

ORAVA FUNDS

ORAVA 20
HOUSE PRICE INDEX
CALCULATION METHODOLOGY



Introduction

Orava indices are house price indices, which are calculated from debt free prices of apartment sales advertisements. Index values can be also interpreted as average prices per square meter.

The index is a market value based price index, which follows price development in 20 largest cities in Finland.

Orava 20 house price index uses debt free prices per square meter of apartment sales advertisements in Oikotie Apartments –portal as its data set. The index consists of sales

advertisements of 1-, 2- and 3-room apartments.

Orava 20 house price index consists of the 20 largest cities measured by population in Finland: Helsinki, Tampere, Turku, Espoo-Kauniainen, Vantaa, Oulu, Jyväskylä, Lahti, Kuopio, Vaasa, Pori, Lappeenranta, Joensuu, Kouvola, Kotka, Hämeenlinna, Rovaniemi, Mikkeli, Seinäjoki and Salo.

Orava 20 house price index is calculated on an hourly basis. The 6.00 p.m. index value is defined as the closing value of the day.



23.05.2017 18.00: 3 027,53
1 kk -0,4%, 3 kk 0,1%

Testikäytössä
Datan lähde: Oikotie

Figure 1 Orava 20 house price index.

Data and calculation

Orava 20 house price index is based on the apartment price advertisements in the Oikotie Apartments –portal. The advertisements are grouped by the city and the number of rooms in the apartment in question. The following observations are removed from calculation:

- The apartment is not located in a city which is used in calculation or
- The apartment is not owner-occupied or
- The number of rooms in the apartment is more than 3 or
- The number of rooms in the apartment is less than 2 (applicable only for a sub group of cities) or
- The building year or the year of complete renovation is the current year or the previous year (new building) or
- The advertisement is published more than 180 days ago or
- The advertisement has expired.

In addition, the following advertisements are removed:

- The floor area of the apartment is less than 15 square meters or
- The debt free price is less than 5 000 euros or
- The building year is undefined or
- The publishing date is in future or
- The end date is in the past,

The sales advertisements are taken into calculation each day on an hourly basis, and the new index value is also calculated hourly. The new advertisements are taken into calculation from the next hour onwards. The debt free square price is calculated by dividing the debt free sales price by the floor area. Orava Funds plc is responsible for the calculation methodology of the house price index, calculation process, setting weights used in the calculation and development of the calculation. The validity of the index is

verified by a daily checkup process.

Calculation methodology

Orava 20 house price index is calculated using the debt free sales prices of 1-, 2- and 3-room apartments. Apartments are divided into segments by city and number of rooms. One segment consists of the apartments having a certain number of rooms in a certain city – for example 2-room apartments in Lahti or 1-room apartments in Vantaa. The 1-room apartment segments are calculated only for the 10 largest cities. Therefore Orava 20 has a total of 50 segments.

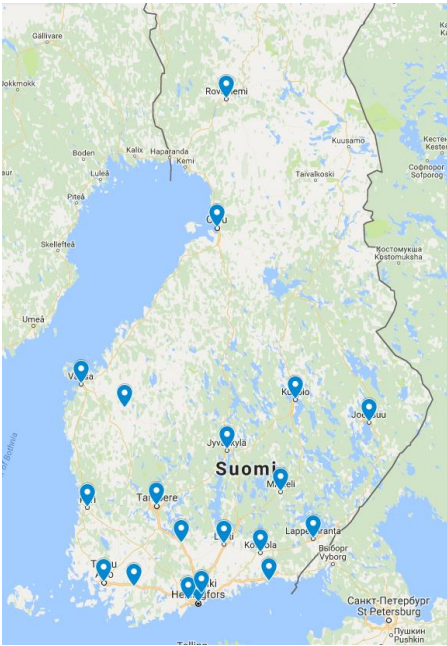


Figure 2 Orava 20 includes 20 largest cities in Finland.

The average prices per square for the segments are calculated using the debt free sales prices in apartment advertisements. The advertisements used in calculation are grouped by the debt free prices per square meter and the number of rooms.

The average price per square meter is the arithmetic average price in the advertisements, so that the lowest and the highest decile are removed from calculation. If the number of advertisements in a segment is less than 20, a new value is not calculated and the previous value is used. The Orava 20 house price index point value is defined as the floor area weighted average of the average prices per square meter in each segment. The calculation formula is:

$$\text{Index value} = \sum_{i=1}^{50} (a_i * p_i)$$

a_i = floor area weigh of a segment

p_i = index value of a segment

The total floor area of a segment is the sum of floor areas of the apartments in that segment. The floor areas are updated every 10 years. The floor areas for 2016-2026 are presented in the table below:

City	1 room	2 rooms	3 rooms
Helsinki	2 392 251	6 200 898	4 733 979
Espoo-Kauniainen	400 625	1 626 084	1 504 005
Tampere	831 547	2 219 204	1 431 752
Vantaa	368 298	1 542 602	1 258 113
Oulu	408 710	1 319 594	873 629
Turku	635 276	1 878 192	1 376 631
Jyväskylä	333 850	1 122 386	732 996
Lahti	294 020	1 036 304	733 511
Kuopio	230 552	869 221	608 279
Kouvola	134 757	453 821	306 729
Pori		505 543	347 110
Joensuu		455 558	309 067
Lappeenranta		548 088	331 948
Hämeenlinna		409 484	267 240
Vaasa		526 803	416 509
Rovaniemi		394 116	264 008
Seinäjoki		274 063	179 109
Mikkeli		339 031	220 600
Kotka		439 195	273 209
Salo		213 453	125 309
Total	6 029 886	22 373 640	16 293 733

Table 1 Floor areas (m²) by segments

Floor areas are based on the 2015 tables of Statistics Finland. A floor area weight of a segment in Orava 20 index is calculated by dividing the floor area of a segment by the

sum of floor areas in all segments. The floor area weights and market value weights are presented in the following tables.

City	1 room	2 rooms	3 rooms
Helsinki	0,053521201	0,138731057	0,105912065
Espoo-Kauniainen	0,008963078	0,036379949	0,033648708
Tampere	0,018603982	0,049649666	0,032032210
Vantaa	0,008239834	0,034512228	0,028147431
Oulu	0,009143961	0,029522929	0,019545471
Turku	0,014212863	0,042020295	0,030799003
Jyväskylä	0,007469138	0,025110846	0,016399126
Lahti	0,006578032	0,023184956	0,016410648
Kuopio	0,005158079	0,019446852	0,013608866
Kouvola	0,003014883	0,010153218	0,006862367
Pori		0,011310380	0,007765801
Joensuu		0,010192079	0,006914675
Lappeenranta		0,012262228	0,007426585
Hämeenlinna		0,009161278	0,005978890
Vaasa		0,011786025	0,009318446
Rovaniemi		0,008817453	0,005906581
Seinäjoki		0,006131539	0,004007158
Mikkeli		0,007585051	0,004935426
Kotka		0,009825994	0,006112433
Salo		0,004775528	0,002803505

Table 2 Floor area weights

City	1 room	2 rooms	3 rooms	Total
Helsinki	14 837	29 410	20 604	64 851
Espoo-Kauniainen	1 810	6 263	4 941	13 014
Tampere	2 407	5 458	3 094	10 959
Vantaa	1 290	4 047	2 826	8 163
Oulu	920	2 531	1 600	5 051
Turku	2 294	4 106	2 511	8 910
Jyväskylä	681	2 267	1 297	4 245
Lahti	674	1 832	1 335	3 841
Kuopio	499	1 785	1 218	3 502
Kouvola	148	469	304	921
Pori		710	525	1 235
Joensuu		1 041	657	1 698
Lappeenranta		1 004	598	1 602
Hämeenlinna		817	457	1 275
Vaasa		1 051	818	1 868
Rovaniemi		589	457	1 047
Seinäjoki		567	326	893
Mikkeli		632	365	997
Kotka		425	248	673
Salo		254	131	385
	25 561	65 258	44 311	135 130

Table 3 Market values (million euros) by 28 November 2016 10.00 a.m. index values

City	1 room	2 rooms	3 rooms	Total
Helsinki	11,0 %	21,8 %	15,2 %	48,0 %
Espoo-Kauniainen	1,3 %	4,6 %	3,7 %	9,6 %
Tampere	1,8 %	4,0 %	2,3 %	8,1 %
Vantaa	1,0 %	3,0 %	2,1 %	6,0 %
Oulu	0,7 %	1,9 %	1,2 %	3,7 %
Turku	1,7 %	3,0 %	1,9 %	6,6 %
Jyväskylä	0,5 %	1,7 %	1,0 %	3,1 %
Lahti	0,5 %	1,4 %	1,0 %	2,8 %
Kuopio	0,4 %	1,3 %	0,9 %	2,6 %
Kouvola	0,1 %	0,3 %	0,2 %	0,7 %
Pori		0,5 %	0,4 %	0,9 %
Joensuu		0,8 %	0,5 %	1,3 %
Lappeenranta		0,7 %	0,4 %	1,2 %
Hämeenlinna		0,6 %	0,3 %	0,9 %
Vaasa		0,8 %	0,6 %	1,4 %
Rovaniemi		0,4 %	0,3 %	0,8 %
Seinäjoki		0,4 %	0,2 %	0,7 %
Mikkeli		0,5 %	0,3 %	0,7 %
Kotka		0,3 %	0,2 %	0,5 %
Salo		0,2 %	0,1 %	0,3 %
	18,9 %	48,3 %	32,8 %	100,0 %

Table 4 Market value weights by 28 November 2016 10.00 a.m. index values





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