

Creation of an official real estate price index in Switzerland: objectives and challenges

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Abstract

Swiss official statistics provides information on prices and their evolution in numerous sectors of the economy, whether it be consumption, production, import or construction. One sector of the economy is not yet covered by official statistics: the real estate sector. However, this market is extremely important, both in terms of investments made and mortgages granted. Under political impetus, the Federal Statistical Office (FSO) has been mandated to produce a real estate price index on a regular basis as of 2018. Although the FSO has long standing experience in producing price indexes, the real estate sector is indeed special and the framework conditions in the production of official statistics have radically changed over the past few years, making the development of a new statistics quite difficult. This document describes the aims of this new official indicator, its potential users and the methodological and logistical challenges that are likely to be encountered. It also presents an initial outline of this new official statistics, particularly in terms of data sources and how qualitative differences will be handled.

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1. An overview of the Swiss real estate market

Switzerland is traditionally a country of renters. Currently 60% of households rent their accommodation whereas 40% are owner of a self-occupied home. The share of homeowners was less than 30% in 1970; it has thus increased considerably over the last few decades and will probably continue to increase over the next few years. This increase is likely a result of facilitated home-ownership through the option of drawing on one's occupational pension scheme from the 1990s¹ onwards, as well as relatively low mortgage rates in European comparison² and attractive tax deductions³. And yet, Swiss real estate prices are among the highest in the world. This can be explained by very high construction prices, the lack of land available and strict construction regulations⁴. Furthermore, a high level of immigration over the past few decades has resulted in consistent high demand for accommodation. In major urban centres, demand exceeds supply, keeping prices very high.

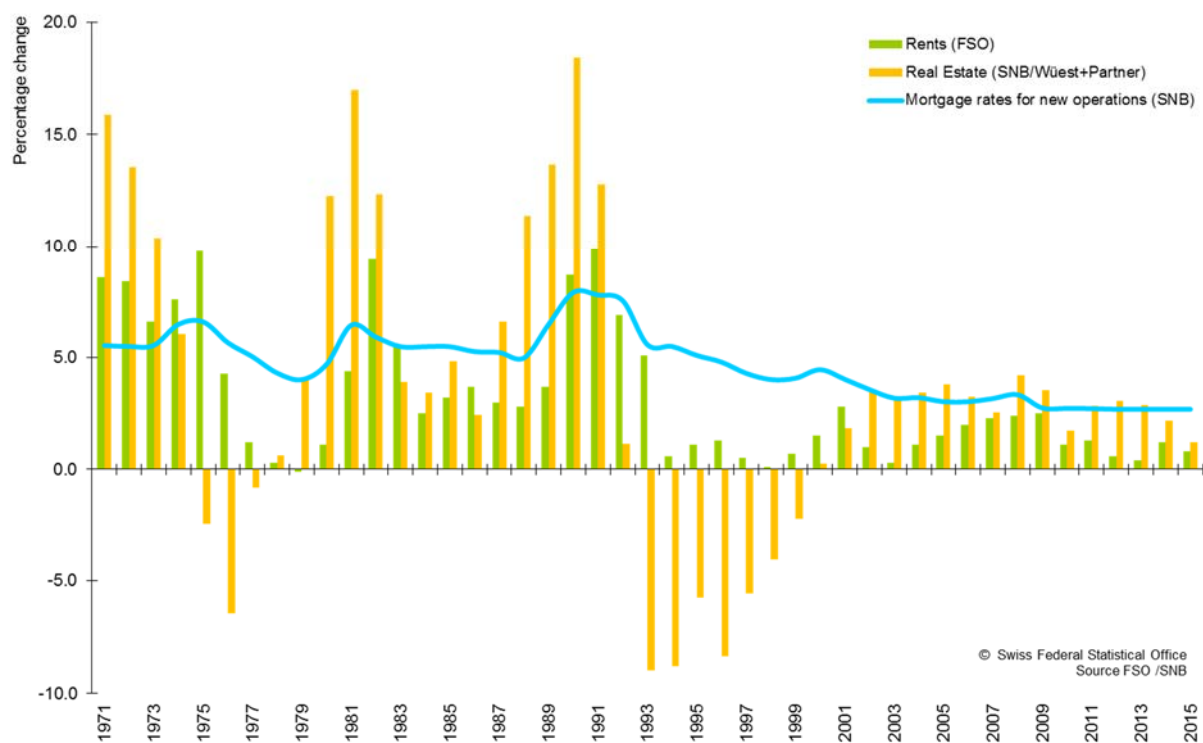


Figure 1: Growth of mortgage rates in Switzerland, real estate prices and rents over the past 40 years.

The situation on the real estate market is currently tense and there is a risk of implosion⁵. Both high real estate prices in certain regions and the total amount of mortgage debt are causes of concern for monitors of the financial and real estate markets and the Swiss National Bank.

¹ Federal Social Insurance Office (FSIO), [home ownership promotion with funds from occupational pension](#)

² Swiss National Bank (SNB), Statistics concerning the [interest rates published for new operations](#), compared with statistics on the [bank interest rates](#) published by the European Central Bank and the national central banks of the Eurosystem

³ Mortgage interest can be deducted from taxable income while estimated rental income is added to it.

⁴ Federal Office for Spatial Development (ARE), [Law of land use planning](#)

⁵ UBS [Swiss Real Estate Bubble Index](#)

Mortgage debt is one of the highest in Europe (CHF 936 billion in 2015)⁶, exceeding the GDP⁷ due in part to extremely low rates. This considerable debt could trigger a real financial crisis if mortgage rates were to suddenly increase⁸.

2. The wish and decision to create an official statistics on real estate prices

At present, official statistics does not offer an indicator for real estate price trends. However, it does already offer some important data on the sector: e.g. rent evolutions over time, the structure of buildings and dwellings, the number of vacant dwellings, housing conditions or even construction investments⁹. Yet there is no official real estate price index. Why is this the case? Firstly, as previously mentioned, because Switzerland is a country of renters, the emphasis is on this sector. Secondly, private institutes¹⁰ have published real estate price trends for many years at a small scale, regional level. The Swiss National Bank also uses data from Wüest und Partner for its economic and monetary policy with real estate prices having a considerable influence on its economy, especially on inflation and the financial system's stability.

In 2011, a political impetus launched a debate concerning the production of an official real estate price index¹¹. This was followed by a feasibility study¹² which was delegated to a group of external experts by the Federal Statistical Office. The conclusions of this study leave no doubt as to the usefulness of an official statistics in this area. In 2012, the Federal Council officially charged the Federal Statistical Office with initiating a project with the aim of producing a residential real estate price index from 2017/2018 onwards.¹³

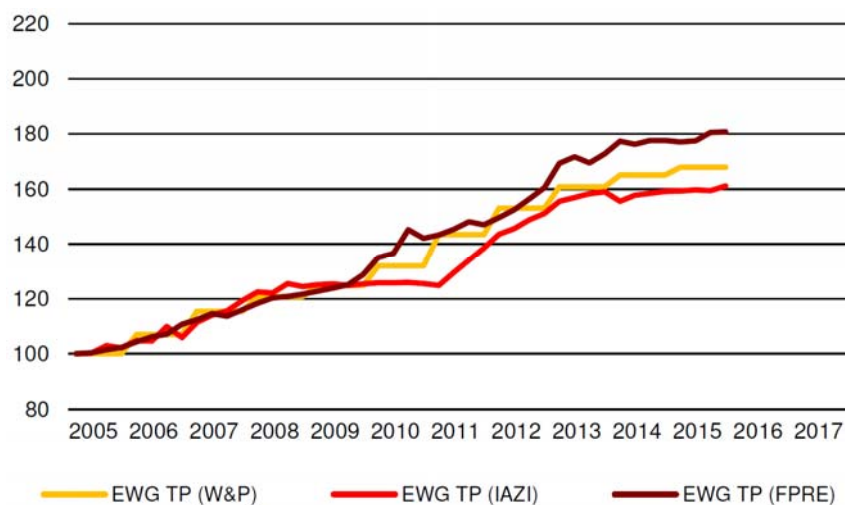


Figure 2: Trends in Private Real Estate Price Indices (EWG TP: Single-family houses, transaction prices) - Wuest and Partner (W&P), IAZI/CIFI, Fahländer Partner Raumentwicklung (FPRE). Source: FPPE, IAZI, W&P

⁶ SNB, [Banks in Switzerland 2015](#), mortgage-secured debts in Switzerland.

⁷ FSO, [Gross domestic product](#), production approach, 2014: CHF 642 billion.

⁸ Short and medium term moderate risk given that specialists do not forecast any interest rate increases because of the bleak economic situation and that homeowners often sign mortgage agreements that are fixed over a period of 5, 10 or 15 years.

⁹ FSO, [Indice des loyers du logement, Bâtiments et logements, Logements vacants, Conditions d'habitation, Construction](#)

¹⁰ Wuest and Partner, IAZI/CIFI, Fahländer Partner Raumentwicklung, some banks

¹¹ [Motion 11.3021](#), Statistical survey on real estate prices, Martin Landolt, 1 March 2011

¹² ARGE EPFL; Econability, HEG, 2012, [Feasibility study](#) for the statistical survey of real estate prices

¹³ [Decision of the Federal Council](#) 12.2458: Launch and introduction of a real estate price index

Although a private real estate offer of price indices already exists, the methods and application fields of these private statistics are different, leading to varying results and possibly some confusion among users. An official statistics following the international standards could offer greater clarity.

Within Eurostat, real estate prices are a priority¹⁴, especially due to the very high number of homeowners in most European countries. Over the last few years, member countries have made considerable investments to launch the real estate price indices. By also producing an indicator in this sector, Switzerland would make up for its delay and would therefore be able to compare trends in real estate prices on its territory with that of its European neighbours.

3. The framework conditions of official statistics

We are a far cry away from the federal census in which civil servants directly delivered forms to households. The use of registers and administrative data has been far more widespread over the past few years with the aim of easing the burden on data providers (households, enterprises). Even if the statistical burden on respondents is low compared with other administrative obligations¹⁵, it nonetheless remains a constraint. When creating a new statistics, the FSO needs to check whether the desired information does not already exist in a register or another source of administrative data, and, if this is the case, it should make use of these data a priority. The main problem is that the registers were not originally established for statistical purposes.

Although federal finances are until now in good shape, the forecast for the years to come is rather pessimistic. The strong franc puts exporting enterprises in a difficult position, encouraging restructuring and delocalisation. The projected economic growth remains weak. This leads to pressure on future budgets and encourages economies to be made including in official statistics. Any new and existing statistics must be produced for as little as possible, calling for more and more creativity and rationalisation from statisticians.

There are multiple user demands on official statistics: complete independence vis-à-vis market stakeholders, scientifically substantiated methods, transparency with regard to methods and comprehensively documented sources of data and quality control. To ensure that the real estate price index project complies with the expectations and requests of users, the FSO has created a support group in which the main stakeholders and users are represented. These closely monitor the work carried out and reach a decision concerning the suggestions made. This approach offers the best chance for the new statistics to establish itself among many other private sources of information.

The problems faced by official statistics include easing the burden on data providers, limiting production costs while providing reliable and high quality price indices. In turn, these lay the foundations for the launch of the new real estate price index.

¹⁴ [EU Regulation No 93/2013](#) as regards establishing owner-occupied housing price indices

¹⁵ Most important are accounting and auditing norms, VAT, safety at work, accident insurance and construction law. See: Federal Council Report on the implementation of postulates 10.3429 Fournier and 10.3592 Zuppiger "Rapport sur les coûts de la réglementation - Estimation des coûts engendrés par les réglementations et identification des possibilités de simplification et de réduction des coûts," Bern, December 2013.

4. The users and their expectations

During the feasibility study following the Landolt motion, a survey was carried out among interested parties who showed interest in an official statistics on this subject. This was confirmed to us within the scope of the project support group. Due to the importance of the real estate sector, there has always been a need for reliable figures. This need has only been partly satisfied by official statistics and private producers. Specifically, situations in which the real estate price indices are used range from information during decision-making processes in property buying or selling to the conduct of monetary policy.

a) Economic indicator

There is a strong correlation between real estate prices and the economic growth: the six major bank crises since the mid-1970s were triggered by the bursting of a real estate bubble. We can discuss whether real estate prices are up-to-date, whether they pre-empt or follow the economy. It is certain, however, that real estate prices are an important indicator. Increasing real estate prices are often associated with economic growth. Their decline, however, corresponds to phases of stagnation or recession.

b) Monitoring financial market stability

Indices are used to monitor the volatility of real estate prices. Variation of these prices may influence the financial sector and household financial stability. A fall in prices leads to an increase in homeowner debt to equity ratios and creditor risk. Mortgage losses oblige banks to review their mortgage strategy. Overvaluation of property assets presents hidden dangers for the entire economy and real estate price indices are fundamental in identifying property bubbles.

c) Monetary policy and inflation driving

Several central banks including the Swiss National Bank aim to keep inflation between zero and 2 percent. As owner-occupied housing is a substantial part of consumption, it is important to consider this for inflation driving. The importance of real estate price indices for this purpose is likely to increase in the future.

d) Decision-making basis

For most households, buying or selling a property is their most important transaction and thus this decision should be well-founded. Price trends have a considerable impact on whether a transaction of this type takes place and price indices are among the information that contributes most to this decision.

Furthermore, real estate price indices are also used for decisions made by the policy-maker and the private economy. Once again, decisions here may also affect price levels. In turn, this may be monitored thanks to price levels.

e) Basis for research and other analyses

In the area of research on the real estate market, multiple stakeholders are dependent on reliable data on price trends. For this, methodological transparency is a key prerequisite. A lot of information is sought after by academics and analysts. This includes long-term price trends, average price levels, implicit prices of building characteristics, price breakdown by land and structure, the number and the volume of transactions and changes in the quality of commercial buildings.

f) Indexing and plausibilisation of valuations

The easiest way to estimate a property's value is to index a price or a previous value. This is far less expensive than carrying out an on-site estimate. A national index would already suffice for property portfolios. For individual properties, however, preciser indices or customised models would be required to calculate the values. Real estate price indices can also facilitate plausibilisation of estimates and evaluations.

g) Benchmarking

Real estate price indices allow inter-regional comparisons as well as comparisons of market trends at international level. For private owners, there is also the possibility of facing up to the market, particularly if statistics also provide indications about price levels.

h) Use in official statistics

A real estate price index will also improve the quality of other statistics in which it will be applied in a number of ways:

- In the Swiss Consumer Price Index, the price change of owner-occupied housing is currently represented by the rent index (rental equivalence method). A residential house price index could replace this approach (acquisition concept).
- Both the Federal Statistical Office (which is responsible for the production of national accounts) and the State Secretariat for Economic Affairs are interested in an official price index for the calculation and plausibilisation of the value of housing stock within the scope of the publication of the gross domestic product.
- Although some figures exist on a regional level to illustrate the real estate market and even if the FSO is primarily focused on the national level, a cooperation with regional stakeholders could be beneficial both for exchanging experience and consolidating statistics at cantonal level (see box below).

With the published price indices available to everyone, it is difficult to anticipate who will adopt them and for what purpose. Beyond the aforementioned situations, we imagine that price indices could benefit other stakeholders differently, e.g. in the compilation of indexed financial products with our figures or as a political tax tool in updating real estate values.

Many users wish to support their forecasts with figures, some would like reliable average price estimates and others would be interested in subindices for market segments. Although these objectives are not essential for the new statistic, the FSO is prepared to cooperate with interested partners if a request is made and the data are available.

Examples of cantonal statistics

- a) The canton of Zurich produces a real estate statistics¹⁶ and publishes the average prices in accordance with several criteria (property, region, age, size, location etc.). A hedonic land price index is currently being examined. The cantonal statistical office benefits from the complete digitalisation of real estate transactions. This is managed by the same civil servants who are both notaries and land registrars. They inform the register inspectorate of changes. In turn the inspectorate forwards this information to the statistical office and to the tax authorities.
- b) The canton of Geneva publishes average prices¹⁷ with the help of cantonal legislation. This foresees the publication of data on real estate transactions and a survey of notaries. Initially, data come from the land register which publishes this information in the official journal. A quarterly statistics is produced on this basis (revised the next quarter). These quarterly statistics are then completed by information from anonymous questionnaires from notaries to produce the annual statistics.
- c) In the canton Basel-Stadt, the land registry has a "Land valuation agency"¹⁸ which collects transaction prices and sends them to the statistical agency. This agency produces and publishes statistics on the number, volume, average prices¹⁹ and mortgages²⁰.
- d) The canton of Basel-Landschaft publishes statistics on the number of free market real estate transactions for land (including prices) and housing²¹.
- e) The cantonal statistical office in Ticino publishes a statistics on the number and cumulated value of real estate transactions (with a focus on apartments)²² and on mortgages²³.
- f) The statistical agencies of Fribourg²⁴ and Aargau²⁵ publish figures on the number and volume of transactions.

5. The framework of the planned statistics

In comparison with other countries, Switzerland has been fairly late in introducing a national statistics on real estate prices. As early as the 1970s efforts were made by the cantons on this subject, and in the private sector price indices have been calculated since the 1990s. Other countries addressed this matter a long time ago. At European level, 28 of the EU countries, as well as Iceland and Norway, currently publish quarterly housing price indices²⁶.

¹⁶ www.statistik.zh.ch > Analysen / Daten > [Immobilien & Raum](#)

¹⁷ www.ge.ch/statistique > [Immobilier](#)

¹⁸ www.gva.bs.ch > Über uns > [Bodenbewertungsstelle](#)

¹⁹ www.statistik.bs.ch/zahlen/tabellen/9-bau-wohnungswesen/grundstueckshandel.html

²⁰ www.statistik.bs.ch/zahlen/tabellen/12-finanzmaerkte-banken.html

²¹ www.statistik.bl.ch > 5 Preise > [Grundbesitzwechsel](#)

²² www.ti.ch/ustat > 09 Costruzioni e abitazioni > [09.05.02 Transazioni immobiliari](#)

²³ www.ti.ch/ustat > 09 Costruzioni e abitazioni > [09.05.01 Mercato immobiliare](#)

²⁴ www.fr.ch/sstat > Tableaux/Conjoncture > [09 Construction et logement](#)

²⁵ www.ag.ch/de/dfr/statistik/statistik.jsp > Daten > Öffentliche Statistik > [09 Bau- & Wohnungswesen](#)

²⁶ The longest time lag is a quarter. Sub-indices for new constructions and existing ones are available for 20 countries. A small number of countries also publish monthly figures.

Several well-established examples at national and international level exist, therefore, to provide us with guidance on the subject of real estate price statistics. Good practices in the production of statistics on real estate prices, i.e. indices and prices for owner-occupied dwellings are described in the international manual and the European legislation²⁷. However, although there is only one set of methodological recommendations and regulations for all countries, multiple calculation methods and survey techniques have been chosen and a working group on this subject, with the participation of the FSO, has been set up by Eurostat²⁸.

a) Property type

At this stage of the project, the forthcoming real estate statistics will concentrate on the production of a price index for the housing sector. The main focus will be on single-family houses and apartments, targeting owner-occupied dwellings in particular. This sector has partly been chosen due to its large size in relation to the whole real estate market²⁹. A price breakdown by structure and by land is not envisaged.

It is usual to divide these statistics into two subsets for individual houses and apartments. These subsets are a reflection of two distinct sub-markets and allow properties to be grouped together by structural similarities. The possibility of separating new from existing constructions is also being considered.

Interested parties have already shown great interest in the inclusion of other property types in the statistics: multi-family houses, offices and business spaces, industrial buildings and shops, land prices. We are reluctant to enlarge the scope of the current project due to the additional difficulty in covering other property types that are even more diverse and for which there is a much smaller number of transactions.

b) Property function

The function of the property is a possible distinguishing criteria. Main or secondary residence, holiday home or investment (for letting), each type has a different buyer segment with distinct outlooks, assessment criteria and purchasing decisions³⁰. The focus of our statistics will be on owner-occupied dwellings, but the task of organising the collection of data to meet this criteria is not a simple one.

c) Periodicity, timeliness and time series

Figures will be published at quarterly intervals, as in most countries in accordance with EU regulation and private indices, in the course of the quarter following the reference period in order to maximise the value of data for economic analysts and stakeholders in the private economy. An even more frequent, monthly, publication of figures, such as already done in

²⁷ a) Handbook on Residential Property Prices Indices (RPPIs), April 2013; b) Methodological manual, Owner-Occupied Housing Price Indices, House Price Indices, February 2013 ; c) Detailed Technical manual on OWNER-OCCUPIED HOUSING for Harmonised Index of Consumer Prices, March 2012 - v.2.0, DRAFT

²⁸ Interest Group "Housing Statistics", organised by Eurostat unit C-4: Price Statistics; Purchasing Power Parities; Housing Statistics

²⁹ FSO Building and dwelling statistics 2013: 65% of buildings are dwellings.

³⁰ In particular, with the adoption of the new [Federal Act on Second Homes](#) (LRS, RS 702) in Switzerland, there is a risk of a break in the market depending on the use of dwellings in tourist regions.

Finland³¹, the United Kingdom³², Ireland³³ and the Netherlands³⁴ seems unlikely to us at this stage due to the small number of transactions carried out in such a short period. Nevertheless, the use of specific statistical methods (rolling window) will perhaps allow us to publish results at different intervals.

Unfortunately, the retroactive calculation of long index series, much desired by macro-economists, is not envisaged, as the data do not allow this.

d) Regionalisation of results

Demand for regional figures is strong, and the private sector in particular has expressed a wish for the finest granularity possible, at the level of "spatial mobility regions"³⁵ or an even finer level. The FSO will, therefore, try to provide the national index with as much information at regional level as possible, depending on the quantity of data collected. For the time being, we are aiming at the major Swiss statistical regions³⁶. Collaboration with local partners, including the cantons, will perhaps allow us to achieve finer granularity at regional level.



Figure 3: The 7 major regions of Switzerland, FSO

³¹ www.stat.fi/index_en.html > Statistics > Housing > Real estate prices > 2015 > 2nd quarter > [Quality Description](#)

³² www.communities.gov.uk > housing > housingresearch > housingstatistics > housingstatisticsby > housingmarket > Housing market and house price information: [notes and definitions](#)

³³ www.cso.ie > StatBank > House Prices > [HPM01](#)

³⁴ de Haan, J.; E. van der Wal; P. de Vries (2009), "The Measurement of House Prices: A Review of the Sales Price Appraisal Method", *Journal of Economic and Social Measurement* 34(2-3), p. 51-86.

³⁵ The 106 SM regions (SM = spatial mobility), into which Switzerland is divided, generally serve as an intermediate, micro-regional level in spatial analysis and regional politics. FSO > Statistical basis > Geographical levels > Regions of analysis: [SM regions and labour market regions](#)

³⁶ In the wake of European integration and for the purposes of regional and international statistical comparison, the 7 major regions were created on the basis of cantonal boundaries. These regions are equivalent to the Eurostat NUTS 2 regions. FSO > Basics and overviews > Geographical levels > [The 7 major regions of Switzerland](#)

As the major regions illustrated above were not designed especially for the real estate markets, we are open to other sub-divisions closer to the reality of this specific market, for example the typology of communes³⁷ or spaces of urban character³⁸.

e) Index calculation

The details of the methodology for the new index have yet to be determined, but we already know that it will be calculated using a formula from the Laspeyres family. To break the market down into more homogeneous sub-groups, stratification will be applied. Observations within each cell will be aggregated with the geometric average, a calculation method used for the Swiss price statistics. Indices within each strata will then be aggregated with a weighting based on the transaction volume of at least 4 quarters. Special uses of the data with other weighting systems will be developed at the request of interested users. For example for the National Accounts, which are more interested in housing stock, the indices could be weighted with data relating to the stock rather than to transactions.

Should the real estate market remain fairly stable, the weightings shall not have to be revised every year. Depending on the analysis of the data we collect, an update might only be carried out when the index is revised, as is the case for the rent index which uses an even larger database, as in the United Kingdom³⁹, in Spain⁴⁰ and in Canada⁴¹, where data cumulated for three years is used to establish weightings.

6. The quality adjustment

The real estate market is comprised of extremely diverse properties. Although there are many similar properties, no two are alike in size, in the surface area occupied, age, location and quality. Over time, the same building will change: it ages, undergoes renovations and its location changes. Therefore, it does not stay the same from one period to another. Lastly, it is not sold every quarter. The same property will never be sold twice. The set of transactions surveyed in the current period will not be of the same quality as those surveyed during the reference period.

An adjustment to neutralise the differences in quality of the buildings surveyed from one period to another is necessary and it is common practice among the producers of such indices to separate the quality effect and the price effect in order to observe the pure price trend. To this end, several techniques, specific to real estate price indices, have been elaborated and illustrated in the international manual.

The best models for the quality adjustment of a real estate price index are hedonic models, possibly combined with stratification, although they require a large amount of data regarding the properties whose transactions are included in the index calculation. It is also our choice,

³⁷ www.bfs.admin.ch > Regional > Statistical bases > Spatial divisions > Spatial typologies > [Commune typologies 2000](#)

³⁸ www.bfs.admin.ch > Regional > Statistical bases > Spatial divisions > Spatial typologies > [Commune typologies 2012](#)

³⁹ www.communities.gov.uk > housing > housingresearch > housingstatistics > housingstatisticsby >housingmarket > Housing market and house price information: [notes and definitions](#)

⁴⁰ www.ine.es > Standard and life conditions > [Housing and consumption price indices](#) > Housing price index

⁴¹ <http://www.statcan.gc.ca/start-debut-eng.html> > Definitions, data sources and methods > [New house price index](#)

which confirms, moreover, the one used for the rent index as well as the feasibility study which led to this project. The hedonic model will also be a hedonic repricing, as in Slovenia⁴², France⁴³ and Finland⁴⁴. One of the advantages of this model is its stability over time. In our opinion, it can easily be understood by the general public. This method foresees the recalculation of the average price of each cell/stratus according to the model and comparing it to the base period. As the quotient of these two values represents the changes in quality, it is used to correct the gross index⁴⁵.

For this adjustment, the structural characteristics of the properties are taken into account (type, age, dimensions, standard, condition) and their location (region, micro and macro location) but not renovation works (which are too diverse), nor the properties' use. The data necessary for calculating the hedonic model should come from the preliminary survey on the 4 quarters preceding the index basis.

Stratification will take into account the main characteristics which define the sub-markets. The characteristics selected are those identified as having the most influence on price trends but also as belonging to the sub-groups which are as heterogeneous as possible. The number of strata, however, will be limited by the quantity of transactions we plan to survey, in order to guarantee a sufficient number of observations for each period.

a) Structural characteristics

- Property type is the main characteristic. We have decided to produce sub-indices for individual houses and apartments. The latter are more homogeneous than the former, which have sub-typologies such as detached house, semi-detached house, one or two dwellings, terrace (at the end, in the middle). Hillside terrace houses are treated as apartments, as they partly share ownership of the land on which they are built. All typologies share characterisation by number of stories (duplex, triplex). The location in the building on the other hand (first floor, ground floor, penthouse, exposure) is specific to apartments.
- The dimensions are also used for stratification. An indicator used a great deal in real estate and in construction is the price per m² or per m³.
- Another important characteristic is the year of construction. We make a distinction between new constructions (first use/younger than 2, 3 or 5 years) and existing ones. Buildings can be classified either by age group or by actual year of construction. The standard of construction and the condition of the building are two variables which probably have a great influence on price but are difficult to measure as they are largely subjective and cannot be estimated easily by proxy. However, we do not wish to exclude them automatically (a luxury villa that has fallen into decay no longer has the same market value).
- Other structural characteristics considered: does the property have parking space, a garage, a swimming pool or a fireplace? How many bathrooms does the house have? What type of heating has been installed? Are rooms air-conditioned? Has

⁴² www.stat.si/statweb/en > Construction > Real Estate Prices > Methodology > [House price indices](#)

⁴³ Gouriéroux, C.; A. Laferrère (2009): Managing hedonic housing price indexes: The French experience. *Journal of Housing Economics* 18(3), p. 206-213

⁴⁴ www.stat.fi/index_en.html > Statistics > Housing > Real estate prices > 2015 > 2nd quarter > [Quality Description](#)

⁴⁵ See "Limitations and impact of hedonic adjustment for the rent index" SFO Christophe Matthey, Corinne Becker Vermeulen, UNECE 2014

the building been awarded a Minergie certificate⁴⁶ ? Where possible we wish to use the main variables to set prices and to follow price trends for quality adjustment.

b) Micro and macro location:

The experience gained with the quality adjustment method for the rent index (see footnote 65) showed that location factors have less impact on prices than do structural factors. A selection of variables suited to the hedonic model will be made on the basis of test data, on literature on the subject and on experience made in the private sector and abroad.

- Macro location factors are those shared by all properties belonging to the same commune: canton (region, district), commune, financial strength, tax burden, proximity to next large town, climate (average temperatures, days of sunshine or rain), are typical macro location characteristics.
- In contrast, the micro location of the building itself is defined by many factors: view (open, of a lake, a mountain), noise (during the day, at night, from the road or railway or airport), the proximity to services (shops, schools, hospitals, restaurants) and public transport, countryside and scenery, gradient and exposure, negative factors (high voltage or other power lines, heavy industry, nuclear power plant) etc.

7. The data, sources and surveys

The new Swiss real estate price index needs various types of data. These data can be categorised as follows: data on the population of decisive transactions (number, volume), data on individual transactions (price, date, and property reference), structural data and data on the property's macro and micro location. Transactions on the real estate market often take several months and involve a number of stakeholders. In the process, information is created, transformed, circulated in different forms and finally archived.

This complex data universe is all the more difficult to understand as no single source has all of the required variables. Some variables even have to be estimated by proxies. The diagram below shows the stakeholders involved in a property transaction and how they are related to each other with the information exchanges of interest to us. In the middle are the main stakeholders: the seller and buyer of the property. The "sale" side is shown in red and the "purchase" side is shown in blue. The institutions involved are green whereas other subsidiary data are purple.

⁴⁶ An ecological label for the low energy consumption of a building.

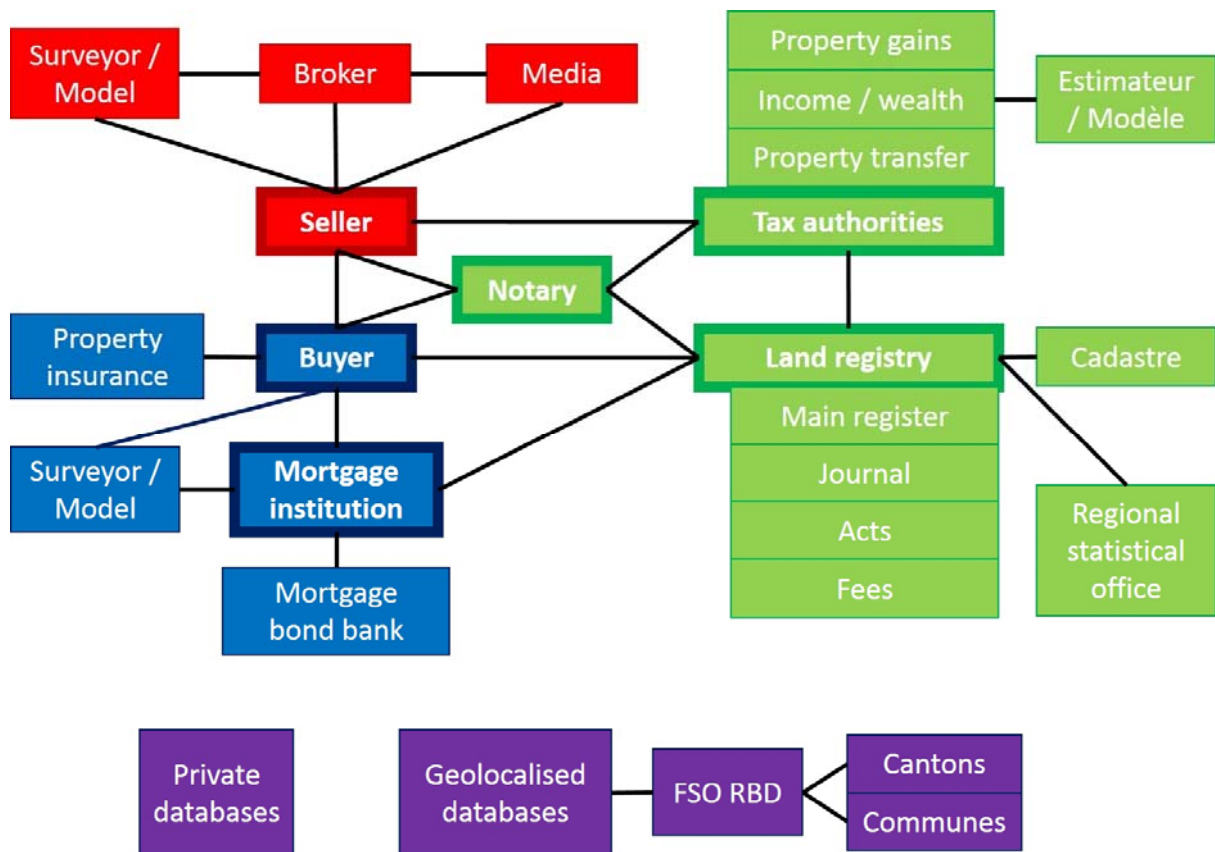


Figure 4: Transaction stakeholders

Population of decisive transactions

The prices of interest to us for the survey are those from transactions on the free market for individual houses and apartments. The total of these transactions is not precisely known today. Private agencies estimate this number to be around 50-60,000 per year throughout the whole country⁴⁷. However, knowledge of the population is necessary to establish weighting systems, to determine survey coverage levels and to possibly draw random samples. If the seemingly trivial definition of "single family house" is actually quite delicate (a different type of land law is applied to apartments, making them easier to define), the real critical point is the characterisation of "transactions on the free market": how can these be differentiated from anticipated inheritance or transactions that do not take place on the free market?

Data on transactions

These data form the basis of our statistics. The price must be the actual transaction price and not any other value in the transaction process:

- the seller's target price;
- the value estimated by the private agency;
- the broker's target property value (or values if more than one broker is trying to sell the same property);
- the price(s) advertised in the media;
- the estimated values calculated by potential buyers or their private agency;

⁴⁷ Wüest & Partner, Immo-Monitoring 2012, Band 2; lazi.ch: "50% Marktabdeckung durch eigenen Datenpool mit rund 30'000 Transaktionen"; FPPE-Rechenschaftsbericht

- the offers made by potential buyers;
- the estimated values calculated by the financial institutions from which the potential buyers have requested a mortgage offer;
- the values decided by these financial institutions to calculate the maximum amount that can be borrowed;
- the cadastral value or estimate by the tax authorities
- the property insurance value

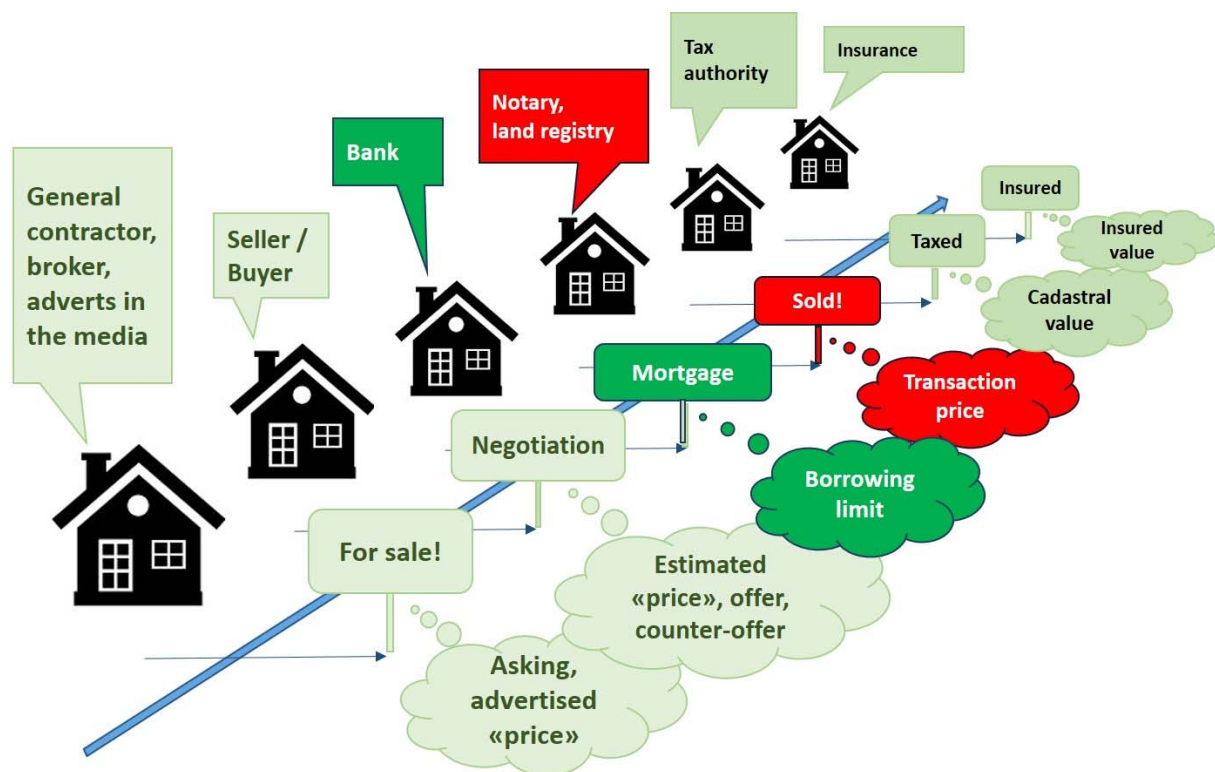


Figure 5: The transaction price time-line

The reference to the property involved in the transaction must be unambiguous to allow matching with structural data sources and localisation sources that are not given by price providers. There is a choice of precise postal address, the land registry plot number, the coordinates or the federal building, dwelling and property numbers. This is a key point which, linked to the date, identifies and connects all data concerning a transaction.

Notably, the identity of the parties involved in the transaction which adds a personal character to the data under the Federal Act on Data Protection (DPA, SR 235.1) is of little interest to us.

Data sources and data suppliers

In the collection of data, the Federal Statistics Act, the Charter of Swiss Official Statistics (along with the European Code of Practice) and the Federal Statistical Office's strategy which aim to limit the work burden of data suppliers and keep costs to a minimum encourage us to prioritise our own sources in our search for data. First of all, we will look within our own institution, then in the registers and other administrative data managed by the federal, cantonal or communal public administration. We will then look at private enterprises followed by households.

Unfortunately, no source has all of the data needed and it is therefore necessary to combine several sources. Data relating to prices and property characteristics will be collected by a main survey of mortgage lending financial institutions: banks, insurance and pensions funds. Not only do they have information about transaction data, but also about property characteristics. Furthermore, these data are handled carefully by a number of competent professionals because they serve as the basis for strategic and operational decisions. Most financial institutions are interested in an official real estate price index which potentially consolidates their motivation to cooperate.

Data relating to the transaction population including precise identification of the property will be collected directly from the land registers. These registers hold information concerning all transactions carried out because they are the legal authorities responsible for registering property. The difficulty with land registry information is filtering transactions and excluding those outside our scope of application: transactions that are not for a residential purpose, are not on the free market and changes other than purchases. It should also be noted that while land registries are informed of transaction prices through official acts, transaction prices are not included in the “main registers” (the main information) nor, with few exceptions, in the “journals” (secondary information).

This is therefore the range of data sources that we envisage:

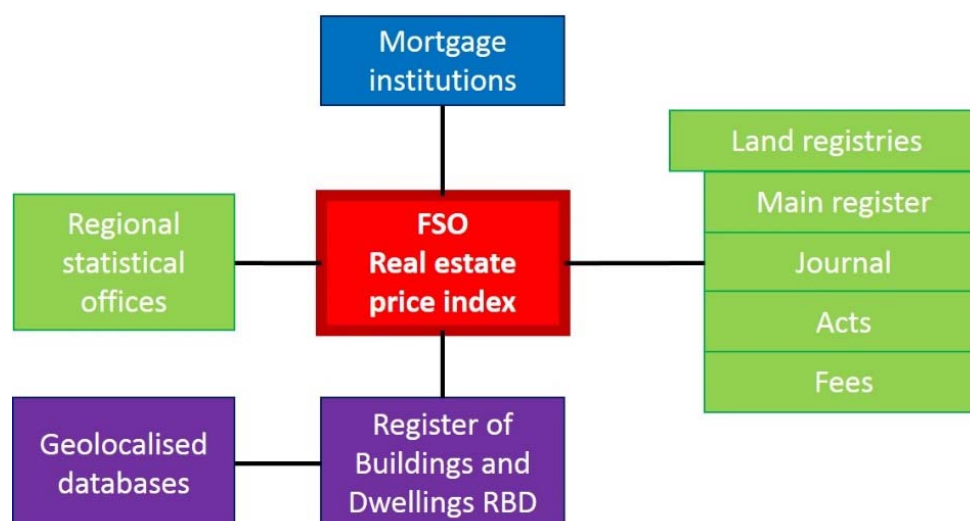


Figure 6: Data sources model

The surveys

Where possible, surveys will be carried out electronically and automatically in real time. The quarterly survey of mortgage lending institutions will be complemented by a survey of land registries. The periodicity and modalities of the latter still need to be defined in more detail. The data will then be enhanced by matching with data from the Register of Buildings and Dwellings and, through using coordinates, matching with data from other geocoded databases of the public administration for additional information on the quality of properties.

While desirable to limit the work burden on data suppliers and to reduce costs, unfortunately a sample survey cannot be used because there is no fast and easy way to determine the transaction population in a given period.

8. The future work

We are currently finalising details of the new statistics. This detailed conceptual phase will keep us busy until the end of the summer. In addition to the methodology, the survey technique also needs to be precisely defined. For this purpose, we are working together with future data suppliers. Other areas still to be considered also include the dissemination of results and the legal bases. There still remains quite a lot of work for us to do. From 2016 onwards, we will implement and test what has been designed and develop the computer application accordingly. From spring 2017 onwards, we will put in place production team work procedures, carry out a pilot survey, collect data to establish weighting systems and develop the quality adjustment hedonic model. We plan to carry out the base survey at the end of 2017 (Q4=100), to conduct the second survey during Q1 2018 and to publish the first results before summer 2018.

At a later stage, it will be important in the mid and long-term to continue to develop and extend the future statistics to consider different types of properties, more data from registers, monthly frequency, faster publication and an automatic survey using computer interfaces. This development of an official real estate price index in Switzerland is only the beginning. It will need to be improved over time and we will need to earmark adequate resources to increase its coverage and improve its quality.