RBE 595 — FAIR-AV
Assignment #1

Arjan Gupta

Problem 1

Use your favorite auto OEM as an example to compute the PCDM using its average ROI or last year's ROI. (2pt)

Solution

I have chosen Honda as an example. The ROI for Honda in 2023 is the average of the data points from 2023, per the data available on Macrotrends. These data points are 4.85%, 5.85%, 6.15%, and 6.53% respectively for the quarters of 2023. The average ROI for Honda in 2023 is given by,

$$\text{Average ROI} = \frac{4.85 + 5.85 + 6.15 + 6.53}{4}$$
$$= 5.845\%$$

The PCDM is the profit per customer driven mile. In 2023, Honda recorded an operating profit of approximately 781 billion Japanese yen. With around 4.5 million cars sold, this translates to an average profit of about 173,555 yen (roughly \$1,200 USD) per car. The source for this data is Statista.

On average, Honda cars have a mileage lifespan of about 200,000 miles. The source for this data is Brickell Honda.

Therefore, we can calculate the PCDM for Honda in 2023 as follows,

$$\text{PCDM} = \frac{\text{Average profit per car}}{\text{Average mileage per car}}$$
$$= \frac{\$1,200}{200,000}$$
$$= \$0.006 \text{ per mile}$$

Let us compound the PCDM with the average ROI for Honda in 2023,

$$\text{PCDM} \times (1 + \text{ROI})^{10} = \$0.006 \times (1 + 0.05845)^{10}$$
$$= \$0.006 \times 1.765$$
$$= \$0.01 \text{ per mile}$$