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Swiss residential property price index

Hedonic Models 2023

Yearly update of the quality adjustment

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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 2021 to 2022. 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		9.264672509	0.050357346	183.97857	< 0.0000000000000002	***
Ln_VolumeOfBuilding	Natural logarithm building volume	0.448720551	0.006701109	66.96213	< 0.0000000000000002	***
StandardOfVolume_1	Dummy recording building volume according to GVA	0.117930658	0.005167323	22.82239	< 0.0000000000000002	***
StandardOfVolume_2	Dummy recording building volume according to SIA 416	0.107046975	0.005329286	20.08655	< 0.0000000000000002	***
StandardOfVolume_3	Dummy recording building volume according to SIA 116	0				
Ln_LandArea	Natural logarithm land area	0.142127686	0.003667011	38.75846	< 0.0000000000000002	***
SingleFamilyHouseType_1	Dummy detached house	0.020091033	0.004236128	4.74278	0.0000021215484768588	***
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	0.274715901	0.010116161	27.15614	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_3 [1]	Dummy second home in a municipality with fewer than 20% second homes	-0.149952622	0.015174025	-9.88219	< 0.0000000000000002	***
YearOfConstruction_1	Dummy year of construction pre-1919	0				
YearOfConstruction_2	Dummy year of construction 1919 to 1945	0.125549839	0.008112972	15.4752	< 0.0000000000000002	***
YearOfConstruction_3	Dummy year of construction 1946 to 1970	0.129566227	0.006884605	18.8197	< 0.0000000000000002	***
YearOfConstruction_4	Dummy year of construction 1971 to 1990	0.195874126	0.006641093	29.49426	< 0.0000000000000002	***
YearOfConstruction_5	Dummy year of construction 1991 to 2005	0.26249531	0.007145806	36.73418	< 0.0000000000000002	***
YearOfConstruction_6	Dummy year of construction 2006 to 2015	0.312633582	0.00810826	38.55742	< 0.0000000000000002	***
YearOfConstruction_7	Dummy year of construction after 2015	0.26618046	0.00879845	30.25311	< 0.0000000000000002	***
NumberOfRooms_3	Dummy 3 rooms or fewer	0				
NumberOfRooms_4	Dummy 4 rooms	0.094832533	0.009574868	9.90432	< 0.0000000000000002	***
NumberOfRooms_5	Dummy 5 rooms	0.135206776	0.009607454	14.07311	< 0.0000000000000002	***
NumberOfRooms_6	Dummy 6 rooms	0.161240407	0.01011808	15.93587	< 0.0000000000000002	***
NumberOfRooms_7	Dummy 7 rooms	0.192284738	0.011251291	17.09002	< 0.0000000000000002	***
NumberOfRooms_8	Dummy 8 rooms or more	0.195814611	0.012171748	16.08763	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
NumberOfBathrooms_1	Dummy 1 bathroom	0				
NumberOfBathrooms_2	Dummy 2 bathrooms	0.059944067	0.003943062	15.20242	< 0.0000000000000002	***
NumberOfBathrooms_3	Dummy 3 bathrooms	0.098449435	0.005786995	17.01219	< 0.0000000000000002	***
NumberOfBathrooms_4	Dummy 4 bathrooms	0.181406036	0.01134658	15.98773	< 0.0000000000000002	***
NumberOfBathrooms_5	Dummy 5 bathrooms or more	0.542874494	0.023253678	23.34575	< 0.0000000000000002	***
ConstructionQuality	Construction Quality	0.003470964	0.000090231	38.4674	< 0.0000000000000002	***
PropertyCondition	Property Condition	0.000969363	0.000086014	11.26982	< 0.0000000000000002	***
Canton_1	Dummy Canton Zurich	0.568971097	0.023057522	24.67616	< 0.0000000000000002	***
Canton_2	Dummy Canton Bern	0.262279497	0.017036614	15.39505	< 0.0000000000000002	***
Canton_3	Dummy Canton Lucerne	0.501217139	0.020150411	24.87379	< 0.0000000000000002	***
Canton_4	Dummy Canton Uri	0.353904883	0.061854824	5.72154	0.0000000106965096709	***
Canton_5	Dummy Canton Schwyz	0.557242371	0.026216471	21.25543	< 0.0000000000000002	***
Canton_6	Dummy Canton Obwalden	0.660454081	0.070621498	9.35203	< 0.0000000000000002	***
Canton_7	Dummy Canton Nidwalden	0.647562268	0.06247316	10.36545	< 0.0000000000000002	***
Canton_8	Dummy Canton Glarus	0.306121663	0.032338485	9.46617	< 0.0000000000000002	***
Canton_9	Dummy Canton Zug	1.061881193	0.031597693	33.60629	< 0.0000000000000002	***
Canton_10	Dummy Canton Fribourg	0.227917762	0.020028172	11.37986	< 0.0000000000000002	***
Canton_11	Dummy Canton Solothurn	0.230937231	0.017714644	13.03652	< 0.0000000000000002	***
Canton_12	Dummy Canton Basel-Stadt	0.623002745	0.024088774	25.86278	< 0.0000000000000002	***
Canton_13	Dummy Canton Basel-Landschaft	0.432022294	0.021018946	20.55395	< 0.0000000000000002	***
Canton_14	Dummy Canton Schaffhausen	0.297466463	0.02478808	12.00038	< 0.0000000000000002	***
Canton_15	Dummy Canton Appenzell Ausserrhoden	0.392253465	0.02767789	14.17209	< 0.0000000000000002	***
Canton_16	Dummy Canton Appenzell Innerrhoden	0.674592027	0.071477951	9.43776	< 0.0000000000000002	***
Canton_17	Dummy Canton St. Gallen	0.380937279	0.021586722	17.64683	< 0.0000000000000002	***
Canton_18	Dummy Canton Graubünden	0.394467796	0.023685044	16.65472	< 0.0000000000000002	***
Canton_19	Dummy Canton Aargau	0.356977706	0.020398953	17.49981	< 0.0000000000000002	***
Canton_20	Dummy Canton Thurgau	0.359534215	0.022050835	16.30479	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Canton_21	Dummy Canton Ticino	0.135852219	0.02461525	5.51903	0.0000000344817389218	***
Canton_22	Dummy Canton Vaud	0.467863124	0.017347526	26.97002	< 0.0000000000000002	***
Canton_23	Dummy Canton Valais	0.098198403	0.023752763	4.13419	0.0000357561498271106	***
Canton_24	Dummy Canton Neuchâtel	0.213337767	0.019924852	10.70712	< 0.0000000000000002	***
Canton_25	Dummy Canton Geneva	0.673176106	0.024732359	27.21844	< 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	-0.209388729	0.006313592	-33.16475	< 0.0000000000000002	***
CommunityType_3	Dummy urban municipality of a small or outside agglomeration	-0.303865204	0.007240689	-41.96634	< 0.0000000000000002	***
CommunityType_4	Dummy peri-urban municipality of high density	-0.203091613	0.007059807	-28.7673	< 0.0000000000000002	***
CommunityType_5	Dummy peri-urban municipality of medium density	-0.226340551	0.006077014	-37.24536	< 0.0000000000000002	***
CommunityType_6	Dummy peri-urban municipality of low density	-0.310564534	0.007275899	-42.68401	< 0.0000000000000002	***
CommunityType_7	Dummy municipality of a rural centre	-0.359100631	0.009878448	-36.35193	< 0.0000000000000002	***
CommunityType_8	Dummy centrally located rural municipality	-0.394263983	0.007623512	-51.71685	< 0.0000000000000002	***
CommunityType_9	Dummy peripheral rural municipality	-0.411296042	0.010891441	-37.76324	< 0.0000000000000002	***
TaxBurden_1	Dummy municipalities with low tax burden	0				
TaxBurden_2	Dummy municipalities with moderate tax burden	-0.110935373	0.010833355	-10.24017	< 0.0000000000000002	***
TaxBurden_3	Dummy municipalities with high tax burden	-0.158924447	0.015674862	-10.13881	< 0.0000000000000002	***
TravelTimeToCenters_1	Dummy municipalities with short journey time to centres	0				
TravelTimeToCenters_2	Dummy municipalities with moderate journey time to centres	-0.061383986	0.004196343	-14.62797	< 0.0000000000000002	***
TravelTimeToCenters_3	Dummy municipalities with long journey time to centres	-0.119321575	0.005778897	-20.64781	< 0.0000000000000002	***
PublicTransportQuality_1	Dummy public transport quality category A	0				
PublicTransportQuality_2	Dummy public transport quality category B	-0.059381175	0.010249125	-5.79378	0.0000000069779964642	***
PublicTransportQuality_3	Dummy public transport quality category C	-0.113723198	0.009870599	-11.52141	< 0.0000000000000002	***
PublicTransportQuality_4	Dummy public transport quality category D	-0.151498155	0.009942567	-15.23733	< 0.0000000000000002	***
PublicTransportQuality_5	Dummy public transport quality category E	-0.175634903	0.010367298	-16.94124	< 0.0000000000000002	***
NoiseExposure_1	Dummy low noise exposure	0				

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
NoiseExposure_2	Dummy moderate noise exposure	-0.022081786	0.003771868	-5.85434	0.0000000048588042618	***
NoiseExposure_3	Dummy high noise exposure	-0.054081965	0.004204435	-12.86307	< 0.0000000000000002	***
Slope_1	Dummy gentle slope	0				
Slope_2	Dummy moderate slope	0.023536358	0.003793076	6.20509	0.0000000005566583055	***
Slope_3	Dummy steep slope	0.031228174	0.004245326	7.3559	0.0000000000001964518	***
Exposure_1	Dummy exposure north, northwest, east, northeast	0				
Exposure_2	Dummy exposure west, southwest, south, southeast	0.00262828	0.003446426	0.76261	0.44570410	
LakeView_1	Dummy no visible lake area	0				
LakeView_2	Dummy little visible lake area	0.031400016	0.00397797	7.89348	0.0000000000000030787	***
LakeView_3	Dummy extensive visible lake area	0.160216176	0.004741218	33.7922	< 0.0000000000000002	***
MountainView_1	Dummy no or few visible mountain peaks	0				
MountainView_2	Dummy medium visible mountain peaks	0.041859683	0.004361773	9.59694	< 0.0000000000000002	***
MountainView_3	Dummy many visible mountain peaks	0.050347266	0.004781313	10.53001	< 0.0000000000000002	***
DistanceToLakes_1	Dummy short distance to the nearest lake	0				
DistanceToLakes_2	Dummy long distance to the nearest lake	-0.100920925	0.012573178	-8.02668	0.0000000000000010524	***
DistanceToRivers_1	Dummy short distance to the nearest river	0				
DistanceToRivers_2	Dummy long distance to the nearest river	0.058315227	0.008619323	6.76564	0.0000000000136134430	***
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	0.041167177	0.011893158	3.46142	0.00053838	***
Year_2021 [1]	Dummy transactions from 2021	0				
Year_2022 [1]	Dummy transactions from 2022	0.064063521	0.003102555	20.64863	< 0.0000000000000002	***

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

Residual standard error: 0.2263945 on 21500 degrees of freedom

Multiple R-squared: 0.8123

Adjusted R-squared: 0.8116

F-statistic: 1193 on 78 and 21500 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		9.31384513	0.03168438	293.957	< 0.0000000000000002	***
Ln_NetLivingArea	Natural logarithm net living area	0.84715049	0.00710537	119.227	< 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	-0.05537776	0.00604075	-9.167	< 0.0000000000000002	***
PrimaryOrSecondaryHome_Quota_3 [1]	Dummy second home in a municipality with more than 20% second homes	-0.07336693	0.00947079	-7.747	0.00000000000000970	***
PrimaryOrSecondaryHome_Quota_4 [1]	Dummy second home in a municipality with fewer than 20% second homes	0.32031151	0.00676129	47.374	< 0.0000000000000002	***
YearOfConstruction_1	Dummy year of construction pre-1919	0				
YearOfConstruction_2	Dummy year of construction 1919 to 1945	0.01072927	0.0139218	0.771	0.440901	
YearOfConstruction_3	Dummy year of construction 1946 to 1970	-0.05655692	0.00901083	-6.277	0.00000000035035602	***
YearOfConstruction_4	Dummy year of construction 1971 to 1990	-0.04105674	0.00817	-5.025	0.00000050519352988	***
YearOfConstruction_5	Dummy year of construction 1991 to 2005	0.02825882	0.00841187	3.359	0.000782	***
YearOfConstruction_6	Dummy year of construction 2006 to 2015	0.13229339	0.00853153	15.506	< 0.0000000000000002	***
YearOfConstruction_7	Dummy year of construction after 2015	0.11887834	0.00890486	13.35	< 0.0000000000000002	***
NumberOfRooms_3	Dummy 1 room	0				
NumberOfRooms_4	Dummy 2 rooms	0.05108807	0.00878791	5.813	0.00000000617464006	***
NumberOfRooms_5	Dummy 3 rooms	0.05898573	0.00964985	6.113	0.00000000099083261	***
NumberOfRooms_6	Dummy 4 rooms	0.05332194	0.0107877	4.943	0.00000077356890269	***
NumberOfRooms_7	Dummy 5 rooms	0.05545935	0.01212596	4.574	0.00000481097617865	***
NumberOfRooms_8	Dummy 6 rooms or more	0.04314777	0.01475633	2.924	0.003458	**
NumberOfBathrooms_1	Dummy 1 bathroom	0				
NumberOfBathrooms_2	Dummy 2 bathrooms	0.08347868	0.00335019	24.918	< 0.0000000000000002	***
NumberOfBathrooms_3	Dummy 3 bathrooms	0.20844696	0.00793205	26.279	< 0.0000000000000002	***
NumberOfBathrooms_4	Dummy 4 bathrooms or more	0.49586854	0.02648003	18.726	< 0.0000000000000002	***
ConstructionQuality	Construction Quality	0.00276859	0.00006661	41.562	< 0.0000000000000002	***
PropertyCondition	Property Condition	0.0008195	0.00007761	10.56	< 0.0000000000000002	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
Canton_1	Dummy Canton Zurich	0.38841516	0.00657967	59.033	< 0.0000000000000002	***
Canton_2	Dummy Canton Bern	0.21290733	0.01228712	17.328	< 0.0000000000000002	***
Canton_3	Dummy Canton Lucerne	0.42886501	0.01076473	39.84	< 0.0000000000000002	***
Canton_4	Dummy Canton Uri	0.68445388	0.03053862	22.413	< 0.0000000000000002	***
Canton_5	Dummy Canton Schwyz	0.33682953	0.01048978	32.11	< 0.0000000000000002	***
Canton_6	Dummy Canton Obwalden	0.60912739	0.02416195	25.21	< 0.0000000000000002	***
Canton_7	Dummy Canton Nidwalden	0.45687657	0.02219328	20.586	< 0.0000000000000002	***
Canton_8	Dummy Canton Glarus	0.14902024	0.04314981	3.454	0.000554	***
Canton_9	Dummy Canton Zug	0.68179105	0.01222582	55.767	< 0.0000000000000002	***
Canton_10	Dummy Canton Fribourg	0.21764516	0.01017734	21.385	< 0.0000000000000002	***
Canton_11	Dummy Canton Solothurn	0.11322689	0.01428968	7.924	0.00000000000000238	***
Canton_12	Dummy Canton Basel-Stadt	0.45364263	0.01465648	30.952	< 0.0000000000000002	***
Canton_13	Dummy Canton Basel-Landschaft	0.29689254	0.01094669	27.122	< 0.0000000000000002	***
Canton_14	Dummy Canton Schaffhausen	0.22192907	0.01765094	12.573	< 0.0000000000000002	***
Canton_15	Dummy Canton Appenzell Ausserrhoden	0.32329336	0.02410084	13.414	< 0.0000000000000002	***
Canton_16	Dummy Canton Appenzell Innerrhoden	0.52433727	0.08353732	6.277	0.00000000035005181	***
Canton_17	Dummy Canton St. Gallen	0.24642723	0.00892655	27.606	< 0.0000000000000002	***
Canton_18	Dummy Canton Graubünden	0.43295352	0.00753554	57.455	< 0.0000000000000002	***
Canton_19	Dummy Canton Aargau	0.23773911	0.00875912	27.142	< 0.0000000000000002	***
Canton_20	Dummy Canton Thurgau	0.21395756	0.01084379	19.731	< 0.0000000000000002	***
Canton_21	Dummy Canton Ticino	0.05815163	0.00770427	7.548	0.00000000000004531	***
Canton_22	Dummy Canton Vaud	0.44864945	0.01241996	36.123	0.0000000000000002	***
Canton_23	Dummy Canton Valais	0				
Canton_24	Dummy Canton Neuchâtel	0.10968458	0.01552542	7.065	0.00000000000163898	***
Canton_25	Dummy Canton Geneva	0.46107294	0.00849197	54.295	< 0.0000000000000002	***
Canton_26	Dummy Canton Jura	0.0961516	0.02256711	4.261	0.00002043411174370	***
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	-0.17913944	0.00480337	-37.295	< 0.0000000000000002	***
CommunityType_3	Dummy urban municipality of a small or outside agglomeration	-0.26004226	0.00537544	-48.376	< 0.0000000000000002	***
CommunityType_4	Dummy peri-urban municipality of high density	-0.16776462	0.00564478	-29.72	< 0.0000000000000002	***
CommunityType_5	Dummy peri-urban municipality of medium density	-0.22059322	0.00501732	-43.966	< 0.0000000000000002	***
CommunityType_6	Dummy peri-urban municipality of low density	-0.29044417	0.00731197	-39.722	< 0.0000000000000002	***
CommunityType_7	Dummy municipality of a rural centre	-0.233134	0.00745567	-31.269	< 0.0000000000000002	***
CommunityType_8	Dummy centrally located rural municipality	-0.34262449	0.00690603	-49.612	< 0.0000000000000002	***
CommunityType_9	Dummy peripheral rural municipality	-0.33726938	0.00844198	-39.951	< 0.0000000000000002	***
TaxBurden_1	Dummy municipalities with low tax burden	0				
TaxBurden_2	Dummy municipalities with moderate tax burden	-0.12824219	0.00659007	-19.46	< 0.0000000000000002	***
TaxBurden_3	Dummy municipalities with high tax burden	-0.21032571	0.01074246	-19.579	< 0.0000000000000002	***
TravelTimeToCenters_1	Dummy municipalities with short journey time to centres	0				
TravelTimeToCenters_2	Dummy municipalities with moderate journey time to centres	-0.06974934	0.00328478	-21.234	< 0.0000000000000002	***
TravelTimeToCenters_3	Dummy municipalities with long journey time to centres	-0.10560856	0.00489497	-21.575	< 0.0000000000000002	***
PublicTransportQuality_1	Dummy public transport quality category A	0				
PublicTransportQuality_2	Dummy public transport quality category B	-0.05167543	0.00481241	-10.738	< 0.0000000000000002	***
PublicTransportQuality_3	Dummy public transport quality category C	-0.08936308	0.00475946	-18.776	< 0.0000000000000002	***
PublicTransportQuality_4	Dummy public transport quality category D	-0.10907346	0.00504053	-21.639	< 0.0000000000000002	***
PublicTransportQuality_5	Dummy public transport quality category E	-0.13867615	0.00602218	-23.028	< 0.0000000000000002	***
NoiseExposure_1	Dummy low noise exposure	0				
NoiseExposure_2	Dummy moderate noise exposure	-0.01197281	0.00291194	-4.112	0.00003938008865331	***
NoiseExposure_3	Dummy high noise exposure	-0.04225008	0.00302377	-13.973	< 0.0000000000000002	***
Slope_1	Dummy gentle slope	0				
Slope_2	Dummy moderate slope	0.04370891	0.00300838	14.529	< 0.0000000000000002	***
Slope_3	Dummy steep slope	0.09099885	0.00355866	25.571	< 0.0000000000000002	***
Exposure_1	Dummy exposure north, northwest, east, northeast	0				
Exposure_2	Dummy exposure west, southwest, south, southeast	0.01133253	0.00267031	4.244	0.00002202418045029	***

Variable	Description	Estimate	Std. Error	t-value	Pr(>|t|)	
LakeView_1	Dummy no visible lake area	0				
LakeView_2	Dummy little visible lake area	0.04817011	0.0032405	14.865	< 0.0000000000000002	***
LakeView_3	Dummy extensive visible lake area	0.19244587	0.0035517	54.184	< 0.0000000000000002	***
MountainView_1	Dummy no or few visible mountain peaks	0				
MountainView_2	Dummy medium visible mountain peaks	0.02730645	0.00348732	7.83	0.00000000000000501	***
MountainView_3	Dummy many visible mountain peaks	0.03683451	0.00395926	9.303	< 0.0000000000000002	***
DistanceToLakes_1	Dummy short distance to the nearest lake	0				
DistanceToLakes_2	Dummy long distance to the nearest lake	-0.04580864	0.00785004	-5.835	0.00000000541268418	***
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	0.03041888	0.0115703	2.629	0.008566	**
Year_2021 [1]	Dummy transactions from 2021	0				
Year_2022 [1]	Dummy transactions from 2022	0.05142919	0.0024142	21.303	< 0.0000000000000002	***

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

Residual standard error: 0.2200 on 33908 degrees of freedom

Multiple R-squared: 0,8498

Adjusted R-squared: 0,8495

F-statistic: 2628 on 73 and 33908 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.