

# Business Experimentation and Causal Methods

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Topic: Price Targeting



# A brief history of pricing

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- Historically, most prices were bargained.
- Innovation by Wannamaker's Grand Depot: Price Tags
- Uniform pricing: Everyone gets the same price





# Downsides of uniform pricing

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- Excludes customers who aren't able to afford lower payment (even if it they would buy at a price that is above marginal cost).
- Fails to extract surplus from customers who value product a lot.





# Upsides of uniform pricing

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- Perceived as fair.
- Simpler to manage communication with customers and implementation.



# Personalized Pricing and Customer Welfare Dube and Misra (2023)





- Firms pay monthly subscription to post job ads
- 40,000 customers in typical month in 2015.
- Uniform price of \$99 per month.
- New firms navigate site until they reach pay wall.
- 133 variables collected by Ziprecruiter



# Idea behind price targeting

- When user lands on the page, use characteristics to serve a personalized price.
- Business Question: Which price to give each consumer? How to validate it?



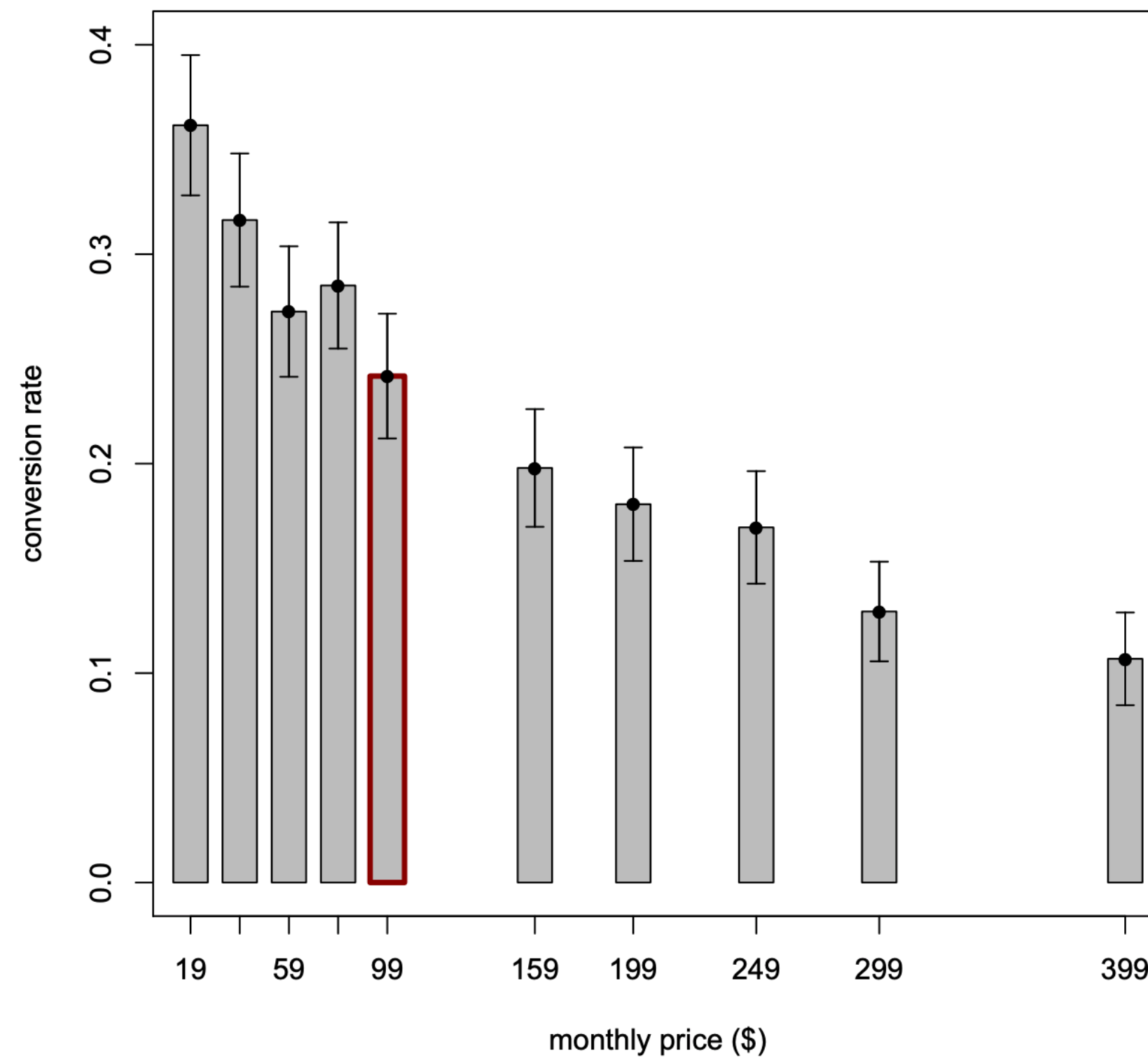
# Experimental Setup

- 1 month of data.
- 7,867 unique customers reach paywall.
- 10 pricing levels.

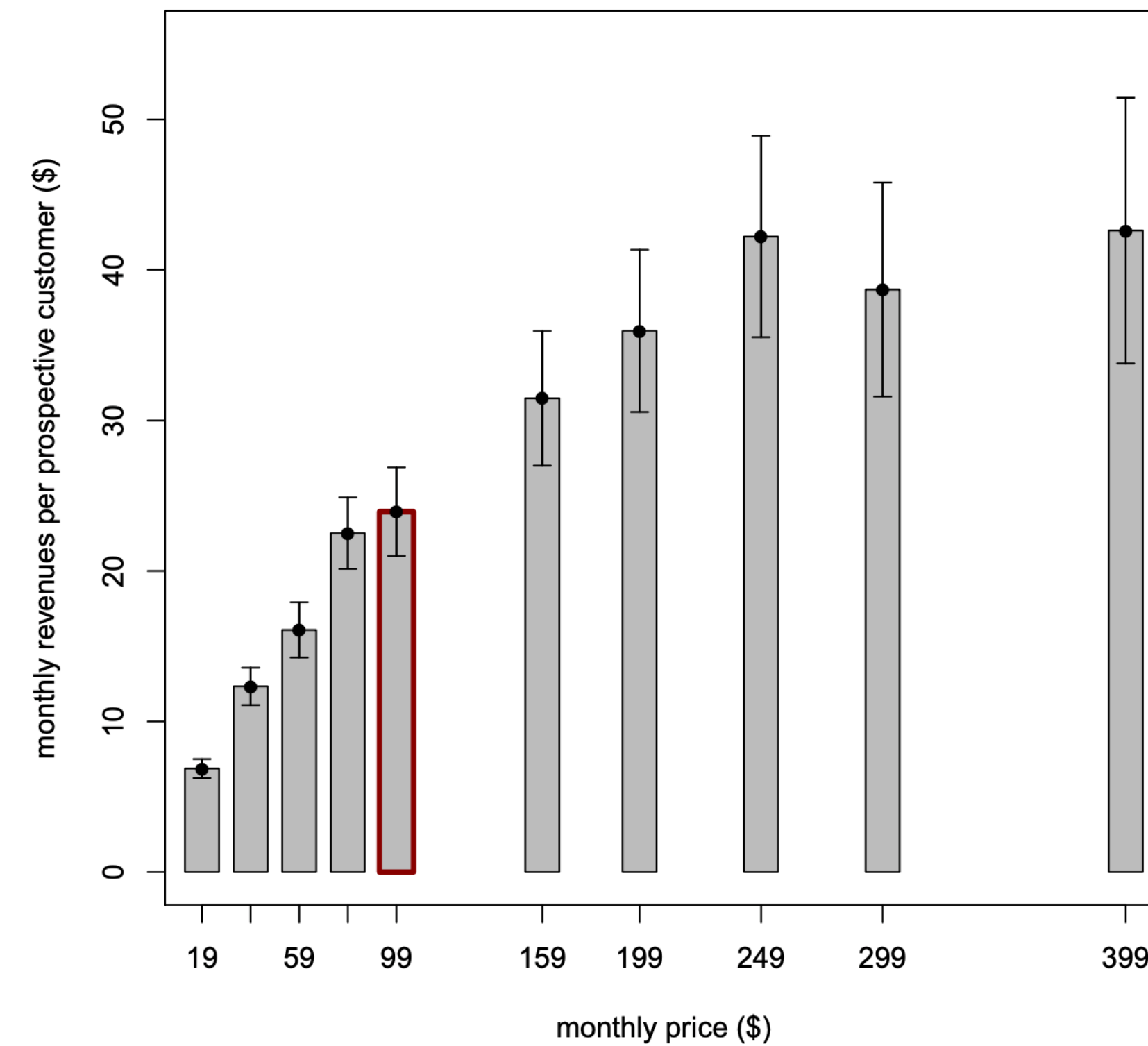




# Conversion Rate

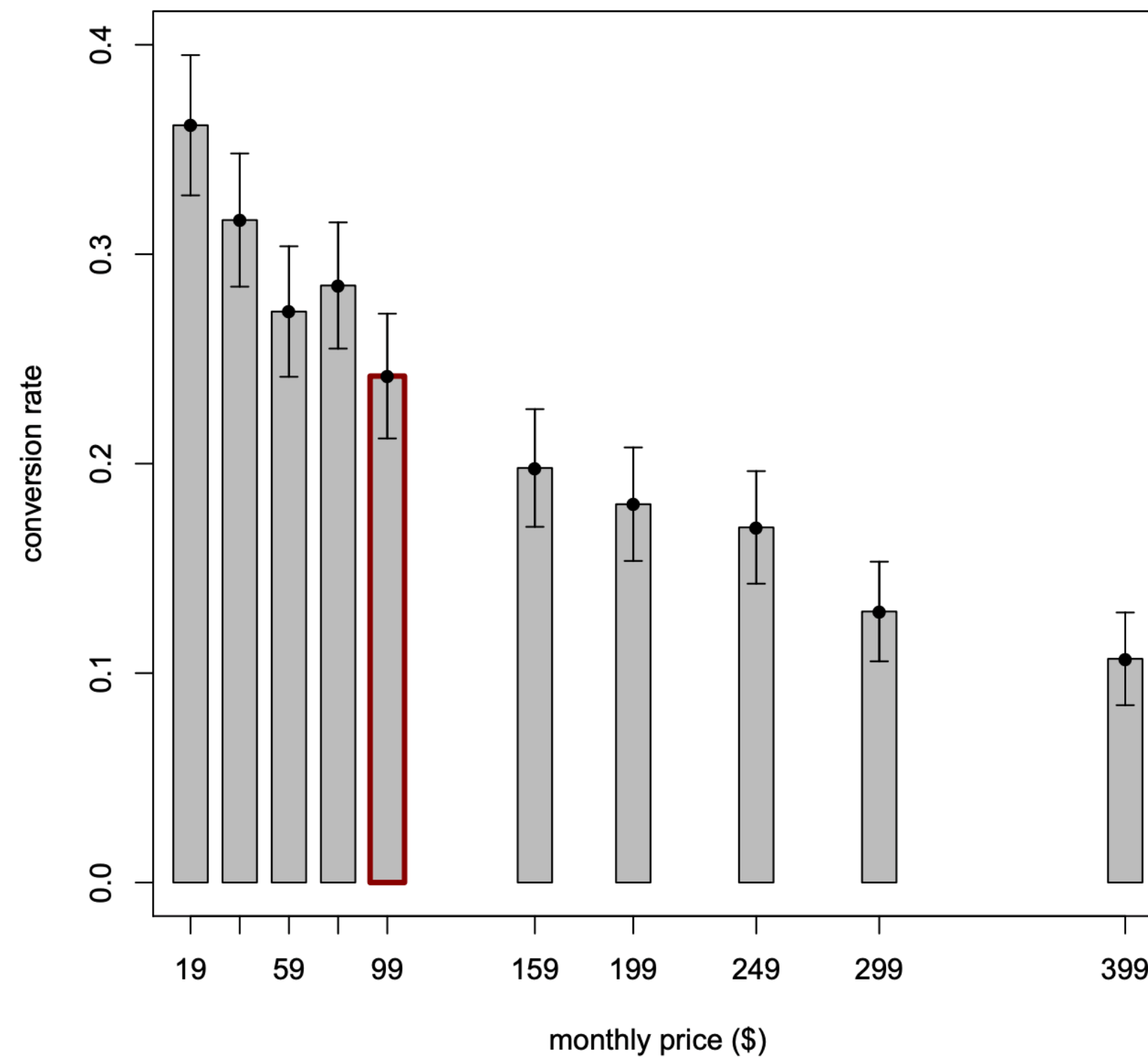


# Revenue

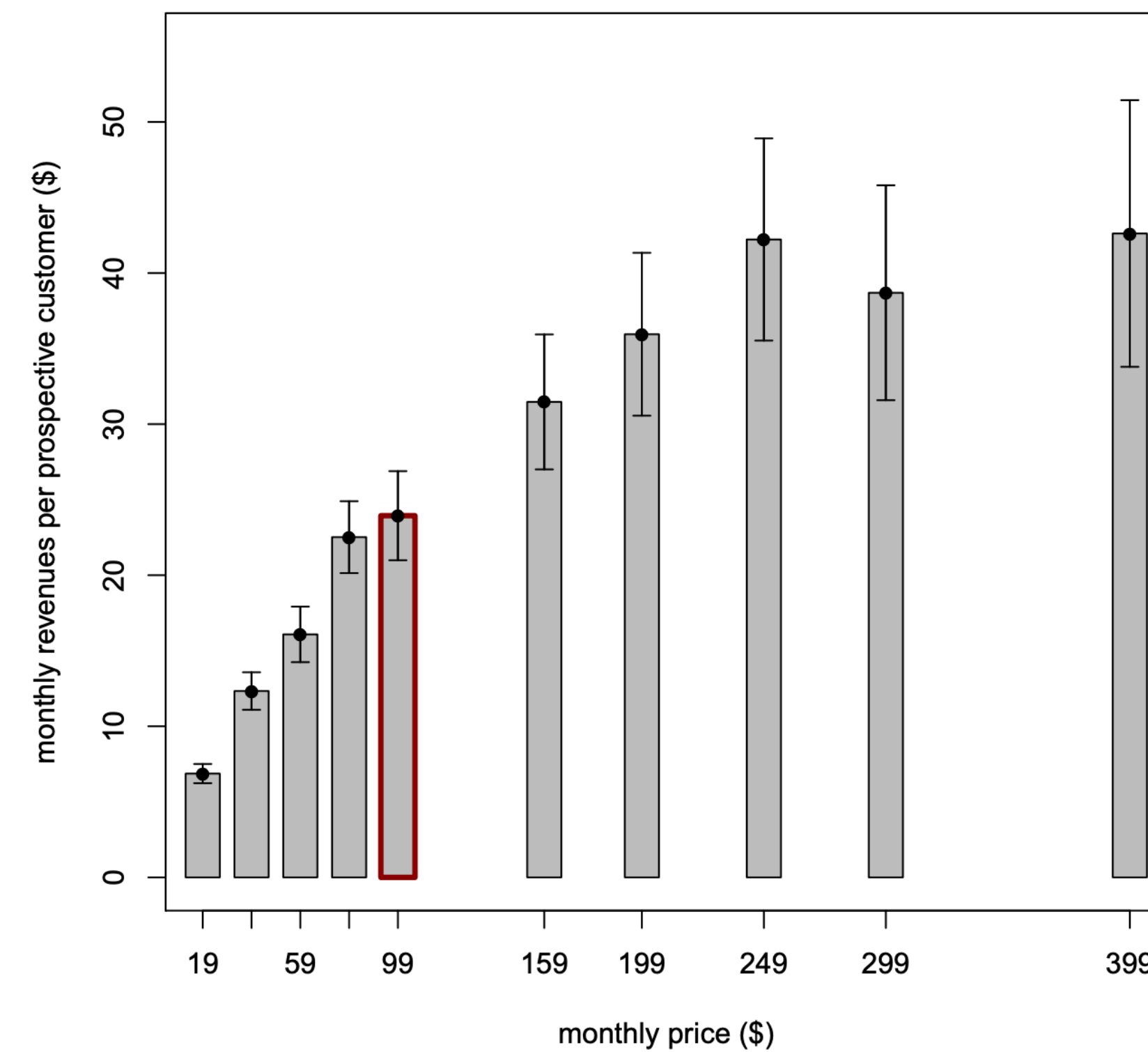


**What uniform price would you set?**

# Conversion Rate



# Revenue

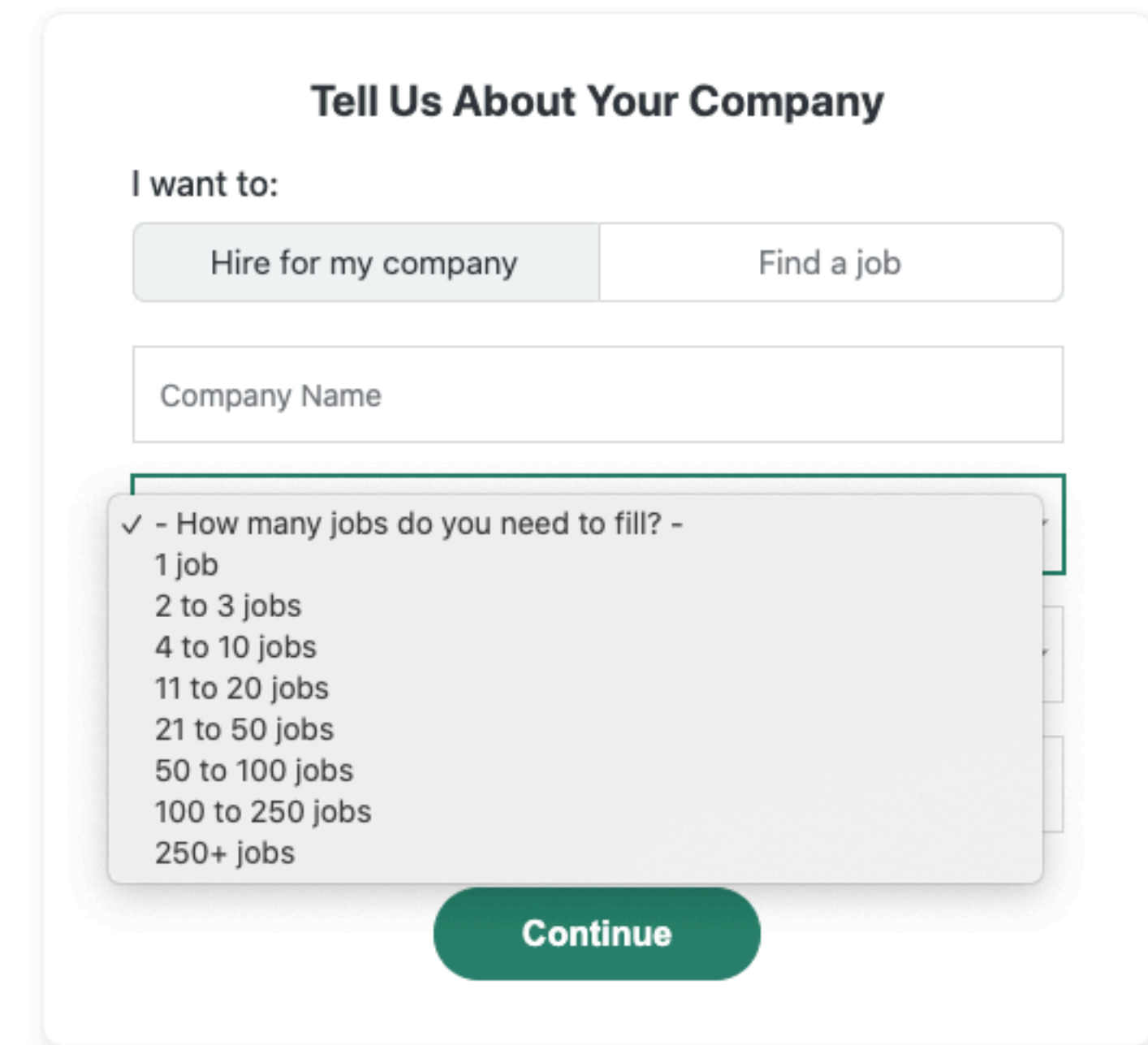


**What uniform price would you set?**  
**Approximately \$249**

# Estimate CATE based on:

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- Characteristics of employer
- Location
- Job type
- Job requirements
- Job description
- Results in over 100 binary variables.
  - e.g. when it's a "full time job", value = 1, otherwise 0.

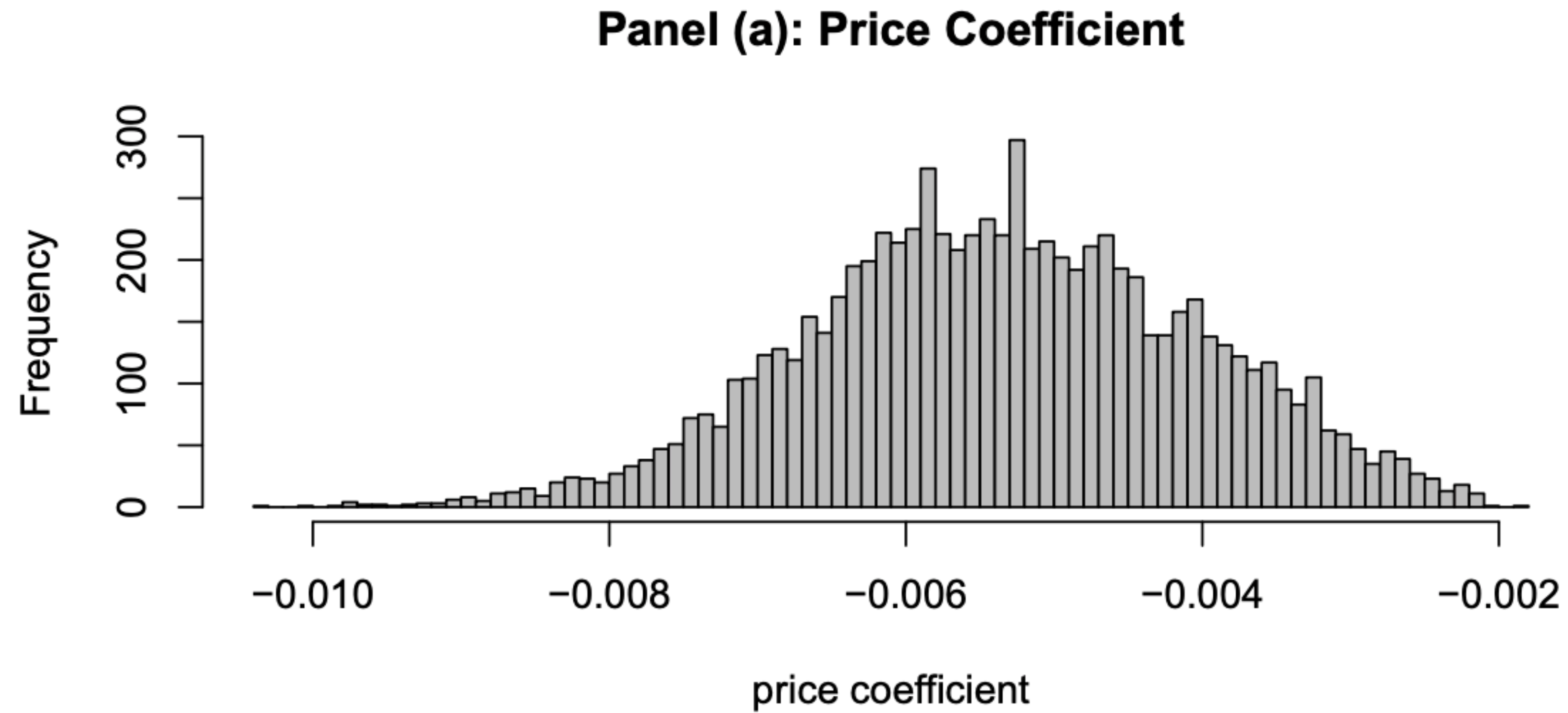


The screenshot shows a web form titled "Tell Us About Your Company". It has two tabs: "Hire for my company" (selected) and "Find a job". Below the tabs is a text input field for "Company Name". A dropdown menu is open, showing a list of job counts: "1 job", "2 to 3 jobs", "4 to 10 jobs", "11 to 20 jobs", "21 to 50 jobs", "50 to 100 jobs", "100 to 250 jobs", and "250+ jobs". The first option, "1 job", is selected and marked with a checkmark. At the bottom right of the form is a green "Continue" button.



# Predicted Price Sensitivities

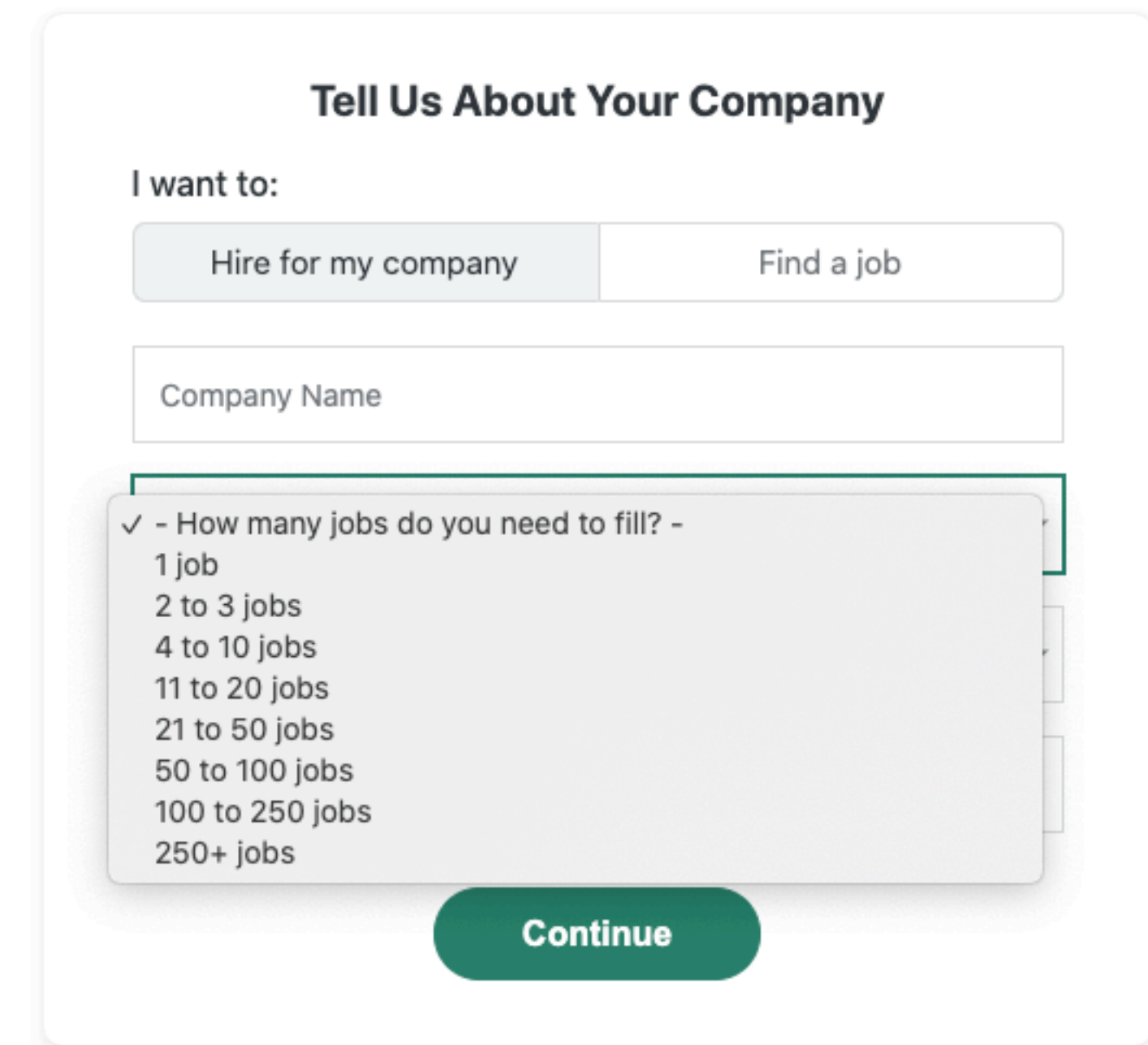
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# Top Predictors of Price Sensitivity

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- “job in British Columbia”
- “company type: staffing agency”
- “employment type: full\_time”
- “is resume required”
- Remember, this doesn’t mean that “is resume required” changes price response casually, it is merely predictive of price response.



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# Experiment 2: Using results from Experiment 1.

- Experiment 2: One Month, 5,315 firms.
- 3 pricing schemes:
- Control Pricing (\$99)
- Uniform Pricing (\$249)
- Targeted Pricing (Compute optimal price for every combination of characteristics)





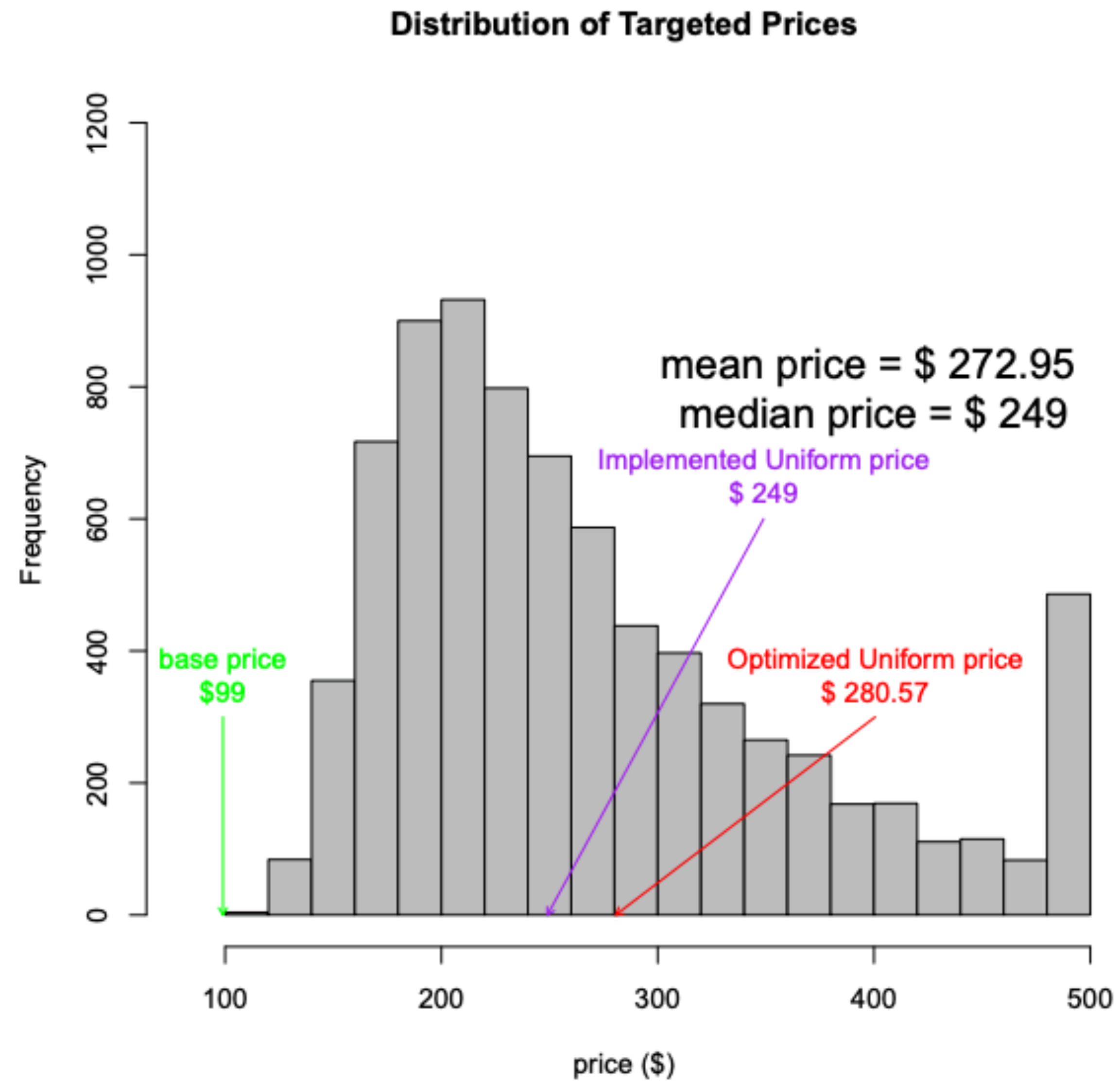


Figure 5: Optimized Prices (N=7,867).

# Improvement From Better Uniform Price

Pricing Structure	# subjects	Conversion Rate		Profit per Lead (\$)	
		Mean	95% Credibility Interval	Mean	95% Cred. Interval
Control	1360	0.26	(0.24,0.29)	25.76	(23.74, 28.5)
Implemented Uniform	1430	0.16	(0.13,0.19)	40.05	(32.97, 47.5)

# Improvement From Targeted Prices

Pricing Structure	# subjects	Conversion Rate		Profit per Lead (\$)	
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Implemented Uniform	1430	0.16	(0.13,0.19)	40.05	(32.97, 47.5)
Targeted	2485	0.15	(0.13,0.18)	44.74	(35.24, 54.09)



# What are we missing?

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- Competitive responses by other jobs platforms.
- Strategic responses by customers.  
For example, lying about job posting in order to avoid high prices.
- Canceling subscription earlier if higher price.
- Customer ‘backlash’ but less likely in business to business settings.

