# Unveiling Market Insights with Real Estate Listing Data in R
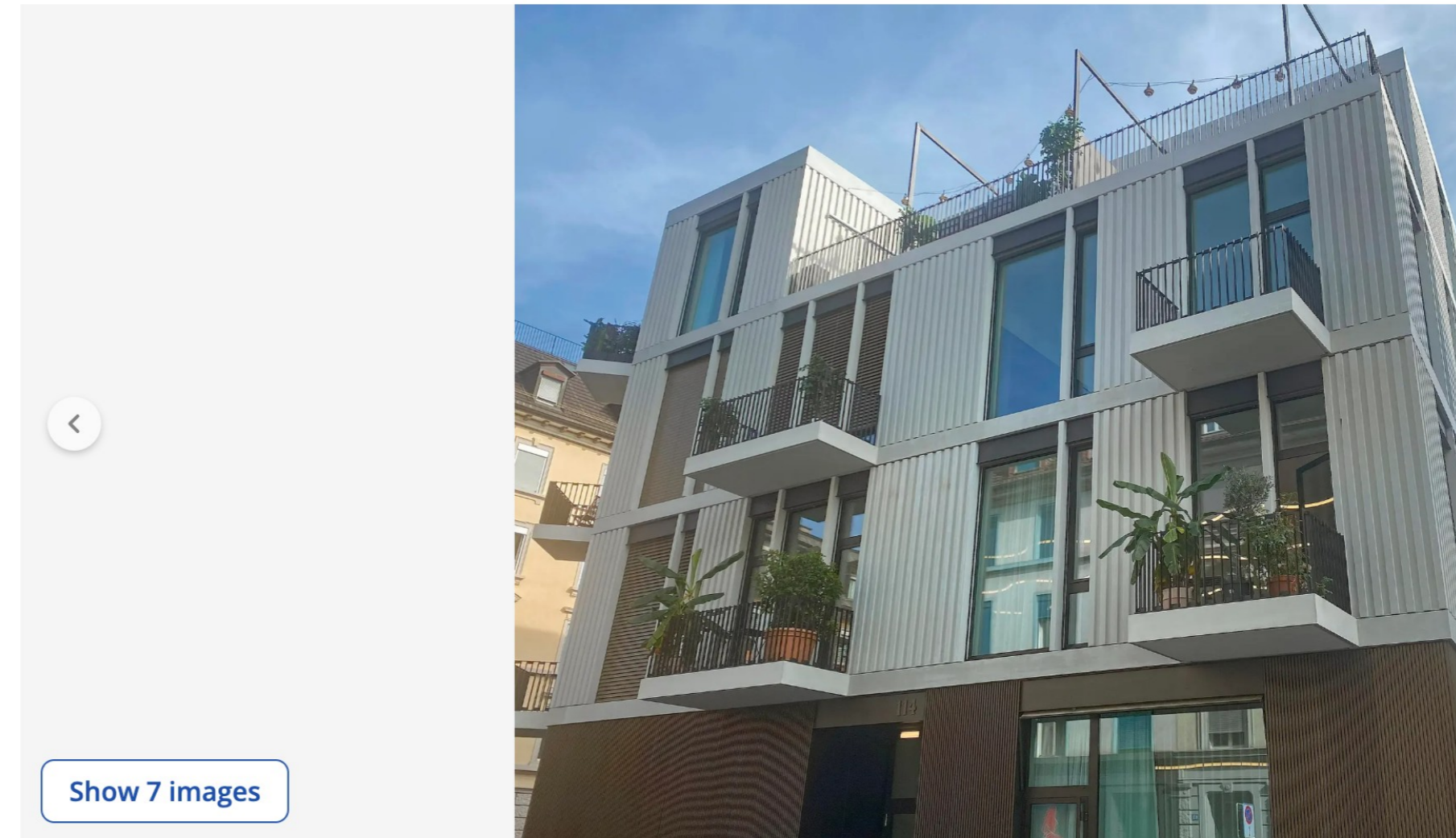
22-11-2023

datahouse

# Agenda

1. Data sources
2. Applications
3. Insights
4. Infrastructure
5. Monetization

# Data Sources

- Real estate portals
- Web scraping
- News paper ads



Show 7 images

Wohnung201_87m2_2OG

**"Maisonettewohnung im Kreis 4 Zürich mit grosser Terrasse"**

| Rent | Rooms | Living space |
|------|-------|--------------|
| **CHF 5,350.–** | **2** | **87m²** |



Zu verkaufen in der 5-Sterne-Region
**Beromünster**

## 9-Zimmer-Einfamilienhaus

schöne, ruhige, ländliche und gleichzeitig zentrale Lage, pure Lebens- und Wohnqualität in familienfreundlichem Einfamilienhaus, Wohnfläche 250 m², Grundstückfläche 686 m², Baujahr 1989, Pool, Sauna, Erdsondenheizung, Doppelgarage.

Verkaufspreis Fr. 1'790'000.– (keine Makler erwünscht). Verfügbar ab 1. Dezember 2023.

Chiffre 742'491 an chiffre@barni.ch oder an Barni-Post AG, Postfach 846, 6281 Hochdorf
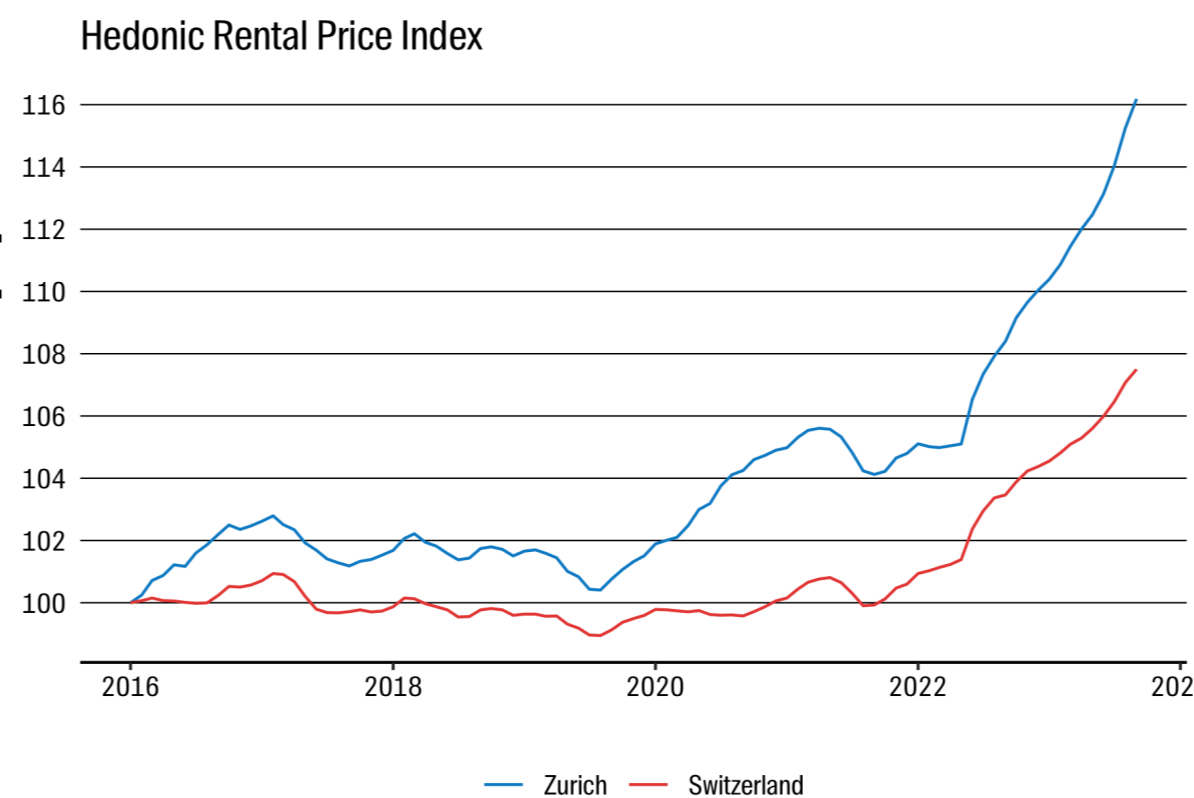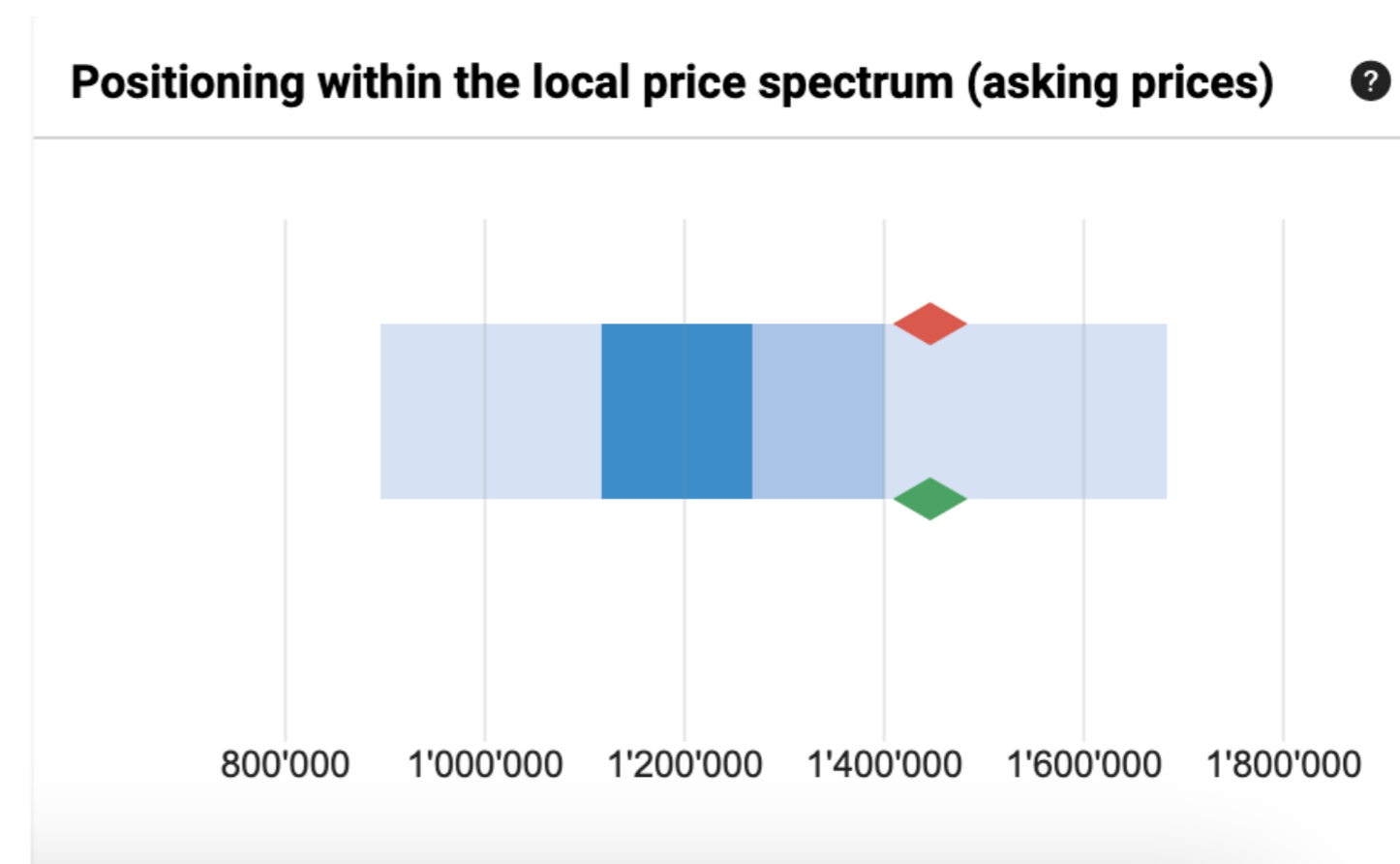
# Applications

**Valuation**

- Predictive models
- Regional price benchmarks

**Research**

- Price indexes
- Market liquidity measurement



Positioning within the local price spectrum (asking prices)



Hedonic Rental Price Index



Rented apartments: supply rate

Source: FSO Housing construction statistics, Wüest Partner, Wüest Partner housing model
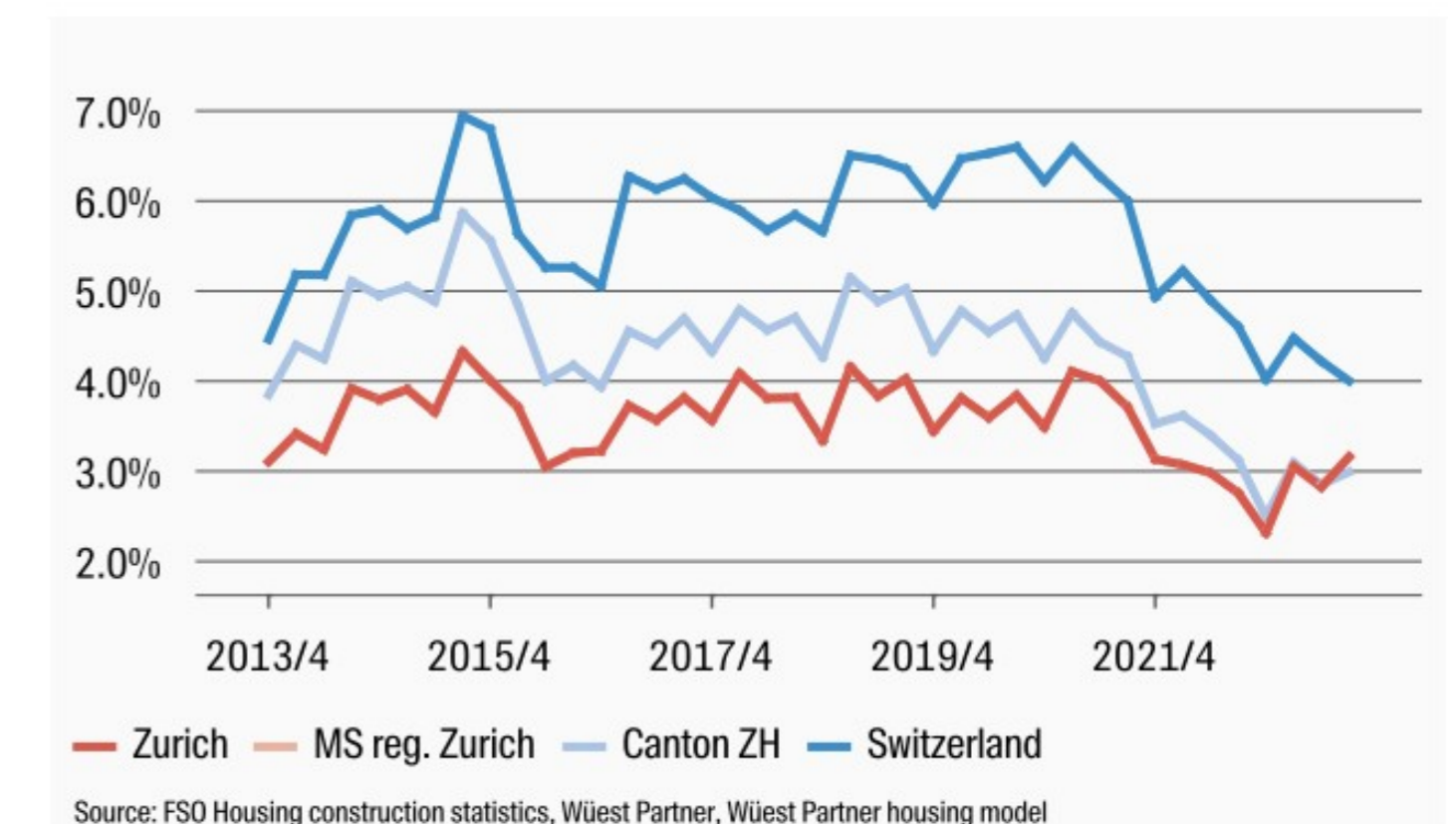
# Median Monthly Rent in Zurich



Median monthly rent (3 bedroom apartment)

# Hedonic Rental Price Index
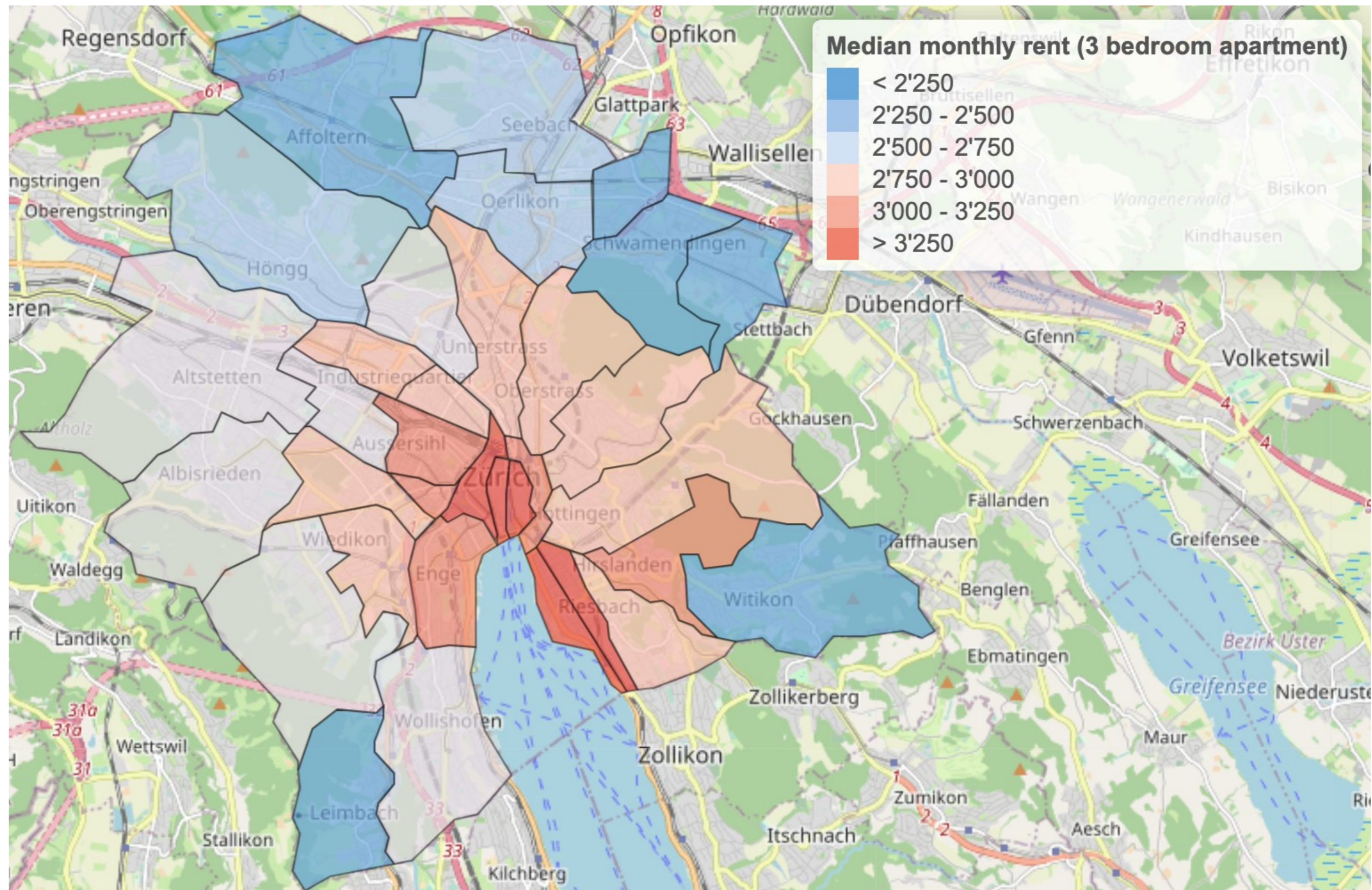


| | Zurich | Switzerland | Consumer Price Index |
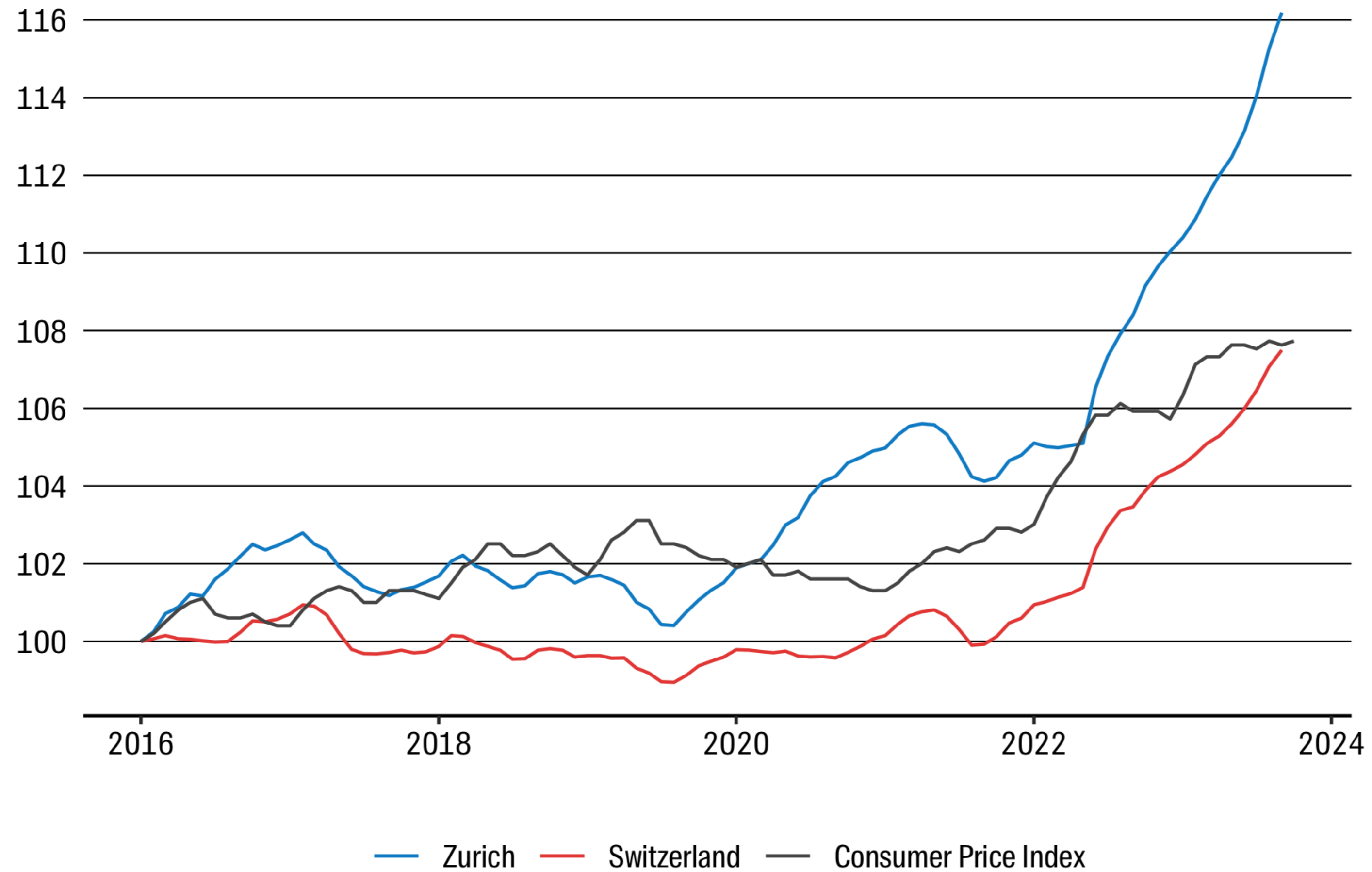
# Infrastructure
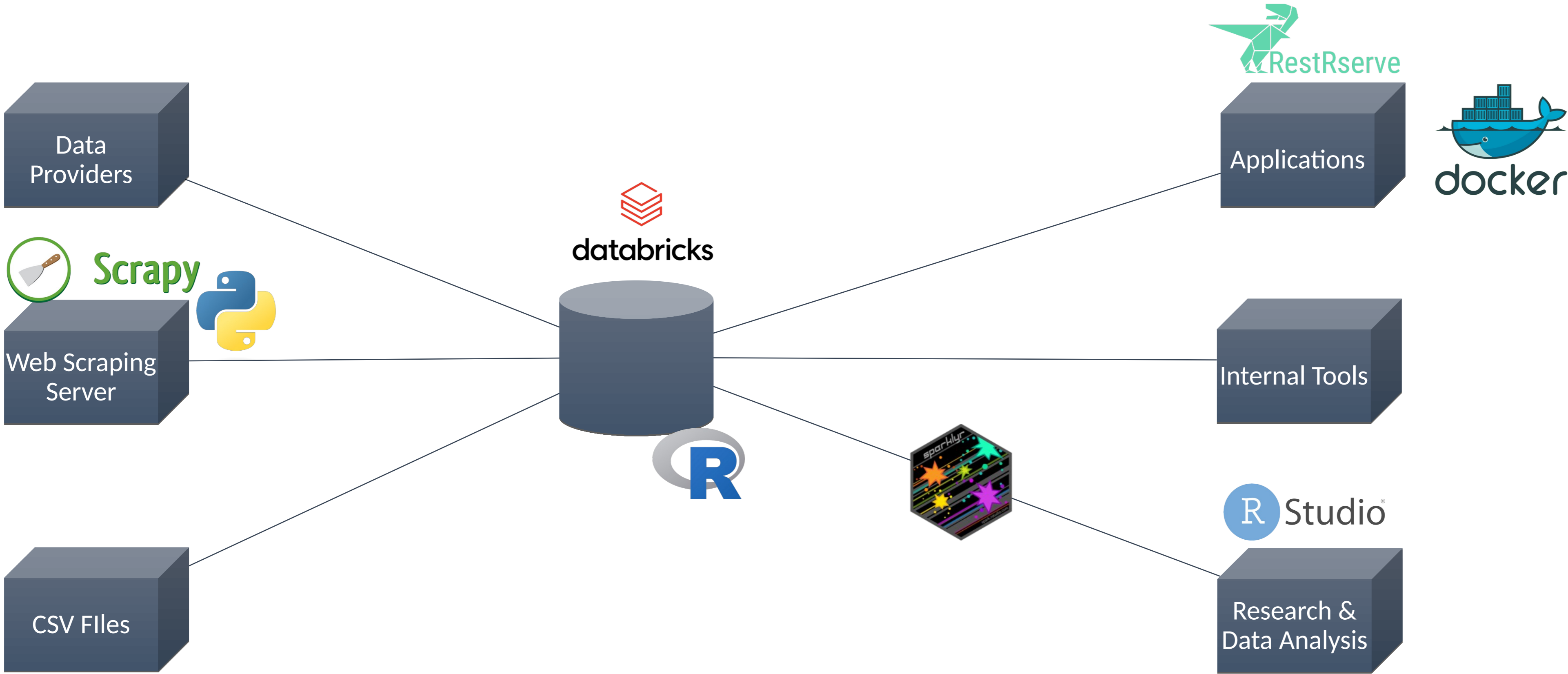
# Valuation Software Wüest Dimensions

| | |
|---|---|
| Owner | |
| Ownership | Sole ownership ▾ |
| Type | Single-family house ▾ |
| Address | Address line 1 |
| | Address line 2 |
| | 8404    Winterthur |
| Canton/province | |
| Country | Switzerland ▾ |
| Accuracy | ▰▰▰▰▰▰▰▰ **Building (9)** |
| Coord. (Lat./Long.) | 47.519762   8.761862   WGS... ▾ |
| Specialty | ▾ |
| Location analysis | LocationSpot ↗ |
| Description | |
| House type | Attached end building ✕ ▾ |
| Residence | Main residence, without restriction of... ✕ ▾ |
| Modified by | **Andreas Thürlimann** |

## Quantitative factors

| | |
|---|---|
| Construction year | 1962 |
| Land plot area in sqm | 423.00 sqm |

## Qualitative factors

| | |
|---|---|
| Energy certificate | Without certificate ✕ ▾ |

**Standard**   ▰▰▰▰▱

○ Estimated value    4.0 - Upscale ✕ ▾

○ Calc. value    ✎

**Condition**   ▰▰▱▱▱

● Estimated value    1.5 - Damaged ✕ ▾

○ Calc. value    **1.5 - Damaged**    ✎

**Micro-location**   ▰▰▰▱▱

● Estimated value    3.0 - Average ✕ ▾

○ Calc. value    **3.0 - Average**    ✎

## Additional parking data

| | |
|---|---|
| Number of on-site garage parking spaces (within building volume) | |
| Number of on-site garage parking spaces (separate garage building) | |
| Number of off-site garage parking spaces | |
| Number of off-site outdoor parking spaces | |

## Result ⊕ Value adjustment ⌄

| | |
|---|---|
| **Gross market value** | 1'271'000 |
| Statistical price range | 1'160'000 - 1'380'000 |
| Statistical traffic light | ▰▰▱ |
| | Generally untypical property |
| Market value compared to Switzerland | ▰▰▰ |
| | Above-average segment |

| Value adjustment | CHF |
|---|---|
| Parking | 0 |
| **Total adjustments** | **0** |

| | |
|---|---|
| Calculated market value (precise) | 1'271'000 |
| ● **Market value after adjustment** | **1'271'000** |
| ○ **Manual market value** | |
| Market value per sqm of developed site | 3'005 |
| Estimated annual rental income (incl. garage/outd. parking) | 23'200 |
| Property assessment | ▰▰▱ |
| | Very small building volume |
| Market rating Winterthur (Guggenbühl) | ▰▰▰ |
| | 5.0 - Excellent |

# RestRserve API



## Immo-service HED Calculation API v0 OAS3

http://localhost:8081/yaml/immo-hed-api.yaml

Immo-service hedonic calculation API. yaml

**Servers**

    http://localhost:8081

**HED SFH**  Calculator for hedonic single family house valuation.

    POST  /{version}/hed-sfh  Calculate a hedonic single family house valuation

**HED Guided Processes**  Calculator for the hedonic guided processes.

    POST  /{version}/hed-micro-location-v1  Calculate a hedonic micro location V1

    POST  /{version}/house-condition-v2  Calculate a hedonic house condition V2

    POST  /{version}/fit-out-standard-v2  Calculate a hedonic fit out standard V2

```r
hedCondominium <- function(
  model, # string
  valuationDate, # string
  constructionYear, # integer
  minergieCertificate, # WITHOUT_CERTIFICATE, MINERGIE, MINERGIE_P, MINERGIE_
  numberOfRooms, # number
  floor, # integer
  residenceType, # MAIN_RESIDENCE, SECOND_RESIDENCE, HOLIDAY_HOME, OTHER
  conditionManualValue, # number
  standardManualValue, # number
  microLocationManualValue, # number
  flatType, # SINGLE_FLOOR_APARTMENT, DUPLEX_APARTMENT, PENTHOUSE_APARTMENT,
  numberOfGarageParkingSpaces = 0 # integer
) {



}

# - register endpoint mapping
api$add_endpoints(
  calc = list(
    `hed-sfh`              = ma$SingleFamilyHouse,
    `hed-micro-location-v1` = ma$MicroLocationV1,
    `house-condition-v2`    = ma$HouseConditionV2,
    `fit-out-standard-v2`   = ma$FitOutStandardV2,
    `hed-con`              = ma$Condominium
  ),
  health = list(`hed-health` = RestHealth$new(cfg)),
  models = list(`hed-available-models` = HedAvailableVersions$new())
)

# - run the API
api$run()
```

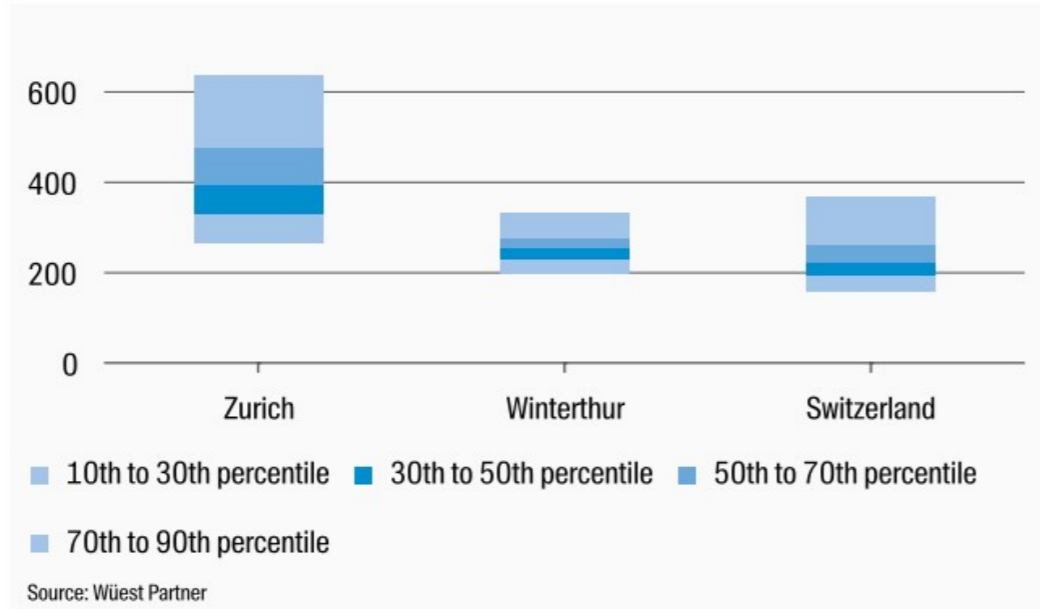# Market & Location Information Software
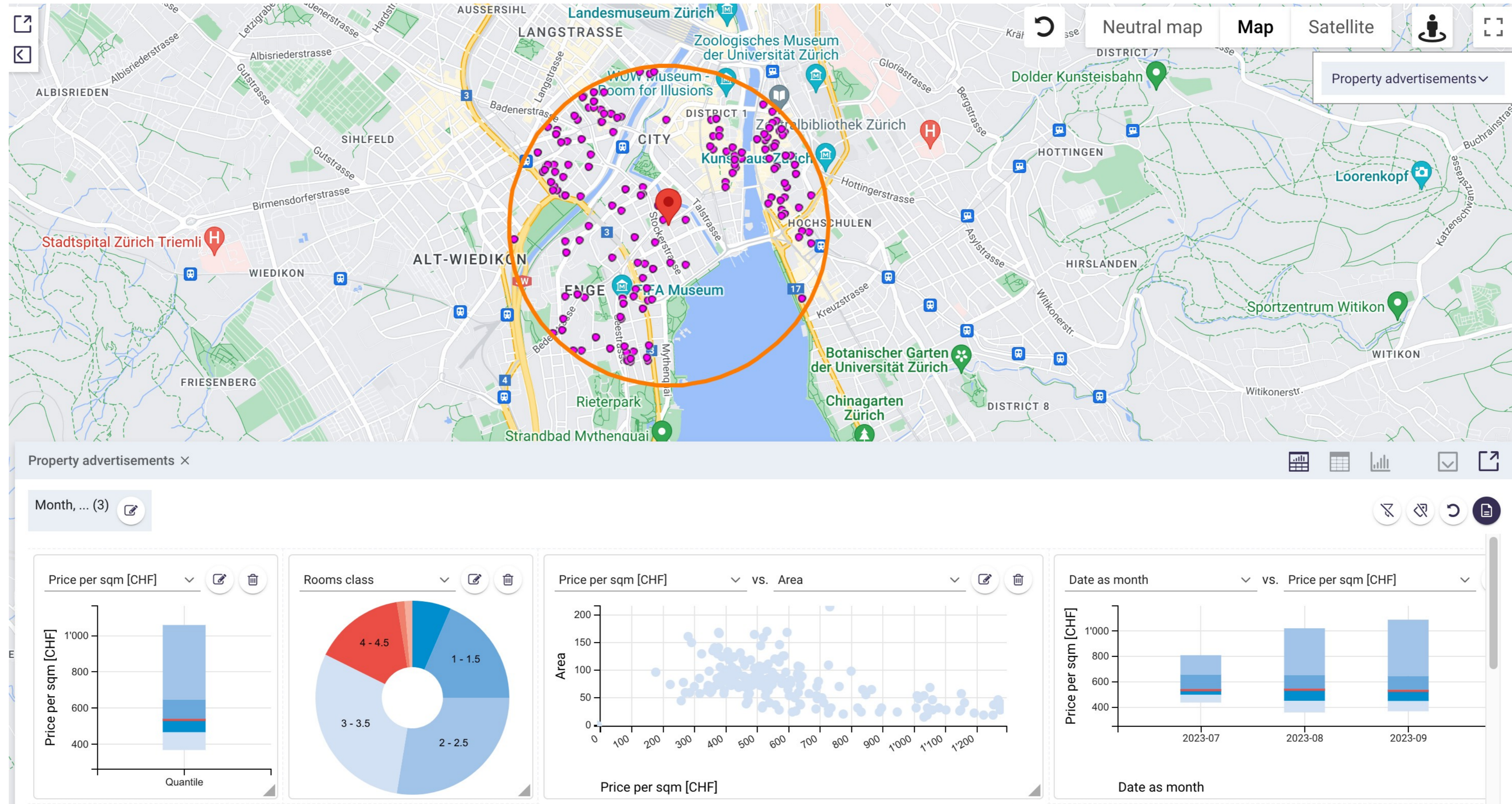
# Market Reports

**wüest**partner

## Prices

**Price range for residential property: rented apartments**

**Rented apartments: price range (net rent in CHF per sqm and year)**



Source: Wüest Partner

|  | Zurich | Winterthur | Switzerland |
|---|---|---|---|
| **90th percentile** | 639 | 334 | 368 |
| **70th percentile** | 478 | 277 | 262 |
| **50th percentile** | 395 | 253 | 223 |
| **30th percentile** | 330 | 230 | 194 |
| **10th percentile** | 266 | 198 | 159 |

**Rental apartments: quarterly development of price spectrums (net rent in CHF per sqm and year), Zurich**



Source: Wüest Partner
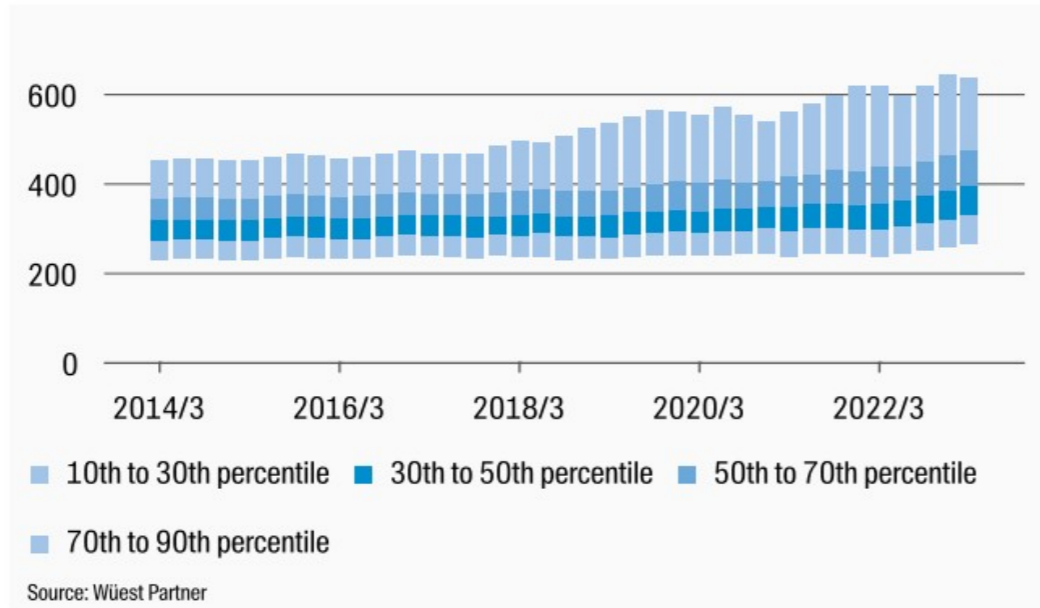
|  | 10th percentile | 30th percentile | 50th percentile | 70th percentile | 90th percentile |
|---|---|---|---|---|---|
| **2021/2** | 246 | 303 | 350 | 408 | 541 |
| **2021/3** | 238 | 296 | 350 | 418 | 561 |
| **2021/4** | 246 | 302 | 357 | 422 | 579 |
| **2022/1** | 245 | 301 | 357 | 431 | 597 |
| **2022/2** | 246 | 299 | 354 | 431 | 620 |
| **2022/3** | 238 | 299 | 357 | 439 | 618 |
| **2022/4** | 244 | 306 | 365 | 441 | 599 |
| **2023/1** | 252 | 313 | 374 | 452 | 619 |
| **2023/2** | 257 | 322 | 385 | 466 | 646 |
| **2023/3** | 266 | 330 | 395 | 478 | 639 |

| Changes relative to the previous quarter (QOQ) and the previous year (YOY) | | | | | |
|---|---|---|---|---|---|
|  | 10th percentile | 30th percentile | 50th percentile | 70th percentile | 90th percentile |
| **QOQ** | 3.5% | 2.5% | 2.6% | 2.6% | -1.1% |
| **YOY** | 11.8% | 10.4% | 10.6% | 8.9% | 3.4% |

# Key Takeaways

- We can learn a lot about the real estate market from real estate listings
- R is the best tool for the job:
  - Data cleaning
  - Analysis & data exploration
  - Modelling
  - Best when combined other open source tools

**d**

Where data
lives

Datahouse AG
Alte Börse,
Bleicherweg 5
CH-8001 Zürich
T +41 44 289 92 00
E zurich@datahouse.ch