Analyzing the Relationships Between Population and Organic Agricultural Sales

CHRISTOPHER DE LA ROSA

Background

Big cultural shift in favor of organic agriculture

Expensive, so good sales necessary

Sales figures have grown exceptionally to sustainable levels

Finding predictors for economic health is tricky

Is there a statistically significant correlation between population and total dollar sales, population and total per capita dollar sales, and total dollar sales and total per capita dollar sales?

QUESTION

Hypotheses

H0: No relationship is statistically significant.

H1: One relationship is statistically significant.

H2: Two relationships are statistically significant.

H3: Three relationships are statistically significant.

H2 is expected

More statistically significant relationships = more confidence as predictors

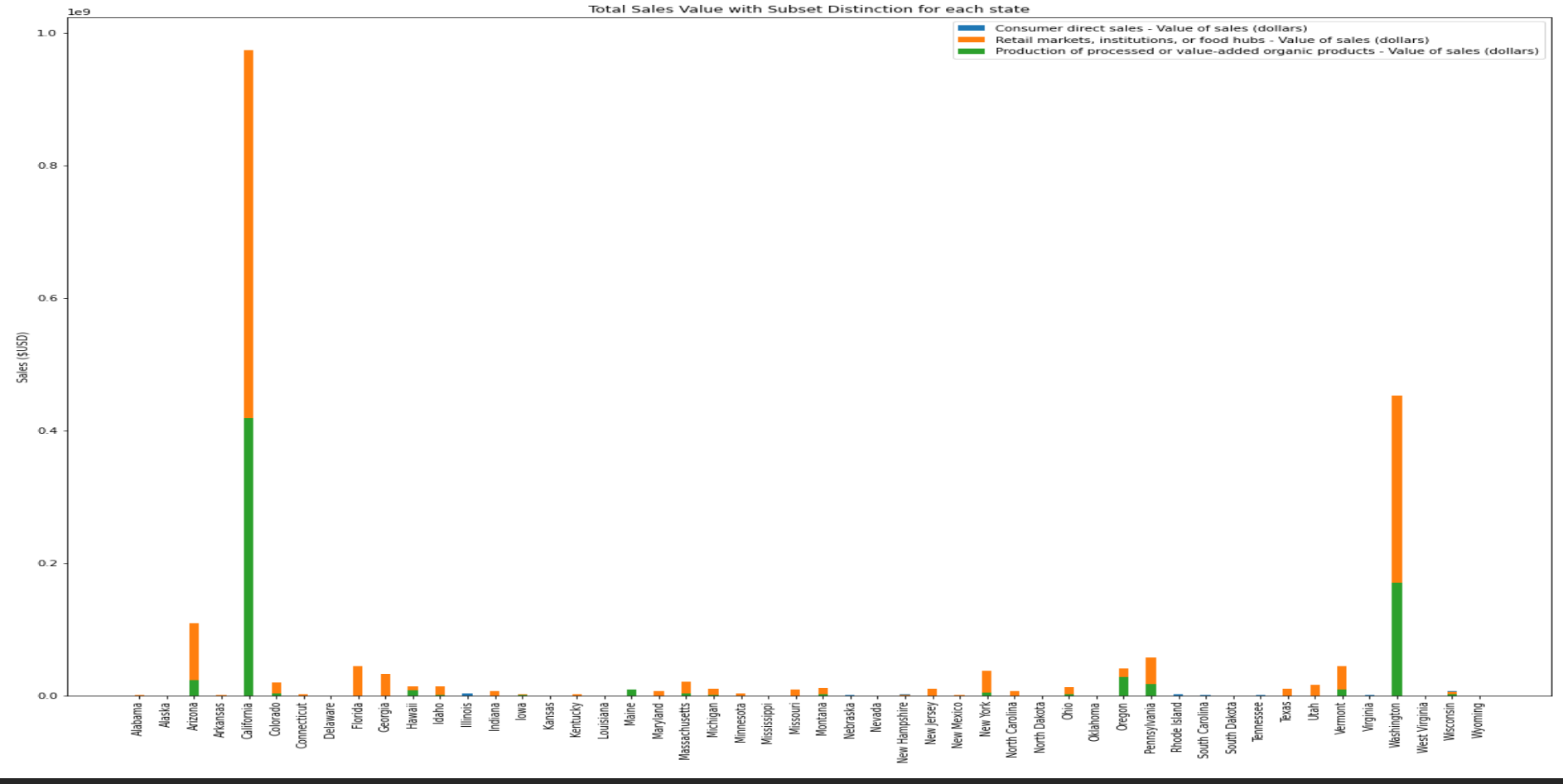
Methodology

Data taken from National Agricultural Statistics Service subdivision of USDA and into DataFrame

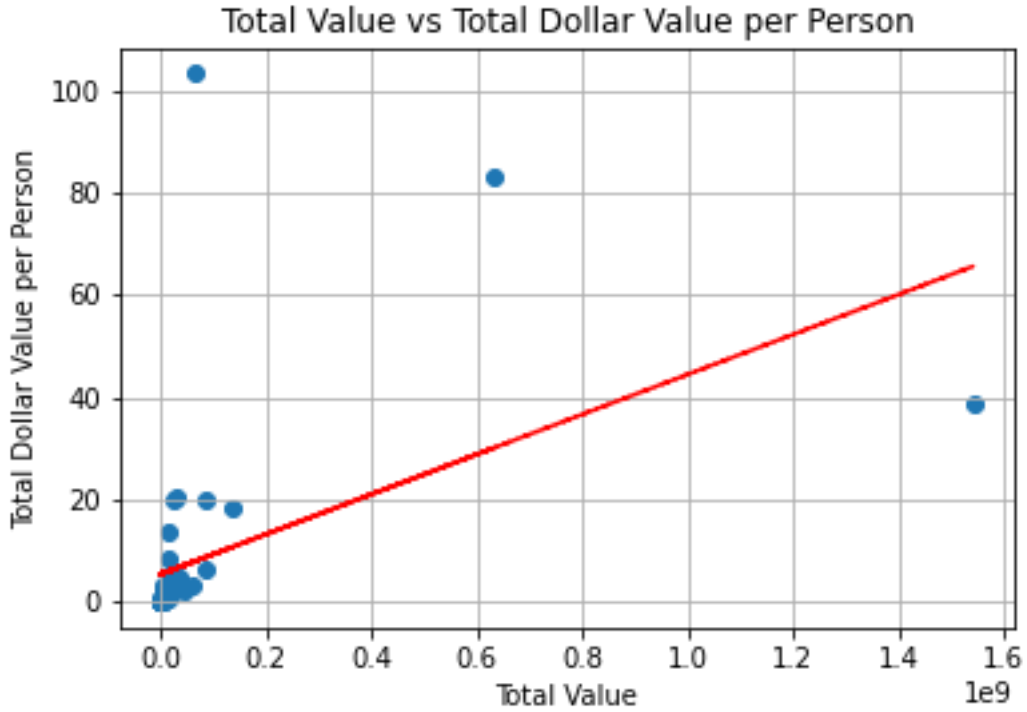
Per capita numbers were calculated for each sales metric

Plotting through matplotlib and regression statistics through scipy

Visualization of Sales



Population vs Total Dollar Sales per capita

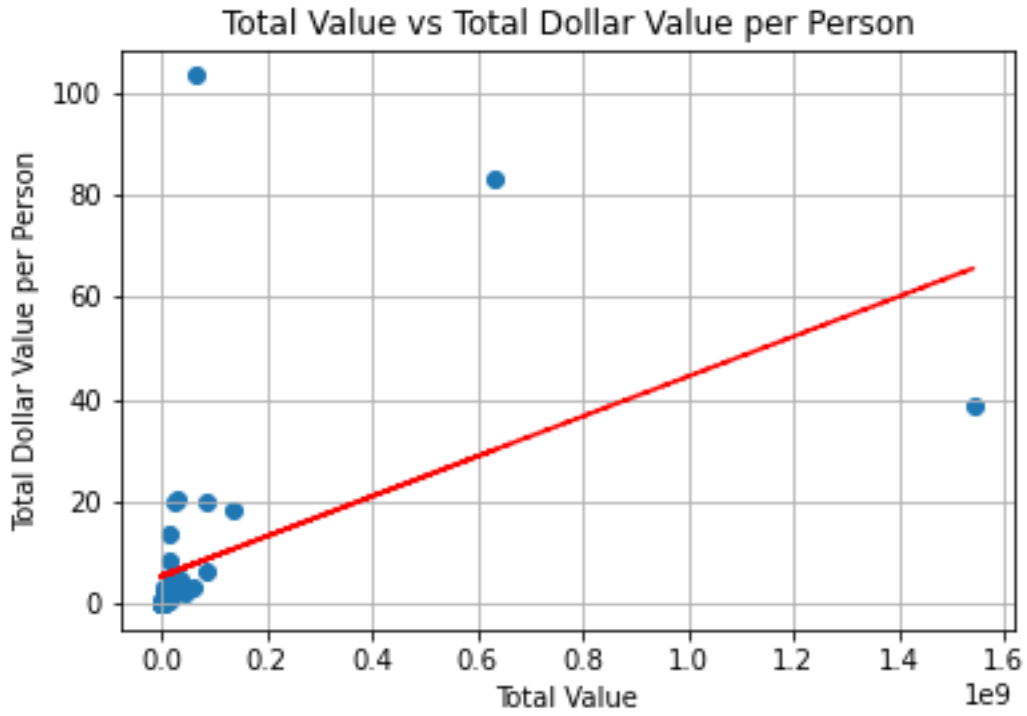


Slope	Intercept	R-Value	P-Value	Std. Error
1.791e-7	6.534	0.069	0.636	3.756e-7

Population vs Total Dollar Sales

Slope	Intercept	R-Value	P-Value	Std. Error
19.802	-69645256.36	0.630	9.574e-7	3.525

Total Dollar Sales vs Total Dollar Sales per capita



Slope	Intercept	R-Value	P-Value	Std. Error
3.916e-8	5.355	0.472	0.001	1.055e-8

Conclusions

H2 is correct hypothesis

There is an extremely loose transitive relationship

Overall idea of project could be good research idea

References

Bialik, K., & Walker, K. (n.d.). Organic farming is on the rise in the U.S. Pew Research Center. Retrieved April 4, 2021, from https://www.pewresearch.org/fact-tank/2019/01/10/organic-farming-is-on-the-rise-in-the-u-s/

Donald W. Lotter. (2003). Organic Agriculture, Journal of Sustainable Agriculture, 21:4, 59-128, DOI: 10.1300/J064v21n04_06

National Agricultural Statistics Service. (2020). 2017 Census of Agriculture - 2019 Organic Survey. United States Department of Agriculture. https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/Organics/ORGANICS.pdf.

Ostapenko R, Herasymenko Y, Nitsenko V, Koliadenko S, Balezentis T, Streimikiene D. Analysis of Production and Sales of Organic Products in Ukrainian Agricultural Enterprises. Sustainability. 2020; 12(8):3416. https://doi.org/10.3390/su12083416

United States Census Bureau. (2019). QuickFacts Population Estimates, July 1, 2019 (V2019). https://www.census.gov/quickfacts/geo/chart/US/PST045219.

Willer, E. H., & Lernoud, J. (2019). The World of Organic Agriculture Statistics and Emerging Trends 2019. 351.