

Advanced Data Analysis of Household Income Distribution in Australia

MIS609 – Data Management and Analytics\77

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Project Overview

Purpose

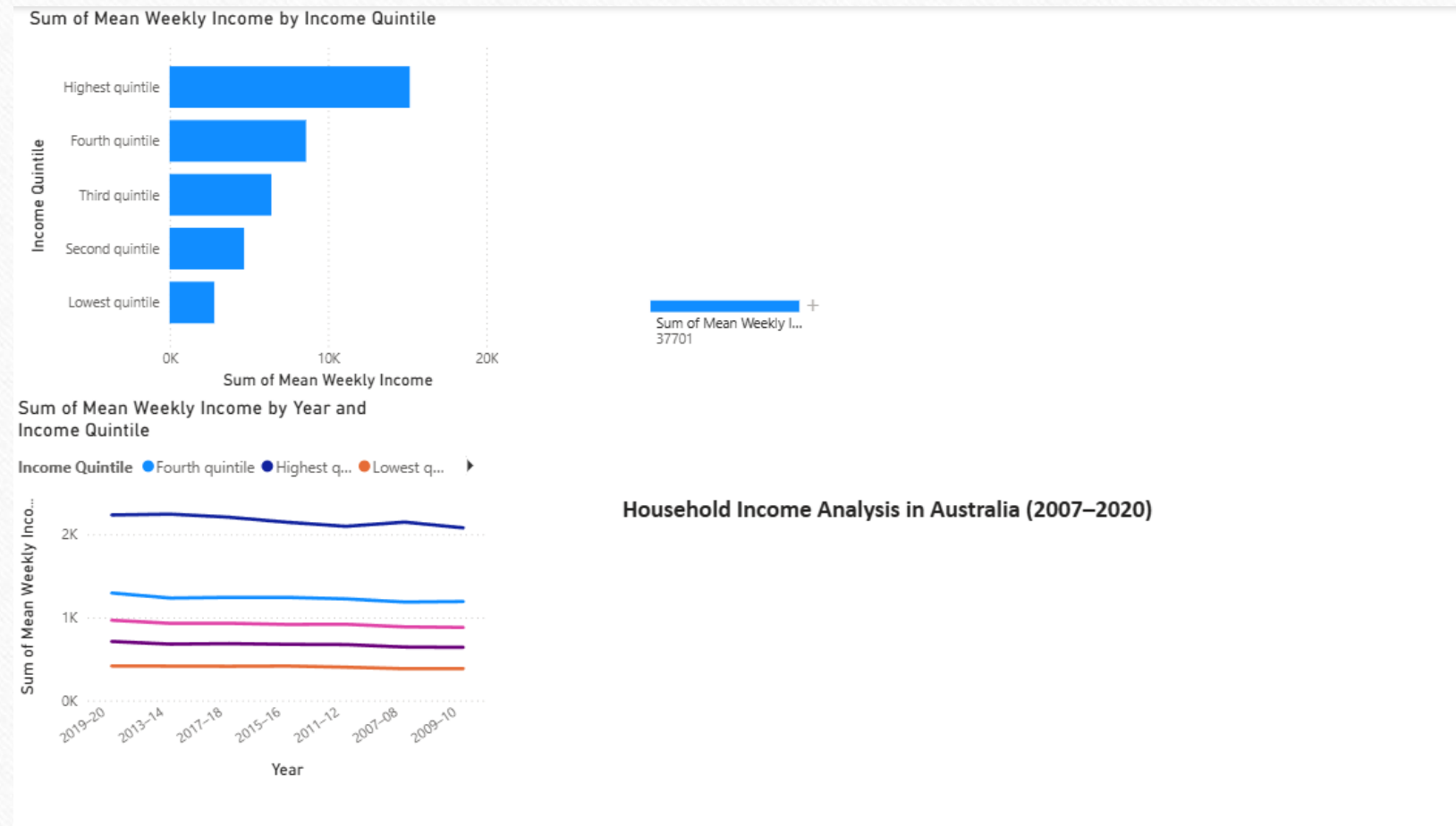
We will analyze the distribution of Australian household incomes, note trends, forecast future income changes and provide suggestions for economic policy.

Dataset Source

We will use the Australian Bureau of Statistics (ABS), which delivers reliable data from a national perspective on economic factors and other elements important to society.

Tools Utilized

- We will utilize Microsoft Excel: for preliminary data cleaning, classification and data preparation.
- We will utilize Microsoft Power BI: for the advanced data modelling and visualization component and interactivity in dashboards.



Dataset Description

Time Series Data

The dataset covers the 2007–08 financial year to and including the 2019–20 financial year which allows us to see changes over time.

Income Quintiles

The distribution of income into five equally sized quintiles from the lowest 20% income quintile to the highest income quintile.

Key Metric

We focus on mean weekly equivalized disposable household income, as it is a standardized currency measure.

Data Preparation Process

Data Cleaning

Dealt with missing values, inconsistent entries, and outliers to maintain data integrity.

Column Renaming

Standardized the interpretation of column headers for clarity and consistency across the data set.

Reshaping Data

Transformed the data from a wide to a long format to make further analysis in Power BI and data visualization easy.

Calculated Measures

Created new measures in Power BI, such as income gap calculations, to provide richer analysis.

Investigative Questions

1

Income Trends Over Time

How has the mean weekly income for each quintile changed from 2007–08 to 2019–20?

2

Income Inequality

What is the observed income gap between the highest and lowest quintiles?

3

Quintile Comparisons

How do income levels compare across all five quintiles in the latest available year (2019–20)?

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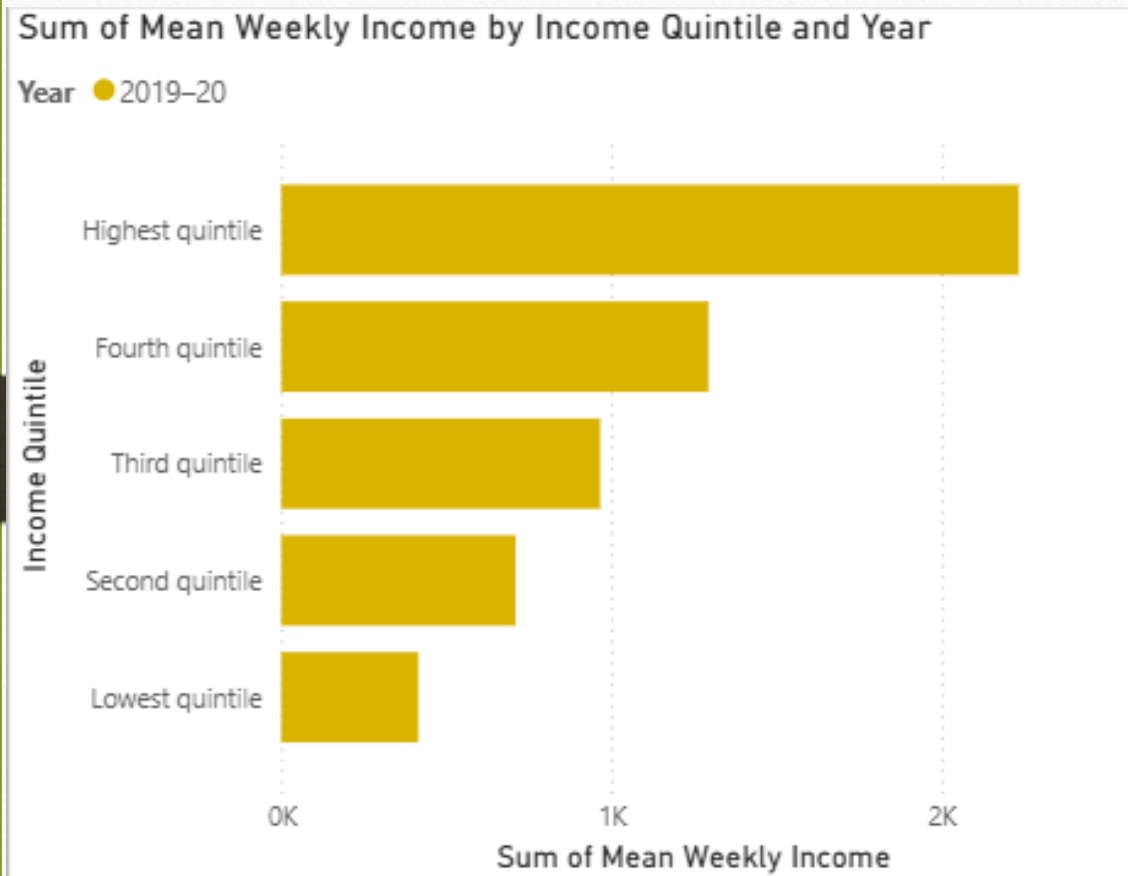
Future Income Projections

Based on historical data, what are the forecasted mean weekly incomes for each quintile?

Income Distribution by Quintile (2019–20)

This bar chart provides an illustration of mean weekly equivalized disposable household income across each quintile for the 2019–20 financial year.

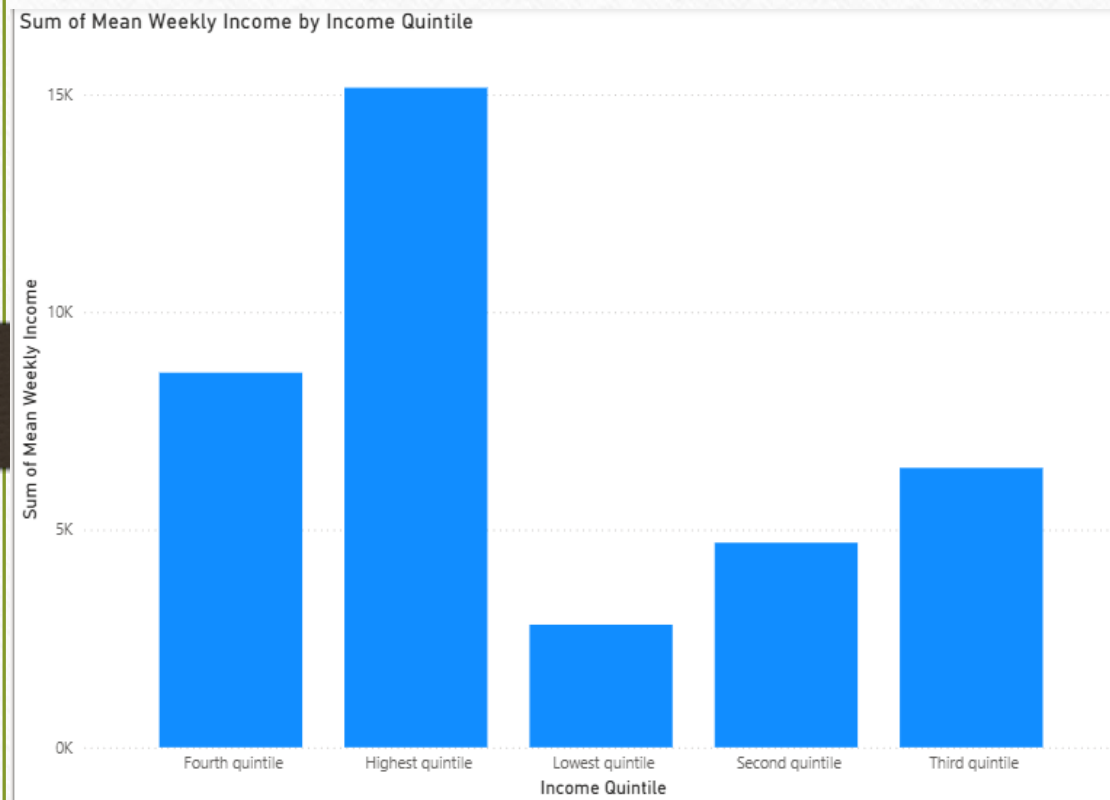
- **Significant Income Gap:** The chart clearly shows a large gap in income inequality between the highest and lowest quintile.

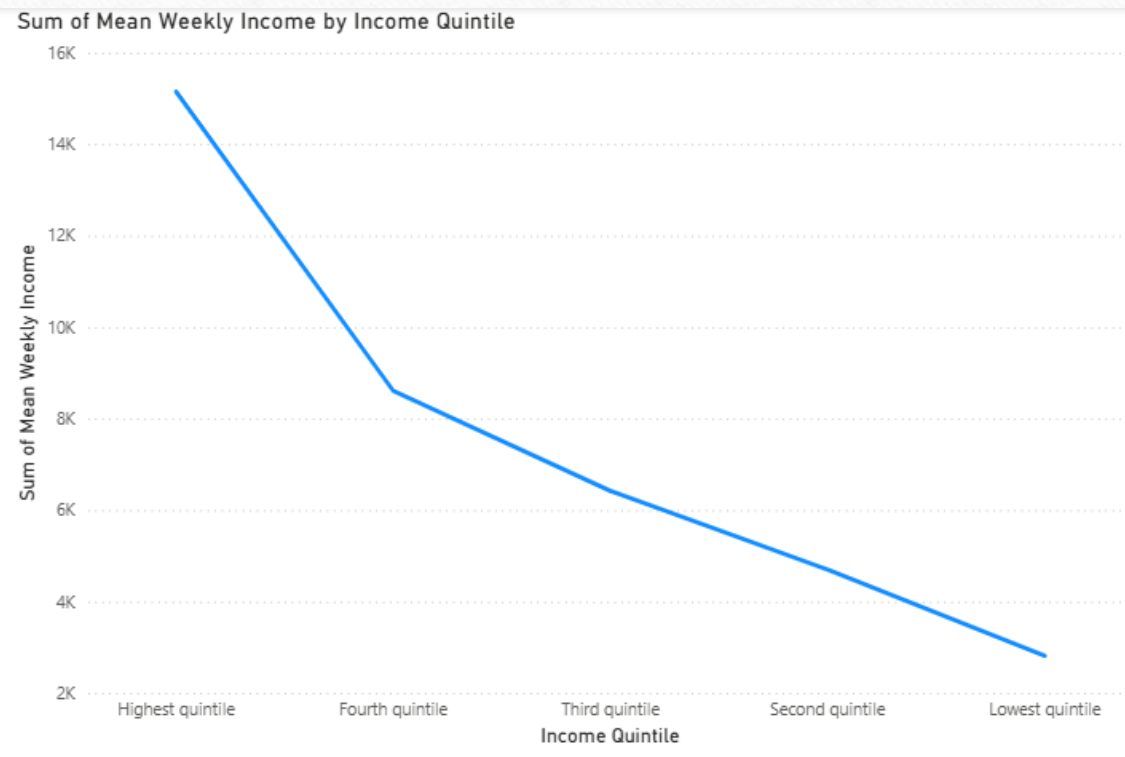


Income Trends Over Time (2007–08 to 2019–20)

This line chart shows the progression of mean weekly equivalized disposable household income for each quintile over time.

- **Widening Gap:** The chart points out that the income gap between the richest households and poorest households has, in all likelihood, been persistent and perhaps even widening over time.





Forecasting Future Income

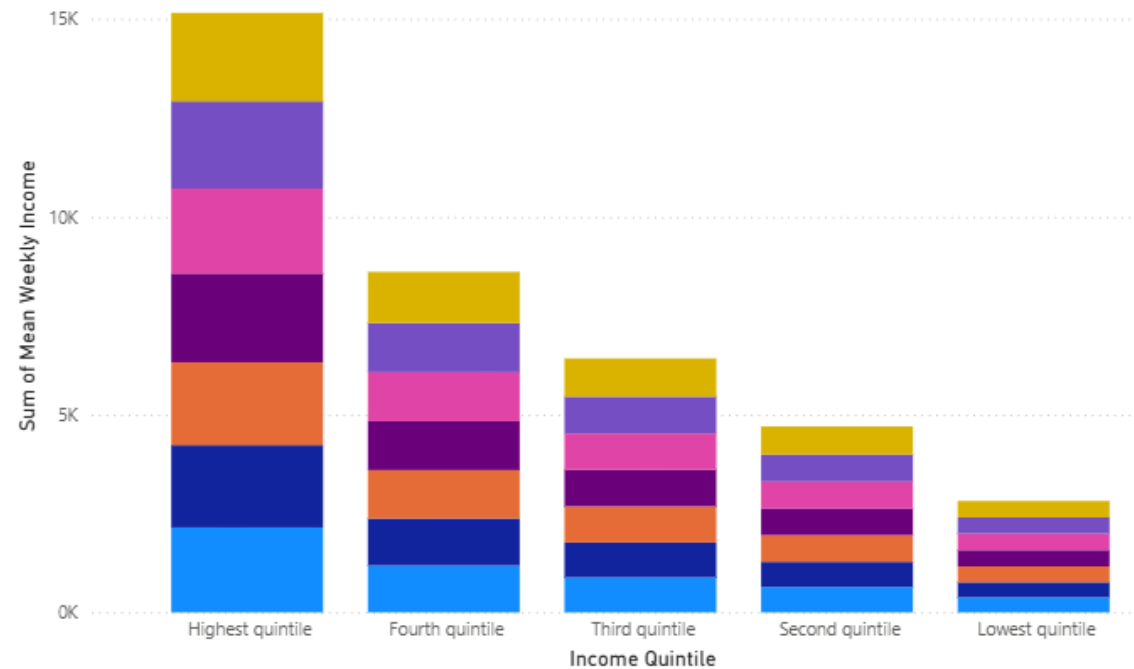
The chart above shows future mean weekly income for each quintile, based on historical trends and forecast modeling.

Projected Increase: The projections indicate a continued increase in mean weekly income across all quintiles, with varying increasing rates for each quintile.

Decomposition Tree Analysis

Sum of Mean Weekly Income by Income Quintile and Year

Year ● 2007-08 ● 2009-10 ● 2011-12 ● 2013-14 ● 2015-16 ● 2017-18 ● 2019-20



Through a drill-down function, the decomposition tree can explore income distribution across dimensions and potential drivers.

- **Drill-Down Insights:** this visual enables detailed exploration of the distribution of income, and allows us to see specific sectors or other factors that would influence income.

Key Findings



Persistent Income Disparity

The analysis shows a significant widening gap in mean weekly income between the richest and poorest quintiles, highlighting that income inequality has widened in Australia.



Overall Income Growth

While it is clear that there are undermining differences, there is a general trend of increasing mean weekly equivalised disposable household income across the quintiles from 2007-08 to 2019-20.



Actionable Insights & Projections

A forecast of the incomes suggests that this is likely to be continuing. Decomposition analysis of the income distribution indicates a more fine-grained understanding about the contributions due to specific variables that have a bearing on incomes. This is useful for informing policy initiatives.

Limitations



Data Limitations

- **Data Scope:** Only uses equivalized disposable income, which doesn't represent total wealth or non-financial benefits.
- **Granularity:** Yearly financial year information may miss fluctuations over short terms or events impacting income in that time.
- **Demographic Information:** No geographic breakdowns, meanings age, education, industry can be used to explore the drivers of income.

2

Forecasting Limitations

- **Assumptions:** Future forecasts use historical trends. It is assumed it persists similar trends which may not be true as a consequence of changes in economic conditions.
- **External Factors:** Predictive models may not fully model the impact of unexpected external - economic shocks, changes to governing policies or global events.
- **Model Simplicity:** Simpler models may miss the complex and multi-dimensional and non-linear relationship in income behaviour which may limit validity.

Group Work Distribution



Member 1

Focused on foundational data processes and comprehensive documentation.

- Data Acquisition & Cleaning
- Statistical Analysis
- Final Report Authoring



Member 2

Responsible for visual insights and presenting the project findings.

- Power BI Dashboard Design
- Presentation Development
- Visual Storytelling

Conclusion

Key Insights Revealed

The analysis revealed a persistent and widening income disparity among Australian households, despite an overall upward trend in mean weekly income across all quintiles from 2007–08 to 2019–20.

Driving Informed Decisions

Data-driven insights are essential for developing targeted economic policies, fostering equitable growth, and understanding the complex dynamics influencing household income distribution.

References

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