Percentage Change in Prices

Jiarui, Weixuan, Elsia, Haris, Shi Wei

I. INTRODUCTION

The Singapore public-housing market has undergone pronounced shifts from 2020 to 2024, driven by demographic trends such as population ageing, household "rightsizing," and policy changes like the rollout of the 2-Room Flexi Scheme. Our project builds on a Straits Times graphic (STRAITS TIMES GRAPHICS, 2025) that maps the **percentage change in HDB resale prices by flat type** over this period. While that original visualization adeptly highlights the surge in small-flat prices, it omits context on transaction volumes, orders categories counter-intuitively, and relies on a uniform grey palette (with minimal accenting) that obscures meaningful above-/below-average patterns.

We set out to reconstruct and enhance this chart in R, creating a **publication-ready bar chart** that:

1. Orders flat types by descending price growth
2. Uses a diverging/single-accent palette to spotlight key deviations from the mean
3. Directly labels every bar with its exact percentage and average annual deals
4. Anchors the narrative with a clear mean-change reference line
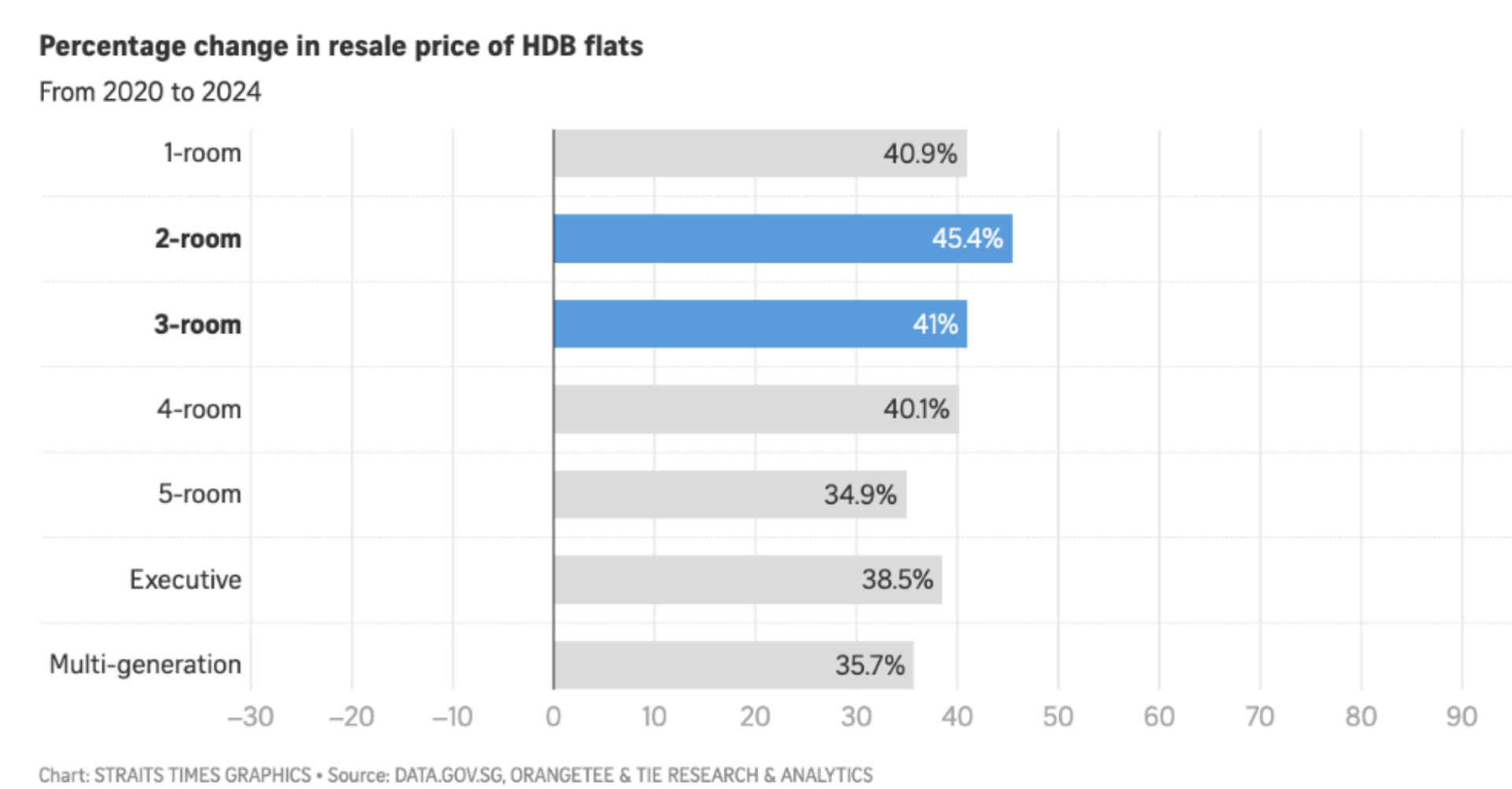
II. ORIGINAL VISUALISATION

Figure 1: Percentage Change in Resale Price of HDB flats

Figure 1: Original Visualization

- Flat types: Seven categories from 1-room up to Multi-generation
- Horizontal bars: Length proportional to percent change; 2-room (45.4 %) and 3-room (41 %) highlighted in blue as the highest-growth segments
- Baseline marker: Vertical zero line to distinguish growth from decline (although all segments appreciated)
- Annotations: Exact percentages labelled at bar ends for quick value retrieval
- Color scheme: Grey for most categories, blue for top two to draw attention
- Source & Credits: Chart: STRAITS TIMES GRAPHICS • Source: DATA.GOV.SG, ORANGETEE & TIE RESEARCH & ANALYTICS

III. CRITICAL ASSESSMENT OF THE ORIGINAL VISUALIZATION

1. **Unordered Categories**
   Flat types appear in an arbitrary sequence, forcing readers to search for the top and bottom performers rather than seeing them at a glance.

2. **Uniform Grey Bars**
   Except for two blue bars, all categories share the same grey, making it hard to discern above- vs. below-average growth.

3. **Lack of Volume Context**
   Percentage changes can be misleading when based on very few transactions (e.g. 1-Room). No indication of deal counts appears.

4. **Clipped & Inconsistent Labels**
   Some annotations overlap the mean-line or the frame, and small-change bars carry labels that are too close to the axis cut-off.

5. **Static, Print-Focused**
   No interactive features to reveal exact values, drill into regional breakdowns, or display uncertainty around medians.

i. Weaknesses

1. *Lack of Temporal Granularity*
   Aggregating from 2020–2024 hides year-by-year or quarter-by-quarter volatility.

2. *No Geographic Context*
   Performance may vary by estate or region; this chart treats all transactions as homogeneous.

3. *Missing Transaction Volume*
   Percentage change alone masks the underlying trade volume, which influences interpretation.

4. *Accessibility Concerns*
   The blue/grey palette may challenge viewers with color-vision deficiencies; no alternative encoding is provided.

5. *Bland Colors*
   Only two color palettes being grey and blue which makes the graph look extremely bland.

IV. SUGGESTED IMPROVEMENTS

1. **Descending Bar Order**
   Reorder flat types by `pct_change` so the largest growth tops the chart.

2. **Single-Accent Highlight**
   Render all bars in light grey, with **2-ROOM** in a bold red—drawing immediate attention to the strongest gainer.

3. **Diverging Palette (Optional)**
   For a richer narrative, use a blue–grey–red gradient centered at the mean change (~39%) to show who outperformed or underperformed.

4. **Direct Labels & Consistent Placement**
   Place every `%` change label to the right of its bar, with a consistent nudge (e.g. 2 pts) and uniform font & color, avoiding overlap.

5. **Annotate Average Annual Deals**
   Show "Avg deals: XXX" beneath each bar in muted grey, so readers immediately gauge sample robustness.

6. **Mean Reference Line**
   Add a dashed vertical line at the overall mean % change, with its value stated in the subtitle for clarity.

7. **Academic Typography & Alignment**
   Left-justify the title, subtitle, and caption using `plot.title.position = "plot"` and `hjust = 0`, adopt sentence case, and set a clear size hierarchy.

V. IMPLEMENTATION FOR THE BAR GRAPH

1) *Data Sources:*

- **Weekly population counts by planning area**
  Obtained from the Singapore Department of Statistics.
  - Each record includes: week identifier, planning area name, total population, and age-group breakdowns.
- **Planning-area boundaries (Master Plan 2019)**
  Downloaded as a KML from the Urban Redevelopment Authority (URA).
  - Provides precise polygons for all 55 planning areas.

2) *Software:*

- **dplyr** — data manipulation (filtering, grouping, summarizing)
- **sf** — import and handle spatial (KML) data as simple features
- **leaflet** — render interactive choropleth maps in R
- **shiny** — build an interactive web dashboard for exploration

VI. IMPROVED VISUALISATION
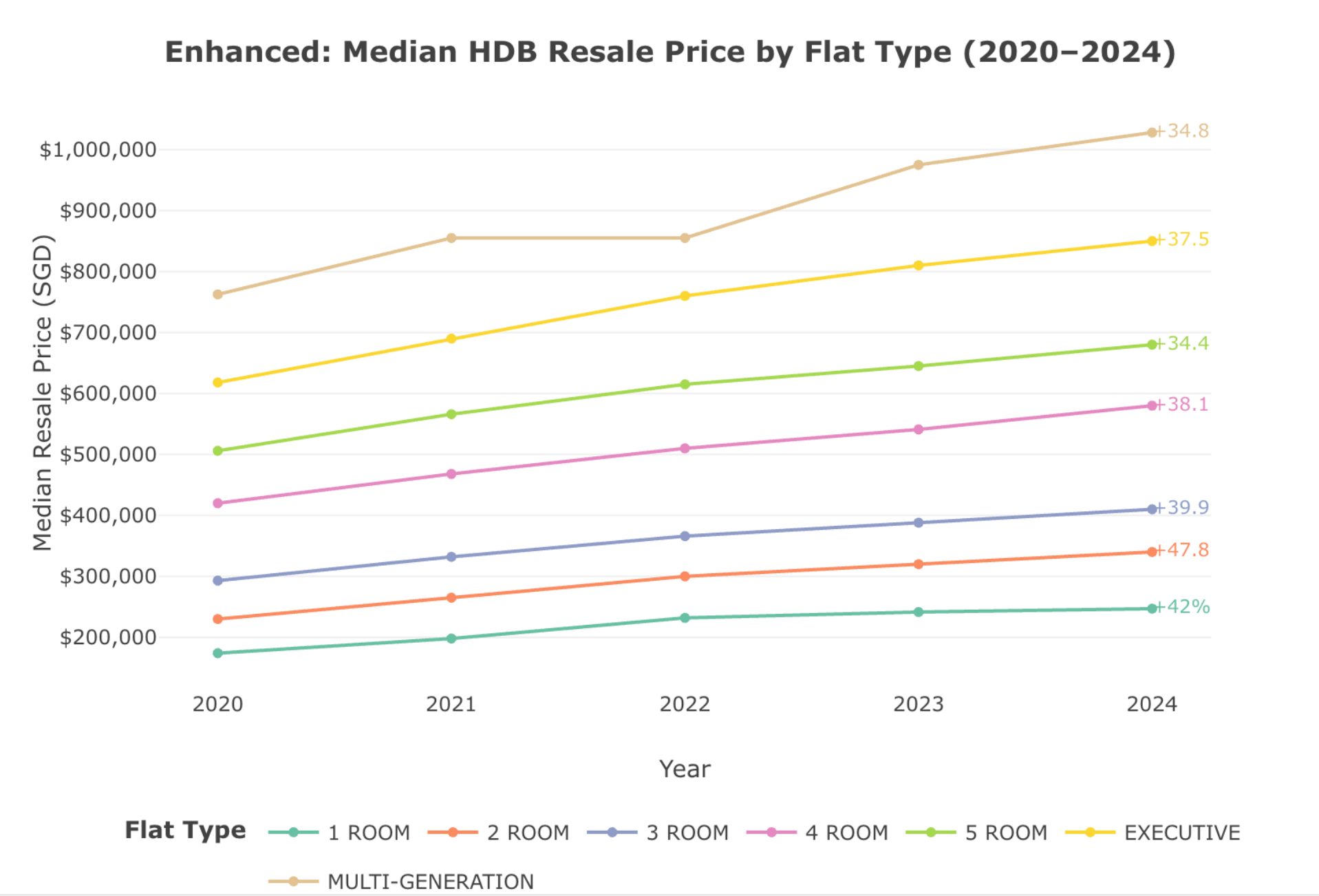
1. *Improved Temporal Granularity*
   Plotting x axis with years grants temporal granularity and insights to specific year.

2. *No Geographic Context*
   Performance may vary by estate or region; this chart treats all transactions as homogeneous. -we dont answer this (chloroplerth map)

3. *Missing Transaction Volume*
   Percentage change alone masks the underlying trade volume, which influences interpretation. -We dont answer this

4. *Accessibility Concerns Addressed*
   Better contrast: Utilize high-contrast colors to improve accessibility for users with visual-impairments, ensuring clarity and ease of interpretation for all users. One such example is the use of Color Universal Design (CUD) colors which are designed to be distinguishable by all users, including those with color vision deficiencies. (Okabe and Ito 2008).

5. *Variety Colors*
   Added a variety of color palettes to increase readability and improve visual appeal.

VII. FURTHER SUGGESTIONS FOR INTERACTIVITY

VIII. Conclusion

IX. References

- STRAITS TIMES GRAPHICS. (2025, May 20). Older buyers, smaller households among factors driving demand for smaller flats [Bar chart]. The Straits Times.
- DataGov.SG. (n.d.). HDB Resale Flat Prices [Data set]. https://data.gov.sg/dataset/hdb-resale-flat-prices