# Targeting the Truth:
# A Look Inside Everyday Pricing

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## Introduction

- People rely on chain stores for necessities like food, home items, and electronics.
- Target offers multiple locations in each state with these diverse offerings.
- So, how do factors like location (regionally, division, state, urban, suburban, or rural), rent prices, unemployment, distance to distribution centers, and population impact Target's pricing strategies?

## Methods

| Data Sources | Explanation |
|---|---|
| Target | Bananas, milk, eggs, cotton swab, diapers, gum, shampoo, t-shirt, toilet paper, vegetable oil, location, and AirPods |
| Rentdata.org | Studio, one bedroom, two-bedroom, three-bedroom, four bedroom |
| census.gov | Area type, population, unemployment rate, division, region, median income |
| Target warehouse | Target warehouse locations (coordinates) |

Data cleaning:

- Appended regional data together.
- Reshape data by pivoting for a tidy dataset.
- Made zip code id.
- Changed data types of certain columns.

Modelling:

- Separate linear regression models for each product to account for different factors influencing the price of different items.

## Exploratory Data Analysis (EDA):



Figure 1: Average Price of Each Product by Division and Area Type



Figure 2: Target Locations
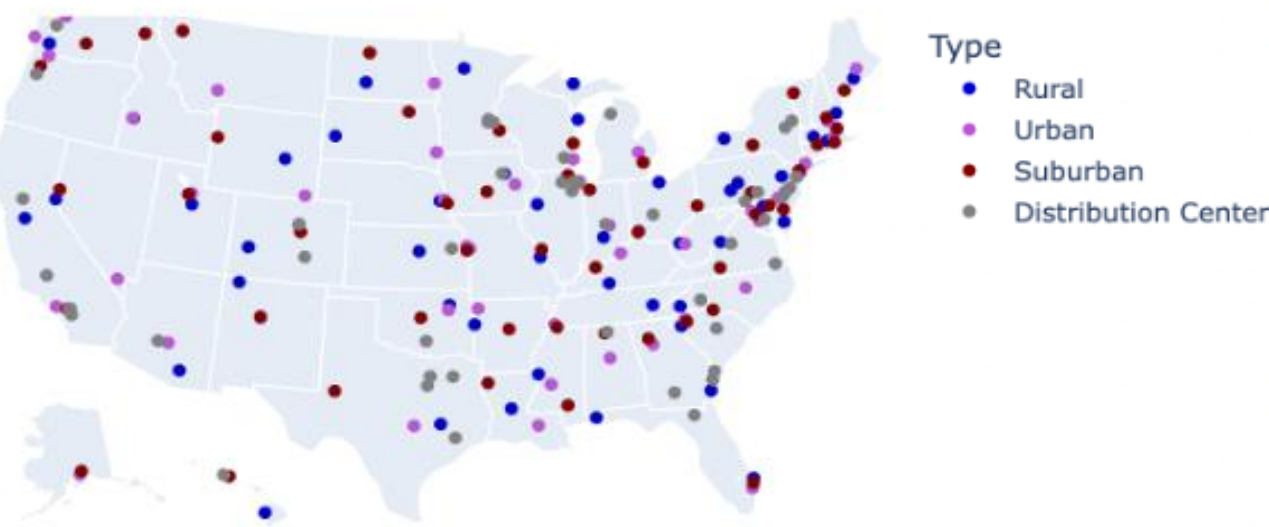


Figure 3: Average Price of Total Basket Cost Divided by Median Income

Table 1: Linear Regression for Eggs
```
---Model for Eggs---
Mean Squared Error: 1.6270600572744982
Coefficients for Eggs:
        AirPods: 1.532826539246128e-16
        Bananas: 0.08277214893351535
        Cotton Swabs: 4.824162599302175
        Diapers: -1.9001109276759995e-13
        Gum: -2.627184271580116
        Milk: 0.06660883158577466
        Shampoo: -11.627319596327679
        T-Shirt: -1.1069599555418223e-12
        Toilet Paper: -4.436078320678079
        Vegetable Oil: 5.808587559739131
        Closest Distro Center: 0.0005414296731119136
        Unemployment Rate: -0.04378448339779112
        Median Income: 9.917512335589606e-07
        Population: 6.327253596911596e-06
        Rent: -0.00010204723514285116
```



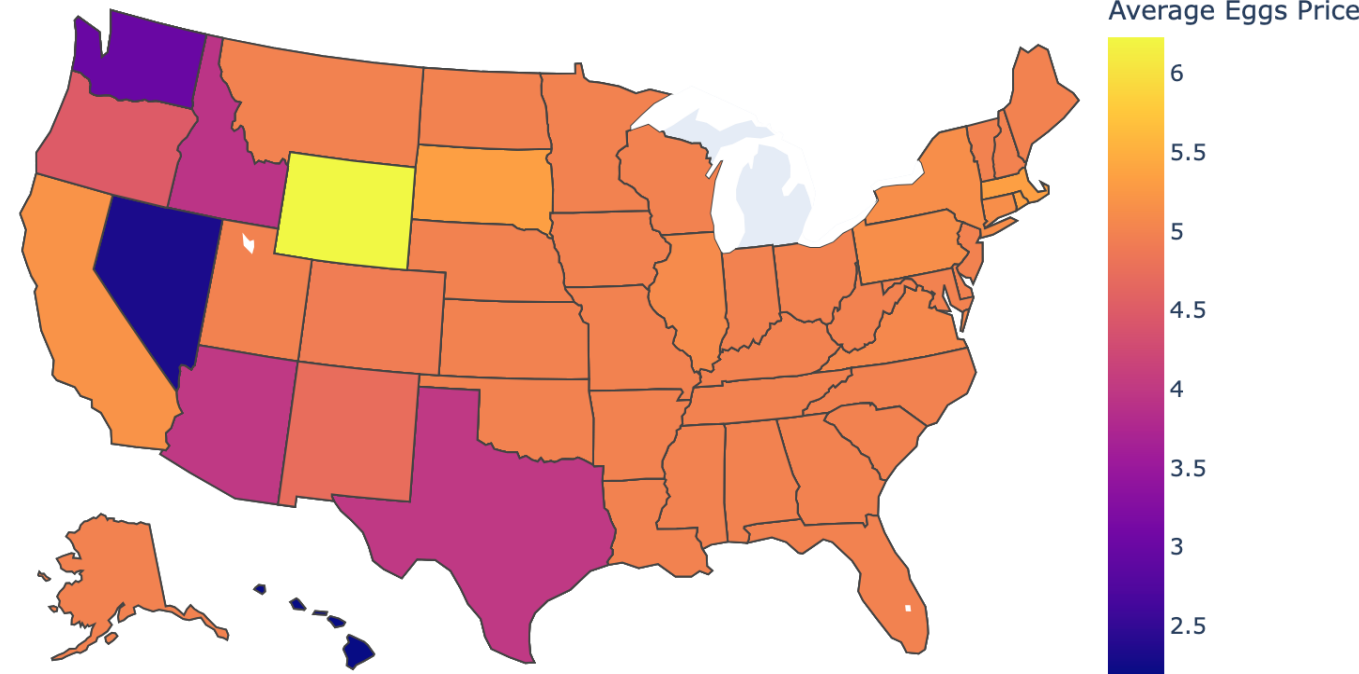Figure 4: Linear Regression Eggs Cost vs. Unemployment Rate



Figure 6: Average Egg Price by State

Table 2: Linear Regression for Milk
```
---Model for Milk---
Mean Squared Error: 0.5878724375011005
Coefficients for Milk:
        AirPods: -1.0261144950465525e-17
        Bananas: 0.4871364434570816
        Cotton Swabs: -3.8766287179438064
        Diapers: 5.182975838193537e-13
        Eggs: -0.0447716770046048
        Gum: -2.718313033732925
        Shampoo: 1.249041626398321
        T-Shirt: 4.3010232102023923e-13
        Toilet Paper: 2.408179534882974
        Vegetable Oil: -1.4829537060149067
        Closest Distro Center: 0.0014114768771896194
        Unemployment Rate: -0.0024596904273568275
        Median Income: -6.8300199315973025e-06
        Population: -4.828426782809544e-06
        Rent: 0.00018408898459385805
```



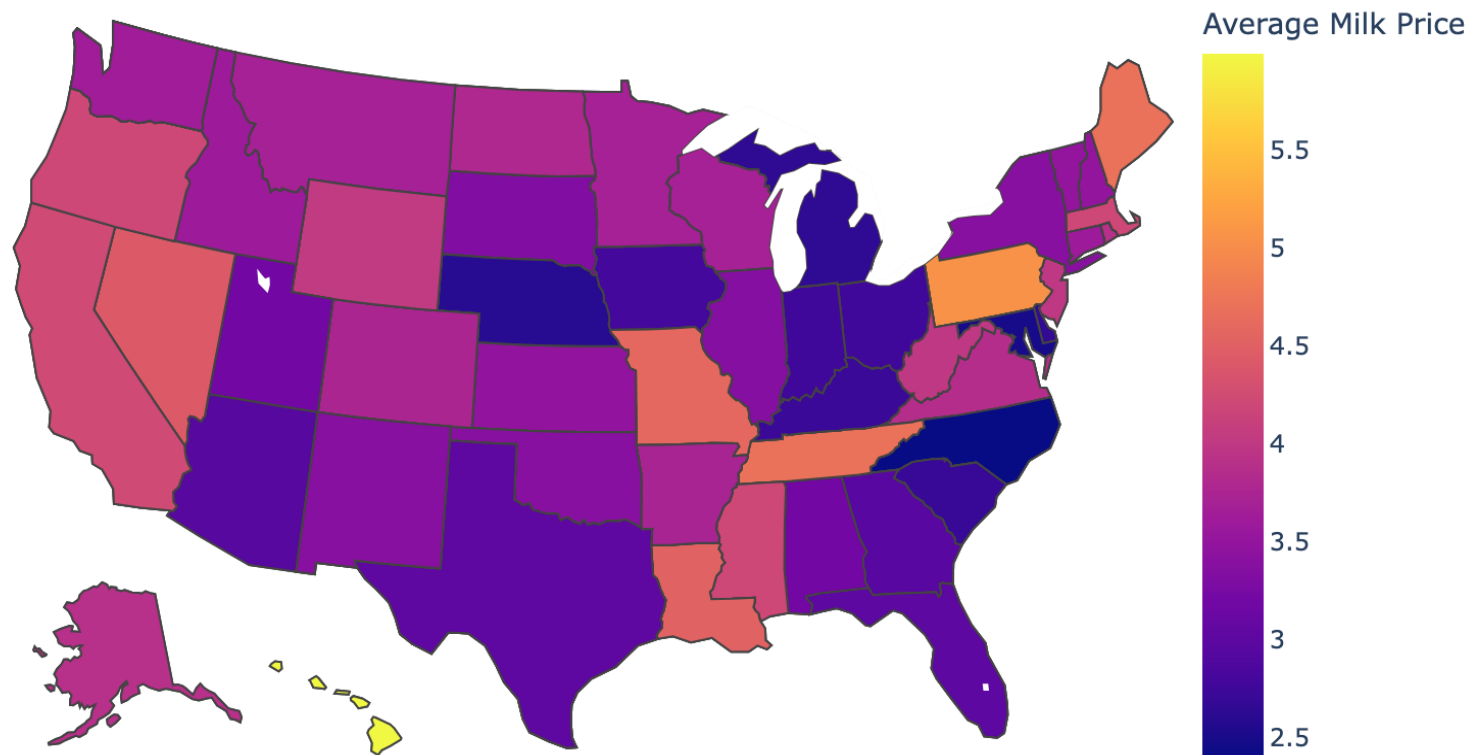Figure 5: Linear Regression Milk Cost vs. Unemployment Rate



Figure 7: Average Milk Price by State

## Conclusions

- Perishable goods like milk and eggs show significant regional price variation: Influenced by transportation costs, supply chain logistics, and local retail infrastructure.
- Non-perishable and manufacturer-controlled items maintain stable pricing, such as AirPods and bananas, across regions, likely due to standardized national pricing.
- Geographic area type influences pricing: Urban areas benefit from lower prices due to proximity to distribution hubs and retail competition, while rural areas experience higher prices due to longer supply chains and fewer retailers. Suburban regions show mixed pricing patterns based on local conditions.
- Distance from distribution centers: Longer distances drive up costs, especially for perishables.

## Implications

Social:

- Individual: knowledge and awareness. Lots of people feel financial pressure paying for their necessities.
- Community: knowledge and advocation.
- Law: gives policymakers insight to pricing differences between regions and area types.

Ethical:

- Although there are supply chain issues to getting to rural areas, rural customers have lower median incomes but are paying more for necessities. Therefore, placing the burden on the consumers and creating financial stress.

Legal:

- Concerns of scraping legally for data privacy and in regulation with Target's policies.

## Citations

Target Prices: Target. Target.com, 2024, www.target.com/.

Rent Prices: "Fare Market Rent." www.rentdata.org, www.rentdata.org/.

Various Area Data: US Census Bureau. "Census.gov." Census.gov, 2025, www.census.gov/.

Target Distribution Centers: Target Distribution Center Locations – Warehouse.ninja. warehouse.ninja/target-distribution-center-locations/.

Zip Code Geolocations: GitHub. "All US Zip Codes from 2023 Government Data, with Geolocations (Latitude and Longitude Coordinates), Comma Delimited." Gist, 31 Mar. 2024, gist.github.com/pramodpendyala/e5688b6a63d2983eac804bbaa1fd7cc0. Accessed 11 Apr. 2025