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Federal Department of Home Affairs FDHA
Federal Statistical Office FSO

Swiss residential property price index

Hedonic Models 2022

Yearly update of the quality adjustment

Neuchâtel, 2022

Published by:	Federal Statistical Office (FSO)	**Layout concept:**	Section DIAM
Information:	IMPI@bfs.admin.ch, tel. 058 463 60 69	**Downloads:**	www.statistics.ch
Editors:	David Fischbach, Manuel Brand, PREIS	**Copyright:**	FSO, Neuchâtel 2022
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Topic:	05 Prices		
Original text:	German		
Translation:	FSO language services		

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1 The need for quality adjustment

When developing a price index, the quality of properties needs to be considered in addition to prices. This is because a portion of the observed price difference between different periods is not be to a pure price change, but to a difference in quality between the two properties. Real estate is a highly heterogeneous good, and individual properties can be distinguished on the basis of many different attributes or characteristics. For this reason, the risk of qualitative distortion – i.e. that like will not be compared with like – is therefore accentuated in a property price index.

In order to allow the prices of different properties to still be compared, quality adjustment processes are used. The aim of such processes is to cancel out the price differences that are purely due to differences in quality between two properties, and to extract the true price change. Various quality adjustment procedures exist, which the FSO evaluated as part of the conceptual work. The property price index uses stratification and a hedonic repricing-type hedonic model, an approach that is widely-used internationally.

2 Hedonic models

Hedonic models are based on the definition of properties as bundles of different features or characteristics. The quality of a property includes information on its physical structure, use and location. The quality of a property can be determined on the basis of these characteristics. Consequently, property prices can also be estimated using the relevant characteristics, similar to a shopping basket whose price is determined by its contents, i.e. the prices of the products it contains. The only difference is that the prices of different property characteristics cannot be observed individually. However, the marginal or implicit prices can be determined on the basis of regressions, so that the hedonic regression equation optimally replicates the price of each property. Using the implicit prices, the quality of the sold property can be assessed and a quality adjustment carried out.

Various tests have shown that the hedonic repricing method is the most suitable for the FSO's project. In this method, the price changes in the individual strata are adjusted through the removal of quality differences. For this purpose, a price change index and a quality change index are calculated for every stratification cell. The quotient of these two indices then equates to the quality-adjusted price change. The quality change index is calculated using a hedonic equation in which the characteristics of all properties from the relevant cell for a period are inserted. Because the hedonic equation is only used to weight property characteristics and to derive the quality adjustment factors in the hedonic repricing method, it does not need to be recalculated in every period, unlike other hedonic methods that use the equation to estimate the quality-adjusted price changes. For the property price index, separate hedonic models were developed for single-family houses and for condominiums. The modelling was based on collected transaction data from the period 2020 to 2021. This concerns a total of around 60'000 transactions.

Although the econometric models can be left stable for a certain time in the hedonic repricing method, it should be noted that the implicit prices of quality characteristics may change in the mid- to long-term. In order to accommodate this, the intention is to recalculate the hedonic repricing model on a yearly basis.

3 Hedonic model for single family houses

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Intercept		9.13084889	0.04967542	183.810	< 0.0000000000000002	***
Ln_VolumeOfBuilding	Natural logarithm building volume	0.46699607	0.00650311	71.811	< 0.0000000000000002	***
StandardOfVolume_1	Dummy recording building volume according to GVA	0.10908180	0.00501293	21.760	< 0.0000000000000002	***
StandardOfVolume_2	Dummy recording building volume according to SIA 416	0.11099455	0.00517810	21.435	< 0.0000000000000002	***
StandardOfVolume_3	Dummy recording building volume according to SIA 116	0				
Ln_LandArea	Natural logarithm land area	0.13719775	0.00353165	38.848	< 0.0000000000000002	***
SingleFamilyHouseType_1	Dummy detached house	0.01654176	0.00411612	4.019	0.0000586975655386	***
SingleFamilyHouseType_2	Dummy attached house	0				
PrimaryOrSecondaryHome_Quota_1 [1]	Dummy first home	0				
PrimaryOrSecondaryHome_Quota_2 [1]	Dummy second home in a municipality with more than 20% second homes	0.21520663	0.00993012	21.672	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_3 [1]	Dummy second home in a municipality with fewer than 20% second homes	-0.09299997	0.01388389	-6.698	0.0000000000215840	***
YearOfConstruction_1	Dummy year of construction pre-1919	0				
YearOfConstruction_2	Dummy year of construction 1919 to 1945	0.11538545	0.00793779	14.536	< 0.0000000000000002	***
YearOfConstruction_3	Dummy year of construction 1946 to 1970	0.12806022	0.00674426	18.988	< 0.0000000000000002	***
YearOfConstruction_4	Dummy year of construction 1971 to 1990	0.20253307	0.00652212	31.053	< 0.0000000000000002	***
YearOfConstruction_5	Dummy year of construction 1991 to 2005	0.27021565	0.00704206	38.372	< 0.0000000000000002	***
YearOfConstruction_6	Dummy year of construction 2006 to 2015	0.32754143	0.00796638	41.115	< 0.0000000000000002	***
YearOfConstruction_7	Dummy year of construction after 2015	0.28728173	0.00877223	32.749	< 0.0000000000000002	***
NumberOfRooms_3	Dummy 3 rooms or fewer	0				
NumberOfRooms_4	Dummy 4 rooms	0.10814993	0.00910274	11.881	< 0.0000000000000002	***
NumberOfRooms_5	Dummy 5 rooms	0.14497798	0.00913681	15.867	< 0.0000000000000002	***
NumberOfRooms_6	Dummy 6 rooms	0.17397707	0.00965733	18.015	< 0.0000000000000002	***
NumberOfRooms_7	Dummy 7 rooms	0.20290397	0.01072833	18.913	< 0.0000000000000002	***
NumberOfRooms_8	Dummy 8 rooms or more	0.20993022	0.01170792	17.931	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
NumberOfBathrooms_1	Dummy 1 bathroom	0				
NumberOfBathrooms_2	Dummy 2 bathrooms	0.06231843	0.00382638	16.287	< 0.0000000000000002	***
NumberOfBathrooms_3	Dummy 3 bathrooms	0.10972198	0.00569650	19.261	< 0.0000000000000002	***
NumberOfBathrooms_4	Dummy 4 bathrooms	0.18362229	0.01108674	16.562	< 0.0000000000000002	***
NumberOfBathrooms_5	Dummy 5 bathrooms or more	0.53501370	0.02441743	21.911	< 0.0000000000000002	***
ConstructionQuality	Construction Quality	0.00323442	0.00008428	38.379	< 0.0000000000000002	***
PropertyCondition	Property Condition	0.00100718	0.00007919	12.719	< 0.0000000000000002	***
Canton_1	Dummy Canton Zurich	0.47214160	0.02315458	20.391	< 0.0000000000000002	***
Canton_2	Dummy Canton Bern	0.25315911	0.01730790	14.627	< 0.0000000000000002	***
Canton_3	Dummy Canton Lucerne	0.49371393	0.01963825	25.140	< 0.0000000000000002	***
Canton_4	Dummy Canton Uri	0.32533085	0.06656096	4.888	0.0000010273940879	***
Canton_5	Dummy Canton Schwyz	0.47160533	0.02616379	18.025	< 0.0000000000000002	***
Canton_6	Dummy Canton Obwalden	0.66416426	0.06415948	10.352	< 0.0000000000000002	***
Canton_7	Dummy Canton Nidwalden	0.57516589	0.08189858	7.023	0.0000000000022369	***
Canton_8	Dummy Canton Glarus	0.29562010	0.03280100	9.013	< 0.0000000000000002	***
Canton_9	Dummy Canton Zug	0.93203741	0.03072674	30.333	< 0.0000000000000002	***
Canton_10	Dummy Canton Fribourg	0.23398868	0.01959343	11.942	< 0.0000000000000002	***
Canton_11	Dummy Canton Solothurn	0.24009974	0.01790955	13.406	< 0.0000000000000002	***
Canton_12	Dummy Canton Basel-Stadt	0.63302431	0.02344580	26.999	< 0.0000000000000002	***
Canton_13	Dummy Canton Basel-Landschaft	0.43003791	0.02051312	20.964	< 0.0000000000000002	***
Canton_14	Dummy Canton Schaffhausen	0.30078666	0.02344507	12.829	< 0.0000000000000002	***
Canton_15	Dummy Canton Appenzell Ausserrhoden	0.38829649	0.02651540	14.644	< 0.0000000000000002	***
Canton_16	Dummy Canton Appenzell Innerrhoden	0.57508016	0.08632500	6.662	0.0000000000276940	***
Canton_17	Dummy Canton St. Gallen	0.33602597	0.02084586	16.120	< 0.0000000000000002	***
Canton_18	Dummy Canton Graubünden	0.42458453	0.02205568	19.251	< 0.0000000000000002	***
Canton_19	Dummy Canton Aargau	0.33180719	0.01985290	16.713	< 0.0000000000000002	***
Canton_20	Dummy Canton Thurgau	0.34573230	0.02120365	16.305	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Canton_21	Dummy Canton Ticino	0.10124257	0.02482504	4.078	0.0000455382328409	***
Canton_22	Dummy Canton Vaud	0.46212773	0.01760966	26.243	< 0.0000000000000002	***
Canton_23	Dummy Canton Valais	0.03099902	0.02413801	1.284	0.199071	
Canton_24	Dummy Canton Neuchâtel	0.22415385	0.02038842	10.994	< 0.0000000000000002	***
Canton_25	Dummy Canton Geneva	0.56706577	0.02489820	22.775	< 0.0000000000000002	***
Canton_26	Dummy Canton Jura	0				
CommunityType_1	Dummy urban municipality of a large agglomeration	0				
CommunityType_2	Dummy urban municipality of a medium-sized agglomeration	-0.19890587	0.00625547	-31.797	< 0.0000000000000002	***
CommunityType_3	Dummy urban municipality of a small or outside agglomeration	-0.29388038	0.00705843	-41.635	< 0.0000000000000002	***
CommunityType_4	Dummy peri-urban municipality of high density	-0.19380275	0.00707045	-27.410	< 0.0000000000000002	***
CommunityType_5	Dummy peri-urban municipality of medium density	-0.21237051	0.00598589	-35.479	< 0.0000000000000002	***
CommunityType_6	Dummy peri-urban municipality of low density	-0.30354873	0.00721184	-42.090	< 0.0000000000000002	***
CommunityType_7	Dummy municipality of a rural centre	-0.33350773	0.00961582	-34.683	< 0.0000000000000002	***
CommunityType_8	Dummy centrally located rural municipality	-0.36352715	0.00756940	-48.026	< 0.0000000000000002	***
CommunityType_9	Dummy peripheral rural municipality	-0.39058255	0.01065370	-36.662	< 0.0000000000000002	***
TaxBurden_1	Dummy municipalities with low tax burden	0				
TaxBurden_2	Dummy municipalities with moderate tax burden	-0.16178062	0.01209471	-13.376	< 0.0000000000000002	***
TaxBurden_3	Dummy municipalities with high tax burden	-0.21541644	0.01548827	-13.908	< 0.0000000000000002	***
TravelTimeToCenters_1	Dummy municipalities with short journey time to centres	0				
TravelTimeToCenters_2	Dummy municipalities with moderate journey time to centres	-0.09403058	0.00433053	-21.713	< 0.0000000000000002	***
TravelTimeToCenters_3	Dummy municipalities with long journey time to centres	-0.15197499	0.00589644	-25.774	< 0.0000000000000002	***
PublicTransportQuality_1	Dummy public transport quality category A	0				
PublicTransportQuality_2	Dummy public transport quality category B	-0.04149789	0.01003950	-4.133	0.0000358673524028	***
PublicTransportQuality_3	Dummy public transport quality category C	-0.09193068	0.00961579	-9.560	< 0.0000000000000002	***
PublicTransportQuality_4	Dummy public transport quality category D	-0.12776368	0.00966601	-13.218	< 0.0000000000000002	***
PublicTransportQuality_5	Dummy public transport quality category E	-0.15299423	0.01006950	-15.194	< 0.0000000000000002	***
NoiseExposure_1	Dummy low noise exposure	0				

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
NoiseExposure_2	Dummy moderate noise exposure	-0.02554564	0.00368933	-6.924	0.0000000000045066	***
NoiseExposure_3	Dummy high noise exposure	-0.05224225	0.00407242	-12.828	< 0.0000000000000002	***
Slope_1	Dummy gentle slope	0				
Slope_2	Dummy moderate slope	0.01395997	0.00369498	3.778	0.000158	***
Slope_3	Dummy steep slope	0.02182701	0.00412863	5.287	0.0000001257155243	***
Exposure_1	Dummy exposure north, northwest, east, northeast	0				
Exposure_2	Dummy exposure west, southwest, south, southeast	0.00284486	0.00334853	0.850	0.395565	
LakeView_1	Dummy no visible lake area	0				
LakeView_2	Dummy little visible lake area	0.02975225	0.00385231	7.723	0.0000000000000118	***
LakeView_3	Dummy extensive visible lake area	0.16257678	0.00458298	35.474	< 0.0000000000000002	***
MountainView_1	Dummy no or few visible mountain peaks	0				
MountainView_2	Dummy medium visible mountain peaks	0.04020101	0.00424332	9.474	< 0.0000000000000002	***
MountainView_3	Dummy many visible mountain peaks	0.04734503	0.00464094	10.202	< 0.0000000000000002	***
DistanceToLakes_1	Dummy short distance to the nearest lake	0				
DistanceToLakes_2	Dummy long distance to the nearest lake	-0.08780241	0.01191507	-7.369	0.0000000000001780	***
DistanceToRivers_1	Dummy short distance to the nearest river	0				
DistanceToRivers_2	Dummy long distance to the nearest river	0.05544339	0.00858145	6.461	0.0000000001063244	***
DistanceToHighVoltagePowerLines_1	Dummy short distance to the nearest high voltage power line	0				
DistanceToHighVoltagePowerLines_2	Dummy long distance to the nearest high voltage power line	0.07248594	0.01215067	5.966	0.0000000024751312	***
Year_2020 [1]	Dummy transactions from 2020	0				
Year_2021 [1]	Dummy transactions from 2021	0.06342491	0.00301863	21.011	< 0.0000000000000002	***

Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 0,2219 on 21790 degrees of freedom

Multiple R-squared: 0,8214

Adjusted R-squared: 0,8208

F-statistic: 1285 on 78 and 21790 DF, p-value: < 0.00000000000000022

[1] A time-dummy variable for the survey year is included in the model. Its influence on the explanatory power of the model is low. However, this variable helps adjust the coefficients of the remaining variables. The time-dummy variable is not incorporated in the index calculation. The same goes for the variable PrimaryOrSecondaryHome_Quota. Although the second home market regulations affect property prices, the quality adjustment should only consider characteristics that directly influence the quality of the property.

4 Hedonic model for condominiums

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Intercept		9.16523233	0.03088402	296.763	< 0.0000000000000002	***
Ln_NetLivingArea	Natural logarithm net living area	0.87646953	0.00696043	125.922	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_1 [1]	Dummy first home in a municipality with more than 20% second homes	0				
PrimaryOrSecondaryHome_Quota_2 [1]	Dummy first home in a municipality with fewer than 20% second homes	-0.05387859	0.00576979	-9.338	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_3 [1]	Dummy second home in a municipality with more than 20% second homes	-0.08136123	0.00910472	-8.936	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_4 [1]	Dummy second home in a municipality with fewer than 20% second homes	0.28932066	0.00654463	44.207	< 0.0000000000000002	***
YearOfConstruction_1	Dummy year of construction pre-1919	0				
YearOfConstruction_2	Dummy year of construction 1919 to 1945	0.02681632	0.01379135	1.944	0.051852	.
YearOfConstruction_3	Dummy year of construction 1946 to 1970	-0.05571325	0.00881078	-6.323	0.000000000259	***
YearOfConstruction_4	Dummy year of construction 1971 to 1990	-0.03364849	0.00804150	-4.184	0.000028670119	***
YearOfConstruction_5	Dummy year of construction 1991 to 2005	0.03482701	0.00826552	4.214	0.000025206159	***
YearOfConstruction_6	Dummy year of construction 2006 to 2015	0.13630204	0.00842885	16.171	< 0.0000000000000002	***
YearOfConstruction_7	Dummy year of construction after 2015	0.14013452	0.00884270	15.847	< 0.0000000000000002	***
NumberOfRooms_3	Dummy 1 room	0				
NumberOfRooms_4	Dummy 2 rooms	0.05244944	0.00862231	6.083	0.000000001192	***
NumberOfRooms_5	Dummy 3 rooms	0.04852107	0.00946338	5.127	0.000000295632	***
NumberOfRooms_6	Dummy 4 rooms	0.04233551	0.01057977	4.002	0.000063062247	***
NumberOfRooms_7	Dummy 5 rooms	0.04573753	0.01188186	3.849	0.000119	***
NumberOfRooms_8	Dummy 6 rooms or more	0.04220665	0.01433693	2.944	0.003243	**
NumberOfBathrooms_1	Dummy 1 bathroom	0				
NumberOfBathrooms_2	Dummy 2 bathrooms	0.07840015	0.00322737	24.292	< 0.0000000000000002	***
NumberOfBathrooms_3	Dummy 3 bathrooms	0.18962400	0.00776860	24.409	< 0.0000000000000002	***
NumberOfBathrooms_4	Dummy 4 bathrooms or more	0.45663623	0.02386886	19.131	< 0.0000000000000002	***
ConstructionQuality	Construction Quality	0.00254963	0.00006247	40.812	< 0.0000000000000002	***
PropertyCondition	Property Condition	0.00110941	0.00007251	15.299	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Canton_1	Dummy Canton Zurich	0.32983640	0.00647835	50.914	< 0.0000000000000002	***
Canton_2	Dummy Canton Bern	0.23729929	0.01238427	19.161	< 0.0000000000000002	***
Canton_3	Dummy Canton Lucerne	0.45281279	0.01077036	42.042	< 0.0000000000000002	***
Canton_4	Dummy Canton Uri	0.76149357	0.03555647	21.416	0.0000010273940879	***
Canton_5	Dummy Canton Schwyz	0.31053336	0.00967741	32.088	< 0.0000000000000002	***
Canton_6	Dummy Canton Obwalden	0.59203516	0.02300239	25.738	< 0.0000000000000002	***
Canton_7	Dummy Canton Nidwalden	0.44743181	0.01895335	23.607	0.0000000000022369	***
Canton_8	Dummy Canton Glarus	0.23089361	0.03751738	6.154	0.000000000763	***
Canton_9	Dummy Canton Zug	0.64923403	0.01131285	57.389	< 0.0000000000000002	***
Canton_10	Dummy Canton Fribourg	0.24854549	0.01061971	23.404	< 0.0000000000000002	***
Canton_11	Dummy Canton Solothurn	0.16060009	0.01400556	11.467	< 0.0000000000000002	***
Canton_12	Dummy Canton Basel-Stadt	0.52139739	0.01578363	33.034	< 0.0000000000000002	***
Canton_13	Dummy Canton Basel-Landschaft	0.32893972	0.01132699	29.040	< 0.0000000000000002	***
Canton_14	Dummy Canton Schaffhausen	0.26972907	0.01846945	14.604	< 0.0000000000000002	***
Canton_15	Dummy Canton Appenzell Ausserrhoden	0.37019409	0.02330944	15.882	< 0.0000000000000002	***
Canton_16	Dummy Canton Appenzell Innerrhoden	0.51272447	0.08017884	6.395	0.000000000163	***
Canton_17	Dummy Canton St. Gallen	0.25657916	0.00912636	28.114	< 0.0000000000000002	***
Canton_18	Dummy Canton Graubünden	0.49802355	0.00924368	53.877	< 0.0000000000000002	***
Canton_19	Dummy Canton Aargau	0.26080744	0.00924840	28.200	< 0.0000000000000002	***
Canton_20	Dummy Canton Thurgau	0.23044057	0.01059300	21.754	< 0.0000000000000002	***
Canton_21	Dummy Canton Ticino	0.07664605	0.00765576	10.012	< 0.0000000000000002	***
Canton_22	Dummy Canton Vaud	0.46536048	0.01265760	36.765	< 0.0000000000000002	***
Canton_23	Dummy Canton Valais	0				
Canton_24	Dummy Canton Neuchâtel	0.16292359	0.01536396	10.604	< 0.0000000000000002	***
Canton_25	Dummy Canton Geneva	0.44498655	0.00863964	51.505	< 0.0000000000000002	***
Canton_26	Dummy Canton Jura	0.14219685	0.02259842	6.292	0.000000000317	***
CommunityType_1	Dummy urban municipality of a large agglomeration	0				

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
CommunityType_2	Dummy urban municipality of a medium-sized agglomeration	-0.17432953	0.00465761	-37.429	< 0.0000000000000002	***
CommunityType_3	Dummy urban municipality of a small or outside agglomeration	-0.25138883	0.00513808	-48.927	< 0.0000000000000002	***
CommunityType_4	Dummy peri-urban municipality of high density	-0.17520738	0.00536692	-32.646	< 0.0000000000000002	***
CommunityType_5	Dummy peri-urban municipality of medium density	-0.22408826	0.00487344	-45.982	< 0.0000000000000002	***
CommunityType_6	Dummy peri-urban municipality of low density	-0.29468218	0.00705835	-41.749	< 0.0000000000000002	***
CommunityType_7	Dummy municipality of a rural centre	-0.22023069	0.00720445	-30.569	< 0.0000000000000002	***
CommunityType_8	Dummy centrally located rural municipality	-0.33514229	0.00655259	-51.147	< 0.0000000000000002	***
CommunityType_9	Dummy peripheral rural municipality	-0.34524977	0.00822757	-41.963	< 0.0000000000000002	***
TaxBurden_1	Dummy municipalities with low tax burden	0				
TaxBurden_2	Dummy municipalities with moderate tax burden	-0.17413280	0.00732293	-23.779	< 0.0000000000000002	***
TaxBurden_3	Dummy municipalities with high tax burden	-0.25015917	0.01075195	-23.266	< 0.0000000000000002	***
TravelTimeToCenters_1	Dummy municipalities with short journey time to centres	0				
TravelTimeToCenters_2	Dummy municipalities with moderate journey time to centres	-0.06879707	0.00329450	-20.882	< 0.0000000000000002	***
TravelTimeToCenters_3	Dummy municipalities with long journey time to centres	-0.12322706	0.00491469	-25.073	< 0.0000000000000002	***
PublicTransportQuality_1	Dummy public transport quality category A	0				
PublicTransportQuality_2	Dummy public transport quality category B	-0.04992011	0.00476904	-10.468	< 0.0000000000000002	***
PublicTransportQuality_3	Dummy public transport quality category C	-0.08434282	0.00467153	-18.055	< 0.0000000000000002	***
PublicTransportQuality_4	Dummy public transport quality category D	-0.09820467	0.00490354	-20.027	< 0.0000000000000002	***
PublicTransportQuality_5	Dummy public transport quality category E	-0.12618694	0.00578911	-21.797	< 0.0000000000000002	***
NoiseExposure_1	Dummy low noise exposure	0				
NoiseExposure_2	Dummy moderate noise exposure	-0.01320430	0.00279856	-4.718	0.000002388391	***
NoiseExposure_3	Dummy high noise exposure	-0.03838801	0.00292040	-13.145	< 0.0000000000000002	***
Slope_1	Dummy gentle slope	0				
Slope_2	Dummy moderate slope	0.04976314	0.00289749	17.175	< 0.0000000000000002	***
Slope_3	Dummy steep slope	0.09832242	0.00342778	28.684	< 0.0000000000000002	***
Exposure_1	Dummy exposure north, northwest, east, northeast	0				
Exposure_2	Dummy exposure west, southwest, south, southeast	0.00731642	0.00257085	2.846	0.004431	**

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
LakeView_1	Dummy no visible lake area	0				
LakeView_2	Dummy little visible lake area	0.03385919	0.00308628	10.971	< 0.0000000000000002	***
LakeView_3	Dummy extensive visible lake area	0.16939188	0.00341346	49.625	< 0.0000000000000002	***
MountainView_1	Dummy no or few visible mountain peaks	0				
MountainView_2	Dummy medium visible mountain peaks	0.02862761	0.00332681	8.605	< 0.0000000000000002	***
MountainView_3	Dummy many visible mountain peaks	0.04001663	0.00379382	10.548	< 0.0000000000000002	***
DistanceToLakes_1	Dummy short distance to the nearest lake	0				
DistanceToLakes_2	Dummy long distance to the nearest lake	-0.07893541	0.00760142	-10.384	< 0.0000000000000002	***
DistanceToHighVoltagePowerLines_1	Dummy short distance to the nearest high voltage power line	0				
DistanceToHighVoltagePowerLines_2	Dummy long distance to the nearest high voltage power line	0.04249901	0.01098024	3.870	0.000109	***
Year_2020 [1]	Dummy transactions from 2020	0				
Year_2021 [1]	Dummy transactions from 2021	0.05020813	0.00230966	21.738	< 0.0000000000000002	***

Signif. codes: 0 '***' 0,001 '**' 0,01 '*' 0,05 '.' 0,1 ' ' 1

Residual standard error: 0,2112 on 33789 degrees of freedom

Multiple R-squared: 0,8602

Adjusted R-squared: 0,8599

F-statistic: 2848 on 73 and 33789 DF, p-value: < 0.00000000000000022

[1] A time-dummy variable for the survey year is included in the model. Its influence on the explanatory power of the model is low. However, this variable helps adjust the coefficients of the remaining variables. The time-dummy variable is not incorporated in the index calculation. The same goes for the variable PrimaryOrSecondaryHome_Quota. Although the second home market regulations affect property prices, the quality adjustment should only consider characteristics that directly influence the quality of the property.