DIGITAL DISRUPTION IN THE AUSTRALIAN BOOK INDUSTRY: SOME EMPIRICAL EVIDENCE

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MQU BOOK PROJECT

- Ongoing research project funded by the Australian Research Council, the Australia Council for the Arts and Macquarie University

- Project investigates:
  - Authors and their responses to changing circumstances
  - Publishers and the ways in which they contribute economic, social and cultural value
  - Practices of contemporary book readers

- Current extensions:
  - International rights sales and exports of Australian books 2008 - 2018
  - The economic, social and cultural impacts of literary festivals
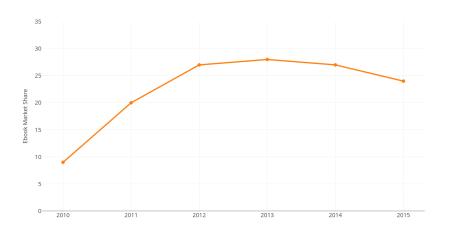
- More info: goto.mq.edu.au/reach

BACKGROUND AND MOTIVATION

Don't judge a book by its cover: Examining digital disruption in the book industry using a stated-preference approach

- The digital transition has changed the way books are written, sold and read

- "Everywhere you turn, publishing as a modern industry is defined by a profound lack of data"

- Large degree of uncertainty as to what the future holds for the book

- Declarations on how consumers value different book formats and attributes remain anecdotal

- Compounded by the fact that books are cultural and experiential in their nature

EBOOKS: A NEW CHAPTER?

Source: Nielsen BookScan (2016)

OBJECTIVES

Advance our understanding of how readers make their book purchasing decisions

- Stated preference survey examining preferences for a variety of book formats and attributes

- Derivation of readers' willingness to pay for different book formats and an array of attributes relating to the reading experience

- Examination of heterogeneity amongst readers in order to identify the size and preferences of distinct consumer segments in the market for books (via a latent class model)

EXISTING LITERATURE

Related applications of latent class modelling:

- Boter et al. (2005) - museum patrons and willingness to travel

- Chan and Goldthorpe (2007) - different types of music and visual arts consumers

- Pulido-Fernandez and Sanchez-Rivero (2010) - predisposition to choose 'cultural tourism'

- Grisolía and Willis (2012) - drivers of theatre choice

- McKenzie et al. (2019) - how SVoD has disrupted film and television consumption

STATED PREFERENCE EXPERIMENT

- Online stated preference survey examining preferences for a variety of book formats and attributes

- D-efficient experimental design, priors derived from a pilot study

- 242 Australian book readers, each presented with 12 choice tasks ($n = 2904$)

- Respondents asked to complete a sample choice task beforehand and provided with an information sheet while completing the choice tasks

- Additional questions on attribute non-attendance, book reading habits, knowledge of authors, cultural value statements, socio-demographic information

BOOK FORMAT ALTERNATIVES

Each choice task asks the respondent to pick from a suite of hypothetical reading experiences (i.e. books)

Alternatives take the form of different book formats:

- Hardback book
- Paperback book
- Ebook
- Audiobook
- No choice

ATTRIBUTES AND LEVELS

Attribute selection based on:

- Review of the existing literature on cultural experience good demand

- Pilot study that asked respondents what attributes of a book play an important role in determining reading choice

Included attributes:

- Genre

- Critical Consensus

- Level of Australian Cultural Content

- Price

SAMPLE CHOICE TASK 1

	Reading Options			
	Hardback Book	**Paperback Book**	**ebook**	**Audiobook**
Genre of Book	Literary Non-fiction	General Non-fiction	Genre Fiction	Genre Fiction
Critical Consensus	6 out of 10	6 out of 10	2 out of 10	6 out of 10
Level of Australian Cultural Content	None	High	Low	Low
Price of Book (in AU$)	$22.50	$7.50	$22.50	$30.00

SAMPLE CHOICE TASK 2

	Reading Options			
	Hardback Book	**Paperback Book**	**ebook**	**Audiobook**
Genre of Book	Genre Fiction	Literary Fiction	General Non-fiction	Literary Non-fiction
Critical Consensus	8 out of 10	8 out of 10	6 out of 10	4 out of 10
Level of Australian Cultural Content	High	None	None	High
Price of Book (in AU$)	$15.00	$22.50	$22.50	$22.50

GENRE

- Examine the presence of the 'cultural omnivore', i.e the link between diverse consumption patterns and:
  - Socio-demographic characteristics
  - Past exposure to cultural goods

- Genre attribute consists of four levels designed to cover the broad spectrum of books on offer:
  - Literary fiction
  - Genre fiction
  - Literary non-fiction
  - General non-fiction

CRITICAL CONSENSUS

- Experiential nature of books renders their quality (largely) indeterminate prior to consumption

- Demand for books is likely to be dependent, at least in part, upon signals of quality

- Aggregated professional review score selected as measure of critical consensus, with the following four levels:
  - 2 out of 10 - book received generally very negative reviews
  - 4 out of 10 - book received generally negative reviews
  - 6 out of 10 - book received generally positive reviews
  - 8 out of 10 - book received generally very positive reviews

CULTURAL CONTENT

- Cultural economists are likely particularly interested in how differing levels of cultural content impact choice

- Government policy regarding the cultural industries is primarily centred around the protection and production of 'national' culture (Mas-Colell, 1999)

- The 'level of Australian cultural content' is introduced into the experiment, and comprises three levels:
    - None - book does not contribute to building a collective Australian identity
    - Low - book contributes in a small way to building a collective Australian identity
    - High - book contributes greatly to building a collective Australian identity

PRICE

- In order to adequately cover the range of book prices on the market the following price levels were chosen:

  - AU$7.50
  - AU$15.00
  - AU$22.50
  - AU$30.00

- Permits the derivation of respondents' willingness to pay for the alternatives and attributes presented

DESCRIPTIVE STATISTICS

		%
Gender	Male	36.8
	Female	63.2
Location	Capital city or suburbs	63.2
	Regional, rural or remote area	36.8
Education	Did not complete high school	9.1
	High school or equivalent	20.2
	Post-secondary diploma / certificate	31.4
	Bachelors degree	27.7
	Postgraduate degree	11.6
Income (AU$)	Less than $400 per week	17.8
	$400 to $999 per week	33.9
	$1,000 to $1,599 per week	24.7
	More than $1,600 per week	23.6
Age	18 to 24	16.6
	25 to 44	45.6
	45 to 64	29.5
	Older than 64	8.3
Dependants	Living with dependent children	27.7
	Not living with dependent children	72.3

UTILITY FUNCTION

Observed utility can be defined

$$U_{nj} = \alpha_j + \mathbf{x}'_j \beta + \varepsilon_{nj}$$

where

- n is the decision maker
- j is the alternative
- $\mathbf{x}$ is the ($k \times 1$) vector of attributes associated with alternative j
- ε is type-1 extreme value error

Estimated parameters are used to estimate elasticities (w.r.t. attributes) and willingness to pay (simply calculated as $\hat{\beta}_k / \hat{\beta}_{price}$)

Computing Elasticities

SUMMARY STATISTICS OF SELECTIONS

Alternative	No. Times Presented	No. Times Chosen	Percentage Chosen
Hardback Book	2904	798	28%
Paperback Book	2904	947	33%
eBook	2904	536	18%
Audiobook	2904	296	10%
No Choice	2904	327	11%
Total	14520	2904	100%

MNL RESULTS

	Coef.	S.E.
Alternatives		
Hardback book	0.8669***	(0.0877)
Paperback book	1.0844***	(0.0900)
eBook	0.4103***	(0.0968)
Audiobook	-0.2105***	(0.1053)
Attributes		
Genre Fiction	0.3000***	(0.0371)
General Non-fiction	-0.0868**	(0.0407)
Literary Non-fiction	-0.1513***	(0.0417)
Critical Consensus	0.2393***	(0.0116)
High Cultural Content	0.0781**	(0.0318)
No Cultural Content	-0.1022***	(0.0366)
Price	-0.0708***	(0.0033)
Log-likelihood	-3872.6185	
AIC/N	2.675	
Observations	2904	

MNL RESULTS

- Format that brings respondents the most utility is paperback, followed by hardback, ebooks and finally audiobooks

- Utility derived from 'traditional' formats is over twice that of the newer ebook format

- Genre fiction yields the most utility. A move from the 'base' genre of literary fiction to either of the non-fiction genres is associated with a decrease in utility

- Critical consensus is found to be a (very) important determinant of book choice

- The parameters associated with a book's level of Australian cultural content indicate not only a desire to consume such content, but also to avoid books containing no such content

- Price parameter is negative as expected

LCM RESULTS

	Class 1		Class 2		Class 3	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Alternatives						
Hardback book	-0.5930***	(0.1585)	4.4781***	(0.4796)	1.3941***	(0.2048)
Paperback book	-0.4277***	(0.1600)	4.7857***	(0.4836)	1.5079***	(0.2073)
eBook	-1.7766***	(0.1618)	2.8255***	(0.5026)	1.8087***	(0.1981)
Audiobook	-2.6248***	(0.2273)	1.3508**	(0.5260)	1.3335***	(0.2110)
Attributes						
Genre Fiction	0.7292***	(0.0656)	0.1287	(0.0861)	0.1159**	(0.0548)
General Non-fiction	-0.3117***	(0.1038)	0.1123	(0.1237)	-0.0320	(0.0671)
Literary Non-fiction	-0.3946***	(0.1229)	-0.1589	(0.1738)	-0.1146	(0.0735)
Critical Consensus	0.3594***	(0.0251)	0.0731**	(0.0336)	0.2888***	(0.0136)
High Cultural Content	0.0635	(0.0622)	0.1764*	(0.1002)	0.1214***	(0.0398)
No Cultural Content	-0.0420	(0.1135)	-0.1880**	(0.0940)	-0.0651	(0.0652)
Price	-0.0928***	(0.0074)	-0.0719***	(0.0059)	-0.0611***	(0.0050)
Membership functions						
Constant	1.1368***	(0.3982)	1.0734***	(0.4116)		
Young	-1.6337***	(0.4191)	-0.9256**	(0.4170)		
University	-0.4522	(0.4093)	-0.9490**	(0.4284)		
Well Read	-0.1593**	(0.0673)	-0.1943***	(0.0747)		
Group Size	30.0%		27.2%		42.8%	
Log-likelihood			-3465.6318			
AIC/N			2.415			
Observations			2904			

MEMBERSHIP FUNCTIONS

Statistically significant segmentation variables:

- Young - under age of 35

- University - possess a bachelors degree (or higher)

- Well read - respondents who reported reading a wider range of authors than the sample average

Variables such as sex, income, marital status, etc. often found to influence demand for other cultural goods (e.g. visits to the opera and theatre)

- Not found to be statistically significant in the case of books

WILLINGNESS TO PAY (AU$)

	MNL	LCM		
		Class 1	Class 2	Class 3
Hardback book	12.24	-6.39	62.28	22.82
Paperback book	15.32	-4.61	66.56	24.68
eBook	5.80	-19.14	39.30	29.60
Audiobook	-2.97	-28.28	18.79	21.82
Genre Fiction	4.24	7.86	1.79	1.90
General Non-fiction	-1.23	-3.36	1.56	-0.52
Literary Non-fiction	-2.14	-4.25	-2.21	-1.88
Critical Consensus	3.38	3.87	1.02	4.73
High Cultural Content	1.10	0.68	2.45	1.99
No Cultural Content	-1.44	-0.45	-2.61	-1.07

LCM RESULTS: CLASS DESIGNATION

Analysis of both the parameter estimates and the willingness to pay calculations lead to the following classification of book readers:

- Class 1: Popular Readers

- Class 2: Avid Readers

- Class 3: Technological Adopters

Own Price Elasticities

Own Price Marginal Effects

CLASS 1: POPULAR READERS

- Accounts for 30% of the market

- Contains readers who show little regard for reading anything other than genre fiction (commonly known as popular fiction) on traditional paper based book formats

- Popular readers show no desire to pay for books with high degrees of cultural content (or to avoid books with no cultural content)

- Willing to pay a relatively high amount to ensure books they purchase are critically acclaimed

- This class has the lowest willingness to pay for books overall

- Analysis of the membership functions indicate this group contains older readers in comparison to classes 2 and 3, who are less well read

CLASS 2: AVID READERS

- Accounts for 27.2% of the market

- Members of this group can be considered to be the most 'traditional' in terms of their reading preferences

- Willingness to pay for traditional paper based formats is considerably higher than it is for newer digital formats

- Show a strong desire to read books that contain a high degree of cultural content, and are also willing to pay to avoid those books that contain no cultural content

- Willing to pay for books that are critically acclaimed, however, this attribute is much less of a deciding factor in choice than it is for members of classes 1 and 3

- This class has the highest willingness to pay for books overall

CLASS 3: TECHNOLOGICAL ADOPTERS

- Accounts for 42.8% of the market

- Analysis of the membership functions indicate this group contains the youngest group of readers, who read the widest variety of books

- Members of this group show a willingness to adopt new content delivery technologies

- Demonstrate a very slight preference for genre fiction (albeit to much less of an extent than class 1)

- The group's desire for high degrees of cultural content traverses the middle ground between class 1 and 2

- Members of this group show the greatest willingness to pay for increases in aggregated critical review score

- This group's overall willingness to pay for a book is similar to the recommended retail prices found on the market today.

SUMMARY

- Those forecasting the imminent demise of the printed book appear to be premature in their predictions

- However, the presence of a large, definable, group of technological adopters is a clear indication that the digital transition is well under way

- Younger readers are powering this transition
  - If preferences for individual formats remain consistent during the life of a reader, market shares of paperback and hardback books could be continually eroded

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SUMMARY

Implications for book publishers and other industry stakeholders

- Results can be used by publishers to incorporate the adoption of newer digital formats into their strategic planning

- Books remain a vital conduit for the transmission of Australian ideas, symbols and ways of life - even for young people

  - Provides a justification for programs designed to fund and maintain an active and engaged Australian literary culture

- Importance of measures of critical consensus in overcoming information problems associated with the consumption of experiential goods

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THANK YOU

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COMPUTING ELASTICITIES

MNL produces choice observation specific elasticities

- Own attribute elasticity: $\varepsilon_{x_{ik}}^{P_i} = \frac{dU_i}{dx_{ik}} x_{ik} (1 - P_i)$

- Cross attribute elasticity: $\varepsilon_{x_{jk}}^{P_i} = \frac{dU_j}{dx_{jk}} x_{jk} P_j$

Because MNL is non-linear, aggregation of the individual-specific elasticities may return biased elasticities. Louviere et al. (2000) use probability-weighted sample enumerated elasticities:

$$\varepsilon_{x_{jk}}^{\bar{P}_i} = \left(\sum_{n=1}^{N} \hat{P}_{in} \varepsilon_{x_{jkn}}^{P_{in}} \right) \Bigg/ \sum_{n=1}^{N} \hat{P}_{in}$$

where $\hat{P}_{in}$ is an estimated choice probability and $\bar{P}_i$ refers to the aggregate probability of choice of alternative i

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OWN PRICE ELASTICITIES

Alternative	MNL	LCM		
		Class 1	Class 2	Class 3
Hardback Book	-0.752	-0.907	-0.614	-0.721
Paperback Book	-0.712	-0.831	-0.580	-0.643
Ebook	-0.825	-1.066	-0.892	-0.579
Audiobook	-0.898	-1.114	-0.946	-0.714

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OWN PRICE MARGINAL EFFECTS

Alternative	MNL	LCM		
		Class 1	Class 2	Class 3
Hardback Book	-0.015	-0.018	-0.016	-0.012
Paperback Book	-0.014	-0.018	-0.015	-0.012
Ebook	-0.013	-0.015	-0.007	-0.012
Audiobook	-0.010	-0.010	-0.002	-0.010

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