Boomers, Kiss My Hass!

An Analysis of Avocado Consumption in Relation to Millennial Populations

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Background

Recently, avocados have been specifically tied to the millennial generation, due to its increasing presence in social media and public platforms. While this connection is universally understood, we wanted to look more into whether it could be statistically supported that millenials consume more avocados, even though increased avocado consumption has also caused increased prices of this unique fruit.

Hypothesis

We expect that cities in the United States with a higher population of millenials consume more avocados despite price increases in recent years.

Data

The **avocado consumption** data was compiled by the Hass Avocado Board, and had data regarding price and units consumed from 2016 to 2018 on the city and state level.

Two datasets were used for **demographic** data:

- US Census Bureau, with data regarding population and age per state from 2016-2018
- National Association of Realtors, with data on proportion of millennials in cities across 50 states in 2017.

Methodology

We first focused on the avocado consumption data and the US Census data. We analyzed trends in avocado consumption by aggregating both datasets by **regions** specified by the Hass Avocado board (i.e. Northeast, South Central, Great Lakes, Southeast, West, California, Midsouth, Plains).

Our second analysis focused on consumption on the **city** level, by observing trends in regards to percentage of millennials in each respective city.

Lastly, we observed **price changes** of avocados through the years 2016 to 2018 to see if this played into consumption changes.

Region Level Analysis

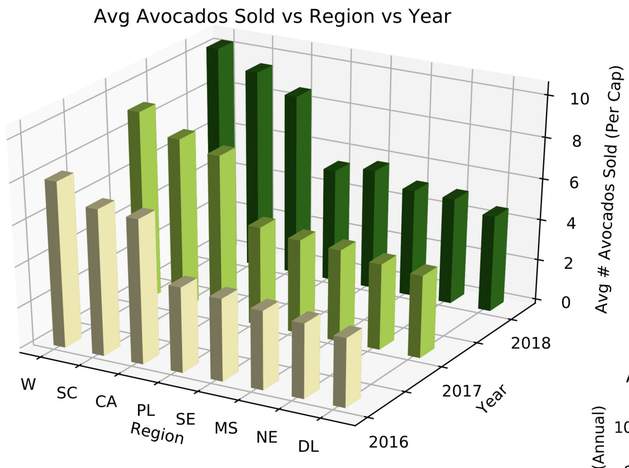

Figure 1. Average avocados sold (per capita) for each region, across years 2016-2018.

We then ran a **panel data regression** with both **entity** and **time fixed effects** using the same dependent variables. This resulted in insignificant correlations:

	Coefficient	P-Value
Percent millennials	-0.940	0.625
Average Unit Price	3.078	0.206

We first ran a **panel data regression** with **entity fixed effects** to find the relationship between consumption and (1) percentages of millenials in a region and (2) the average selling price of avocados. We arrived at the following test statistics, indicating a **significant** negative correlation:

	Coefficient	P-Value
Percent millennials	-6. 74	0.002
Average Unit Price	-3.29	0.000

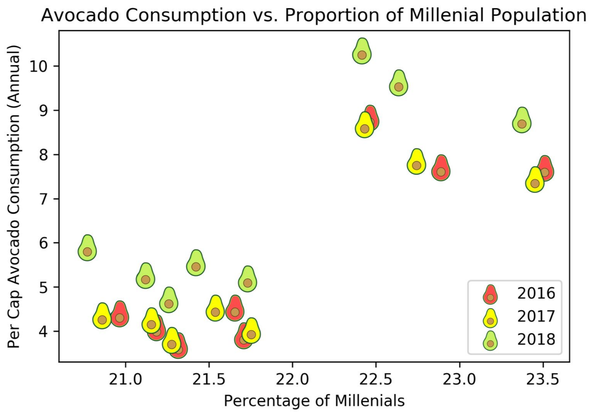

Figure 2. Average avocados sold (per capita, per year) vs. percentage of millenials, across years 2016-2018

City Level Analysis

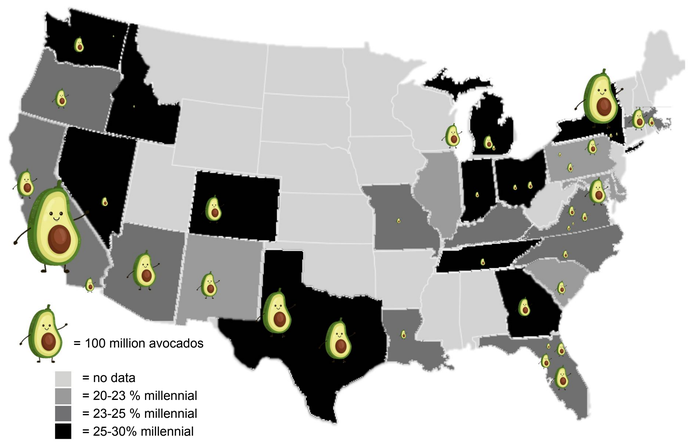

Figure 3. Avocado consumption in 2017 for cities across the US with varying percentages of millennials.

With city-level millennial percentages, we ran a **robust multiple regression** to find the relationship between consumption and (1) percentages of millennials per city and (2) average selling price. We arrived at the following regression results:

	Coefficient	P-Value
Percent millennials	-2.42	0.079
Average Unit Price	-9.23	0.540

This suggests that when we expand our analysis to the city-level, there is **no evidence** to suggest that cities with higher percentages of millennials consume more avocados.

Price Analysis

	Avg Unit Price ($/Avocado)			Annual Percent Change		2-Yr Change
Region	2016	2017	2018	2016-17	2017-18	2016-18
California	1.17	1.34	1.16	14.81%	-13.70%	-0.91%
Great Lakes	1.23	1.42	1.15	15.14%	-18.77%	-6.47%
Midsouth	1.21	1.36	1.18	12.61%	-13.82%	-2.95%
Northeast	1.31	1.49	1.28	14.14%	-14.60%	-2.53%
Plains	1.16	1.35	1.10	16.49%	-18.41%	-4.95%
South Central	0.89	1.01	0.84	12.86%	-16.72%	-6.01%
Southeast	1.16	1.37	1.12	18.93%	-18.81%	-3.45%
West	1.08	1.21	1.08	11.59%	-10.90%	-0.57%

Figure 4. Average Unit Price and Percent Change in Avocado Prices across regions

Our intuition that avocado **prices** have increased in recent years is incorrect. In fact, prices have **decreased** over the studied three-year period, possibly due to larger supplies from growers.

Conclusions

While performing a entity-fixed regression on region-level data showed the possibility of a negative correlation between percentage of millennials and avocado consumption, fixing both time and regional effects showed insignificant correlations. Furthermore, a more in depth analysis of city-level consumption similarly showed insignificant correlations.

However, many factors could affect our findings:

1. All cities in our avocado consumption data set were major cities, causing the general variance of millennial percentages to be extremely low.
2. Since 2016, avocado consumption has increased across regions, regardless of the share of millennials in that region.

Challenges

- Hass Avocado Board only has consumption data on specific cities and states, which didn't always line up with the state-level demographic data.
- Region level data aggregation (in order to overcome the lack of overlap explained above) yielded very few points for analysis.