This report presents an analysis of factors influencing US home prices using a multiple linear regression model. The objective is to understand how various economic and financial indicators impact home prices, with a focus on the S&P Case-Schiller Home Price Index (CSUSHPISA) as the target variable.

Model Performance

The multiple linear regression model was trained and evaluated with the following performance metrics:

- Mean Absolute Error (MAE): 234.11
- Mean Squared Error (MSE): 71809.41
- Root Mean Squared Error (RMSE): 267.97
- R-squared (R^2): 0.56

The model demonstrates moderate predictive performance, with an R-squared value of 0.56 indicating that approximately 56% of the variance in home prices can be explained by the selected independent variables.

Coefficients of Independent Variables:

The coefficients of the independent variables in the model are as follows:

- Intercept: -3047.58
- 'Inflation, consumer prices (annual %)': 61.67
- 'GDP (constant 2015 US$)': 2.84e-10
- 'Oil rents (% of GDP)': 749.51
- 'Tax revenue (% of GDP)': 17.36
- 'GDP per capita': -0.06
- 'Households and NPISHs Final consumption expenditure': 2.33e-10

Interpretation of Coefficients:

1. 'Inflation, consumer prices (annual %)': A one-unit increase in inflation is associated with a 61.67 unit increase in home prices, holding other variables constant.

2. 'GDP (constant 2015 US$)': The GDP variable does not appear to have a significant impact on home prices, as the coefficient is close to zero.

3. 'Oil rents (% of GDP)': A one-unit increase in the percentage of GDP from oil rents is associated with a 749.51 unit increase in home prices, holding other variables constant.

4. 'Tax revenue (% of GDP)': An increase in tax revenue as a percentage of GDP by 1% is associated with a 17.36 unit increase in home prices.

5. 'GDP per capita': A one-unit increase in GDP per capita is associated with a slight decrease in home prices, with a coefficient of -0.06.

6. 'Households and NPISHs Final consumption expenditure': This variable does not appear to have a significant impact on home prices, as the coefficient is close to zero.

Conclusion:

The analysis indicates that inflation, the percentage of GDP from oil rents, and tax revenue as a percentage of GDP have significant impacts on US home prices, with inflation and oil rents contributing positively, while tax revenue has a positive influence. However, other variables, such as GDP (constant 2015 US$), GDP per capita, and household consumption expenditure, do not seem to play a significant role in explaining home price variations.

It's important to note that the model explains approximately 56% of the variance in home prices, suggesting that additional factors beyond those considered in this analysis also influence the housing market.