# "One Discriminatory Rent" or "Double Jeopardy":

# Multi-Component Negotiation For New Car Purchases

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# The vehicle sales process consists of several steps

## AUTO RETAILING PROCESS

1. In-person consumer visit (after research, often online)
2. Typically test drive
3. Sit-down with sales person/manager
4. Initial price offer on vehicle (typically MSRP)
5. Trade-in offer
6. Negotiation over monthly payment and down payment (if financing – most do)
7. Sit-down with "Finance and Insurance" (F&I) manager
8. Credit check and renegotiation of financial terms
9. Offer of additional services (extended warranties, extended service contracts, payment insurance, etc.)
10. Disclosure of additional fees ("Doc Fees")
11. Deal closes

# Auto retailing exhibits multiple versions of splitting pricing into multiple components

## TYPES OF COMPONENT PRICING

- **Drip Pricing:**
  - Consumers learn about **surcharges** and **add-on** prices only **after** they see the **base price** of the product
  - Example: "Doc fee" is revealed in the "F&I" office after the price negotiation is finalized
- **Partition Pricing:**
  - A product's price is divided into **two or more parts**
  - Example: "Destination & Handling" fee (e.g. $895 for BMW) is always charged but never included in the posted vehicle price

# Auto retailing exhibits multiple versions of splitting pricing into multiple components

## TYPES OF COMPONENT PRICING

- **Multi-Component Negotiation:**
  - Total transaction for most consumers consists of **multiple negotiations**
    - New vehicle price
    - Payment for trade-in
    - Financing terms
    - Add-on services (extended warranties, extended service contracts, payment insurance, etc.)
  - Negotiations may seem **independent** to consumers
  - Negotiations are **explicitly linked** within dealership

# There are important benefits to multi-component negotiations for dealerships

## WHY DEALERS LIKE MULTI-COMPONENT NEGOTIATIONS

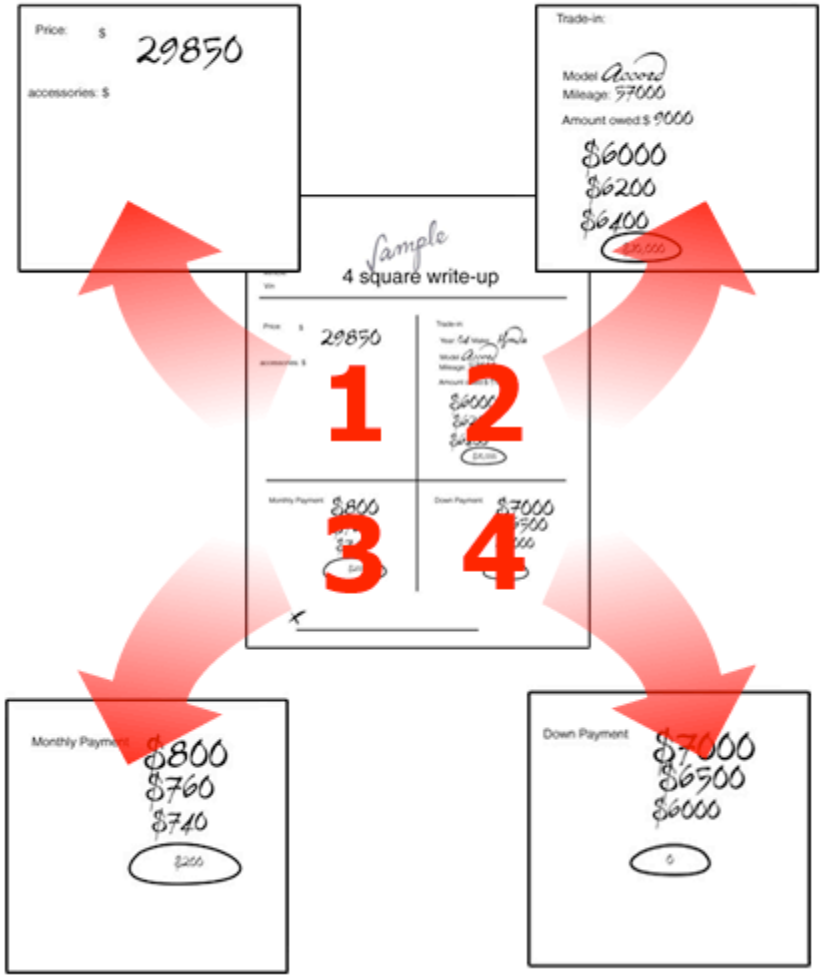
- Dealer can concede a **lower price** on one component that ...
  - consumer is particularly focused on
  - consumer has particularly good price knowledge about
- While compensating with a **higher price** on a component that ...
  - consumer does not focus on
  - consumer has no price knowledge about
  - consumer doesn't understand

## EXAMPLE: Four-Square Pricing

| | |
|---|---|
| Vehicle Price | Trade-in Value |
| Monthly Payment | Down Payment |

# Four-square pricing suggests a process for negotiating with consumers that favors dealership

## FOUR-SQUARE PRICING




- Emphasizes components **other than vehicle price**
- Allows vehicle price to be adjusted **after profit margin** on other components has been **determined**
- **Obfuscates financing** terms such as length of loan term, APR
- **Leases** add even **more obfuscation**
  - "Money factor" = APR divided by 24
  - Marketing exclusively focused on monthly payment
    - Customers don't realize they can negotiate price of vehicle

# Many sources of car buying advice warn consumers about the dangers of multi-component negotiation

## EXAMPLES OF CAR BUYING ADVICE

- www.buyingadvice.com:
  - "The **biggest advantage** the car dealer has is the **knowledge** that a car sale involves **three negotiations, not one** - the sales price, the trade price and the financing terms."
  - "In the carefully choreographed dance that is taught to car salesmen all over the country, the key element is to identify which of these elements is the most important to the customer. They can then use this information to **meet the customer's goals** while making their **profit from other areas**."
- www.edmunds.com
  - "Remember, a good deal isn't just the lowest selling price. It's the lowest total out-the-door cost on a car that meets your needs. This means that to get a fair deal you have to be **alert throughout the entire purchase process**, even after you and the salesman agree on a price."

# Many sources of car buying advice warn consumers about the dangers of multi-component negotiation

## EXAMPLES OF CAR BUYING ADVICE

- www.consumerreports.com
  - "Negotiate one thing at one time. Salespeople like to mix financing, leasing, and trade-in negotiations together, often asking you to negotiate around a monthly payment figure. This tactic gives the dealer **more latitude** to offer you a **favorable figure in one area while inflating figures in another**."
  - "...a **good price** in one area could be **canceled out by a poor price** in the other."
- cars.about.com
  - "…if the offer for your trade-in sounds too good to be true, be wary; you can be sure the dealer is **making up the difference** in the negotiated price of your new car."

# This paper investigates how much buyers and dealers differ in how they think about multi-component negotiation

## DEALER PROFIT

Dealer profit = (New car price) - (New car cost) + (Trade-in cash value) - (Trade-in price)

**New Vehicle Margin** | **Trade-In Margin**

Dealer profit = (New car price) - (Trade-in price) + (Trade-in cash value) - (New car cost)

**What can be negotiated** | **Exogenous**

Dealer knows that:
1. Both can be negotiated
2. The two components are perfect substitutes in its profit calculation

# This paper investigates how much buyers and dealers differ in how they think about multi-component negotiation

## CONSUMER SURPLUS

Consumer surplus = (New car utility) - (New car price) + (Trade-in price) - (Trade-in utility)

**How do consumers see this?**

Consumer surplus = (Trade-in price) - (New car price) + (New car utility) - (Trade-in utility)

**What can be negotiated** **Exogenous**

- Buyers view the negotiation the same way as dealers
- Some buyers may be better negotiators than others, so some buyers may give dealers higher total profits than others
- The trade-in margin and new vehicle margin should be negatively correlated

**One Discriminatory Rent**

# This paper investigates how much buyers and dealers differ in how they think about multi-component negotiation

## CONSUMER SURPLUS

Consumer surplus = (New car utility) - (New car price) + (Trade-in price) - (Trade-in utility)

**How do consumers see this?**

Consumer surplus = (New car utility) - (New car price)
Consumer surplus = (Trade-in price) - (Trade-in utility)

- Buyers view the negotiation the same way as dealers
- Some buyers may be better negotiators than others, so some buyers may give dealers higher total profits than others
- The trade-in margin and new vehicle margin should be negatively correlated

**One Discriminatory Rent**

- Buyers may be better or worse negotiators, and that applies to both margins
- The trade-in margin and new vehicle margin should be positively correlated

**Double Jeopardy**

# We use detailed information on prices and on new vehicle sales

## AUTOMOBILE TRANSACTION DATA

- 20% of new car dealerships in US, selling new and used vehicles
- All transactions from July 2006 through December 2007 (roughly 2007 model year)
- Detailed information on
  - Negotiated prices
  - Dealer costs
  - Customer demographics (Census-block level)
  - New vehicle and trade-in characteristics ("vehicle type")
    - make and model (e.g. Honda Accord)
    - model year (e.g. 2007, 2008)
    - body type (e.g. convertible, coupe)
    - doors (e.g. 2 door, 4 door, 4D Ext Cab)
    - trim level (e.g. for Honda Accord, EX, LX etc.)
    - drive train type (e.g. 2WD, 4WD)
    - cylinders (e.g. 4 Cyl, 6 Cyl)
    - displacement (e.g. 3.0 liters, 3.3 liters)

## MAIN VARIABLES OF INTEREST

- New vehicle margin = Contract price – Dealer's cost of vehicle
- Trade-in margin = Actual cash value of trade-in – Trade-in price

# We approximate our ideal experiment with a matching approach

## IDEAL EXPERIMENT

- Observe the new vehicle price and trade-in price actually negotiated in a transaction
- Observe the outcome of a hypothetical alternative transaction
- Ask: If the new vehicle price had been higher by $X, how much higher or lower would the trade-in price have been?"
- Can't observe such hypotheticals
- Zhu, Chen, and Dasgupta (2008) try to approximate this experimentally

**Instead, use a matching approach**

# Our matching approach pairs up similar transactions

## MATCHING APPROACH

- Consider two transactions in which:
  - the same "vehicle type" is purchased
  - at the same dealership
  - in the same month
  - both using a trade-in
- Suppose transaction **A** gives the dealer a larger new vehicle margin than transaction **B.**
- How does the trade-in profit margin compare?
  - "One Discriminatory Rent": Trade-in profit margin is lower by the same amount that new vehicle margin is higher.
  - "Substitutes": Trade-in margin is lower, but not one-for-one
  - "Double Jeopardy": Trade-in margin is also higher

# Our matching approach pairs up similar transactions

## MATCHING PROCEDURE

1. Use only transactions with trade-ins
2. Group transactions by "vehicle type," dealer, month, and actual cash value of trade-in (rounded to nearest $500)
3. Draw pairs randomly within group
   - Draw without replacement
   - Drop 1 transaction if group has an odd number
4. Label as "Transaction A" the transaction with higher new vehicle margin. "Transaction B" as transaction with lower new vehicle margin
5. Define
   **New vehicle margin difference** = New vehicle margin **A** - New vehicle margin **B** ( > 0 )
   **Trade-in margin difference** = Trade-in margin **A** - Trade-in margin **B** ( > 0 or < 0 )

# We first investigate the relationship between trade-in margin and new vehicle margin

## SPECIFICATION

$$TradeInMarginDiff = \alpha_0 + \alpha_1 \, NewVehicleMarginDiff + \varepsilon_1.$$

## RESULT

| Trade-In Margin Difference | Coef/SE |
|---|---|
| New Vehicle Margin Difference | -0.86** |
| | (0.004) |
| Constant | 421.1** |
| | (5.8) |
| R-squared | 0.62 |
| Observations | 90,472 |

**We find evidence of imperfect "substitution" between trade-in and new vehicle margins, suggesting that trading off occurs, but is not one-for-one**

# We can also investigate whether observable differences between buyers lead to more different outcomes

## "HIGH-MARGIN CUSTOMER" INDEX

- **Idea:** Estimate which customer characteristics are associated with high total profit margins

- Use only transactions **without** a trade-in (2,316,402)

  - For these transactions the new vehicle margin is the total profit margin
  - Use customer **demographics**, indicators for whether the vehicle was purchased on a **weekend**, at the **end of the month** or at the **end of the year**, and **"vehicle type"** fixed effects to predict the new car profit margin

- Based on estimated coefficients create **index** for trade-in sample for whether a particular customer is **likely** to be a **"high total margin"** customer

- For each paired transaction, measure how different the two customers are on this index, ***IndexDiff*** = *Index* ***A*** – *Index* ***B***

# The relationship between trade-in and new vehicle margin is not affected by observable differences between customers

## SPECIFICATION

$$TradeInMarginDiff = \beta_0 + \beta_1 \, \mathbf{Q(IndexDiff)} \, NewVehicleMarginDiff + \varepsilon_2$$

## RESULT

| Trade-In Margin Difference | Coef/SE |
|---|---|
| New Vehicle Margin Difference * | -0.85** |
| IndexDiff Quintile 1 | (0.008) |
| New Vehicle Margin Difference * | -0.87** |
| IndexDiff Quintile 2 | (0.008) |
| New Vehicle Margin Difference * | -0.85** |
| IndexDiff Quintile 3 | (0.009) |
| New Vehicle Margin Difference * | -0.86** |
| IndexDiff Quintile 4 | (0.008) |
| New Vehicle Margin Difference * | -0.86** |
| IndexDiff Quintile 5 | (0.007) |
| Constant | 422.5** |
| | (5.8) |
| R-squared | 0.62 |
| Observations | 90,471 |

# Financing is the third major margin on which dealers earn profits

## FINANCING MARGIN

- We observe the net present value of the expected profits to the dealer from the financing terms and from sales of insurance and service contracts
- We calculate
  **Financing margin difference** = Financing margin **A** - Financing margin **B**
- Note that these are not differences in financing terms, but differences in financing profits

# Next we investigate the relationship between financing and new vehicle margin

## SPECIFICATION

$$FinanceMarginDiff = \gamma_0 + \gamma_1 NewVehicleMarginDiff + \varepsilon_3.$$

## RESULT

| Finance Margin Difference | Coef/SE |
|---|---|
| New Vehicle Margin Difference | 0.064** |
| | (0.002) |
| Constant | 38.48** |
| | (4.4) |
| R-squared | 0.02 |
| Observations | 86,674 |

**We find evidence of "Double Jeopardy" between financing margin and new vehicle margins**

# The relationship between financing and new vehicle margin differences *is* affected by observable differences

## SPECIFICATION

$$FinanceMarginDiff = \delta_0 + \delta_1 \mathbf{Q(IndexDiff)}\ NewVehicleMarginDiff + \varepsilon_4$$

## RESULT

| Trade-In Margin Difference | Coef/SE |
|---|---|
| New Vehicle Margin Difference * | 0.026** |
| IndexDiff Quintile 1 | (0.004) |
| New Vehicle Margin Difference * | 0.050** |
| IndexDiff Quintile 2 | (0.004) |
| New Vehicle Margin Difference * | 0.060** |
| IndexDiff Quintile 3 | (0.005) |
| New Vehicle Margin Difference * | 0.069** |
| IndexDiff Quintile 4 | (0.005) |
| New Vehicle Margin Difference * | 0.100** |
| IndexDiff Quintile 5 | (0.004) |
| Constant | 40.1** |
| | (4.4) |
| R2 | 0.02 |
| Observations | 86,673 |

# Why are trade-in and new vehicle margins generally "substitutes" while financing and new vehicle margins show "double jeopardy"?

## WHICH MARGINS ARE CONSUMERS ABLE TO TRADE-OFF?

- Consumers may not realize that financing terms are negotiable, or may have more difficulty understanding (and negotiating over) financing than trade-in price
- Consumers may care more about trade-in price
  - Zhu, Chen, and Dasgupta (2008) hypothesize that a car is a **"mental account"** that consumers want to "close out" as well as possible by getting a **good price** on their **trade-in car**
- We investigate whether this has an effect on margins by dividing transactions on the basis of whether the customer negotiated a trade-in price that was greater than the actual cash value of their trade-in
  - We suppose that customers who **care a lot** about the price of their trade-in are **more likely** to negotiate a trade-in price that is **above** the actual cash value
- We **redo our matching procedure** within the **subsamples** of customers for which **TradeInPrice > ActualCashValue** and for which **TradeInPrice < ActualCashValue**

# Customers who seem to care less about the trade-in price are less likely to recoup trade-in margin differences in new vehicle margins

## SPECIFICATION

$$TradeInMarginDiff = \alpha_0 + \alpha_1 \, NewVehicleMarginDiff + \varepsilon_1.$$

## RESULT

| Trade-In Margin Difference | Trade-in price > Actual cash value | Trade-in price < Actual cash value |
|---|---|---|
| New Vehicle Margin Difference | -0.90** | -0.13** |
| | (0.006) | (0.038) |
| Constant | 269.8** | 114.6** |
| | (10.6) | (34.0) |
| R-squared | 0.72 | 0.04 |
| Observations | 22,081 | 8,531 |

**Customers who negotiate a trade-in price less than the actual cash value of the trade-in make up less of the difference in a lower new vehicle price**

# Conclusion

## WHAT WE HAVE DONE

- Estimated the correlation in the profit margins for different components of a new car negotiation between consumers and dealers
  - New vehicle margin
  - Trade-in margin
  - Financing margin

## WHAT WE HAVE FOUND

- Profit margin on the new vehicle and the profit margin on the trade-in are generally **negatively correlated** but **do not** reflect one-for-one offsets
- Profit margin on the new vehicle are **positively correlated** with financing profit margins

## WHAT WE THINK IT MEANS

- Consumers realize that there is substitution between new vehicle margins and trade-in margins but fail to negotiate a full offset
- There is "Double Jeopardy" with regards to new vehicle margins and financing margins