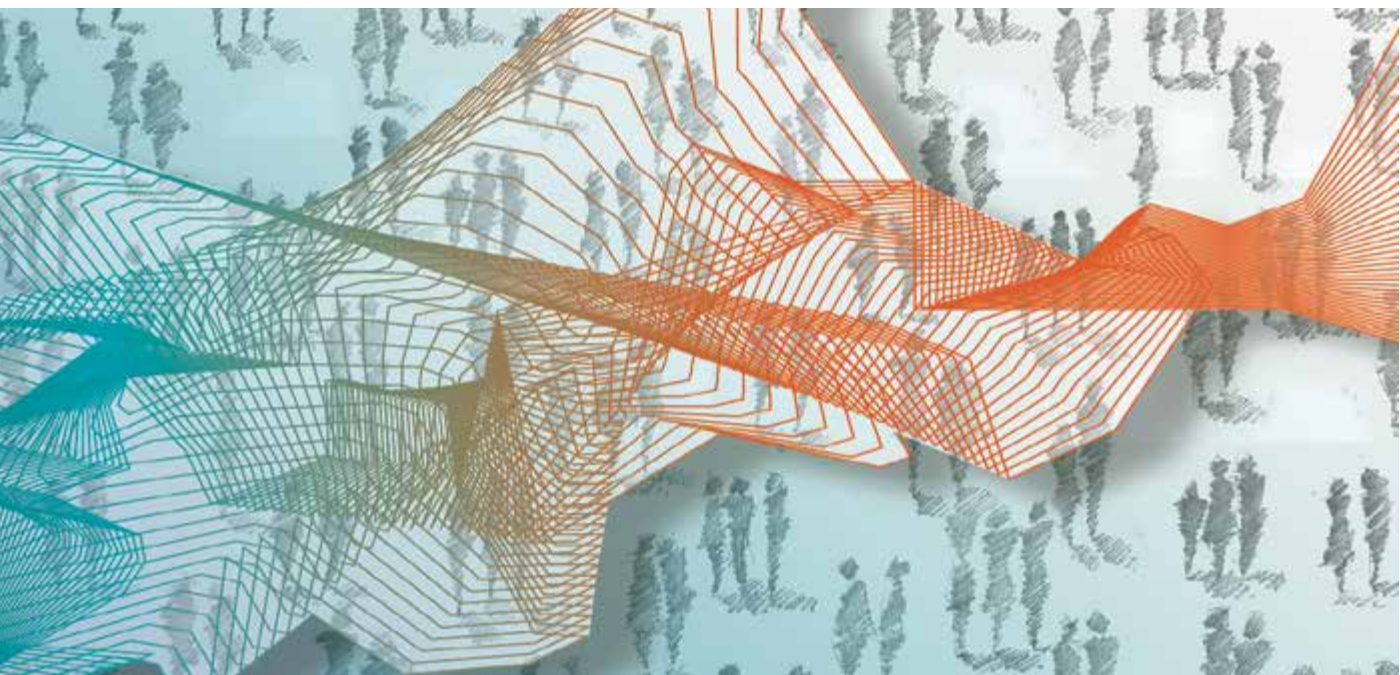National Accounts Institute

National **accounts**

Stock of land: method of estimation
for individuals (S.14 + S.15)

Methodological note
(March 2018 version)

National Bank
OF BELGIUM

Eurosystem

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Stock of land: method of estimation for individuals (S.14 + S.15)

1. Introduction: scope of project

ESA 2010 came into force in September 2014, together with the associated transmission programme (TP); however, the latter includes new elements which do not become obligatory until 2017.

As of then, an estimate has to be delivered of the stock of land owned by individuals, i.e. all households (S.14) and NPISHs (S.15) as an element of the balance sheet for non-financial assets shown in table 26 of the TP. An estimate of land owned by other sectors may be submitted on a voluntary basis, as for many other elements of the balance sheet for non-financial assets.

A taskforce was set up by Eurostat and the OECD in 2013; in June 2015, it produced the "Compilation guide on land estimation[1]" (referred to below as "the Guide"), which represents the first exhaustive summary of the conceptual and practical difficulties associated with the assessment of the non-produced asset "Land" (AN.211) on the balance sheet in relation to national accounts.

2. General principles for implementation in Belgium

2.1 Nomenclature

The nomenclature[2] used for the publication is that proposed in the Guide, with an additional category to separate land for construction purposes.

```
AN 211 Land
      AN 2111    Land underlying buildings and structures
            AN 21111      Land underlying dwellings
            AN 21112      Land underlying other buildings and structures
      AN 2112    Land under cultivation
            AN 21121      Agricultural land
            AN 21122      Forestry land
            AN 21123      Surface water used for aquaculture
      AN 2113    Recreational land and associated surface water
      AN 2119    Other land and associated surface water
            AN 21191      Land for construction purposes
            AN 21192      Other land
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1   "Eurostat-OECD compilation guide on land estimation", 2015 edition, Eurostat, Luxembourg, 2015.
2   It is standardised to 5 digits for computer purposes (for example, AN211 becomes AN21100)

2.2 Method of calculation of values

The methods used to calculate the value of land are among those suggested by the Guide.

For <u>undeveloped land</u>, the "**direct method**" may be used, i.e. the stock is estimated via a volume x price approach with direct observation of the two components:

Undeveloped land = stock in volume x price

For <u>developed land</u>, the land register data gives the total value of the land and buildings or structures built on it.

To obtain a single value for the land, the "**residual method**" has to be used, which subtracts the value of buildings as estimated in the capital stock by the perpetual inventory method (PIM) from the total value:

Developed land alone =	value of stock of land and buildings
	LESS value of stock of buildings

To this end, the correspondence between non-produced assets (land, AN211*) and produced assets (stocks of buildings, AN11*) is as follows:

AN211*	Developed land	AN11*	Buildings and structures
AN 21111	Land underlying dwellings	AN11111	Dwellings
AN 21112	Land underlying buildings and other structures	AN11210 + AN11220	Non-residential buildings Other structures

3. Basic data

3.1 Volume data

The volumes of property are taken from the files of the FPS Finance, General Administration of Heritage Documentation (GAHD).

At each year-end, the database determining the tax position of all registered parcels of land is fixed in order to generate a statement on the first of January; the situation on 1 January at the end of year Y+1 is used for the data of year Y.

Two files are extracted from this situation for the NBB's NA department, from 2005 onwards:
– an aggregated file (AF) of all registered parcels of land aggregated by type of property, region and type of owner;
– a detailed file (DF) of all individual parcels of land owned by each of the legal persons.

3.1.1 Aggregated file

The aggregated file combines the characteristics of property owned by several categories of owner:
– A: resident natural persons;
– B: resident natural persons with joint ownership with legal persons;
– C: resident natural persons with joint ownership with non-resident individuals;
– D: non-resident natural persons with joint ownership with legal persons;
– E: legal persons;
– F: resident natural persons with joint ownership with non-resident natural persons and legal persons;

Real estate is broken down by the region in which it is situated and by type (houses, apartments, factories, fields, woods, etc.); the classification comprises almost 500 types of property (referred to below as CATV), sixty for undeveloped land and the remainder for developed land (see Appendix 1).

For each breakdown, three variables are collected:
– the number of parcels observed;
– the corresponding surface area in m²;
– the cadastral income.

The **number of parcels** is the unit of volume used for **developed property**, and the **area in m²** is the unit of volume used for **undeveloped land**.

3.1.2 Detailed file

The detailed file comprises the characteristics of all parcels of land owned by each legal person identified by their company number in the case of a resident legal person, or by the ISO code of the country of residence of a foreign legal person.

Real estate is broken down by region and CATV (cf. 3.1.1. above), the surface area in m² and the cadastral income in euros are communicated for each parcel of land.

3.2 Price data

Paragraph 2.68 of the Guide specifies that stocks of land should be valued at market price (in accordance with ESA 2010 paragraph 7.33), which is the value of the land as if it were sold during the year in question.

In Belgium, price data for property come from the FPS Economy, Directorate General of Statistics (Statbel), which produces statistics for selling prices of real estate based on data supplied by the registries of the FPS Finance, which fit the definition of market price.

3.2.1 Years 2005 to 2014

For years 2005 to 2014, the price statistics cover 25 categories of property (referred to below as CATP, see description in Appendix 2), and indicate the value of transactions in the case of developed parcels (CATP 1 to 15) and the value per m² in the case of undeveloped parcels (CATP 16 to 25).

The following variables are given for each region and category:
– Number of transactions
– Total value of sales (= value of transactions)
– Total area in m²
– Average price
– First decile (P10)
– First quartile (Q25)
– Median (Q50)

– Third quartile (Q75)
– Last decile (P90)

It is fundamental to the quality of the estimates to have a geographical stratification of prices, since the location of a piece of land is a factor determining its price (cf. guide paragraph 5.17).

However, as price data are linked to transactions, we frequently encounter problems of representativeness and heterogeneity for certain categories of rarely exchanged property, which generate excessive price volatility (see example below). This already applies sometimes at regional level, especially in Brussels, and explains why it has been decided not to use a finer level of detail[1].

TABLE 1   EXAMPLE OF MISSING OR ERRATIC DATA: PRICES OF HOTEL/RESTAURANT/CAFE ESTABLISHMENTS (CATP 7)

Brussels	Number of transactions	total price (€)	total area (m²)	average price (€)	P10 price (€)	Q25 price (€)	Q50 price (€)	Q75 price (€)	P90 price (€)
2005	6	4 990 000	5 081	831 667	50 000	205 000	717 500	1 300 000	2 000 000
2006	9	6 598 283	4 170	733 143	100 000	170 000	405 000	803 243	2 940 000
2007	7	5 867 000	2 141	838 143	40 000	130 000	750 000	1 247 000	2 200 000
2008 to 2014	<5	confidential data							

Source : Statbel.

Moreover, since the capital stock itself is only available at national level, there is no point working at a fine geographical level for any developed property estimated using the residual method (see below).

3.2.2   Years 2015 and 2016

Following the reorganisation of its computer system in 2015, the Land Registry ceased to be able to supply data in their old form; the publication by Statbel of statistics for real estate transactions was suspended and did not resume until the end of 2016, and for three categories of property only (houses, villas & apartments). Prices of building land have been published by the federation of notaries since 2015.

Until Statbel resumes its publications, prices of non-residential property and undeveloped land for the years 2015 and 2016 have had to be estimated using other indicators:
– other developed land: average for houses, villas & apartments, by region;
– industrial land: building land for construction purposes, by region
– woodland: prices in France[2]
– agricultural land: prices in France
– other undeveloped land: average for agricultural land and woodland

For land owned by individuals (S.14 + S.15), the incidence of such approximations is fortunately fairly limited, as these categories represent just 19 % of the value of their land, on average, between 2005 and 2014.

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1   The data exist per municipality, district, region and for Belgium as a whole.
2   Source: Sociétés d'aménagement foncier et d'établissement rural (SAFER :http://www.le-prix-des-terres.fr/)

3.3 Table of correspondence between volume and price categories

As the volume and price categories are not identical, it was necessary to produce a table of correspondence between them, and with the classifications used in the ESA.

This mapping is set out in Appendix 3; it is the same for all geographical entities and for all years[1].

CATV	Heading	CATP	Land AN21	Buildings AN11
001000	land, field	P16	AN21121	
002000	pasture	P17	AN21121	
004000	garden	P24	AN21192	
043000	rampart / wall	P11	AN21112	AN11220
044000	embankment	P11	AN21112	AN11220
045000	slag heap	P25	AN21192	
050000	industrial land	P21	AN21192	
200010	house with garden	P1	AN21111	AN11100
200030	villa	P3	AN21111	AN11100
200460	house (place of worship)	P12	AN21112	AN11210
220102	production plant	P11	AN21112	AN11210

Source : NAI.

3.4 Structure of basic data: analysis based on year 2012

Based on data from the Land Register and mapping, an overview of the total number of parcels available to us is shown in Table 3, by type of owner and by price category in 2012.

3.4.1 Distribution of type of property by class of owner

There are a total of 10 274 728 registered parcels of land, 80.8 % of which are owned solely by resident natural persons. Parcels of land owned solely by legal persons represent just over 16 % of all parcels.

The inventory of parcels of land belonging wholly or partially to legal persons therefore encompasses more than 16 % of the total population of registered parcels of land. However, the assets of legal persons are different from those of natural persons. In particular, they are much more diversified. In fact, all categories of property are generally well represented there. The most highly represented category of property is "arable land" with 13.2 % of parcels. While, in the case of natural persons, "ordinary dwelling houses" occupy first place with 25.6 % of parcels (compared to 12.7 % for legal persons).

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1   In reality, it differs for two sub-periods: firstly 2005 to 2014 and secondly 2015 onwards.

TABLE 3 DISTRIBUTION OF NUMBER OF PARCELS OF LAND BY TYPE OF USE AND TYPE OF OWNER

CATP	Category of property	A Resident natural persons	B Resident natural persons & legal persons	C Resident and non-resident natural persons	D Non-resident natural persons and legal persons	E Legal persons	F Resident and non-resident natural persons and legal persons	TOTAL	Weight per CATP
P1	ordinary dwelling houses	2 122 699	18 565	4 779	3 581	215 172	41	2 364 837	23,0 %
P2	apartment blocks	2 084	152	5	6	2 360	-	4 607	0,0 %
P3	villas, bungalows, country homes	1 016 452	14 878	1 723	2 094	24 513	25	1 059 685	10,3 %
P4	apartments, flats, studios	747 064	25 954	3 090	7 648	77 162	53	860 971	8,4 %
P5	parts of buildings not otherwise specified	645 966	36 522	2 181	4 587	218 081	271	907 608	8,8 %
P6	retail units, businesses	114 250	6 911	387	459	37 157	9	159 173	1,5 %
P7	hotels, restaurants, cafés	1 634	277	6	14	2 514	2	4 447	0,0 %
P8	commercial premises	2 535	689	8	10	9 138	2	12 382	0,1 %
P9	office blocks	1 963	1 014	11	15	8 648	4	11 655	0,1 %
P10	other buildings of a commercial nature	1 746	88	4	9	780	-	2 627	0,0 %
P11	buildings of an industrial nature	77 498	16 471	249	389	134 739	65	229 411	2,2 %
P12	buildings not otherwise specified and miscellaneous buildings	60 408	2 182	726	4 185	77 274	44	144 819	1,4 %
P13	farmhouses	62 867	1 078	144	156	2 926	2	67 173	0,7 %
P14	agricultural properties	78 773	2 866	267	284	7 670	6	89 866	0,9 %
P15	horticultural properties	10 194	609	26	20	1 766	3	12 618	0,1 %
P16	arable land	1 274 015	15 459	6 862	9 961	224 100	100	1 530 497	14,9 %
P17	grassland	986 365	12 165	6 163	8 537	201 642	125	1 214 997	11,8 %
P18	orchards	101 909	1 548	429	351	12 596	6	116 839	1,1 %
P19	mixed agricultural land	3 927	27	23	94	1 144	-	5 215	0,1 %
P20	land for construction purposes	211 577	6 272	838	1 236	74 310	45	294 278	2,9 %
P21	industrial land	6 452	817	82	1 238	19 808	4	28 401	0,3 %
P22	woodland	361 270	5 573	3 903	5 703	142 961	57	519 467	5,1 %
P23	uncultivated land	79 376	1 465	1 627	1 262	80 031	46	163 807	1,6 %
P24	small parcels of land	248 988	3 000	1 817	661	38 282	35	292 783	2,8 %
P25	mixed and miscellaneous land	83 891	4 009	2 382	821	85 365	97	176 565	1,7 %
TOTAL		**8 303 903**	**178 591**	**37 732**	**53 321**	**1 700 139**	**1 042**	**10 274 728**	**100,0 %**
Weight by owner		**80,8 %**	**1,7 %**	**0,4 %**	**0,5 %**	**16,5 %**	**0,0 %**	**100,0 %**	

Source: NAI.

3.4.2 Territorial representativeness

The statistics supplied by the land registry (for all categories of property combined) cover 28 708 km² of the 30 528 km² or 94 % of Belgian national territory (see Tableau 4).

The remaining stock of land (6 % of the territory) will have to be estimated or extrapolated; the missing areas encompass land under roads, rivers and streams, which fall under the public sector (S.13).

3.4.3 Correspondence between types and categories of property

The information from the FPS Economy is aggregated in 25 property categories (CATPs), whereas the data from the land registry encompass more than 400 property types (CATVs). According to this table of correspondence

between CATVs and CATPs, 20 CATPs out of 25 cover a maximum of 10 CATVs, while some can cover more than 100 CATVs (e.g.: "Buildings of an industrial nature" encompasses 134 different types of property – see Appendix 3) and therefore be very heterogeneous in quality. This is a weakness in the data set at our disposal.

Based on data for 2015, we should have a finer breakdown of the CATPs; as the calculations are still in progress at Statbel, it is impossible to comment at this stage on the qualitative contribution of this new information.

3.4.4   Unknown distribution of types of property sold

The price statistics communicated by Statbel cover sale transactions on the secondary market performed during the year for each of the regions. Although the number of parcels of each type of property in each category is known, the price statistics give no indication of the proportion of each type of property sold within a category. As is shown in Table 4, the categories (and therefore the property types) which are most highly represented nationally are not necessarily those which change owners most often (e.g.: apartments, flats, studios represent 8.4 % of parcels but 23.9 % of transactions), meaning that the average price for a property category is not necessarily representative of all types of property included in the category.

TABLE 4   SIZE OF PROPERTY CATEGORIES IN 2012.

Property category	CATP	CATV number	Source Land Registry						Source FPS			
			Number of parcels	%	Total area of parcels	%	Total cadastral income	%	Number of transactions in 2012	%	Total value of sales in 2012	%
ordinary dwelling houses	P1	8	2 364 837	23,0 %	1 125 265 536	3,9 %	1 676 165 486	20,2 %	127 150	34,9 %	24 611 169 792	34,8 %
apartment blocks	P2	2	4 607	0,0 %	614 576	0,0 %	2 831 380	0,0 %	3 286	0,9 %	1 341 825 672	1,9 %
villas, bungalows, country homes	P3	3	1 059 685	10,3 %	1 292 499 920	4,5 %	1 439 216 409	17,4 %	34 636	9,5 %	11 433 824 424	16,2 %
apartments, flats, studios	P4	7	860 971	8,4 %	28 811 442	0,1 %	1 106 911 015	13,4 %	86 902	23,9 %	17 575 757 824	24,8 %
parts of buildings not otherwise specified	P5	18	907 608	8,8 %	124 262 137	0,4 %	98 533 597	1,2 %	9 098	2,5 %	420 172 108	0,6 %
retail units, businesses	P6	12	159 173	1,5 %	81 601 046	0,3 %	331 423 623	4,0 %	10 946	3,0 %	3 280 611 520	4,6 %
hotels, restaurants, cafés	P7	6	4 447	0,0 %	8 326 807	0,0 %	32 533 689	0,4 %	168	0,0 %	97 579 070	0,1 %
commercial premises	P8	5	12 382	0,1 %	33 458 863	0,1 %	109 828 941	1,3 %	3 826	1,1 %	1 133 670 768	1,6 %
office blocks	P9	6	11 655	0,1 %	22 071 327	0,1 %	342 185 890	4,1 %	568	0,2 %	639 774 404	0,9 %
other buildings of a commercial nature	P10	6	2 627	0,0 %	1 493 089	0,0 %	1 311 121	0,0 %	76	0,0 %	5 741 524	0,0 %
buildings of an industrial nature	P11	134	229 411	2,2 %	495 608 303	1,7 %	2 231 397 875	26,9 %	5 074	1,4 %	2 059 002 392	2,9 %
buildings not otherwise specified and miscellaneous buildings	P12	127	144 819	1,4 %	373 586 728	1,3 %	668 366 170	8,1 %	10 064	2,8 %	1 517 804 288	2,1 %
farmhouses	P13	2	67 158	0,7 %	219 920 454	0,8 %	52 439 624	0,6 %	3 274	0,9 %	855 685 944	1,2 %
agricultural properties	P14	10	89 753	0,9 %	118 176 933	0,4 %	23 044 325	0,3 %	1 470	0,4 %	174 374 514	0,2 %
horticultural properties	P15	5	12 463	0,1 %	43 563 682	0,2 %	11 300 663	0,1 %	194	0,1 %	46 863 548	0,1 %
arable land	P16	3	1 530 497	14,9 %	9 420 100 705	32,8 %	48 643 908	0,6 %	13 860	3,8 %	479 343 480	0,7 %
grassland	P17	3	1 214 446	11,8 %	6 678 385 351	23,3 %	30 897 942	0,4 %	9 418	2,6 %	294 743 328	0,4 %
orchards	P18	2	116 757	1,1 %	418 247 304	1,5 %	3 127 956	0,0 %	772	0,2 %	19 221 306	0,0 %
mixed agricultural land	P19	3	5 211	0,1 %	29 302 750	0,1 %	141 433	0,0 %	40	0,0 %	436 980	0,0 %
land for construction purposes	P20	5	294 278	2,9 %	373 404 237	1,3 %	27 134 086	0,3 %	33 880	9,3 %	4 322 671 564	6,1 %
industrial land	P21	10	28 401	0,3 %	244 898 215	0,9 %	30 011 462	0,4 %	122	0,0 %	26 742 946	0,0 %
woodland	P22	1	519 467	5,1 %	6 053 809 451	21,1 %	8 947 996	0,1 %	6 576	1,8 %	201 265 408	0,3 %
uncultivated land	P23	7	163 807	1,6 %	825 398 167	2,9 %	173 068	0,0 %	1 048	0,3 %	28 570 229	0,0 %
small parcels of land	P24	1	292 783	2,8 %	196 726 158	0,7 %	1 401 649	0,0 %	54	0,0 %	1 865 939	0,0 %
mixed and miscellaneous land	P25	29	176 565	1,7 %	498 824 890	1,7 %	2 254 895	0,0 %	1 540	0,4 %	200 094 863	0,3 %
TOTAL		**415**	**10 273 808**	**100 %**	**28 708 358 071**	**100 %**	**8 280 224 203**	**100 %**	**364 042**	**100 %**	**70 768 813 834**	**100 %**

3.4.5 Regional distribution of property types

Table 5 shows the distribution of the number of parcels of land by property category and region: this varies greatly from one region to another and also differs depending on whether the number of parcels or the area is considered. For example, the number of parcels of "ordinary dwellings" represents 23 % of the area in all three regions, but just 18 % in Brussels, 5 % in Wallonia and 3 % in Flanders.

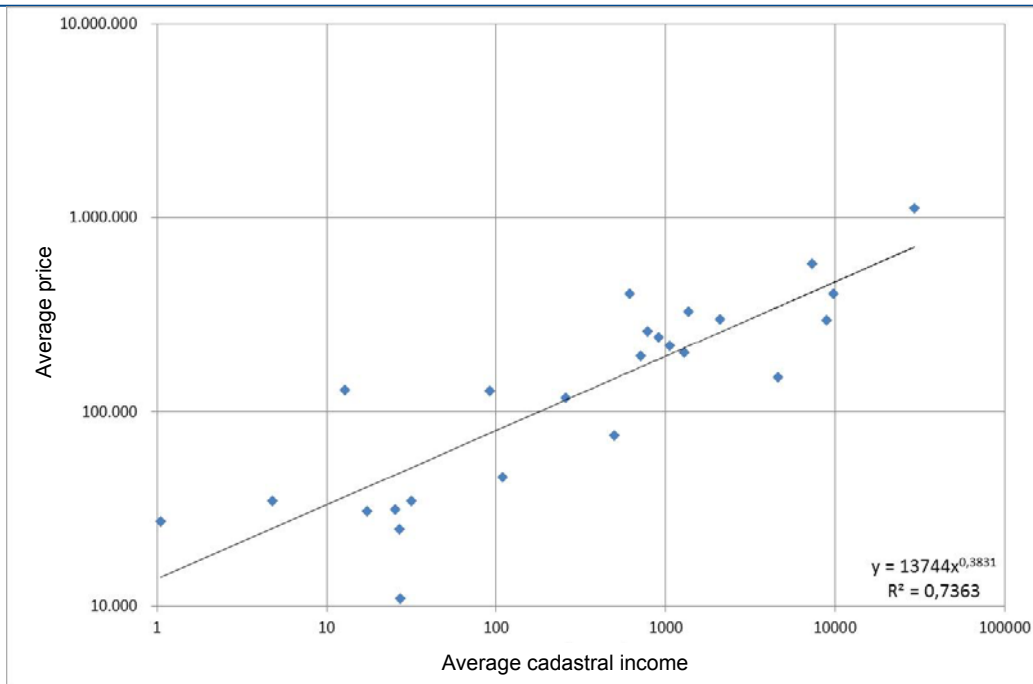TABLE 5 REGIONAL DISTRIBUTION OF PROPERTY CATEGORIES IN 2012

Property category	Code	Number of parcels			Area (m²)		
		BXL	WAL	FLA	BXL	WAL	FLA
ordinary dwelling houses	P1	122 893	937 729	1 304 215	22 832 395	499 184 560	603 248 581
apartment blocks	P2	384	2 917	1 306	13 096	370 365	231 115
villas, bungalows, country homes	P3	6 802	305 954	746 929	5 808 769	398 809 854	887 881 297
apartments, flats, studios	P4	215 048	134 406	511 517	3 088 844	6 673 743	19 048 855
parts of buildings not otherwise specified	P5	135 451	224 898	547 259	13 789 467	30 525 270	79 947 400
retail units, businesses	P6	17 601	49 578	91 994	3 369 713	23 028 443	55 202 890
hotels, restaurants, cafés	P7	242	1 748	2 457	194 585	3 608 133	4 524 089
commercial premises	P8	381	5 471	6 530	948 910	15 557 783	16 952 170
office blocks	P9	1 406	3 712	6 537	2 869 697	6 538 375	12 663 255
other buildings of a commercial nature	P10	100	738	1 789	45 391	334 133	1 113 565
buildings of an industrial nature	P11	21 271	66 072	142 068	7 998 030	152 688 003	334 922 270
buildings not otherwise specified and miscellaneous buildings	P12	4 733	67 144	72 942	14 085 092	134 571 134	224 930 502
farmhouses	P13	-	25 365	41 793	-	61 253 667	158 666 787
agricultural properties	P14	-	41 034	48 719	-	33 333 429	84 843 504
horticultural properties	P15	-	2 155	10 308	-	1 833 641	41 730 041
arable land	P16	2 494	657 919	870 084	5 955 503	4 669 781 462	4 744 363 740
grassland	P17	-	713 459	500 987	-	3 903 903 013	2 774 482 338
orchards	P18	-	47 886	68 871	-	168 924 654	249 322 650
mixed agricultural land	P19	-	3 590	1 621	-	19 195 031	10 107 719
land for construction purposes	P20	5 081	99 865	189 332	4 995 115	130 720 286	237 688 836
industrial land	P21	419	12 649	15 333	1 042 462	118 186 715	125 669 038
woodland	P22	223	366 337	152 907	18 465 172	4 951 760 829	1 083 583 450
uncultivated land	P23	466	94 018	69 323	978 642	407 722 274	416 697 251
small parcels of land	P24	4 564	154 658	133 561	3 445 643	86 961 300	106 319 215
mixed and miscellaneous land	P25	**4 320**	**82 322**	**89 923**	**15 995 756**	**192 586 424**	**290 242 710**
TOTAL		**543 879**	**4 101 624**	**5 628 305**	**125 922 282**	**16 018 052 521**	**12 564 383 268**

Source: NAI

3.4.6 Distribution of cadastral income & distribution of average prices

Generally speaking, property categories representing a large share of the total cadastral income have a high sale value. The scatter diagram of the average price of transactions by property category in terms of average cadastral income is shown in chart 1, revealing that property value correlates to cadastral income.

CHART 1 AVERAGE PRICE OF TRANSACTIONS IN TERMS OF CADASTRAL INCOME PER PROPERTY CATEGORY
(double logarithmic scale)

Source: NAI.

Moreover, for several types of property, the distribution of cadastral income appears to follow an approximately log-normal distribution. By way of illustration, chart 2 shows the regional distributions of the logarithm of cadastral income for "houses without habitable basements" (code 200040). The logarithm for cadastral income therefore follows an approximately normal distribution.

Log-normal distributions are characterised by left dissymmetry with an average above the median. The statistics supplied by Statbel also indicate that for most property categories, the average is greater than the median, with two exceptions: "land for construction purposes" and "mixed and miscellaneous land". For these two property categories, the average price per m² is frequently less than the median price per m², probably due to excessive heterogeneity between the types of property included in these categories.

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CHART 2   DISTRIBUTION OF LOG10 (CADASTRAL INCOME) BY REGION: PROPERTY 200040, YEAR 2012

(double logarithmic scale)
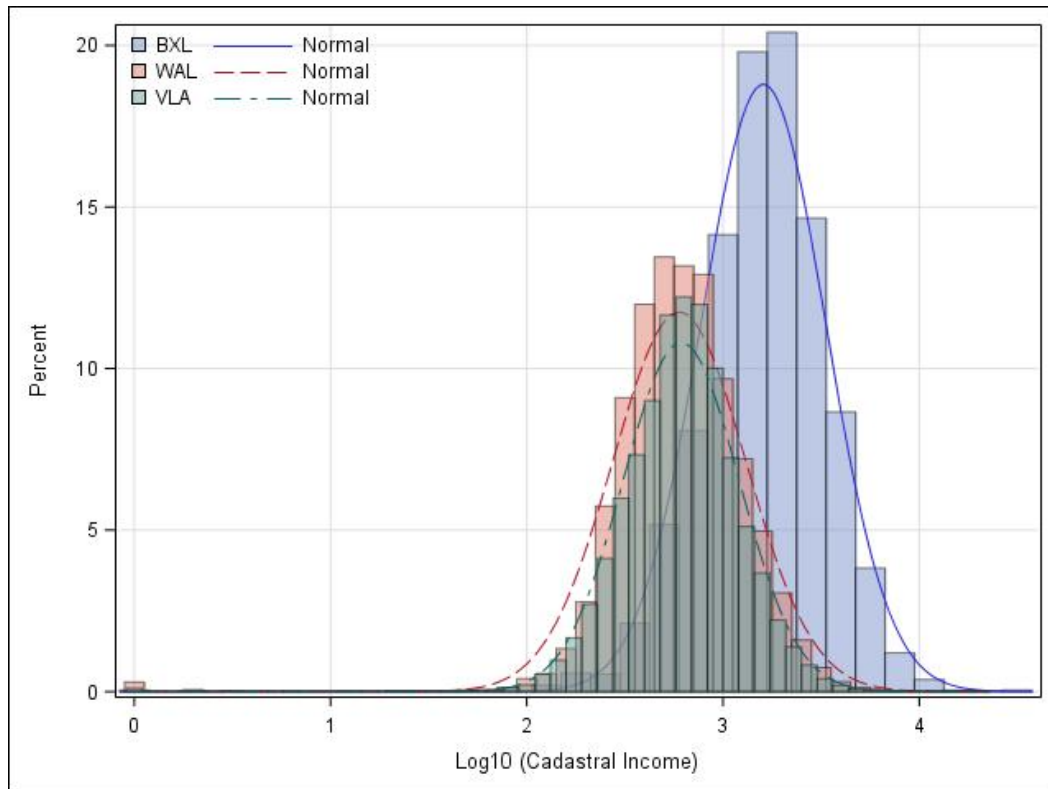
Source: NAI.

3.4.7 Regional distribution of prices

While property prices vary from one property category to another, they also vary greatly from one region to another, confirming the importance of incorporating the geographic dimension.

Average and median prices in the Brussels region are generally greater than those applying in the Flemish region, which are themselves greater than those applying in the Walloon region (chart 3).

CHART 3   SCATTER DIAGRAM OF AVERAGE AND MEDIAN PRICES BY PROPERTY CATEGORY AND BY REGION (2012) –
PROPERTY CATEGORIES 1 TO 15

(double logarithmic scale)
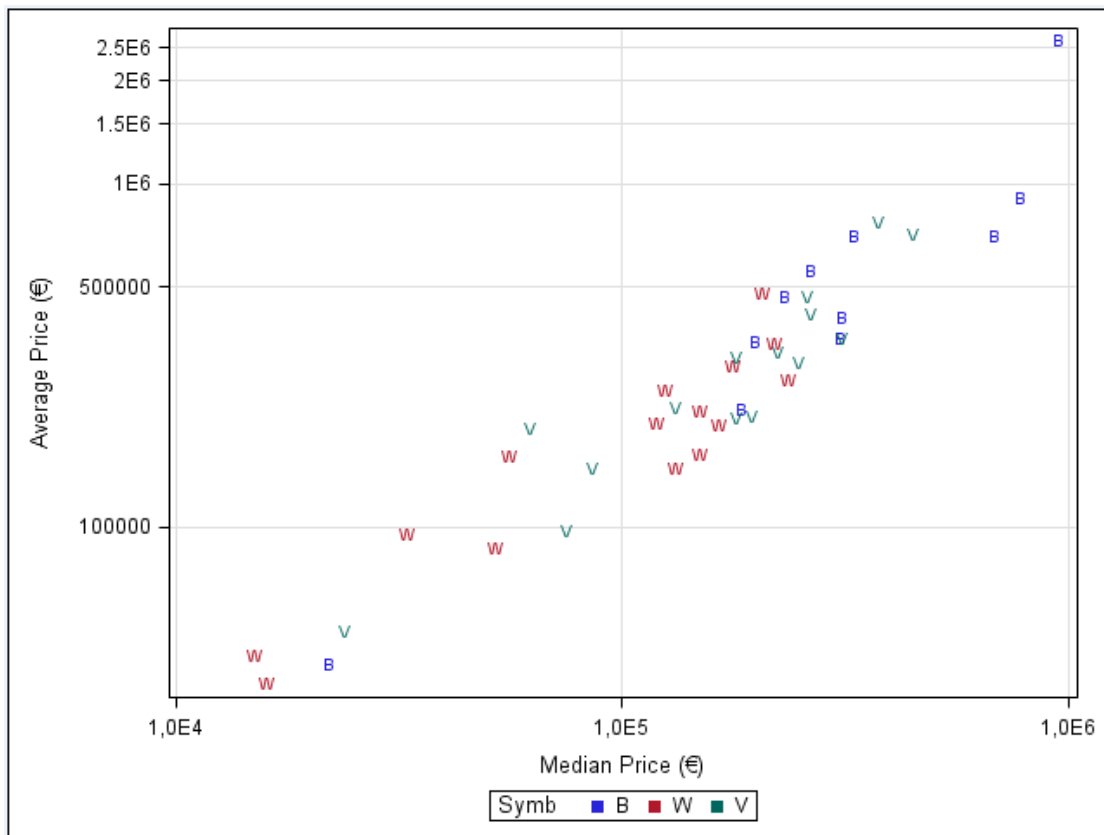
Source : NAI.

4. Processing of volume data: sectorisation issues

4.1 Sectorisation of the detailed file

Since each entry in the detailed file (FD) has a VAT number, it should be simple to allocate it to an institutional sector by matching this number to the register for the data year concerned, also ensuring consistency with other aggregates from the national accounts.

However, some VAT numbers present in the detailed file are missing from recent registers; in this case, there are two possible solutions:
– if we can find this number in previous registers, the most recent characteristics are applied;
– otherwise, a search is carried out with the Cross Bank of Enterprises, and classification is made based on the address and name;
– there are still a thousand VAT numbers for which no information is found (out of more than 1.8 million parcels of land) and which are therefore not included in the estimate. In terms of area, this represents some 3 km², or less than 0.01 % of the total registered.

4.2 Sectorisation of the aggregated file

The aggregated file (referred to below as AF) only supplies aggregates per category of owner (see point 3.1.1 above); the rules therefore have to be relaxed in order to transform certain categories (resident natural persons, legal persons, non-resident natural persons, or a combination of these) into institutional sectors.

4.2.1 General rules

The correspondence between types of owner and institutional sectors is based on the following premises:
– resident natural persons = households sector (S.14)
– legal persons = non-financial corporations (S.11), financial corporations (S.12), public sector (S.13), NPISH (S.15) or rest of the world (S.2)
– non-resident natural persons = S.2

This reasoning is reflected in a theoretical allocation of the different types of owners as follows:
– **A** comprises real estate belonging to resident natural persons
  A is allocated to S.14
– **B** comprises real estate owned jointly (with a joint ownership clause) by resident natural persons and legal persons
  B is theoretically allocated to all sectors except S.2 (1/2 to S.14; remainder to S.11, S.12, S.13 or S.15)
– **C** comprises real estate owned jointly (with a joint ownership clause) by resident and non-resident natural persons
  C is allocated half to S.14 and half to S.2
– **D** comprises real estate owned jointly (with a joint ownership clause) by non-resident natural persons and legal persons
  D is theoretically allocated to all sectors except S.14 (2/3 to S.2; remainder to S.11, S.12, S.13 or S.15)
– E comprises real estate belonging to legal persons
  E is theoretically allocated to all sectors, **in practice to the sector determined by the NA** listing according to the VAT number (based on the detailed file, see below).
– F comprises real estate owned jointly (with a joint ownership clause) by resident natural persons, non-resident natural persons and legal persons.
  F is theoretically allocated to all sectors, **and in practice to the sector determined by the NA** listing according to the VAT number (based on the detailed file, see below).

4.2.2 Consistency with the detailed file

The detailed file (referred to below as DF) covers all parcels of land owned by legal persons, i.e. the whole of category E plus (an unknown) part of categories B, D and F of the aggregated file[1]:

$$DF = E + hyp\ B/2 + hyp\ D/3 + F^2$$

A sectoral key is then calculated based on the information from the detailed file.

The final result for the whole population included in the aggregated file is illustrated with the following colour codes:
– blue: fixed distribution of values from the AF;
– green: precise distribution of the DF;
– yellow: distribution of values from the AF using key derived from the DF;
– grey: empty combinations (= 0).

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1 Since the detailed file does not mention the category of owner.
2 In view of their minor importance (750 to 1 000 parcels out of a total of several tens of millions), parcels with owners of type F are considered to all be included in the DF

Sector	Category of owner						
	A	Ba	Bb	C	Da	Db	E & F
S11			Bb11			Db11	
S12			Bb12			Db12	
S13			Bb13			Db13	
S15			Bb15			Db14	
S14							
S2							
TOTAL							

Giving, in terms of weight:

Sector	Category of owner				
	A	B	C	D	E+F
S11	0	50 %*p11/(p11+p12+p13+p15)	0	33 %*p11/(p11+p12+p13+p15)	p11
S12	0	50 %*p12/(p11+p12+p13+p15)	0	33 %*p12/(p11+p12+p13+p15)	p12
S13	0	50 %*p13/(p11+p12+p13+p15)	0	33 %*p13/(p11+p12+p13+p15)	p13
S15	100 %	50 %	50 %	0	0
S14	0	50 %*p15/(p11+p12+p13+p15)	0	33 %*p15/(p11+p12+p13+p15)	p15
S2	0	0	50 %	67 %	p2

4.3 Change of classification for some properties owned by households (S.14)

In theory, the mapping between property categories in the Land Register (CATV) is unique for all sectors.

When analysing the initial results for S.14, it appeard that, in relation to the level of capital stock, the value of land seems to be low for residential property and especially high for non-residential property, when measured by the "Land to structure ratio" (LSR, the ratio of the value of the land to that of the buildings and structures situated on it).

In order to achieve greater consistency with the approach followed in the national accounts, especially for investments in real estate, additional assumptions had to be made for the processing of some properties owned by households (S.14).

4.3.1 Change of ESA classification

Certain types of property, classed as non-residential property due to their economic purpose, appear to be able to fulfil a partial or whole housing function when owned by households (self-employed).

CATV heading	General classification	Classification for S.14
farms (240020)	AN21112	AN21111 (100 %)
castle (523470)	AN21112	AN21111 (100 %)
small cattle farm (243530)	AN21112	AN21111 (50 %) remainder in AN21112
rural building (247530)	AN21112	AN21111 (50 %) remainder in AN21112
large cattle farm (244530)	AN21112	AN21111 (25 %) remainder in AN21112
industrial workshop (265300)	AN21112	AN21111 (25 %) remainder in AN21112
other workshop (265999)	AN21112	AN21111 (10 %) remainder in AN21112
bakery (281300)	AN21112	AN21111 (10 %) remainder in AN21112
butcher's shop (282300)	AN21112	AN21111 (10 %) remainder in AN21112

Certain anomalies emerge in the ownership of property by households whose function is clearly reserved for the financial sector (S.12, for example banks), or the public sector (S.13, for example town halls), or the non-profit sector (S.15, for example churches).

Remember that this is due to the fact that property owned by type of owner A is all allocated to sector S.14, without the availability of individual data to ensure consistency with the classification of the economic entity used in the national accounts.

For the final results, certain types of property will therefore be allocated systematically to S.12, S.13 or S.15 irrespective of the initial sectorisation:

CATV heading	Sectorisation via automatic process	Specific classification
bank (400400 or 400499)	S.14 (ou S.15)	S.12
town hall (420480)	S.14 (ou S.15)	S.13
government building (421480)	S.14 (ou S.15)	S.13
royal palace (422480)	S.14 (ou S.15)	S.13
courthouse (423480)	S.14 (ou S.15)	S.13
prison (424480)	S.14 (ou S.15)	S.13
police station (426480)	S.14 (ou S.15)	S.13
military building (427480)	S.14 (ou S.15)	S.13
administrative building (434480)	S.14 (ou S.15)	S.13
places of worship (CATV ending in 460: church, chapel, bishop's palace, seminary, etc.)	S.14	S.15

5.   Processing of price data

5.1   Processing of price data

Regional data for transaction prices are analysed by CATP and by region, in order to deal with missing data or outliers. The analysis is performed on average prices, then extended to the various percentiles.

In the case of missing data, corrections are mainly made:
– by intrapolation within the same series if there are few missing items
– using the corresponding series for Belgium if most / all of the series is missing (this applies to Brussels in particular).

In the case of outliers, corrections are made:
– by intrapolation
– by the use of average growth rates
– by the use of average levels
– by using the corresponding series for Belgium

5.2   Link between the distribution of prices by percentiles and that of cadastral income in the detailed file

Once the basic data are completed and corrected, we have to decide what price to assign to each parcel of land.

The first - simplistic - method consists in allocating to each parcel the average price for the CATP to which its characteristic CATV/region combination corresponds.

However, we have much more information about price distribution than it would be appropriate to use to highlight

the details at our disposal and increase the precision of our estimates.

Firstly, we have certain percentiles of transaction prices (P10, Q25 Q50 Q75 and P90) in the data from Statbel per CATP and per region.

Secondly, the distribution of cadastral income (CI) is known in the data from the Land Registry. Even though the CI levels are irrelevant in relation to market value (CI has not been reviewed for more than 40 years - base year = 01/01/1975 but has been index-linked since 1991), their distribution remains representative of their relative value. Only relative CI will therefore be used, by no means their absolute value.

Combining these two types of information in a second method of calculation will enable the price level allocated to each parcel of land to be refined significantly.

5.3 Method of estimation: assignment of a price per parcel of land

Let, for a year t:

  c = 1, …, c identifying a category of property CATP (with c=25),
  b = 1, …, b identifying a type of property CATV (with b=415),
  b_c =1, …, B_c identifying a type of property belonging to property category "c",
  r = 1, …, r identifying a region (with r=3),
  p = 1, …, p identifying a type of owner (with p=6),
  s = 1, …,s identifying an institutional sector (S11, S12, S13, S14, S15, S2, NK[1]) (with s=7)
  Number of parcels of land :

N_{rb} = the total number of parcels of land of property type "b" in region "r"
  with $N_{rc} = \sum_{b_c=1}^{B_c} N_{rb_c}$ = the total number of parcels of land of property type "c" in region "r".

n_{rc} = the number of transactions relating to parcels of land of property category "c" in region "r"

n_{rb} = the total number of parcels of land of property type "b" in region "r"

"Price" of a parcel of land

y_{rbi} = the value of a parcel of land "i" of property type "b" in region "r" (with i = 1, …n_{rb})

y_{rci} = the value of a parcel of land "i" of property category "c" in region "r" (with i = 1, …n_{rc})

  with $\bar{y}_{rc} = \frac{\sum_{i=1}^{n_{rc}} y_{rci}}{n_{rc}}$; *the average price of a property category per region for period t*

  $\bar{y}_{rc}$ and n_{rc} are two statistics communicated by Statbel.

Cadastral income of a parcel of land

x_{rbi} = the cadastral income of a parcel of land "i" of property type "b" in region "r" (with i = 1, …n_{rb})

x_{rci} = the cadastral income of a parcel of land "i" of property category "c" in region "r" (with i = 1, …n_{rc})

Weight of a parcel of land

w_{rci} = adjusted weight of i in the population of parcels of land in property category "c" in region "r".

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1 NK : Not known

The simplest method would be to extrapolate the total value of the stock based on the average value of transactions multiplied by the number of parcels of land.

The results of the assignment of a unique average price to all parcels of land of a given CATV in a given region reveal at least two major problems, in relation to developed non-residential land (AN21112):

1. The valuation of such land for non-financial corporations (S.11) is barely higher than that of developed residential land and is lower than the real estate assets total from annual accounts. It is also far below the capital stock of non-residential buildings (AN11210) and structures (AN11220) from the national accounts, which would lead to a NEGATIVE value for this land alone after the application of the residual approach.

2. The value of developed non-residential land owned by S.11 is lower than the corresponding estimate for households (S.14), which is totally unlikely.

The average non-residential market prices have obviously been underestimated, as there are too few transactions, especially for high-value property. This is confirmed by the structure of the total value of land in the economy, where the ratio of residential/non-residential is around 55/45 for cadastral income, but 80/20 for market value if we take average prices, which is hardly plausible.

Such a simple approach underexploits the richness of the information available to us, in terms of price (it ignores percentile data) and relative cadastral income available at individual level in the detailed volume file.

It was therefore essential to develop a richer and more complex method in order to improve the estimates.

5.3.1 Extrapolation from price percentiles and marginal calibration

5.3.1.1 WEIGHTING OF PARCELS OF LAND IN THE SAMPLE

Considering that the inventory of parcels of land owned by legal persons is a sample of parcels taken from the total population, by weighting each parcel in the sample appropriately, it is possible to estimate the total value of each type of property across Belgium as a whole.

To weight each parcel, we have auxiliary information, namely:
– the number of parcels of land by type of property and by region,
– the area of parcels of land by type of property and by region,
– the cadastral income of parcels of land by type of property and by region.

This auxiliary information is available in detailed form (for each parcel of land in the sample) as well as in aggregated form at national and regional level for each type of property. These aggregates correspond to the marginal totals of distributions of cadastral income and area.

Using the marginal calibration method, it is possible to weight each of the parcels so that in the end, the weighted sum of the cadastral income, area and number of parcels of land correspond to the national and regional totals for each type of property.

w_{rci}= the weight of each parcel of land "i" in the sample situated in region "r" and property category "c".

The sample adjusted in this way is then representative of the population for each property type, per region; the adjustment criteria being the number of parcels, area and cadastral income of the parcels. The principle behind the adjustment method (marginal calibration) is described briefly in Appendix 4.

5.3.1.2 ASSIGNMENT OF A PRICE TO THE PARCELS OF LAND IN THE SAMPLE

The method of estimation used (known as CALMAR) is based on a sample of parcels of land whose weightings have been adjusted/calibrated based on the criteria of number, area and cadastral income by region and type of property.

We also assume that the prices and cadastral income of the parcels of land are correlated and simply consider that an increasing monotonic relationship links the two variables: in other words, within a given property category and for a given region, the highest prices are assigned to parcels of land with the highest cadastral income.

Based on the price statistics communicated by Statbel, we know some parameters which will enable the price distribution within a property category to be drawn roughly, per region. These are:
– first decile (P10),
– first quartile (Q25),
– second quartile or median (Q50),
– third quartile (Q75)
– last decile (P90)
– maximum price (P100)[1]

Based on the sample of weighted parcels of land, we can estimate the complete distribution of cadastral income by property category and region. The value of a parcel of land is estimated by matching its position in the distribution of cadastral income with the corresponding percentile in the price distribution.

Since we do not know each value of each percentile in the price distribution, the intermediate percentiles are estimated linearly as follows:

Let
$$x_{rc1} < \cdots < x_{rcq} < \cdots < x_{rcn_{rc}} : P_q\big(k \leq x_{rcq}\big) = \frac{q}{n_{rci}},$$
$P_a \, et \, P_b$ two known price percentiles: $P_a < P_b$ with x_{rcq_a} the value of the cadastral income corresponding to percentile "a" for property category "c" of region "r".

The estimated price of a parcel of land is:

$$\hat{y}_{rci} = y_{rcq_a} + (x_{rci} - x_{rcq_a})/(x_{rcq_b} - x_{rcq_a}).(y_{rcq_b} - y_{rcq_a})^{[2]}$$

However, observation of the results suggests that the price statistics relate to transactions where the most expensive properties are underrepresented[10].

However, the median price is considered a sufficiently robust estimator (hardly affected by the shortage of transactions relating to the most expensive properties). We therefore consider that the first percentiles up to the median are reliable.

On the other hand, P75, P90 and P100 (=Max) are skewed (underestimated) and therefore readjusted as follows:

$$P75(Prix) = P50(Prix) * \frac{P75(RC)}{P50(RC)} \qquad (4a)$$
$$P90(Prix) = P50(Prix) * \frac{P90(RC)}{P50(RC)} \qquad (4b)$$
$$PrixMax = P100(Prix) = P50(Prix) * \frac{P100(RC)}{P50(RC)} \qquad (4c)$$

Based on equations 4, 4a, 4b, 4c, a price is assigned to each parcel in the sample: $\hat{y}_{rci}$

The total value of the parcels of land in a property category is now:

$$\widehat{Y}_{rc} = \sum_{i=1}^{n_{rc}} w_{rci}.\widehat{y}_{rci} \qquad (5)$$

---

1 The maximum price (P100) did not initially form part of the data supplied by Statbel, but we have been given it for each CATP and region for the period from 2005 to 2014.
2 In other words, exceptional property transactions are less frequent than projected, in view of the proportion which these properties may represent in relation to the whole of the parcels of land.

As for the estimate of the size of each sector, this is also calculated based on the parcels of land owned by legal persons alone. The share of each sector is determined as follows:

$$\hat{Y}_{psrc} = \sum_{i=1}^{N_{psrc}} \hat{y}_{psrci} = \sum_{i=1}^{N_{psrc}}(y_{rcq_a} + (x_{psrci} - x_{..rcq_a})/(x_{..rcq_b} - x_{..rcq_a}) \cdot (y_{rcq_b} - y_{rcq_a}))$$

$$\cong \hat{Y}_{p.rc} \cdot \frac{\sum_{i=1}^{n_{psrc}} \hat{y}_{psrci}}{\sum_{p=1}^{P} \sum_{i=1}^{n_{psrc}} \hat{y}_{psrci}}$$

This second method of estimation actually supposes that the following assumptions are true:

1. In each region and for each property category, the number of transactions performed during the year is broken down by type of property in proportion to the (numerical) size of each type of property in the category concerned ($\forall r, \forall b \in c : \bar{y}_{rc} = \bar{y}_{rb}$).
2. The inventory of property belonging to legal persons is a "representative" sample of all properties throughout Belgium.
3. In each region and for each property category, the prices of parcels of land are positively correlated with their cadastral income. Their is an increasing monotonic function which links these two variables ($\forall r, \forall b \in c, \forall x_{rci} < x_{rcj} : f(x_{rci}) = y_{rci} < y_{rcj} = f(x_{rcj})$).

5.3.1.3 CORRECTION OF MAXIMUM PRICES

The results from the CALMAR method have proven to rectify the main problem by sharply increasing the value of non-residential developed land (AN21112), especially in S.11.

A more detailed analysis by property category (CATV) reveals, however, that the estimated maximum prices sometimes reach absurd levels, causing the total value of land in this category to explode.

For each year, CATV and region, the estimated value of P100 was therefore checked for plausibility. In the case of property owned by a legal person, this was compared to the book value appearing in the annual accounts, and adjusted if necessary.

5.3.2 Price differentiation by sector

However, the initial results from the CALMAR method for developed land still pose problems of consistency and plausibility, particularly when evaluated in the light of the Land to structure ratios (LSR= value of the land alone / value of the buildings and structures), which, for non-residential property, fluctuate between 900 % and 1 300 %.

Beside the classification and sectorisation issues already discussed above (section 4.3), we managed to demonstrate that the average CIs of properties owned by individuals (owner A - proxy for S.14) were systematically lower than those owned by other owners, because these were smaller, older or less well-equipped properties in general. Unsurprisingly, this applies especially to non-residential property, where the average CI of properties owned by A owners represents barely 10 % of the average CI of those owned by E owners.

TABLE 6 RATIO OF AVERAGE CI BETWEEN NATURAL PERSONS AND LEGAL PERSONS
(average 2005-2014)

	Average CI for A owners (proxy S.14) (1)	Average CI for E owners (proxy S11+S12+S13) (2)	(1)/(2)
AN21111			
BXL	EUR 1 190 per parcel of land	EUR 1 195 per parcel of land	**61 %**
VLA	*EUR 832 per parcel of land*	*EUR 794 per parcel of land*	*105 %*
WAL	EUR 717 per parcel of land	EUR 744 per parcel of land	**96 %**
AN21112			
BXL	EUR 2 186 per parcel of land	EUR 26 622 per parcel of land	**8 %**
VLA	EUR 1 020 per parcel of land	EUR 10 838 per parcel of land	**9 %**
WAL	EUR 749 per parcel of land	EUR 6 793 per parcel of land	**11 %**

Source : NAI

It was therefore decided, in assigning prices to each parcel of land, to also factor in the owner sector, to differentiate the price level according to the owner. This was implemented as follows:

Let
$\widehat{\overline{Y}}_{rb}$ the average price of property type b in region r,
$\widehat{\overline{Y}}_{rbp}$ = the average price of property type b in region r owned by type p owners

$$\widehat{\overline{Y}}_{rb} = \frac{\sum_{i=1}^{n_{rb}} w_{rbi} \cdot \hat{y}_{rbi}}{\sum_{i=1}^{n_{rb}} w_{rbi}} = \frac{\sum_{p=1}^{P} N_{rbp} \cdot \widehat{\overline{Y}}_{rbp}}{\sum_{p=1}^{p} N_{rbp}}$$

Supposing the average price for a property type for a region and owner type is proportional to the average cadastral income:

$$\widehat{\overline{Y}}_{rbp} = t_{rbp} \cdot \overline{X}_{rbp} = t_{rbp} \cdot \frac{X_{rbp}}{N_{rbp}}$$

with
X_{rbp} = the total cadastral income for type b parcels of land in region r owned by type p owners
N_{rbp} the corresponding number of parcels of land.

These two parameters are known at the level of the population (transmitted in the aggregated file from the land registry).

In this way, we can differentiate the average price for a property type in a region according to the type of owner ($\widehat{\overline{Y}}_{rbp}$).

$$\widehat{\overline{\overline{Y}}}_{p.rb} = \frac{\sum_{i=1}^{n_{prbi}} x_{prbi}}{\sum_{p=1}^{P} \sum_{i=1}^{n_{prbi}} x_{prbi}} \cdot \left(\widehat{\overline{Y}}_{rb}\right) \cdot \frac{N_{rb}}{N_{prb}}$$

6.   Retropolation S.14 and S.15 for the period 1995-2004

In table 26 of the TP, the mandatory transmission of stocks of land owned by households (S.14) and NPISHs (S.15) relates to the period 1995-2015.

The main underlying databases for the project are however only available in the necessary detail from 2005 onwards.

Previous years for which transmission to Eurostat is mand atory must therefore be estimated using a simplified retropolation method.

6.1   Volume data

For the period 2000 to 2004, the volume data from the land register are available per category to 3 positions (some 200 CATV 3 digits categories, compared to 400 to 500 CATV 6 digits for 2005 and subsequent years). They exist per region, but their level of detail is insufficient to produce a distribution by sector.

For the period 1995 to 1999, we only have a few totals per region:
>   developed parcels of land
>   undeveloped parcels of land
>   public buildings
>   apartment blocks (CATV3 222)
>   woodland (CATV3 009)

6.2   Price data

Price data are available for the entire period to be covered, for 32 categories and it is possible to relate most of these data to those available from 2005 onwards, as shown in table 7.

TABLE 7   PRICE NOMENCLATURE 1995-2004

1995-2004		2005-2014	
Number	Heading	CATP	Heading
01	dwelling houses	P1	ordinary dwelling houses
02	apartment blocks	P2	apartment blocks
03	principal dwellings and mansions	-	-
04	villas, bungalows, country homes	P3	villas, bungalows, country homes
05	apartments, flats, studios	P4	apartments, flats, studios
06	parts of buildings not otherwise specified	P5	parts of buildings not otherwise specified
07	retail units, businesses	P6	retail units, businesses
08	hotels, restaurants, cafés	P7	hotels, restaurants, cafés
09	commercial premises	P8	commercial premises
10	office blocks	P9	office blocks
11	offices (part of building)	-	-
12	other buildings of a commercial nature	P10	other buildings of a commercial nature
13	buildings of an industrial nature	P11	buildings of an industrial nature
14	buildings not otherwise specified and miscellaneous buildings	P12	buildings not otherwise specified and miscellaneous buildings
15	ruined and dilapidated buildings	-	-
16	farmhouses	P13	farmhouses
17	agricultural properties	P14	agricultural properties
18	horticultural properties	P15	horticultural properties
19	miscellaneous properties	-	miscellaneous properties
20	arable land	P16	arable land
21	grassland	P17	grassland
22	arable land and grassland	-	-
23	horticultural land	-	-
24	orchards	P18	orchards
25	mixed agricultural land	P19	mixed agricultural land
26	land for construction purposes	P20	land for construction purposes
27	industrial land	P21	industrial land
28	woodland	P22	woodland
29	uncultivated land	P23	uncultivated land
30	recreational land	-	-
31	small parcels of land	P24	small parcels of land
32	mixed and miscellaneous land n.d.a.	P25	mixed and miscellaneous land n.d.a.

Source : NAI

6.3   Calculation of volumes

It is easy to aggregate the data for the period 2005-2014 according to the 3-position categories already present; we then have series covering 2000 to 2014 for the 200 categories.

A linear regression[1] is performed on this period on the number of parcels of land for developed land and the area in m² for undeveloped land.

The specific series already available (apartments, public buildings, woodland), are included as they stand.

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1   Regression over time with a constant term on the number of parcels of land for developed land and the area in m² for undeveloped land. In the three regions, the series relating to apartments has been estimated using a loglinear model; in Brussels, this also applies to the common parts of buildings.

The other series are then recalibrated so as to respect the totals for developed / undeveloped land.

This method delivers a satisfactory estimate, especially for undeveloped land, as shown by the gaps to be redistributed in order to calibrate based on the existing totals.

Gap between totals before and after calibration

	Flanders	Wallonia	Brussels
Developed parcels of land	1,6 %	1,0 %	5,9 %
Undeveloped parcels of land	0,2%	0,2%	0,1%

6.4 Calculation of prices

Although the headings are the same, there are some very noticeable changes between 2004 and 2005 (both upward and downward), which could indicate breaks in series. Since there are no years common to both nomenclatures, we proceeded as follows:

In each region, for categories where the average price rose by more than 100 % or fell by more than 50 %, we see if the 2005 level is abnormally high (or low in the case of a fall) in relation to the 2006-2014 series:

> If not, we assume that there is no break and accept the change observed;

> If so, we look for a category with similar content and apply its change between 2004 and 2005, and retropolate the rest of the series with the variations applying to the initial category. If there is no similar category with "normal" changes, we cap the rise at 100 % and the fall at 50 %.

The following series had their 2004/2005 changes modified:

Price category[1]	Flanders	Wallonia	Brussels
P5 / 06		limited to +100 %	change P4
P10 / 12	change P8	change P8	change P8
P14 / 17	change P15	limited to -50 %	
P15 / 18		limited to -50 %	
P19 / 25	average change P16+P17		
P21 / 26	change P20		
P22 / 28	average change P16+P17		limited to +100 %
P23 / 29			limited to +100 %
P24 / 31	change P25		
P25 / 32		limited to +100 %	

[1] The first code is the reference for data from 2005 onwards, the second, before 2005.

6.5 Calculation of the value indicator

The starting value is the value estimate according to the CALMAR method for the year 2005, broken down by region, by 6-digit CATV and by sector.

The raw results were modified in order to rectify certain issues of consistency between the estimate for land and that for buildings for S.14 modelled on what was done for 2005 and subsequent years.

For S.14:

Transfer of (parts of) some properties to residential developed land

Transfer of some categories of property to S.12, S.13 and S.15.

For S.15:

Transfer of some categories from other sectors (essentially S.14)

Appendices

Appendix 1: volume categories CATV

CATV	Heading volume
001000	land, field
002000	pasture
003000	meadow
004000	garden
005000	vegetable garden
006000	ha field
007000	grazing, pasture land
008000	sheep grazing land
009000	woodland
010000	high orchard
011000	low orchard
013000	plant/tree nursery
014000	Christmas trees
017000	park
018000	sports field
020000	playground
021000	campsite
022000	swimming pool
024000	watering place
025000	pool
026000	pond
027000	lake
028000	canal
029000	ditch
030000	fish farm
033000	path
034000	square
035000	uncultivated land
036000	moorland
038000	marsh
039000	fen
041000	alluvium
042000	dune
043000	rampart / wall
044000	dyke
045000	slag heap
046000	disused tip
046999	disused tip (other)
049000	tip in use
049999	tip in use (other)
050000	industrial land
051000	yard
052000	quay
054000	basin (not included elsewhere)
055000	railway

CATV	Heading volume
056000	slag heap in use
057000	quarry
059000	canal
062000	burial mound
062999	burial mound (other)
063000	marker stone
067000	permit for construction of an ordinary building
068000	permit for construction of a special building
069000	permit for construction of an industrial building
070000	parcel of land for construction purposes
071000	car park
072000	aerodrome
073000	military land
074000	cemetery
075000	vineyard
076000	ordinary basin
077000	courtyard
078000	land for construction purposes
079000	open air parking area
164000	area and common parts of an apartment block
165000	common parts of an apartment block
166000	developed area of a building
200010	house with garden
200030	villa
200031	bungalow
200032	country house
200040	house without habitable basement
200041	two-storey house
200050	house with habitable basement
200060	house with only a porch as entrance
200070	house with entrance and porch
200080	house with no dwelling on the ground oor
200460	house (place of worship)
200999	house (other)
201500	temporary accommodation (outbuilding of accommodation (no garage))
201510	temporary accommodation (technical or industrial outbuilding)
201520	temporary accommodation (commercial outbuilding)
201999	temporary accommodation (other)
202500	shack (outbuilding of a dwelling)
202510	shack (technical or industrial outbuilding)
202520	shack (commercial outbuilding)
202999	shack (other)
203300	storage place (industrial building)
203500	storage place (outbuilding of a house)
203510	storage place (technical or industrial outbuilding)
203520	storage place (commercial outbuilding)
203999	storage place (other)

CATV	Heading volume
204500	garage (outbuilding of a dwelling)
204510	garage (technical or industrial outbuilding)
204520	garage (commercial outbuilding)
204999	garage (other)
205500	lean-to (outbuilding of a dwelling)
205510	lean-to (technical or industrial building)
205520	lean-to (commercial outbuilding)
205999	lean-to (other)
206500	toilets (outbuilding of a dwelling (not garage))
206510	toilets (technical or industrial building)
206520	toilets (commercial building)
206999	toilets (other)
220101	apartments (in a building without a lift)
220102	production plant (in a building without a lift)
220103	garage/parking area (in a building without a lift)
220104	miscellaneous premises (in a building without a lift)
220110	apartment in a building with a single owner (in a building with a lift)
220111	apartments (in a building with a lift)
220112	production plant (in a building with a lift)
220113	garage/parking area (in a building with a lift)
220114	miscellaneous premises (in a building with a lift)
220999	other (in a building without a lift)
221101	apartment (in residential block without a lift)
221102	production plant (in residential block without lift)
221103	garage / parking area (in residential block without lift)
221104	miscellaneous premises (in residential block without lift)
221111	apartment (in residential block with lift)
221112	production plant (in residential block with lift)
221113	garage / parking area (in residential block with lift)
221114	miscellaneous premises (in residential block with lift)
221999	other (in residential block without lift)
222080	apartment in a house with no dwelling on the ground oor
222100	apartment in a building with a single owner (in a building without a lift)
222110	apartment in a building with a single owner (in a building with a lift)
222210	apartment (with private entrance)
222999	other apartments
223105	stacked dwellings (in residential block with lift)
223999	stacked dwellings (other)
240020	farm
240999	farm (other)
241530	stable
241999	barn (other)
242530	dovecote
242999	dovecote (other)
243530	small cattle farm
243999	small cattle farm (other)
244530	large cattle farm

CATV	Heading volume
244999	large cattle farm (other)
245531	greenhouse in an agricultural property
245532	independent greenhouse
245999	greenhouse (other)
246530	mushroom cultivation area (farm)
246999	mushroom cultivation area (other)
247300	rural buildings (industrial building)
247530	rural buildings (farms)
247999	rural buildings (other)
260300	printing works
260999	printing works (other)
261300	bodyshop (industrial building)
261999	bodyshop (other)
262300	forge (industrial building)
262999	forge (other)
263300	carpentry workshop (industrial building)
263999	carpentry workshop (other)
264300	laundry (industrial building)
264999	laundry (other)
265300	workshop (industrial building)
265999	workshop (other)
280300	dairy (industrial building)
280999	dairy (other)
281300	bakery (industrial building)
281999	bakery (other)
282300	butcher's shop (industrial building)
282999	butcher's shop (other)
283300	slaughter house (industrial building)
283999	slaughter house (other)
284300	animal feed factory (industrial building)
284999	animal feed factory (other)
285300	coffee factory (industrial building)
285999	coffee factory (other)
286300	brewery (industrial building)
286999	brewery (other)
287300	drinks factory (industrial building)
287999	drinks factory (other)
288300	tobacco factory (industrial building)
288999	tobacco factory (other)
289300	flour mill (industrial building)
289999	flour mill (other)
290300	food factory (industrial building)
290999	food factory (other)
300300	clothing factory (industrial building)
300999	clothing factory (other)
301300	textile factory (industrial building)
301999	textile factory (other)

CATV	Heading volume
302300	leather factory (industrial building)
302999	leather factory (other)
303300	furniture factory (industrial building)
303999	furniture factory (other)
304300	toy factory (industrial building)
304999	toy factory (other)
305300	papermill (industrial building)
305999	papermill (other)
306300	consumer goods factory (industrial building)
306999	consumer goods factory (other)
320300	brickworks (industrial building)
320999	brickworks (other)
321300	cement works (industrial building)
321999	cement works (other)
322300	sawmill (industrial building)
322999	sawmill (other)
323300	paint factory (industrial building)
323999	paint factory (other)
324300	construction materials factory (industrial building)
324999	construction materials factory (other)
340300	metalworks (industrial building)
340999	metalworks (other)
341300	blast furnace (industrial building)
341999	blast furnace (other)
342300	lime kiln (industrial building)
342999	lime kiln (other)
343300	construction workshop (industrial building)
343999	construction workshop (other)
344300	electrical equipment factory (industrial building)
344999	electrical equipment factory (other)
345300	oil refinery (industrial building)
345999	oil refinery (other)
346300	chemicals factory (industrial building)
346999	chemicals factory (other)
347300	rubber factory (industrial building)
347999	rubber factory (other)
348300	ice factory (industrial building)
348999	ice factory (other)
349300	glassworks (industrial building)
349999	glassworks (other)
350300	plastic factory (industrial building)
350999	plastic factory (other)
351300	ceramics factory (industrial building)
351999	ceramics factory (other)
352300	coal mine (industrial building)
352999	coal mine (other)
353300	power station (industrial building)

CATV	Heading volume
353999	power station (other)
354300	gasworks (industrial building)
354999	gasworks (other)
355300	gasometer (industrial building)
355999	gasometer (other)
356300	coke factory (industrial building)
356999	coke factory (other)
357300	factory (industrial building)
357999	factory (other)
370300	hangar (industrial building)
370999	hangar (other)
371300	warehouse (industrial building)
371540	warehouse (special building)
371999	warehouse (other)
372300	electrical cabin (industrial building)
372999	electrical cabin (other)
373300	pylon (industrial building)
373999	pylon (other)
374300	gas cabin (industrial building)
374999	gas cabin (other)
375300	cabin (industrial building)
375999	cabin (other)
376300	tank (industrial building)
376999	tank (other)
377300	silo (industrial building)
377999	silo (other)
378300	research centre (industrial building)
378999	research centre (other)
379300	drying plant (industrial building)
379999	drying plant (other)
380300	refrigeration plant (industrial building)
380999	refrigeration plant (other)
381300	tools and equipment (industrial building)
381999	tools and equipment (other)
382305	part of factory (industrial building)
382999	part of factory (other)
400030	bank
400400	bank (office building)
400999	bank (other)
401400	stock exchange (office building)
401999	stock exchange (other)
402400	office building (office building)
402480	office building (public use)
402999	office building (other)
403420	café (hospitality)
403999	café (other)
404420	hotel (hospitality)

CATV	Heading volume
404999	hotel (other)
405420	restaurant (hospitality)
405999	restaurant (other)
406430	reception hall (for cultural, sporting or recreational purposes)
406999	reception hall (other)
407030	commercial establishment
407040	commercial establishment without habitable basement
407200	commercial establishment without private entrance
407210	commercial establishment with private entrance
407220	commercial establishment with just a porch as entrance
407230	commercial establishment with a porch and a private entrance
407999	commercial establishment (other)
408410	large (commercial) store
408999	large store (other)
409300	garage/storeroom (industrial building)
409540	garage/storeroom (special building)
409999	garage/storeroom (other)
410410	car park building (for commercial purposes)
410999	car park building (other)
411410	petrol station (for commercial purposes)
411999	petrol station (other)
412410	covered market (for commercial purposes)
412999	covered market (other)
413300	exhibition hall (industrial bulding)
413410	exhibition hall (for commercial purposes)
413999	exhibition hall (other)
414540	kiosk (special building)
414999	kiosk (other)
415540	animal home or enclosure (special building)
415999	animal home or enclosure (other)
420480	town hall (public use)
420999	town hall (other)
421480	government building (public use)
421999	government building (other)
422480	royal palace (public use)
422999	royal palace (other)
423480	courthouse (for public use)
423999	courthouse (other)
424480	penitentiary facility (public use)
424999	penitentiary facility (other)
425480	embassy (public use)
425999	embassy (other)
426480	police station (public use)
426999	police station (other)
427480	military building (public use)
427999	military building (other)
428480	station (public use)

CATV	Heading volume
428999	station (other)
429480	shelter (public use)
429999	shelter (other)
430480	phone booth (public use)
430999	phone booth (other)
431480	telecommunications building (public use)
431999	telecommunications building (other)
432480	airport (public use)
432999	airport (other)
433480	morgue (public use)
433999	morgue (other)
434300	administrative building (industrial building)
434400	administrative building (office building)
434440	administrative building (care and welfare)
434480	administrative building (public use)
434999	administrative building (other)
440440	orphanage (care and welfare)
440999	orphanage (other)
441440	crèche (care and welfare)
441999	crèche (other)
442440	sheltered workshop (care and welfare)
442999	sheltered workshop (other)
443440	care home (care and welfare)
443999	care home (other)
444440	nursing home (care and welfare)
444999	nursing home (other)
445440	spa establishment (care and healthcare)
445999	spa establishment (other)
446440	social assistance building (care and welfare)
446460	social assistance building (place of worship)
446999	social assistance building (other)
460040	school building (without habitable basement)
460450	school building (for educational purposes)
460999	school building (other)
461450	university (for educational purposes)
461999	university (other)
462430	museum (for cultural, sporting or recreational purposes)
462999	museum (other)
463430	library (for cultural, sporting or recreational purposes)
463999	library (other)
480460	church (place of worship)
480999	church (other)
481460	chapel (place of worship)
481999	chapel (other)
482460	monastery/convent (place of worship)
482999	monastery/convent (other)
483460	presbytery (place of worship)

CATV	Heading volume
483999	presbytery (other)
484460	seminary (place of worship)
484999	seminary (other)
485460	bishop's palace (place of worship)
485999	bishop's palace (other)
486460	synagogue (place of worship)
486999	synagogue (other)
487460	mosque (place of worship)
487999	mosque (other)
488460	temple (place of worship)
488999	temple (other)
489440	religious building (for care and welfare)
489460	other religious buildings
489999	other religious buildings (other)
500430	bathing establishment (for cultural, sporting or recreational purposes)
500999	bathing establishment (other)
501430	sports centre (for cultural, sporting or recreational purposes)
501999	sports centre (other)
502430	holiday home (for cultural, sporting or recreational purposes)
502999	holiday home (other)
503033	holiday residence (for cultural, sporting or recreational purposes)
503999	holiday residence (other)
504430	youth centre (for cultural, sporting or recreational purposes)
504999	youth centre (other)
505430	theatre (for cultural, sporting or recreational purposes)
505999	theatre (other)
506430	performance venue (for cultural, sporting or recreational purposes)
506999	performance venue (other)
507430	cultural centre (for cultural, sporting or recreational purposes)
507999	cultural centre (other)
508430	cinema (for cultural, sporting or recreational purposes)
508999	cinema (other)
509430	casino (for cultural, sporting or recreational purposes)
509999	casino (other)
510430	viewpoint (for cultural, sporting or recreational purposes)
510999	viewpoint (other)
520460	ruins (place of worship)
520540	ruins (special building)
520999	ruins (other)
521540	underground space (special building)
521999	underground space (other)
522540	pavilion (special building)
522999	pavilion (other)
523470	castle
523999	castle (other)
524540	historic building (special building)
524999	historic building (other)

CATV	Heading volume
525540	monument (special building)
525999	monument (other)
526540	windmill (special building)
526999	windmill (other)
527540	watermill (special building)
527999	watermill (other)
528540	water tower (special building)
528999	water tower (other)
529540	water collection facility (special building)
529999	water collection facility (other)
530540	water treatment plant (special building)
530999	water treatment plant (other)
531540	waste treatment facility (special building)
531999	waste treatment facility (other)

Appendix 2: price categories CATP

CATP	Heading prices
P1	ordinary dwelling houses
P2	apartment building
P3	villas, bungalows, country homes
P4	apartments, flats, studios
P5	parts of buildings not otherwise specified
P6	retail units, businesses
P7	hotels, restaurants, cafés
P8	commercial premises
P9	office blocks
P10	other buildings of a commercial nature
P11	buildings of an industrial nature
P12	buildings not otherwise specified and miscellaneous buildings
P13	farmhouses
P14	agricultural properties
P15	horticultural properties
P16	arable land
P17	grassland
P18	orchards
P19	mixed agricultural land
P20	land for construction purposes
P21	industrial land
P22	woodland
P23	uncultivated land
P24	small parcels of land
P25	mixed and miscellaneous land

Appendix 3: volume / price / land / buildings mapping

Volume CATV	Price CATP	Land AN211	Buildings AN111
001000	P16	AN21121	
002000	P17	AN21121	
003000	P17	AN21121	
004000	P24	AN21192	
005000	P16	AN21121	
006000	P17	AN21121	
007000	P17	AN21121	
008000	P17	AN21121	
009000	P22	AN21122	
010000	P18	AN21121	
011000	P18	AN21121	
013000	P19	AN21121	
014000	P19	AN21121	
017000	P25	AN21130	
018000	P25	AN21130	
020000	P25	AN21130	
021000	P25	AN21130	
022000	P25	AN21130	
024000	P25	AN21192	
025000	P25	AN21192	
026000	P25	AN21192	
027000	P25	AN21192	
028000	P11	AN21112	AN11220
029000	P25	AN21192	
030000	P25	AN21123	
033000	P25	AN21192	
034000	P25	AN21192	
035000	P23	AN21192	
036000	P23	AN21192	
038000	P23	AN21192	
039000	P23	AN21192	
041000	P19	AN21121	
042000	P23	AN21192	
043000	P11	AN21112	AN11220
044000	P11	AN21112	AN11220
045000	P25	AN21192	
046000	P25	AN21192	
046999	P25	AN21192	
049000	P25	AN21192	
049999	P25	AN21192	
050000	P21	AN21192	
051000	P21	AN21192	
052000	P11	AN21112	AN11220
054000	P11	AN21112	AN11220
055000	P11	AN21112	AN11220

Volume CATV	Price CATP	Land AN211	Buildings AN111
056000	P21	AN21192	
057000	P21	AN21192	
059000	P11	AN21112	AN11220
062000	P25	AN21192	
062999	P25	AN21192	
063000	P25	AN21192	
067000	P20	AN21111	
068000	P20	AN21112	
069000	P20	AN21112	
070000	P20	AN21191	
071000	P11	AN21112	AN11220
072000	P11	AN21112	AN11220
073000	P11	AN21112	AN11220
074000	P25	AN21192	
075000	P16	AN21121	
076000	P11	AN21112	AN11220
077000	P25	AN21191	
078000	P20	AN21191	
079000	P25	AN21191	
164000	P1	AN21111	AN11100
165000	P1	AN21111	AN11100
166000	P12	AN21112	AN11210
200010	P1	AN21111	AN11100
200030	P3	AN21111	AN11100
200031	P3	AN21111	AN11100
200032	P3	AN21111	AN11100
200040	P1	AN21111	AN11100
200041	P1	AN21111	AN11100
200050	P1	AN21111	AN11100
200060	P1	AN21111	AN11100
200070	P1	AN21111	AN11100
200080	P1	AN21111	AN11100
200460	P12	AN21112	AN11210
200999	P1	AN21111	AN11100
201500	P5	AN21111	AN11100
201510	P11	AN21112	AN11210
201520	P10	AN21112	AN11210
201999	P12	AN21112	AN11210
202500	P5	AN21111	AN11100
202510	P11	AN21112	AN11210
202520	P10	AN21112	AN11210
202999	P12	AN21112	AN11210
203300	P11	AN21112	AN11210
203500	P5	AN21111	AN11100
203510	P11	AN21112	AN11210
203520	P10	AN21112	AN11210
203999	P12	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
204500	P5	AN21111	AN11100
204510	P11	AN21112	AN11210
204520	P10	AN21112	AN11210
204999	P12	AN21112	AN11210
205500	P5	AN21111	AN11100
205510	P11	AN21112	AN11210
205520	P10	AN21112	AN11210
205999	P12	AN21112	AN11210
206500	P5	AN21111	AN11100
206510	P11	AN21112	AN11210
206520	P10	AN21112	AN11210
206999	P12	AN21112	AN11210
220101	P4	AN21111	AN11100
220102	P11	AN21112	AN11210
220103	P5	AN21111	AN11100
220104	P5	AN21111	AN11100
220110	P4	AN21111	AN11100
220111	P4	AN21111	AN11100
220112	P11	AN21112	AN11210
220113	P5	AN21111	AN11100
220114	P5	AN21111	AN11100
220999	P5	AN21111	AN11100
221101	P4	AN21111	AN11100
221102	P11	AN21112	AN11210
221103	P5	AN21111	AN11100
221104	P5	AN21111	AN11100
221111	P4	AN21111	AN11100
221112	P11	AN21112	AN11210
221113	P5	AN21111	AN11100
221114	P5	AN21111	AN11100
221999	P5	AN21111	AN11100
222080	P4	AN21111	AN11100
222100	P4	AN21111	AN11100
222110	P4	AN21111	AN11100
222210	P4	AN21111	AN11100
222999	P4	AN21111	AN11100
223105	P2	AN21111	AN11100
223999	P2	AN21111	AN11100
240020	P13	AN21112	AN11210
240999	P13	AN21112	AN11210
241530	P14	AN21112	AN11210
241999	P14	AN21112	AN11210
242530	P14	AN21112	AN11210
242999	P14	AN21112	AN11210
243999	P14	AN21112	AN11210
244530	P14	AN21112	AN11210
244999	P14	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
245531	P15	AN21112	AN11210
245532	P15	AN21112	AN11210
245999	P15	AN21112	AN11210
246530	P15	AN21112	AN11210
246999	P15	AN21112	AN11210
247300	P11	AN21112	AN11210
247530	P14	AN21112	AN11210
247999	P14	AN21112	AN11210
260300	P11	AN21112	AN11210
260999	P11	AN21112	AN11210
261300	P11	AN21112	AN11210
261999	P11	AN21112	AN11210
262300	P11	AN21112	AN11210
262999	P11	AN21112	AN11210
263300	P11	AN21112	AN11210
263999	P11	AN21112	AN11210
264300	P11	AN21112	AN11210
264999	P11	AN21112	AN11210
265300	P11	AN21112	AN11210
265999	P11	AN21112	AN11210
280300	P11	AN21112	AN11210
280999	P11	AN21112	AN11210
281300	P11	AN21112	AN11210
281999	P11	AN21112	AN11210
282300	P11	AN21112	AN11210
282999	P11	AN21112	AN11210
283300	P11	AN21112	AN11210
283999	P11	AN21112	AN11210
284300	P11	AN21112	AN11210
284999	P11	AN21112	AN11210
285300	P11	AN21112	AN11210
285999	P11	AN21112	AN11210
286300	P11	AN21112	AN11210
286999	P11	AN21112	AN11210
287300	P11	AN21112	AN11210
287999	P11	AN21112	AN11210
288300	P11	AN21112	AN11210
288999	P11	AN21112	AN11210
289300	P11	AN21112	AN11210
289999	P11	AN21112	AN11210
290300	P11	AN21112	AN11210
290999	P11	AN21112	AN11210
300300	P11	AN21112	AN11210
300999	P11	AN21112	AN11210
301300	P11	AN21112	AN11210
301999	P11	AN21112	AN11210
302300	P11	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
302999	P11	AN21112	AN11210
303300	P11	AN21112	AN11210
303999	P11	AN21112	AN11210
304300	P11	AN21112	AN11210
304999	P11	AN21112	AN11210
305300	P11	AN21112	AN11210
305999	P11	AN21112	AN11210
306300	P11	AN21112	AN11210
306999	P11	AN21112	AN11210
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320999	P11	AN21112	AN11210
321300	P11	AN21112	AN11210
321999	P11	AN21112	AN11210
322300	P11	AN21112	AN11210
322999	P11	AN21112	AN11210
323300	P11	AN21112	AN11210
323999	P11	AN21112	AN11210
324300	P11	AN21112	AN11210
324999	P11	AN21112	AN11210
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340999	P11	AN21112	AN11210
341300	P11	AN21112	AN11210
341999	P11	AN21112	AN11210
342300	P11	AN21112	AN11210
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344300	P11	AN21112	AN11210
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346300	P11	AN21112	AN11210
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347999	P11	AN21112	AN11210
348300	P11	AN21112	AN11210
348999	P11	AN21112	AN11210
349300	P11	AN21112	AN11210
349999	P11	AN21112	AN11210
350300	P11	AN21112	AN11210
350999	P11	AN21112	AN11210
351300	P11	AN21112	AN11210
351999	P11	AN21112	AN11210
352300	P11	AN21112	AN11220
352999	P11	AN21112	AN11220
353300	P11	AN21112	AN11220
353999	P11	AN21112	AN11220

Volume CATV	Price CATP	Land AN211	Buildings AN111
354300	P11	AN21112	AN11210
354999	P11	AN21112	AN11210
355300	P11	AN21112	AN11210
355999	P11	AN21112	AN11210
356300	P11	AN21112	AN11210
356999	P11	AN21112	AN11210
357300	P11	AN21112	AN11210
357999	P11	AN21112	AN11210
370300	P11	AN21112	AN11210
370999	P11	AN21112	AN11210
371300	P11	AN21112	AN11210
371540	P11	AN21112	AN11210
371999	P11	AN21112	AN11210
372300	P11	AN21112	AN11220
372999	P11	AN21112	AN11220
373300	P11	AN21112	AN11220
373999	P11	AN21112	AN11220
374300	P11	AN21112	AN11220
374999	P11	AN21112	AN11220
375300	P11	AN21112	AN11220
375999	P11	AN21112	AN11220
376300	P11	AN21112	AN11220
376999	P11	AN21112	AN11220
377300	P11	AN21112	AN11210
377999	P11	AN21112	AN11210
378300	P11	AN21112	AN11210
378999	P11	AN21112	AN11210
379300	P11	AN21112	AN11210
379999	P11	AN21112	AN11210
380300	P11	AN21112	AN11210
380999	P11	AN21112	AN11210
381300	P11	AN21112	AN11210
381999	P11	AN21112	AN11210
382305	P11	AN21112	AN11210
382999	P11	AN21112	AN11210
400030	P9	AN21112	AN11210
400400	P9	AN21112	AN11210
400999	P9	AN21112	AN11210
401400	P9	AN21112	AN11210
401999	P9	AN21112	AN11210
402400	P9	AN21112	AN11210
402480	P9	AN21112	AN11210
402999	P9	AN21112	AN11210
403420	P7	AN21112	AN11210
403999	P7	AN21112	AN11210
404420	P7	AN21112	AN11210
404999	P7	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
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405999	P7	AN21112	AN11210
406430	P10	AN21112	AN11210
406999	P10	AN21112	AN11210
407030	P6	AN21112	AN11210
407040	P6	AN21112	AN11210
407200	P6	AN21112	AN11210
407210	P6	AN21112	AN11210
407220	P6	AN21112	AN11210
407230	P6	AN21112	AN11210
407999	P8	AN21112	AN11210
408410	P8	AN21112	AN11210
408999	P8	AN21112	AN11210
409300	P11	AN21112	AN11210
409540	P10	AN21112	AN11210
409999	P10	AN21112	AN11210
410410	P10	AN21112	AN11210
410999	P10	AN21112	AN11210
411410	P6	AN21112	AN11210
411999	P6	AN21112	AN11210
412410	P6	AN21112	AN11210
412999	P6	AN21112	AN11210
413300	P11	AN21112	AN11210
413410	P6	AN21112	AN11210
413999	P6	AN21112	AN11210
414540	P6	AN21112	AN11210
414999	P6	AN21112	AN11210
415540	P10	AN21112	AN11210
415999	P10	AN21112	AN11210
420480	P12	AN21112	AN11210
420999	P12	AN21112	AN11210
421480	P12	AN21112	AN11210
421999	P12	AN21112	AN11210
422480	P12	AN21112	AN11210
422999	P12	AN21112	AN11210
423480	P12	AN21112	AN11210
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424480	P12	AN21112	AN11210
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426480	P12	AN21112	AN11210
426999	P12	AN21112	AN11210
427480	P12	AN21112	AN11210
427999	P12	AN21112	AN11210
428480	P12	AN21112	AN11210
428999	P12	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
429480	P12	AN21112	AN11210
429999	P12	AN21112	AN11210
430480	P12	AN21112	AN11210
430999	P12	AN21112	AN11210
431480	P12	AN21112	AN11210
431999	P12	AN21112	AN11210
432480	P12	AN21112	AN11220
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433480	P12	AN21112	AN11210
433999	P12	AN21112	AN11210
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434440	P12	AN21112	AN11210
434480	P12	AN21112	AN11210
434999	P12	AN21112	AN11210
440440	P12	AN21112	AN11210
440999	P12	AN21112	AN11210
441440	P12	AN21112	AN11210
441999	P12	AN21112	AN11210
442440	P12	AN21112	AN11210
442999	P12	AN21112	AN11210
443440	P12	AN21112	AN11210
443999	P12	AN21112	AN11210
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460999	P12	AN21112	AN11210
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461999	P12	AN21112	AN11210
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463999	P12	AN21112	AN11210
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481460	P12	AN21112	AN11210
481999	P12	AN21112	AN11210
482460	P12	AN21112	AN11210
482999	P12	AN21112	AN11210
483460	P12	AN21112	AN11210
483999	P12	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
484460	P12	AN21112	AN11210
484999	P12	AN21112	AN11210
485460	P12	AN21112	AN11210
485999	P12	AN21112	AN11210
486460	P12	AN21112	AN11210
486999	P12	AN21112	AN11210
487460	P12	AN21112	AN11210
487999	P12	AN21112	AN11210
488460	P12	AN21112	AN11210
488999	P12	AN21112	AN11210
489440	P12	AN21112	AN11210
489460	P12	AN21112	AN11210
489999	P12	AN21112	AN11210
500430	P12	AN21112	AN11210
500999	P12	AN21112	AN11210
501430	P10	AN21112	AN11210
501999	P10	AN21112	AN11210
502430	P10	AN21112	AN11210
502999	P10	AN21112	AN11210
503033	P10	AN21112	AN11210
503999	P10	AN21112	AN11210
504430	P10	AN21112	AN11210
504999	P10	AN21112	AN11210
505430	P10	AN21112	AN11210
505999	P10	AN21112	AN11210
506430	P10	AN21112	AN11210
506999	P10	AN21112	AN11210
507430	P10	AN21112	AN11210
507999	P10	AN21112	AN11210
508430	P10	AN21112	AN11210
508999	P10	AN21112	AN11210
509430	P10	AN21112	AN11210
509999	P10	AN21112	AN11210
510430	P12	AN21112	AN11210
510999	P12	AN21112	AN11210
520460	P12	AN21112	AN11210
520540	P12	AN21112	AN11210
520999	P12	AN21112	AN11210
521540	P12	AN21112	AN11220
521999	P12	AN21112	AN11220
522540	P12	AN21112	AN11210
522999	P12	AN21112	AN11210
523470	P12	AN21112	AN11210
523999	P12	AN21112	AN11210
524540	P12	AN21112	AN11210
524999	P12	AN21112	AN11210
525540	P12	AN21112	AN11210

Volume CATV	Price CATP	Land AN211	Buildings AN111
525999	P12	AN21112	AN11210
526540	P12	AN21112	AN11210
526999	P12	AN21112	AN11210
527540	P12	AN21112	AN11210
527999	P12	AN21112	AN11210
528540	P12	AN21112	AN11210
528999	P12	AN21112	AN11210
529540	P12	AN21112	AN11220
529999	P12	AN21112	AN11220
530540	P11	AN21112	AN11210
530999	P11	AN21112	AN11210
531540	P11	AN21112	AN11210
531999	P11	AN21112	AN11210

Appendix 4: Principle of adjustment of weight: marginal calibration

Let:

    j = 1, …, N with N, the total number of parcels of land in the population (Belgium or each region),

    N^{PM}: total number of parcels of land owned by legal persons (Belgium or per region),

    w_j: sampling weight of parcel of land "j",

    d_j: adjusted weight of parcel of land "j",

    k = 1, …, K, with K the total number of auxiliary variables.

    x_{kj}: the value of auxiliary variable k for parcel j.

    X_k: the marginal total of auxiliary variable k

In conventional sampling design, each individual selected in a sample is weighted so that the sum of the weights of the individuals in the sample corresponds to the total size of the population. The weightings or sampling weights are inversely proportional to the probability of selecting an individual from the sample.

In the "LAND" project, individuals correspond to parcels of land. These have been selected exhaustively from the subpopulation of parcels of land belonging to legal persons (detailed file). The value of the sampling weight is therefore 1 if we consider the subpopulation of parcels of land belonging to legal persons. So that this sample of parcels of land is representative of all parcels of land in Belgium (or its regions), we have to at least "inflate" the weights so that the sum of weights corresponds to the total number of parcels of land in Belgium.

Marginal calibration is a method of adjusting weights which allows the weights to be altered so that they adjust to the total for the population. They also allow other constraints to be factored in. Adjusted weights are actually sampling weights, corrected based on other known criteria of the population, such as the region, area or cadastral income of the parcels of land. Linear (regression) or non-linear (ranking ratio) adjustment of the weights allows the weight to be adjusted so that the sample is also representative of these other criteria (X_k) which were not factored in or unmanageable when designing the sampling. Calibration minimises modifications to the weight while respecting the following constraints:

$$d_j = f\left(w_j, x_k, X_k\right):$$
$$\sum_{j=1}^{n} d_j . x_{kj} = X_k$$
$$\sum_{j=1}^{n} d_j = N$$

The calibration of the weights is performed across the whole net sample using the CALMAR macro (source INSEE). The calibration is performed by region and by type of property (CATV) using the non-linear method (ranking ratio). The criteria taken into account are:

-     the area of the parcels of land,
-     the cadastral income of the parcels of land,
-     the number of parcels of land.