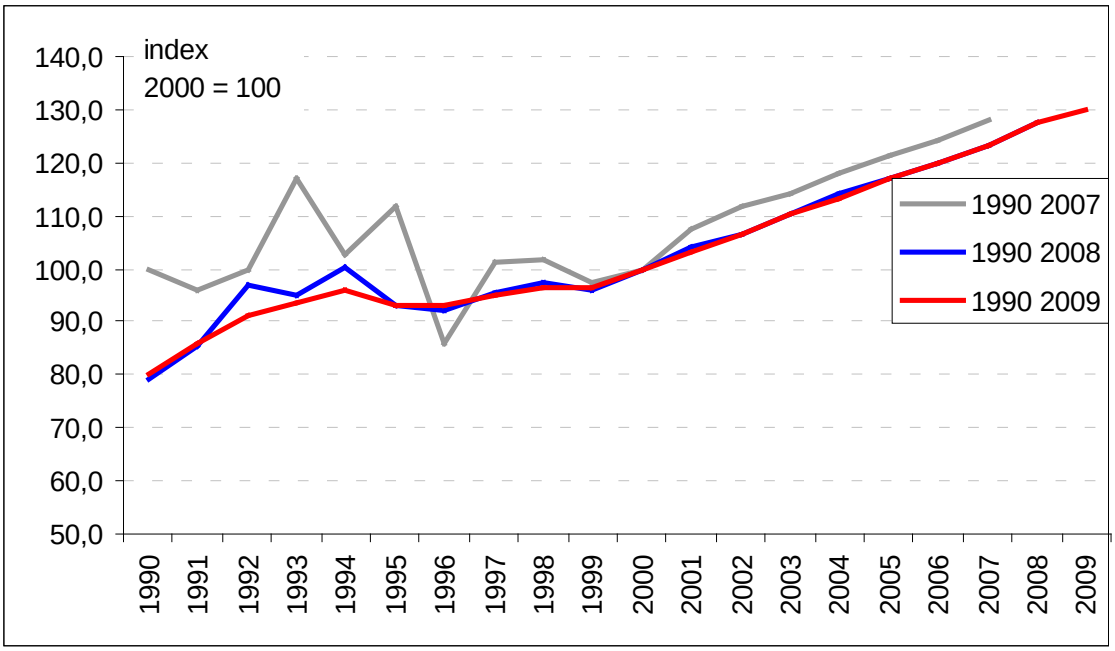
Figure 6: Accuracy of the rent index, 1990-2009



Effect of revisions: revision volatility

According to Bailey *et al.* (1963), the repeat model is more efficient than other methods because it utilizes information about the price index for earlier periods that is contained in rents in later periods. Therefore, the index values gain precision. Similarly, Shiller (1991) argues that such a revision is the result of increased efficiency in the estimators. However, present-day information changes the past values of the index (Baroni, 2004). Thus, additional tenancy agreements have

Figure 7: Rent index, different sample periods starting in 1999



implications for the index values because new pairs will provide additional information about changes in the rent level beyond that obtained from the previous sample. This is termed revision volatility and it may induce problems regarding the interpretability of the index, as the new index values may not be similar to the old ones.

To obtain an impression of the scale of these changes for the rent index, we calculated the index values with all the data up to 2007, 2008 and 2009 (i.e. 1 and 2 years additional information). The indices are presented in Tables 5 and 6 and shown in Figure 7. The results show that the coefficients are too volatile for the index estimated up to and including 2007. It would also appear that the indices based on pairs between 1990-2008 and 1990-2009 show an almost identical trend. Figure 8 presents information about the trend of the indices if the initial years are disregarded. It can be seen here that there are no obvious differences between the three series of indices.

We conclude that a rent index based on the repeat sales method is possible for the period from 1990. However, additional research is called for, and we are confident that the addition of the tenancy agreements concluded in 2010 will improve the index. Another conclusion is that the revision is small and acceptable.

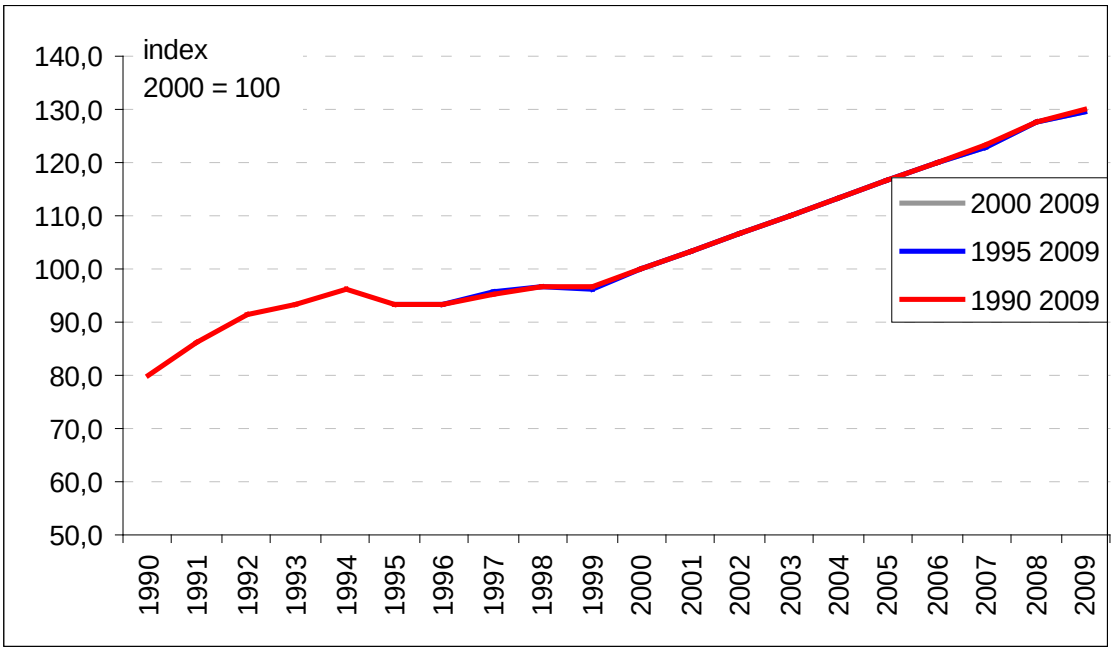
Table 5: Rent index for Flanders, 2000 = 100, several sample periods

Year	Sample period								
	1990			2000			2000	1995	1990
	2007	2008	2009	2007	2008	2009	2009		
	Index 2000 = 100								
1990	99.6	79.2	79.9						79.9
1991	96.0	85.2	86.0						86.0
1992	99.6	97.1	91.3						91.3
1993	116.8	94.9	93.4						93.4
1994	102.7	100.4	96.0						96.0
1995	111.7	93.2	93.3					93.2	93.3
1996	85.9	92.2	93.1					93.3	93.1
1997	101.1	95.5	95.2					95.5	95.2
1998	101.8	97.5	96.5					96.4	96.5
1999	97.5	96.0	96.5					96.4	96.5
2000	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
2001	107.5	103.9	103.3	106.6	104.3	103.3	103.3	103.3	103.3
2002	111.6	106.7	106.6	111.0	107.2	106.5	106.5	106.5	106.6
2003	114.3	110.3	110.1	113.8	110.6	109.9	109.9	110.0	110.1
2004	118.1	114.0	113.3	118.3	114.4	113.2	113.2	113.2	113.3
2005	121.5	117.0	116.8	121.3	117.4	116.7	116.7	116.7	116.8
2006	124.4	120.1	119.9	124.2	120.4	119.8	119.8	119.8	119.9
2007	128.2	123.2	123.1	128.0	123.6	123.0	123.0	123.1	123.1
2008		127.7	127.6		128.1	127.4	127.4	127.5	127.6
2009			129.8			129.6	129.6	129.6	129.8

Table 6: Rent index for Flanders, 2000 = 100, several sample periods

Year	Sample period								
	1990			2000			2000	1995	1990
	2007	2008	2009	2007	2008	2009	2009		
	%-mutation								
1990									
1991	-3.6	7.5	7.6						7.6
1992	3.7	14.0	6.1						6.1
1993	17.3	-2.3	2.3						2.3
1994	-12.1	5.9	2.8						2.8
1995	8.8	-7.2	-2.8						-2.8
1996	-23.1	-1.1	-0.2					0.2	-0.2
1997	17.7	3.6	2.3					2.4	2.3
1998	0.7	2.1	1.3					0.9	1.3
1999	-4.2	-1.6	0.0					-0.1	0.0
2000	2.6	4.2	3.7					3.8	3.7
2001	7.5	3.9	3.3	6.6	4.3	3.3	3.3	3.3	3.3
2002	3.8	2.7	3.2	4.2	2.7	3.2	3.2	3.1	3.2
2003	2.4	3.4	3.3	2.5	3.2	3.2	3.2	3.3	3.3
2004	3.3	3.4	2.9	3.9	3.5	3.0	3.0	2.9	2.9
2005	2.9	2.7	3.1	2.5	2.6	3.1	3.1	3.1	3.1
2006	2.3	2.6	2.7	2.4	2.6	2.7	2.7	2.7	2.7
2007	3.1	2.6	2.7	3.1	2.6	2.7	2.7	2.7	2.7
2008		3.7	3.6		3.6	3.6	3.6	3.6	3.6
2009			1.7			1.7	1.7	1.6	1.7

Figure 8: Rent index, different sample periods ending 2009



6. Discussion

After a thorough literature study and based on the characteristics of our dataset (very large but without property characteristics) and the target of our study (a geometric mean index value), we chose the repeat 'tenancy agreements' method to calculate annual indices for the tenancy agreements in Flanders. One major benefit of the repeat model is that it theoretically removes quality differences between packages of homes for which the tenancy agreements are extended by different periods (Bailey *et al.*, 1963). It thereby distinguishes differences in quality from differences in rent price (Abraham and Schauman, 1991). All the characteristics that could be included in a hedonic regression analysis or in a hybrid method are corrected (theoretically) by the repeat sales model (Abraham and Schauman, 1991). With an accuracy of between 8 and 10%, we believe that the rent index is reasonably acceptable. However, accuracy may become a problem with smaller subsamples. However, as yet we have estimated no series of indices for subsamples. We also observed that the revision volatility for the rent index was reasonably small and acceptable.

To conclude, given the characteristics of the available dataset and our target, the repeat 'tenancy agreements' model seems to be an adequate method for calculating a rent index for Flanders.

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