Optimal Manufacturing Site Analysis

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The following recommendations for selecting the location of the new facility are based on data provided. The data has been processed and visualized in three barplots to support a detailed analysis of potential locations. These graphs focus on key metrics: personal income per capita, computer and electronic product manufacturing output, and their interplay across Metropolitan Statistical Areas (MSAs).

Analysis of Key Findings

1. Personal Income Per Capita and Market Potential

The first barplot highlights the top 10 MSAs with available data on personal income per capita and computer and electronic product manufacturing. Pittsburgh emerges as a notable option due to its prominence in this dataset. However, from an economic standpoint, selecting a highly competitive location like Pittsburgh may not be advantageous due to market saturation and elevated operational costs. In contrast, St. George, Utah, presents a compelling alternative. While less competitive than Pittsburgh, it offers a population with sufficient disposable income to support demand for computer products, making it a viable candidate.

2. Manufacturing Output Considerations

The second barplot focuses solely on computer and electronic product manufacturing output. Los Angeles leads as the top producer among the analyzed MSAs. However, building a facility in a region with such high existing production capacity, like Los Angeles, could lead to oversupply and intense competition. To avoid this, I recommend excluding the top 10 MSAs with the highest manufacturing output from consideration for the new facility.

3. Income as a Driver of Demand

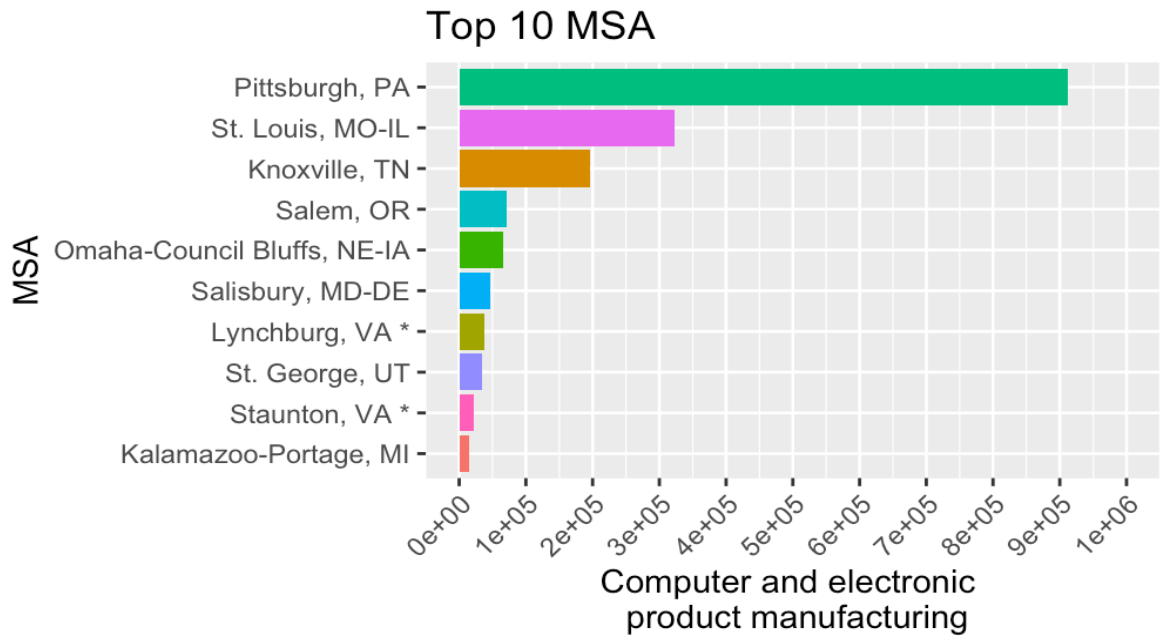
To maximize sales potential, personal income per capita is a critical factor, as higher-income populations are more likely to purchase advanced technological products. According to the data, Boston stands out with the highest personal income per capita among the analyzed MSAs. This suggests Boston could be an optimal location for the facility, given the purchasing power of its residents and potential demand for computer products.

Limitation

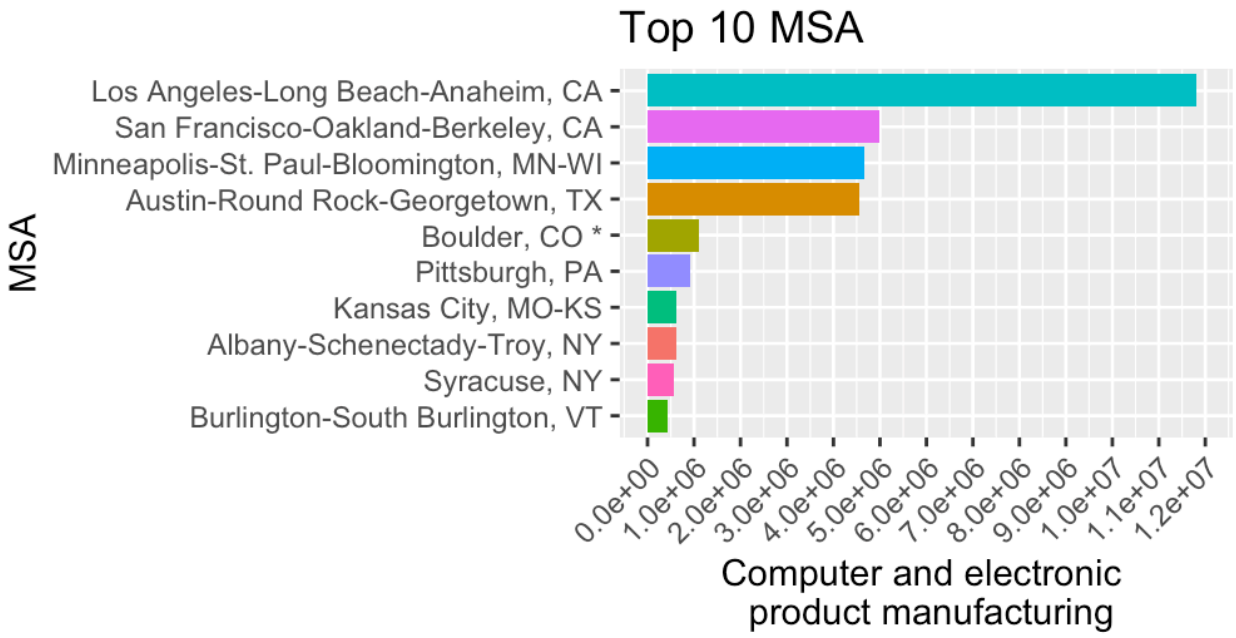
The dataset contains numerous missing values, which limits the precision of the analysis and the reliability of the visualizations. Furthermore, critical variables such as land costs and state tax rates—both of which significantly impact site selection—are absent from the provided data. For instance, if land acquisition and construction costs in Boston exceed those in a lower-cost region like Kansas, the latter may offer a more cost-effective option despite differences in income levels. Similarly, state tax policies play a pivotal role for manufacturing firms. California, for example, imposes substantially higher taxes than Tennessee. A facility in Tennessee could yield significant savings on tax expenditures, enhancing long-term profitability.

Conclusion and Recommendation

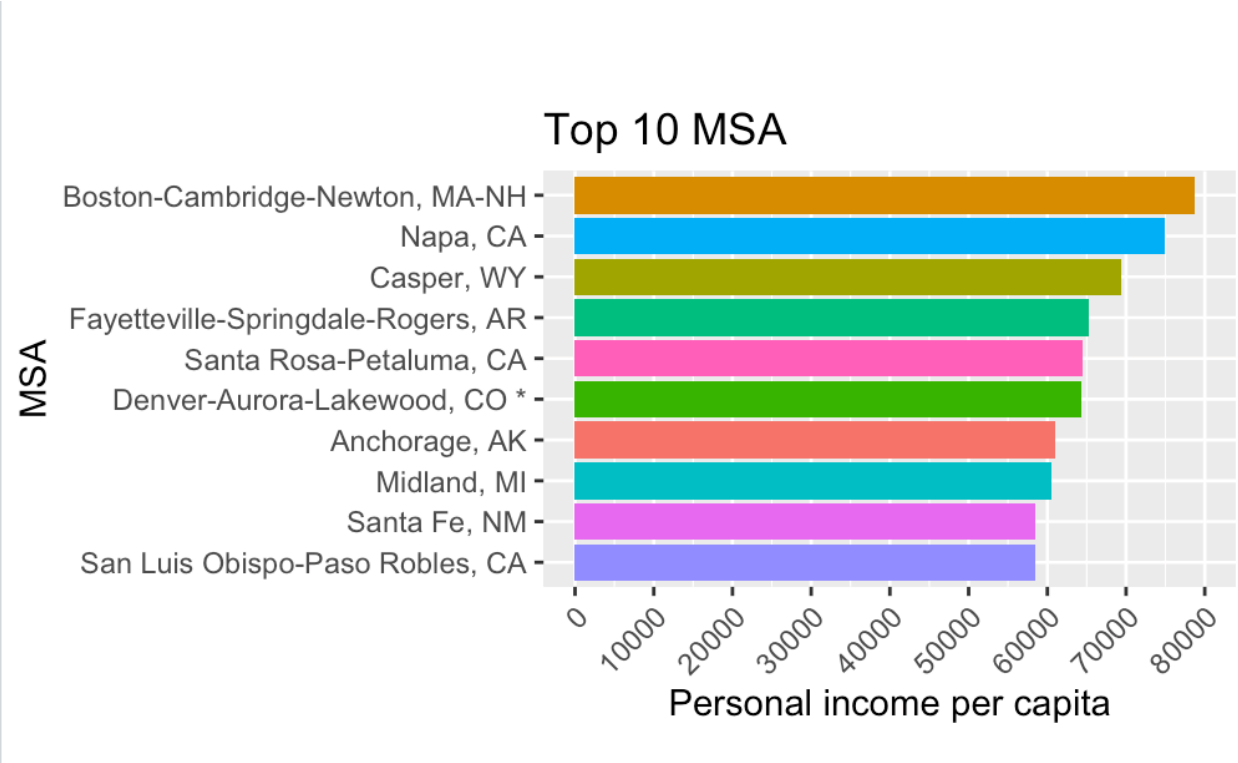
Based on the available data, Boston appears to be the strongest candidate for the new facility due to its high personal income per capita, which aligns with the goal of targeting affluent markets for computer sales. However, to ensure a fully informed decision, I recommend supplementing this analysis with comprehensive data on land costs, state tax rates, and other operational expenses across the shortlisted MSAs. With these insights, the company can better balance market potential with cost efficiency.



Graph 1:Top 10 MSA based on Personal income per capita with available Computer and electronic product manufacturing



Graph 2: Top 10 MSA based on Computer sales



Graph 3:Top 10 MSA based on Personal income per capita