The Effect of Paid Search Advertisement on Used Car Demand: The Moderating Role of Advertiser Credibility

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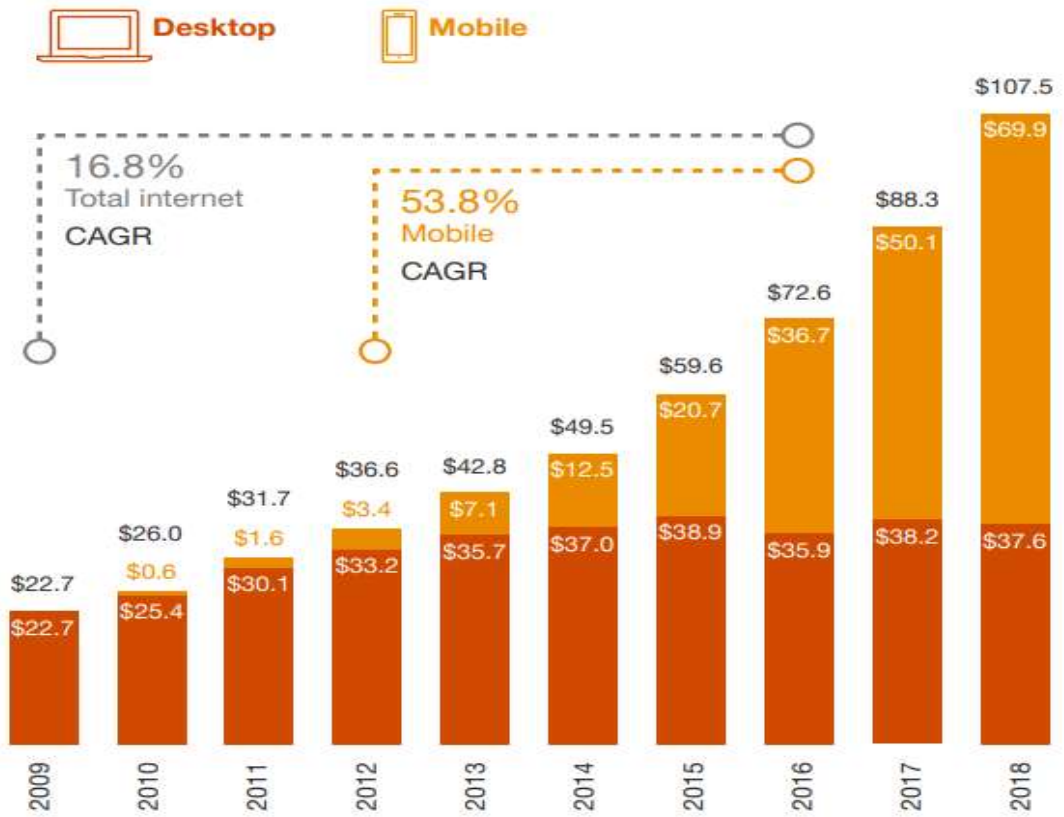
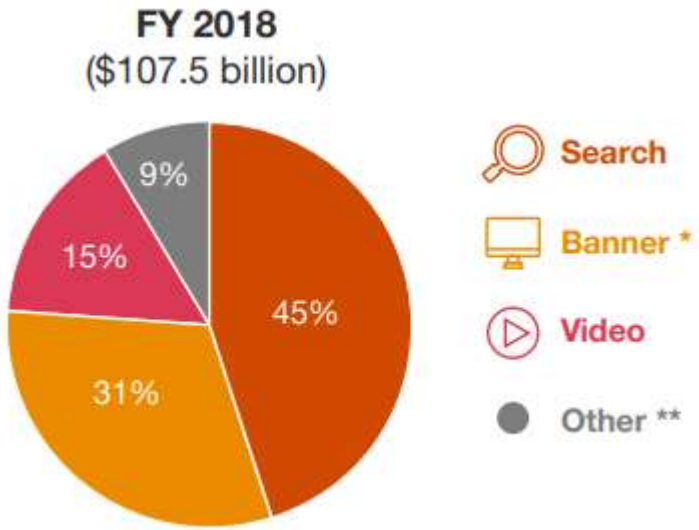
Agenda

- Research Motivation
- Research questions and objectives
- Data Description
- Model Development
- Empirical Results
- Implications
- Conclusion

Research Motivation

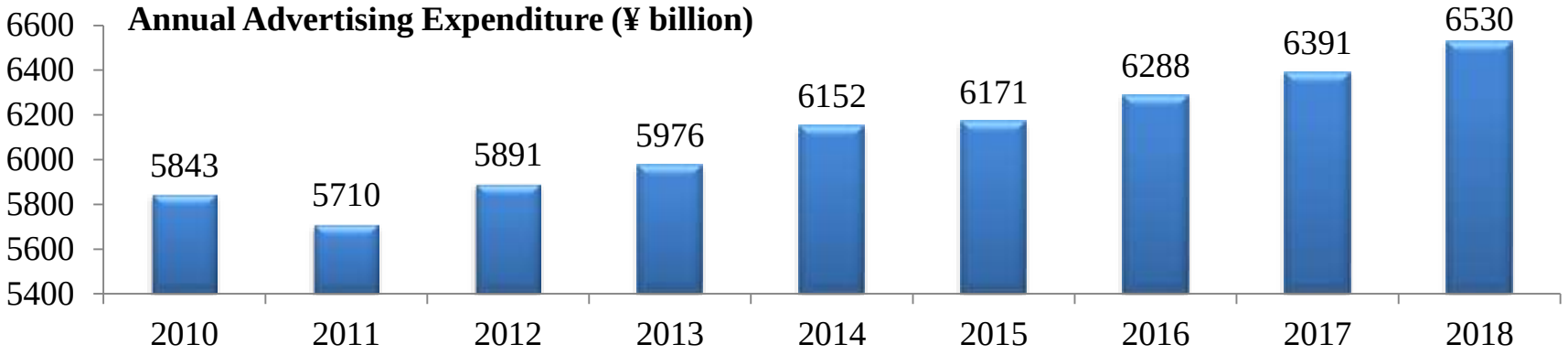
Digital Advertising Expenditure





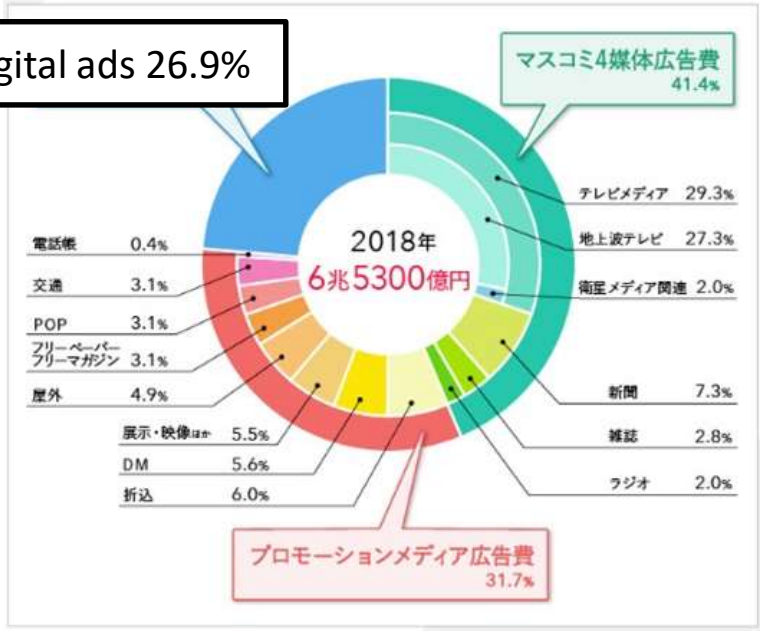
Source: Interactive Advertising Bureau (2019)

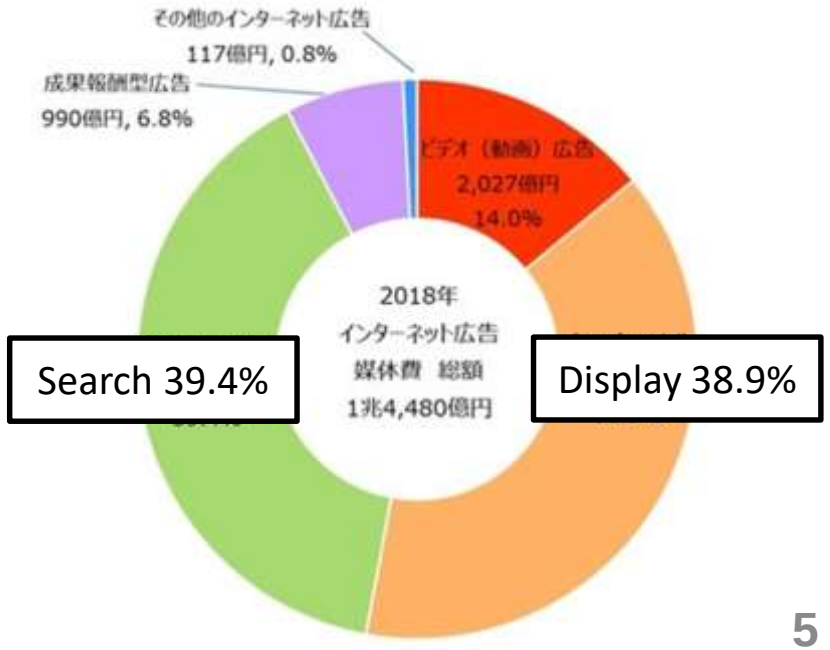
Advertising Expenditures in Japan



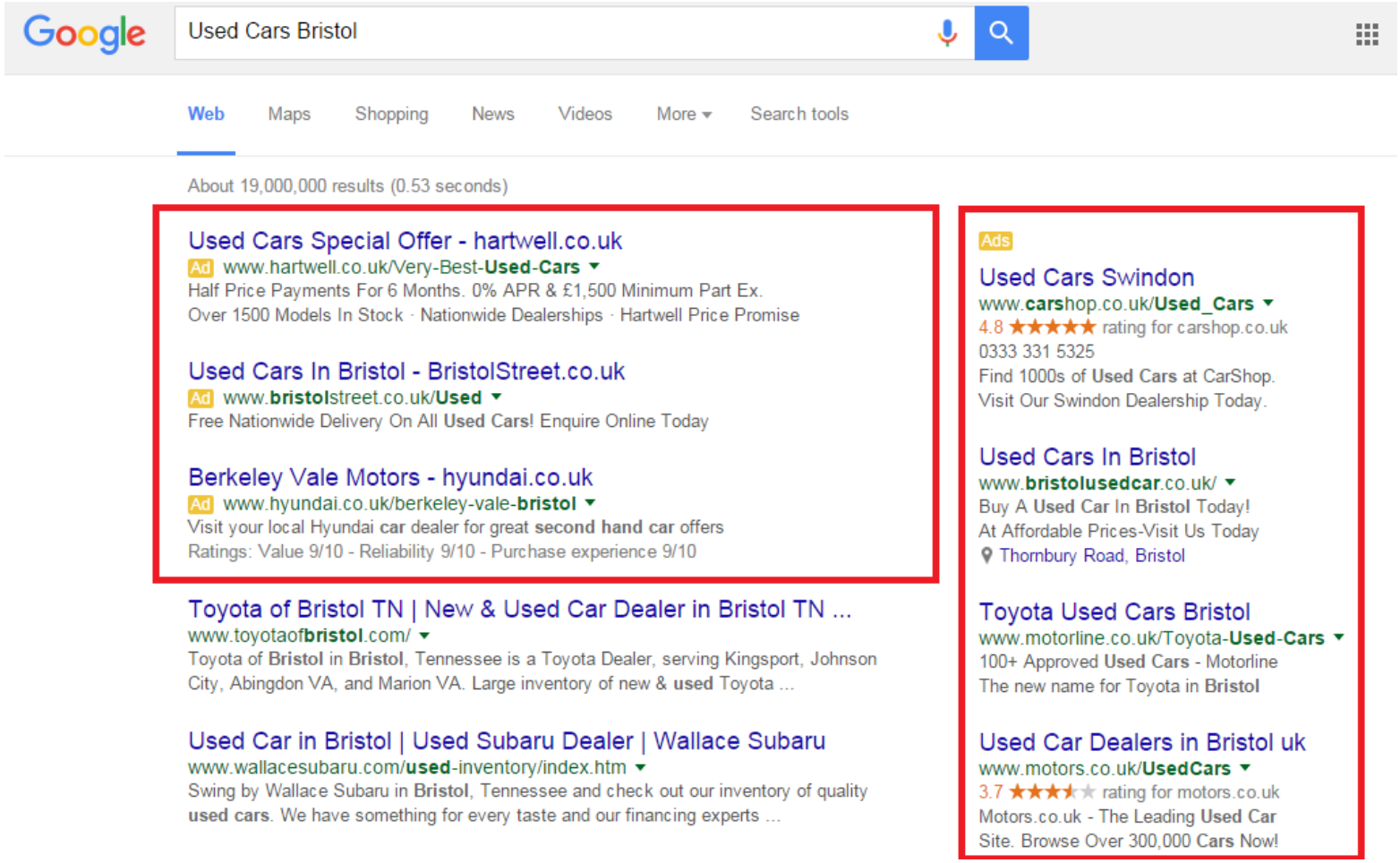
媒体別構成比

Digital ads 26.9%

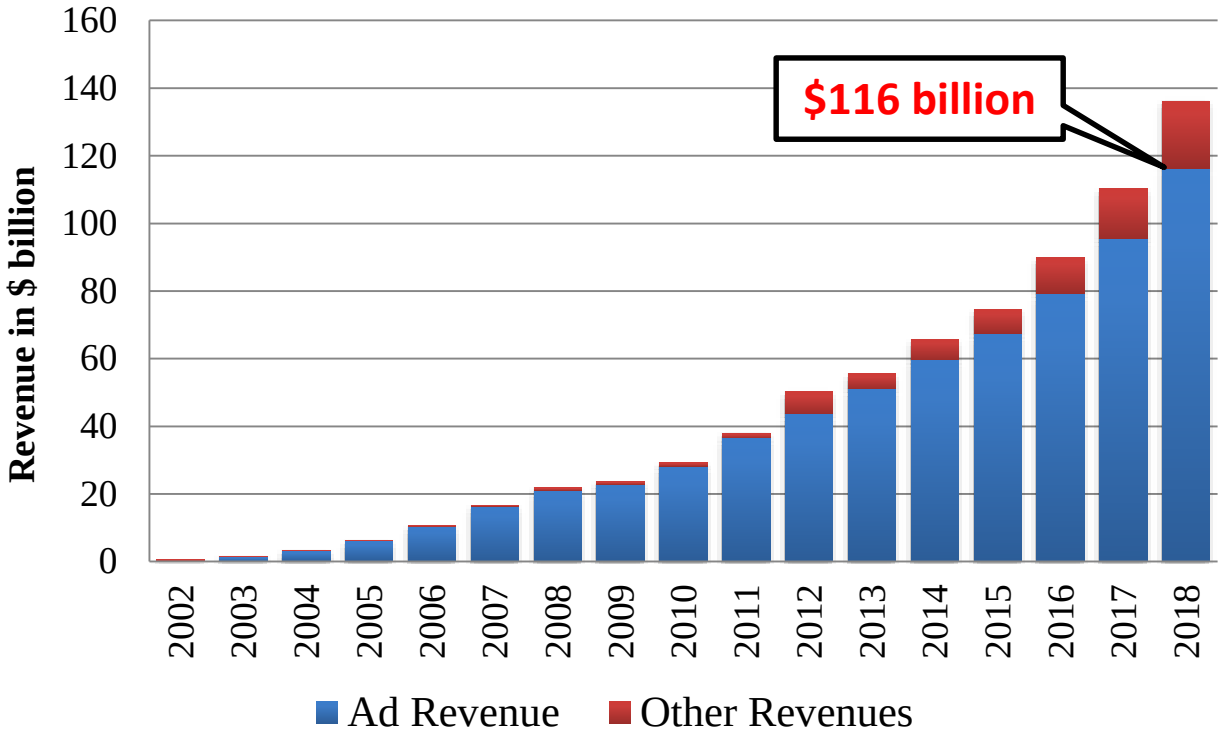


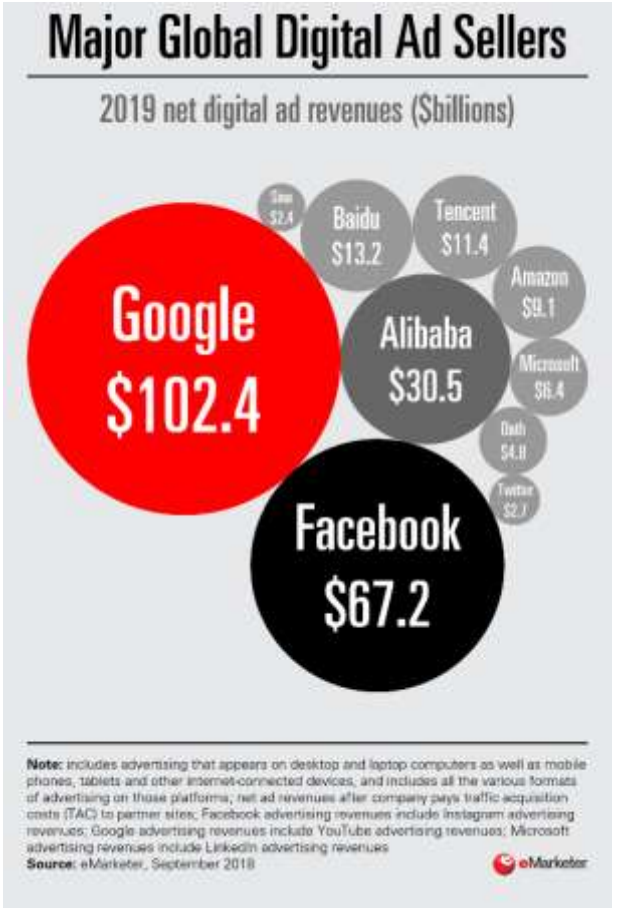


Google Search Ads



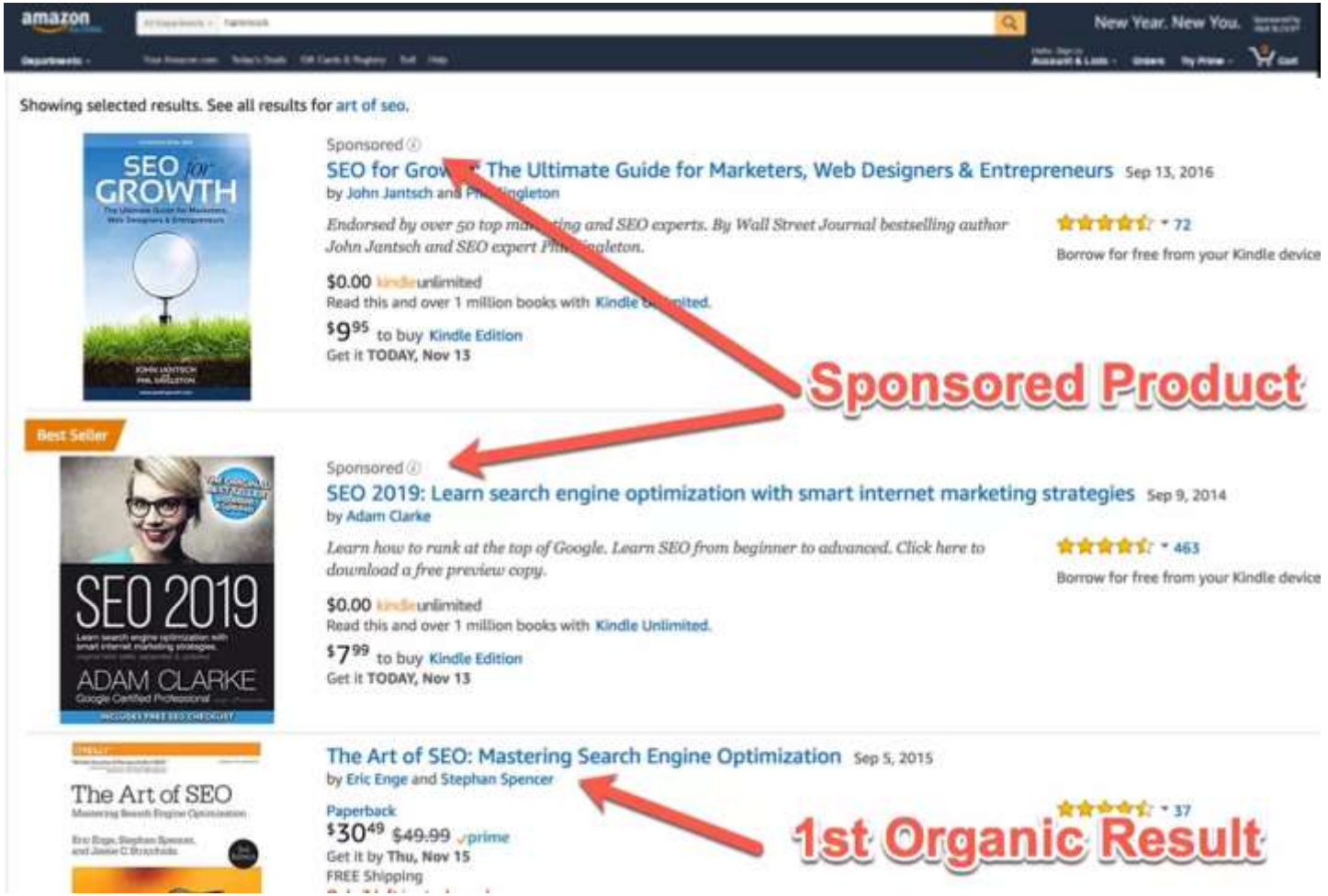
Google Worldwide Revenue



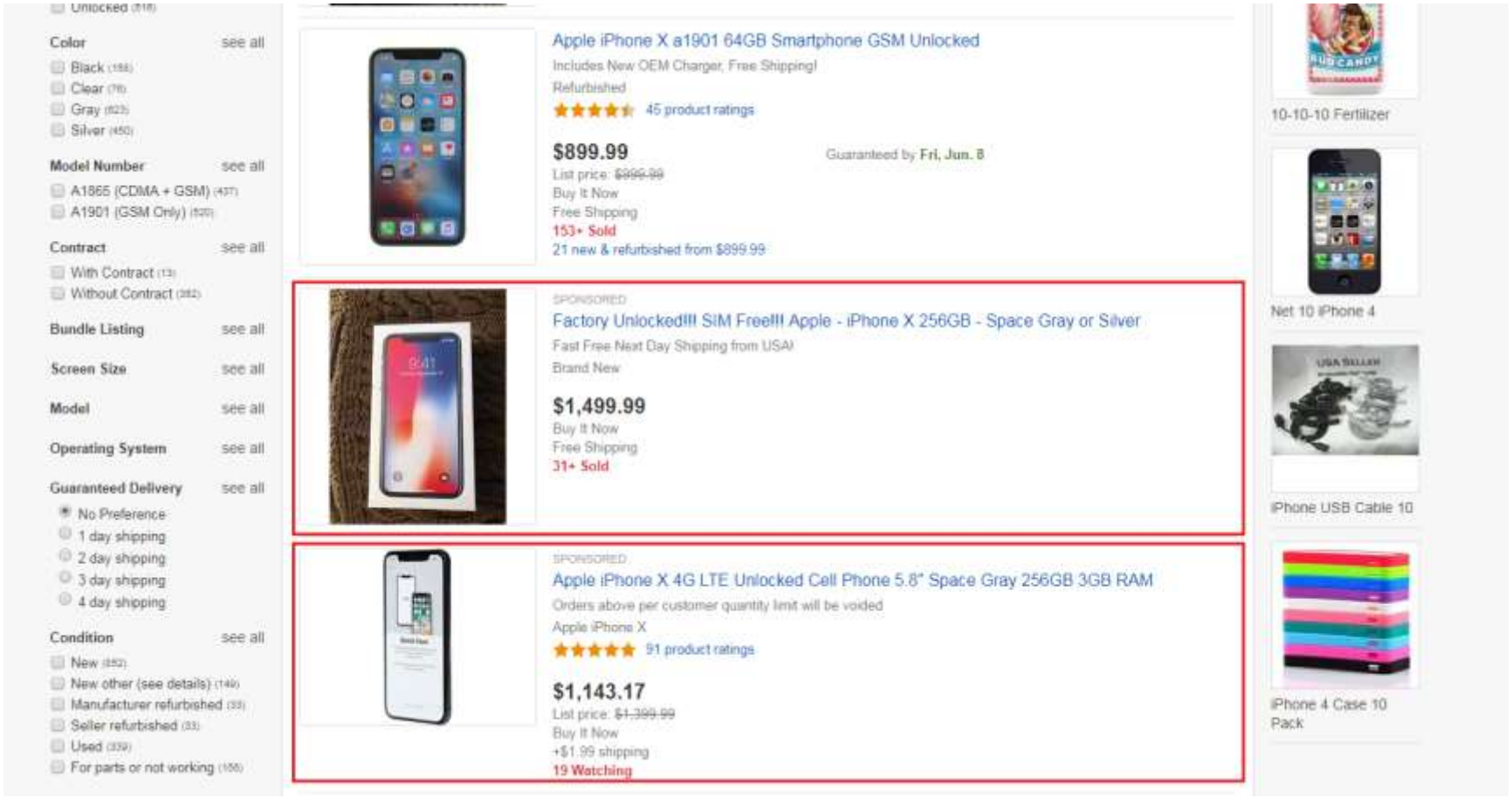


Source: Statista (2019)
https://www.statista.com/statistics/266249/advertising-revenue-of-google/

amazon sponsored products



ebay Promoted Listings
Bulk Uploads



Search Ads


augmented reality
NoMoss AR
Augment - 3D
INKHUNTER try de...
photo filters
LightRight
Photo filters for all lighting
GET
Rookie Cam™
Photo & Video
travel tracker
TripTrek
Visited - Travel tracker
Travel Personalized World Map
Set a travel goal

Sponsored Results

Features of Non-search Engine Platforms

Feature	Search Engine Platform	Non-search Engine Platform
Pricing scheme	Pay per click (PPC), prices is determined based-on second price auction .	• Fixed flat rate • A percentage of sales induced by the sponsored listings.
Number of slots	Very limited (3 to 5 slots for a keyword).	Larger number of slots. About 10 to 30 percent of overall listing.
Quality scores	Yes	No
Ad position	Top of search result pages.	• Top of search result pages. • Amid organic listings but with a sponsored identifier
Advertiser	**Primarily large retail, service, and manufacturing firms.**	**Broader range of advertisers including small firms and consumers in C2C marketplaces.**

Research Questions and Objectives

Related Research

- Paid search ads lead to an increase in:
  - Effective impression (Chan & Park, 2015).
  - Click-through rate (Goldman & Rao, 2016; Jeziorski & Segal, 2015; Yang & Ghose, 2010).
  - Conversion rate (Agarwal et al., 2011; Ghose & Yang 2009; Rutz, Bucklin, & Sonnier, 2012).

- Why search ads induce traffic and sales? (Narayanan & Kalyanam, 2015)
  - Consumers may use search ads as quality cues.
  - Consumers may perceive links displayed in upper positions as more relevant or providing better information.
  - Sponsored links drive greater attention from consumers.

The Role of Advertiser Characteristics

- The effect of search ads is small for well-known retailers such as eBay (Blake, Nosko, & Tadelis, 2015).
- Search ads could alter more than half of the traffic to a smaller company's website (Coviello, Gneezy, & Götte, 2017).
- Click-through rates (CTR) increased significantly when two small-size firms get a higher position in sponsored listings, but this appears not to be the case for a larger company (Narayanan & Kalyanam, 2015).
- Some retailers in the top 100 of Alexa rankings have only up to 13% higher CTR in position 1 than in position 2, while those not in the top 100 Alexa rankings experience a lift of 30% to 50% (Jeziorski & Moorthy, 2018).

In essence, the effect of search ads is likely to be *negatively* moderated by the size, popularity, or consumer awareness of the advertisers.

Limitations of the Extant Literature

- The primary focus has been on search engine platforms.
  - It is unclear how search ads would work in platforms run by other types of businesses (e.g., online retailers or C2C marketplaces).
  - In non-search engine platforms, there can be numerous advertisers with different **transaction experiences** and **credibility** (e.g., business and individual).

- The efficacy of search ads has been measured by using metrics such as CTR and conversion rate.
  - No study has been conducted to investigate the extent to which search ads affect the **selling duration** of a product (i.e., the time taken by an advertiser to sell a product since it was posted for sale).

Research Questions and Objectives

- Research questions:
  - Whether search ads increase conversion probability and accelerate selling duration in a non-search engine platform?
  - If so, how the effect would be moderated by the experience (new vis-à-vis regular) and organizational type (individual vis-à-vis business) of the advertisers?

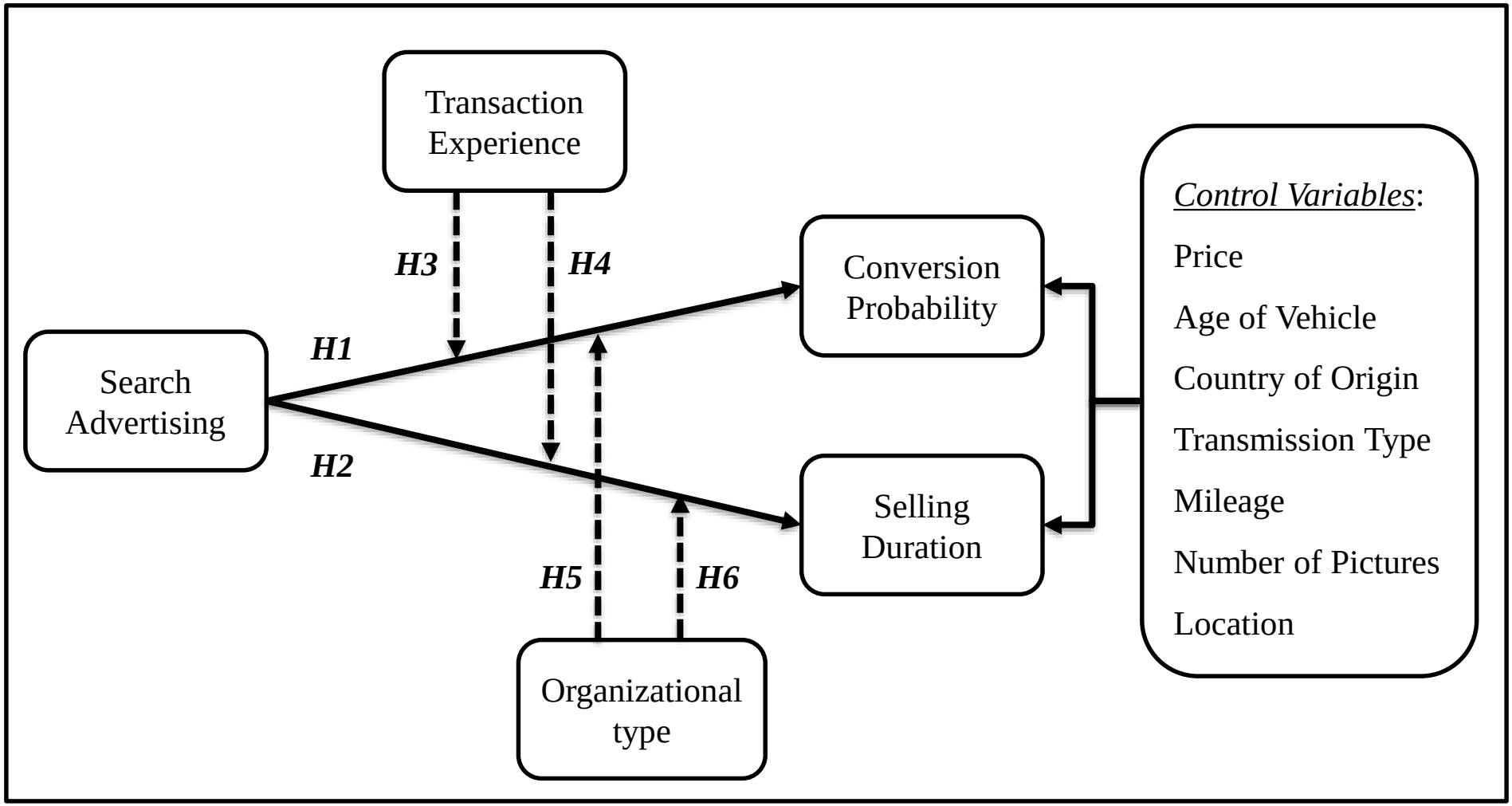
- Research objectives:
  - Investigating the effect of search ads on conversion probability and conversion probability of used cars transacted in an online marketplace.
  - Examining the moderating role of advertiser transaction experience and organizational type.

Research Positioning

Article	Advertising platform	Dependent Variable	Product category	Advertiser characteristics
Blake, Nosko, & Tadelis (2015)	Search engine	Click-through rate Profit	Not specified	Company size
Narayanan & Kalyanam (2015)	Search engine	Click-through rate Sales order	Consumer durables	Company size
Coviello, Gneezy, & Götte (2017)	Search engine	Click-through	Automotive information	Company size
Jeziorski & Moorthy (2018)	Search engine	Click-through rate	Digital camera	Company prominence evaluated by using Alexa ranking system
Sharma & Abhishek (2017)	Online marketplace	Click-through rate Conversion rate	Clothing Electronics	NA
This study	**Online marketplace**	Conversion rate **Selling duration**	**Used car**	**Transaction experience** **Organizational type**

Research Framework and Hypotheses

Conceptual Model



H1: Main Effect on Conversion Probability

- Search ads can improve the visibility and quality perceptions of a sponsored product (Narayanan & Kalyanam, 2015).
- The quality signaling effect is more salient for product categories with a high degree of information asymmetry (Sharma & Abhishek, 2017).
- Information asymmetry in the used car market is high (Akerlof, 1970).

H1: Search advertising increases the conversion probability of used cars sold in an online marketplace.

H2: Main Effect on Selling Duration

- As consumers tend to adopt a sequential search strategy and browse search result pages from top to bottom (Chan & Park, 2015), a sponsored product has a greater chance to be included in a consumer's consideration set before the consumer inspects other alternatives from organic results.

- At any point in the search process, consumers will either continue searching for a better alternative or make an immediate choice decision from the current consideration set depending on the marginal benefit and cost of the additional search (Rothschild, 1974).

- The uniqueness of a used car evokes scarcity perceptions (Suri, Kohli, & Monroe, 2007) that can reduce marginal benefit of search, eventually motivating consumers to make immediate purchase decision (Gabler & Reynolds, 2013).

H2: Search advertising shortens the selling duration of used cars sold in an online marketplace.

H3: Moderating Role of Transaction Experience

- Compared to novice advertisers, regular advertisers are likely to provide richer information such as transaction history, consumer reviews, and ratings.
- As consumers may use multiple cues when evaluating a used car (Gabbott, 1991), the availability of different sorts of information could reduce their reliance on search ads, leading to a weaker advertising effect.
- Sahni and Nair (2018) provide evidence that sponsored listings are more effective in inducing conversion for restaurants that have received fewer ratings.

H3: The effect of search advertising on conversion probability is stronger for new advertisers than for regular advertisers.

H4: Moderating Role of Transaction Experience

- Consumers who have transaction experiences with some regular advertisers should perceive fewer risks when evaluating products sold by the same sellers.
- Risk perception is positively associated with perceived benefits of search (Sundaram & Taylor, 1998).
- Consumers who have some products offered by regular advertisers in their consideration set should have lower intention to engage in additional searches.
- Claycomb and Frankwick (2004) show that buyer-seller relationship duration reduces the likelihood of buyer searching for a new supplier.

H4: The effect of search advertising on selling duration is stronger for regular advertisers than for new advertisers.

H5: Moderating Role of Organizational Type

- Intuitively, business advertisers would have higher expertise in the product category than their individual counterparts.
- Perceived expertise of a seller is positively associated with trust (Kim & Ahn, 2007) and perceived integrity of the seller (Pavlou & Gefen, 2004).
- Thus, consumers would find the information on used cars posted by business advertisers more reliable, and use the information as an alternative indicator of quality.
- The availability of different quality cues could reduce the importance of search ads as indicators of product quality.

H5: The effect of search advertising on conversion probability is stronger for individual advertisers than for business advertisers.

H6: Moderating Role of Organizational Type

- Higher perceived competency of business advertisers may lead to a higher predictability of the advertisers' behavior from consumers' perspective (Pavlou & Gefen, 2004).
- Business sellers should be perceived as more responsive because they typically have a department or person in charge of delivering information to consumers promptly.
- Lu, Zhao, and Wang (2010) show that perceived responsiveness is positively related to trust in other transaction members.
- Higher predictability and trust would lower perceived risks, eventually shortens the process of information search (Sundaram & Taylor, 1998).

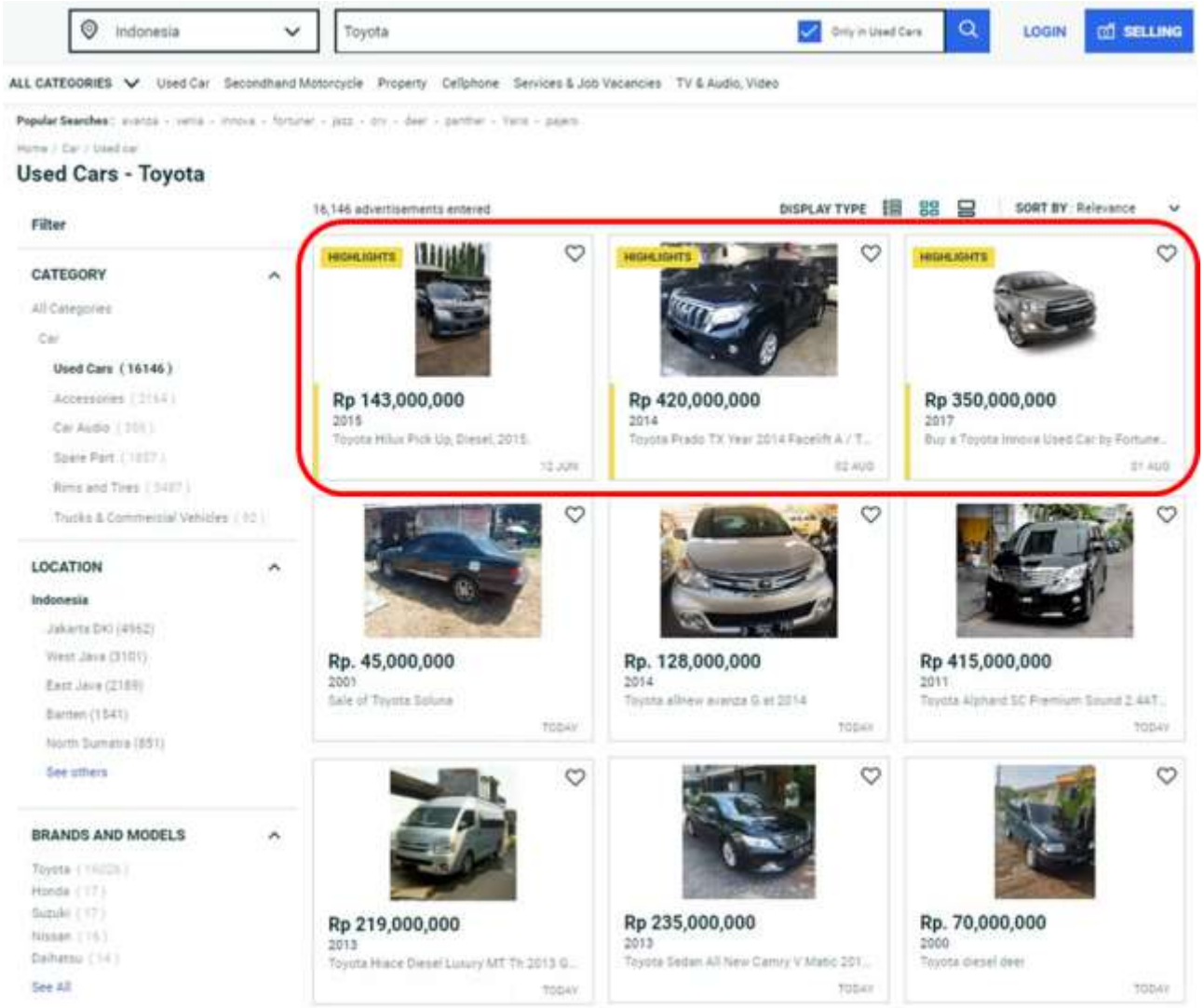
H6: The effect of search advertising on selling duration is stronger for business advertisers than for individual advertisers.

Data Description

Data Source and Institutional Features

- Data were provided by a company running an online marketplace for used cars, which is headquartered in Jakarta, Indonesia.
- Business and individual users can advertise their cars for sale, buy used cars, and communicate with each other within the marketplace.
- Sellers can advertise their products free of cost for 30 days.
- The hosting company provides a sponsored listing service with a fixed flat rate.
- The original data set contains information on almost four million used cars posted for sale from January to December 2017.
- We randomly selected one million of used cars after removing those having missing values.

Search Ads in the Focal Firm's Website

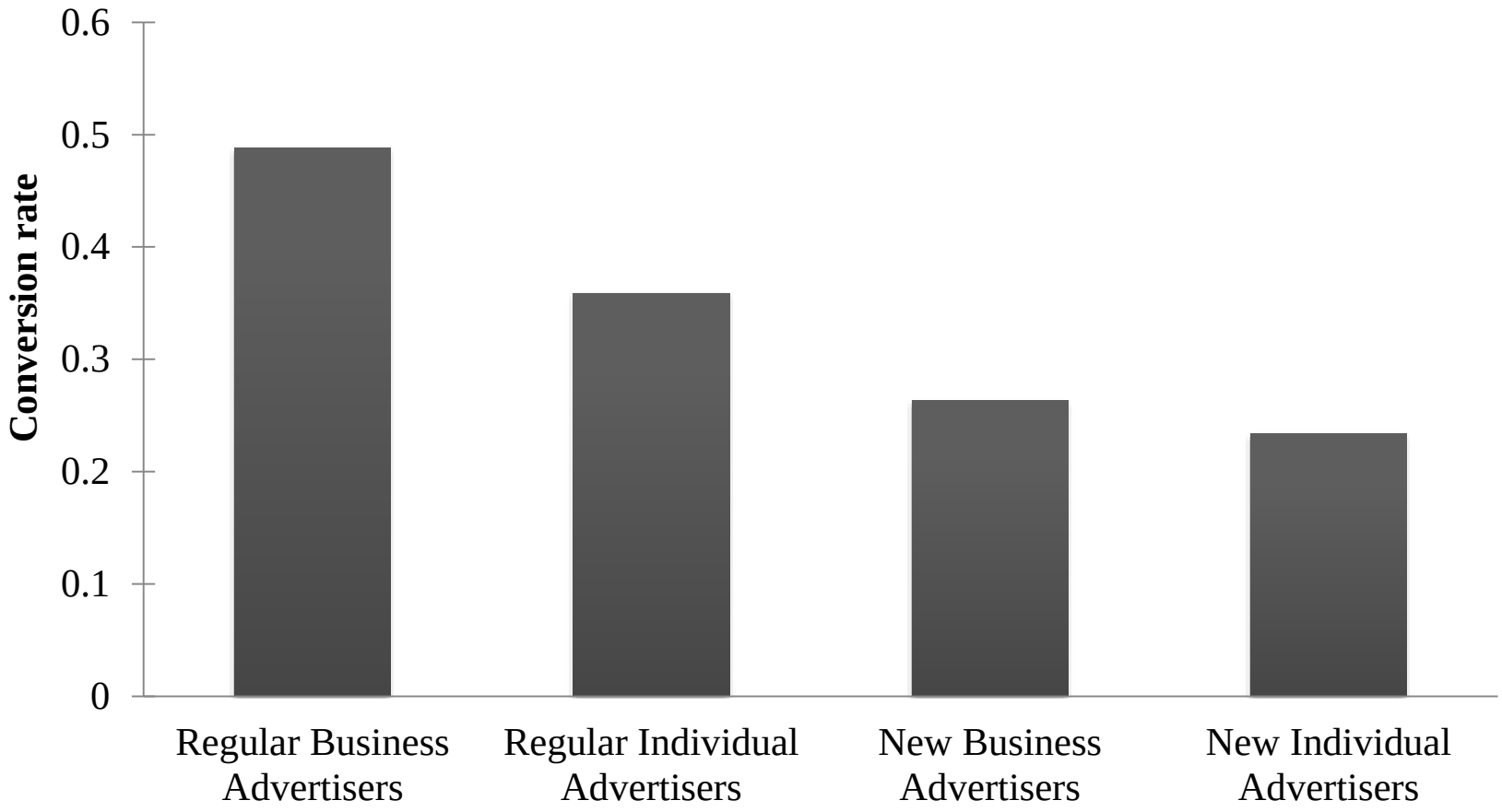


Descriptive statistics

Car/Advertiser Attributes	Number of cars
Conversion	447,252
Manual transmission	611,532
Mileage	
<5000 km	286,645
5000-10,000 km	47,552
10,000-15,000 km	40,156
15,000-20,000 km	35,947
20,000-25,000 km	38,148
25,000-30,000 km	71,518
>30,000 km	480,034
Country of origin	
Asian car	925,633
American car	25,729
European car	37,733
Other	10,905
Advertiser type	
Regular business	765,914
Regular individual	144,102
New business	20,727
New individual	69,257

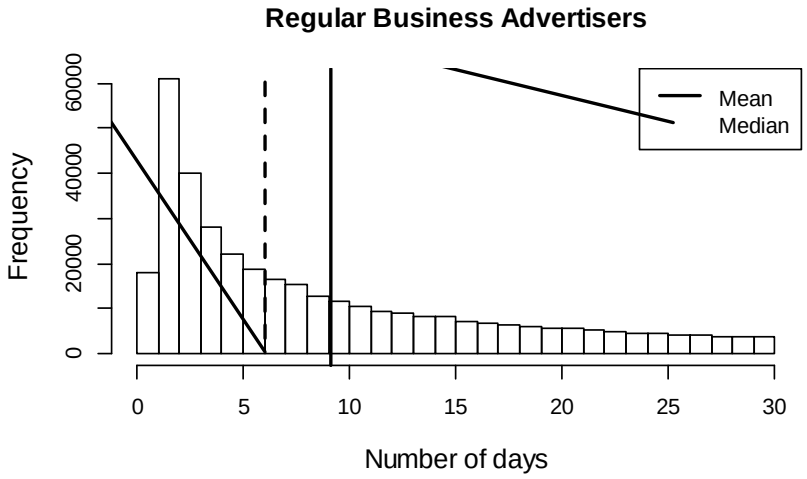
	Mean	SD	Min	Max
Log price	18.61	0.79	15.83	23.34
Age of car (years)	8.54	7.22	0	31
Selling duration (days)	9.35	7.86	1	30

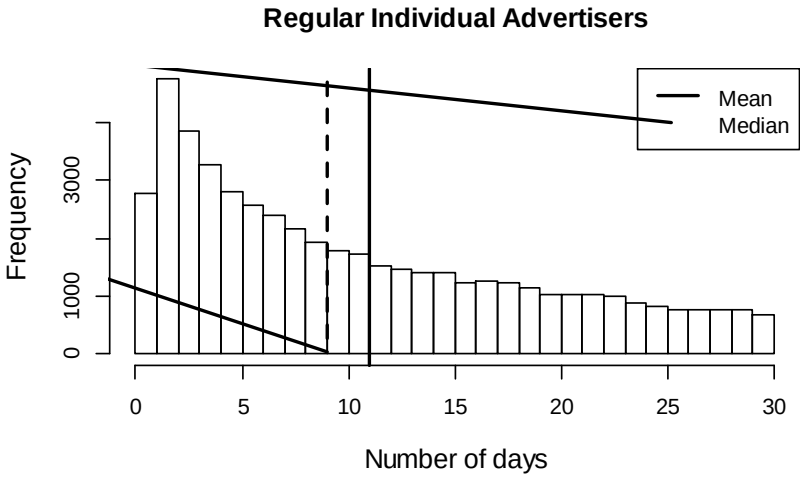
Conversion Rates of Different Advertisers

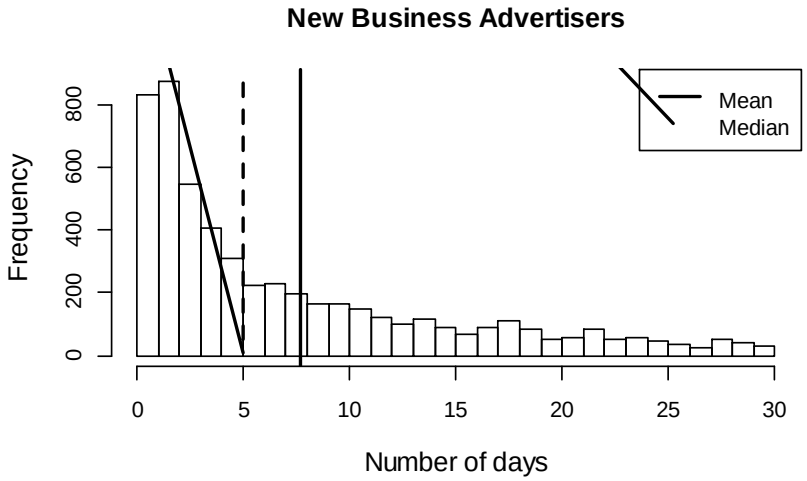


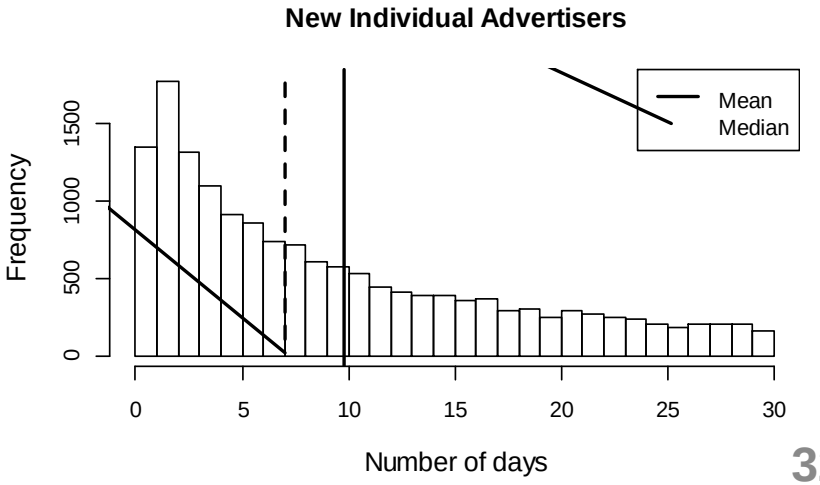
Note: we define conversion rate as the percentage of cars ended up with a conversion. It should not be confused with the commonly used definition, i.e., the ratio of the number of conversion to the number of click-through.

Selling Duration Distributions









Model Free Evidence

Advertiser Type	Conversion rate		Selling duration	
	With ads	Without ads	With ads	Without ads
Regular Business	0.604	0.422	8.123	9.947
Regular Individual	0.635	0.358	10.981	11.636
New Business	0.510	0.262	7.240	7.733
New Regular	0.532	0.233	8.615	9.830

Model Development

Dependent and Independent Variables

Dependent Variables	
Conversion Probability	Probability a car is purchased during the permissible advertising period.
Selling Duration	Time elapsed since the first day at which a car is posted until it is purchased.
Independent Variables	
AD	Binary indicator of whether a car appeared in sponsored listings.
PR	Logarithm of a car's price.
SQP	Square of PR
CAGE	Number of years elapsed since the production year of a vehicle.
ASC	Dummy variable of a car produced by an Asian manufacturer.
AMC	Dummy variable of a car produced by an American manufacturer.
EUC	Dummy variable of a car produced by a European manufacturer.
MAN	Binary indicator of whether a car has a manual transmission.
MILE	Number of miles traveled by a car.
PIC	Number of pictures of a car submitted by its advertiser
LOC	Dummy variable of whether the advertiser address is located in Java Island.

Some Issues in Model Development

- Right-censored selling duration
- Correlation between conversion probability and selling duration
  - Used car with higher conversion probability might have shorter selling duration.
- Endogeneity
  - Some dealers may stock numerous popular cars and use sponsored listings frequently to sell the cars more quickly.

Conversion Incidence Model

We assume the conversion probability of a car depends on its attractiveness, denoted by y_{1i}^{*}, which is partially determined by its attributes.

$$y_{1i}^{*} = \beta_0 + \beta_1 \mathrm{AD}_i + \beta_2 \mathrm{PR}_i + \beta_3 \mathrm{SQP}_i + \beta_4 \mathrm{CAGE}_i + \beta_5 \mathrm{ASC}_i + \beta_6 \mathrm{AMC}_i + \beta_7 \mathrm{EUC}_i + \beta_8 \mathrm{MAN}_i + \beta_9 \mathrm{MILE}_i + \beta_{10} \mathrm{PIC}_i + \beta_{11} \mathrm{LOC}_i + \varepsilon_{1i}, \quad (1)$$

where $\varepsilon_{1i} \sim N(0, \sigma_1^2)$ is an i.i.d random error.

Let d_i denote an indicator function that takes a value of 1 if a car is purchased during the advertising period, and equals 0 if otherwise.

$$d_i = \begin{cases} 1, & y_{1i}^{*} > 0 \\ 0, & y_{1i}^{*} \leq 0 \end{cases} \quad (2)$$

Selling Duration Model

We employ a Type II Tobit specification for selling duration. We only observe the selling duration of cars ending up with conversion, denoted by y_{2i}. Let y_{2i}^* be a latent variable corresponding to y_{2i}, the censoring mechanism is given by:

$$y_{2i} = \begin{cases} y_{2i}^*, & y_{1i}^* > 0 \\ c, & y_{1i}^* \leq 0 \end{cases}, \tag{3}$$

where c is equal to 30 days, the maximum admissible advertising period. We model y_{2i}^* as follows.

$$\begin{aligned} y_{2i}^* = \gamma_0 + \gamma_1 \mathrm{AD}_i + \gamma_2 \mathrm{PR}_i + \gamma_3 \mathrm{SQP}_i + \gamma_4 \mathrm{CAGE}_i + \gamma_5 \mathrm{ASC}_i + \gamma_6 \mathrm{AMC}_i \\ + \gamma_7 \mathrm{EUC}_i + \gamma_8 \mathrm{MAN}_i + \gamma_9 \mathrm{MILE}_i + \gamma_{10} \mathrm{PIC}_i + \gamma_{11} \mathrm{LOC}_i + \varepsilon_{2i}, \end{aligned} \tag{4}$$

where $\varepsilon_{2i} \sim N(0, \sigma_2^2)$ is an i.i.d random error.

Correlation between Conversion and Duration

The Tobit specification allows for the correlation between conversion incidence and duration, $\rho_{12} = Cor(\varepsilon_{1i}, \varepsilon_{2i})$. It can be shown that the expected value of selling duration conditional on conversion depends on this correlation.

$$E(y_{2i}^{*}|y_{1i}^{*} > 0) = x_i'\gamma - \rho_{12}\sigma_2\lambda\left(\frac{x_i'\beta}{\sigma_1}\right), \quad (5)$$

where the function $\lambda(\cdot)$ is the inverse Mills ratio. Thus, the marginal effect of search ads on selling duration is given by:

$$\frac{\partial E(y_{2i}|y_{1i}^{*} > 0)}{\partial \mathrm{AD}_i} = \gamma_1 - \rho_{12}\sigma_2\beta_1\lambda(x_i'\beta)[x_i'\beta + \lambda(x_i'\beta)]. \quad (6)$$

Endogeneity

To deal with endogeneity issue, we simultaneously model advertiser decision to use search ads. We assume this decision is determined by the advertiser expectation of a car's conversion likelihood and selling duration, denoted by EXCON and EXDUR, respectively. Let y_{3i}^{*} be the latent utility to use search advertising for car i which is given by:

$$y_{3i}^{*} = \delta_0 + \delta_1 \mathrm{EXCON}_i + \delta_2 \mathrm{EXDUR}_i + \varepsilon_{3i}, \quad (7)$$

where $\varepsilon_{3i} \sim N(0, \sigma_3^2)$ is an i.i.d random error. Because neither EXCON nor EXDUR is observable by the researcher, we model these variables as follows.

$$\text{Probit}\,(\mathrm{EXCON}_i) = \zeta_0 + \zeta_1 \mathrm{CAGE} + \zeta_2 \mathrm{ASC}_i + \zeta_3 \mathrm{AMC}_i + \zeta_4 \mathrm{EUC}_i + \zeta_5 \mathrm{MAN}_i + \zeta_6 \mathrm{MILE}_i \quad (8)$$

$$\mathrm{EXDUR}_i = \xi_0 + \xi_1 \mathrm{CAGE} + \xi_2 \mathrm{ASC}_i + \xi_3 \mathrm{AMC}_i + \xi_4 \mathrm{EUC}_i + \xi_5 \mathrm{MAN}_i + \xi_6 \mathrm{MILE}_i + e_i \quad (9)$$

Estimation Procedure (MCMC)

- Draw ζ and ξ in Equation (8) and (9).
- Calculate the predicted value of EXCON_i and EXDUR_i.
- Generate the value of $(y_{1i}^*, y_{2i}^*, y_{3i}^*)$ from the corresponding univariate conditional distribution (Ansari, Mela, & Neslin, 2008).

$$p(y_{1i}^*, y_{2i}^*, y_{3i}^*) = p(y_{1i}^*)p(y_{2i}^*|y_{1i}^*)p(y_{3i}^*|y_{1i}^*, y_{2i}^*) \quad (10)$$

- Draw β, γ and δ from the seemingly unrelated regression (SUR) system.

$$y = X\theta + E \quad (11)$$

$$y = (y_1^*, y_2^*, y_3^*)', \theta = (\beta, \gamma, \delta)', E = (\varepsilon_1, \varepsilon_2, \varepsilon_3)', \; X = \begin{bmatrix} x & 0 & 0 \\ 0 & x & 0 \\ 0 & 0 & z \end{bmatrix}$$

where x and z are vectors of independent variables in Equation (1) and (7) stacked over the whole sample.

- Draw Σ

$$\Sigma = \begin{bmatrix} \sigma_1^2 & \sigma_{12} & \sigma_{13} \\ \sigma_{21} & \sigma_2^2 & \sigma_{23} \\ \sigma_{31} & \sigma_{32} & \sigma_3^2 \end{bmatrix} = \begin{bmatrix} \Sigma_{11} & \Sigma_{12} \\ \Sigma_{21} & \sigma_3^2 \end{bmatrix}$$

Data Augmentation

Data augmentation for y_{1i}^*.

$$y_{1i}^* \sim \begin{cases} TN_{(-\infty,0]}(x_i'\beta, \sigma_1^2), & d_i \leq 0 \\ TN_{(0,\infty)}(x_i'\beta, \sigma_1^2), & d_i > 0 \end{cases} \tag{12}$$

where $\beta = (\beta_0, \beta_1, \ldots, \beta_{11})'$ and x_i is a vector of independent variables in Equation (1) and (4). We set $\sigma_1 = 1$ for identification purposes.

Data augmentation for $y_{2i}^* | y_{1i}^*$.

$$y_{1i}^* > 0, \qquad y_{2i}^* = y_{2i} \tag{13}$$

$$y_{1i}^* \leq 0, \qquad y_{2i}^* | y_{1i}^* \sim TN_{(c,\infty)}(\mu_{2i}, \xi_{2i}) \tag{14}$$

where

$$\mu_{2i} = x_i'\gamma - \rho_{12}\sigma_2\lambda(x_i'\beta) \tag{15}$$

$$\xi_{2i} = \sigma_2^2\{1 - \rho_{12}^2\lambda(x_i'\beta)[\lambda(x_i'\beta) + x_i'\beta]\}. \tag{16}$$

Data Augmentation

Data augmentation for $y_{3i}^*|y_{1i}^*, y_{2i}^*$.

$$y_{3i}^*|y_{1i}^*, y_{2i}^* \sim \begin{cases} TN_{(-\infty,0]}(\mu_{3i}, \xi_3), & \text{AD}_i \leq 0 \\ TN_{(0,\infty)}(\mu_{3i}, \xi_3), & \text{AD}_i > 0 \end{cases} \tag{17}$$

where

$$\mu_{3i} = z_i'\delta - \Sigma_{21}\Sigma_{11}^{-1}(y_{12i}^* - \mu_{12}) \tag{18}$$

$$\xi_3 = \sigma_3^2 - \Sigma_{21}\Sigma_{11}^{-1}\Sigma_{12} \tag{19}$$

$$y_{12i}^* = (y_{1i}^*, y_{2i}^*)' \tag{20}$$

$$\mu_{12} = (x_i'\beta, x_i'\gamma)' \tag{21}$$

Empirical Results

Correlation Estimates

	Conversion	Duration	Advertising
Conversion	1.000		
Duration	−0.680	1.000	
Advertising	*0.001*	*−0.002*	1.000

Note: Non-significant results are presented in italic.

Results for Advertising Decision Model

	Regular Business Advertiser		Regular Individual Advertiser		New Business Advertiser		New Individual Advertiser	
	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD
CONS	−2.571	0.136	−0.760	0.096	−0.243	0.107	−0.266	0.116
EXCON	**5.901**	0.303	*0.208*	*0.117*	*−0.048*	*0.086*	*−0.102*	*0.119*
EXDUR	**−0.059**	0.004	*0.005*	*0.004*	*0.001*	*0.010*	*−0.001*	*0.005*

Note: Non-significant results at 95% are presented in italic.

Results for Conversion Model

	All Sample		Regular Business Advertiser		Regular Individual Advertiser		New Business Advertiser		New Individual Advertiser	
	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD
CONS	−5.954	0.099	−7.778	0.256	−4.951	0.139	−3.156	0.279	−3.876	0.097
AD	**0.574**	**0.117**	**0.505**	**0.120**	**0.689**	**0.132**	**0.650**	**0.129**	**0.844**	**0.148**
PR	0.572	0.012	0.821	0.028	0.410	0.017	0.202	0.035	0.212	0.013
SQP	−0.016	0.000	−0.024	0.001	−0.010	0.001	−0.005	0.001	−0.004	0.001
CAGE	0.009	0.000	0.009	0.000	0.004	0.001	0.022	0.002	0.014	0.001
ASC	0.033	0.007	0.023	0.009	0.070	0.019	*−0.070*	*0.071*	0.075	0.031
AMC	−0.194	0.010	−0.197	0.012	−0.166	0.023	−0.309	0.092	−0.108	0.040
EUC	−0.151	0.014	−0.074	0.019	−0.220	0.032	−0.403	0.114	−0.372	0.043
MAN	0.079	0.002	0.087	0.003	0.063	0.008	−0.053	0.021	*0.018*	*0.012*
MILE	0.111	0.005	0.065	0.004	0.203	0.008	0.183	0.023	0.338	0.015
PIC	0.056	0.001	0.058	0.001	0.045	0.002	0.040	0.004	0.022	0.002
LOC	−0.036	0.003	−0.036	0.002	−0.027	0.006	−0.062	0.020	−0.042	0.009

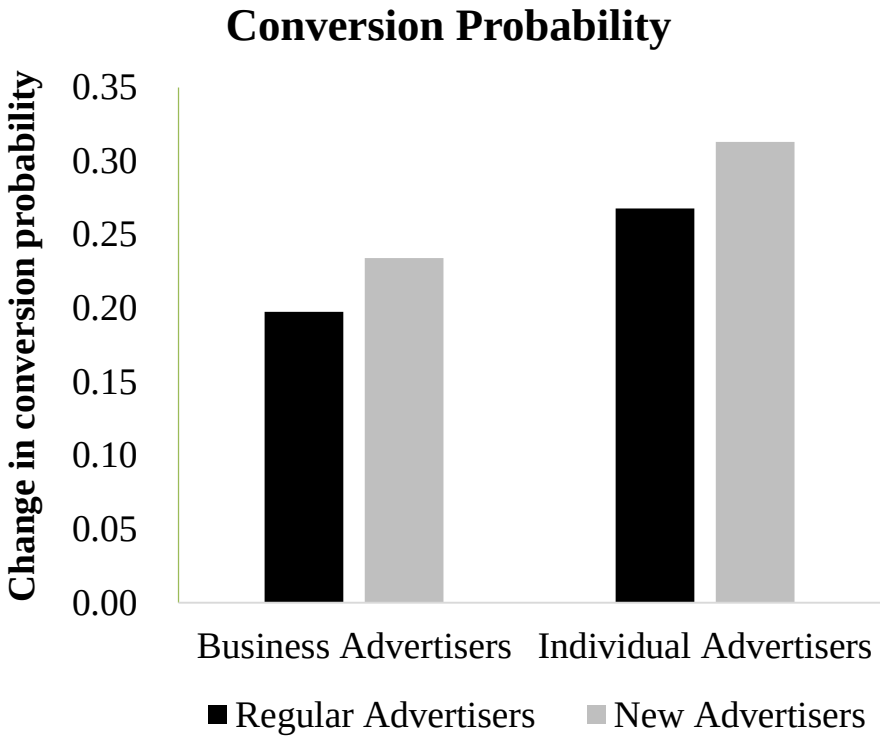
Note: Non-significant results at 95% are presented in italic.

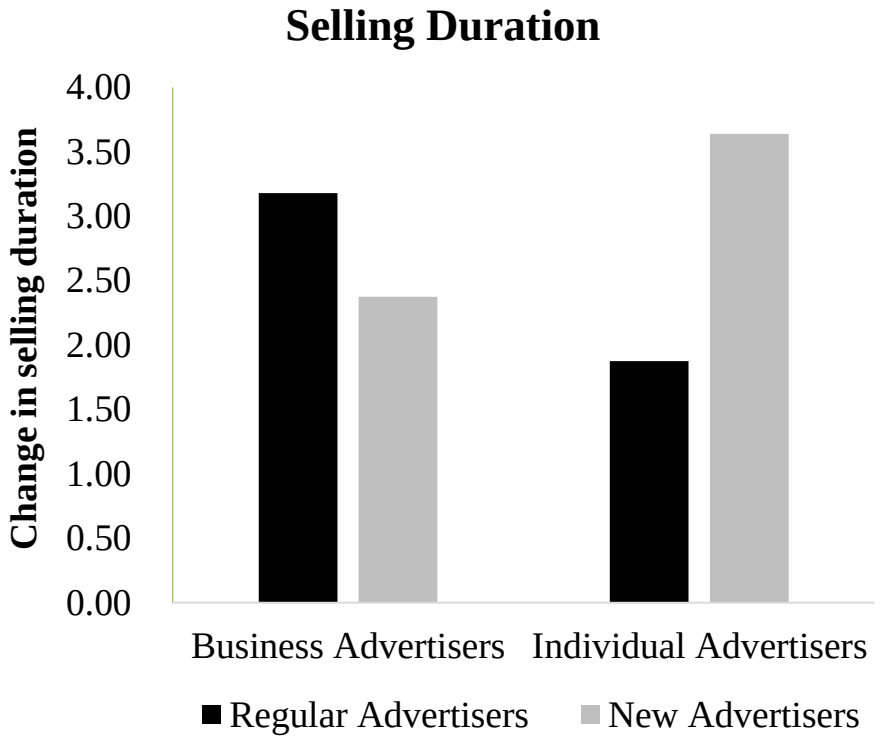
Results for Duration Model

	All Sample		Regular Business Advertiser		Regular Individual Advertiser		New Business Advertiser		New Individual Advertiser	
	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD	Post Mean	Post SD
CONS	46.064	0.425	50.406	0.622	42.560	0.858	39.945	2.531	38.931	0.728
AD	**−7.224**	**0.372**	**−6.551**	**0.451**	**−6.037**	**0.707**	**−6.718**	**1.321**	**−8.402**	**1.098**
PR	−1.924	0.063	−2.885	0.080	−1.117	0.102	−0.881	0.344	−0.350	0.130
SQP	0.060	0.002	0.097	0.003	0.028	0.004	0.022	0.013	*0.002*	*0.005*
CAGE	−0.074	0.003	−0.086	0.004	*−0.005*	*0.004*	−0.190	0.017	−0.078	0.008
ASC	−0.554	0.096	−0.454	0.110	−0.847	0.224	*0.391*	*0.735*	−0.808	0.338
AMC	2.173	0.152	2.387	0.145	1.411	0.258	2.139	0.929	*0.540*	*0.426*
EUC	1.904	0.197	1.631	0.247	1.624	0.368	2.543	1.172	1.815	0.425
MAN	−1.213	0.028	−1.376	0.038	−0.745	0.081	*0.239*	*0.246*	−0.264	0.106
MILE	−0.846	0.057	−0.457	0.071	−1.753	0.112	−0.837	0.276	−2.088	0.137
PIC	−0.507	0.006	−0.538	0.007	−0.383	0.018	−0.358	0.042	−0.130	0.020
LOC	0.362	0.029	0.400	0.040	0.200	0.091	0.490	0.217	0.220	0.087

Note: Non-significant results at 95% are presented in italic.

Testing of Moderating Effects





Advertiser	Marginal Effect	Confidence Interval
Regular	0.206	[0.069, 0.081]
New	0.281	
Business	0.196	[0.065, 0.092]
Individual	0.274	

Advertiser	Marginal Effect	Confidence Interval
Regular	−3.309	[0.231, 0.429]
New	−3.001	
Business	−2.416	[0.682, 0.875]
Individual	−3.194	

Summary of Hypothesis Testing

Hypothesis	Antecedent/moderator	Consequence	Predicted direction	Result
H1	Search advertising	Conversion probability	(+)	Supported
H2	Search advertising	Selling duration	(−)	Supported
H3	Transaction experience	Conversion probability	(−)	Supported
H4	Transaction experience	Selling duration	(−)	Supported
H5	Organizational type (business)	Conversion probability	(−)	Supported
H6	Organizational type (business)	Selling duration	(−)	Not supported

Implications

- Theoretical Implications
  - Empirical evidence of the positive impacts of search ads on conversion in an online marketplace.
  - Novel insights into how search advertising can shorten selling duration.
  - The efficacy of search advertising varies depending on the transaction experience and organizational type of advertisers.
- Managerial Implications
  - Pricing strategy: customizing search ad prices to different advertiser segments should be more profitable than imposing a fixed flat rate.
  - Optimal advertising budget.
  - Efficient inventory management.