



Dynamic Price Discrimination in Airline Markets Among Strategic Consumers

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1. Research Question

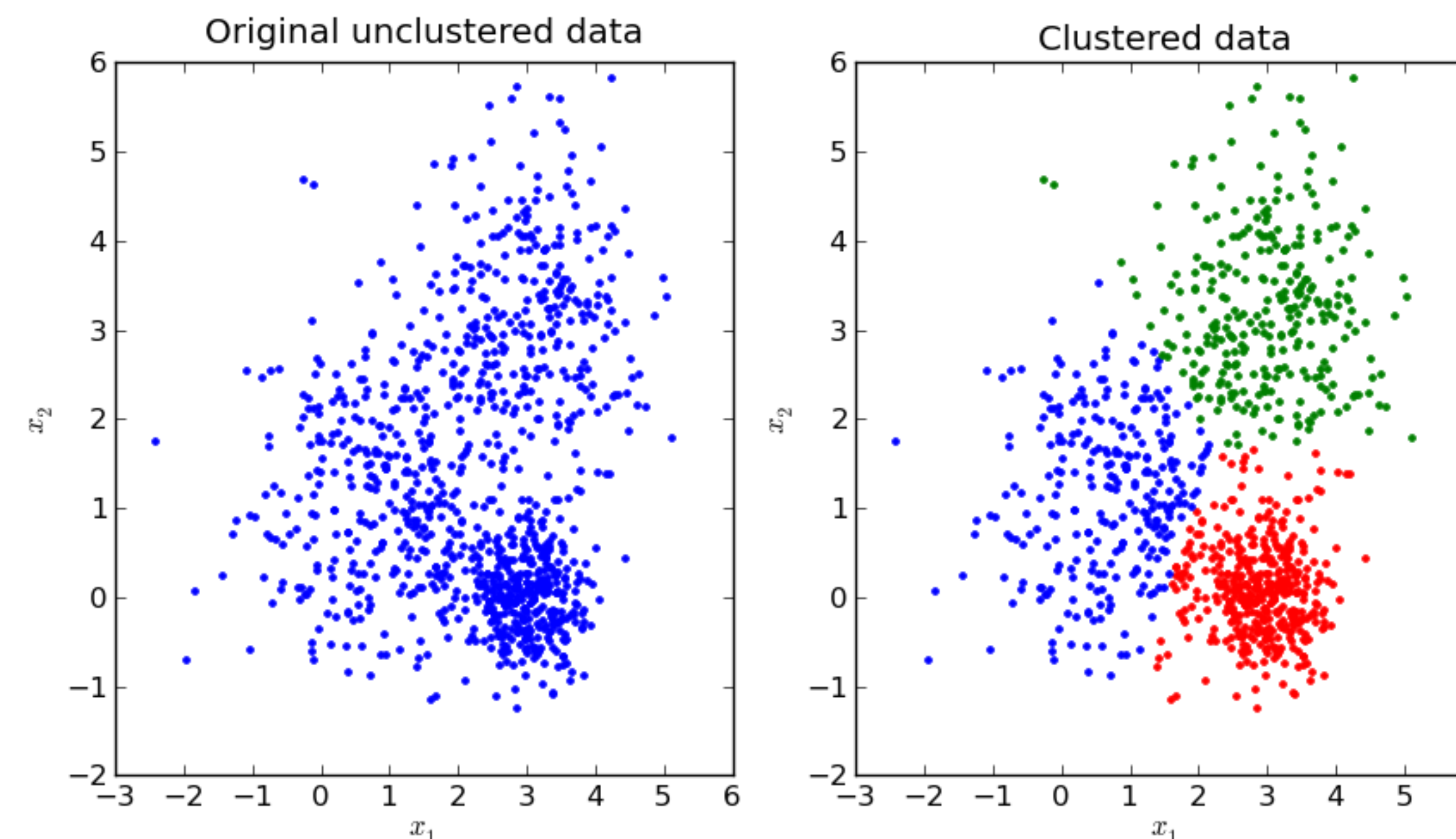
Do strategic consumers exist in airline markets?

(And if so, what effect do firms' dynamic pricing behaviors have on their purchasing behavior?)

2. Background and Theory

- A consumer is **strategic** if they:
 - Use prior information about price to inform future decisions
 - Exhibit cost-minimizing behavior, such as timing their purchases to minimize costs
- **Dynamic price discrimination (DPD)** is a series of pricing strategies employed by firms to maximize profits over some time horizon.
 - Airlines offer “discounts” to consumers who purchase earlier (these are called advanced purchase discounts or *APDs*).
 - Airlines generally raise prices near the date of departure to capitalize on consumers with low sensitivity to higher prices (*intertemporal price discrimination*).
- Airlines want to maximize revenue by selling as many seats as possible for the highest price.
- All consumers want to purchase airline tickets at the lowest possible price.
- **Hypothesis:** If strategic consumers exist in airline markets they will take behaviors to minimize costs in response to DPD:
 - Purchase **earlier** if prices generally **increase**
 - Purchase **later** if prices generally **decrease**

3. Data and Methods



Visualization of Clustering.

(Source: <https://i.stack.imgur.com/cIDB3.png>)

The dataset consists of millions of individual flight transactions for over 300,000 flights in a 20-month period. The dataset also contains seat capacity information for each flight up to 330 days before departure. All of the data came from one airline. The following are procedures and methods:

- ❖ Generate unique flight identifier
- ❖ Generate number of days out variable
- ❖ Generate average price change variables
- ❖ Group similar flights into markets
- ❖ Calculate relative average purchase date (*measure of purchasing behavior*)
- ❖ Calculate distributions/quantiles of average price change (*measure of dynamic pricing*)
- ❖ Generate k-means clusters based on price change quantiles (*measure of dynamic pricing*).
- ❖ Regress measures of purchasing behavior onto measures of dynamic pricing behavior

4. Results and Conclusions

1. Certainty of price **increases** will cause consumers to purchase **earlier** on average
2. Certainty of price **decreases** will cause consumers to purchase **later** on average
3. When price behavior is **uncertain** consumers will purchase **later** upon resolving more of their own uncertainty
4. Results were most convincing for the across-market analysis looking at clusters
5. Price changes over the final 30 days before departure had the strongest effect on consumers' purchasing behaviors

Consumers are exhibiting strategic cost minimizing behaviors on average. This result holds true across different flight markets and within flight markets. Therefore, **there is evidence of strategic consumers in airline markets.**

There remains concerns about endogeneity in this study. There are also limitations with the data arising from their single-firm origin and lack of exact price data.

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