Is San Francisco City Still affordable?

Audience

The Audience for this dashboard will be prospective renters who plan on moving to San Francisco City, the “city of dreams”.

Claim

Is San Francisco still a city of dreams with respect to affordability for new comers to the city?

The purpose of this visualization is to analyze the rent changes in San Francisco City with respect to the changes in the household income in order to analyze the affordability of living in the San Francisco City.

Methodology

Data Wrangling

Input Data Sets

1. Comparison of rent of San Francisco City and other Major metro cities in US
2. Petitions to Rent Board by tenants of San Francisco City
3. San Francisco Median Rent over the years (scrapped from multiple sites over the net)

Sources:

1. Major City Rent: https://www.zumper.com/blog/2015/06/zumper-national-rent-report-june-2015/
2. Rent Petitions: https://data.sfgov.org/Housing-and-Buildings/Petitions-to-the-Rent-Board/6swy-cmkq/data
3. http://www.deptofnumbers.com/rent/california/san-francisco/
4. http://www.deptofnumbers.com/income/california/san-francisco/

Tool Used: Python Scripting

The main aim of cleaning up data was to standardize the field names and optimize the input into tableau as a number of columns were not needed and hence were removed during the cleanup.

Specific Cleanup Actions:

Data Set 1: Major_City_Rent_2015

- The Column City in the raw file had comma separated city and state information. In order to be able to filter information based on city or state, the column was split into two columns of city and state.

- Nulls were removed
- Added header names

Data Set 2: Median Income

- Nulls were removed
- Date datatype was changed

Data Set 3: Rent Petitions

- The raw data file had more than 25 columns. For our analysis only 5 columns were needed and hence the unwanted columns were removed during cleanup
- Even after removing columns, we still only wanted specific rows based on whether the petition was related to Rent Increase and hence filtering was done to reduce the input data size.
- From the "Date Filed" column, only the year information was extracted as only year information was needed for our analysis since we were only looking at year over year increase.
- Nulls were removed

Visual Exploration and Validation

Once the data was cleaned up, the three files were uploaded into tableau to perform analysis by comparing and contrasting, identifying patterns and predicting.

In order to get a sense of where San Francisco lies with respect to other major metro cities, a simple bar graph was plotted to compare median 2br bedroom rent for each of these major cities. The graph clearly indicated that San Francisco lies among the top 10 cities.

Parameter:

- Top Cities: A new Parameter was created in order to filter the cities to find out the top 5, 10, 20 ..N cities by rent dynamically. The "Top Cities" parameter will allow to dynamically control the filter in order to see the top cities.

Calculated Field

- Affordability: A new category was created using the calculated field option in order to categorize the metro cities in relation to affordability based on the median 2 Br rent information available. The data was divided into following categories
    - Cheap: For rent < $1000
    - Affordable: For rent > $1000 and < $2000
    - Expensive: For rent > $2000 and < $3000
    - Very Expensive: For rent > $3000 and < $4000
    - Unaffordable: For rent > $4000

Fig: 1

However, only having highest rent does not make San Francisco City un-affordable. A quick comparison of San Francisco median household income against national annual median household income showed that San Francisco has consistently higher income than the national median income. Thus, in order to further assess the affordability, I calculated the percentage of income that is spent on Rent for San Francisco.

Calculated Field:

- Percentage of income spent on Rent: Increase in rent alone cannot be an indicator of affordability as if the corresponding income increases in the same proportion as rent, then despite increase in rent, the city will still be affordable. Thus, to correctly measure the affordability the percentage of income spent on rent is calculated and then analyzed over a period of 10 years from 2005 to 2015 to identify the trend.

The Rise in Rent is not proportional the increase in the income and hence people are spending larger and larger portion of their income on rent.

Fig: 2

In order to assess the dissatisfaction level of current renters in San Francisco City, I analyzed the data from the rent board which records the complaints/petitions made to the Rent Board regarding rent increase. The graph shows a steady increase in number of complaints over the 10-year period from 2005 to 2015 which shows a rising discomfort with the rent increase.

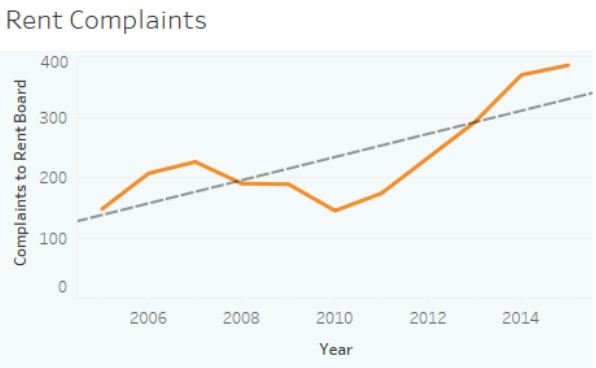

Fig: 3

The last assessment criterion is to estimate the future trend in order to assess the affordability of San Francisco City for future renters who wish to move to the city for better prospects. A forecast of San Francisco annual Median Household Income and Median 2Br Rent over the next 5 years shows a steadily growing gap between the income and rent.

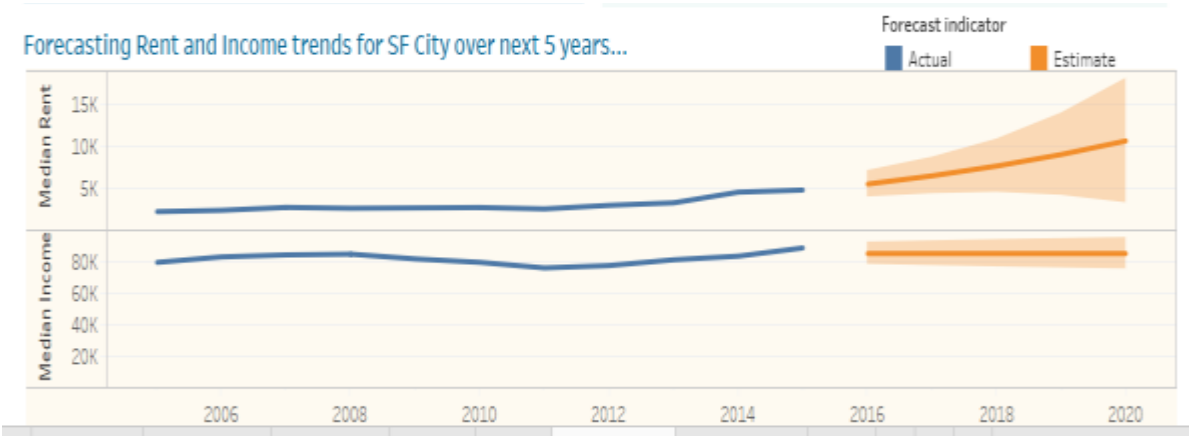

Fig: 4

Conclusion

San Francisco has become prohibitively expensive in terms of renting a home and its shows an continuing upward trend. Even a salary of $100,000 is not enough for a 2Br apartment in SF city, if one doesn't want to cut back on other luxuries in order to be able to afford living in the City. Though there

are a number of other factors such as weather, access to opportunities (SF is world's tech hub) also indirectly contribute while making the decision of moving to the city or not but simply from rent vs income perspective SF City does not make a viable choice until the household income is at least $200000, especially for a family that would prefer 2 bedroom or above.

Project Critique:

1. A better way of comparison would be to get the percentage income spent on rent for other major cities to compare affordability
2. A more detailed comparison of regions within San Francisco city would have added depth to the analysis as there can be huge variations in rent within the city
3. Aesthetically, this visualization is quite simple. It can be made more interactive with better utilization of colors to convey information.
4. The entire analysis is done taking 2Br median Rent. It would be better to include other apartment types such as studio, 1 Br, 3Br in order to give an even more realistic picture.

Note: Due to limited data constraints, time constraints above mentioned aspects were not included in analysis.

Things that I learned in the project…

1. Data Wrangling/Cleanup is one of the most crucial steps in data analysis and visual representation. The probability of having perfect raw data sets that absolutely satisfy all your analytical needs is almost close to zero. Hence, in order to save precious hours trying to make sense of dirty data, it is always a good idea to spend some time initially cleaning data before loading into any visualization tool for analysis.
2. Too much information and too less information are equally painful outcome of any visualization exercise. While simplicity is better, it is also important to utilize the tool of a "visual representation" to convey all of the relevant and necessary information in an easy to understand way.
3. Data deception can unknowingly creep-in if not enough care is taken while deciding axis values, data range and type of graph or pictorial representation to be used.

References:

https://medium.com/@mccannatron/1979-to-2015-average-rent-in-san-francisco-33aaea22de0e

https://medium.com/@mccannatron/1979-to-2015-average-rent-in-san-francisco-33aaea22de0e

https://www.apartmentlist.com/rentonomics/rent-growth-since-1960/

https://sf.curbed.com/2015/5/29/9955610/breaking-down-sfs-big-annual-rent-increase-by-neighborhood

https://marthabridegam.com/sf-rent-history-chart/

https://www.rentjungle.com/average-rent-in-san-francisco-rent-trends/

https://sf.curbed.com/2017/3/27/15079428/sf-rent-map-march-2017