
“Consumer choice of theatrical productions: a combined revealed preference – stated preference approach”

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Empirical Economics, 2016

Structure

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Motivation

- ✓ One of a few papers used RP-SP method
- ✓ Comparison of SP and RP methods
- ✓ Along with performance characteristics the model includes the socio-demographic indicators
- ✓ Explore the differences in tastes

Purpose of the study

- theatrical production comprises a bundle of attributes (type of show, the cast, the conductor...)
 - there is no separate market for these individual attributes
 - people' preferences and WTP can be ascertained by asking consumers directly (SP) or inferring from how they actually behave (RP)
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- ✓ To analyze factors that determine theatre demand using a model with joint RP and SP data
 - ✓ To estimate willingness-to-pay (WTP) for the different attributes of a theatre production

RP and SP methods

Revealed preferences

Method of analyzing choices made by individuals which asserts that the best way to measure consumer preferences is to observe their purchasing behavior.

- Based on what consumers do, rather than they say will do,
- requires large datasets,
- does not allow to test hypothesis about the attributes of theatrical productions, if they are not separable.

RP and SP methods

Stated preferences

Method of analyzing choices by asking individuals what they will do in a particular situation

- Allows to run an experiment,
- allows to induce variation in attributes that may take a long time to observe in the RP market,
- obviates the need to collect large datasets.

RP and SP methods

Similarities

- Lancaster' theory of consumer demand (Lancaster, 1966);
- Random Utility Theory (RUT);
- the same underlying choice process;
- both models can be estimated using discrete choice models (DCM).

RP and SP methods

RP-SP method:

- RP data embody the market equilibrium;
- RP-SP data contain realism that might not be attained in an SP study;
- RP responses makes the respondent the SP task more thoughtfully;
- RP-SP model can achieve higher efficiency and improved the model predictive ability.

Theoretical Background

Lancaster's theory of consumer demand:

$$U_{njt} = \beta X_{njt} + \varepsilon_{njt},$$

n – individual,

j – alternative,

t – choice situation.

Theoretical Background

Multinomial logit (MNL):

$$U_{njt} = \beta X_{njt} + \varepsilon_{njt},$$

$$\varepsilon_{njt} \sim \text{i.i.d. EV I.}$$

The probability that the individual i chooses the alternative j in the choice situation:

$$P_{njt} = \frac{\exp(\beta x_{njt})}{\sum \exp(\beta x_{nqt})}, \forall j.$$

Theoretical Background

Mixed logit (MXL):

$$U_{njt} = \beta_n X_{njt} + \varepsilon_{njt},$$

$$U_{njt} = (\beta + v_n) X_{njt} + \varepsilon_{njt}.$$

The probability that the individual i chooses the alternative j in the choice situation:

$$P(y_n = j) = P(y_n | \beta_n) P(\beta_n = b).$$



Theoretical Background

Willingness to pay - the maximum price at or below which a consumer will definitely buy one unit of the product:

$$WTP = \frac{\partial V / \partial x_k}{\partial V / \partial P} = \frac{\beta_k}{\beta_c}$$

Data

- Theatre Royal (Newcastle)
- 380 shows per year
- 1224 seating capacity
- the regional home of Royal Shakespeare Company
- 700 questionnaires were post (5 weeks)
- 421 were returned
- 353 questionnaire is a final dataset
- people attended six shows

Data

	Type of play	Show	Min price (£)	Max Price (£)	Average price	Reviews	Cast
1	Drama	For King & Country	8	25	16.5	V. good	
2	Ballet	Eternal Light Tour	9.5	22	16.5		
3	Drama	An Inspector Calls	12	25	17.54	Must see	
4	Family show	Le Grand Cirque Fantasy	12.5	33.5	25.80		
5	Musical	Jolson & Co	14	29	19.54		Famous
6	Drama	Waiting for Godot	10	40	27.06		Famous

Data

- age (divided into four groups),
- income,
- status (student, friends of theatre),
- marital status,
- children.

Data. Revealed preferences

- performance;
- price;
- alternatives available for consumer (in Theatre Royal):
 - include individuals who chose the venue and then the play,
 - exclude who ignored the alternatives,
 - exclude who selected on impulse,
 - exclude who attended because someone else had made the decision,
 - exclude who considered plays at other theatres.

60% of individuals were suitable candidates for inclusion in a RP model

Questionnaire design

Variable	Levels
Price (pounds)	15, 22, 30, 45
Type of show	Drama (baseline) Comedy Musical Opera
Context	Written before 1900 (baseline) Written after 1900 RSC
Reviews	Non available (baseline) Poor Average Very good Must see
Type of production	Modern Traditional
Cast	Unknown (baseline) Famous
Author	Unknown (baseline) Known

Questionnaire design

Type of play	Drama	Comedy	Musical	Opera
Price	£ 45	£ 22	£ 22	£ 30
Context	After 1900	Before 1900		After 1900
Reviews	Must see ★★★★★	Average ★★	Very good ★★★	Non available
Type of production	<i>Modern adaptation</i>	<i>Modern adaptation</i>		Traditional production
Cast	Famous	Famous	Unknown	Famous
Writer	Known	Known	Unknown	Known
I would choose... (tick one)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Example of choice card

Results 1

	Name (<i>SE dummy in italics</i>) and random parameters in bold	Join RP+SP		SP		RP	
		Value	<i>t</i> -stat	Value	<i>t</i> -stat	Value	<i>t</i> -stat
Type of show	Drama (reference)						
	Ballet	-0.646	-2.58			1.04	2.23
	Musical (mean)	-0.327	-2.57	-0.267	-2.09	-0.370	-0.60
	Musical (standard deviation)	-1.07	-11.77	-1.13	-11.49		
	<i>Musical × high educated people</i>	-0.860	-4.69	-0.990	-5.49		
	Opera (mean)	-1.89	-11.40	-1.87	-11.71		
	Opera (standard deviation)	-1.60	-9.28	-1.59	-9.53		
	<i>Opera × youngsters (below 30)</i>	-0.891	-2.46	-0.911	-2.69		
	Comedy (mean)	-0.430	-5.45	-0.424	-5.31		
	Comedy (standard deviation)	0.389	3.95	0.409	4.01		
	<i>Comedy × high educated people</i>	-0.381	-3.55	-0.396	-3.67		
	<i>Comedy × youngsters (below 30)</i>	0.302	2.81	0.341	3.03		
	<i>Comedy × families with dependent children</i>	0.277	2.25	0.277	2.30		
	Family (mean)	-2.81	-3.92			-0.979	-4.70
	<i>Families with children × Comedy + family show</i>	0.277	2.25				
Classic versus modern, known and unknown author	Show written before 1900 and known author	0.196	3.09	0.200	3.12		
	Modern play (written after 1900) and known author	0.394	5.89	0.436	6.49		
	Modern play (written after 1900) and unknown author	0.175	1.98	0.180	1.93		

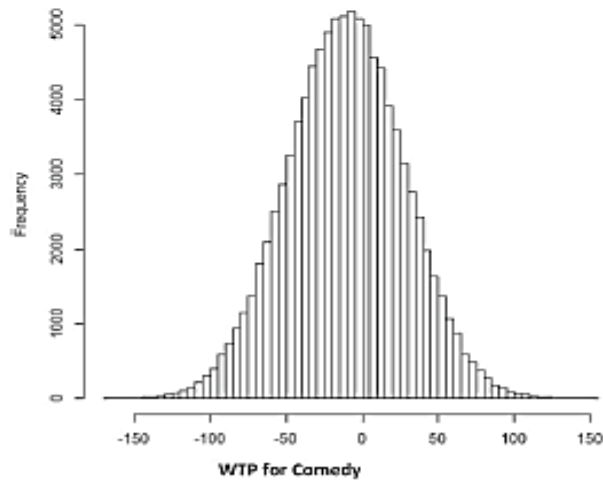
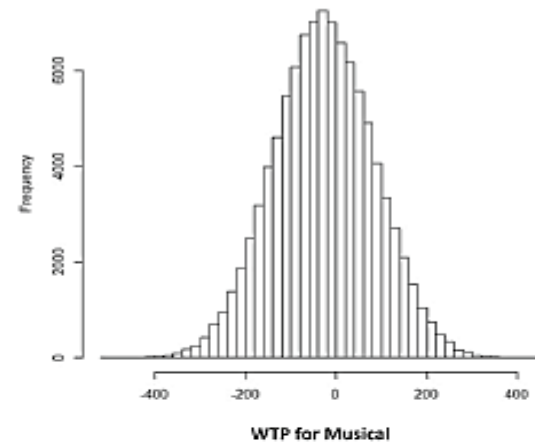
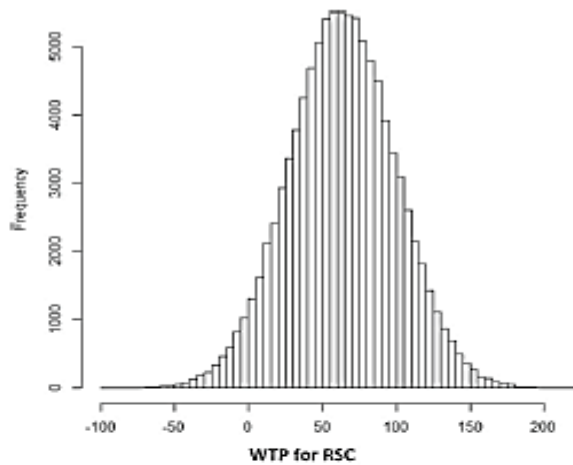
Results 2

	Name (<i>SE dummy in italics</i>) and random parameters in bold	Join RP+SP		SP		RP	
		Value	<i>t</i> -stat	Value	<i>t</i> -stat	Value	<i>t</i> -stat
Type of production	Modern production	0.466	7.45	0.503	7.62		
Cast	Cast	0.415	9.37	0.428	9.45	2.22	5.09
	<i>Cast × youngster (below 30)</i>	-0.208	-1.97	-0.184	-1.71		
Price	Price (mean)	-0.0122	-5.81	-0.0121	-5.84	-0.0248	-1.54
	Price (standard deviation)	-0.00899	-2.01	-0.0125	-3.49		
Reviews	Reviews 1 : poor	-0.103	-1.09	-0.125	-1.30		
	Reviews 2 : average	0.360	4.72	0.311	3.87		
	Reviews 3: very good + must see	0.472	6.45	0.394	4.92	2.89	6.36
RSC	RSC (mean)	0.507	5.60	0.530	5.61		
	RSC (deviation)	-0.411	-2.95	0.369	2.14		
Final log-likelihood		-4381.200		-4034.526		-383.880	
Pseudo- R^2		0.152		0.152		0.188	
Adj. pseudo- R^2		0.147		0.147		0.176	
Observations		3662		3434		264	
Individuals		353		350		264	
Parameters k		27		23		6	

Results 3. WTP

Name	Join RP+SP		SP model		RP model	
	Value	<i>t</i> -stat	Value	<i>t</i> -stat	Value	<i>t</i> -stat
Comedy	-10.72	-1.47	-58.91	-4.91		
Comedy (standard deviation)	38.35	5.55				
Musical	-27.47	-2.55	-35.96	4.73	-14.92	0.54
Musical (standard deviation)	-111.24	-19.99				
RSC	63.07	6.93	81.21	5.99		
RSC (standard deviation)	36.08	2.58				
Ballet	-48.48	-1.86			41.94	1.29
Family Show					-39.48	1.61
Cast	57.78	11.19	56.81	5.63	89.52	1.62
Classic show known author	19.94	3.32				
Modern play known author	36.43	4.90				
Modern play unknown author	6.56	0.65				
Modern production	58.54	15.47				
Reviews 1 poor	-5.30	-0.67	-16.91	5.32		
Reviews 2 average	38.80	5.57	43.3	15.92		
Reviews 3 (must see and very good)	54.15	7.31	55.12	4.38	116.53	0.94

Results 3. WTP



Conclusions

- RP-SP model allowed to avoid some problems,
- revealed the most important determinants of choice and WTP,
- type of show, RSC, reviews are the most important,
- socioeconomic variables allowed to reveal systematic heterogeneity in tastes,
- considerable non-systematic heterogeneity with respect to the type of show, the RSC and price,
- results can be useful to theatre managers to inform policy towards theatrical production and ticket prices.