# IOCBD 2023

# How much does **location** determine the **market value** of a building according to a multiple **econometric** analysis?

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> "There are three things that matter in property: location, location, location"
>
> Lord Harold Samuel (Apocryphal)

## Topic of interest

**Topic** — Discuss how **fixed effects** influence the best estimate of a premise's market value through **multi-parametric** estimation techniques

**Development** — Investigate whether (or not) the recent events of the **Covid-19** pandemic and the **War in Ukraine** have changed the influence of the property's location over its market value
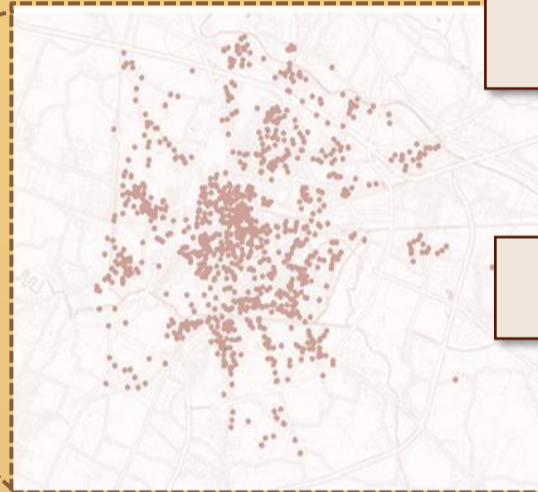
## Research Question?

❑ How much does location determine the market value of a building according?

❑ Does the axiom "location, location, location" remain unchanged in 2023?

## Method and Development

### DOWNLOAD OBSERVATIONS
#### The case study of PADOVA (North Italy)

python

**Web Crawler**

**Construction features**
- Energy class
- Maintenance
- Area and rooms
- Garden
- Cellar
- Terrace
- Parking
- Building type
- Plants

**Location features**
- city center
- train station
- bus and tram
- education
- commercial facilities
- urban parks
- sports facilities
- hospitals

### FEAUTURE SELECTION PROCESS
#### Random Forest

python

**Variables selection**

## Results

### ECONOMETRIC ANALYSIS
#### Multivariate regression

SPSS

**Stepwise analysis**

| Unit of measure selected per each regressor | | Simulation A | | | Simulation B | | | Simulation C | | | Simulation D | | | Simulation E | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | t-student | Coefficient | Keep | t-student | Coefficient | Keep | t-student | Coefficient | Keep | t-student | Coefficient | Keep | t-student | Coefficient | Keep |
| Constant | | | 1997.1 | | | 1971.1 | | | 2010.6 | | | 2180.3 | | | 2010.4 | |
| Area | Square meters | -5.21 | -1.71 | x | -5.22 | -1.72 | x | -7.03 | -1.75 | x | -6.97 | -1.73 | x | -6.94 | -1.73 | x |
| Number of Rooms | Total number | -0.08 | -2.16 | x | -0.08 | -2.21 | | | | | | | | | | |
| Energy Performance | Energy class from A4 to G | 22.33 | 149.47 | x | 22.45 | 149.55 | x | 22.46 | 149.46 | x | 22.30 | 148.12 | x | 22.14 | 146.84 | x |
| Hospitals | Straight line distance | -1.18 | -99.94 | x | -1.17 | -98.37 | | | | | | | | | | |
| Leisure Services | N. in a 1 km ring buffer | -1.55 | -1.80 | x | -1.56 | -1.79 | x | -1.79 | -2.03 | | | | | | | |
| Cultural Services | N. in a 1 km ring buffer | 5.04 | 12.78 | x | 5.16 | 12.67 | x | 5.30 | 12.98 | x | 13.32 | 8.14 | x | 13.04 | 7.58 | x |
| Medical Centers | N. in a 1 km ring buffer | -0.18 | -0.57 | | | | | | | | | | | | | |
| Pharmacies | Travel time by public transport | 1.63 | 12.87 | x | 1.64 | 12.92 | | | | | | | | | | |
| Primary School | N. in a 1 km ring buffer | -2.63 | -53.31 | x | -2.66 | -53.62 | x | -2.95 | -58.75 | x | -3.67 | -70.00 | x | | | |
| Nursery | Straight line distance | -0.07 | -6.07 | | | | | | | | | | | | | |
| Shopping Malls | N. in a 1 km ring buffer | -3.48 | -45.09 | x | -3.53 | -45.15 | x | -3.28 | -39.99 | x | -4.61 | -50.71 | x | -4.75 | -52.42 | x |
| Small Commercial | Straight line distance | -2.28 | -178.15 | x | -2.34 | -173.92 | x | -2.23 | -163.77 | x | -2.15 | -158.33 | | | | |
| City center | Actual travel distance by car | -3.60 | -60.70 | x | -3.77 | -59.80 | x | -4.20 | -65.34 | x | -5.22 | -71.20 | x | -7.41 | -92.52 | x |
| Train Station | Travel time by public transport | 1.17 | 2.94 | x | 1.27 | 3.06 | x | 1.26 | 3.04 | | | | | | | |

$$Unitary\ Price =$$
$$2010.4 - (1.73 * Area) + (146.84 * Energy\ Performance) + (7.58 * Cultural\ Services) - (52.42 * Shopping\ Malls) - (92.52 * City\ Centre)$$