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Real Estate in Paris (2022–2024)



Data Analyst Bootcamp – 09.09.2025 – 03.12.2025

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1. Hypothesis & Business Questions

1.1 Hypothesis

“The Paris real estate market shows signs of **stabilisation rather than growth** – indicated by a decline in transaction volumes between 2022 and 2024. Apartments continue to dominate the market, and while the number of transactions is decreasing, average apartment prices per m² remain stable or show slight increases in some areas.”

Note: The analysis covers apartment price trends (€/m²) and transaction values by property type, showing that while sales activity has slowed, prices have remained resilient.

1.2 Business Questions

To test this hypothesis, the following business questions were addressed using Power BI dashboard visuals:

Business Question	KPI / Chart Used to Answer
Is the Paris real estate market growing or slowing down?	Transactions per Year
Are there noticeable seasonal or monthly patterns in transactions?	Transactions Over Time
Which property types dominate the market?	Transactions by Property Type
How has total market value changed across property types?	Market Value by Property Type
How have apartment prices (€/m ²) evolved from 2022-2024?	Median €/m ² – Apartments

How do values differ across Paris districts (arrondissements)?	Map – Median €/m ² by District (Apartments Only)
What is the relationship between price levels and transaction volumes?	Scatter Plot – Transactions vs Median €/m ² (by District)

2. Assumptions & Methodological Approach

2.1 Key Assumptions

- The dataset accurately represents Paris property transactions from 2022 to 2024.
 - `property_value, actual_built_surface` and `square_meter_area_of_1st_lot ... 5th_lot` fields are partly reliable for calculating deal values and €/m² for apartments.
 - No major data gaps across time or districts. However, around 10% duplicates were removed – these may reflect manual entry errors but could also include repeated real transactions.
 - Extreme values may slightly affect price per m² accuracy – further analysis could refine results even more.
-

2.2 Methodological Approach

Goals

- Determine whether the Paris real estate market is expanding or cooling.
- Identify the key factors driving these trends.



Challenges

- Data quality issues, particularly missing or inconsistent values for property size and price.
- Presence of extreme values affecting the accuracy of €/m² calculations.
- Extensive data cleaning required.
- No external indicators (e.g., interest rates, inflation) available to enrich the context.

Analytical Approach

The analysis was structured around **two main areas – market activity and value trends**:

- Examined transaction volumes, deal types, and market structure across property types.
 - Calculated price per m² for apartments as the most reliable subset.
 - Conducted district-level (arrondissement) analysis using a map and a scatter plot.
 - Visualised results in Power BI, with data cleaning and preprocessing done in Python and initial validation in Excel.
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3. Data Overview

3.1 Scope

- **Location:** Paris Metropolitan Area
 - **Period:** January 2022 – June 2024
 - **Data Source:** Property transactions dataset (cleaned)
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3.2 Key Variables Used

Variable	Description
transaction_date	Date of sale, used for time-based analysis.
property_value	Total transaction value (€).
actual_built_surface	Interior surface area (m ²); used for €/m ² calculation when applicable.
square_meter_area_of_1st_lot ... 5th_lot	Lot-level surface variables used in Power BI to calculate total surface area when <i>actual_built_surface</i> was incomplete.
nature_of_transaction	Indicates whether the record refers to an apartment, outbuilding, or other lot type – used to understand lot composition in €/m ² calculations.
property_unit_id	Unique identifier used to track units and remove duplicates.
address fields	Used for validation, manual checks, and geographic consistency.
local_type	Simplified classification grouped into four main categories: apartments, commercial, houses, and outbuildings.
dim_arr_coord	Used for geographic comparison across Paris.

3.3 Data Preparation & Outlier Treatment

To ensure reliable median €/m² calculations for apartments and reduce the impact of extreme or incorrect values, the following thresholds were applied before the analysis:

- **Minimum apartment area:** 10 m²
- **Minimum total apartment cost:** €10,000
- **Included cost per m² range:** €1,000 to €30,000 - This upper limit intentionally excludes ultra-luxury properties, as they fall far outside typical market ranges and would distort the analysis.
- **Property type filtered to:** apartments only

These thresholds were determined based on the observed data distribution and applied to remove outliers, unrealistic entries, and duplicated or misreported transactions commonly found in the DVF dataset.

They ensure that the calculated median values reflect realistic and comparable market conditions across districts and time periods.

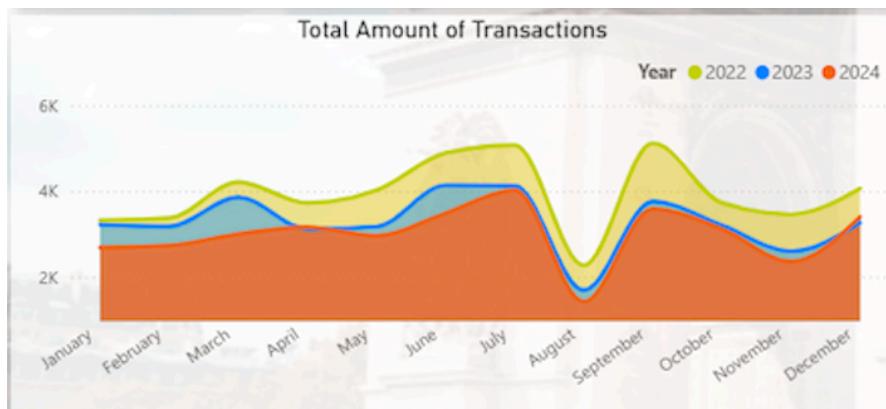
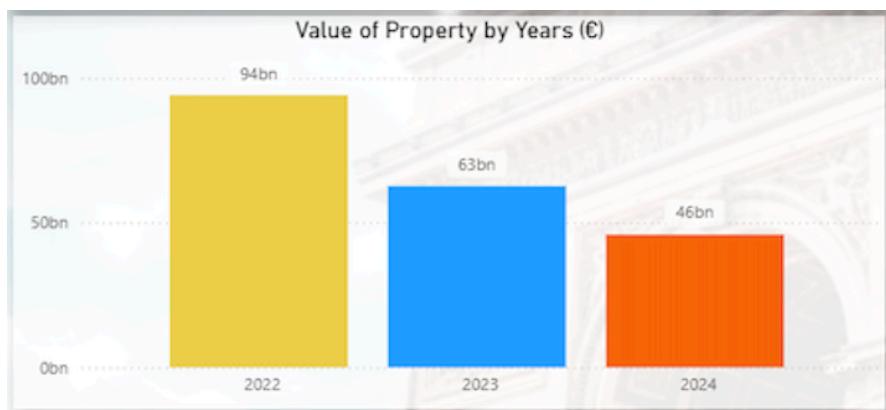
4. Dashboard Narrative & Key Insights

This section summarises the key insights displayed in the Power BI dashboard, which covers **market activity, value trends, and spatial differences** in the Paris real estate market between 2022 and 2024.

4.1 Transaction Volume Over Time

Business Question: Is the Paris real estate market growing or slowing down?

Figure 4.1 – Transactions per Year / Transactions Over Time



Insight Narrative:

- Transaction volumes declined from **2022 to 2024**, indicating a cooling market.
- Monthly trends confirm consistent **seasonality**, with activity peaking in **June–July** and again in **September**, and dropping sharply in **August** due to the summer holiday period.
- While seasonal patterns remain stable, overall activity levels have **decreased year over year**.

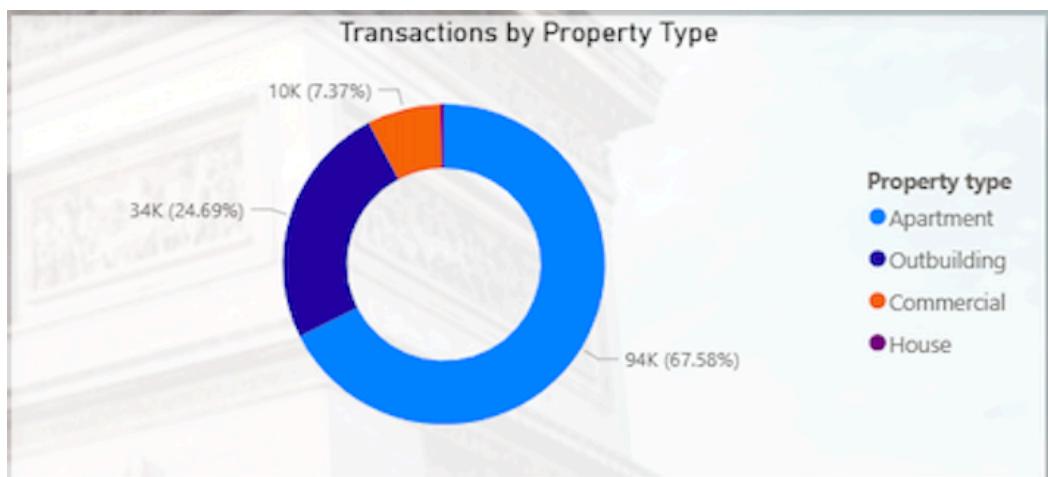
Interpretation:

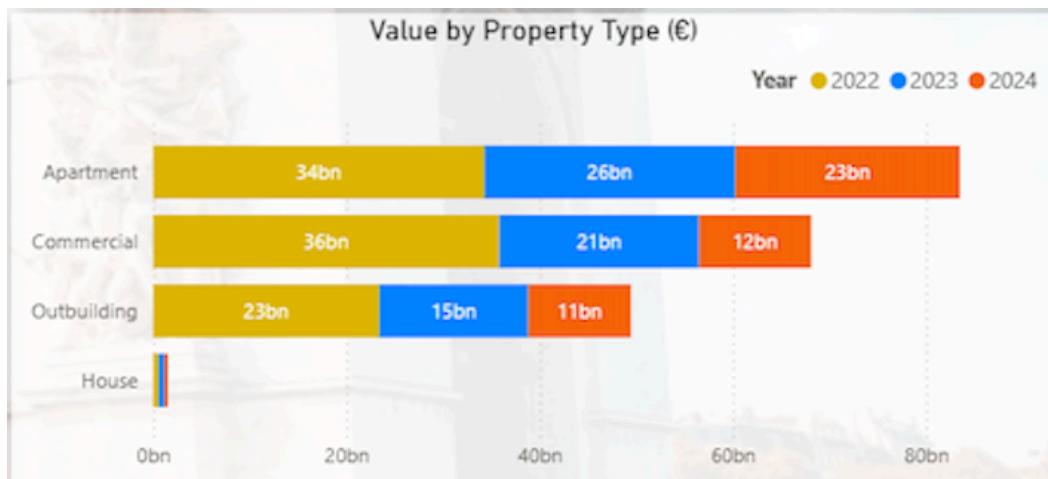
The market shows signs of slowdown rather than growth, influenced by tighter financing conditions and reduced buyer activity.

4.2 Property Type Distribution & Market Value

Business Question: Which property types dominate the Paris market, and how has total market value changed?

Figure 4.2 – Transactions by Property Type / Market Value by Property Type





Insight Narrative:

- Apartments continue to dominate the Paris market, accounting for around **68% of all transactions**.
- Houses and commercial properties represent smaller shares.
- When comparing market values, apartments also generate the **largest total transaction value**, reflecting their central role in the urban housing market.

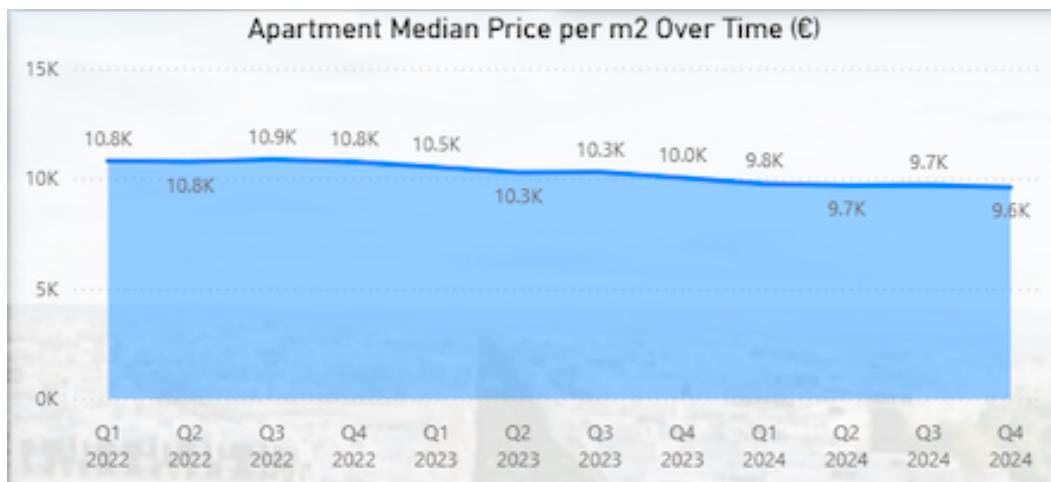
Interpretation:

The Paris real estate market remains **apartment-driven**, with limited diversification across property types.

4.3 Median Apartment Prices Slightly Decline Over Three Years

Business Question: How have apartment prices evolved from 2022–2024?

Figure 4.3 – Apartment Median Price per m² Over Time(€)



Insight Narrative:

- Median apartment prices per m² show a **slight overall decline** from 2022 to 2024. Prices start at around **€10.8k** in early 2022, fluctuate moderately through 2023, and end at approximately **€9.6k** in late 2024.
- Although the trend is downward, the movement remains **gradual**, with no sharp drops during the period.

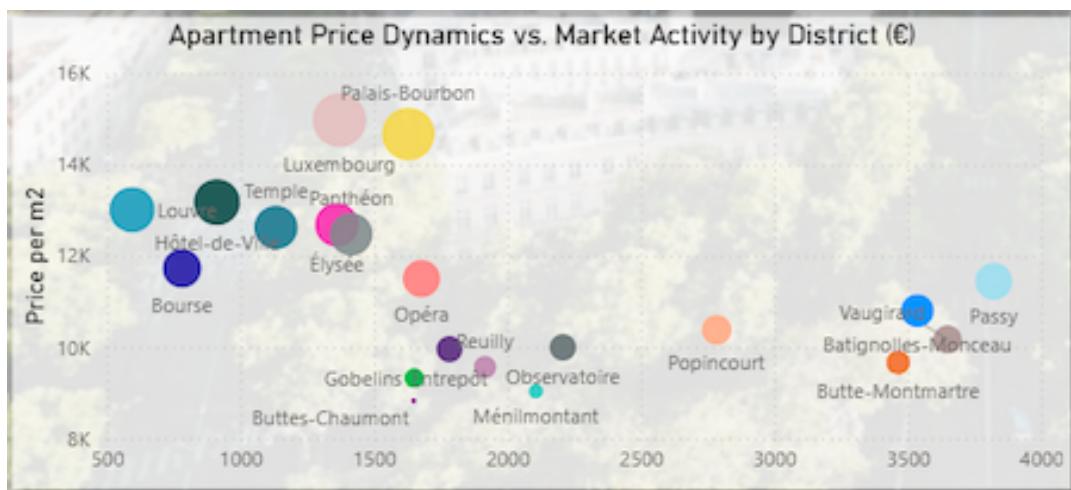
Interpretation:

The data reflects a **softening rather than a steep correction**. Prices have eased but remain relatively high, indicating a gradual adjustment in the market rather than significant depreciation.

4.4 Price Levels Shape Transaction Patterns Across Districts

Business Question: What is the relationship between transaction volume and price levels?

Figure 4.4 – Apartment Price Dynamics vs. Market Activity by District (€)



Insight Narrative:

- The scatter plot shows that districts with **higher median €/m²** tend to record fewer transactions, while districts with lower to mid-range median prices cluster toward higher activity levels.
- The distribution forms a clear downward trend, indicating that transaction volume decreases as price levels rise.

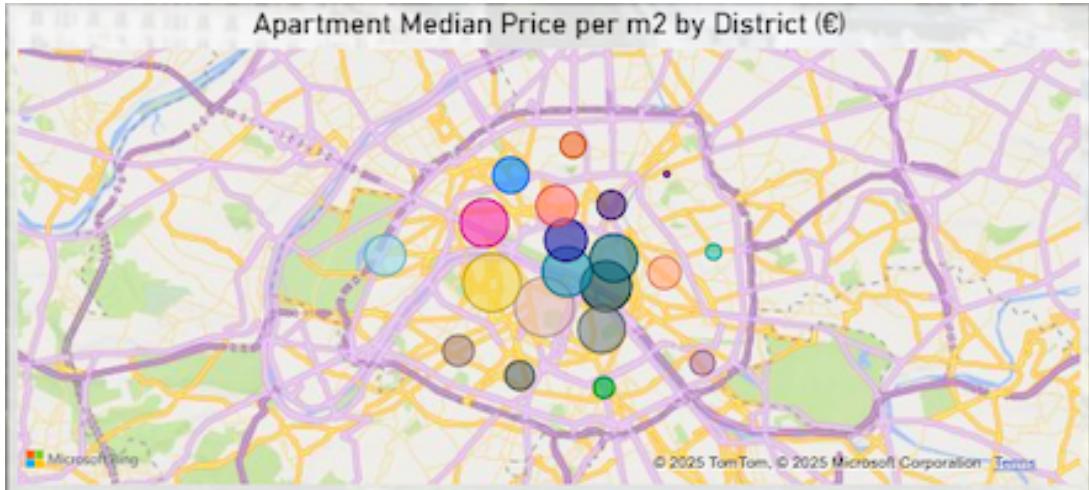
Interpretation:

The visual pattern suggests an inverse relationship between **median price** and market activity across districts: more affordable areas experience more transactions, while higher-priced districts show limited turnover.

4.5 Apartment Prices Vary Significantly by District

Business Question: How do prices and transaction values vary across districts (arrondissements)?

Figure 4.5 – Apartment Median Price per m² by District (€)



Insight Narrative:

- The map indicates that central arrondissements have the **highest median apartment prices per m²**, shown by the largest and darkest-coloured bubbles.
- In contrast, outer districts display **lower median price levels**, represented by smaller or lighter-coloured bubbles, highlighting clear variation across the city.

Interpretation:

The spatial distribution shows a consistent price gradient, with a high-value central core surrounded by more affordable peripheral districts.

5. Conclusion & Actionable Insights

5.1 Conclusion

Hypothesis:

“The Paris real estate market shows signs of stabilisation rather than growth – indicated by a decline in transaction volumes between 2022 and 2024. Apartments continue to dominate the market, and while the number of transactions is decreasing, average apartment prices per m² remain stable or show slight increases in some areas.”

Answer: Yes – based on the available data, the hypothesis is supported.

Findings Summary:

Hypothesis Component	Supported by Data?	Evidence
Transaction volume is declining over time	<input checked="" type="checkbox"/> Yes	Yearly and monthly transaction data show a consistent drop from 2022 to 2024.
Apartments dominate the market	<input checked="" type="checkbox"/> Yes	Apartment transactions account for ~68% of total sales, highest in both count and total market value.
Seasonal trends exist	<input checked="" type="checkbox"/> Yes	Clear peaks in July and September and a consistent dip in August each year.
Prices per m² are stable or slightly increasing	<input checked="" type="checkbox"/> Yes	Median apartment prices per m ² remain stable across 2022–2024, showing resilience despite lower sales activity.
Total market value is decreasing	<input checked="" type="checkbox"/> Yes (slightly)	Market value declined in line with transaction volumes, though price stability softened the overall impact.

Final Conclusion:

- The analysis supports the hypothesis of a **market slowdown with price stabilisation**.
- Between 2022 and 2024, the Paris property market experienced **fewer transactions**, particularly from 2023 onwards, but **apartment prices remained steady**, suggesting

demand resilience in a constrained supply environment.

- Apartments remain the **core driver** of both transaction count and total market value, while seasonal trends continue to shape annual activity.
- Geographic analysis confirms the **price divide** between central and outer districts, with higher-value central areas showing lower transaction activity.

The Paris market is **cooling in activity** but **stable in value**, indicating **stabilisation rather than downturn**.

5.2 Actionable Insights

Based on our analysis results, we recommend customers in the Paris property market to:

Buyers:

- Focus on **outer and mid-priced districts**, where activity is higher and opportunities for negotiation are more likely due to slower market dynamics.
- Prioritise **timing purchases outside peak seasonal months** (June–July, September) to benefit from lower competition.

Sellers:

- Leverage the **price stability** observed in the market, especially in central districts where values remain resilient despite fewer transactions.
- Plan listings during **seasonal peaks**, when buyer activity historically increases.

Investors:

- Consider **medium-priced districts with strong activity**, as they offer a balance between liquidity and value.
 - Monitor price softening trends for long-term opportunities, particularly if the gradual decline continues into 2025.
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6. Limitations

While the findings are reliable, several factors may influence interpretation:

Limitation	Description
Data Quality & Completeness	Some property records contained missing or inconsistent values for price and surface area, limiting full price-per-m ² accuracy.
Presence of Extreme Values	Extreme values may slightly distort average price calculations – further analysis could refine results even more.
No External Variables	Macroeconomic indicators such as interest rates, inflation, or population trends were not integrated, which could explain part of the market dynamics.
Time Constraints	Due to the tight project timeline, in-depth outlier detection, and advanced statistical modelling were not performed.

7. Next Steps & Recommendations

7.1 Next Steps

- **Develop a predictive model** to support forecasting and improve buy-side decision-making.
- **Refine the geographic visualisation** by implementing a more detailed district-level map.

- **Introduce price-based categorisation** (e.g., low-cost, mid-range, high-end, luxury) at district level to enable comparison of affordability across locations.
 - **Enhance dashboard interactivity** by adding filters and sliders (e.g., price range, location, property characteristics) to help users identify options that best match their budget and preferences.
 - **Integrate additional external data sources** to expand the dashboard's analytical capabilities and enrich the insights available to users.
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7.2 Recommendations

Based on our findings, we recommend that **the Direction Générale des Finances Publiques (DGFiP¹)**, as the publisher of the DVF dataset, **consider the following measures to improve data quality** and support more reliable anomaly analysis:

- **Introduce regular data quality checks** to detect and prevent missing values, outliers, extreme values, duplicates, or repeated transactions.
 - **Strengthen validation rules at data-entry stage** to minimise incorrect or out-of-range values before publication.
 - **Enhance dataset documentation** by providing clearer field descriptions, definitions and metadata to support faster interpretation and more effective use by analysts.
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8. Appendices

8.1 Gantt Chart

The project is progressing according to plan, with all initial milestones met and further development on schedule for completion in November 2025.

¹ Direction Générale des Finances Publiques – the French governmental institution responsible for public finance and taxation data.

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Phase	Details	Deliverable	Planned Deadline	Status
Step 0 – Project Kick-Off	Defined project scope, objectives, and dashboard goals.	-	10 Oct 2025	<input checked="" type="checkbox"/> Completed
Step 1 – Data & Context Exploration	Analysed the Valeurs Foncières dataset to understand structure and limitations.	Data Audit Document	13 Oct 2025	<input checked="" type="checkbox"/> Completed
Step 2 – Cleaning & Preprocessing	Cleaned and validated transaction records for Paris (2022–2024).	Interim Report Part 1	24 Oct 2025	<input checked="" type="checkbox"/> Completed
Step 3 – Dashboard Development	Created interactive visualisations in Power BI and aligned them with business questions.	Power BI Dashboard + Report Part 2	3 Nov 2025	<input checked="" type="checkbox"/> Completed
Step 4 – Final Report & Code Submission	Consolidated all insights, verified data accuracy, and finalised visual narrative.	Final Report + Jupyter Notebook	10 Nov 2025	<input checked="" type="checkbox"/> Completed
Step 5 – Final Presentation	Delivered the project defence, demonstrating dashboard insights and conclusions.	Presentation + Dashboard Demo	19 Nov 2025	<input checked="" type="checkbox"/> Upcoming