

**Ex Post Merger Evaluation in the UK Retail Market for Books**  
**Online Appendix**

## Appendix 1. Selection of areas using propensity score matching

This Appendix describes the methodology used in the selection of areas. In its database (Nielsen bookscan) Nielsen collects information on book sales from a wide panel of Waterstone's and Ottakar's stores. As regards the pre-merger period, this panel includes 359 stores of Waterstone's and Ottakar's, located in 203 different areas<sup>1</sup> (defined at the local authorities level), of which 33 were overlap areas (as defined by the CC) and 170 were non-overlap ones.

To select the 60 stores for which we were given permission to collect data by HMV, we followed an approach based on the *Propensity Score Matching* (henceforth PSM). PSM has its roots in the *Matching* literature and it was developed as a means to correct for sample selection bias that may affect the estimate of the treatment effects. In non-experimental studies assignment of subjects to the treatment and control groups is not random, thus the estimate of a causal effect obtained by comparing a treatment group with a non-experimental comparison group could be biased because of systematic differences between the two groups. In other words, units receiving treatment and those excluded from treatment may differ not only in their treatment status but also in other characteristics that affect both participation and the outcome of interest

The bias can be reduced if the comparison of outcomes is performed using treated and control groups which are as similar as possible. It might be relatively simple to assign a comparison unit based on a single observable characteristic, however, if the matching process is to be effective in mitigating the potential bias, one needs to consider a full range of factors across which the treatment and control group might differ. Propensity-score matching allows this matching problem to be reduced to a single dimension

Under the PSM the degree of closeness among groups is measured by the *propensity score*, i.e. the probability of treatment, given the set of observed characteristics. The idea is that all relevant differences between the groups pre-treatment can be captured by observable characteristics in the data<sup>2</sup> and these characteristics can be used to estimate the *propensity score*. Through this approach a propensity score (which ranges from 0 to 1) is attached to every unit and the treatment and control group are then matched based on it.

A fundamental requirement for this method is that the predicted probabilities of treatment, for control and treated units, must have a wide common support region, i.e. the existence of a substantial overlap between the propensity score of control and treated units. That is in order to find valid matches.

In practice, we applied PSM accordingly to these steps:

- (a) Identify the relevant explanatory variables;
- (b) Estimate the predicted probability (*pscore*) of assignment to treatment for all areas;
- (c) Match (without replacement) each treated area with the control area that has the closest *pscore*.

In the first step the aim is to select all the observable explanatory variables that characterize the book retailing market at the local level (hence, we need variables that vary at the local level). These variables can be broadly classified in two groups: (i) factors that may impact on the demand and (ii) factors that may affect the supply. Table A1.1 lists the explanatory variables we relied on.

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<sup>1</sup> From our selection we excluded all the shops in the London area which, although both Waterstone's and Ottakar's operated some stores in that area was not considered an overlap location by the CC.

<sup>2</sup> Once accounted for these differences, one can take assignment to treatment to have been random.

**Table A1.1: Explanatory variables for PSM**

<b>Variable</b>	<b>Source</b>
<b>Demand factors</b>	
Population	UK Office for National Statistics, Neighbourhood Statistics section or Scottish Neighbourhood Statistics when relevant (2001 census)
Population density	UK Office for National Statistics, Neighbourhood Statistics section or Scottish Neighbourhood Statistics when relevant (2001 census)
Average sales (volumes) of books (HMV year 2005)	Nielsen Bookscan
Number of universities	<a href="http://www.lovemytown.co.uk/Universities/UniversitiesTable1.asp">http://www.lovemytown.co.uk/Universities/UniversitiesTable1.asp</a>
Share of population with a degree	UK Office for National Statistics, Neighbourhood Statistics section or Scottish Neighbourhood Statistics when relevant (2001 census)
Gross value added 2004	UK Office for National Statistics, Neighbourhood Statistics section or Scottish Neighbourhood Statistics when relevant (2001 census)
Internet penetration 2005	Internet Access, Households and Individuals, Office of National Statistics
<b>Supply factors</b>	
Average house prices 2005	<a href="http://www.landregistry.gov.uk/">http://www.landregistry.gov.uk/</a> for England and Wales, and <a href="http://www.ros.gov.uk">www.ros.gov.uk</a> for Scotland
Number of <i>specialist</i> stores	Nielsen Bookscan
Number of supermarkets	Nielsen Bookscan

Using the above variables, we estimated the predicted probability of being in an overlap area running a logistic regression on the discrete dependent variable of treatment assignment.<sup>3</sup> The results from this regression can be found in Table A1.2.

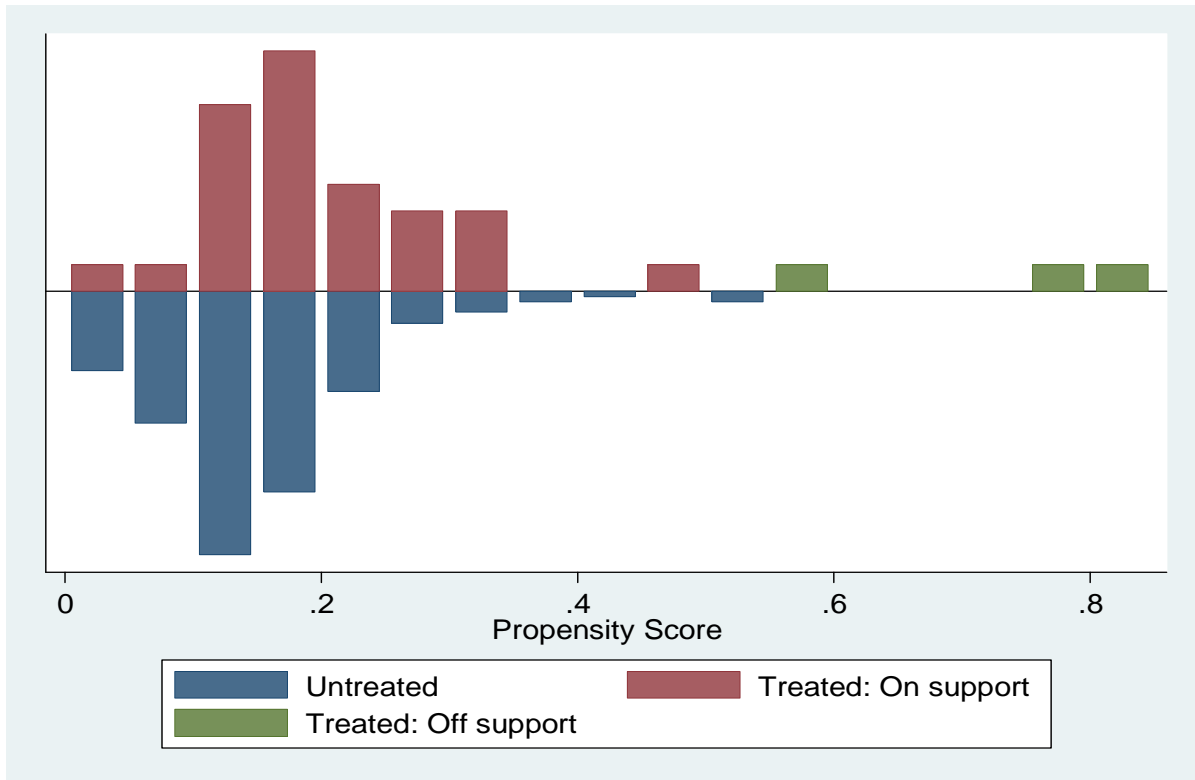
<sup>3</sup> The dependent variable is the treatment status (overlap area = 1; non-overlap area = 0).

**Table A1.2: Propensity Score Matching, estimation results**

	<b>dep variable: Overlap</b>
population	0.0000139 (0.27)
pop_density	-0.000199 (-0.01)
avgsales	0.00000569 (0.09)
universities	-0.00950 (-0.01)
education	-0.00379 (-0.03)
GVA_2004	0.0000805 (0.51)
internet_2005	-0.0419 (-0.27)
house_price_2004	-0.00000477 (-0.37)
spec_proxy	-0.0170 (-0.12)
supermarkets	-0.0189 (-0.30)
scotland	-0.412 (-0.33)
constant	1.659 (0.22)
observations	50
t statistics in parentheses	
* p<0.05, ** p<0.01, *** p<0.001	

After the regression each local areas is assigned a probability of treatment. By looking at the distribution of these predicted probabilities (see Figure A1.1) we can check if the common support requirement is satisfied. We conclude that there is substantial overlap and we are then reassured that we can find a sufficient number of treatment local areas with a close enough match in the control group.

**Figure A1.1: Pscore distribution by groups and common support**



The selection of the treated areas was also constrained by data availability<sup>4</sup> and out of the 33 overlap local areas we could use only 20. For each of the 20 selected local areas we found the closest match in the non-overlap areas following the PSM approach. Table A1.3 presents the final list of areas from this matching process.

<sup>4</sup> Some shops closed, or were not surveyed by Nielsen Bookscan.

**Table A1.3: Store Matching Outcome**

	Treated			Control		
	location	pscore	store	location	pscore	store
a) areas where we selected only a Waterstone's store	Southend-on-Sea	0.110	W	Oxford	0.111	W
	Worcester	0.269	W	Nottingham	0.256	W
	Canterbury	0.308	W	Bournemouth	0.300	W
	Kings Lynn	0.192	W	Bath	0.189	W
	Milton Keynes	0.102	W	Romford	0.103	W
b) areas where we selected only a Ottakar's store	Folkestone	0.222	O	Dumfries	0.222	O
	Bromley	0.033	O	Barnet	0.033	O
	Cheltenham	0.169	O	High Wycombe	0.171	O
	Guildford	0.162	O	Barnstaple	0.159	O
	Harrogate	0.115	O	Staines	0.115	O
c) areas where we selected both a Waterstone's and a Ottakar's store	Aberdeen	0.469	W	Bristol	0.508	W
	Aberdeen	0.469	O	Newport	0.382	O
	Chelmsford	0.285	W	Stirling	0.294	W
	Chelmsford	0.285	O	Elgin	0.279	O
	Coventry	0.167	W	Chichester	0.167	W
	Coventry	0.167	O	Newton Abbot	0.165	O
	Inverness	0.230	W	Winchester	0.233	W
	Inverness	0.230	O	Loughborough	0.230	O
	Huddersfield	0.071	W	Stockport	0.072	W
	Huddersfield	0.071	O	St Albans	0.071	O
	Crawley	0.203	W	Derby	0.202	W
	Crawley	0.203	O	Ashford	0.204	O
	Lancaster	0.198	W	Wolverhampton	0.194	W
	Lancaster	0.198	O	Andover	0.198	O
	Meadowhall	0.182	W	Stoke On Trent	0.188	W
	Meadowhall	0.182	O	Carlisle	0.186	O
	Norwich	0.309	W	Leicester	0.316	W
	Norwich	0.309	O	Aberystwyth	0.315	O
	Epsom	0.120	W	Bedford	0.116	W
	Epsom	0.120	O	Bishop's Stortford	0.123	O

A graphical representation of this selection can also be found in Figure A1.2, where it is possible to see that the matched overlap and non-overlap localities are equally spread around the UK (the only exception is for Wales where we could not find any overlap areas).

**Figure A1.2: Geographic distribution of Treatment and Control Areas**



For these selected localities we also tested the equality of means for the relevant explanatory variables and verified if the means across the two groups were not statistically different (see Table A1.4).

**Table A1.4: Test on equality of means for explanatory variables**

Variable	Mean		t-test	
	Treated	Control	t	p>t
pscore	0.196	0.203	-0.26	0.793
population	180000	170000	0.48	0.633
pop_density	14.051	13.62	0.11	0.912
universities	0.75	0.73333	0.08	0.937
education	19.9	20.6	-0.38	0.702
avgsales	180000	180000	-0.01	0.989
GVA_2004	16876	16630	0.22	0.824
GVA_2005	17327	17146	0.16	0.871
internet_2005	56.4	56.833	-0.39	0.702
internet_2007	62.0	63.1	-0.72	0.477
house_price_2004	180000	190000	-0.61	0.548
house_price_2007	220000	230000	-0.52	0.606
specialist_retailer <sup>5</sup>	6.15	6.3667	-0.15	0.883
supermarkets	15.15	14.767	0.11	0.916
scotland	0.1	0.1	0	1

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<sup>5</sup> Number of specialist retailers per area.



## Appendix 2. List of book titles for Waterstone's/Ottakar's merger

Table A2.1 below lists the 200 titles on which we performed the econometric analyses.

**Table A2.1: List of the titles included in our dataset**

	<b>Title</b>	<b>Author</b>
1	Complete Beginners' Cookbook	Watt, Fiona
2	"In the Night Garden" Little Library: Little Library: In the Night Garden	.
3	"Playboy": Bartender's Guide	Mario, Thomas
4	"York Notes on ""An Inspector Calls"": York Notes"	Scicluna, John
5	7000 Baby Names: Classic and Modern	Spence, Hilary
6	Adventure of English,The	Bragg, Melvyn
7	Allen Carr's Easy Way to Stop Smoking	Carr, Allen
8	Amber the Orange Fairy: Rainbow Magic	Meadows, Daisy
9	Angel	Price, Katie
10	Angels:Miniature Editions	.
11	Animal Discovery Cards: Baby Einstein S.	Aigner-Clark, Julie
12	Art of Drawing Manga, The	Krefta, Ben
13	Atonement	McEwan, Ian
14	Bad Beginning,The: Series of Unfortunate Events	Snicket, Lemony
15	Bare Bones	Reichs, Kathy
16	Beginner's French: Teach Yourself Languages	Carpenter, Catrine
17	Bible Code,The	Drosnin, Michael
18	Blow Fly	Cornwell, Patricia
19	BMA Concise Guide to Medicines and Drugs	Henry, John A.
20	Body Double	Gerritsen, Tess
21	Body Shape Bible,The: Forget Your Size Discover Your Shape Transform Yourself	Constantine, Susanna
22	Bond Assessment Papers:Second Papers in Maths 8-9 Years: Bond Assessment Papers S.	Baines, Andrew & Bon
23	Broker,The	Grisham, John
24	Brother's Journey, A: Surviving a Childhood of Abuse	Pelzer, Richard B.
25	Brussels and Bruges: AA Citypacks	Franquet, Sylvie & S
26	Castle of Wizardry: Belgariad S.	Eddings, David
27	Cause of Death	Cornwell, Patricia
28	Change Your Life in Seven Days	McKenna, Paul
29	Chapter House Dune:(Bk. 6) :Gollancz S.F.	Herbert, Frank
30	Child Called It,A	Pelzer, Dave
31	Cigars of the Pharoah: The Adventures of Tintin S.	Herge

	<b>Title</b>	<b>Author</b>
32	Coast	Somerville, Christop
33	Coming Out	Steel, Danielle
34	Concise Colour Medical Dictionary: Oxford Paperback Reference S.	Martin, Elizabeth
35	Concise Oxford Spanish Dictionary	.
36	Confusion,The	Stephenson, Neal
37	Contest	Reilly, Matthew
38	Cranks Recipe Book,The	Canter, David
39	Crucible,The: A Play in Four Acts: Penguin Modern Classics	Miller, Arthur
40	Curious Incident of the Dog in the Night-time,The	Haddon, Mark
41	Dark is the Moon:View from the Mirror S.	Irvine, Ian
42	Dark Tower,The:D rawing of the Three (Bk. 2)	King, Stephen
43	Devil's Disciples,The: The Life and Times of Hitler's Inner Circle	Read, Anthony
44	Diaries 1969-1979:The Python Years	Palin, Michael
45	Dr. Gillian McKeith's Ultimate Health Plan: The Diet Programme That Will Keep You Slim for Life	McKeith, Gillian
46	Duck:My Thomas Story Library	Awdry, W.
47	Elder Gods,The	Eddings, David & Edd
48	Electrician's Guide to the Building Regulations (Approved Document P, Electrical Safety in Dwellings)	.
49	Elegance	Tessaro, Kathleen
50	English Grammar in Use with Answers: A Self-study Reference and Practice Book for Intermediate Students of English	Murphy, Raymond
51	English Passengers	Kneale, Matthew
52	Enormous Crocodile,The	Dahl, Roald
53	Essential Costa Brava:AA Essential S.	Kelly, Tony
54	Essential Teaching Skills	Kyriacou, Chris
55	Face the Fire:Three Sisters Island	Roberts, Nora
56	Faithless	Slaughter, Karin
57	False Impression	Archer, Jeffrey
58	Farm:Usborne Look and Say	.
59	Filth	Welsh, Irvine
60	Flat Stanley in Space	Brown, Jeff
61	GCSE Double Science: Chemistry Revision Guide - Higher (Pt. 1 & 2)	Parsons, Richard
62	Girls Only! All About Periods and Growing-up Stuff	Parker, Victoria
63	Girls Out Late	Wilson, Jacqueline
64	Girls under Pressure	Wilson, Jacqueline
65	Good Night, Gorilla	Rathmann, Peggy
66	Gordon Ramsay's Playing with Fire: Raw, Rare to Well Done	Ramsay, Gordon

	<b>Title</b>	<b>Author</b>
67	Great Lies to Tell Small Kids	Riley, Andy
68	Harry Potter Pbk Boxed Set	Rowling, J.K.
69	High Fidelity	Hornby, Nick
70	High Hopes	Hopkins, Billy
71	Highest Tide,The	Lynch, Jim
72	Holy Bible,The:King James Version: Authorized King James Version	.
73	Holy Blood and the Holy Grail,The	Baigent, Michael & L
74	Horrid Henry and the Mega-mean Time Machine:(Bk. 13) :Horrid Henry	Simon, Francesca
75	Horrid Henry Meets the Queen:(Bk . 12) :Horrid Henry	Simon, Francesca
76	How to Boil an Egg:... And 184 Other Simple Recipes for One	Arkless, Jan
77	Humble Pie	Ramsay, Gordon
78	I Am Too Absolutely Small for School:Charlie & Lola	Child, Lauren
79	I Know You Got Soul	Clarkson, Jeremy
80	I Love Capri	Jones, Belinda
81	IEE on Site Guide (BS 7671: 2001 16th Edition Wiring Regulations Including Amendment 2: 2002)	.
82	Innocent Graves	Robinson, Peter
83	Internet for Dummies,The: For Dummies S.	Levine, John R. & Yo
84	Introduction to Buddhism:An Explanation of the Buddhist Way of Life	Kelsang Gyatso, Gesh
85	Introductory Guide to Anatomy and Physiology,An	Tucker, Louise
86	Invisible Boy,The: Magical Children S.	Gardner, Sally
87	It's Not About the Bike:My Journey Back to Life	Armstrong, Lance
88	Jasper's Beanstalk:Jasper	Butterworth, Nick &
89	Jolly Postman, or, Other People's Letters,The: Or, Other People's Letters:Viking Kestrel picture books	Ahlberg, Allan & Ahl
90	Jonathan Strange and Mr. Norrell	Clarke, Susanna
91	Jose Mourinho:Made in Portugal - the Authorised Biography	Lourenco, Luis & Mou
92	Kalahari Typing School for Men,The:No.1 Ladies' Detective Agency S.	McCall Smith, Alexan
93	Kama Sutra, The: Great Sex S.	Hooper, Anne
94	Krakatoa: The Day the World Exploded	Winchester, Simon
95	KS1 Maths: Question Book (Pt. 1 & 2)	Parsons, Richard
96	KS2 Science:S AT's Practice Papers - Levels 3-5 (bookshop)	Parsons, Richard
97	KS3 Science: Revision Guide - Levels 5-7	Parsons, Richard & G
98	Last Juror,The	Grisham, John
99	Last Term at Malory Towers: Malory Towers S.	Blyton, Enid
100	Learning to Counsel: Develop the Skills You Need to Counsel Others	Sutton, Jan & Stewar
101	Letter from America:1946-2004	Cooke, Alistair
102	Little Miss Scary: Little Miss library	Hargreaves, Roger

	<b>Title</b>	<b>Author</b>
103	Lord of the Rings,The: Return of the King (v.3)	Tolkien, J. R. R.
104	Lost for Words:The Mangling and Manipulating of the English Language	Humphrys, John
105	Lovely Bones,The	Sebold, Alice
106	Low-Fat Meals in Minutes: "Australian Women's Weekly" Home Library	Tomnay, Susan
107	Magician's Nephew,The: Chronicles of Narnia S.	Lewis, C.S.
108	Mammoth Book of Extreme Science Fiction, The: Mammoth Book of S.	.
109	Man Called Cash,The:The Life, Love and Faith of an American Legend	Turner, Steve
110	Memoirs of a Geisha	Golden, Arthur
111	Monkey Puzzle	Donaldson, Julia
112	Moondust:In Search of the Men Who Fell to Earth	Smith, Andrew
113	Mr. Christmas	Hargreaves, Roger
114	Mr. Fussy:Mr. Men Library	Hargreaves, Roger
115	Mr. Perfect	Robinson, Catherine
116	Mr. Uppity:Mr. Men Library	Hargreaves, Roger
117	New First Aid in English, The	Maciver, Angus
118	New Pocket Dog Training	Fogle, Bruce
119	New Rector,The:Tales from Turnham Malpas	Shaw, Rebecca
120	Next Accident,The	Gardner, Lisa
121	Nursing Calculations	Gatford, J.D. & Phil
122	Nursing Practice:Hospital and Home - The Adult	Alexander, Margaret
123	Office 2003 in Easy Steps:Colour Edition:In Easy Steps S.	Copestake, Stephen
124	One Child	Hayden, Torey L.
125	One Hundred Ways for a Cat to Train Its Human	Haddon, Celia
126	One Hundred Years of Solitude	Garcia Marquez, Gabr
127	Other Side of the Story, The	Keyes, Marian
128	Other Woman,The	Green, Jane
129	Oxford English Minidictionary	.
130	Oxford French Verbpak,The	.
131	Oxford Reading Tree: Stage 4: Storybooks: the Storm	Hunt, Roderick
132	Pale Horseman,The	Cornwell, Bernard
133	Pale Horseman,The	Cornwell, Bernard
134	Peekaboo Farm!: Peekabooks S.	.
135	Philip's Motoring Atlas Britain 2006:Philip's Road Atlases	.
136	Philosophy:The Basics: Basics (Routledge Paperback)	Warburton, Nigel
137	Picking Up the Pieces	Britton, Paul
138	Pippi Longstocking	Lindgren, Astrid
139	Precious Time	James, Erica

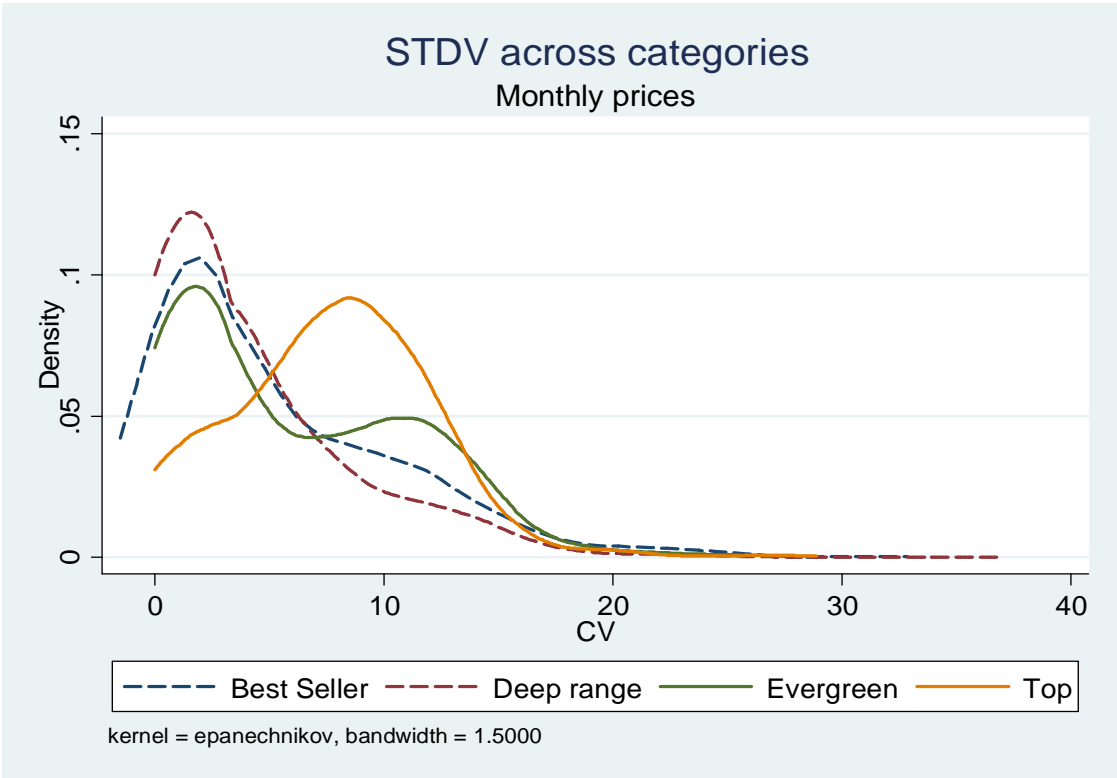
	<b>Title</b>	<b>Author</b>
140	Pregnancy Questions and Answer Book, The	Lees, Christoph & Re
141	Prince,The	Machiavelli, Niccolo
142	Q Pootle 5	Butterworth, Nick
143	Quick Course in Microsoft Excel 2000:Quick Course	.
144	Really Rotten Experiments: Horrible Science S.	Arnold, Nick
145	Rebecca	Du Maurier, Daphne
146	Recoil	McNab, Andy
147	Restaurant Guide,The:2004:AA Lifestyle Guides	.
148	Revenge of the Middle-aged Woman	Buchan, Elizabeth
149	Rick Stein's Mediterranean Escapes	Stein, Rick
150	River Cottage Meat Book,The	Fearnley-Whittingsta
151	Ronnie:The Autobiography of Ronnie O'Sullivan	O'Sullivan, Ronnie
152	Rottweiler,The	Rendell, Ruth
153	Rough Guide to Venice,The: Rough Guide Travel Guides	Buckley, Jonathan
154	RSPB Pocket Birds	Elphick, Jonathan &
155	Rules of Management: The Definitive Guide to Managerial Success	Templar, Richard
156	Russian Dictionary:Collins GEM	.
157	Salisbury and The Plain, Amesbury:1: 50 000:OS Landranger Map	.
158	Savage Stone Age,The: Horrible Histories S.	Deary, Terry
159	Secret of Crickley Hall,The	Herbert, James
160	Sexual Life of Catherine M, The	Millet, Catherine
161	Sharon Osbourne Extreme: My Autobiography	Osbourne, Sharon
162	Shopaholic and Sister	Kinsella, Sophie
163	Silly Verse for Kids: Puffin Books	Milligan, Spike
164	Silver Spoon,The	.
165	Smelly Slugsy:Read-to-Me Scented Storybook: "Fifi and the Flowertots"	.
166	Social Work:Themes, Issues and Critical Debates	.
167	Sorceress	Rees, Celia
168	South Africa: AA Explorer S.	Shales, Melissa
169	Sovereign:Shardlake	Sansom, C.J.
170	Spanish Verb Tenses: Practice Makes Perfect Series	Richmond, Dorothy De
171	Storm of Swords,A: (1) :Song of Ice and Fire	Martin, George R.R.
172	SUMO (Shut Up, Move On):The Straight Talking Guide to Creating and Enjoying a Brilliant Life	McGee, Paul
173	Taking,The	Koontz, Dean
174	Tao of Pooh and Te of Piglet,The: Wisdom of Pooh S.	Hoff, Benjamin
175	Thief of Time: A Discworld Novel	Pratchett, Terry

	<b>Title</b>	<b>Author</b>
176	This Little Puffin:Finger Plays and Nursery Games:Puffin Books	Matterson, Elizabeth
177	Thousand Days in Venice,A: An Unexpected Romance	de Blasi, Marlina
178	Thud!:Discworld Novels	Pratchett, Terry
179	Time and Chance	Penman, Sharon K.
180	Times Tables: Magical Skills (Level 2) :Magical skills	Fidge, Louis & Broad
181	Trojan Odyssey	Cussler, Clive
182	Truth,The: Discworld Novels	Pratchett, Terry
183	Twelfth Card,The	Deaver, Jeffery
184	Twilight Children: Three Voices No One Heard - Until Someone Listened	Hayden, Torey L.
185	Twist of Gold	Morpurgo, Michael
186	Twisted:Collected Stories of Jeffery Deaver	Deaver, Jeffery
187	Ultimate Dinosaur Glow in the Dark Sticker Book,The: Ultimate Stickers	.
188	Under Orders	Francis, Dick
189	Understanding Health and Social Care:An Introductory Reader: Published in Association with the Open University	.
190	Unlocking Formative Assessment: Practical Strategies for Enhancing Pupils' Learning in the Primary Classroom	Clarke, Shirley
191	Untouchable: Alpha Force S.	Ryan, Chris
192	Usborne Complete Book of Drawing:Usborne Activity Books	.
193	Vesuvius Club,The:A Lucifer Box Novel	Gatiss, Mark
194	Vieira: My Autobiography	Vieira, Patrick
195	Wasp Factory,The	Banks, Iain
196	Wedding Flowers: Over 80 Glorious Floral Designs for That Special Day	Roberts, Stephen
197	Wee Free Men,The	Pratchett, Terry
198	Wide Sargasso Sea: Student Edition:Penguin Modern Classics	Rhys, Jean
199	Wide Window, The: Series of Unfortunate Events	Snicket, Lemony
200	Yorkshire Dales: Walks: Pathfinder Guide	Conduit, Brian & Mar

### Appendix 3. Local vs national price competition for Waterstone's/Ottakar's merger

This Appendix presents some further results on the analysis of the geographic scope of price competition among book retailers. Figure A3.1 below compares the distribution of the discount's standard deviation (calculated over the entire period) for the four title categories.

Figure A3.1: Distribution of monthly standard deviation (comparison by title category)

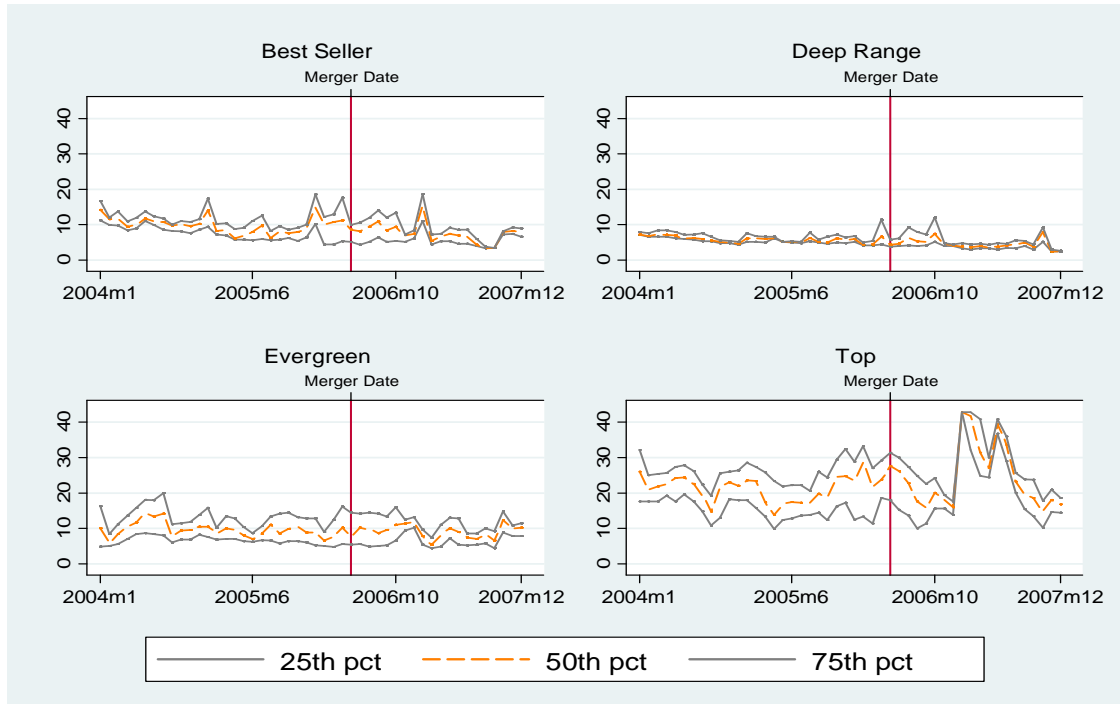


As already stressed, the discount variability differs across categories. Top-selling titles and, to a lesser extent, evergreen ones have a high standard deviation, while the discount variability of best-sellers and deep-range titles appears to be lower and concentrated around 0. This latter result suggests that for these titles price competition mainly occurs at national level. However, we cannot say, in particular for deep-range titles, whether this low variability was due to a strict application of a centrally set pricing policy, or to the fact that local conditions did not vary much (for example, because the demand for deep-range titles was scarcely elastic over the entire nation).

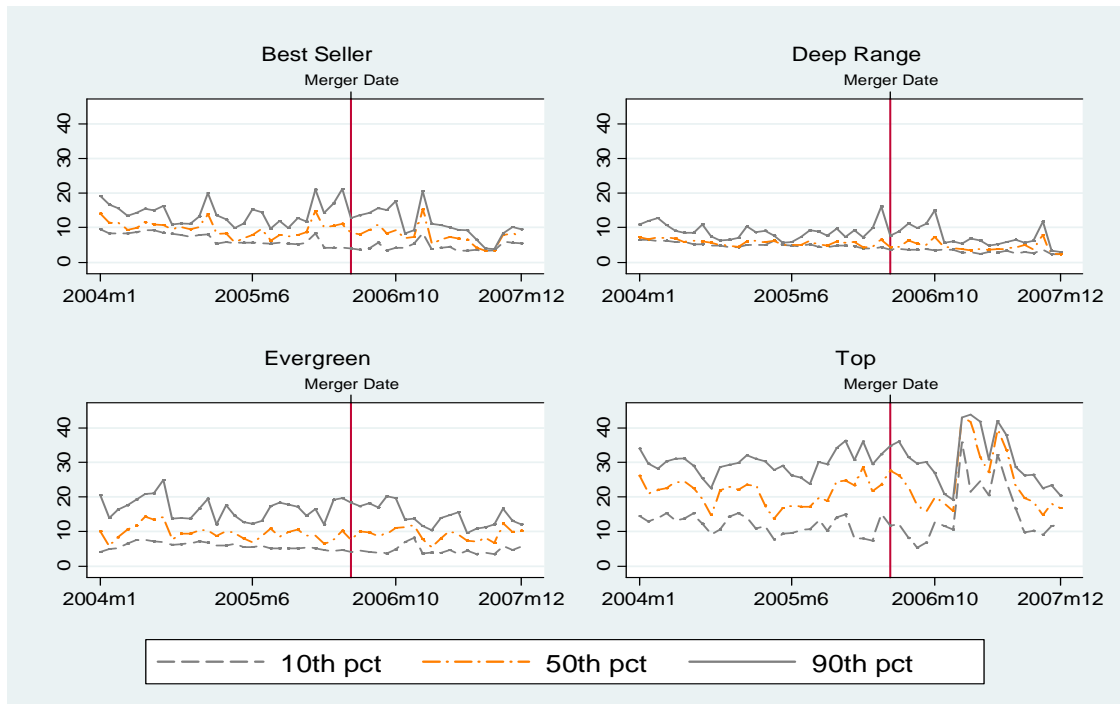
To further investigate the issue of local price variation, we also examined the percentiles of the discount distribution. For each title in each month, we derived the percentiles of this distribution and analysed them graphically. A higher vertical difference between percentiles would suggest higher dispersions of the discount across stores.

In the Figure A3.2 we plot a relatively narrow interval (percentiles 25<sup>th</sup> 50<sup>th</sup> and 75<sup>th</sup>), whereas in Figure A3.3 we plot a larger interval (percentiles 10<sup>th</sup> 50<sup>th</sup> and 90<sup>th</sup>).

**Figure A3.2: Percentiles of the discount distribution (25<sup>th</sup>, 50<sup>th</sup>, and 75<sup>th</sup>)**



**Figure A3.3: Percentiles of the discount distribution (10<sup>th</sup>, 50<sup>th</sup>, and 90<sup>th</sup>)**





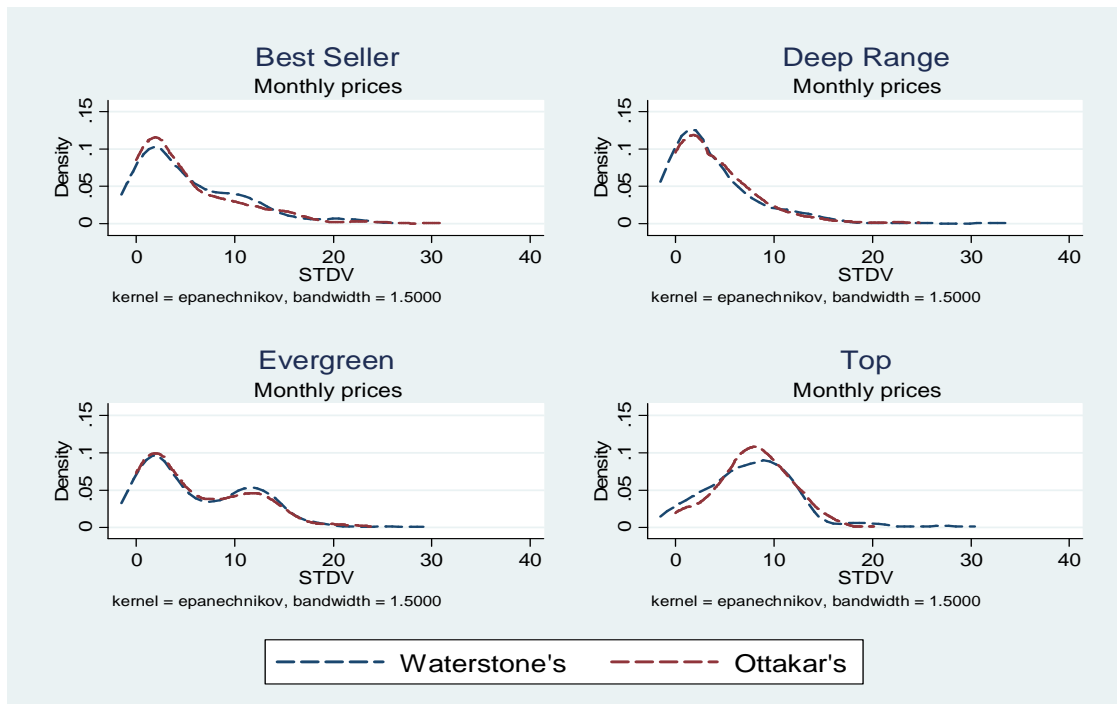
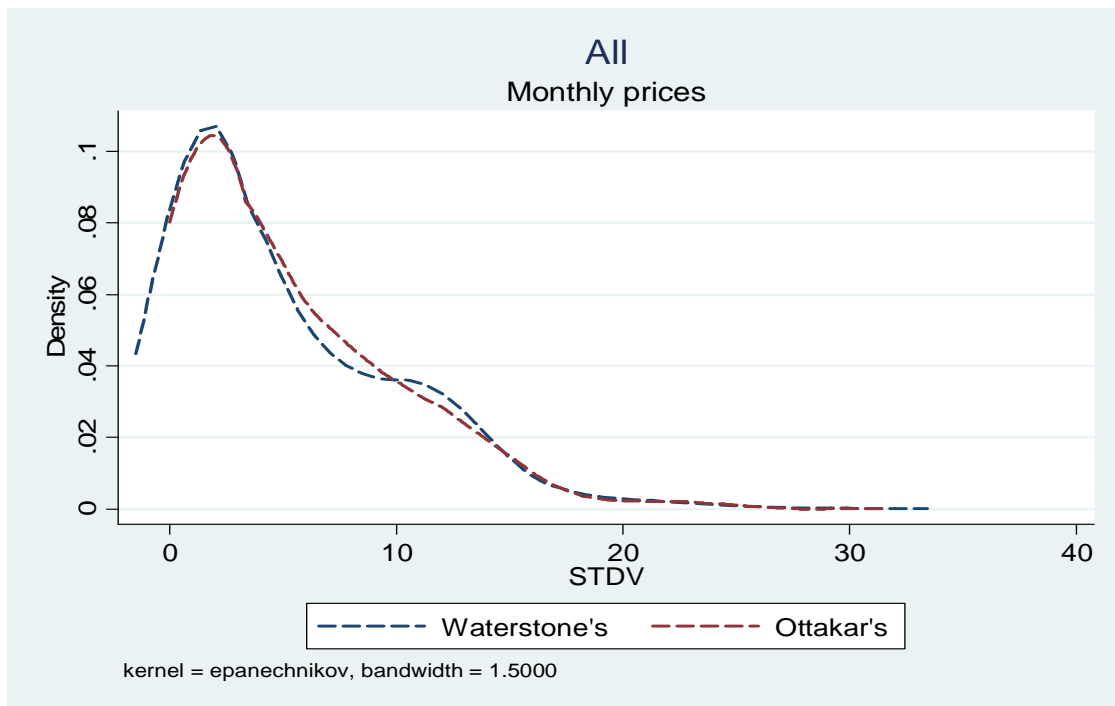
The percentiles analysis confirms the previous results. We observe a high variability for evergreen and top-selling titles, a lower one for best-sellers and a very low one for deep range titles.

Finally, we also verified whether there was any difference in the pricing policies adopted by Waterstone's and Ottakar's before the merger. This was done in order to check the opinions expressed by some market participants<sup>6</sup> who claimed that Ottakar's tended to have a more local-oriented pricing policy. Hence, we computed the discount variability across Waterstone's stores before and after the merger and compared it with the same figures for Ottakar's. In the following figures we plot the distribution of the discount standard deviations across Waterstone's and Ottakar's stores before the merger.

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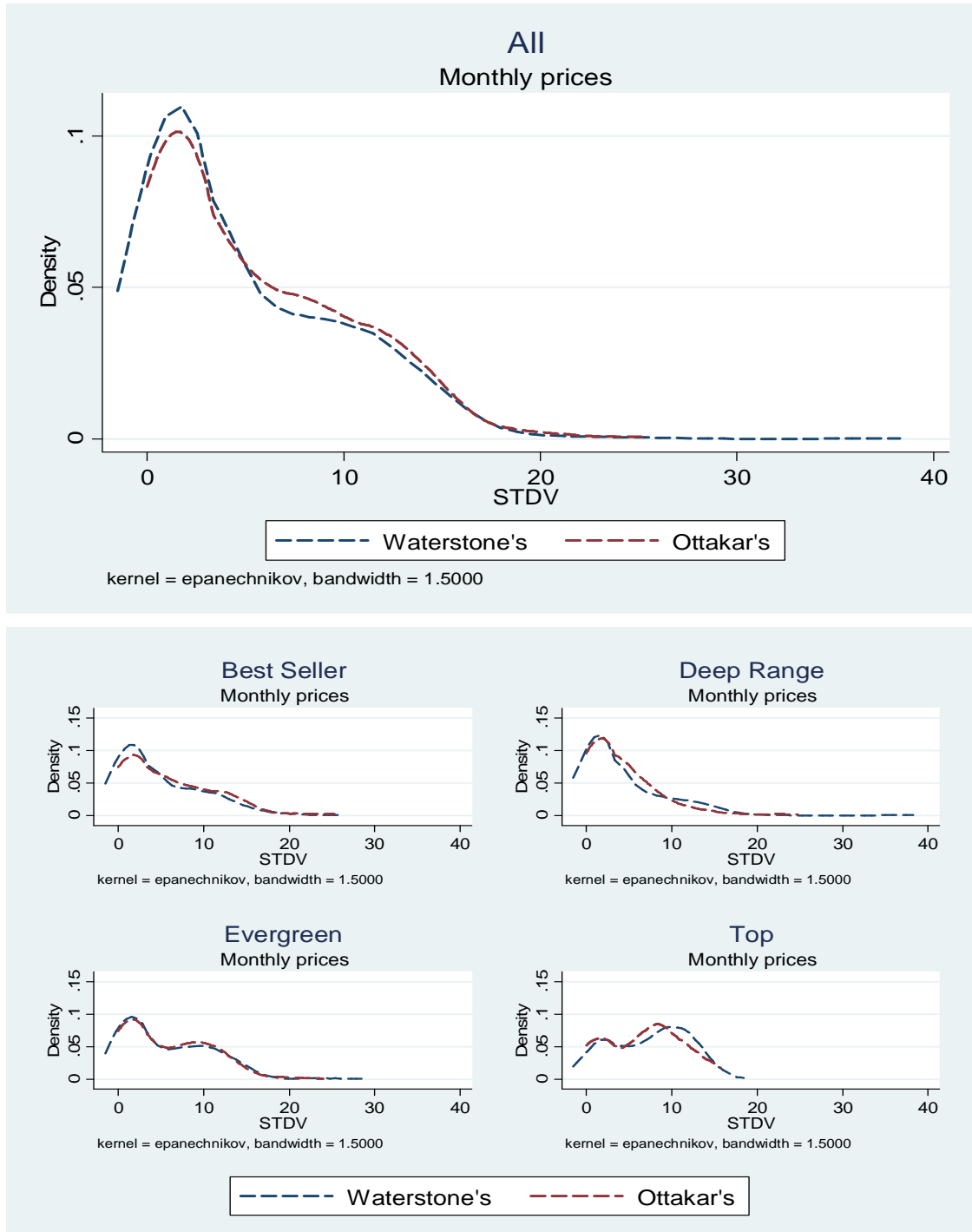
<sup>6</sup> These opinions were expressed to both the CC during its inquiry and to us in the responses of our questionnaires.

**Figure A3.4: Distribution of monthly standard deviation before merger: Waterstone's vs Ottakar's**



The graphical inspection shows no significant difference between the merged parties, suggesting that before the merger the extent to which Waterstone's and Ottakar's adopted local pricing was similar. As expected, this holds all the more for the discounts applied once the merger was consummated (see the figure below).

Figure A3.5: Distribution of monthly standard deviation after the merger: Waterstone's vs Ottakar's



## Appendix 4. The views of the market participants

As a integrating part of the ex post assessment, we also collected the views of a set of market participants. This was done through a written questionnaire. Out of the twelve players who had declared their willingness to participate in the questionnaire, we received responses from seven: two from wholesalers and five from publishers. However, one wholesaler completed only a shortened version of the questionnaire and one publisher extensively discussed his views on the effects of the merger on the industry by e-mail, but did not complete the questionnaire.

The questions focused on:

- the trends in the discounts off RRP's and in the volumes sold, distinguishing by retail channel<sup>7</sup> and type of book. Special attention was devoted to understanding what determined these trends and identifying possible shifts;
- consumers' purchasing habits; and
- the changes in the merged entity's commercial strength.

Most of the questions were closed. When inquiring about opinions or facts, we listed a number of statements and asked the respondents whether and to what extent they agreed with them. When investigating for possible explanations and causes, we allowed for open-ended answers. In both cases we left space for comments and clarifications.

The majority of questions required separate answers for the two years preceding the merger (2004-2005) and the two following the merger (2006-2007), and thus stimulated a comparison between the pre and post-merger years.

Due to the low response rate, we do not consider the interviewed sample to be representative of the population. Hence, these questionnaires only provide some useful, additional information to evaluate and challenge the outcomes of the econometric analysis, but they do not have the same statistical validity of a survey.

### *1.1. Geographical dimension of the competition*

To shed light on the issue of local versus national competition, we asked market participants whether, and to what extent, chains allowed individual stores to decide the level of the discounts according to local market conditions.

The answers consistently suggest that most retailers adopted a uniform national discount policy during the entire 2004-2007 period for all categories of books. In particular, this was true for Waterstone's, both before-and-after the merger.<sup>8</sup> The results for Ottakar's were less clear cut: half of the respondents reported that its stores were allowed some autonomy (albeit limited) in setting discounts before the merger.

### *1.2. Trends in the discounts offered and in the volumes sold*

To understand whether the merger had an impact on competition, we asked market participants to identify what had been the trends in the discounts on RRP's offered and the volumes sold for each category of titles in the years preceding (i.e. 2004-2005) and following (i.e. 2006-2007) the merger. We also asked for their views on what were the driving factors behind these trends and if there had been any changes that they considered to be a consequence of the merger. The questions were asked

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<sup>7</sup> We identified three retailing channels: non-specialist retailers, those who sell books as part of a wide range of goods (e.g. Tesco and WHSmith); specialists, those who are specialized in the sale of books, which have brick and mortar stores and may also sell online (being they part of large chains, like Waterstone's, or single independent bookshops); online retailers, those who don't have brick and mortar stores and only sell online (like Amazon).

<sup>8</sup> Only one respondent stated that Waterstone's used to allow shop by shop discounts on a limited range of titles before the merger.

separately for three retail channels: specialist retailers, non-specialist retailers and on-line retailers. The answers do not reveal a lessening of competition following the merger.

With respect to specialist retailers, the respondents tend to agree that discounts had been increasing over whole period.<sup>9</sup> By contrast, as regards volumes some respondents suggested that there had been a reduction in the volumes sold in the two years after the merger. The reason behind these trends was a growing pressure from on-line retailers and, in more recent years, from supermarkets, which had reduced the customer base of the specialist bookstores and had forced them to cut prices.<sup>10</sup>

As regards the other retailers (non-specialist and online retailers) the respondents share the view that they reduced their prices and enjoyed a consistent growth in volumes sold during the four years under scrutiny, due to their aggressive discount policies.

### *1.3. Competition among retailers*

We asked market players about consumers' purchasing habits. In particular, we asked whether consumers that bought books from non-specialist retailers also bought from specialist ones; whether the reverse was true or not; whether consumers were willing to pay a small premium on the books they bought from brick and mortar outlets in exchange for the opportunity to browse among books and obtain advice from staff. We concluded by asking whether non-specialist retailers also sold deep-range books and whether this had changed over the period under examination.

Our aim was twofold. First, we wanted to collect views about the relevant market dimension, i.e. whether all retailer belong to the same relevant market. Second, we were interested in investigating the extent of competition among retailers on deep-range titles, for which there appeared to be less price competition.

From the answers provided, it emerged that (i) those consumers who buy mainly from specialist retailers also buy from non-specialist ones (while the opposite is not true); and (ii) only a minority of the consumers are willing to pay a (small) price premium over the price they would have got online in exchange for the opportunity to browse among books and obtain advice from staff, which is the typical benefit of brick and mortar outlets. Moreover, we found that shopping habits vary depending on what consumers are buying and for what purpose. All in all, respondents seem to share the view that those consumers who mainly buy from specialist retailers tend to diversify their purchases. This implies that the other retailers (non-specialist and internet retailers) are able to exert a competitive constraint on specialist outlets, at least to some extent.

As for the deep-range titles, there is consensus on the fact that deep-range portfolio of non-specialist retailers is rather limited.

### *1.4. Effects of the merger on the parties*

We also questioned market participants about the effects of the merger on the merged entity's market behaviour.

In terms of the price and non-price dimensions, there were mixed views on whether the merged entity had an increased capacity of reducing the level and frequency of the discounts, as well as on the range of books it offered in its stores. One respondent claimed that "the merger led to a considerable reduction in consumer choice". It was also stated that the range reduction in which high street retailers have engaged might have a "devastating" effect in terms of cultural diversity, especially in some specific regions of the country. However, another respondent argued that reasons other than merger might have also played a role in the range reduction. In particular, the economic crises and the subsequent need for cost cuts led to a decrease in staffing (particularly buying teams) and fostered the

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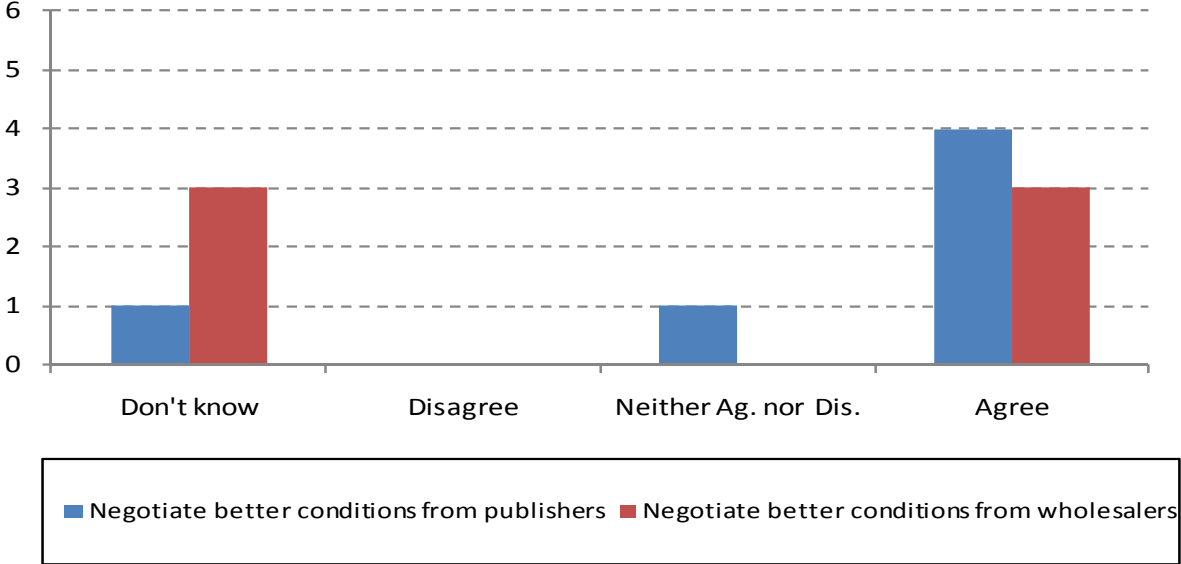
<sup>9</sup> Only one respondent signaled a reduction in discounts offered by specialist retailers, specifically on deep range books.

<sup>10</sup> Supermarkets mainly competed on top-selling titles, while online retailers on deep range ones.

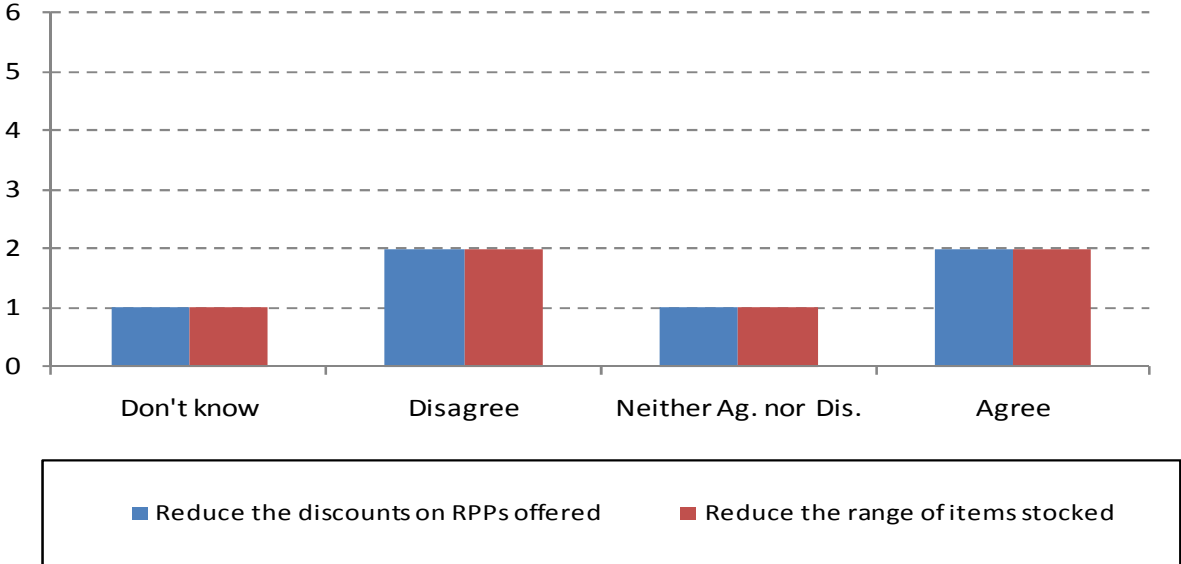
process of centralization in buying decision, which in turn resulted in the rolling out “a bland customized and standard offer”.

As for the post-merger bargaining power, the answers seem to indicate that Waterstone’s increased its capacity to negotiate better conditions from publishers with a more mixed picture for wholesalers, which one respondent said placed small independent publishers in a difficult bargaining position<sup>11</sup>. These results are shown in Figure A4.1 and Figure A4.2 below.

**Figure A4.1: Views on the effects of the merger on the merged entity’s bargaining power**



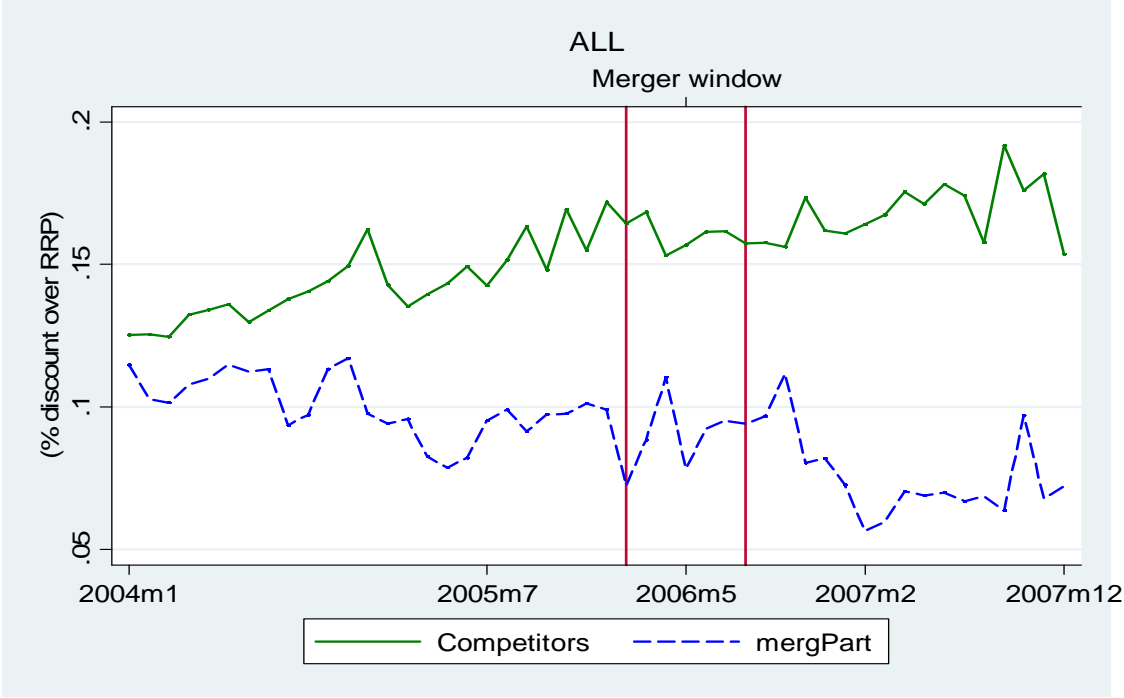
**Figure A4.2: Views on the effects of the merger on the merged entity’s discounts and range**



<sup>11</sup> Yet, the same respondent recognized that this situation might have deeper roots in the deregulation process that followed the end of the Net Book Agreement. It wrote that “the essential problem is that the UK market is completely deregulated with regard to price” and “the uncontrolled price wars now raging are in the process of destroying the traditional high street”. In this context, the merger may have then exacerbated and speeded up this process “through the permission of unprecedented aggregation of buying power into ever fewer hands”.

**Appendix 5. Robustness checks on national competition analysis**

**Figure A5.1: Distribution of monthly national discounts: merged parties vs competitors (All titles)**



**Table A5.1: DiD on local prices – time fixed effects**

	All titles (1)	Best sellers (2)	Deep-range (3)	Evergreen (4)	Top-sellers (5)
overlap		0.127 (0.35)	0.147 (0.67)	0.130 (0.39)	0.408 (0.88)
<b>TrEff</b>	<b>-0.190</b> <b>(-0.87)</b>	<b>-0.011</b> <b>(-0.02)</b>	<b>-0.244</b> <b>(-1.10)</b>	<b>0.027</b> <b>(0.07)</b>	<b>-0.054</b> <b>(-0.07)</b>
closed	0.093 (0.27)	-0.245 (-0.44)	-0.114 (-0.31)	0.119 (0.21)	-0.180 (-0.22)
<b>TrEff_closed</b>	<b>0.080</b> <b>(0.17)</b>	<b>0.997</b> <b>(1.05)</b>	<b>0.354</b> <b>(0.74)</b>	<b>0.331</b> <b>(0.45)</b>	<b>-0.493</b> <b>(-0.33)</b>
constant	60.691*** (10.50)	38.061*** (15.22)	26.556*** (20.90)	15.257*** (7.15)	50.269*** (13.53)
observations	176,668	37,981	59,548	57,974	20,754
R-squared	0.074				
number of id	11,842	4,549	6,916	2,445	2,930
cluster	ISAN*ISBN <sup>12,13</sup>	ISAN*ISBN	ISAN*ISBN	ISAN*ISBN	ISAN*ISBN
Time FE	YES	YES	YES	YES	YES
FE	ISAN*ISBN				
Robust t-statistics in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

The dependent variable is the price discount. In all columns we control for a monthly time trend, trading\_m1, trading\_m2, trading\_m3, a seasonal dummy, the price of wood pulp, the internet penetration rate, the housing price, gross value added, and the years elapsed since publication. In the random effects specifications (columns 2 to 5) we additionally control for waterstone, avgsales\_area, population, pop\_density, urban\_area, universities, education, classD2, classD3, classD4, series, figure, pages, paperback (see Table 4 for the description of control variables). Robust t-statistics (columns 1) and z-statistic (columns 2 to 5) in parentheses, The symbols \*\*\*, \*\*, and \* represent significance at the 1%, 5%, and 10% level respectively.

<sup>12</sup> ISAN is the Nielsen's unique identifier of a store.

<sup>13</sup> ISBN is the Nielsen's unique identifier of a title.



**Table A5.2: DiD on national prices (top-selling titles as control group) with time fixed effects**

VARIABLES	(1) BS per_DIS_m	(2) DR per_DIS_m	(3) EG per_DIS_m
titlecategory	-9.848*** (-4.41)	-18.126*** (-8.41)	-5.522** (-2.54)
<b>TrEFF<sub>2</sub></b>	<b>2.298</b> <b>(0.66)</b>	<b>6.390*</b> <b>(1.84)</b>	<b>5.407</b> <b>(1.62)</b>
pages	-0.003 (-1.08)	-0.002 (-1.23)	0.006 (0.93)
series	1.261 (0.69)	2.853** (2.20)	2.037 (1.01)
figure	-2.386 (-0.86)	-2.612 (-1.40)	2.071 (0.77)
paperback	4.518** (2.00)	3.924** (2.53)	2.069 (0.67)
classD2	1.984 (0.53)	2.233 (1.01)	-8.149* (-1.72)
classD3	0.538 (0.18)	0.892 (0.40)	-5.078** (-2.01)
classD4	-3.916 (-1.35)	-2.992* (-1.71)	-4.878 (-1.44)
elapsed_year	-1.179*** (-2.73)	-0.057 (-0.43)	-1.694*** (-3.84)
just_pub	4.845*** (3.55)	2.214* (1.88)	5.454*** (3.45)
constant	26.965*** (6.69)	25.386*** (9.08)	22.277*** (4.09)
observations	1,792	4,186	2,034
number of id	127	184	90
cluster	ISBN	ISBN	ISBN
Time FE	YES	YES	YES
RE	YES	YES	YES
Robust z-statistics in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

**Table A5.3: Before-and-after analysis on national prices – the merging parties**

VARIABLES	(1)	(2)	(3)	(4)	(5)
	BA All per_DIS_m	BA BS per_DIS_m	BA DR per_DIS_m	BA EG Per_DIS_m	BA TP per_DIS_m
month_t	-0.0979* (-1.861)	-0.299** (-2.335)	-0.119** (-2.495)	0.0717 (0.468)	-0.505* (-1.785)
<b>post_merger</b>	<b>-0.814</b> <b>(-0.807)</b>	<b>-5.075</b> <b>(-1.416)</b>	<b>-0.0201</b> <b>(-0.0229)</b>	<b>-1.850</b> <b>(-0.896)</b>	<b>-7.047</b> <b>(-0.845)</b>
woodpulp	0.000282 (0.562)	0.000724 (0.512)	0.000135 (0.250)	0.00182 (1.367)	-0.00189 (-0.611)
pages		-0.00476* (-1.858)	-0.00353** (-2.202)	0.00752 (1.003)	0.0106 (1.066)
series		0.358 (0.163)	3.040** (2.407)	1.075 (0.509)	4.282 (1.169)
figure		-3.135 (-0.877)	-3.696* (-1.882)	1.636 (0.464)	0.872 (0.203)
paperback		4.336* (1.695)	4.416*** (4.737)	-1.260 (-0.491)	2.322 (0.599)
classD2		3.593 (0.909)	3.959* (1.851)	-7.112 (-1.128)	-2.810 (-0.540)
classD3		0.297 (0.0726)	2.553 (1.168)	-9.828*** (-3.590)	0.0888 (0.0221)
classD4		-2.991 (-0.860)	-1.377 (-0.752)	-4.143 (-1.019)	-7.118 (-1.066)
house_price	1.17e-05 (0.0710)	0.000500 (0.762)	0.000154 (0.727)	0.000133 (0.428)	0.00102 (0.803)
internet	-0.330 (-0.655)	2.022*** (3.360)	0.572*** (3.022)	0.424 (1.621)	0.187 (0.103)
GVA	-14,701** (-2.541)	-12,059 (-1.232)	-4,416 (-1.356)	-5,070 (-0.949)	-5,813 (-0.286)
just_pub	6.349*** (5.859)	5.888*** (3.352)	-1.446 (-1.478)	3.900** (2.344)	2.874 (1.215)
elapsed_year	14.07** (2.201)	-0.605 (-1.513)	0.0783 (0.676)	-1.224*** (-2.825)	-2.850*** (-4.459)
season	0.515* (1.904)	2.236*** (3.261)	-0.459** (-2.368)	0.627 (0.786)	3.082*** (3.020)
constant	277.5** (2.511)	53.66 (0.776)	34.59 (1.254)	61.40 (1.184)	-48.17 (-0.333)
observations	6,571	1,208	3,489	1,456	404
R-squared	0.120				
number of id	200	78	135	41	49
cluster	ISBN	ISBN	ISBN	ISBN	ISBN
Time Trend	YES	YES	YES	YES	YES
Fixed-effects	ISBN	NO	NO	NO	NO

Robust t-statistics in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1