UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

UNITED STATES OF AMERICA, Plaintiff, v. APPLE, INC., et al., Defendants.	Civil Action No. 12-CV-2826 (DLC)

THE STATE OF TEXAS; THE STATE OF CONNECTICUT; et al., Plaintiffs, v. PENGUIN GROUP (USA) INC. et al., Defendants.	Civil Action No. 12-cv-03394 (DLC)

Direct Testimony of Orley C. Ashenfelter, PhD.

Contains Materials Designated As Highly Confidential Per Protective Order

I. QUALIFICATIONS

1. I am the Joseph Douglas Green 1895 Professor of Economics at Princeton University. I am the former President of the American Economics Association and the former President of the American Law and Economics Association. I am a recipient of the IZA Prize in Labor Economics and the Mincer Award for Lifetime Achievement of the Society of Labor Economists. I am a Fellow of the Econometric Society, a Fellow of the American Academy of Arts and Sciences, a Fellow of the Society of Labor Economics, a Corresponding Fellow of the Royal Society of Edinburgh, and a Distinguished Fellow of the American Economics Association. My areas of specialization include labor economics, industrial organization, econometrics, and law and economics. I was previously the Director of the Industrial Relations Section at Princeton University, and I have been Director of the Office of Evaluation of the U.S. Department of Labor, a Guggenheim Fellow, and the Benjamin Meeker Visiting Professor at the University of Bristol. I edited the *Handbook of Labor Economics* and I was a previous editor of the *American Economic Review* and a previous co-editor of the *American Law and Economics Review*.

2. My time is being billed at the rate of $840 per hour for my work in this matter. This is my normal hourly rate for this type of work. I may also receive payment from Ashenfelter & Ashmore, which has supported my work in this case.

II. ASSIGNMENT

3. I have been retained by the attorneys general for Alabama, Alaska, Arizona, Arkansas, Colorado, Connecticut, Delaware, District of Columbia, Idaho, Illinois, Indiana, Iowa, Kansas, Louisiana, Maryland, Massachusetts, Michigan, Missouri, Nebraska, New Mexico, New York, North Dakota, Ohio, Pennsylvania, Puerto Rico, South Dakota, Tennessee, Texas, Utah, Vermont, Virginia, West Virginia and Wisconsin. ("The states.") The states have alleged that Penguin Group (USA) Inc. ("Penguin"), Holtzbrinck Publishers, LLC ("Macmillan"), Simon and Schuster, Inc. and Simon & Schuster Digital Sales (collectively "Simon & Schuster"), Hachette Book Group, Inc. ("Hachette"), HarperCollins Publishers, L.L.C. ("HarperCollins"), and Apple Inc. ("Apple") conspired to convert all retailers to the agency model in order to raise e-book prices.[1] (I will refer to the publishers in this group as the "conspiring publishers".)

4. Counsel for the states have asked me to assume that the conspiracy alleged by the states occurred. For my purposes, I assumed a conspiracy that led to the adoption of the agency model and its pricing on April 1, 2010. They have also asked me, acting on that assumption, to study the following questions for fiction and non-fiction e-books:

[1] State of Texas et al. v. Penguin Group (USA) et al., Second Amended Complaint for Injunctive Relief Civil Penalties & As Parens Patriae on Behalf of Consumers, May 11, 2012. (Under the Agency Model the publisher receives 70 percent of the retail price and the retailer receives 30 percent of the retail price.)

- whether there is statistical evidence that the conspiring publishers' e-book prices rose as a result of the conspiracy;

- whether there is statistical evidence that consumers bought fewer e-books from the conspiring publishers or bought a different mix of e-books as a result of the conspiracy; and

- whether it is possible to provide a statistical estimate of the magnitude of the own-price elasticity of demand for e-books. (The "own-price elasticity of demand" gives the percentage change in the number of sales of a good or a service in response to a one percent change in its price. I will refer to it as the "price elasticity.")

This testimony summarizes the results of my research on these questions to date.

5. Counsel for the states have also asked me to review and comment on the statistical evidence presented in expert reports prepared by Dr. Michelle Burtis which I anticipate may form the basis of part of her testimony.[2] Counsel for the states have also asked me to review the transcript of Dr. Burtis's deposition.[3]

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[2] PX-0831 Expert Report Of Dr. Michelle Burtis On Behalf Of Apple Inc., Holtzbrinck Publishers, LLC D/B/A Macmillan And Penguin Group (USA) Inc., February 8, 2013. ("Burtis Report.") and PX-0832 Rebuttal Expert Report Of Dr. Michelle Burtis On Behalf Of Apple Inc. and Penguin Group (USA) Inc., March 1, 2013. ("Burtis Rebuttal Report.")

[3] Deposition of Michelle Burtis, Ph.D., April 5, 2013 ("Burtis Deposition.")

[redacted]

III. SUMMARY OF CONCLUSIONS

7. The first step of my analysis is based on a comparison of the change in e-book prices for the conspiring publishers from the six-month period prior to the implementation of the Agency Model (the "pre-period") to the six-month period following the implementation of the Agency Model (the "post-period"). The second step of my calculation adjusts for factors that would have affected e-book prices and quantities sold in the absence of the conspiracy.

8. I adjust for factors that that would have affected e-book prices and quantities sold in the absence of the conspiracy in two ways. First, I employ a control group of titles published by Random House, Inc. ("Random House"), which did not adopt the Agency Model during the period I study. Second, I use a regression model to adjust for differences

[redacted]

by factors specific to the retailer, factors specific to each title, factors specific to each month, whether the observation was affected by the "buy button" incident[5] and whether the title was on the backlist.[6] (Note that adjusting both for differences in factors specific to the title and differences in factors specific to the month, implicitly adjusts for differences in the length of time since a title was first published.) The model also allows for the possibility that the "buy button" incident, factors specific to the month and whether the title was on the frontlist might have different effects at different retailers.

9. Once I have calculated the percentage effect of the conspiracy on prices and quantities sold I calculate the relevant price elasticity as the ratio between the two percentage effects.[7]

10. I conclude that prices for e-books sold by the conspiring publishers did increase. I also conclude that consumers either bought fewer e-books from the conspiring publishers or bought a different mix of e-books as a result of the conspiracy. I calculate that the price increase was 16.8 percent. I calculate that the fall in the quantity sold was 14.5 percent. These differences are both statistically significant. In addition, I calculate

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[5] I describe the "buy-button" incident in Section V Analysis.

[6] See Oral Statement of Maja Thomas, July 28, 2010, page 47 and Oral Statement of Ana Maria Allessi, August 26, 2010, page 23.

[7] Strictly speaking, I calculate the change in the natural logarithm of the price and of the quantity sold. This is approximately equal to the percentage change. I then calculate elasticities as the change in the log quantity divided by the change in the log price.

that the price elasticity for e-books was -1.01. That is, a price increase of ten percent is associated with a decline in e-book unit sales of 10.1 percent.

11. I also conducted tests of the sensitivity of my results to the use of different datasets and specifications. These changes in the model included the use of different "windows" for the pre-post comparisons, the use of data from different sets of retailers, and a study of the effect on prices and quantities when Random House finally adopted the agency model. In all cases, the price and quantity effects remain significant, and they are generally within 5 percentage points of the corresponding effects in my primary analysis. All of these tests of the robustness of my results support my conclusions.

12. I have reviewed Dr. Burtis's report, rebuttal report and relevant portions of her deposition transcript and my opinions (to date) of her statistical analyses are as follows:

13. Dr. Burtis agrees with my conclusion that prices for e-books sold by the conspiring publishers increased from the period of time prior to the introduction of the Agency Model (the "pre-period") to the period of time following the introduction of the Agency Model (the "post-period").[8] She states, "Although average retail prices of

[8] PX-0825. Report Of Orley Ashenfelter In Connection With State Of Texas Et Al. v. Penguin Group (USA), Inc. Et Al., February 8, 2013, ("Ashenfelter Report") ¶8.

Publisher Defendants' eBooks increased (to varying degrees) after the Agency agreements went into effect …. "[9]

14. Dr. Burtis also appears to agree, at least in part, with my conclusion that consumers either bought fewer e-books from the conspiring publishers or bought a different mix of e-books as a result of the introduction of the Agency Model. In Section IV of her report, entitled "Empirical Evidence Contradicts Plaintiffs' Claim That Agency Agreements Had an Anticompetitive Effect," she indicates that "Publisher Defendants' share of eBook sales declined over time, beginning before agency and continuing through the agency period, while sales by other publishers increased."[10]

15. Dr. Burtis analyzes changes in the mean price of all e-books from the pre-period to the post-period, finding that these prices fell, on average, over this period.[11] She concludes this fall in average prices provides statistical evidence that contradicts the plaintiffs' claim that the adoption of the Agency Model had an "anticompetitive effect."[12]

16. The correct way to measure whether the Agency Model increased prices is to compare actual prices to the prices that would have prevailed but for the adoption of the

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[9] Burtis Report, ¶5a.

[10] Burtis Report, ¶29.

[11] Burtis Report, ¶25.

[12] Burtis Report, ¶23.

Agency Model.[13] Dr. Burtis does not say explicitly whether she considers prices in the pre-period to be a measure of "but-for" prices. However, since a comparison of prices in the pre-period to prices in the post-period is otherwise irrelevant for her purpose, I assume that she does consider prices in the pre-period to be a measure of "but-for" prices. Dr. Burtis provides no support for this assumption.

17. What is more, Dr. Burtis does not take account of the change in mix of e-books on sale during this period. Once I adjust her study to take account of the changing mix of publishers, for example, her data indicate that the price of e-books did not fall but instead rose, on average, during the period she studied. This illustrates how changes in the composition of e-book sales could be responsible for the price effect found by Dr. Burtis.

18. Dr. Burtis finds that the volume of unit sales of all e-books rose, on average, from the pre-period to the post-period[14] and concludes that this increase in unit sales provides statistical evidence that contradicts the plaintiffs' claim that the adoption of the Agency Model had an "anticompetitive effect."[15] Once again, this conclusion appears to be based on the implausible assumption that unit sales of e-books would not have changed from the pre-period to the post-period in the absence of the Agency Model. (Otherwise this comparison is irrelevant for her purpose.) Given that e-book unit sales were growing

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[13] I will refer to a hypothetical world that is the same as the actual world but for the adoption of the Agency Model as the "but-for" world.

[14] Burtis Report, ¶25.

[15] Burtis Report, ¶23.

at an annual rate of 406 percent prior to the introduction of the Agency Model, this seems unlikely. In fact, Dr. Burtis's data indicate that during the post-period, the average level of total e-book unit sales was seven percent lower after controlling for the trend for the pre- and post-periods taken together.[16] This illustrates how Dr. Burtis's failure to control for how the market would have changed in the absence of the Agency Model can lead to flawed conclusions.

[redacted]

20. In addition, my robustness checks using data for (a) Barnes and Noble only and (b) Amazon, Barnes and Noble, Apple, and Sony show that price and quantity effects were similar across retailers [redacted].

[16] This is computed from a regression of log quantities on a continuous time variable, which measures the trend in volumes, and a dummy variable indicating the post-period. [redacted]

IV. DATA

21. This section of my report gives a brief description of my data sources and provides a series of illustrative graphs intended to introduce certain pricing patterns. I describe a more formal analysis of these patterns in the next section of my report.

A. Data Sources

22. The data I use for my analyses are sales data provided by e-book retailers. Much of my analysis focuses on Amazon, Barnes & Noble, and Apple, but I also analyze data from the smaller e-book retailers Sony, Kobo, Google, and Books-A-Million. It is my understanding that the data were collected in the normal course of business. The data provide units sold and revenue in each week for each e-book. The data also provide information on the genre of each title, its release date, and the publication date of all print editions of the title.

B. Illustrative Graphs

23. An illustrative descriptive analysis of what happened to e-book prices and quantities after the adoption of the Agency Model by the conspiring publishers is contained in Figures 1 through 10.[18] Each figure is in the same format and presents illustrative data from Amazon for a single e-book title. The books are selected to represent the various

[18] These figures use data from the parallel database described in Appendix A rather than the data used for the primary analysis below. In particular, when there are multiple editions of the same e-book title, as identified by a 'Title ID' variable in the Amazon data, the units sold and revenues are combined.

publishers who are alleged to be a part of the conspiracy and who raised prices April 1, 2010,[19] plus Random House (not alleged to be a part of this group). They are also selected to represent popular titles; that is, books with a sizeable sales volume.

24. The top panel of each figure contains a graph of the average price of the e-book, while the bottom panel contains a graph of the quantity of the book sold. A vertical line is drawn on each graph at the point April 1, 2010 to indicate the date these conspiring publishers raised prices.

25. The first two books listed were published by Random House and they provide an example of the benchmark used in the regression analysis that follows. In that subsequent analysis Random House pricing will be used to control for other factors that might have affected e-book prices absent any conspiracy. It is apparent from both Figures 1 and 2 that there are no price changes shown on the graph in the week of April 1, 2010. Quantities tend to be considerably more variable in these graphs, with fairly steady declines that tend to follow a book's initial introduction.

26. Figures 3 through 10 show e-book prices and sales for 8 books published by Hachette, HarperCollins, Macmillan, and Simon and Schuster. It is apparent from these charts that prices were increased in the week of April 1, 2010 for all of the books depicted.

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[19] As I explain in more detail in Section V, Penguin raised some prices on April 1, 2010 and others between May 26 and May 31, 2010.

The apparent price increase is either about $3 or $5 per book, but not all price increases are identical.

V. PRIMARY ANALYSIS

27. In this section of my report I describe the methods I use to measure the effect of the shift to the Agency Model on prices and unit sales and report on the results of that analysis. In Section V.A, I discuss my methods. In Section V.B I describe the data sample I use for the analysis. In Section V.C I describe the factors I include in my model. In Section V.D I report the results of my analysis.

A. Methods

28. In order to measure the effects of the conspiracy, I compare what actually happened with what would have happened but for the conspiracy. In particular, it may not be appropriate to assume that e-book prices and quantities sold would have remained the same in the "but-for" world. The method I use to control for changes in e-book prices and quantities sold that are independent of the existence of the conspiracy is based on a regression model that uses Random House titles as a control for e-book prices and demand and also uses a number of other factors.

29. The first step of my calculation is based on a comparison of the change in e-book prices for the conspiring publishers from the six-month period prior to the implementation of the Agency Model (the "pre-period") to the six-month period following the implementation of the Agency Model (the "post-period"). The second step of my

calculation adjusts for factors that would have affected e-book prices and quantities sold in the absence of the conspiracy.

30. I take account of changes affecting all e-book prices and quantities sold during the year I studied by using a control group of titles. For the control group I use titles from Random House, which did not adopt the Agency Model during this period. That is, I assume that, if there were changes in e-book pricing that would have affected the prices or quantities sold of e-books from the conspiring publishers, had they not conspired, these changes and other factors are reflected in the price and quantity sold of e-books from Random House.

31. For example, suppose prices for e-books from conspiring publishers rose 18 percent from the pre-period to the post-period. And suppose that because of an increase in demand for e-books the average price of an e-book from the conspiring publishers would have increased by two percent had there been no conspiracy. In this case, the effect of the conspiracy was to raise prices by 16 percent (18 minus 2).

32. For unit sales and revenues, the changes that would have occurred absent the conspiracy are likely to have been more substantial. Considering that e-book unit sales were growing at an annual rate of 406 percent prior to the introduction of the Agency Model, a raw comparison of unit sales or revenues from the pre-period to the post period is

particularly uninformative.[20] Suppose the number of e-books sold by conspiring publishers rose 100 percent from the pre-period to the post-period. And suppose that because of an increase in demand for e-books their sales would have increased by 120 percent had there been no conspiracy. In this case, the effect of the conspiracy was to lower sales by twenty percent (100 minus 120).

33. To capture the changes in price and quantities sold that would have occurred anyway, I assume that changes in demand for e-books were also reflected in the prices and quantities sold of e-books from Random House. This implies that the impact of the conspiracy on prices and quantities sold can be calculated as the change in the average price (or quantity sold) of e-books from conspiring publishers minus the change in control group (Random House) prices (or quantity sold). In the field of empirical economics this analytical design is called an analysis of difference-in-differences.

34. Once I have calculated the percentage effect of the conspiracy on prices and quantities sold I calculate the relevant price elasticity as the ratio between the two percentage effects. Note that the price and quantity effects imply an effect on revenues from conspiring publisher e-book sales. I also report this revenue effect to complete my analysis of these issues.

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[20] This rate of growth is based on a regression of log quantities on a continuous time variable, which measures the trend in volumes, with month controls for seasonal variations, for February 2008 through March 2010 only.

35. In choosing titles from Random House as a control group I considered how the conspiracy might have affected the prices of Random House e-books. For example, an increase in the conspiring publishers' prices might have diverted demand from conspiracy group titles and caused the price of Random House titles to increase. This increase in Random House prices would result in my calculation overestimating the level of the conspiracy group's prices in the absence of the conspiracy and, therefore, understating the impact the conspiracy had on the conspiracy group's prices. That is, to the extent that the conspiracy increased prices for Random House titles my calculation of the effect of the conspiracy on prices is conservative. I've seen no compelling evidence that the prices for Random House books changed during the period of this study.[21]

36. In another example, I understand that following the beginning of the Agency Model Amazon promoted titles from Random House more favorably than titles from the conspiracy group of publishers.[22] To the extent that this was a response to the adoption of the Agency Model by the conspiracy group, Random House's sales might have been higher during this period than they would have been in the absence of the Agency Model. This increase in Random House sales would result in my calculation overestimating the level of conspiracy group's sales in the absence of the conspiracy and, therefore, overstating the impact the conspiracy had on the conspiracy group's sales. This would not,

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[21] [redacted] I also discuss Dr. Burtis's data on prices in Section VIII of this report.

[22] PX-0378

however, affect my conclusions since it would indicate that the mix of e-books purchased changed because of the adoption of the Agency Model.[23]

B. Regression Sample

37. Only titles published prior to March 1, 2010 are included in the regression sample so that there is at least one month of sales prior to the change to the Agency Model to compare with sales in the post-period for each title. The regression sample is limited to titles published by Penguin, Macmillan, Simon & Schuster, Hachette, HarperCollins and Random House.

38. For the regressions, consecutive four-week periods are pooled together into single observations roughly corresponding to months.[24] I use six such four-week periods before the event (October 11, 2009 – March 27, 2010) and six four-week periods after the event (April 4, 2010 – September 18, 2010).

39. I use the same database Dr. Burtis uses for her analyses and follow her definitions as closely as possible in order to minimize the chance that any difference

[23] In addition, see Section VI for an analysis that uses only data from Barnes & Noble so that any special treatment of Random House by Amazon will not affect the results.

[24] I do not make use of data for a title at a given retailer if that title had at least one four-week period without any sales after its release date at that retailer. This is because of the potential for bias introduced by the fact that the logarithm of zero is not defined.

between Dr. Burtis's statistical results and my statistical results are a consequence of differences in how we processed the information provided by e-book retailers.[25, 26]

C. Regression Model

40. My regression model includes adjustments for differences specific to each retailer. This takes account of any effects on e-book prices and quantities associated with changes in where people purchase e-books.

41. I adjust for differences specific to each title. This adjustment takes account of differences in average price or quantity sold that are associated with changes in which e-books customers are buying. For example, suppose that the price of each individual e-book title remains exactly the same, but sales of e-books priced at $1 increase relative to other titles. Then the overall mean price of e-books would decrease, even though there is not a single e-book title for which the price decreased. My method, however, would correctly show that no price changes on e-books occurred.

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[25] In my rebuttal report (PX-0826 ¶17, fn 20), I noted that I had been unable to exactly reproduce some of Dr. Burtis's results from the statistical back-up materials she provided. I have since discovered that this was due to differences in how the intermediate data files were generated from the raw source data. In order to further minimize the chance of differences in data affecting my results, all results in this testimony have been produced (or re-produced) using the intermediate data files, which Dr. Burtis subsequently provided. The changes to the results do not affect my conclusions. For instance, the t-statistic on the price effect in Table 1 is 90.57 rather than the 90.55 reported in my rebuttal report.

[26] I also performed a parallel analysis with different source data and some differences in variable definition and sample selection described in detail in Appendix A. While I have adopted Dr. Burtis's sample for my primary analysis, the results of this parallel analysis are included for comparison in Appendix A.

42. I adjust for differences in factors specific to each month.[27] This adjustment takes account of any differences in prices or quantities sold that are associated with changes in e-book purchasing patterns over time. (Note that adjusting both for differences in factors specific to the title and differences in factors specific to the month, implicitly adjusts for differences in the length of time since a title was first published.[28])

43. I adjust for differences that are attributable to the book being on the "backlist."[29] This adjustment takes account of the fact that the price of a book is often lowered when it leaves the frontlist and becomes a "backlist" book. It also takes account of changes in the book's sales that are a result of price changes as the book ages.

44. As part of its negotiation with Macmillan over whether to adopt the Agency Model, Amazon removed the buy button from its web pages for all editions, including e-book editions, of Macmillan titles. The buy buttons were removed no later than January

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[27] By "month" I mean a consecutive four-week period. This empirical design thus includes fixed effects for retailer, title and month.

[28] In technical terms these factors are perfectly collinear.

[29] I use the same definition of backlist as Dr. Burtis, which includes all sales not classified as New York Times ("NYT") bestseller sales, hardcover new release sales, or paperback sales. An observed sale is classified as an NYT bestseller during the period for which the corresponding hardcover book is on a Hardcover Fiction, Nonfiction, or Advice & Misc. NYT bestseller list, or for 90 days following its initial inclusion on the list, whichever is longer. E-book sales are categorized as hardcover new release sales if they occur within one year of the release of the first corresponding hardcover or until the release of the first corresponding paperback (if such paperback release date is at least 7 months after the hardcover release date), whichever comes first. Finally, paperback sales are those that take place within a year of the release of the first corresponding paperback. See Burtis Report, ¶¶ 15-19.

29, 2010 and were replaced no later than February 6, 2010.[30] I adjust for any effect this might have had on Macmillan's sales with a variable that indicates, for Macmillan titles, whether any portion of this period is included in the relevant month.

45. I measure the effect of the Agency Model on conspiring publisher prices and sales by means of a variable that indicates whether Agency Model contracts were used by the publisher at the relevant retailer in the relevant month. For Simon & Schuster, HarperCollins, Macmillan and Hachette, Agency Model contracts were in effect beginning April 1, 2010 at all three retailers included in my study. Penguin's sales at Apple and at Barnes & Noble were covered by Agency Model contracts beginning April 1, 2010. However, it did not use an Agency Model contract at Amazon until sometime between May 26, 2010 and May 31, 2010.[31, 32] Because of this staggered move to the Agency model at different retailers, sales of Penguin ebooks at Barnes & Noble and Apple are considered to be Agency Model sales beginning April 1, 2010, but sales of Penguin ebooks at Amazon are not considered to be Agency Model sales until two months later.

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[30] PX-704 and PX-0379

[31] Despite the "most favored retailer" clause in the Agency Model contracts, Penguin typically priced their e-books at Apple and Barnes & Noble at higher prices than those set by Amazon beginning April 1, 2010. (For examples of the most favored retailer clause, see PX-0007 at ¶ 5, PX-0010 at ¶ 2(c), PX-0009 at ¶ 2(c), PX-008 at ¶ 6.3, and PX-0011 at ¶ 3(g)(i). For a comparison of the relevant prices, see Table 8.)

[32] PX-0015, PX-0002, PX-0010 and PX-0284

D. Results

46. Table 1 (attached) shows the results of my analysis. I report the results of my analysis of e-book prices in the first column of the table and the results of my analysis of e-book quantities sold in the second column of the table. I also report the results of an analysis of revenues in the third column of the table.

47. The first row of the table shows my calculation of the effect of the alleged Agency Model conspiracy. In this row a positive value indicates an increase, on average, from the pre-period to the post-period and a negative value indicates a decrease, on average, over the same period. The table indicates that prices for conspiracy publisher titles were 0.155 log points (16.8 percent) higher, on average, in the post-period than in the pre-period, after taking account of the factors controlled for in my model.[33] The table also indicates that unit sales of e-books from conspiracy group publishers were 0.157 log points lower (14.5 percent) on average in the post-period than in the pre-period, after taking account of the factors controlled for in my model. In the third column, the table indicates that revenues from sales of conspiring publisher e-books fell 0.002 log points (0.2 percent) from the pre-period to the post-period.

[33] Note that this average gives equal weight to all titles regardless of how many copies of the title were sold. I use this weighting scheme in this context because it is important to calculate price and quantity effects consistently. Should I be asked to study overcharges for the purpose of computing damages I will consider whether this weighting scheme is appropriate in that context.

48. The second row of the table provides the absolute value of the t-statistics for a test of whether the calculated effects are statistically significantly different from zero. Generally speaking, a t-statistic with an absolute value of 1.96 or more indicates that the calculated effect is statistically significant at the five percent significance level. Both the t-statistic for the price effect (90.57) and the t-statistic for the quantity effect (22.59) indicate that the calculated effect is statistically significant. The absolute value of the t-statistic for the revenue effect is 0.24, indicating that it is not statistically significant.

49. The third row of the table lists the number of e-book titles included in my analysis: 27,791. The fourth row of the table indicates the total number of observations (title/retailer/month combinations) included in my analysis. It is 406,440.

50. The final row of the table displays my calculation of the price elasticity. This is computed as the quantity effect divided by the price effect. It is -1.01 indicating that a ten percent increase in prices will lead to a 10.1 percent decline in unit sales.

VI. ROBUSTNESS CHECKS

51. I have examined a number of alternative versions of my primary analysis to test whether the results are sensitive to the time period or retailers included. In all cases, the price and quantity effects remain significant, and they are generally within 5 percentage points of the corresponding effects in my primary analysis.

52. I report results here for three alternative time periods.[34, 35] In Table 2 I show the results of an analysis identical to that above except that only one week before and one week after the start of the Agency Model are used to estimate the effect of the conspiracy.[36] This analysis finds a statistically significant price increase of 0.131 log points (13.9 percent) and a statistically significant reduction in the volume of sales of 0.068 log points (6.6 percent). Table 3 likewise shows the results for two-week periods.[37] This analysis finds a statistically significant price increase of 0.129 log points (13.7 percent) and a statistically significant reduction in the volume of sales of 0.078 log points (7.5 percent). These results may be compared with the results in my primary analysis: a price increase of 0.155 log points (16.8 percent) and a quantity reduction of -0.157 log points (-14.5 percent). Lengthening the time period in the analysis increases the quantity effects, while leaving the price effects unchanged. This suggests a lag in the response of consumers to the price changes that resulted from adoption of the Agency Model.

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[34] I anticipate Prof. Gilbert may also testify about these time periods using different methods. (See PX-0821 Expert Report Of Richard J. Gilbert, February 8, 2013, ("Gilbert Report") ¶71, ¶128, ¶139.)

[35] I referred to these analyses in my deposition testimony. See Ashenfelter Deposition (3/29/2013) at 59:5-10.

[36] The weeks used are March 14-20, 2010 and April 11-17, 2010. Penguin titles are excluded from this analysis because they did not fully adopt the Agency Model until after this entire period.

[37] The periods used are March 7-20, 2010 and April 11-24, 2010. Penguin titles are excluded from this analysis because they did not fully adopt the Agency Model until after this entire period.

53. Table 4 examines changes over a longer period of time by using February, 2010 as the pre-period and February, 2011 as the post-period. This analysis finds a statistically significant price increase of 0.220 log points (24.6 percent) and a statistically significant reduction in the volume of sales of 0.215 log points (19.3 percent).

54. In summary, for all three alternative time periods, the price effects are positive and statistically significant and the quantity effects are negative and statistically significant. In addition, the revenue effects in Tables 2 and 3 are positive and statistically significant.

55. As I discussed in the previous section, Amazon may have promoted the titles of Random House more than titles of other publishers during the period I study. To examine the extent to which my results are affected by any special treatment of Random House by Amazon, I have also conducted my analysis using only price and sales data from Barnes & Noble.[38] The results of this analysis are reported in Table 5. The price effect is statistically significant at 0.179 log points (19.6 percent) and the quantity effect is statistically significant at -0.183 (-16.8 percent).

56. Finally, I checked whether limiting my analysis to only Amazon, Barnes & Noble, and Apple affected my results. Table 6 displays the results when Sony is included

[38] I referred to these analyses in my deposition testimony. Ashenfelter Deposition (3/29/2013 at 104:2-24).

as well.[39] This analysis finds a statistically significant price increase of 0.127 log points (13.6 percent) and a statistically significant reduction in the volume of sales of 0.140 log points (13.1 percent).

57. I also study whether Random House increased its prices when it adopted the agency model. This also serves as a check on the robustness of my previous findings.

58. This study uses the same techniques as the study described in the Section V with two differences. In this analysis, the conspiring publishers act as the control group. I also study the six four-week periods prior to Random House's adoption of the Agency Model on March 1, 2011 and the six four-week periods following that event.

59. Table 7 (attached) shows the results of this analysis. It follows the same format as Table 1 and can be read in the same way. It shows a statistically significant increase in Random House's prices for e-books of 0.168 log points (18.3 percent), on average. It also shows that Random House's unit sales of e-books were reduced by 0.183 log points (16.7 percent). This effect is also statistically significant. The calculated revenue effect shows a reduction in revenue from e-books of 0.015 log points (1.5 percent). This revenue effect is also statistically significant.

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[39] I referred to these analyses in my deposition testimony. Ashenfelter Deposition (3/29/2013) at 127:15-25. Simon & Schuster switched to the Agency Model with Sony on April 19, 2010. (SEL-R-0140422) Therefore, I cannot categorize observations for Simon & Schuster titles at Sony during the four-week period of April 4 to May 1, 2010 as either agency or non-agency. As a result, Sony observations for Simon & Schuster were dropped from the analysis for that month.

VII. DR. BURTIS'S ANALYSIS OF ALL E-BOOK PRICES

60. Dr. Burtis analyzes changes in the mean price of all e-books from the pre-period to the post-period, finding that this overall mean price fell, over this period.[40] She concludes this fall in average prices provides statistical evidence that contradicts the plaintiffs' claim that the adoption of the Agency Model had an "anticompetitive effect."[41]

61. The correct way to measure whether the Agency Model increased prices is to compare actual prices to the prices that would have prevailed but for the adoption of the Agency Model. Dr. Burtis does not say explicitly whether she considers prices in the pre-period to be a measure of "but-for" prices. However, since a comparison of prices in the pre-period to prices in the post-period is otherwise irrelevant for her purpose, I assume that she does consider prices in the pre-period to be a measure of "but-for" prices.

62. That is, Dr. Burtis appears to assume that, but for the adoption of the Agency Model, prices would have remained unchanged.[42] In other words, Dr. Burtis appears to assume that no other factor would have affected e-book prices absent the alleged conspiracy. Dr. Burtis provides no support for this assumption.

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[40] Burtis Report, ¶25.

[41] Burtis Report, ¶23.

[42] Note that I did not make this assumption in my analysis of price changes for conspiracy publisher titles. Rather, I assumed that the prices of Random House titles provide a measure of "but-for" prices. (See Section V.)

63. What is more, Dr. Burtis compares the average price in the pre- and post-periods without taking account of the changing composition of e-book sales. As she herself points out, the share of publishers other than the "big six" (Penguin, Macmillan, Simon & Schuster, Hachette, HarperCollins and Random House) was higher during the post-period than in the pre-period.[43] Dr. Burtis's Graph 1 implies that prices for books from non-big six publishers were lower than prices for e-books from the big six, on average.[44] Dr. Burtis's decline in mean prices may reflect a decrease in the relative sales of the higher-priced books sold by the big six publishers rather than a general decrease in the prices of particular books. That is, Dr. Burtis is not showing what happened to the prices of the same books or even of books from the same publishers.

64. Figure 11 (attached) illustrates this effect. Figure 11 shows Dr. Burtis's data for the unadjusted average price of all e-books as a light grey line.[45] It also shows her data after adjusting for the changing composition of publishers as a black line.[46] It is apparent

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[43] Burtis Report, ¶29.

[44] The graph shows the mean price of all e-books as consistently lower than the mean price of e-books from the big six. Therefore, prices for e-books from non-big six publishers were lower, on average, than prices for e-books from the big six, on average.

[45] For the sake of consistency with the adjusted prices I report, these data omit sales of titles where data do not indicate the publisher of the title. These omitted observations amount to 2.9 percent of Dr. Burtis's total unit sales and 1.2 percent of revenues.

[46] I made these adjustments by means of a regression model that takes account of the publisher of the particular e-book under observation. In her analysis, Dr. Burtis effectively weights the price of each title sold in a given month by the number of copies sold relative to the total number of copies of all e-books sold in that month. To be consistent with Dr. Burtis's approach, I use the same weights. (More technically, my replication of Dr.

from the figure that, while the unadjusted price fell following the adoption of the Agency Model by the conspiring publishers, the adjusted prices rose over that time period.

65. This illustrates how changes in the composition of e-book sales could be responsible for the price effect found by Dr. Burtis and that her analysis does not indicate a general reduction in the prices of particular books.

VIII. DR. BURTIS'S ANALYSIS OF UNIT SALES OF E-BOOKS

66. Dr. Burtis also analyzes changes in the volume of all e-books sold. Her analysis compares the volume of unit sales in the pre-period to the post-period, and shows that sales volumes increased over this period.[47] She concludes that this increase in unit sales provides statistical evidence that contradicts the plaintiffs' claim that the adoption of the Agency Model had an "anticompetitive effect."[48]

67. As with Dr. Burtis's analysis of e-book prices, the correct way to measure whether the Agency Model increased unit sales is to compare actual unit sales to the unit sales that would have occurred but for the adoption of the Agency Model. Thus, once again, Dr. Burtis appears to assume that there would have been no change in e-book unit

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Burtis's results is equivalent to a regression of prices on time dummies only, using Dr. Burtis's weights for the regression. My analysis controlling for the publisher's identity simply adds publisher dummy variables to this regression.) Because I make only a single change to Dr. Burtis's methods I can be confident that adding controls for publishers causes the difference between our results.

[47] Burtis Report, ¶27

[48] Burtis Report, ¶23.

sales but for the Agency Model. Given that e-book unit sales were growing at an annual rate of 406 percent prior to the introduction of the Agency Model, this seems unlikely.[49]

68. In order to illustrate the flaws in Dr. Burtis's approach, I checked whether total e-book unit sales were above or below trend following the introduction of the Agency Model on April 1, 2010. To do this I have performed a regression analysis that addresses this question. This regression model finds that, during the post-period, the average level of total e-book unit sales was seven percent lower after controlling for the trend for the pre- and post-periods taken together.[50]

69. This illustrates how Dr. Burtis's failure to control for how the market would have changed in the absence of the Agency Model can lead to flawed conclusions.

IX. [redacted] COMMENTS ON MY REGRESSION DESIGN

70. [redacted]

[49] See footnote 20, above.

[50] This is computed from a regression of log quantities on a continuous time variable and a dummy variable indicating the post-period, with month controls for seasonal variation.

[redacted]

[redacted] One way to measure whether Amazon's discounting of Random House e-books changed post-agency is to see whether it increased the number of Random House titles that it was selling below cost. Figure 12 shows what actually happened to the count of Random House titles sold below cost at Amazon.[redacted] Figure 12[redacted] shows a count of actual titles sold below cost.[redacted] It is apparent from Figure 12 that only between five and ten percent of Random House titles were sold below cost at Amazon before the Agency Model was adopted. Figure 12 also shows that, if anything, the fraction of Random House titles sold below cost at Amazon decreased after the Agency Model was adopted. This demonstrates that in the post-agency period, Amazon did not increase the percentage of Random House titles that Amazon sold below wholesale cost. [redacted]

[redacted]

[redacted] (Figure 12 also shows that there was no increase in below cost sales of titles from non-big 6 publishers.)

[redacted]

72. First my analysis reported in Table 5 is performed only for retail sales at Barnes and Noble, so it is not affected by behavior at Amazon only. This analysis shows price increases and quantity decreases due to the adoption of the Agency Model that are similar to those in my primary analysis.

73. Second, my analysis in Table 6 includes the minor sales at Sony [redacted] the results of this analysis also differ only slightly from the results of my primary analysis.[56]

[redacted]

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct. Executed on June 6, 2013.

Respectfully submitted,

Orley C. Ashenfelter, PhD.

Figure 1

[redacted]

Random House

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 2

[redacted]

Random House

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 3

[redacted]

Hachette

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 4

[redacted]

Hachette

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 5

[redacted]

HarperCollins

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 6

[redacted]

HarperCollins

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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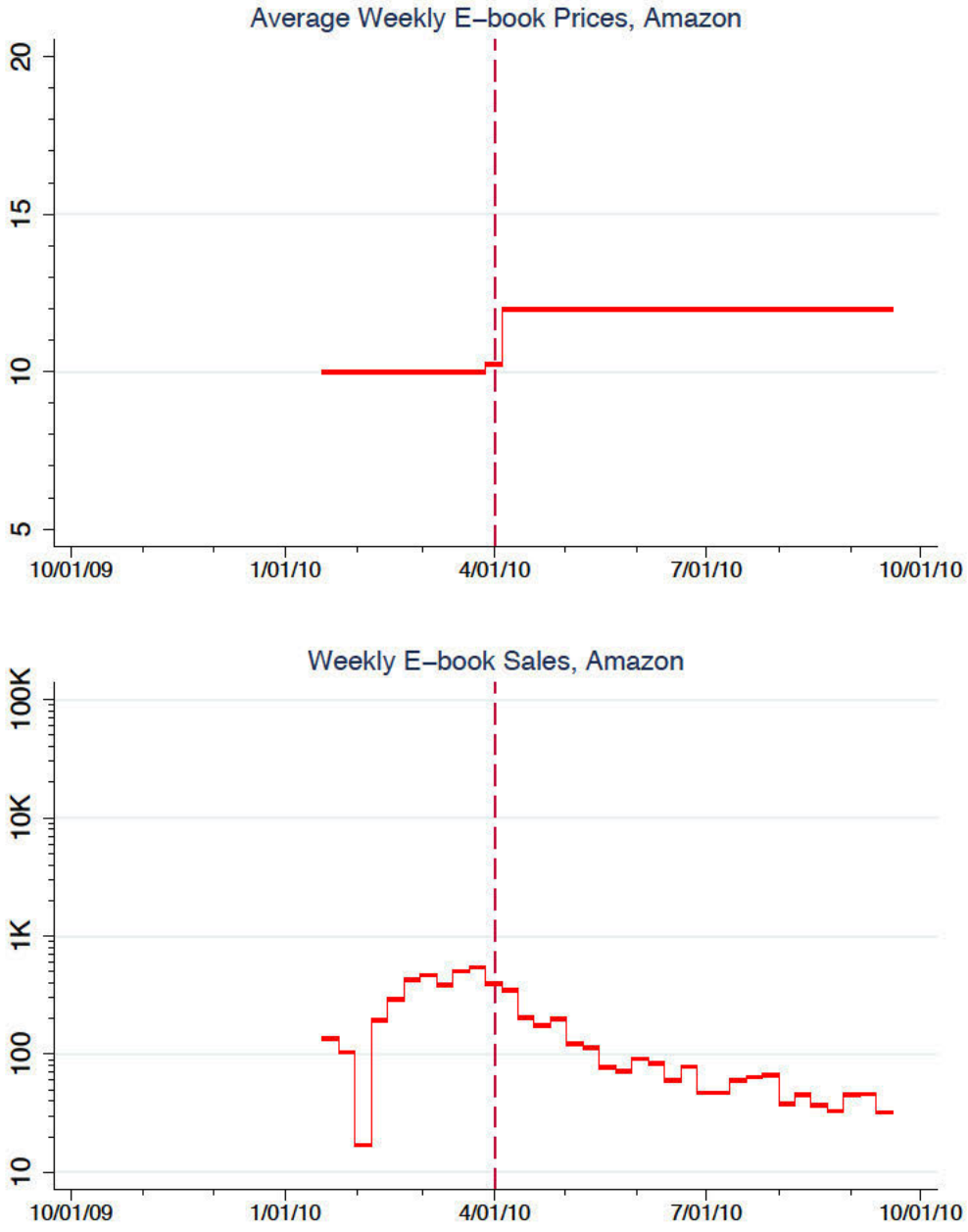
Figure 7

[redacted] Macmillan



The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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Figure 8

[redacted]

Macmillan

The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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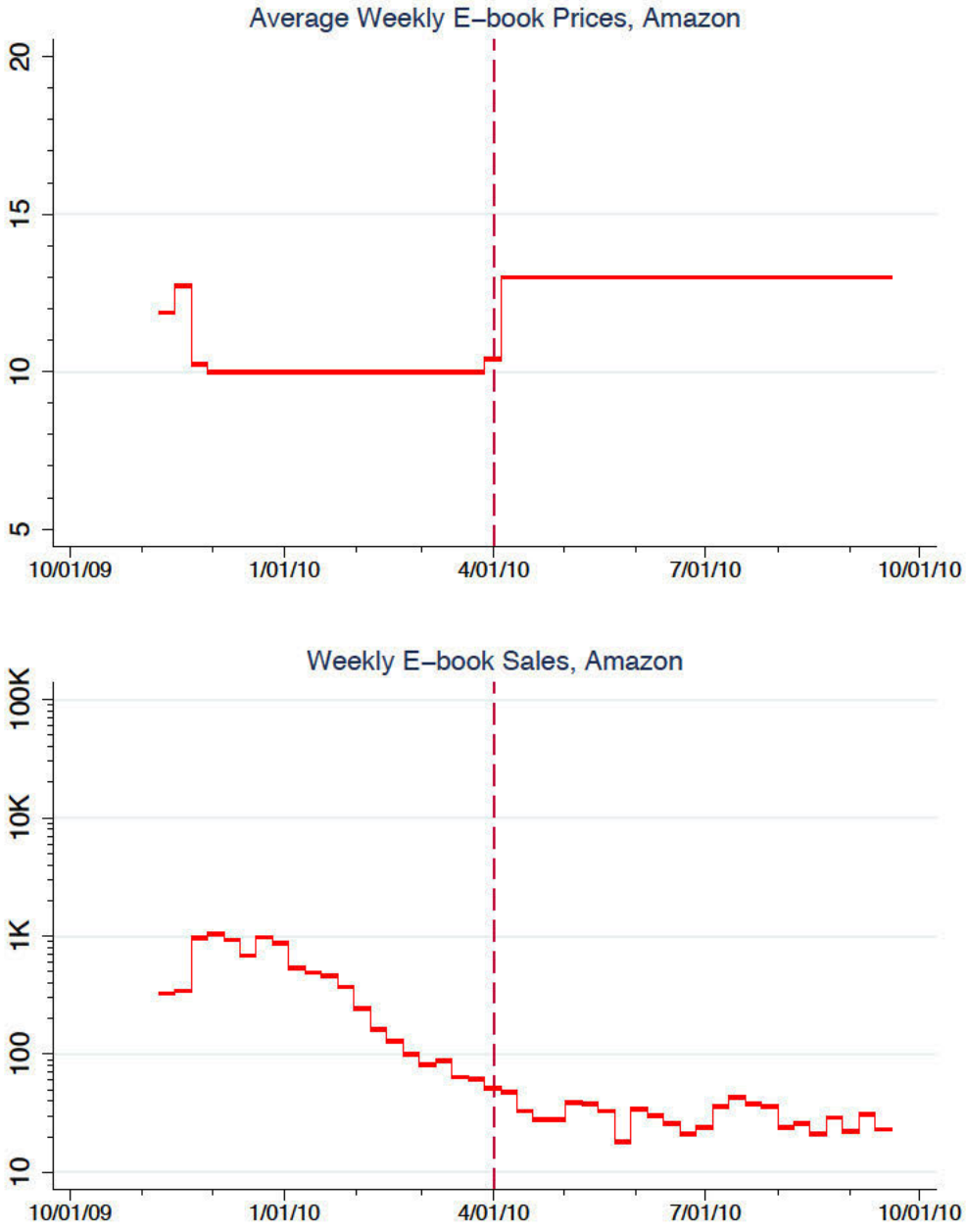
Figure 9

[redacted]

Simon & Schuster



The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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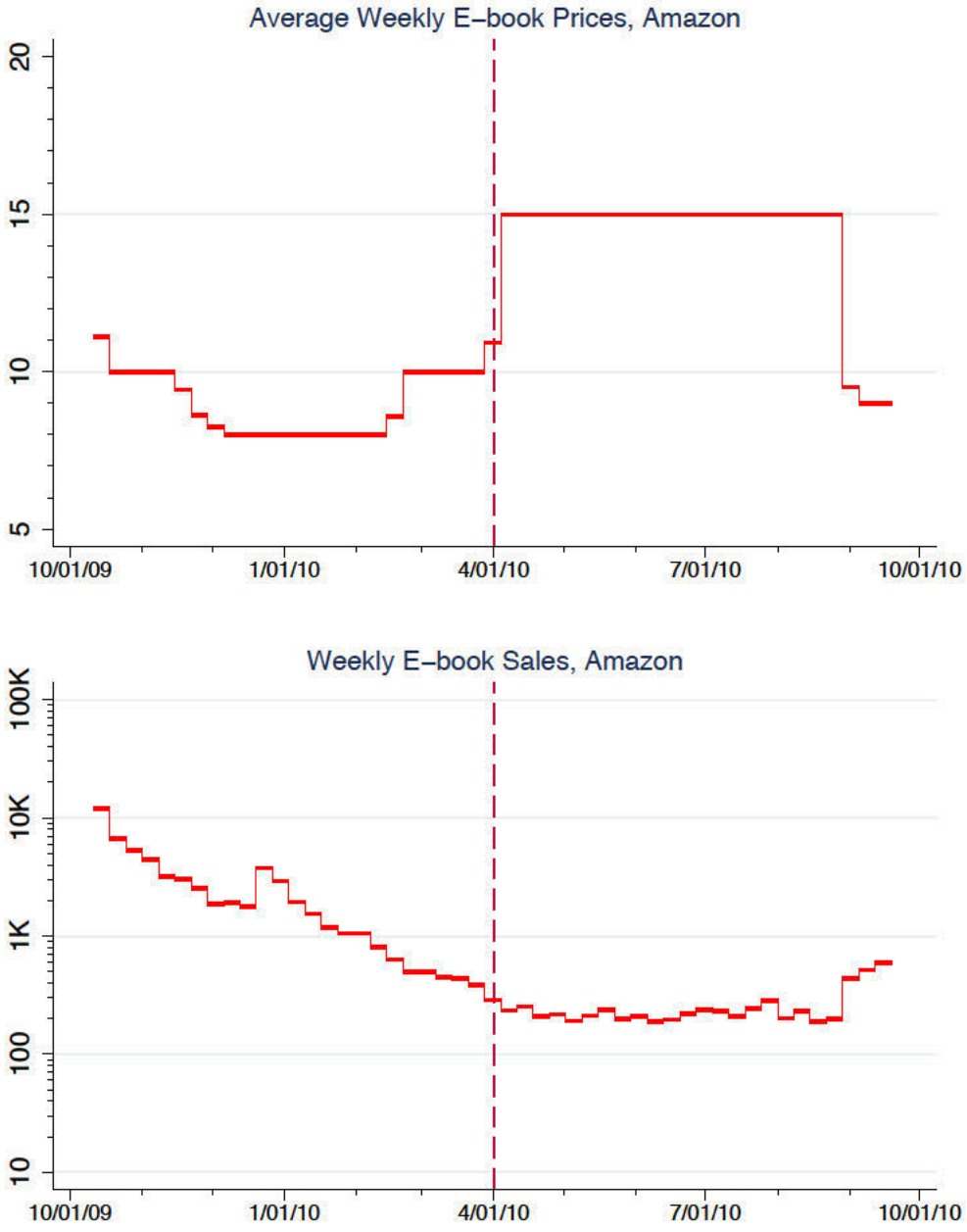
Figure 10

[redacted]

Simon & Schuster



The dashed line is at April 1, 2010. All prices are weekly revenue (USD) divided by weekly quantity sold.

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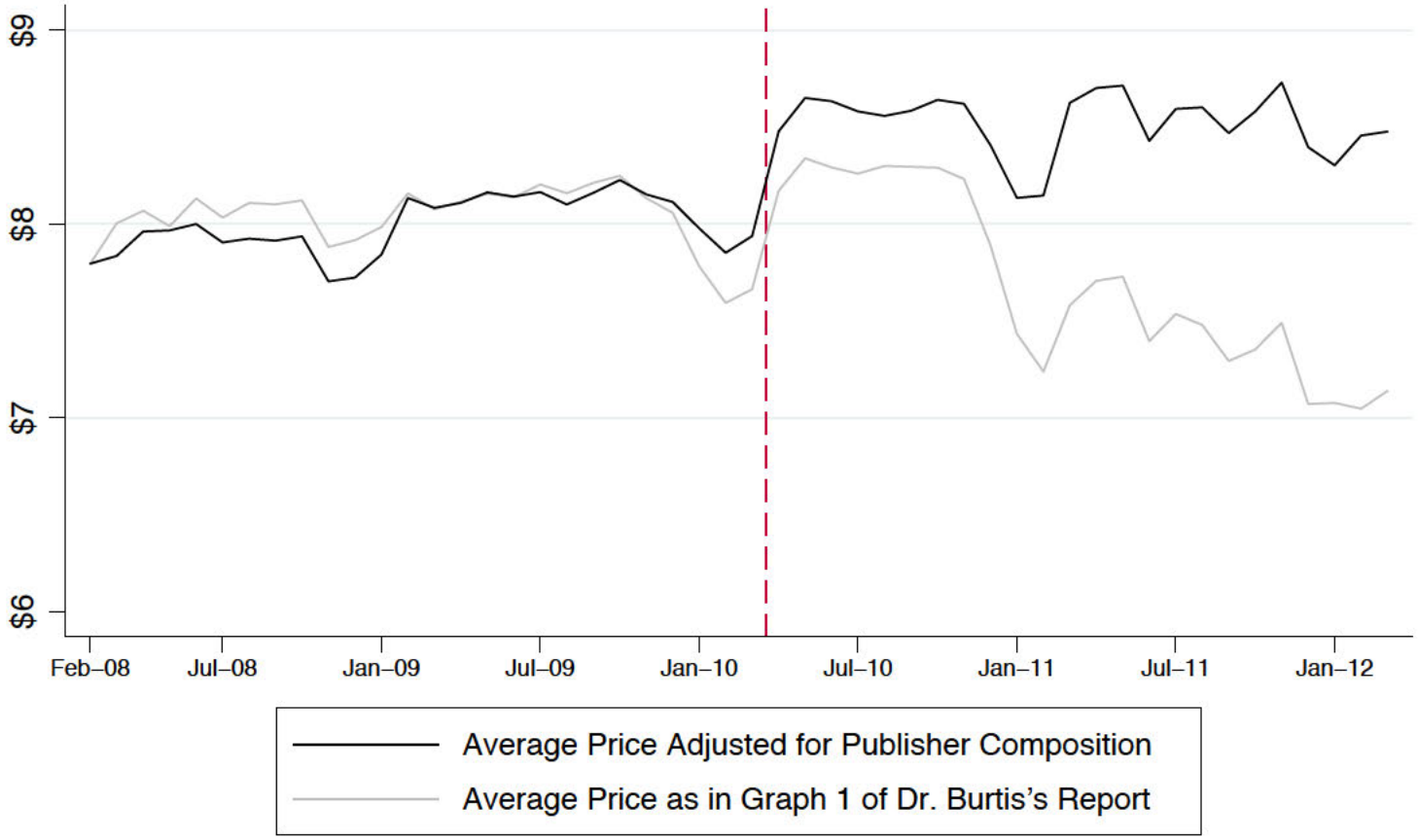
Figure 11: Average E–book Retail Prices Adjusted for Publisher Composition Compared to the Unadjusted Average Price Shown by Dr. Burtis



Average prices calculated rom aggregated Amazon, Barnes & Noble, Apple, Sony, Google, Books–A–Million, and Kobo sales rom ebruary 2008 to March 2012 he dashed line is at April 1, 2010

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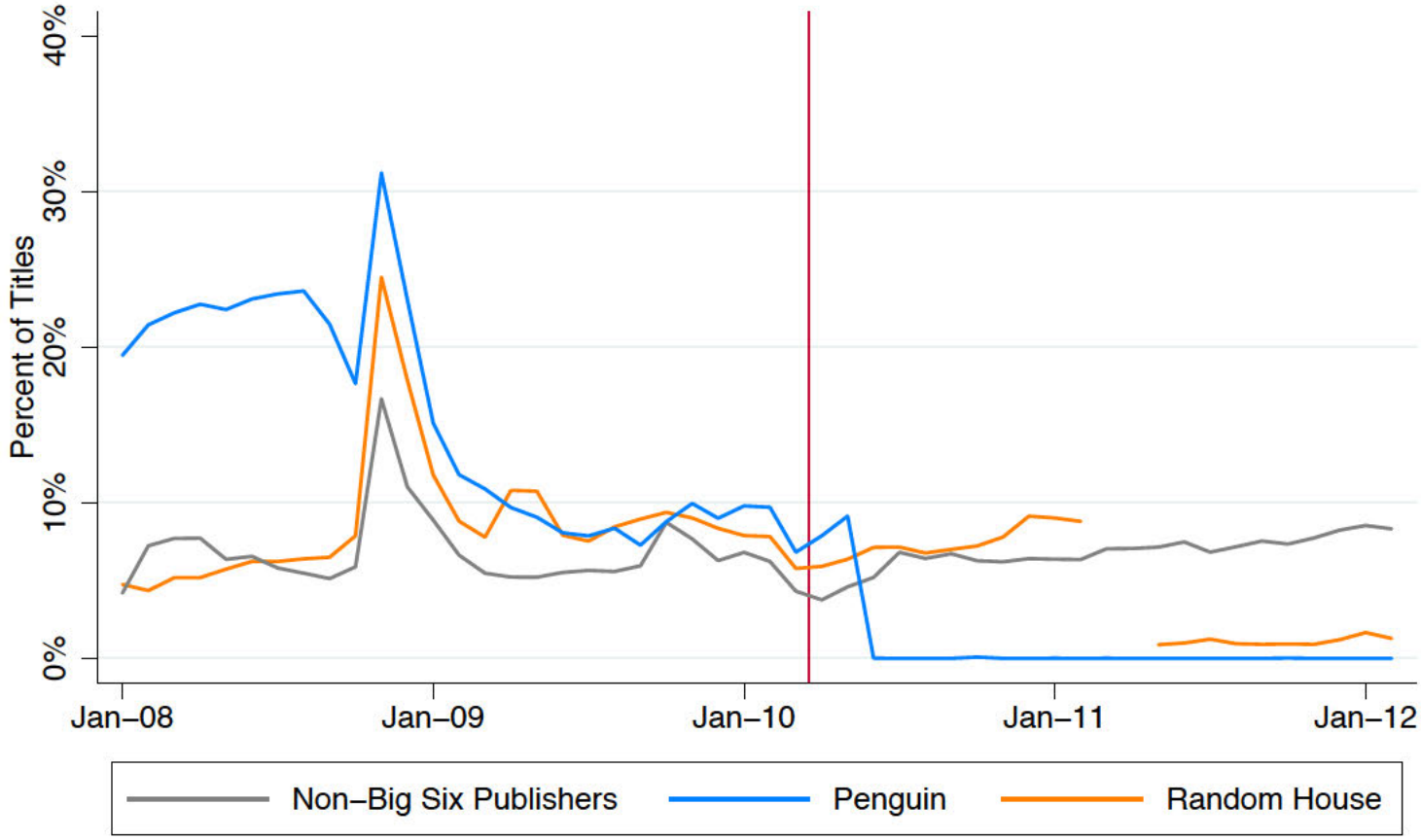
Figure 12: Amazon Titles Priced Below Wholesale Cost

All Titles



he vertical line marks April 1, 2010 March and April 2011 observations have been excluded or Random House, as in Exhibit 21 o Dr Rubin eld s report

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Table 1: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore

	Price	Units Sold	Revenue
Effect of the Agency Model	0.155	-0.157	-0.002
Absolute Value of the T-Statistic	(90.57)	(22.59)	(0.24)
Number of Titles	27,791	27,791	27,791
Total Number of Observations	406,440	406,440	406,440
Elasticity		-1.01	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the observation was affected by the 'buy button' incident, whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 2: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Using One Week Pre and Post (Penguin excluded)

	Price	Units Sold	Revenue
Effect of the Agency Model	0.131	-0.068	0.062
Absolute Value of the T-Statistic	(60.14)	(6.73)	(6.26)
Number of Titles	19,290	19,290	19,290
Total Number of Observations	48,118	48,118	48,118
Elasticity		-0.52	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and week (specifically the weeks ending March 20, 2010 or April 17, 2010).

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each week.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 3: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Using Two Weeks Pre and Post (Penguin excluded)

	Price	Units Sold	Revenue
Effect of the Agency Model	0.129	-0.078	0.050
Absolute Value of the T-Statistic	(67.48)	(8.76)	(5.72)
Number of Titles	24,496	24,496	24,496
Total Number of Observations	62,728	62,728	62,728
Elasticity		-0.61	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and two-week period (specifically March 7-20, 2010 or April 11-24, 2010).

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each period.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 4: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Using February 2010 and February 2011

	Price	Units Sold	Revenue
Effect of the Agency Model	0.220	-0.215	0.005
Absolute Value of the T-Statistic	(86.13)	(19.41)	(0.50)
Number of Titles	34,939	34,939	34,939
Total Number of Observations	93,062	93,062	93,062
Elasticity		-0.98	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the observation was affected by the 'buy button' incident, whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 5: Results of the Regression Analyses of E-Book Prices and Units Sold
Barnes & Noble Only

	Price	Units Sold	Revenue
Effect of the Agency Model	0.179	-0.183	-0.005
Absolute Value of the T-Statistic	(59.10)	(13.13)	(0.36)
Number of Titles	9,229	9,229	9,229
Total Number of Observations	91,957	91,957	91,957
Elasticity		-1.03	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title, whether the observation was affected by the 'buy button' incident, whether the title was on the frontlist (less than 1 year old) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 6: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, iBookstore, and Sony

	Price	Units Sold	Revenue
Effect of the Agency Model	0.127	-0.140	-0.013
Absolute Value of the T-Statistic	(70.96)	(19.97)	(1.87)
Number of Titles	29,042	29,042	29,042
Total Number of Observations	487,575	487,575	487,575
Elasticity		-1.10	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the observation was affected by the 'buy button' incident, whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 7: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Using Random House's Adoption of the Agency Model as the Event

	Price	Units Sold	Revenue
Effect of the Agency Model	0.168	-0.183	-0.015
Absolute Value of the T-Statistic	(87.53)	(28.09)	(2.35)
Number of Titles	35,563	35,563	35,563
Total Number of Observations	770,809	770,809	770,809
Elasticity		-1.09	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by Random House after adjusting for factors specific to each title and differences by retailer interacted with whether the title was on the backlist (Dr. Burtis's definition) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table 8: Comparison of Penguin E-book Prices at Different Retailers During April and May, 2010

	Proportion of Titles Priced Higher than Amazon*		Average Difference from the Amazon Price**	
	Barnes & Noble	iBookstore	Barnes & Noble	iBookstore
Apr. 4 - May 1, 2010	92.2%	92.7%	$1.65	$1.96
May 2 - May 29, 2010	97.5%	97.2%	$1.61	$1.91

During this period, Penguin had Agency Model contracts with Barnes & Noble and iBookstore but not with Amazon.

* The percentage shown represents the proportion of titles for which the average price during the specified four-week period at the named retailer is more than $0.01 higher than the average price at Amazon.

** The amount shown is the average price difference between the named retailer and Amazon, conditional on the title being priced higher by more than $0.01.

APPENDIX A

Parallel Analyses Using a Different Database

1. The database I use for my primary analyses is different from the database I use for the parallel analyses presented in this Appendix in several ways.[1] This serves as a robustness check on my primary analyses. The differences between the two databases are as follows.

2. My primary database was drawn from different source files. In particular, it was built from transactional level data provided by the retailers, while the parallel database was built from weekly summaries provided by the retailers. As a result of this difference in sources, the primary database covers a longer period of time than the data used for the parallel analysis. The primary data cover the period January 2008 to April 2012, while the parallel data cover the period January 2008 to February 2011.[2]

3. The definition of "backlist" in the primary analysis is that used by Dr. Burtis. In the parallel analysis, the variable indicating "backlist" simply indicates whether the title has been on the market for more than one year.

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[1] The origin of these separate databases is that the parallel analysis database was created for my February 8, 2010 report. In my rebuttal report, I replicated my results using Dr. Burtis's database to check whether I would get the same results.

[2] The parallel database also only includes data for Amazon, Barnes & Noble, and Apple. In addition, it is based on weekly data provided by Barnes & Noble using weeks that start on Mondays. So the start and end dates of the weekly periods differ by one day from the corresponding periods for the Amazon and Apple data, which start on Sundays.

4. In addition, in the parallel analysis, I exclude titles first published after October 1, 2009 if the e-book edition was delayed for some time after the release of the hardcover edition because their pattern of sales over time may be affected by this delay. The primary database does not include a straightforward means to identify these titles and, as a result, these titles are included.

5. The parallel analysis is limited to titles in adult fiction and non-fiction genres. My primary analysis does not include a measure of a book's genre. As a result, the primary analysis includes books of all genres included in the data provided by retailers.[3]

6. Except for these differences, the parallel analysis I report here uses the same methods as the analysis I describe in the main body of my testimony. The parallel analysis equivalents of Tables 1-5 and Table 8 are attached. I did not produce parallel versions of Tables 6 and 7 because the parallel dataset does not include data for Sony and does not include sufficient data from after Random House's adoption of the Agency Model.

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[3] In addition, in the primary analysis e-books are treated as separate items if they have different ISBNs. In the parallel analysis, I combine sales according to the 'TITLE_ID' variable provided by Amazon.

Table A-1: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Parallel Analysis

	Price	Units Sold	Revenue
Effect of the Agency Model	0.172	-0.161	0.011
Absolute Value of the T-Statistic	(91.75)	(19.43)	(1.40)
Number of Titles	18,186	18,186	18,186
Total Number of Observations	286,169	286,169	286,169
Elasticity		-0.93	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the observation was affected by the 'buy button' incident, whether the title was on the frontlist (less than 1 year old) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table A-2: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Parallel Analysis using One Week Pre and Post (Penguin excluded)

	Price	Units Sold	Revenue
Effect of the Agency Model	0.145	-0.067	0.079
Absolute Value of the T-Statistic	(52.62)	(5.67)	(6.88)
Number of Titles	12,772	12,772	12,772
Total Number of Observations	35,042	35,042	35,042
Elasticity		-0.46	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and week (specifically the weeks ending March 20, 2010 or April 17, 2010).

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the title was on the frontlist (less than 1 year old) and factors specific to each week.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table A-3: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Parallel Analysis using Two Weeks Pre and Post (Penguin excluded)

	Price	Units Sold	Revenue
Effect of the Agency Model	0.145	-0.087	0.058
Absolute Value of the T-Statistic	(58.68)	(8.36)	(5.71)
Number of Titles	15,664	15,664	15,664
Total Number of Observations	45,276	45,276	45,276
Elasticity		-0.60	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and two-week period (specifically March 7-20, 2010 or April 11-24, 2010).

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the title was on the frontlist (less than 1 year old) and factors specific to each period.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table A-4: Results of the Regression Analyses of E-Book Prices and Units Sold
Amazon, Barnes & Noble, and iBookstore
Parallel Analysis using February 2010 and February 2011

	Price	Units Sold	Revenue
Effect of the Agency Model	0.244	-0.110	0.134
Absolute Value of the T-Statistic	(75.90)	(8.01)	(9.97)
Number of Titles	24,519	24,519	24,519
Total Number of Observations	73,083	73,083	73,083
Elasticity		-0.45	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title, retailer, and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title and differences by retailer interacted with whether the observation was affected by the 'buy button' incident, whether the title was on the frontlist (less than 1 year old) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table A-5: Results of the Regression Analyses of E-Book Prices and Units Sold
Barnes & Noble Only
Parallel Analysis

	Price	Units Sold	Revenue
Effect of the Agency Model	0.179	-0.323	-0.144
Absolute Value of the T-Statistic	(39.74)	(17.10)	(7.94)
Number of Titles	4,833	4,833	4,833
Total Number of Observations	47,629	47,629	47,629
Elasticity		-1.81	

The dependent variable is the average price, unit sales or revenue (in natural logarithms) for a given e-book title and month.

The table presents the mean difference in e-book price, unit sales or revenue (expressed in logarithms) from the period prior to agency pricing to the period following agency pricing for e-books published by conspiring publishers after adjusting for factors specific to each title, whether the observation was affected by the 'buy button' incident, whether the title was on the frontlist (less than 1 year old) and factors specific to each month.

Absolute values of the t-statistic in parentheses, calculated using robust standard errors. Generally speaking, a t-statistic greater than 1.96 in absolute value indicates that the calculated effect is statistically significant.

Table A-6: Comparison of Penguin E-book Prices at Different Retailers During April and May, 2010
Parallel Analysis

	Proportion of Titles Priced Higher than Amazon*		Average Difference from the Amazon Price**	
	Barnes & Noble	iBookstore	Barnes & Noble	iBookstore
Apr. 4 - May 1, 2010	97.2%	96.8%	$1.67	$2.00
May 2 - May 29, 2010	98.3%	98.3%	$1.70	$2.00

During this period, Penguin had Agency Model contracts with Barnes & Noble and iBookstore but not with Amazon.

* The percentage shown represents the proportion of titles for which the average price during the specified four-week period at the named retailer is more than $0.01 higher than the average price at Amazon.

** The amount shown is the average price difference between the named retailer and Amazon, conditional on the title being priced higher by more than $0.01.