

REAL ESTATE DATA IN EUROPE AND THE US

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INTRODUCTION

This report offers an overview of real estate data in nine countries: Germany, England, France, Spain, Italy, Norway, Sweden, Switzerland and the US (Figure 1). It particularly concerns pricing and rental data for housing in the private market. It is not exhaustive but rather for information purposes, comparing data production ecosystem. And because it deals with such a broad topic, the report is not forward-looking either but rather a snapshot, and in most cases it excludes any innovative or disruptive solutions arising from the digital revolution.

Besides England and the US, which are central to the real estate industry, the European countries surveyed were selected because they represent a broad range of case studies. The countries concerned include the European Union's main long-standing members, such as Germany, France, Italy and Spain, along with Sweden whose publicly-available data is particularly extensive and is thus of course central to our analysis. Looking beyond the European Union, Norway and Switzerland were added to the sample because they lack official price statistics and their markets are dominated by private producers, so their cases are very specific.

Note that Wales has been included in the sample by default as it falls under English law and shares its land register with England.

*Figure 1. Countries featuring in the report:
Germany, England, Spain, Italy, Norway, Sweden, Switzerland and the US*



Note that four other countries were scanned for exploratory purposes before establishing the case studies to be used in this report: Belgium, Austria, Luxembourg and Denmark, where the land register is open to the public and provides extensive data - such as land register numbers and property prices over the years - and is also accessible for a fee via private distributors.

**For the eight case studies
selected, the survey mainly
tackles the following
3 questions:**

- 1) Are the public authorities major producers of real estate data?**
- 2) Which countries make their real estate data open to the public?**
- 3) What role does the private sector play in the production ecosystem?**

Nota bene on rents

Public authorities in the countries being compared here generally conduct market rental surveys when establishing their consumer price indices, which are used to measure inflation. As far as we know, the results of these surveys are not available except via the rental index the authorities produce from the surveys carried out nationwide. More generally, there appear to be few sources of rental data, be they public or private, so little emphasis is placed on them in this report.

PUBLIC AUTHORITIES CENTRAL TO THE REGISTRATION OF OFFICIAL DOCUMENTS AND PRODUCTION OF DATA

Document registration, an obligation and a guarantee

In the nine countries compared, the public authorities require deeds of sale for housing property to be registered and define the conditions for doing so. They manage the associated registers and are thus the official depositories of information on property transactions.

As the guarantor of land records, and in an effort to increase transparency, they provide access at least to extracts or copies of deeds on an individual basis. Access can be provided directly via a digital interface or by the appropriate body on demand; this often requires a fee to be paid but can be free of charge.

The general rule is that documents are centralised within a same depository (a single register). There are three exceptions:

In the US, deeds are available and accessible in digital format but each county has its own register (and there are about 3,000 of them!);

In Switzerland, registers are held in each canton (26) and are not fully digitalised. In this second case, therefore, the information is deposited but the data itself is lacking.

In Germany, notarised documents are not transferred to an official register but to databases managed by expert committees on a regional level.

Registers in the other countries surveyed are centralised and digitalised; the information within them is available in data form. But only three of these registers are publicly available: the first and the second, free of charge, is in England since 1995 and in France since 2019; the third, accessible for a fee, in Sweden. In Italy, the register has only been available in database form since 2016. Plans to open up Italy's register to the public. Have been recently subject to the vagaries of Italy's unstable government and there is no guarantee they will be successfully completed.

Research carried out shows that France and Spain is alone in offering notary databases. There, is responsible for transferring and registering notarised documents in a specific database. The data is used in both cases to establish the national statistical institute's price index. In the other countries operating under Latin civil law, where notaries are public officials responsible for certifying and registering deeds of sale, notarised documents tend to be transferred directly to the land register.

In other countries, it is up to the real estate agent or even the individual to record the deed of sale in the land register. This is the case in England, where deeds can be deposited by legal advisers and real estate agents. In Sweden, it is up to the real estate agent to do this, while in Norway, it can even be the individual.

Different systems for registering deeds in Europe and the US

Germany, France, Spain and Italy: Latin civil law and the role of notaries in certifying and registering deeds of sale

In Germany, France, Spain, Italy and other countries operating under Latin civil law within the European Union (totalling 22 in all), notaries have the role of public officials and act by delegation on the state's behalf. Where property is concerned, their role is to certify the legal documents and deeds they draw up for their clients. Notaries guarantee that the certified document is publicly recorded for third parties and the state, primarily by adding it to the public registers that exist for this purpose. They are also responsible for preserving the deed and must keep the original in their archives indefinitely while issuing certified copies. Last of all, they receive payment and in turn pay taxes to the tax authorities and ultimately deliver the property title to the buyer.

Switzerland: notaries are also responsible for registration, but only for their respective cantons

The notary profession in Switzerland depends on each canton's distinct jurisdiction, and only half of them come under Latin civil law. The country's notaries operate either as liberal professionals or as civil servants. But they all register the certified documents required by law, such as deeds of sale of property, as is the case in France, Germany, Spain and Italy. Registering these documents in a land register is a formality that is necessary for property law to exist. But there is no federal land register, instead each canton has its own. Nor are the registers fully digitalised, so the pages containing the prices involved in property transactions are actually still in the form of paper archives.

Sweden: a central role for real estate agents

Sweden is among the members of the European Union whose registration system differs from that applied under Latin civil law. Property transactions in the country are, most of times, conducted by real estate agents (private person can sell an real estate without using an agent). There are no notaries involved, so the real estate agent is also responsible for ensuring that contracts comply with all legal obligations and constraints as well as for registering them. Real estate agents operate within a regulated industry and cannot practice without being registered with a specific legal administration, Sweden's Board of Supervision of Estate Agents (Fastighetsmäklarinspektionen). As is the case everywhere, deeds of sale are placed in the land register. But, more specifically, document registration is a highly digitalised process and takes no more than a few weeks.

Norway: a mandatory registration system but open to the public

Norway also has an official land register. It is supervised by the Ministry of Local Government and Modernisation (Kosmmunal-og moderniseingsdepartementet) and was digitalised at the turn of the 1990s. One particular feature is that anyone can submit the transfer of property documentation to the register, be they a real estate agent, solicitor or individual. The register is publicly available and can be consulted for a fee.

England: transaction agreements are private but non-certified, a register of property transfers exists but the land register is incomplete

England is a common law country, so the concept of certified document does not exist. Its legal system includes no provisions for certified instruments issued by public officials. But there are some formalities that do apply to documents. They do not involve certification but rather written documents, witnesses and registration. In principle, property transfer documentation requires a deed, which is a sort of private agreement that serves as both confirmation and undertaking. It can be drawn up by a legal advisor or approved real estate agent. As a general rule, the parties involved in the transaction are still represented by solicitors, notaries or licensed conveyancers, all of whom are experts specialising in property transactions. These experts are responsible for registering the documents.

The country's Land Registry is where property transfer documentation is deposited, but it is worth noting that the register does not contain all of the country's properties. The register is expanding as new property transactions are incorporated into it. New property deals have been added to it since the reforms introduced in the early 2000s, helping it to become a real land register.

US: registration within each county

In the US, deeds of sale and all related documents, including transfers of ownership, are written up by the buyer's and seller's lawyers. Notaries have the authority to certify the documents. Lawyers send the deeds to be registered. There is no central land register, instead each county has its own. The predispositions for managing these registers vary between states and between counties.

THE OPEN DATA DEBATE

The legislative framework, open data vs privacy

US: the pioneer of open data

Open data has become a big issue and is now incorporated into legislation. It all began in the US in the 1960s¹ with the Freedom of Information Act (1966). The act is based on the principle that we all have the right to information, and it forces federal agencies to provide access to their documents to anyone who asks. More generally, it introduced the notion of open public data. Its scope is very broad but not infinite. Nine exceptions are made, for instance to protect the interests of national security, classified defence files and doctor-patient confidentiality.

Another exception is the right to privacy, whereby it is possible to refuse that data be made public. In other words, privacy prevails over open data. The US Constitution itself, in its 4th Amendment, introduced the right of citizens to be “secure in their persons, houses, papers, and effects”, thus protecting them against the government. At the federal level², the Privacy Act (PA) of 1974 reinforced this fundamental right and established rules for processing personal data collected by the different branches of government.

Then there is a series of law aimed at protecting personal data in the private sector³. Ultimately, businesses are free to manage data provided their practices are not unfair, i.e. incompatible with the consumer’s legitimate expectations.

Europe at the turn of the 2000s

In Europe, open data emerged at the turn of the 2000s. England was the pioneer, along with the other members of the UK, and in 2000 it adopted its own Freedom of Information Act. The European Union soon followed when it adopted Directive 2003/98/EC of 17 November 2003. This directive “establishes a minimum set of rules governing the re-use and the practical means of facilitating re-use of existing documents held by public sector bodies” (art. 1)⁴. It authorises the re-use of public documents for commercial or non-commercial purposes (art. 3) but leaves “intact” the level of protection of individuals... under the provisions of Community and national law (art. 1).

In no way does the 2003 directive actually modify the rights and obligations stipulated in Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

¹ Interview with Regis Chatellier, prospective market researcher at CNIL

² Each state recognises the principle of personal protection under common law. .

³ Maxwell W.J. (2013), “La protection des données à caractère personnel aux Etats-Unis : convergences et divergences avec l’approche européenne” [Protection of personal data in the United States: convergences and divergences with the European approach], *Le Cloud Computing, L’informatique en nuage*, Hogan Lovells.Society of Comparative Legislation: <https://www.hoganlovells.com/~media/f411e461f30741ce8937bc69cdd544ed.ashx>

⁴ Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, Official Journal of the European Union, 31 December 2003: <https://eur.lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2003:345:0090:0096:EN:PDF>.

The definition of personal data in this founding text is “any information concerning an identified or identifiable person (person concerned)”. It stipulates that “an identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity (art. 2, point 2)⁵”. This reference is often cited to justify closing down if not eliminating certain variables from the real estate datasets originating from public sources.

The 1995 directive was reinforced in 2000 by the Charter of Fundamental Rights of the European Union. Article 8 of the Charter stipulates that “everyone has the right to the protection of personal data concerning him or her”⁶. So any processing of data within the European Union is potentially a breach of a fundamental right and must be justified by a legitimate purpose, consent, the execution of a contract, etc.

More recently, the General Data Protection Regulation (GDPR)⁷ consolidated personal rights further. It imposes tighter restrictions on the processing of personal data and gives citizens more control over how the data concerning them can be used. It tackles the big issue of trust.

⁵ Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, Official Journal of the European Union, 23 November 1995:

<https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:31995L0046&from=EN>

⁶ Charter of Fundamental Rights of the European Union, Official Journal of the European Communities, 18 December 2000: http://www.europarl.europa.eu/charter/pdf/text_en.pdf.

⁷ Note that it came into effect in France on 25 May 2018.

Open data is now an obligation for the European Union's member states

Directive 2003/98/EC contains no obligation to provide access to documents nor any obligation to authorise the re-use of these documents. Ten years after the 2003 directive was adopted, it was amended by Directive 2013/37/EU⁸ which imposes a clear obligation on member states to render all open data re-usable whether for commercial purposes or not. This was based on the following observations:

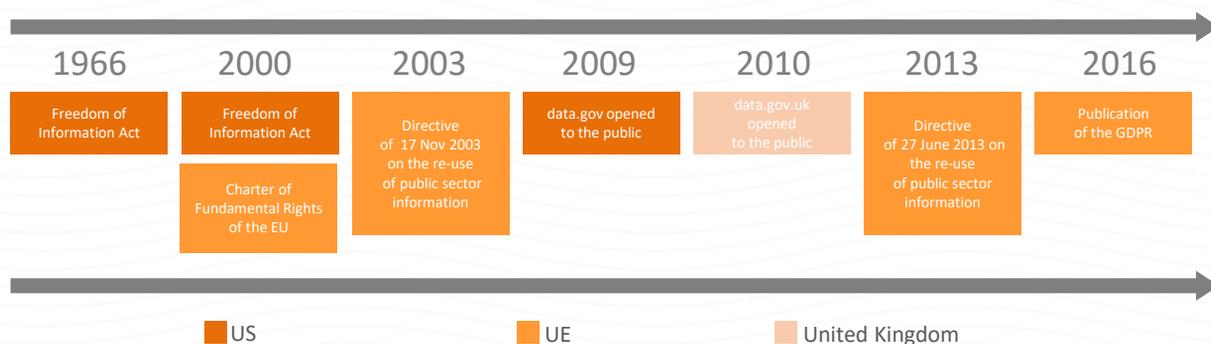
- 1) “Documents produced by public sector bodies of the Member States constitute a vast, diverse and valuable pool of resources that can benefit the knowledge economy”;
- 2) “Open data policies which encourage the wide availability and re-use of public sector information for private or commercial purposes, with minimal or no legal, technical or financial constraints, and which promote the circulation of information not only for economic operators but also for the public, can play an important role in kick-starting the development of new services (...), stimulate economic growth and promote social engagement”;
- 3) “Allowing the re-use of documents held by a public sector body adds value for the re-users, for the end users and for society in general and in many cases for the public body itself, by promoting transparency and accountability and providing feedback from re-users and end users which allow the public sector body concerned to improve the quality of the information collected”;
- 4) “The amount of data in the world (...) has increased exponentially (...). In parallel (...) this rapid technological evolution makes it possible to create new services and new applications, which are built upon the use, aggregation or combination of data.” *Idem*.⁹

So the purpose of the 2013 directive is to update regulations and adapt them to changing circumstances. The aim is to grasp the economic and social opportunities offered by the re-use of public sector data. This approach is at the very core of the open data policies adopted by member states.

⁸ Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information (Text with EEA relevance), Official Journal of the European Union, 27 June 2013: <https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:32013L0037&from=EN>.

⁹ *Idem*

Figure 2. Key legislation governing open data in the US, European Union and UK



Open data, a movement driven also by civil society

Since being set up in the UK in 2004, the NGO Open Knowledge Foundation (OKFN) has helped to steer the open data movement in around 60 countries. It promotes “free culture”, in this case open data, but also open knowledge, open access and open science. In 2006, this non-profit association carried out a marketing campaign in the Guardian newspaper called “Give us back our crown jewels”, with the aim of opening up public data which is produced and financed thanks to the taxpayer. This campaign was considered decisive internationally. It met a positive response in the US where, for example, Barack Obama himself made a commitment during his 2008 campaign in favour of open government, the idea being that it would be possible to “open up” government through information. Three years later, in 2011, the Open Government Partnership (OGP) was set up in the US with the aim of making public action more transparent.

According to this pro-active movement, the data must be raw (non-processed), accessible in a non-proprietary format, under a licence that enables the data to be used, and distributed indiscriminately and at a marginal cost. The principle distinguishes between data and its uses. According to open data militants, this is necessary if the opening up of public data is to live up to expectations.

Source: Courmont A. (2016), *Politique des données. Ce que l’open data fait au gouvernement urbain*, Thèse de doctorat en science politique, Institut d’études politiques de Paris.

The process of opening up data is rarely complete even now

As far as open data is concerned, there is little that can be learned about house prices if we take a look at the nine countries being compared (*Table 1*).

In the public sector, as we have already seen, only three countries have opened up their individual data (i.e. by sale): the US, England and, within the European Union, Sweden. As in France, Italy's open data project is a work in progress.

The factsheets by country provide some necessary details about the rules governing open data that prevail in these countries. For instance, in Sweden, unlike the US and England, a fee must be paid in some cases and the data is not available without an access filter.

Aggregated data is openly available everywhere, although rarely on a very detailed scale.

In the private sector, there is little open individual data available. Those that produce aggregators of data from the digital economy exist in the US and England, but apparently not anywhere else. Meanwhile, the vast amount of individual data held by trade bodies can only be accessed internally if needed. This can also be the case for aggregated data.

Table 1. Price data: summary of open data in Europe and the US

	PUBLIC DATA		PRIVATE DATA	
	Open individual* data	Open aggregated data	Open individual* data	Open aggregated data
PRICE DATA	US, England, France, Sweden (Italy, work in progress)	Everywhere	US, England, France (in rare cases)	Everywhere, but not systematically

**individual data refers to data specific to a single property transaction (one line = one transaction).*

As far as rental data is concerned, the survey confirms that indices exist everywhere. Rent indices tend to be available on a national scale, but they can in some cases also exist on a regional level, as in England. The public sector is responsible for them but the private sector can also produce such indices, generally as financial indicators for use by professionals.

It is hard to find more detailed statistics about rents, except in France with le réseau des Observatoires publics locaux des loyers since 2015.

Individual data is apparently non-existent, except in the US and also in England where Property data is an aggregator that shares the data found in online property ads for free.

The private sector's role in data production

In all countries, the private sector is a key contributor to the production of real estate data. Besides providing data about finalised property deals, it also adds asking-price data to the production system. This is particularly significant when it comes to listed property prices. In the countries being compared. Most of time, the final transaction prices are the official indicator but data on listing prices be legitimate and used too. In a few countries, asking prices or even estimated prices collected through surveys can also add to the production not only of private statistics but also of public statistics.

More generally, there are four cases worth mentioning in particular.

- 1) **US** is a special case. The private sector aggregates public data as there is no central depository. It expands the amount of data by combining it with an ever-growing number of sources on homes, their occupants and their neighbourhoods. Zillow is the market leader, and it shares its information for free right down to each individual neighbourhood; but it charges a fee for data that is any more specific than that.
- 2) **In England**, there is a lot of private data but it is not accessible or it is aggregated and destined for only a small group of users. As an exception, a real estate marketplace was created relatively recently that delivers individual asking-price data free of charge. Unlike in the US, individual price data opened up by the public authorities in England is not included in private databases, according to the sources cited. One exception is Datscha, a newcomer from the digital economy.
- 3) **Switzerland** is also a special case. There is a lack of public sources, leaving it up to the private sector to produce real estate data. There are lots of private sources and they vary depending on the interested party, with banks, investors and insurers on the one hand, and real estate agents and valuation experts on the other. .
- 4) **In Norway**, too, private sources are predominant. One specific feature is that these sources are essential to public statistics and all of the country's source and data producers form a particularly integrated microcosm.

9 COUNTRIES, 9 REAL ESTATE DATA PRODUCTION SYSTEMS

The following pages contain factsheets for each country, providing an overview of their existing real estate sources and data.

The countries are ranked from the most “open” to the most “closed” in open data terms, i.e. in the following order:

- 1) US
- 2) England
- 3) France
- 4) Sweden
- 5) Norway
- 6) Italy
- 7) Germany
- 8) Spain
- 9) Switzerland

The factsheets are all illustrated with a succinct diagram. The reader can therefore rapidly identify the producers and their data, and also determine whether or not this data is publicly available.

In the appendices of this report, there is a list of people who provided resources making it possible to complete the documentation work.

The US is a special case among the eight countries being compared. In short, there are lots of open sources, and aggregators (still a novelty in Europe) already play a key role in the system for producing real estate data (Figure 3).

Sources are open but fragmented

As mentioned above, the US was a pioneer when it came to opening up its public data. The first two legal sources of real estate data to have opened up are: **the Census Bureau**, which produces estimates of property prices and rents for a sample of housing units; and the federal authorities, which monitor property subdivision permits on a monthly basis. More unusually, the different counties fulfil the role of tax authorities and issue, for free, all the deeds of sale and property titles they register. The data is particularly extensive (for instance, it includes the names of property owners and the values of previous property transactions). But there is no central depository. So, to access all this data, the user needs to go through all the assessor office websites of the 3,000 or so counties in the US. Nor is the data standardised, so it differs significantly from one county to another.

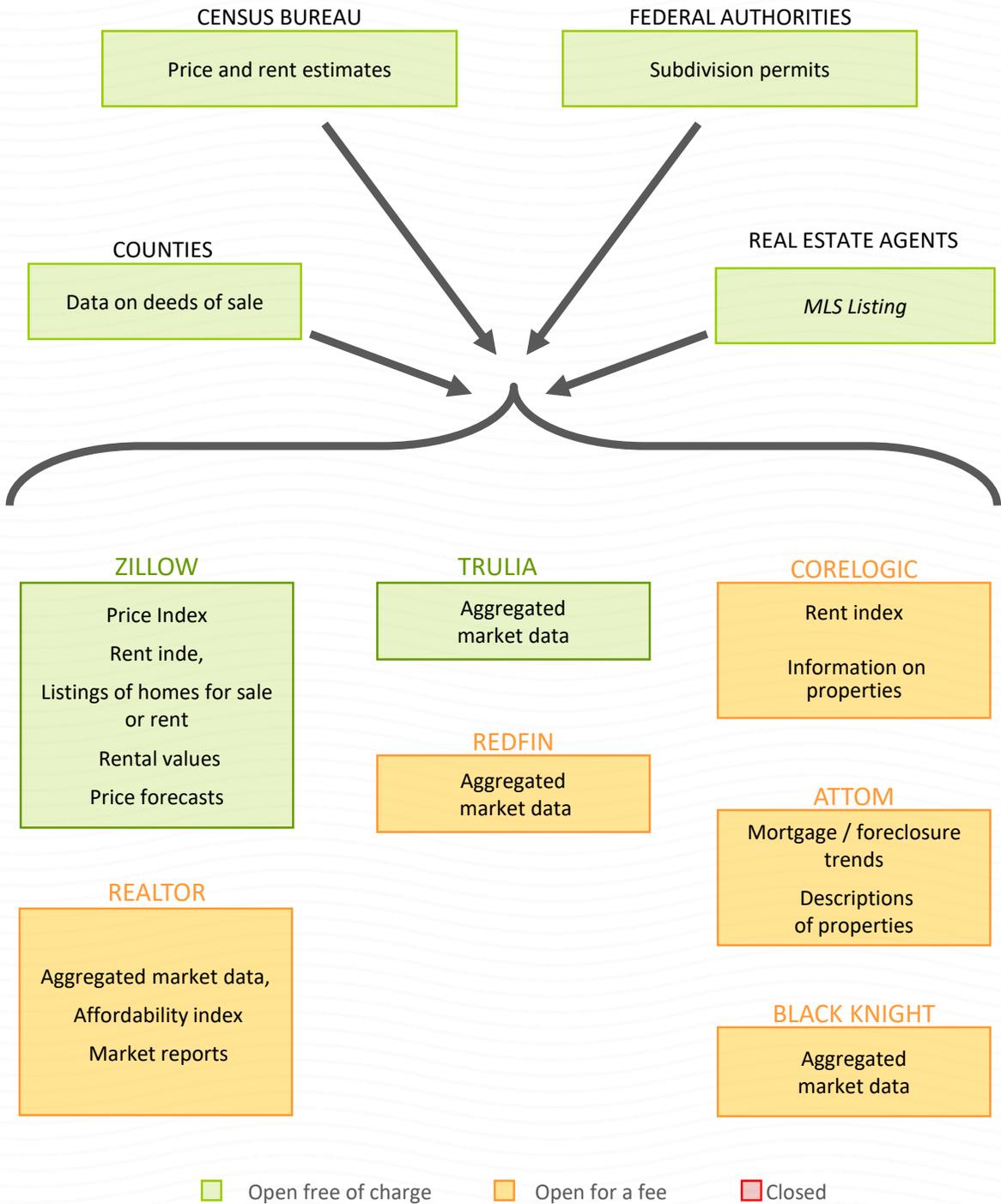
Prevalence of private aggregators of public data

A real market for real estate data has emerged in the US thanks to the availability, abundance and fragmentation of sources. For several decades now, private firms have handled the collection, aggregation and harmonisation of the data opened up by the public authorities. They are able to greatly increase the potential of this data thanks to **MLS (Multiple Listing Services)**; these are files shared by real estate agencies which register their exclusive listings continuously (90% of total listings). The amount of information obtained is increased further by the huge quantity of public and private data about properties, their occupants and their neighbourhoods. All of this helps to create powerful models that add a predictive dimension to the services on offer. In short, the data switches from the public to the private domain and becomes accessible only for a fee; it also switches from being specific to an individual property transaction to being almost “comprehensive” and strategic.

Zillow, a real estate marketplace, leads the market followed by Realtor, the property ad website for the National Association of Realtors. Zillow is continuously incorporating new sources of information into the databases of its Zillow Research division to enhance its models. The main products thus generated include a price index (Zillow Home Value Index, ZHVI) and a rent index (Zillow Rent Index, ZRI), as well as a listing of home sales (Home Listings and Sales, including volumes, median prices, housing stock, days spent on Zillow before a sale is finalised, price cuts, etc.), a listing of rentals (Rental Listings), rental values (Rental Values) and price forecasts. All this information can be downloaded for free on different scales, the most precise being that of a neighbourhood. Other information can be supplied on demand, for a fee.

Like Zillow, **Realtor**'s approach is to aggregate more and more data into its database. Its latest achievement is its alliance with Porch, a database with around a hundred million renovation projects and renovations, enabling it now to present a detailed report of the work carried out in its members' listed homes.

Figure 3. Main real estate sources and data in the US



Other online marketplaces operate using the same model. Examples include **Redfin** and **Trulia**. Using a wide variety of sources, these companies offer both general real estate information and specific products: for example, Redfin monitors the competition by continually updating its sale listings, while Trulia provides neighbourhood guides.

Companies whose primary purpose is to produce data supplement the real estate information collected by Redfin and Trulia. These companies include **CoreLogic**, **Black Knight** and **Attom Data Solutions**. They, too, offer a combination of data and services. Each of them offers specific products, for instance CoreLogic's search engine for property reports (*RealQuest*), Black Knight's automated valuation tools, and the database of listed property ads provided by Attom Data Solutions and its subsidiary RealtyTrac (Attom has two other subsidiaries, HomeFacts and HomeDisclosure, which provide information on neighbourhoods, with the former placing a big emphasis on safety and the latter offering a tool that can be used to generate property reports).

Newcomers in data aggregation geared towards e-prospection

Last of all, it is worth mentioning **Homesnap** as one of the many newcomers to the market. Homesnap is a website that makes it possible to access information about any home based on its photograph, even if it is not up for sale. In the US there is a lot of innovation in the area of real estate information, a sign that open data helps new services to emerge. Many offer tools for e-prospecting highly-qualified prospects¹⁰.

¹⁰ Juillard C. (2017), *Données et services. Quand les données immobilières fondent la création de nouveaux services numériques [Data and services. When real estate data allows for the creation of new digital services]*, report dated 1 October 2017 and carried out for Lifti.

England

Open official data

In the United Kingdom, **Her Majesty's Land Registry** is a non-ministerial government body set up in 1862. It produces legal data on properties and property transactions. The register collects data about deeds of sale drafted and registered by solicitors, notaries and licensed conveyancers, all of whom are experts specialising in property transactions. It covers England and Wales, since Scotland and Northern Ireland have their own registration systems.

The Land Registry produces an official price index. Above all, its website provides free online access to its database. Data is available on individual transactions carried out since 1995 and is geocoded. But little descriptive information about housing is supplied.

The Land Registry's price index is used and disseminated by the **Ministry of Housing Communities and Local Government** and by the **Office for National Statistics**.

Lots of private sources but little openly available data

There are at least three categories of private companies that contribute to the stock of real estate information by publishing reports and statistics from their databases. But they do not supply any of their detailed data.

The **Royal Institution of Chartered Surveyors (RICS)** has a large real estate database which is considered to be the official source of data. This trade body was set up in 1868 and helps to regulate and promote the real estate industry. It issues occupational qualifications to Chartered Surveyors, who are reputed for their flawless ethics and absolute expertise in the areas of land property, real estate and construction. The RICS produces reports about the real estate market.

The National Association of Estate Agents (NAEA) is another trade body that centralises data from its real estate agency members and uses it to draft reports. The bigger real estate agencies, meanwhile, produce their own statistics. Examples include **Knight Frank** and **Savills**, which each offer their own price index.

Last of all, banks hold data on the mortgage loans contracted by their clients. **Halifax** and **Nationwide** in turn use this data to establish price indices.

Data aggregators

Data aggregators offer new sources of information.

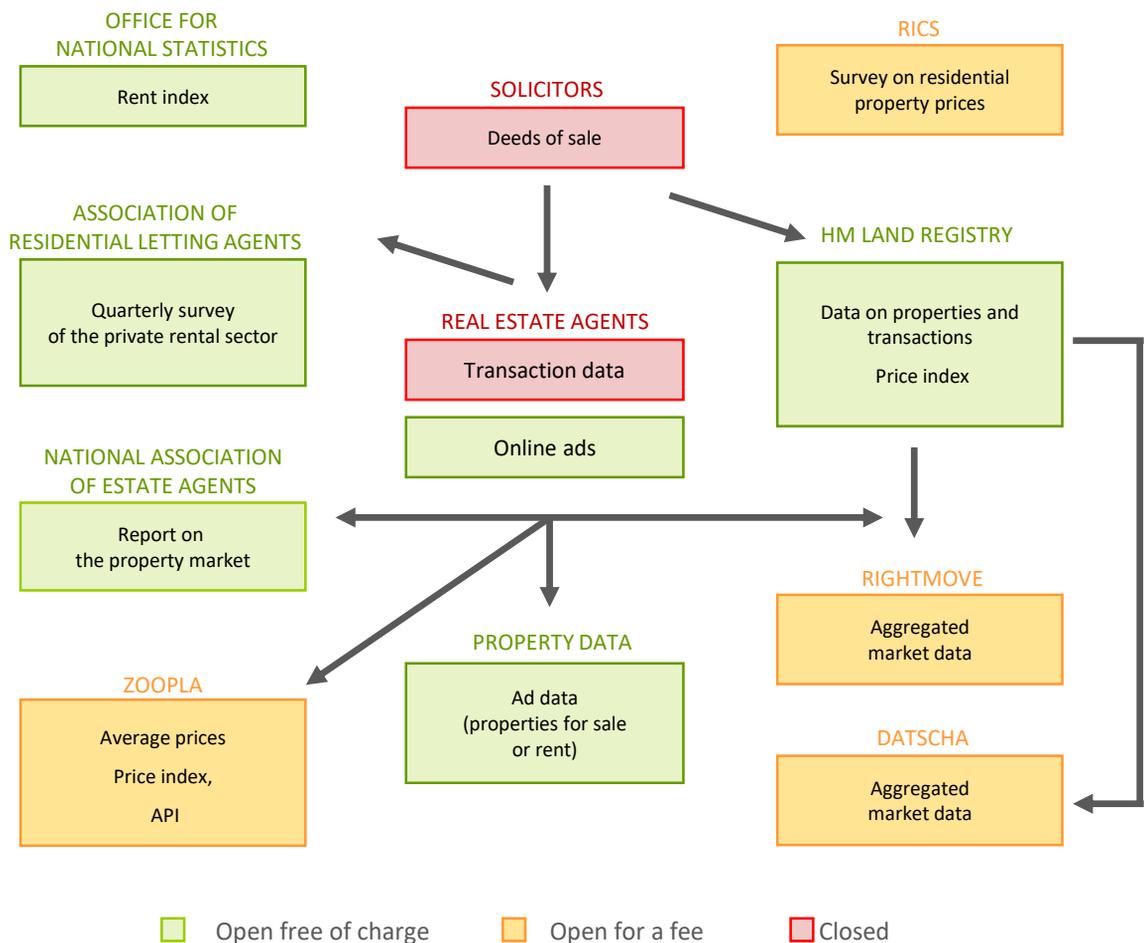
Rightmove is the longest-standing of them. It was set up in 2000 by the UK's four biggest real estate companies (Countrywide, Connells, Halifax, Royal and Sun Alliance) and aggregates data from its partner members with data from the Land Registry. It uses it to create varied market data and sells it to investors, builders and property transaction professionals.

Zoopla was set up in 2007 and has established itself as the market leader; it collects all the data available online on existing properties. Along with average prices and its index, Zoopla also markets its own API.

Property Data is a platform offering competitive watch services in real time. It aggregates data from online ads for listed properties available for sale or rent at any given time. Its individual data can be downloaded free of charge, and the zone of interest can be defined by hand using a map that can be scaled down as far as the neighbourhood level. The data refers to asking prices for properties available for sale or rent. It also exists in the form of an API.

Datscha is a tool that was created in Sweden and imported into England. It maps residential and commercial property transactions and offers a precise description of the properties in question. The company allows access to individual data for a fee, but it offers users the possibility to download data at the municipal level free of charge.

Figure 4. Main real estate sources and data in England (and Wales)



England, too, offers little data on rents

England is the UK country with the most precise **British rental index**, calculated by **the Office for National Statistics**. The index is available for England's nine regions.

It has been possible for several years now to compare its aggregated countrywide version with the respective indices for Scotland and Wales. Since September 2018, the Northern Ireland index has offered another point of comparison and is included in the index calculated for the United Kingdom as a whole.

The UK's rental index and its components are based on administrative data from the Valuation Office Agency in England and Wales, the respective governments in Wales and Scotland, and the Housing Executive in Northern Ireland. It also uses sources from three real estate service companies, which themselves produce indices.

Over in the private sector, **the Association of Residential Letting Agents (ARLA)** publishes a quarterly survey on the private market based on agency data.

NB. Like Germany and France, England has local rent observatories.

France

France was the subject of a dedicated study¹¹ so there is more in-depth research available on this market; this somewhat distorts any comparison with the other eight countries discussed in this report. The observations made point to a large number of data sources, both in the public and private domains, and they show that access to data has greatly improved recently. They also underline the essential role played by the public authorities within the ecosystem of data producers.

Housing prices: one public data source, two information systems

One of France's particular features when it comes to property sale prices is that the public authorities supply data for two information systems from one single data source: notarised documents. On one side we have the notary profession, which manages two databases: **BIEN** for Paris and the Paris region; **PERVAL** for the rest of France. On the other side, we have the Directorate General for Public Finances (DGFIP), which manages the **DVF** (demande de valeurs foncières, or request for property values) database.

Up until 2019, only notary data was available to the public, albeit under certain conditions. Ever since such databases were first created in the 1990s, they have been the only ones based on sources certified by the public authorities. Access to them recently became much more open thanks to a government-driven open data initiative. Free data can be consulted online in its aggregate form, and it is possible to download lists of the latest registered property sales per quarter (these lists are available for the past three years). The DGFIP's raw data has been open to the public free of charge since 2019. Such data covers the last five years of property transactions.

Production of benchmark property prices and rents: a role shared by the public and private sectors

Each segment of the private housing market has data produced by both public and private sources. So none of them have exclusive data.

Besides BIEN, PERVAL and DVF, the Ministry of Housing provides newbuild price data thanks to a survey carried out as part of its role as a supplier of public statistics: the **ECLN** (Enquête sur la Commercialisation des Logements Neufs, or Sales of New Dwellings Survey). Over in the private sector, newbuilds are specifically covered by a vast array of local observatories (the first appeared in the 1970s), almost all of which supply data to the national observatory of the **FPI** (Fédération des promoteurs immobiliers, a property developer trade association set up in 2009).

Also in the private sector, property sale prices are supplied by the **Fnaim** (Fédération nationale de l'immobilier, a real estate agent trade association set up in 1995), **meilleursAgents** (an intermediation platform linking individuals and real estate agents set up in 2008), **LPI-Seloger** (Les Prix de l'immobilier_Seloger, an observatory partnership set up in 2009) and **Yanport** (a start-up offering competitive watch tools for real estate agents and property developers set up in 2015). Together they cover existing properties more specifically but also offer reference data on newbuilds.

The rental market, meanwhile, is specifically covered by **Clameur** (a private observatory set up in 2006) and by the network of **local public observatories** (since 2014).

¹¹Juillard C., *Le tournant numérique des données immobilières: permanences et recompositions*. Paris, PUCA/Iread.

The central role of the public authorities

The public authorities have the monopoly on official data. BIEN, PERVAL and DVF have legitimacy thanks to the “certified” nature of their data sources (notarised documents). The very recent opening up of DVF is an example of exhaustive data that had never previously been used being made public free of charge. It has a great deal of potential to disrupt the property data market. First of all, private data operators were keen to gain access in order to offset the complications of accessing BIEN and PERVAL and thus supplement their own information systems and shore up their own data production. The DGFIP’s mission is not to compile statistics from such data for the time being; however, by opening up its data, it certainly paves the way for improved production of housing price statistics.

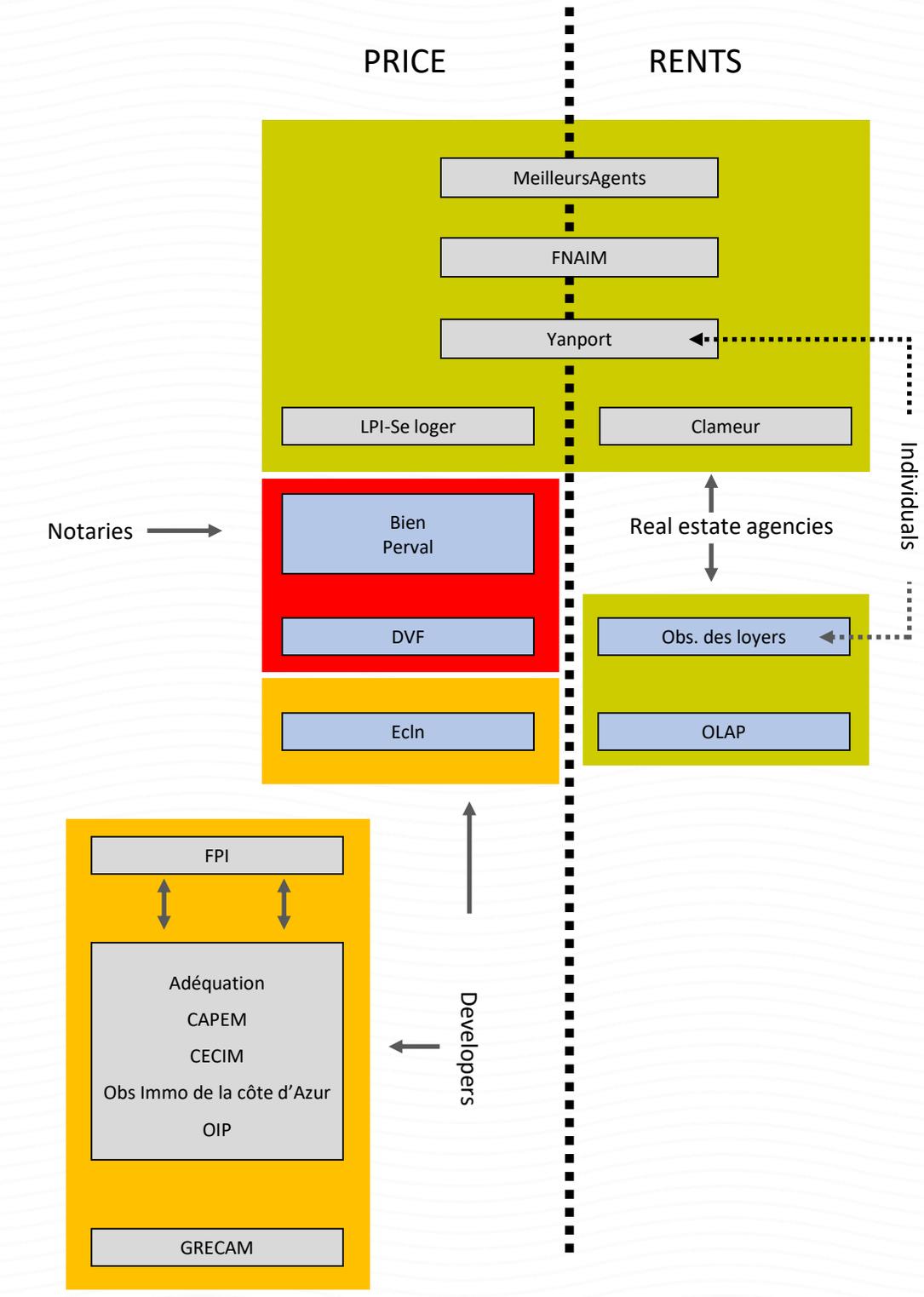
As regards the ECLN survey, property developers often point to its failings but still use it for the reference data it produces. In fact, private newbuild statistics are calibrated to the ECLN.

An ecosystem consisting of relatively stable components and methods

There are about ten organisations involved in producing property price and rental data in France. The vast majority have been around for decades, leaving little room for proptech to gain at best a “minority” foothold. There is a growing number of automatic estimators and dataplaces; however, for the time being, they complement rather than compete directly with the incumbent data producers.

In addition, digital technology is establishing itself throughout the supply chain but without changing many of the existing practices involved in producing and distributing data.

Figure 5. Main real estate sources and data in France



■ Public
 ■ Private
 ■ Notaries
 ■ Developers
 ■ Real estate agencies

Sweden

Public data is wide open

The public authorities in Sweden opened up their real estate data as far back as the mid-1980s. More specifically, **the country's land register (Lantmäteriet, Ministry of Industry)** supplies its data not only to administrations and local authorities but also to authorized researchers and private firms who request it. The accessible data is can be aggregated or individual. It available for a fee which depends on the request. Lantmäteriet also has some geographical data (map data) as open data free of charge.

Access to the land register is a passport enabling users to gain access to the data in **the tax register (Skatteverket)**, the former being included in the latter which is not directly accessible. One particular feature is that around ten private companies are authorised to supply the data on the public authorities' behalf.

The combined land and tax registers supply information on properties, their physical attributes, their values (estimated and listed) and their occupants (sellers and buyers). All this information is input into the databases of **the official statistics agency (Statistiska Centralbyran)**. The statistics agency enables anyone to access the indicators it produces, but it limits its individual data to a restricted group of public bodies and researchers.

The indicators it produces include the average and median prices of existing and new properties, as well as price indices. The statistics agency also provides rental data based on statistical surveys, as well as data on building permits based on information transferred from the municipal services that examine planning applications. It is all accessible in the form of nationwide and/or regionwide statistics. It can also be consulted at the town level using a search engine that makes it possible to extract data by hand.

An ecosystem mostly linked together by data

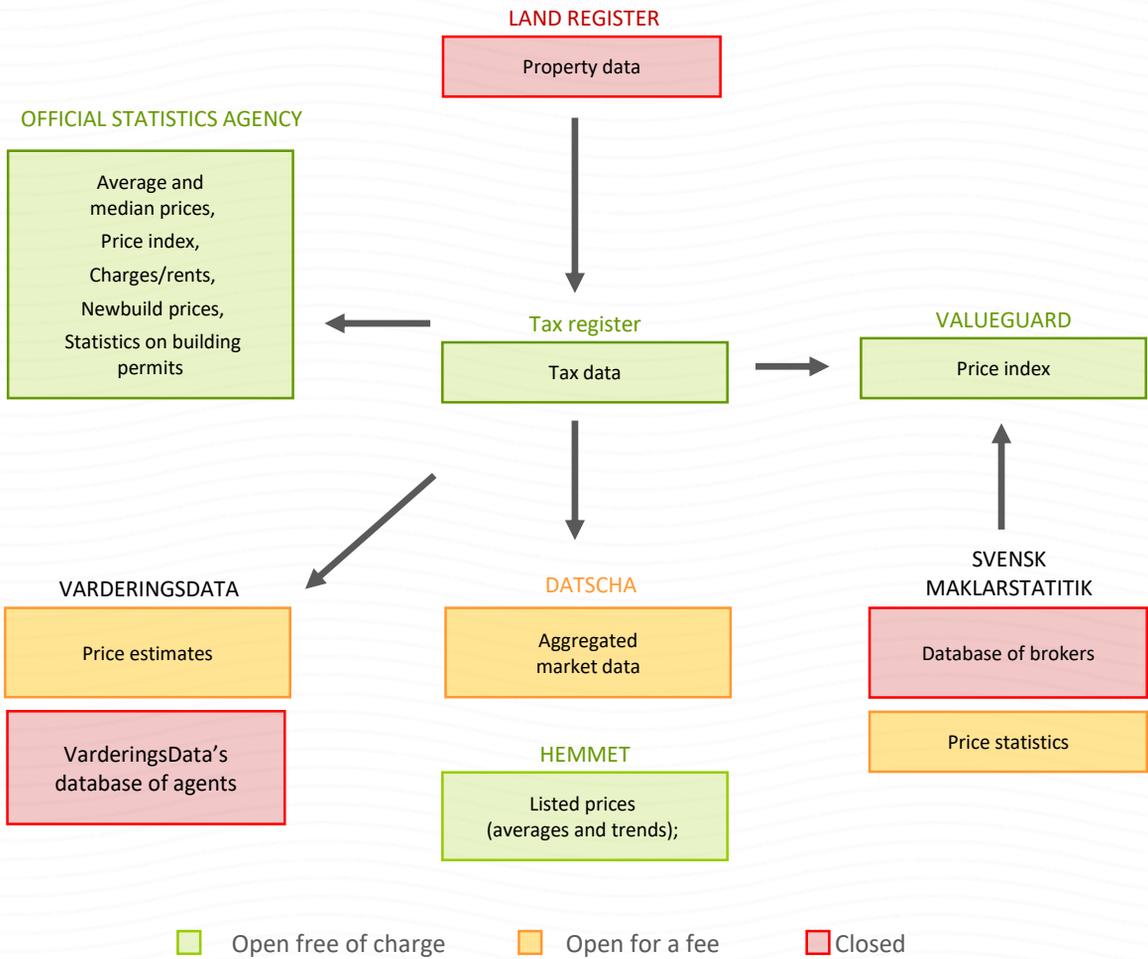
The land and tax registers also provide information for private firms involved in producing real estate data. Examples include **VarderingsData** and **Datscha**, two companies that market property valuations online and, in Datscha's case, a tool for consulting market data via maps.

Valueguard is another example. Valueguard is renowned for its price index (HOX®) and also sells strategic data to the market's main operators. It also uses data from real estate agents **Capitex** and **SFF**, and from **Svensk Mäklarstatistik AB** (brokers).

Svensk Mäklarstatistik AB is actually the most commonly used private source of data. Its data is renowned for being more up to data than public data because it is based on information on finalised deeds of sale which is transferred automatically by the brokers. Its statistics are updated monthly.

Last of all, **Hemnet**, the biggest property marketplace in Sweden, enables online users to consult average prices and price trends at a regional level or even at the municipal level for some cities. Its statistics are based on its own property ad data.

Figure 6. Main real estate sources and data in Sweden



Norway

Private sources and public statistics

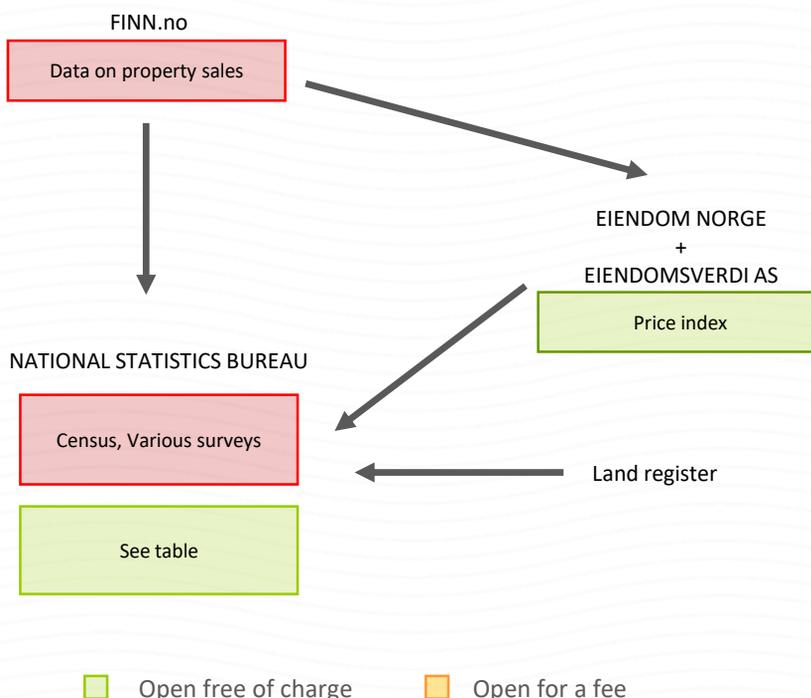
In Norway, private sources are the predominant producers of real estate data. They are, in fact, essential to the production of public statistics. Individual data is apparently not accessible. Only indicators are available on a regional scale and usually on a quarterly basis.

About 140,000 property deals go ahead each year in Norway. **FINN.no**, a marketplace similar to Leboncoin in France, registers almost all of them. It is thus a central source of information.

The national association for Norwegian realtor brokerages (Eiendom Norge) is the second most crucial source of data in the ecosystem, with its members covering 96% of all property transactions. Its data is processed by **Eiendomsverdi**, a provider of services for real estate companies. FINN.no, Eiendom Norge and Eiendomsverdi jointly publish an annual bulletin of real estate statistics. They also supply their aggregated data to the country's statistics bureau.

Private sources are predominant in Norway for at least two reasons: the first is that it takes much longer to update the land register than it does for real estate agents and brokers to transfer their data; the second is that private sources cover almost the entire market because it is so highly concentrated, with just one online marketplace and just one national association together covering almost all the country's property transactions.

Figure 7. Main real estate sources and data in Norway



Norway's statistics bureau is the core of its real estate information

The national statistics bureau (Statistik Sentralbyrå) supplies the main series of indicators of home prices and rents in Norway. Private sources of data obtained from market sales (above) are central to the bureau's output. But in order to provide broader coverage of real estate information, they are supplemented either by the land register, the population census or various public surveys of home builders or occupants, depending on the indicator in question (Table 2).

All indicators are openly available in CSV or Excel format in their aggregated form on a national and/or regional scale (Norway has 11 regions). Apparently only an annual series of house prices is available for each individual town. Meanwhile, only microdata on newbuild transactions is openly available to university academics strictly for research purposes.

The national statistics bureau also produces data on newbuilds; this data is available on the same terms as the indicators mentioned above.

Table 2. Indicators produced by Norway's national statistics bureau

	SEGMENT	INDICATOR	SMALLEST SCALE	FREQUENCY	SOURCES
PRICES	Existing	Price index	Regions	Quarterly	FINN.no
		Average price / m2 for detached dwellings	Regions	Quarterly	FINN.no via Eiendomsverdi AS + Eiendom Norge
			Town	Annual	
	Newbuilds	Price index for detached dwellings	Regions	Quarterly	Survey of homeowners + land register
		Price index for multi-dwelling buildings	Regions	Quarterly	Survey of builders and property developers
		Average price / m2 for detached dwellings	Regions	Quarterly	Survey of homeowners
RENTS (PRIVATE STOCK)	--	Average rent / m2		Annual	Census of households + municipal registers + survey

Italy

Italy has official price statistics, but individual data is not yet available.

The country's public rental statistics are not available except in print form, but its property price statistics are. This information supplements the survey data collected by private data producers.

Official price statistics, but individual data is not yet available

The Revenue Agency only began centralising all notarised documents in a real database in 2016. It is planning to open up its individual data. The project is in the process of being examined by the various authorities concerned. Judging by the project put forward by the agency, the focus will be on the physical, technical and economic attributes of properties. It rules out the possibility of disseminating any information that is personal or that might constitute a breach of privacy, such as land registry references or registration numbers.

For now, the Revenue Agency offers direct access to its transaction volume data per town for its provinces' main administrative centres. It also shares estimated price bands (quotazioni) for a sample of about 1,400 towns (70% of the annual national sales and 65% of the national stock), with towns divided into smaller zones (specific zones defined by the Revenue Agency). For the remaining municipalities (about 6,600), price ranges are also estimated but through indirect investigation using methodologies based on the experience and the knowledge of the reference territory owned by the Revenue Agency's officials.

These price bands began being published about 15 years before the central database itself was launched. They are calculated based on a sample of deeds supplemented with property ad data and estimates by industry professionals.

The Revenue Agency also produces rent bands based on a similar method to the one it uses for price bands. Its reliable sources of data include the rental contracts (atti di locazione) registered by its provincial branches, as required by law.

The Revenue Agency also publishes various quarterly and bi-annual reports, some of which jointly with the **Associazione Bancaria Italiana** (the trade association of Italian banks), others with the **Bank of Italy (Banca d'Italia)** and **Tecnoborsa**, which is an offshoot of the Chamber of Commerce and Industry dedicated to the development, regulation and transparency of the property market. This last series of reports is established from an opinion poll of real estate agents.

Last of all, the Revenue Agency opens up its price bands to **Italy's national institute of statistics (Istituto Nazionale di Statistica, ISTAT)**, which uses them to draw up a nationwide index. The ISTAT uses the Revenue Agency's database to build its own housing price index. The index is updated quarterly and covers the whole of Italy. The series can be downloaded from the ISTAT's website. The institute also produces building permit statistics from data collected from each town, which it then centralises directly. These statistics are published quarterly on a national scale. They are apparently not available on a smaller scale.

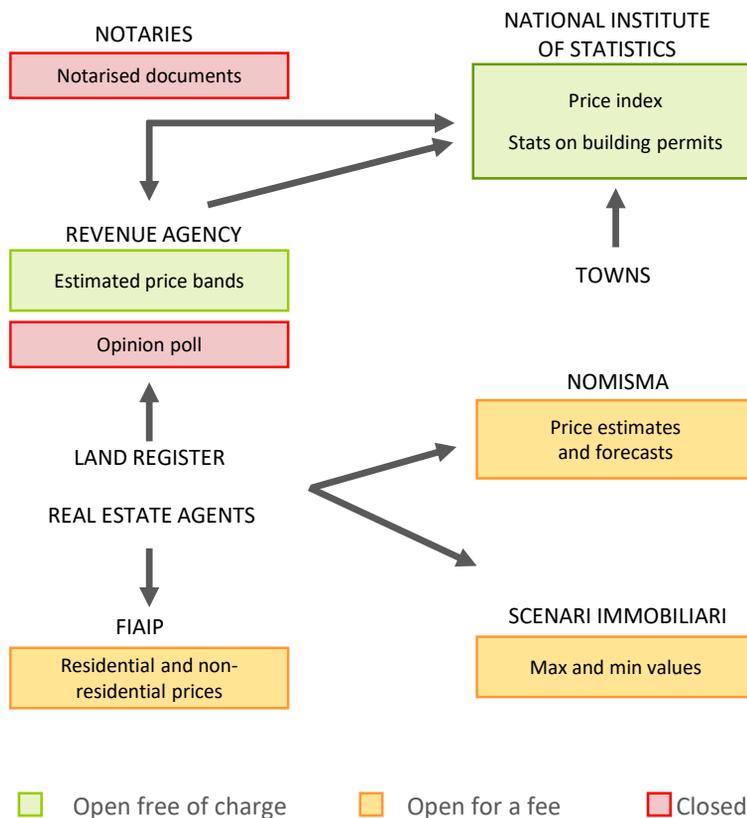
Private sector: public aggregated data combined with private survey data

There are three main sources of data in the private sector: FIAIP, Nomisma and Scenari Immobiliari.

The **FIAIP** (Italian real estate trade association: Federazione Italiana Agenti Immobiliari Professionali) is Italy's leading trade association for real estate agents. The property market data and reports it establishes from this data are restricted to its members and information providers. The dataset is available by region or by province, depending on the indicator in question.

Online property platforms (immobiliare.it, casa.it and idealista.it) apparently do not produce any data on prices or rents.

Figure 8. Main real estate sources and data in Italy



Nomisma, a multi-sector research laboratory and consultancy firm, has run a real estate observatory for the past thirty years. It produces price data (estimates and forecasts) by town for a series of 26 cities based on aggregates published by the Revenue Agency and a survey carried out on a sample of real estate agents. Its data by town is available to its subscribers. Nomisma also sells its quarterly property market reports (either individually or through a subscription).

Scenari Immobiliari, is a private research institute founded in 1990. It offers paid access to its data on the property markets of the main administrative centres (capoluoghi) of Italy's 110 provinces. The data corresponds to minimal and maximal values as well as most commonly observed values. It distinguishes between city centres and outskirts, and can even be consulted at the micro-zone scale by individual street. It is a combination of public and private data.

Germany

No openly available public data but nationwide indices

In Germany, individual data on prices and rents is not openly available to the public. **Notaries** don't register the data but they transfer a copy of the purchase contract to the local official Expert committees for property values (*Gutachterausschüsse*: see below) which then transfer the data to the Federal Statistical Office (*Destatis*) after it has been registered and added to specific databases (*Kaufpreissammlungen*). **Federal Statistical Office** (*Destatis*) uses it to draw up a price index. The index is calculated nationwide for both existing and new homes. It has been available on a quarterly basis since the early 2010s.

The Federal Statistical Office also produces statistics on building permits along with a construction cost index. It transfers the relevant data to its different data centres (*Forschungsdatenzentren*), which arrange for academics to gain access to microdata exclusively for their research projects.

Local statistics were standardised only ten years ago

Notary data is also used by the **committees of property valuation experts of Germany's Länder** (*Gutachterausschuss für Grundstückswerte*) and their working group of **committees of valuation experts and higher committees of valuation experts in Germany** (*Arbeitskreis der Gutachterausschüsse und Oberen Gutachterausschüsse in Deutschland, AK-OGA*).

The committees of valuation experts and the working group at which they meet were set up by the public authorities in the late 2000s with the aim of supplying property data that is standardised nationwide¹². This data supplements the notary data generated from surveys. The entire dataset has been used to draft an annual report on Germany's complete property market since 2007. The report provides price statistics for Germany's main cities. In accordance with the law, the source data used for the published report can only be supplied in exceptional circumstances.

The Federal Institute for Research on Building, Urban Affairs and Spatial Development (*Bundesinstitut für Bau, Stadt und Raumforschung*) also produces data on prices and rents. It combines the data and analyses it in a series of reports, referring extensively to those drafted by the working group of valuation expert committees and supplementing them. The data can also be consulted online via Inkar, an open mapping interface but designed more particularly for local authorities.

¹²On these committees and their mission of transparency of the markets: Ache P. (2019), «Nationwide real estate market transparency prevents a bubble. From local expertise to statewide market knowledge », Lecture on FIG Working Week 2019 in Hanoi, Vietnam April 22-26, 2019.

Bank data: crucial but restricted

Bank data is a crucial source of information in Germany, but it is restricted to the data producers themselves and limited to their own respective market shares. Since 2004, **VDP Research** has managed data from 600 banks on behalf of two of Germany's five main banking associations: VDP and BVR. It is apparently the most central and most solid reference, and it produces quarterly price and rent indices.

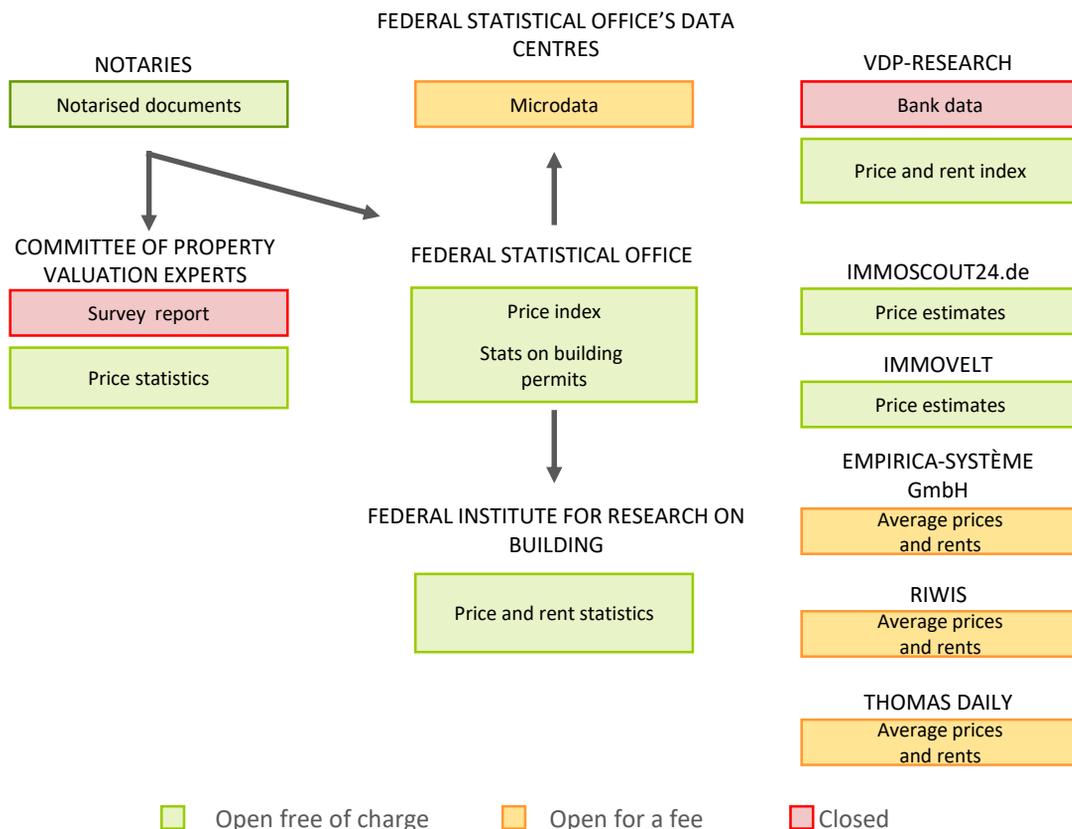
Property ad data and estimates

Immoscout24 and **Immovelt** offer property automatic valuations online based on the property ad data it they manages.

This niche also includes **Riwis** and **Thomas Daily** (part of since 2011, **Empirica-systeme** has supplied data to a housing market database and gives its clients access to this database. Average prices and rents per town are calculated and updated daily based on property ad data; they help to provide an overview of market trends and the housing stock. Besides residential property, it also deals with data on commercial property from a broader perspective including financial indicators such as yield.

This niche also includes **Riwis** and **Thomas Daily** (part of the Costar group). Among the aggregators, meanwhile, we have **Realxdata** and **21re**.

Figure 9. Main real estate sources and data in Germany



Spain

There is apparently little real estate data in Spain and, above all, it is not possible to access raw data.

Notary databases as a public source of data

Notarised documents account for some of Spain's public statistics on home prices. In the early 2000s, the **Notarial Certification Agency (Agencia notarial de certificacion, ANCERT)** began transferring data into, and managing, the real estate database of the General Council of the Notariat (Consejo general del notariado). It transfers data to the **National Statistical Institute (Instituto nacional de estadística)** which has used this data to build a quarterly price index since 2007. The index has three parts: one for new housing, one for existing housing and one for new and existing housing combined. It is available in CSV format on a national and regional scale.

Another major body involved in public statistics is the **Ministry of Public Works and Transport (Ministero de Fomento)**, which runs a housing observatory. Each quarter, since 2004, it has produced average listed prices and estimated prices (or "valuations") for the country's 17 regions ("autonomous communities") and 50 or so provinces.

The entire price dataset from 2004 onwards can be downloaded in Excel format from the ministry's website. The data comes from three sources: the ANCERT, supplying average listed prices; the **AEV (Asociacion Espanola de Analisis de Valor, or Spanish Association of Value Analysis)**, a non-profit organisation covering 90% of property valuations carried out in Spain (by 23 companies); and the **ATASA (Asociacion Profesional de Sociedades de Valoracion, or Professional Association of Valuation Companies)**, supplying estimated prices.

Property ad data and estimates

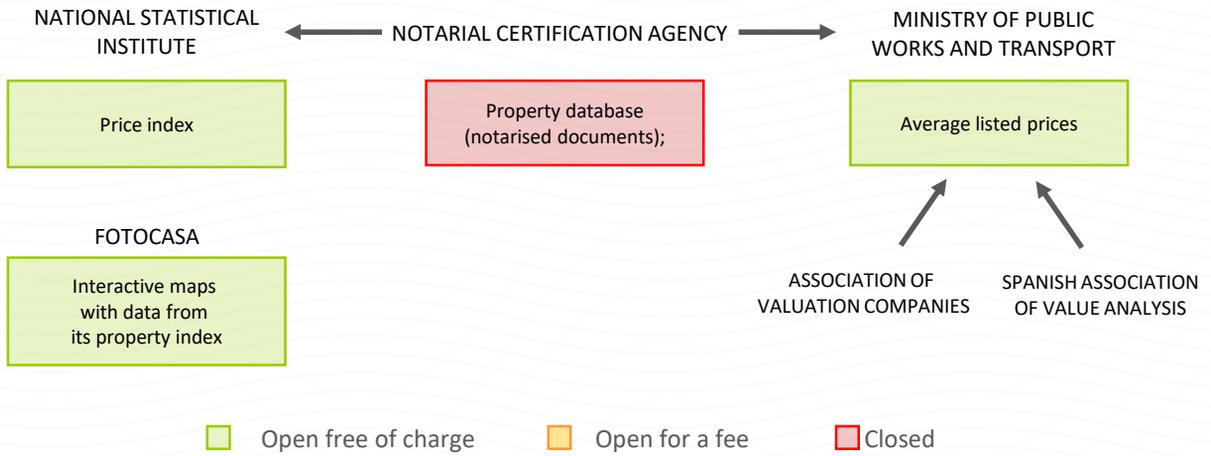
There appears to be a lack of statistics in the private sector but lots of price estimates. These estimates are based on property ad data and are offered by at least five companies: **Valoracion.es**, **TerceroB**, **BBVA Valora**, **Red House** and **Realo**.

Last of all, the property platform **Fotocasa** offers interactive maps with data from its real estate index based on the property ads it registers. This tool provides sale and rental prices (per m²) almost in real time.

Rents are not monitored closely in Spain, not only because just 15% of Spanish households rent their homes but also because a large proportion of rents are regulated or even frozen in the same way as those that come under the law of 1948 in France¹³.

¹³ Vorms C. (2009), "Surproduction immobilière et crise du logement en Espagne" [Oversupply in the property market and the housing crisis in Spain], *La Vie des idées*, 12 May 2009. URL: <https://laviedesidees.fr/Surproduction-immobiliere-et-crise.html>.

Figure 9. Main real estate sources and data in Spain



Switzerland

Switzerland has official statistics on rents and newbuilds but not on property prices (buying-selling prices). However, the Federal Statistical Office is working on it and says it will publish its first price index in late 2019.

No publicly available price data

Switzerland lacks official price statistics because it lacks sources. First of all, there is no centralised depositary for notarised documents; land registers are held by each separate canton but not at the federal level.

Moreover, notaries inform their respective cantonal land register offices of any property transfers and, in some cantons, they also inform the tax authority. But they supply very little information about the properties themselves. Nor do they publish their own data, except in the cantons of Zurich and Geneva which are rather pro-active as regards open data.

The purpose of the **Six Terravis** platform is to centralise all deeds of sale certified by a notary, but it does not cover all the country's cantons. It provides access to the documents to a limited public of civil servants and government officials, but does not build a database from the material it collects. Above all, not all deeds of sale are digitalised; this means that the prices involved in property transactions are to be found only in the copies kept by the notaries and tax authorities.

Many private sources of data

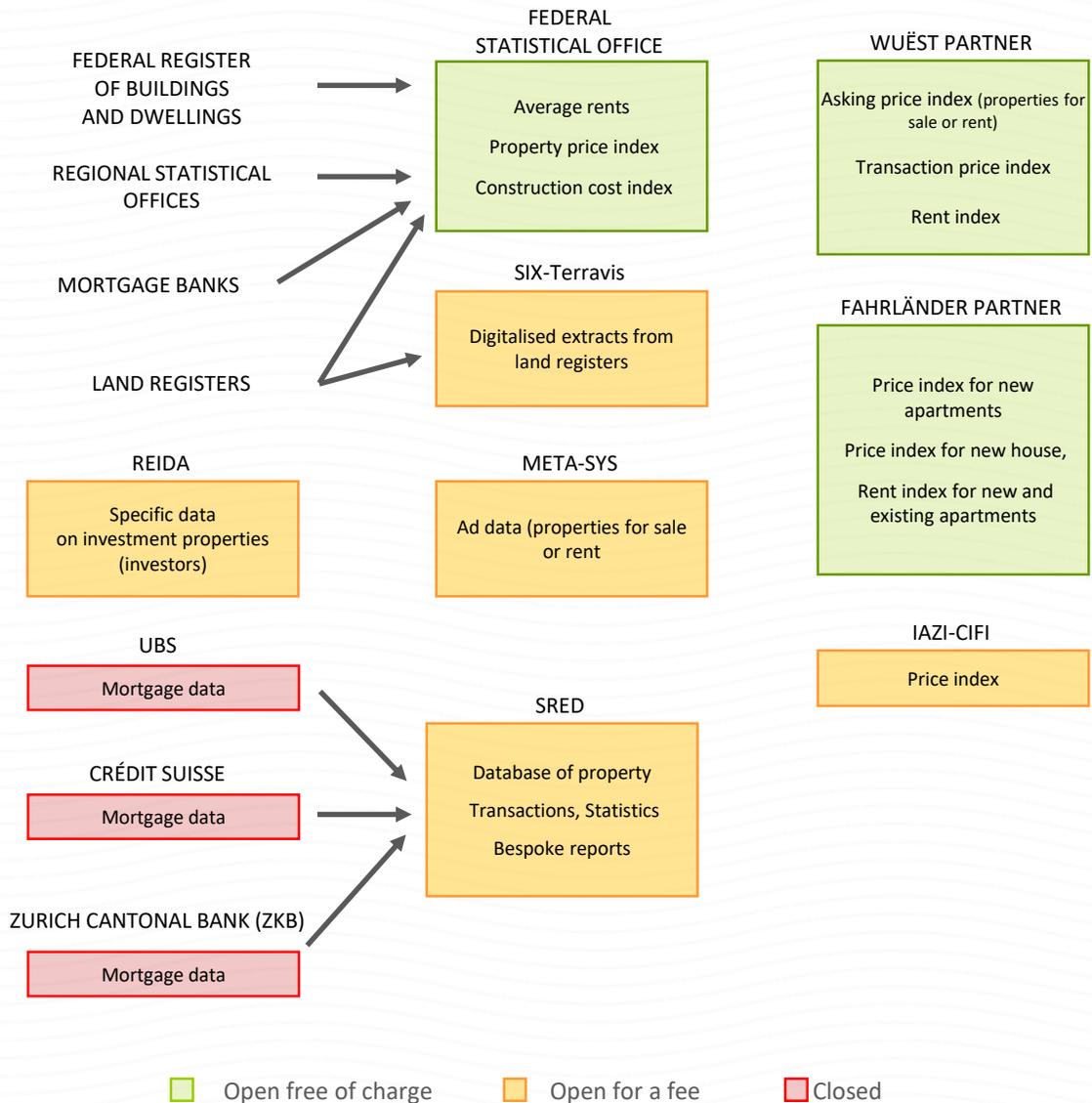
Lots of private institutes fill in the gaps existing in public statistics by publishing their own market data; the longest-standing among them have done so since the 1980s. Each has its own scope and methods, and **the Federal Statistical Office** says this gives the impression that their results vary¹⁴. There is indeed a lot of data. Data for individual property transactions is available for a fee in all cases, and can sometimes even be restricted to subscribers.

Wüest Partner, a consultancy firm created in 1985, is the reference used by the Swiss National Bank. It produces several indices based on data from real estate agencies: an asking-price index covering the property transactions and rental market; a transaction price index; and a rental index. Wüest Partner also markets a whole range of financial indicators.

Fahrländer Partner, a market research and consultancy firm, has published three indices since the 1980s: a price index for new apartments; a price index for new houses; and a rental index for new and existing apartments. These indices can be downloaded quarterly and are available on a national, regional and cantonal level. Other aggregates can be accessed on request. The indices are calculated using the hedonic pricing method. Calculations are based on an online survey of 500 to 700 experts across the entire country. The survey brings in data on property price valuations and rents.

¹⁴Federal Statistical Office (2016), *Creation of an official real estate price index in Switzerland: objectives and challenges*.

Figure 10. Main real estate sources and data in Spain Switzerland.



REIDA (Real Estate Investment Data Association) is a non-profit organisation. Since the early 2010s it has offered a series of data on investment properties (lease agreements, building prices). Its statistics are based on data from the institutional investors among its members. Its individual data is anonymised and made available to non-members for an annual fee of €26,400 (CHF30,000). Data can be accessed in various forms: CSV files, direct access to the database, API requests.

Meta-Sys has managed the REIDA's data since it was created. Moreover, in 2004 it developed Ad-Scan, a database of classified ads for housing available for sale or rent. Data transfers are carried out using the spidering process (spider programmes that collect data from the internet). Its individual data is available on the same terms as the REIDA's.

The **SRED (Swiss Real Estate Datapool)** is an association set up in the early 2000 by UBS, Crédit Suisse and ZKB (Zurich Cantonal Bank); it manages a database of mortgage loans granted by its members. Its remit includes the collection, anonymisation, quality adjustment, geocoding and transfer of data on listed property transactions; it covers about 60% of all transactions.

The SRED offers direct access to its database, customised data retrieval and even bespoke statistics. The interface it has developed allows for reports and analyses to be configured on a customised basis. The SRED also offers general and bespoke reports. Note that its members receive compensation for expenses from external clients.

IAZI-CIFI, a consultancy and valuation firm, has built property market indicators for investors since the mid-1990s. Its indices are available for individual towns, regions and cantons, but if requested they can be calculated on any scale and can also be broken down by category of property. In particular, IAZI-CIFI produces a quarterly index of listed prices (SWX IAZI Real Estate Price Index) from anonymised data provided by banks, insurance companies and pension funds. The index is calculated using the hedonic pricing method and covers over 60% of property transactions (roughly 15,000 of 25,000) involving apartments and houses in Switzerland. It can be downloaded free of charge on a national scale and is also available for each individual town. The SWX IAZI Real Estate Price Index provides input for the performance index also developed by IAZI-CIFI.

IAZI-CIFI also produces an asking-price index (Swiss Real Estate Offer Index), in partnership with ImmoScout24, a property marketplace. This, too, is a hedonic index. It is updated in real time based on property ad data, so it follows asking-price trends for properties available for sale or rent. It consists of three main nationwide indices and several regional sub-indices.

PriceHubble is a newcomer in the world of big data and artificial intelligence. It was set up in Switzerland in 2015 before being imported into France and Germany. It develops real estate analysis, valuation and prediction tools for use by industry professionals.

Rents and newbuilds

Besides the rental data produced by private institutes, the Federal Statistical Office includes questions about rents in its structural census, an annual survey of a sample of 200,000 people (via a questionnaire that can be filled online or on paper). The structural census has been carried out since 2010, when the new annual population census was introduced. It includes questions about the individuals surveyed, their households and their housing conditions.

In addition, the building departments of the country's town and canton authorities report on any new constructions, transformations and demolitions submitted for authorisation. Since 1948, the Federal Statistical Office has used this information to draw up quarterly and annual statistics. These statistics are broken down on various scales (by town, district, canton, large region and category of town).

APPENDICES

List of people surveyed

UNITED KINGDOM

Her Majesty's Land Registry

Sue Gambles, central office

NORWAY

Eiendom Norge (National Association for Norwegian realtor brokerages)

Erik Lundesgaard, Head of Communications

ITALY

Agenzia delle Entrate (Revenue Agency)

Giovanni Cantone

Nomisma

Gualtiero Tamburini, Vice Chairman and Scientific Director of the Real Estate Department

Instituto di statistica pubblica (ISTAT)

Silvia Colio, Department for National Accounts and Economic Statistics, Directorate for economic statistics, construction statistics

SPAIN

University of Avignon

Guilhem Boulay, Lecturer

Higher Institute of Business Studies (Madrid)

José Luis Suárez, professor in the Financial Management department, academic director of the Centre for International Finance and director of the IESE campus in Madrid.

SWEDEN

Lantmäteriet (Ministry of Industry, land registry)

David Boman,

Geodata Division

KTH Royal Institute of Technology in Stockholm

Christina Gustafsson, School of Architecture and the Built Environment, Department of Real Estate and Construction Management

Statistics Sweden

Niclas Sjölund, Urban Management and Tourism, Regions and Environment Department

GERMANY

Working group of committees of valuation experts and higher committees of valuation experts

in Germany

Peter Ache,

Bureau of the Higher Committee of property valuation experts of Lower Saxony

Statistical Office for Berlin-Brandenburg

Katja de la Motte,

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Bulwiengesa AG

(strategic consulting in the field of real estate data)

Andreas Schulten, Directeur général de

Zivilarena GmbH, filiale de Bulwiengesa AG

SWITZERLAND

Meta-Sys AG (economic data platform)

Daniel Sager, Director

DENMARK

Statistics Sweden

Jakob Holmgaard, *Head of the Prices and Consumption Department*

Anne Kaag Andersen, *senior consultant*

Development and simplification council (institution promoting the creation of the country's future digital tax administration)

Hans Christian Gabriel, *special consultant, property data bureau*

ESTONIA

Ministry of Justice, Judicial Administration Policy Department

Kadri Laud, *adviser, legislative drafting and development division*

OVERVIEW

Laurent Ternisien, *CEO de BNP Paribas Real Estate Investment Management Luxembourg (formerly IPD)*

Jacques Friggit, *general engineer in the General Council for the Environment and Sustainable Development, France*

Daniele Westig, *Economic Adviser, European Mortgage Federation, European Covered Bond Council*



Figures and tables

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Maria GUSAROVA has a degree in Urbanism and International Expertise and works on urban innovation issues in the commercial, tertiary and residential real estate sectors.

She deals more generally with the city of tomorrow and the impact of the digital revolution on urban issues worldwide.

REAL ESTATE DATA IN EUROPE AND THE US

May 2019

A study carried out with the support
of iread, LIFTI, PUCA and Urbanics

