

BUYING SMART: WHEN TO BUY, WHAT TO AFFORD, AND HOW FAR IT GROWS

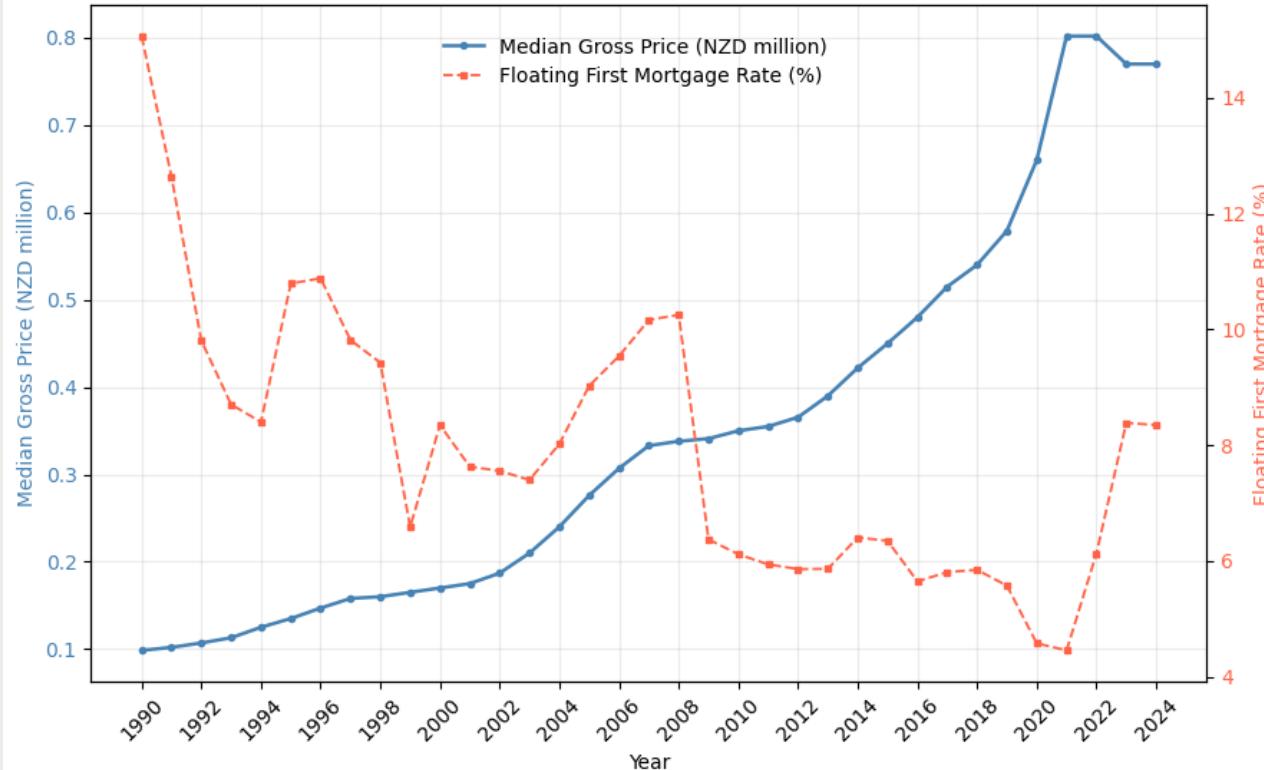


A DATA JOURNEY THROUGH NEW ZEALAND'S HOUSING MARKET

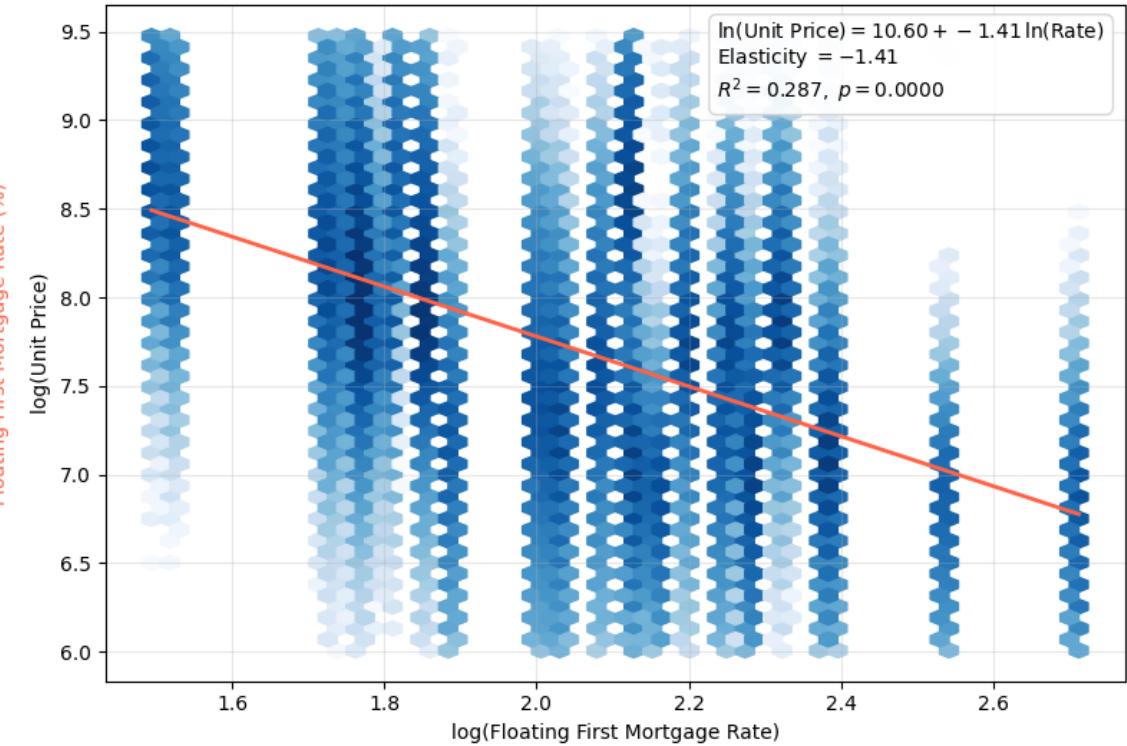
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DATE: 21 OCT 2025

Median Gross Price vs Floating First Mortgage Rate (1990-2024)



Elasticity of Unit Price to Floating Mortgage Rate (log-log model)



10⁴
10³
10²
10¹

Data source: Reserve Bank of New Zealand (RBNZ)(2025).Retail interest rates on lending and deposits - B3 (1964-current) <https://www.rbnz.govt.nz/-/media/project/sites/rbnz/files/statistics/series/b/b3/hb3.xlsx>

WHEN INTEREST RATES RISE, DO HOUSE PRICES FALL?

INTEREST RATE IMPACT ON UNIT HOUSE PRICE

WHEN TO BUY — INTEREST RATE VS HOUSE PRICE

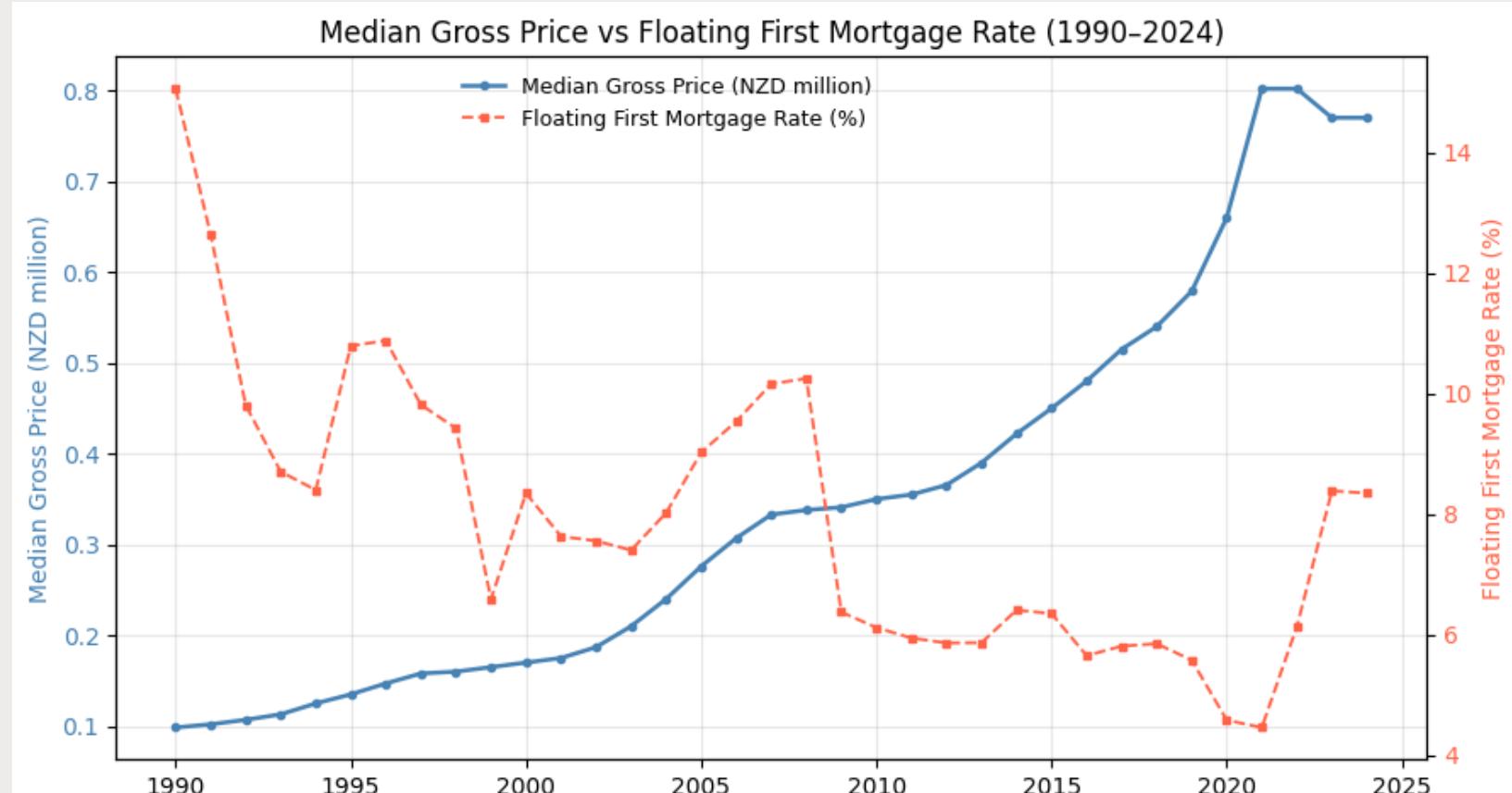
Dataset:

- Residential property sale statistics (Property IQ et al., 2010)
- Retail interest rates on lending and deposit – B3 (hb3) (RBNZ, 2025)

Data Size & Cleaning:

- ≈3.5 million sale records (1990-2024)
- Removed negative prices only

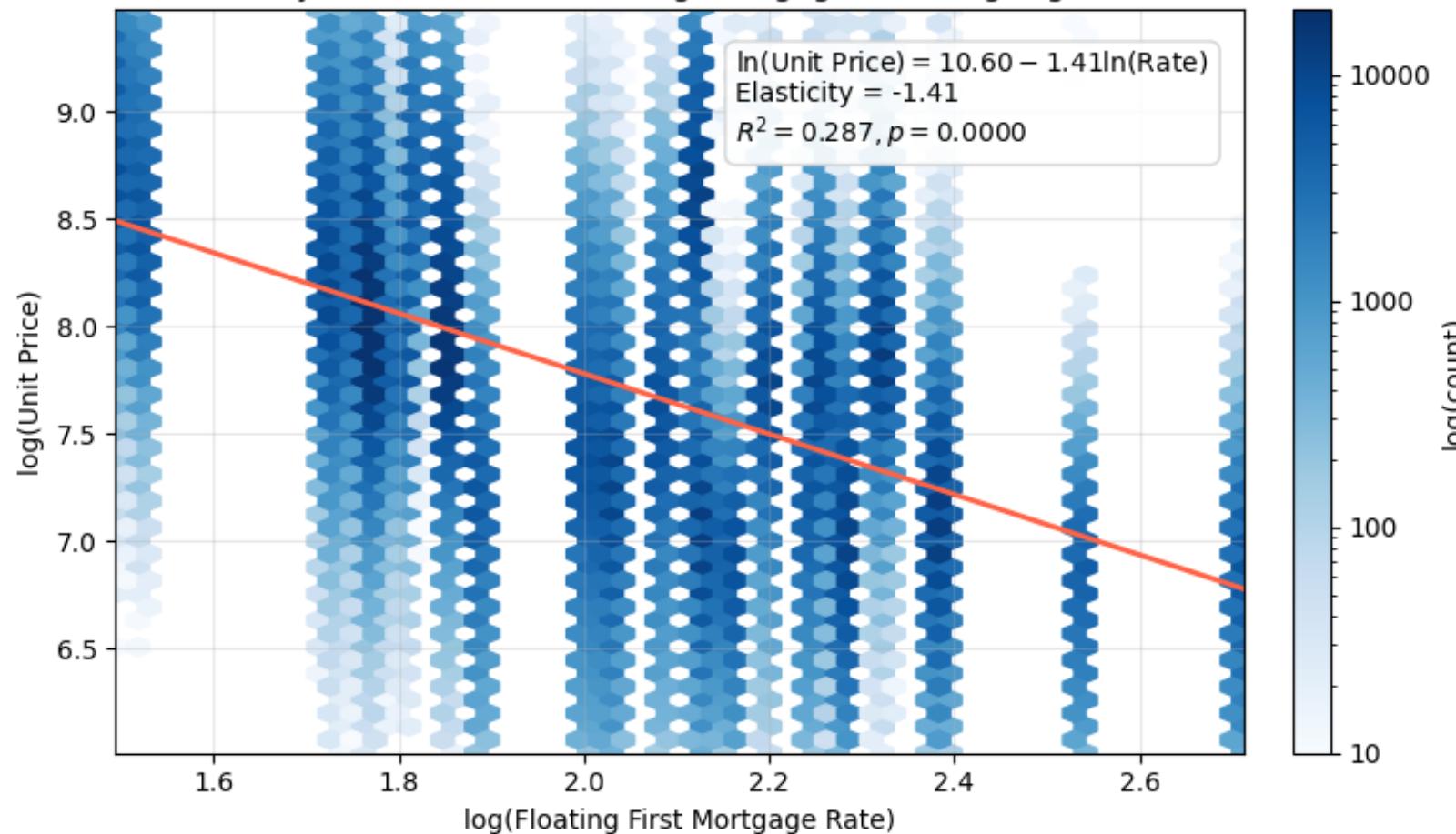
Clear Inverse Relationship



Data source: Reserve Bank of New Zealand (RBNZ, 2025). 'Retail interest rates on lending and deposits - B3 (1964-current)'. Retrieved from <https://www.rbnz.govt.nz/statistics/series/exchange-and-interest-rates/new-residential-mortgage-standard-interest-rates>

WHEN TO BUY — INTEREST RATE VS HOUSE PRICE

Elasticity of Unit Price to Floating Mortgage Rate (log-log model)

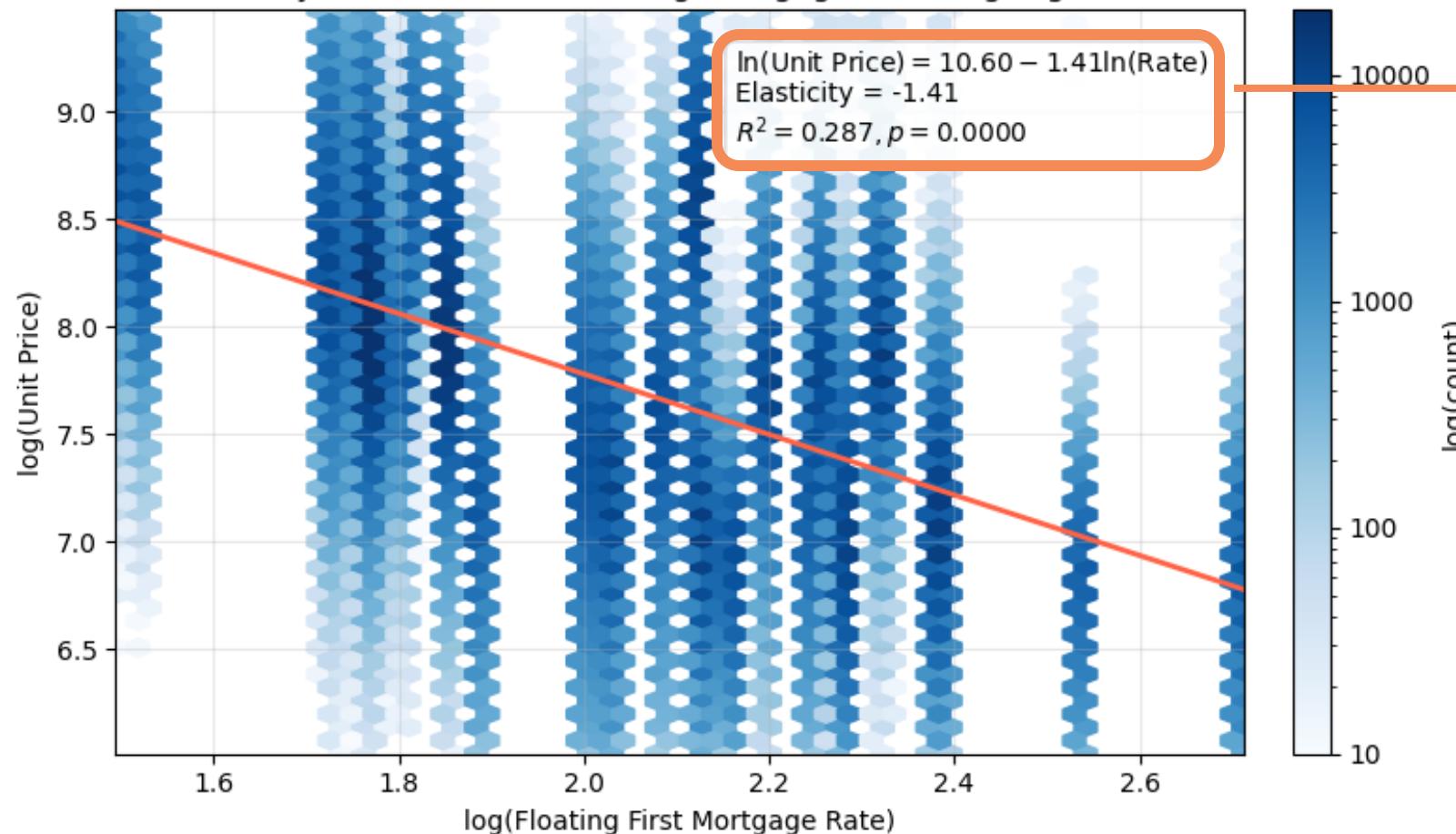


Data Preparation:

- Removed top & bottom 1 % to drop extremes
- Unit price = Gross Price / Floor Area

WHEN TO BUY — INTEREST RATE VS HOUSE PRICE

Elasticity of Unit Price to Floating Mortgage Rate (log-log model)



Elasticity measures how sensitively prices respond to rate changes.

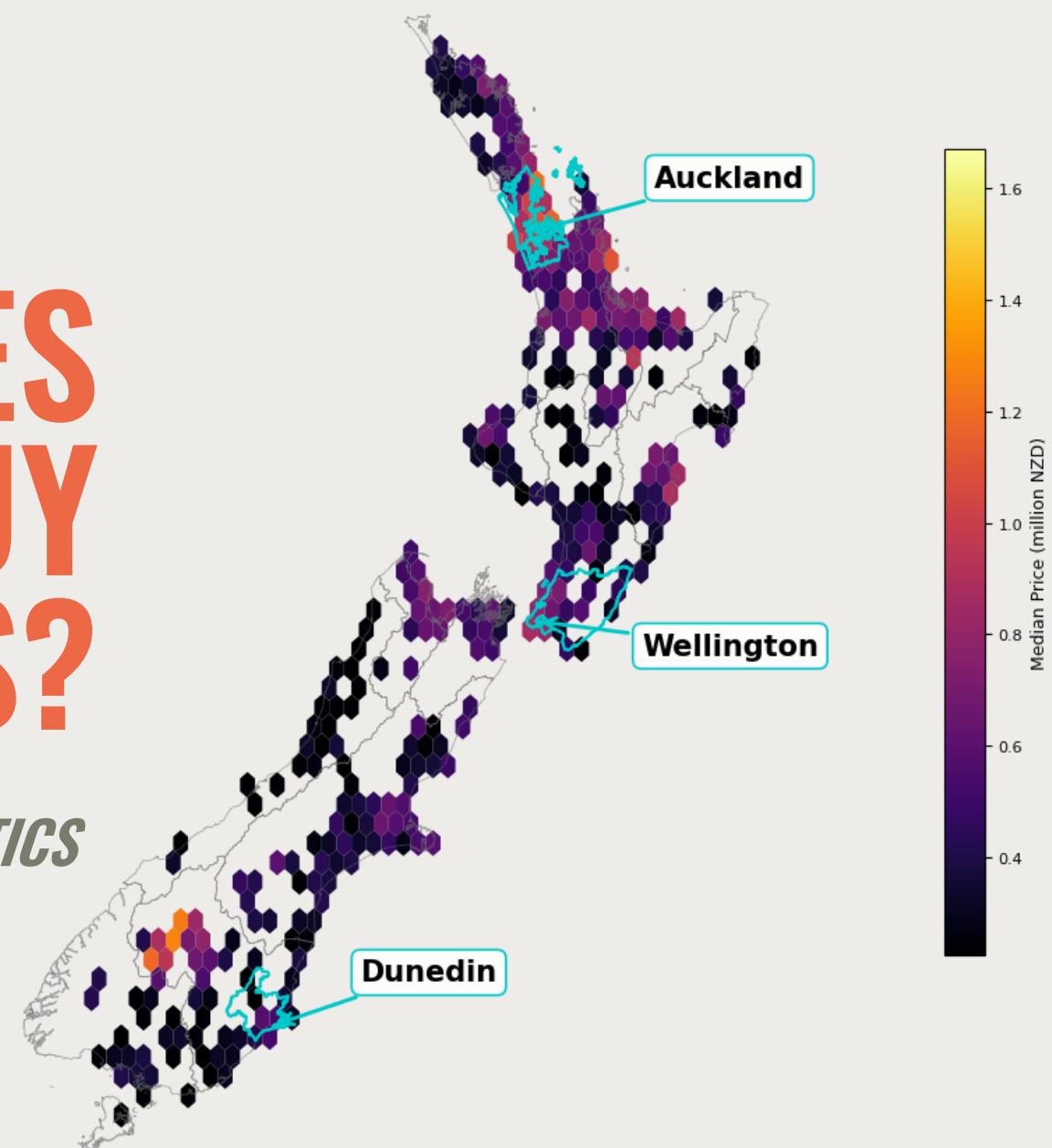
1 % rise in interest rate →
1.41 % fall in unit price.



**Significant but small effect
— best to buy when rates fall.**

WHAT DOES \$780K BUY ACROSS CITIES?

TYPICAL HOME CHARACTERISTICS



WHY 780K? – A REALISTIC FIRST-HOME BUDGET

LOAN = 6 x INCOME = \$130K ANNUAL HOUSEHOLD INCOME REQUIRED

  Two Graduate Engineers ($2 \times 65\text{ K}$)

  1½ Mid-Level Engineer ($1.5 \times 87\text{K}$)

 One Senior Engineer ($1 \times 130\text{K}$)

TYPICAL HOME FEATURES – K-NEAREST NEIGHBOUR MACHINE LEARNING

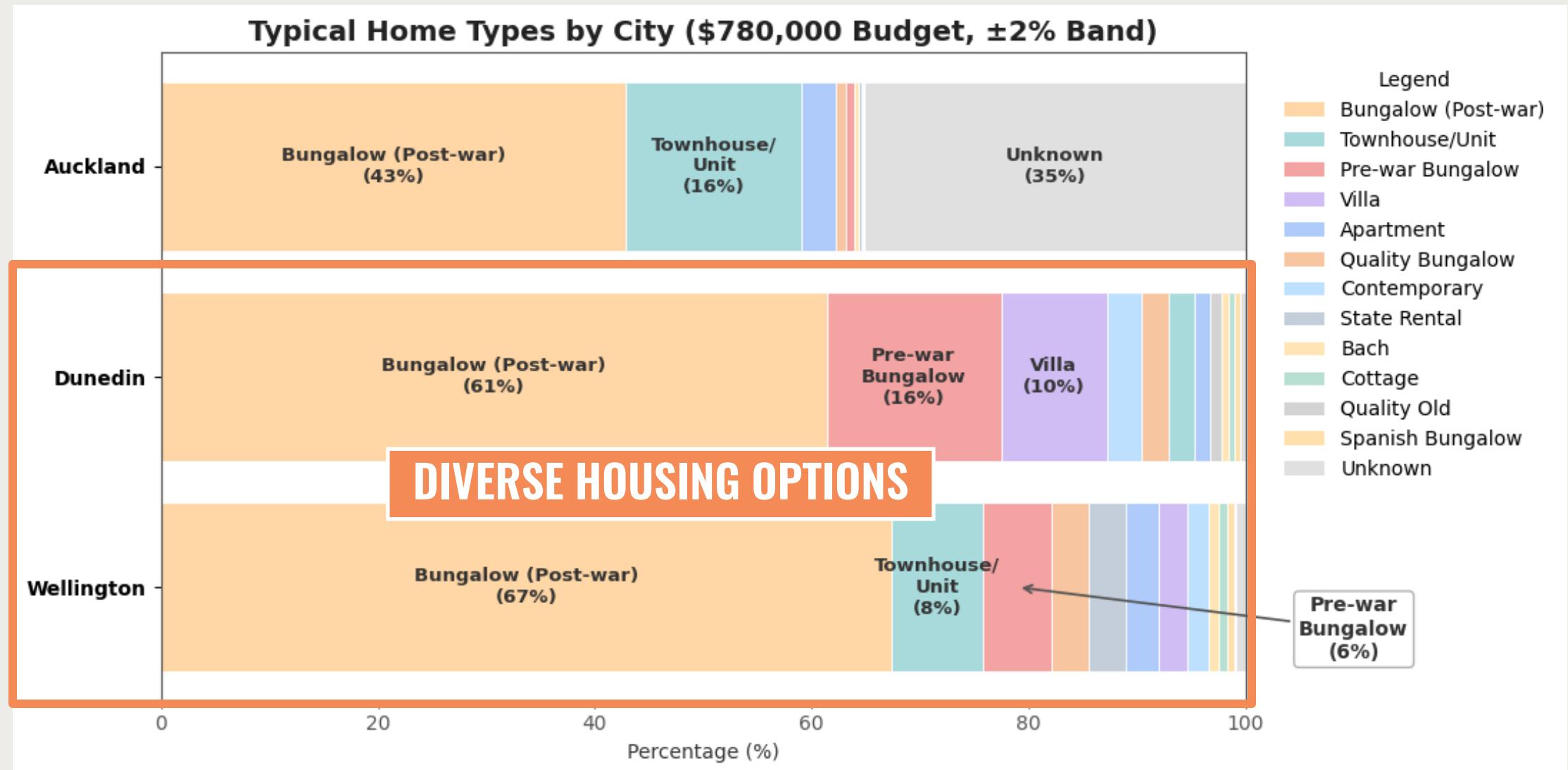
- SAME budget,
DIFFERENT living standard.**
- Time Frame: 2018 – 2024
 - Budget: \$780K \pm 2% price band → Newer, smaller homes →
 - Selection: Top 20% closest → Moderate size →
(min. 100 homes per city)
Largest but older stock →

Table 2. Median Typical Homes with \$780K Budget

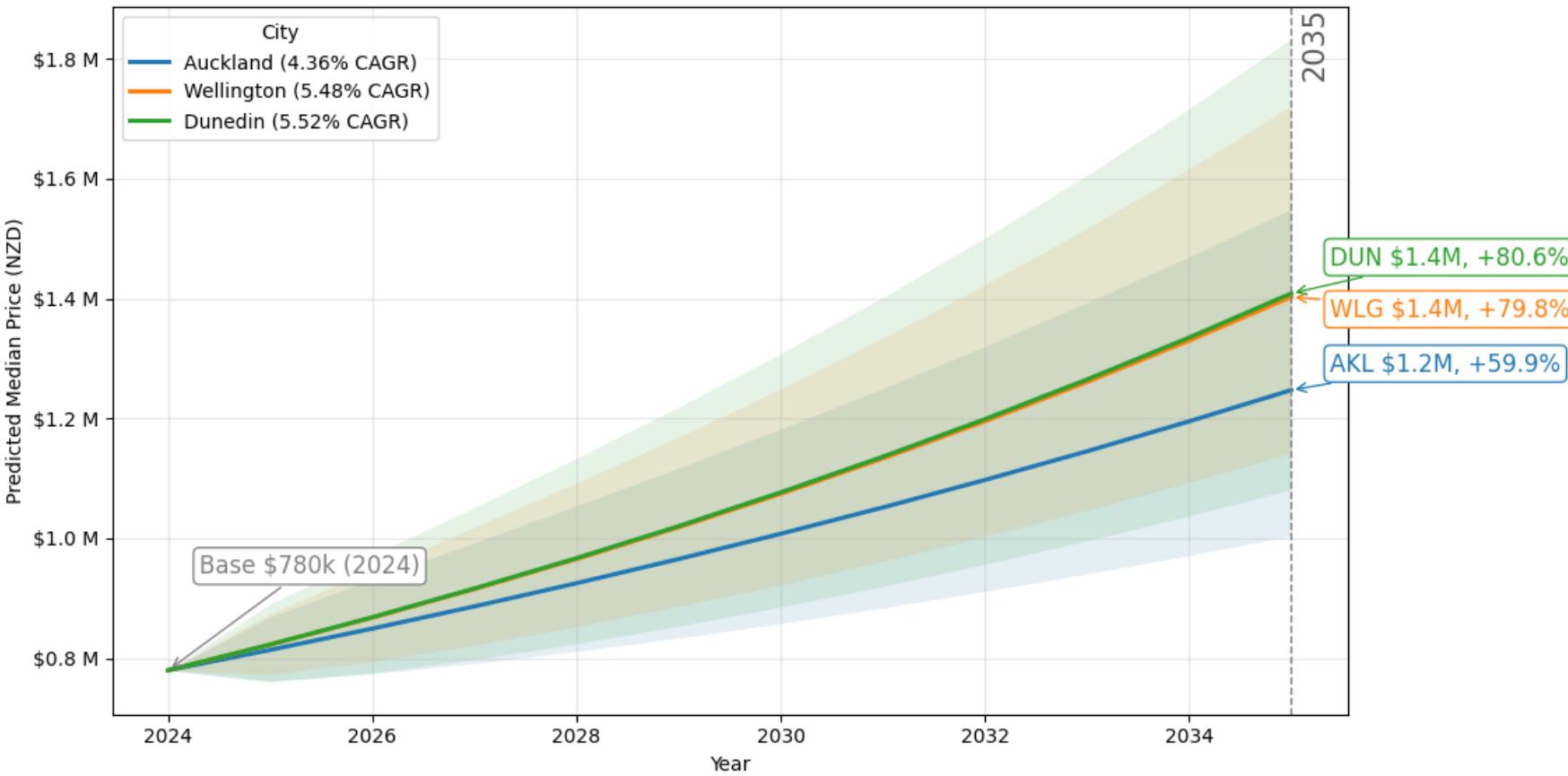
| City | # of Matched Homes | Typical Home | Floor (m ²) | Land (m ²) | Age (yrs) |
|------------|--------------------|----------------|-------------------------|------------------------|-----------|
| Auckland | 5,094 | 3 bed / 1 bath | 92 | 104 | 34 |
| Wellington | 2,709 | 3 bed / 1 bath | 123 | 551 | 48 |
| Dunedin | 399 | 3 bed / 2 bath | 180 | 629 | 54 |

TYPICAL HOMES TYPES

Same budget,
Different lifestyles, maintenance costs &
neighbourhood environments.



Typical Home Price Projection & Volatility Estimate*



WHERE ARE PRICES HEADING IN 10 YEARS?

HOUSE PRICE PROJECTION ACROSS CITIES

COMPOUND ANNUAL GROWTH RATE (CAGR) TREND MODELLING

Filter by Land & Floor Area

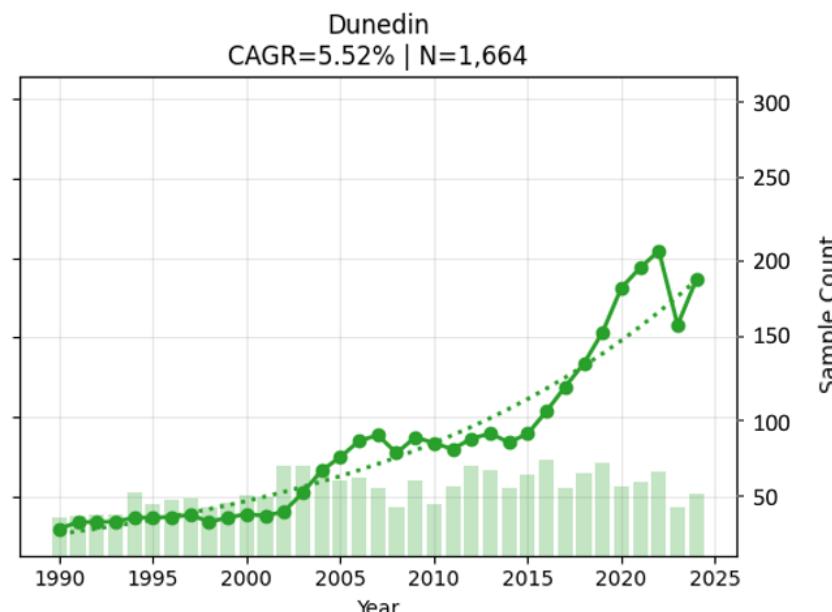
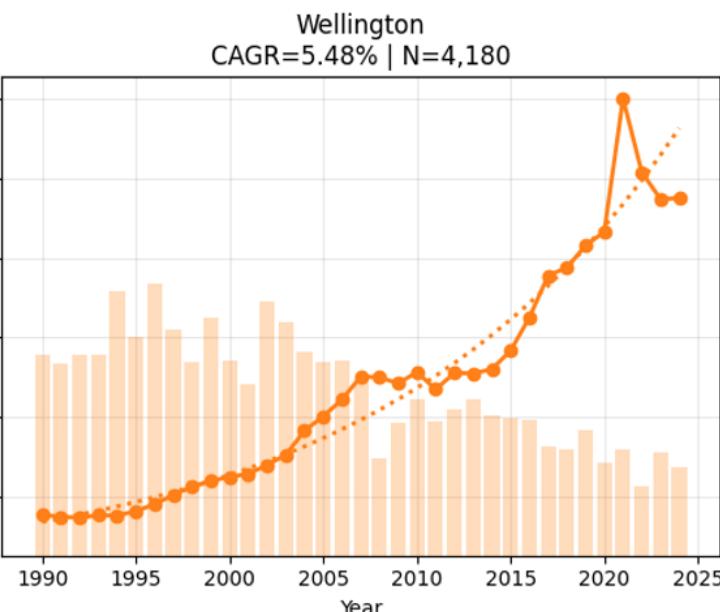
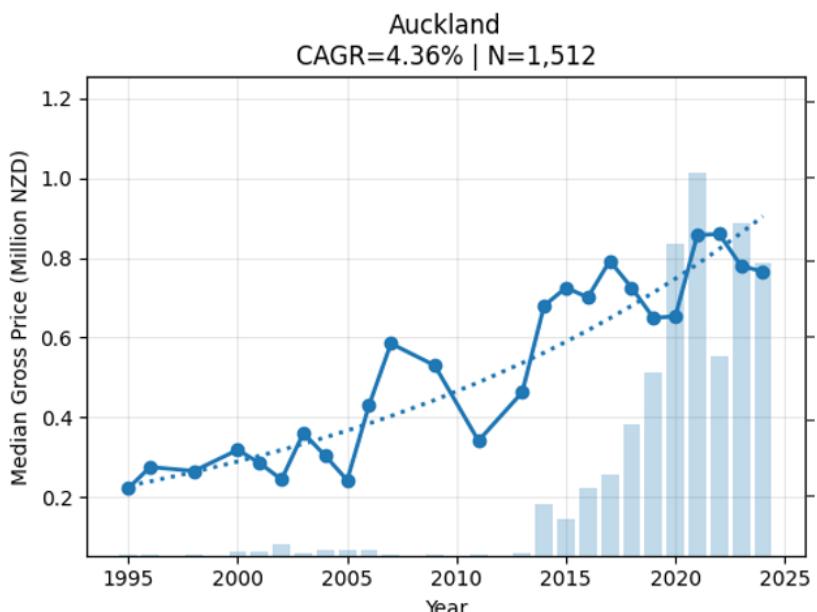
Test with Tolerance

Prediction Method Test

Accuracy Verification

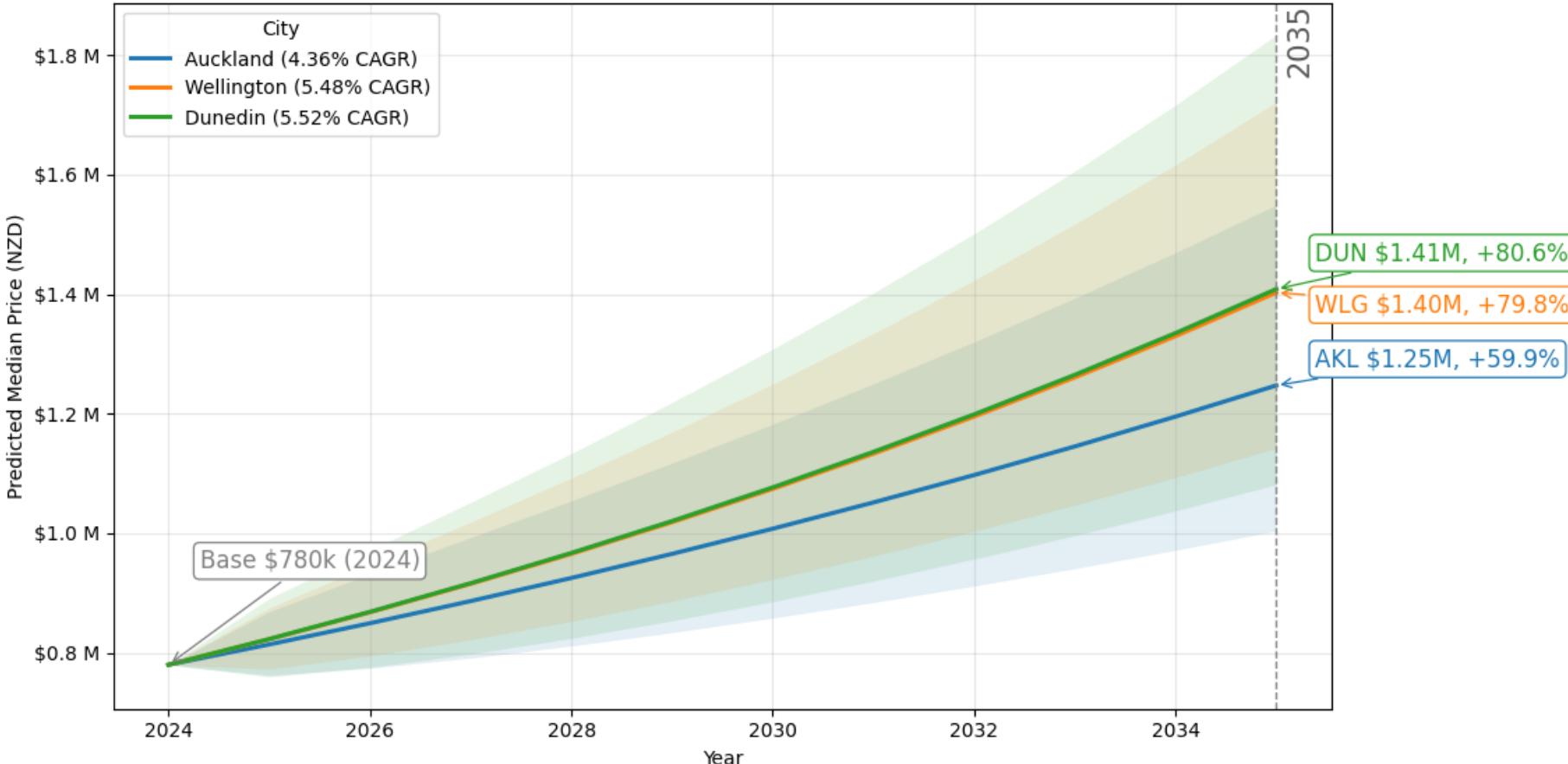
Typical Homes: $\pm 10\%$ Structural Tolerance | City Windows

Bars = Count — Solid = Median Dotted = Log-linear



2035 PROJECTION — GROWTH VS STABILITY

Typical Home Price Projection & Volatility Estimate*



- Dunedin & Wellington: fastest growth but Dunedin more volatile.
- Auckland: slower, steadier trend.

**Big city ≠ big return
— buy smart!**

*Note: Volatility is from annual log returns of city median prices (1995–2024). Bands show historical variability, not forecast uncertainty.

LIMITATION & FUTURE POTENTIAL

Limitations

- Auckland trend mainly based on post-2014 data
- Only 3 cities analysed
- Median hides local variation

Potentials

- Apply model nationwide or to smaller regions
- Test with other price range
- Add factors like school zone, material type, house conditions etc.



Practical application:
*What if this model became a
TradeMe Property feature?*

CONCLUSION & RECOMMENDATIONS

- Interest-rate changes affect prices only **slightly** ($\approx -1.4\%$)
- **For buyers: If it's not essential, wait until rates drop — prices won't rise as much as expected.**
- Same budget = completely different lifestyles (e.g. Dunedin + 90 m² floor / + 500 m² land than Auckland)
- Despite popular belief, Wellington & Dunedin outperformed Auckland in long-term growth with 780k budget.



REFERENCES

Property IQ New Zealand., CoreLogic NZ., and Cotality. *Residential Property Sales Statistics*. Wellington: Property IQ New Zealand, 2010. Web.

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QUESTIONS?



THANK YOU

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