RESIDENTIAL PROPERTY PRICE INDEX IN ARMENIA

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CENTRAL BANK OF ARMENIA
STATISTICS DEPARTMENT
REAL SECTION STATISTICS DIVISON

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TABLE OF CONTENT

01 Objectives

02 Development Journey

03 Data and Methodology

04 Results

05 Conclusion

06 Further contributions

OBJECTIVES

Internationally comparable RPPI for Armenia that can support policymakers and investors:

- Assessing inflation-related risks
- Identifying vulnerabilities in the banking system

DEVELOPMENT JOURNEY

2014
Initial Concept and Challenges

2019
IMF Mission and Starting Point

2020
Agreement and Collaboration /Central Bank, Statistical Office, Cadastre Committee/

2023-2024
Second and Third IMF Missions and RPPI Developments

2025
RPPI first published in Armenia

DATA AND METHODOLOGY

THE DATASET SOURCE

- Cadastre Committee of RA

DATA TRANSFORMATION

- Define Stratification
- Cleaning and Formatting
- Imputation of Missing Data
- Outliers detection

METHOD

- Median with Stratification
- Time Dummy Hedonic

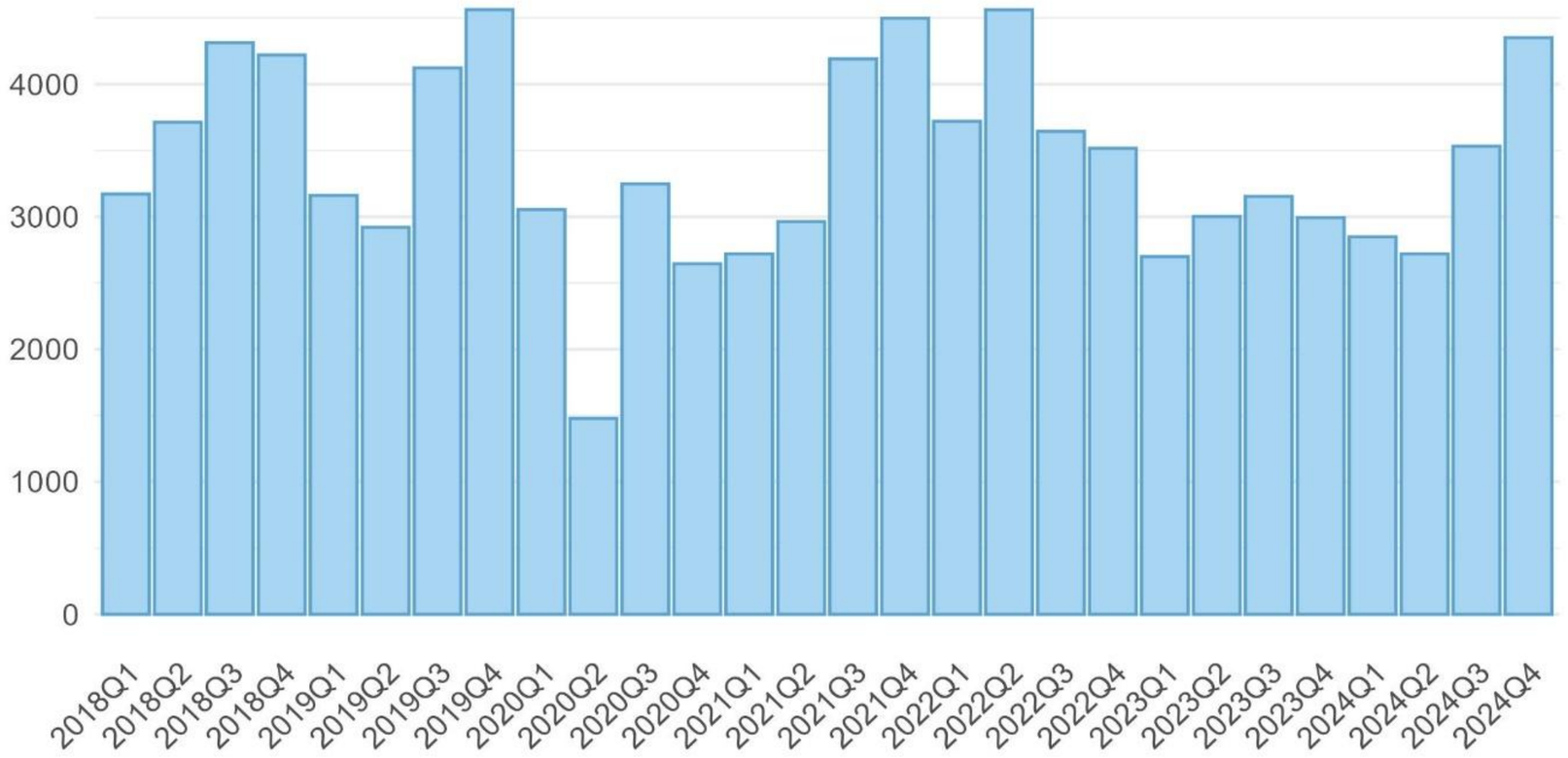
DATA AND METHODOLOGY

TABLE 1. The characteristics which are used in TDH method for apartments

Characteristics	Description
Build_year	*The year of construction of a building*
Cons_material	*Construction material of a building*
Floor_Area	*Total area in squared metres*
Region	*The marz where the apartment is located*
Zone	*Appraisal Zones based on characteristics of the geographical area*
Floor_level	*Floor level of apartment in the building*
Quarter	*The dummies for the time period*

DATA AND METHODOLOGY

FIGURE 1. Total number of transactions for apartments in each period



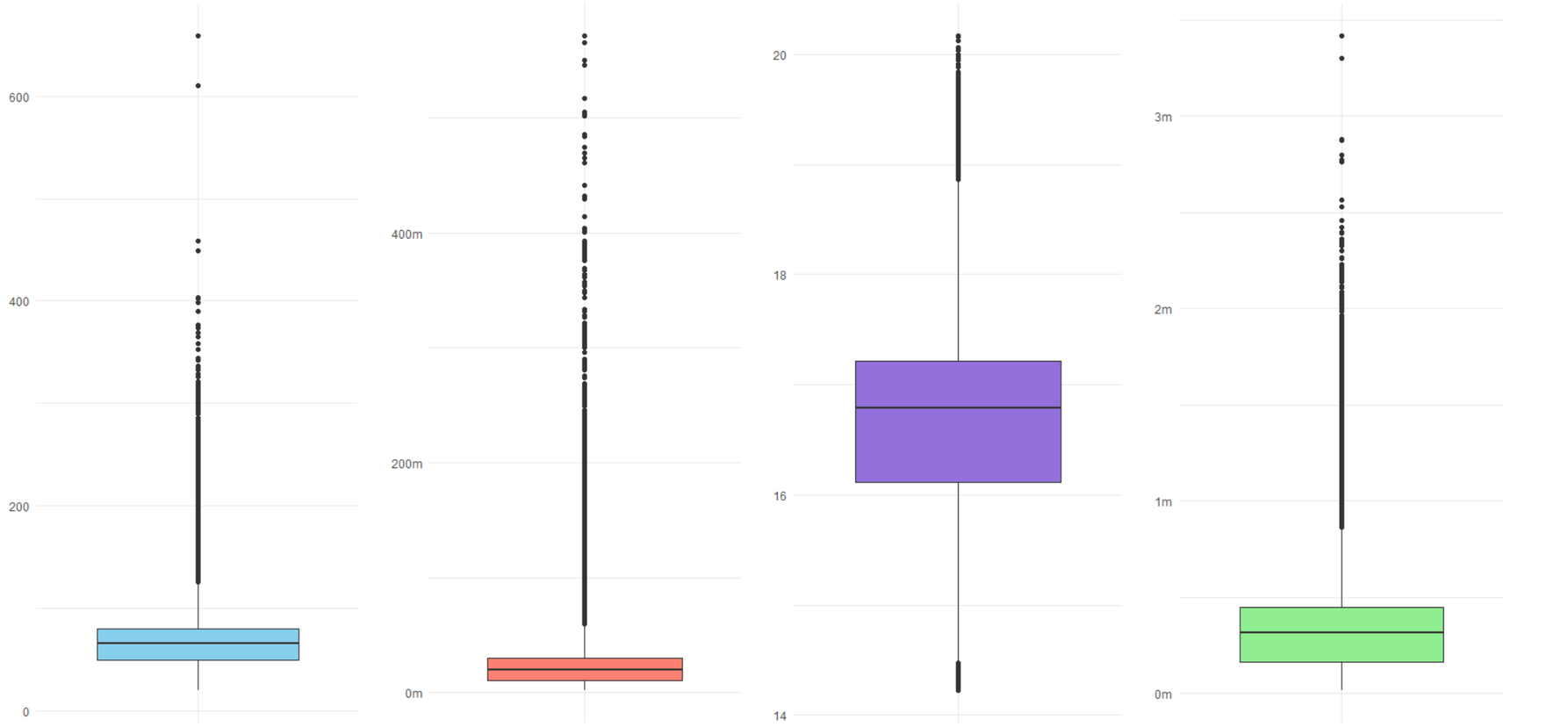
DATA AND METHODOLOGY

TABLE 2. Descriptive statistics of apartments (2018Q1-2024Q4)

Variable	*Min.*	*1st Q*	*Median*	*Mean*	*3rd Q*	*Max.*
Floor area, sqm	**20.0**	**50.30**	**66.00**	**69.38**	**80.70**	**398.80**
Price, AMD	**1,500,000**	**10,000,000**	**19,500,000**	**24,038,708**	**30,000,000**	**571,356,000**
Log of price	**14.22**	**16.12**	**16.79**	**16.65**	**17.22**	**20.16**
Price per sqm, AMD	**15,168**	**166,362**	**316,432**	**339,128**	**446,512**	**3,415,444**

DATA AND METHODOLOGY

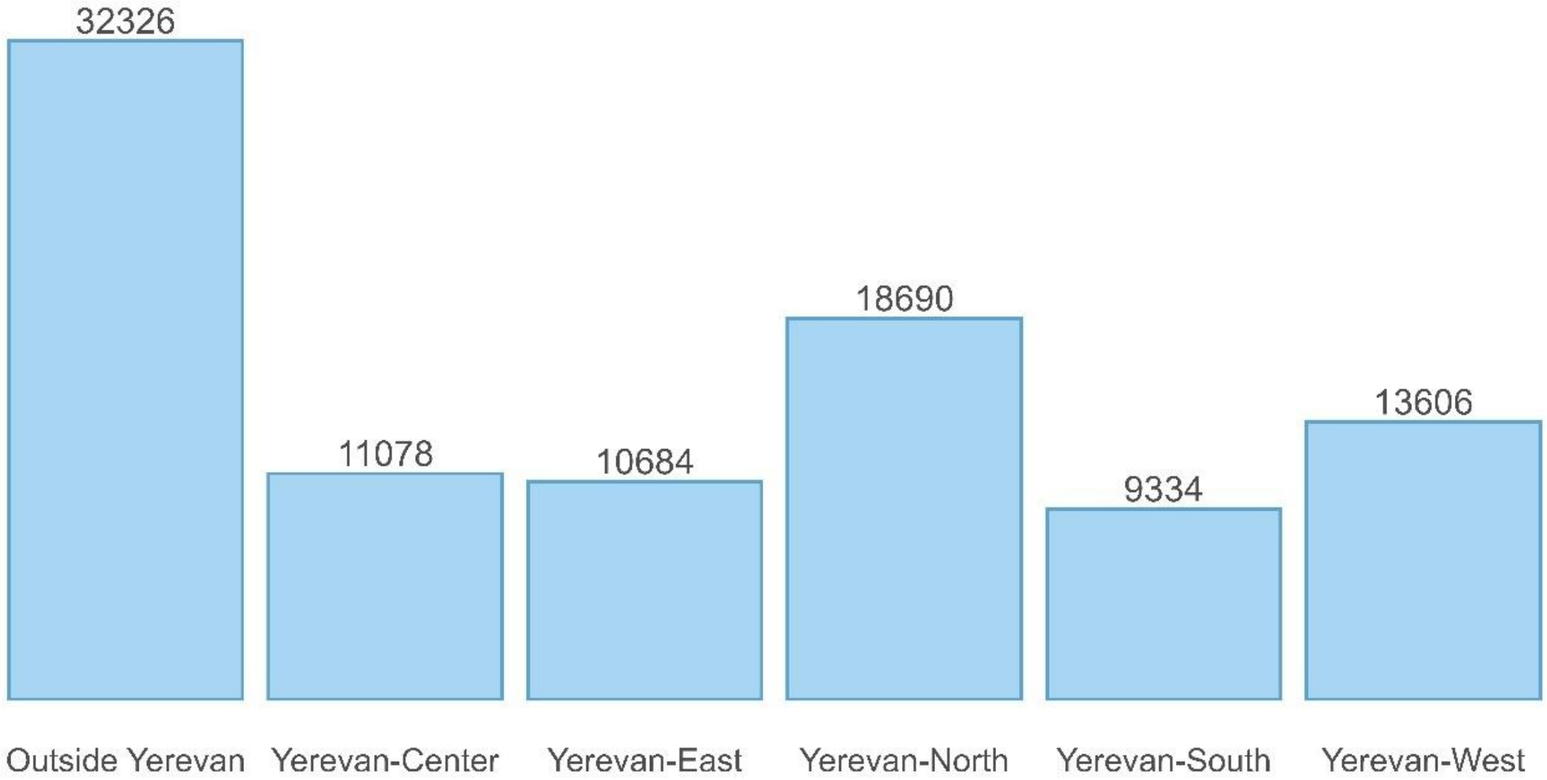
FIGURE 2. Distribution of main variables (Apartments, 2018Q1-2024Q4)



Area, sqm | Price, Million AMD | Log, of Price | Price per sqm, Million AMD

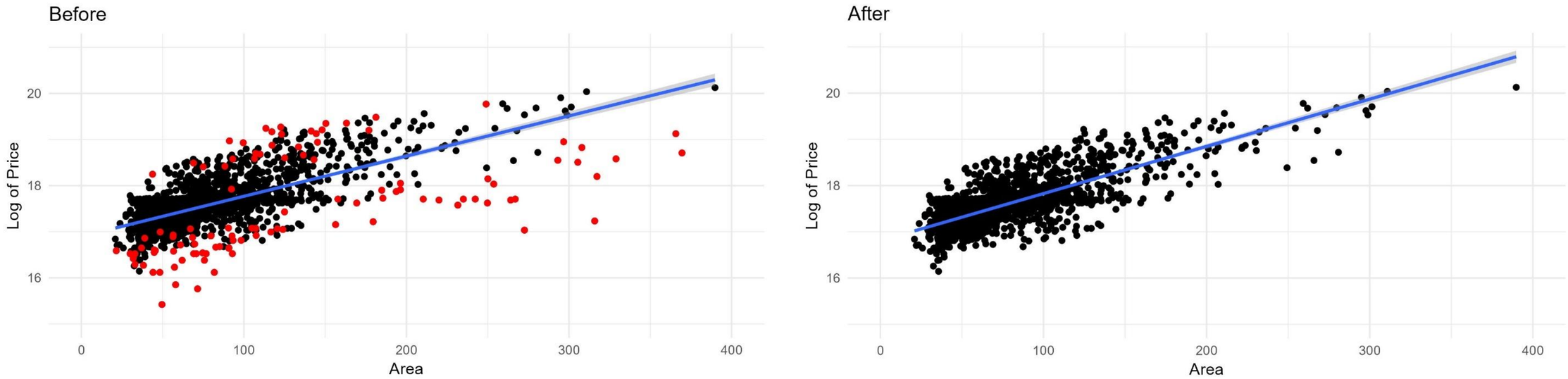
DATA AND METHODOLOGY

FIGURE 3. Number of observations in each stratum (Apartments, 2018Q1-2024Q4)



DATA AND METHODOLOGY

FIGURE 4. Applying Cook's Distance for outlier detection using sample data for Apartments



DATA AND METHODOLOGY

TABLE 3. The characteristics which are used in TDH method for individual houses

Characteristics	Description
Floor_Area	*Total area in squared metres*
Region	*The marz where the apartment is located*
Quarter	*The dummies for the time period*

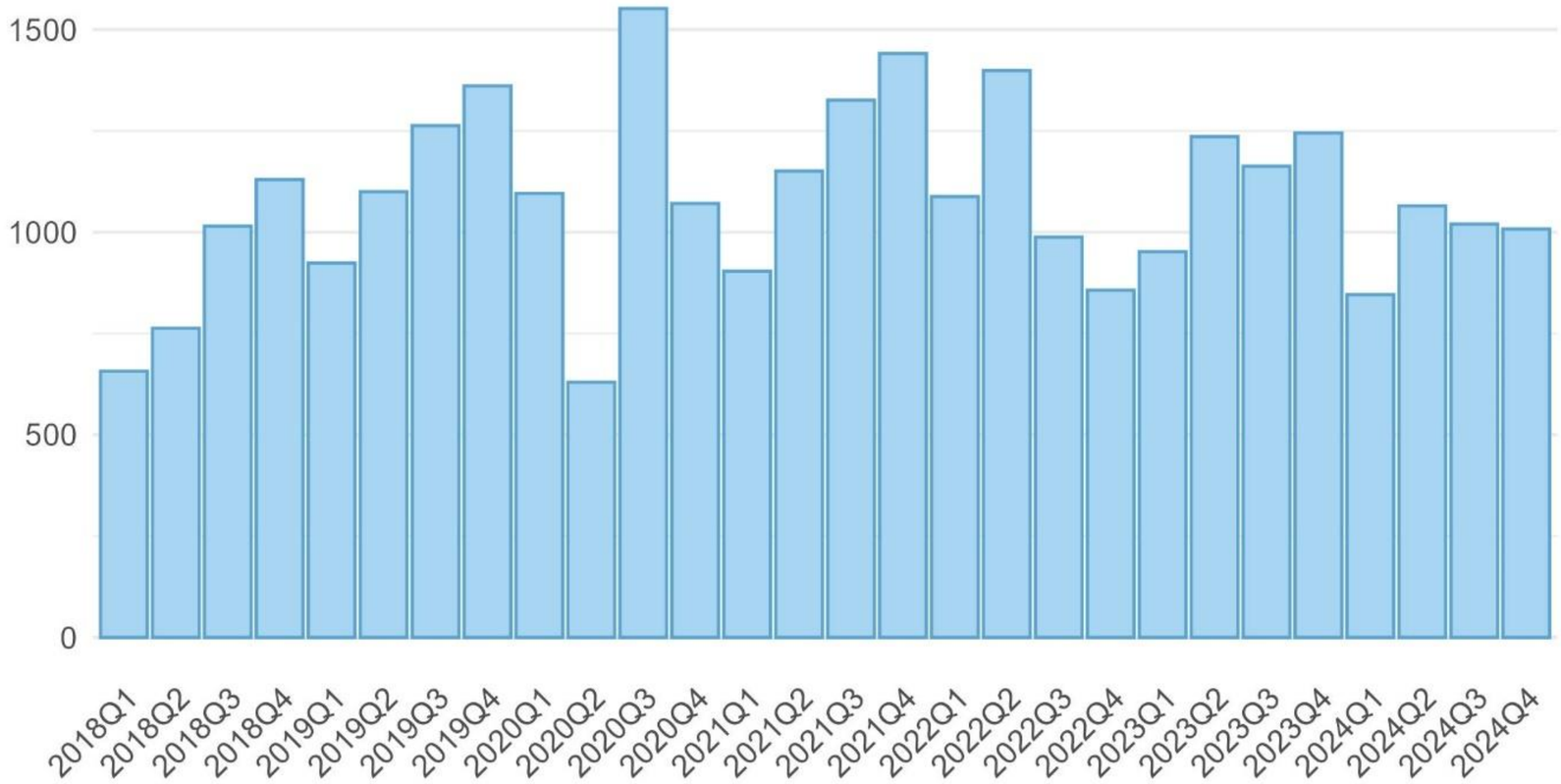
DATA AND METHODOLOGY

TABLE 4. Descriptive statistics of individual houses (2018Q1-2024Q4)

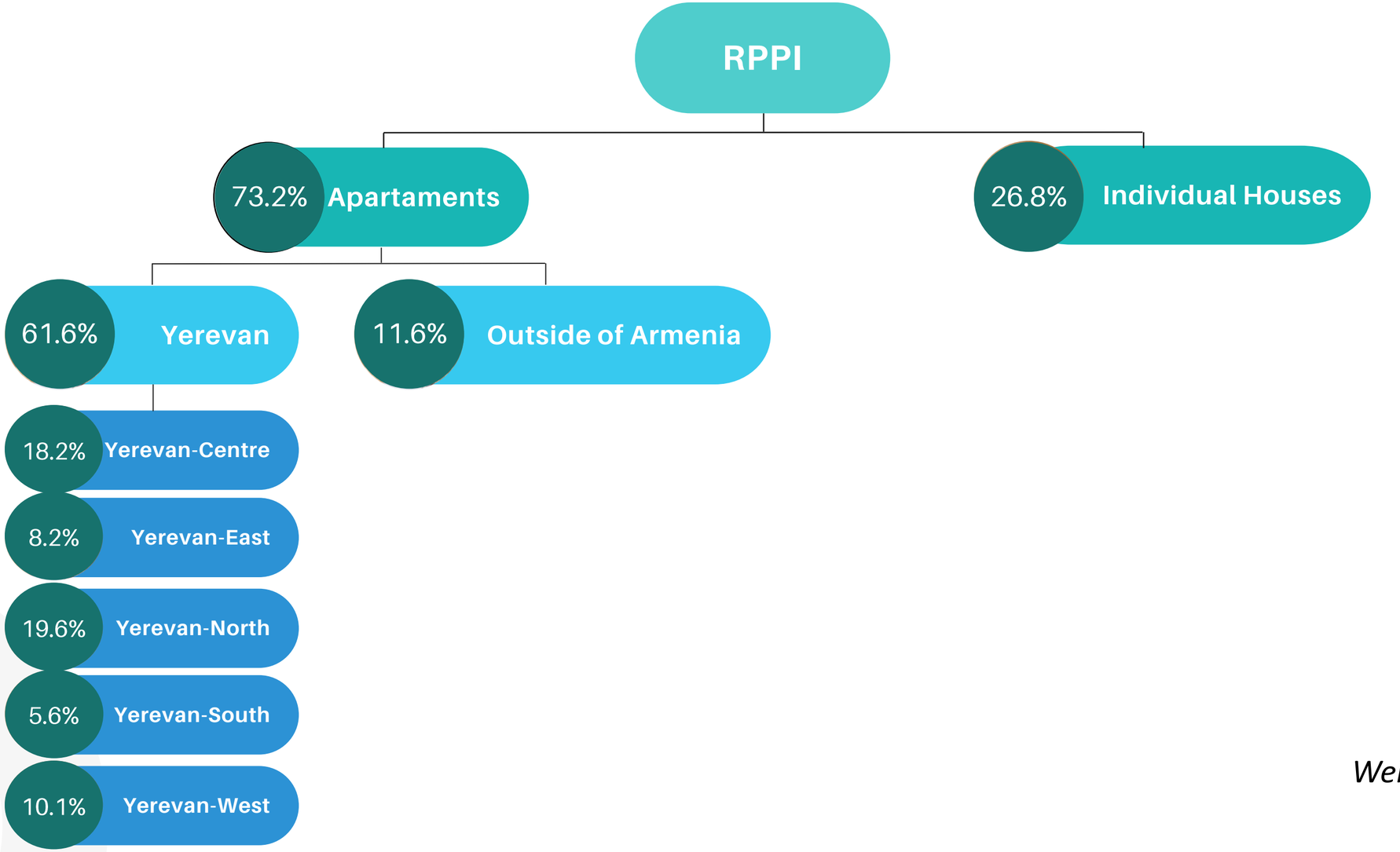
Variable	*Min.*	*1st Q*	*Median*	*Mean*	*3rd Q*	*Max.*
Floor area, sqm	***40.0***	***101.6***	***159.6***	***177.3***	***234.9***	***499.8***
Land area, sqm	***40.0***	***307.0***	***600.0***	***827.4***	***1,087.0***	***12,618.0***
Price, AMD	***1,500,000***	***5,860,418***	***11,400,000***	***19,127,974***	***21,979,500***	***481,140,100***
Log of price	***14.22***	***15.58***	***16.25***	***16.29***	***16.91***	***19.99***
Price per sqm, AMD	***15,001***	***36,451***	***71,248***	***127,638***	***155,103***	***4,788,119***

DATA AND METHODOLOGY

FIGURE 5. Number of observations by period (Individual Houses, 2018Q1-2024Q4)



DATA AND METHODOLOGY



Weights refer to 2024.

DATA AND METHODOLOGY

TIME DUMMY HEDONIC METHOD

$$ln\, p_n^t = \beta_0 + \sum_{t=1}^{T} \delta^t D_n^t + \sum_{k=1}^{K} \beta_k Z_{nk}^t + \varepsilon_n^t, \qquad where$$

t – period, where t = 0, …, T

n – dwelling n, n = 1, …, N

k – characteristic, k = 1, …, K

$ln\, p_n^t$ – natural logarithm of dwellings n price

β_0 – intercept

δ^t –coefficient of periods t time dummy variable that will generate the index

D_n^t – time dummy vector that is one in period dwelling n is transacted, and zero otherwise

β_k –“shadow” price of characteristic k

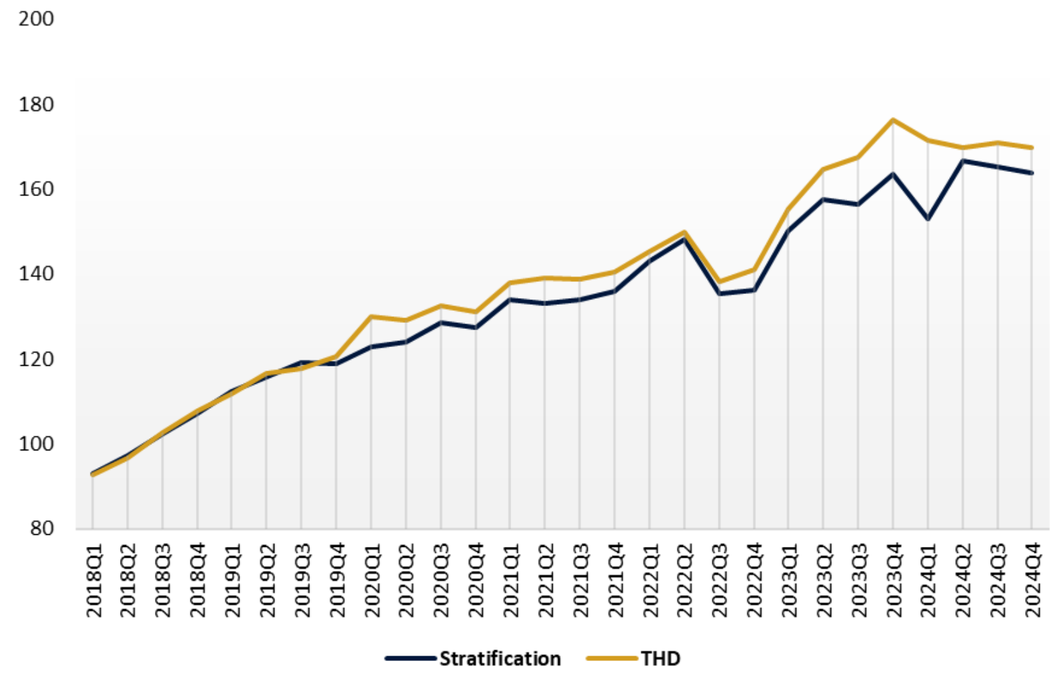
Z_{nk}^t –quantity of characteristic k in period t and dwelling n

ε_n^t – dwelling specific error term.

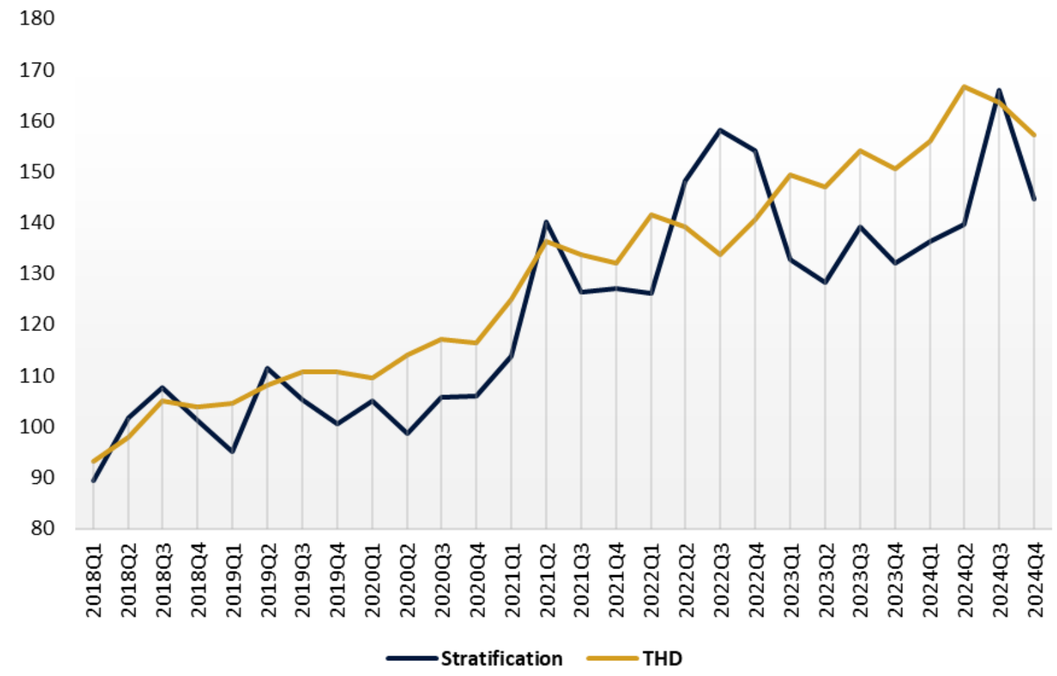
RESULTS

FIGURE 6. The RPPI with TDH and Stratification methods by dwelling type (2018Q1-2024Q4), 2018=100, %

(a) Apartments



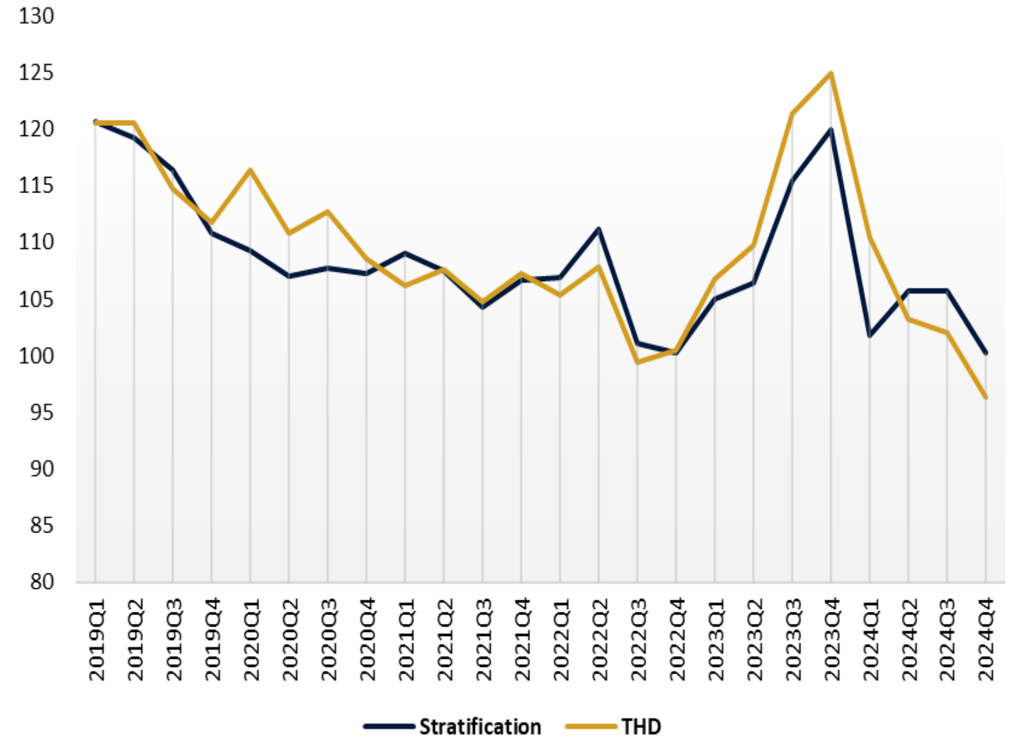
(b) Individual Houses



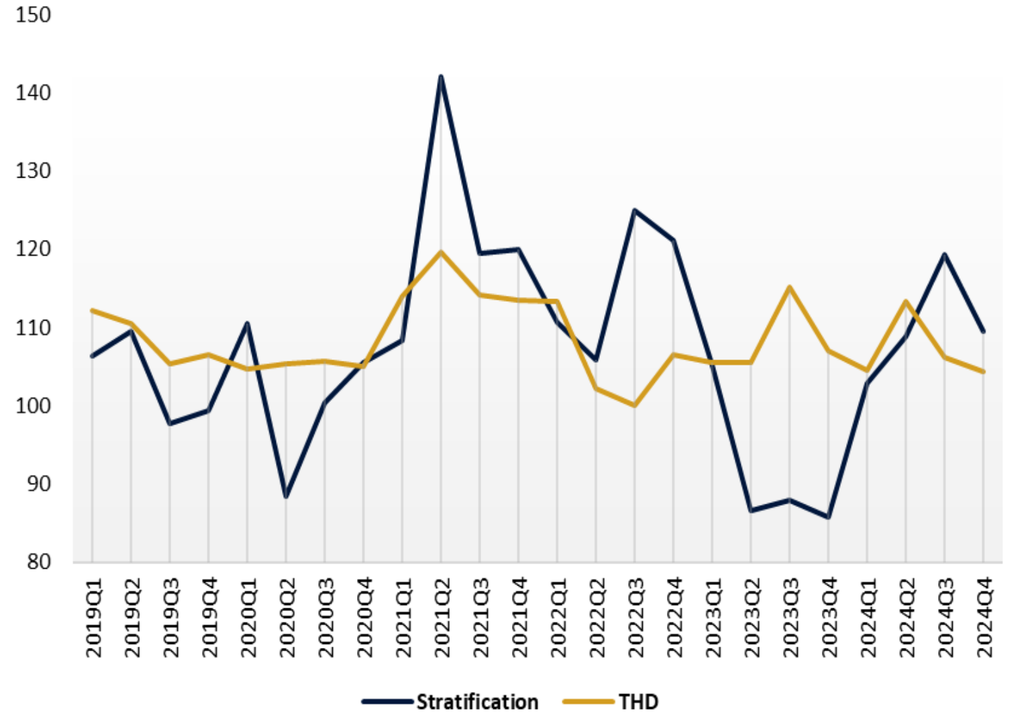
RESULTS

FIGURE 7. The RPPI with TDH and Stratification methods by dwelling type (2018Q1-2024Q4), compared to the same quarter of previous year, %

(a) Apartments

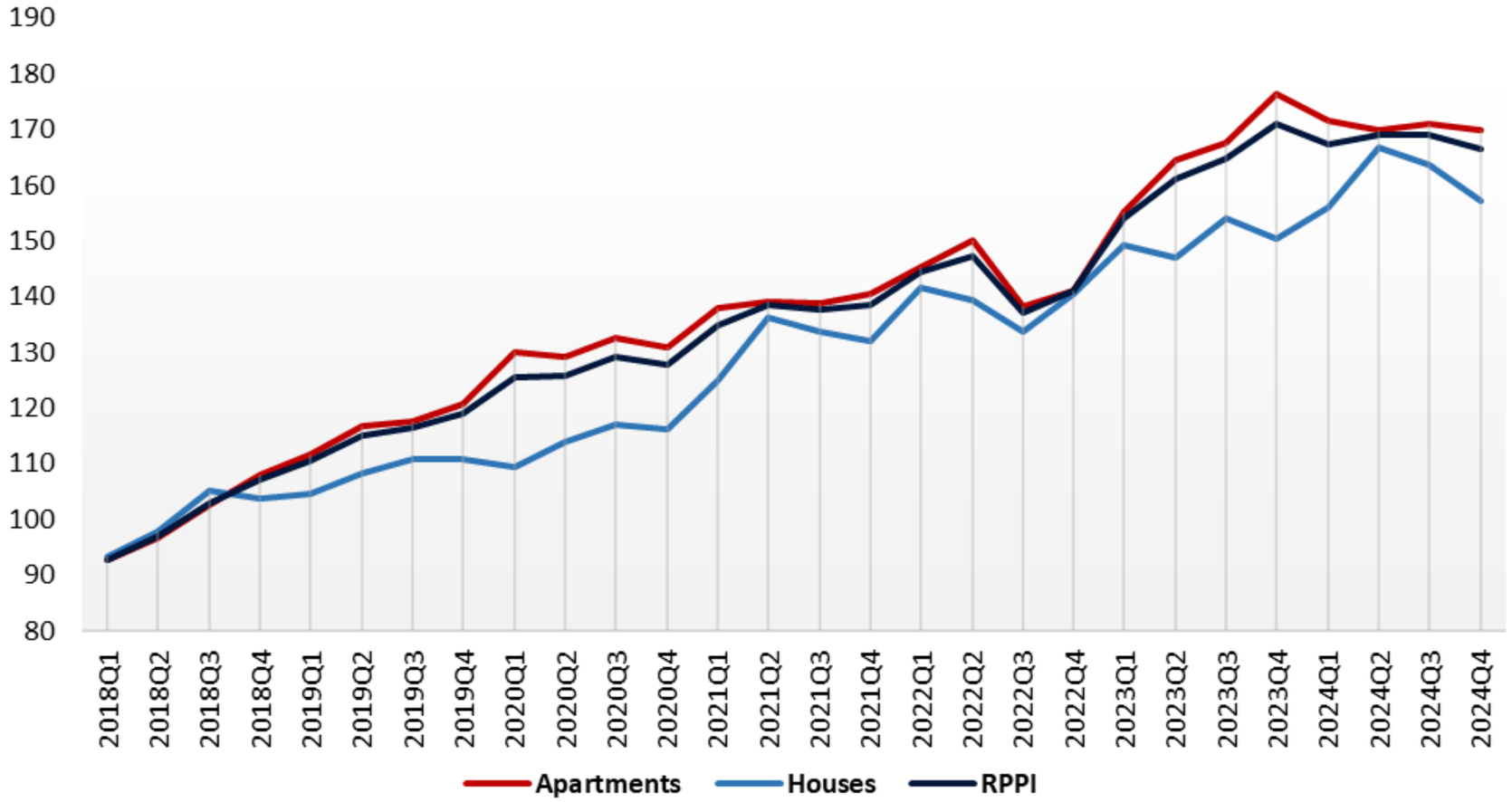


(b) Individual Houses



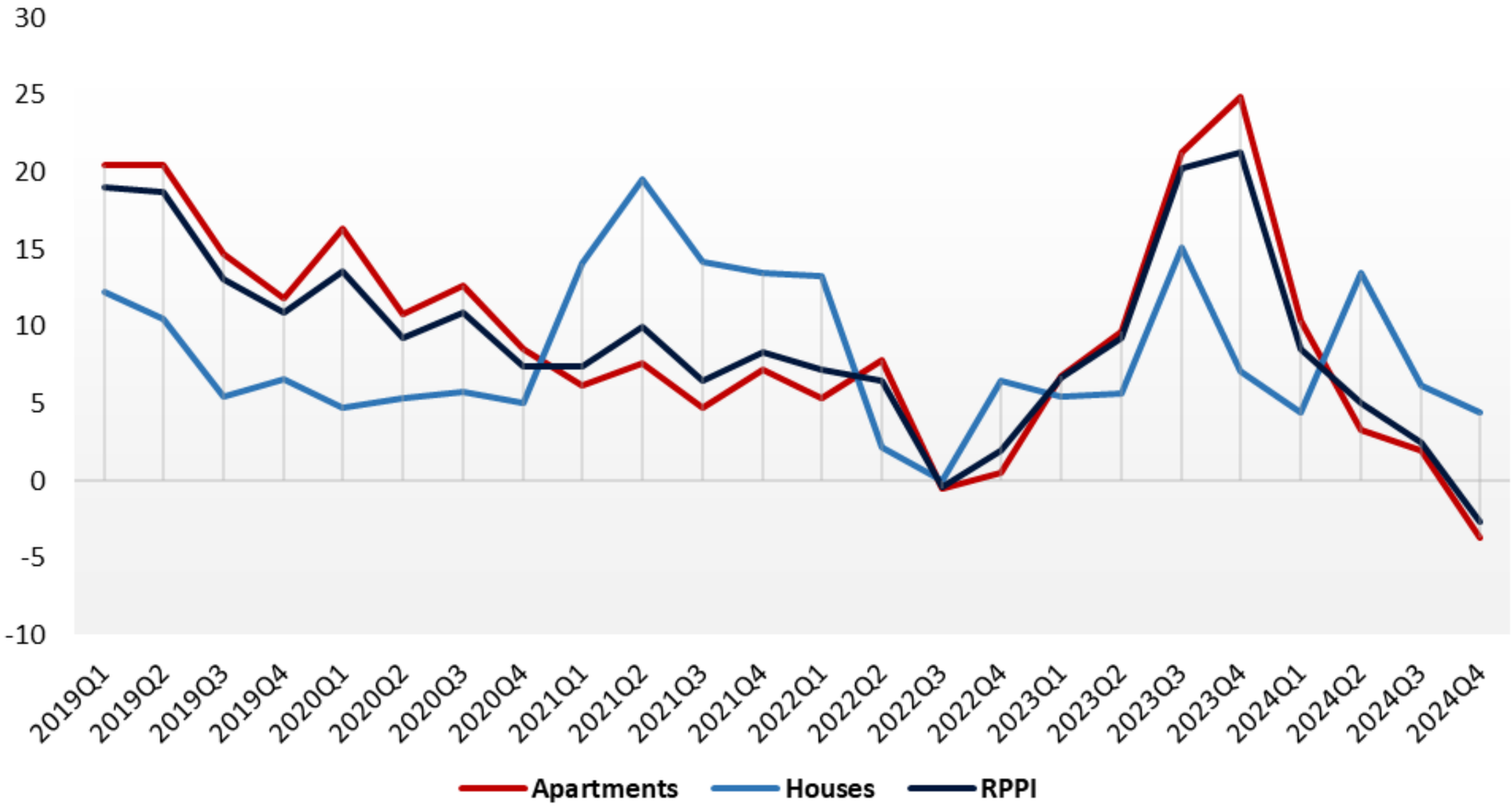
RESULTS

FIGURE 8. The RPPI by strata (2018Q1-2024Q4), 2018=100, %



RESULTS

FIGURE 9. The RPPI by strata (2018Q1-2024Q4), compared to the same quarter of previous year, %



CONCLUSION

★★★★★

Among various available data sources, the CCA dataset has been selected because of its full coverage, including all transactions, a rich set of appropriate characteristics for apartments and individual houses, and the timeliness.

★★★★★

Time-dummy hedonic regression method was selected because it incorporates a larger set of characteristics and thus offers a stronger ability to capture for quality changes over time.

★★★★★

The national index is further split into two sub-indices for apartment and individual houses. Due to the better quality characteristics for apartments, this segment is additionally split into two main stratums.

FURTHER CONTRIBUTIONS

★★★★★

Collaboration with Cadaster committee to expand and develop dataset for compilation of separate sub-indices for new and existing residential properties and separate indices for individual houses at the region level.

★★★★★

Utilizing web-scraped data for timely and high-frequency RPPI estimates.

★★★★★

Exploring the launch of a CPPI for a complete market perspective.

THANK YOU

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