Discounts on food orders are resulting in huge losses. We need to find a sweet spot for offering discounts and charging commissions. To find a sweet spot for commission and discount percentages, we can analyze the characteristics of profitable orders more deeply. Specifically, we need to look for:

* A new average commission percentage based on profitable orders.
* A new average discount percentage for profitable orders, that could serve as a guideline for what level of discount still allows for profitability.

Let’s calculate:

* The average commission percentage for profitable orders.
* The average discount percentage for profitable orders.

#code

# filter the dataset for profitable orders

profitable\_orders = food\_orders[food\_orders['Profit'] > 0]

# calculate the average commission percentage for profitable orders

profitable\_orders['Commission Percentage'] = (profitable\_orders['Commission Fee'] / profitable\_orders['Order Value']) \* 100

# calculate the average discount percentage for profitable orders

profitable\_orders['Effective Discount Percentage'] = (profitable\_orders['Discount Amount'] / profitable\_orders['Order Value']) \* 100

# calculate the new averages

new\_avg\_commission\_percentage = profitable\_orders['Commission Percentage'].mean()

new\_avg\_discount\_percentage = profitable\_orders['Effective Discount Percentage'].mean()

print(new\_avg\_commission\_percentage, new\_avg\_discount\_percentage)



So,

* New Average Commission Percentage: 30.51%
* New Average Discount Percentage: 5.87%

Visualizing a comparison of profitability using actual versus recommended discounts and commissions across all orders.

For this, we need to:

* Calculate the profitability per order using the actual discounts and commissions already present in the dataset.
* Simulate profitability per order using the recommended discounts (6%) and commissions (30%) to see the potential impact on profitability.

# simulate profitability with recommended discounts and commissions

recommended\_commission\_percentage = 30.0 # 30%%

recommended\_discount\_percentage = 6.0 # 6%%

# calculate the simulated commission fee and discount amount using recommended percentages

food\_orders['Simulated Commission Fee'] = food\_orders['Order Value'] \* (recommended\_commission\_percentage / 100)

food\_orders['Simulated Discount Amount'] = food\_orders['Order Value'] \* (recommended\_discount\_percentage / 100)

# recalculate total costs and profit with simulated values

food\_orders['Simulated Total Costs'] = (food\_orders['Delivery Fee'] +

food\_orders['Payment Processing Fee'] +

food\_orders['Simulated Discount Amount'])

food\_orders['Simulated Profit'] = (food\_orders['Simulated Commission Fee'] -

food\_orders['Simulated Total Costs'])

# visualizing the comparison

import seaborn as sns

plt.figure(figsize=(14, 7))

# actual profitability

sns.kdeplot(food\_orders['Profit'], label='Actual Profitability', fill=True, alpha=0.5, linewidth=2)

# simulated profitability

sns.kdeplot(food\_orders['Simulated Profit'], label='Estimated Profitability with Recommended Rates', fill=True, alpha=0.5, linewidth=2)

plt.title('Comparison of Profitability in Food Delivery: Actual vs. Recommended Discounts and Commissions')

plt.xlabel('Profit')

plt.ylabel('Density')

plt.legend(loc='upper left')

plt.show()

