1   Robert A. Mittelstaedt #60359
    ramittelstaedt@jonesday.com
2   Craig E. Stewart #129530
    cestewart@jonesday.com
3   Michael Scott #255282
    michaelscott@jonesday.com
4   JONES DAY
    555 California Street, 26th Floor
5   San Francisco, CA 94104
    Telephone: (415) 626-3939
6   Facsimile: (415) 875-5700

7   Attorneys for Defendant
    APPLE INC.

8

9   UNITED STATES DISTRICT COURT

10   NORTHERN DISTRICT OF CALIFORNIA

11   SAN JOSE DIVISION

12

13   THE APPLE iPOD iTUNES ANTI-TRUST   **Case No. C 05-00037 JW**
     LITIGATION.   **C 06-04457 JW**
14
                                              EXPERT REPORT OF
15   **DR. MICHELLE M. BURTIS**

16   **Date:**   October 5, 2009
                                              Time: 9:00 A.M.
17   **Place:**   Courtroom 8, 4th floor

18

19

20

21   **I.   BACKGROUND AND EXPERIENCE**

22   1.   My background and experience are summarized in my expert report of June 17,

23   2009 in the indirect purchaser case.[1] This report is attached as Exhibit A. My hourly rate is

24   $540.

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     [1] Expert Report of Michelle M. Burtis, Ph.D., *Apple iPod iTunes Antitrust Litigation*, Case No. C
28   07-6507 JW (RS), June 17, 2009, ("Burtis Indirect Purchaser Report").

                                                      Expert Report of Michelle M. Burtis
                                                        C 05-00037 JW; C 06-04457 JW

1   II.   **INTRODUCTION**

2   2.   I was the economic expert for Apple in the indirect purchaser case. In that case, I

3   was asked to address whether the econometric analysis proposed by plaintiff's expert, Dr. French,

4   was a valid methodology to demonstrate antitrust impact and measure damages to proposed class

5   members. My conclusion was that Dr. French had not shown that a regression model would work

6   here and that based on my analysis to date his proposed regression models would not work.

7   3.   In my report in the indirect purchaser case, I explained how the regression models

8   work[2] and described several flaws in Dr. French's regression models, including the inability of

9   his models to distinguish the effects of the challenged conduct from the effects of other

10   competitive supply and demand factors and the inability of his models to distinguish between the

11   periods before and after the challenged conduct.[3] I showed that Dr. French had not identified or

12   quantified key variables and had collected little if any data. In my testimony at the evidentiary

13   hearing on June 30, 2009, I contrasted Dr. French's flawed regression approach with a successful

14   regression model I had constructed elsewhere to deal with crude oil prices in the aftermath of

15   Hurricane Katrina. As I described, one of the reasons I was able to reliably estimate a regression

16   model there was that sufficient data were available before the hurricane struck. A copy of the

17   transcript of that hearing is attached as Exhibit B.

18   4.   The Court denied the indirect purchasers' motion to certify a damages class under

19   Rule 23(b)(3) on July 17, 2009. The Court found that "Dr. French's testimony was limited to

20   making unspecified proposals as to how he might be able to prove damages, while Dr. Burtis's

21   testimony showed the significant challenges that Dr. French would face in carrying out his

22   proposals. Dr. French has proffered no specific economic model and has examined no set of data,

23   and has never accomplished what he purports to accomplish in an indirect purchaser antitrust

24   class action."[4]

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26   [2] Burtis Indirect Purchaser Report, pp. 4-7.

    [3] Burtis Indirect Purchaser Report, pp. 3-4, 8-18.

27   [4] "Order Denying In Part Plaintiff's Motion for Class Certification," *Apple iPod iTunes Antitrust*

28   *Litigation*, Case No. C 07-6507 JW (RS), July 17, 2009, p. 12.

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1   III.   **ASSIGNMENT**

2   5.   Counsel for Apple has asked me to address whether the methodologies proposed

3   by Professor Noll in the direct purchaser case can be used to estimate class-wide damages.[5]

4   6.   A list of material that I considered in preparing this report is attached as

5   Exhibit C.

6   7.   I summarize my conclusions in Section IV and describe the basis and reasons for

7   my conclusions in Sections V and VI.

8   IV.   **SUMMARY OF CONCLUSIONS**

9   8.   Professor Noll has proposed three approaches for estimating damages: "before-

10   after," "yardstick," and "mark-up." Dr. French proposed the same three basic approaches:

11   "temporal competitive benchmark," "yardstick competitive benchmark," and "margin analysis."[6]

12   Professor Noll's proposed methods suffer from the same basic flaws this Court found in Dr.

13   French's three methods. Like Dr. French, Professor Noll has not developed any actual model or

14   provided sufficient information about his proposed methods to demonstrate that these methods

15   would work. On the contrary, as I discuss below, his testimony shows he is doubtful that certain

16   of these methods can work. Further, like Dr. French, he has not collected any data or shown that

17   data exist to implement these methods. He has not identified or quantified the specific variables

18   he will use to estimate damages. He has written no equations. He has proposed no solutions to

19   the numerous obstacles that his proposed methodologies create.

20   9.   Professor Noll's first method for estimating damages is the "before-after" method.

21   He proposes using regressions to "compare iPod prices before and after April 2003."[7] This

22   approach suffers from the same basic flaws as Dr. French's "before-during" or "temporal

23   competitive benchmark" method. The purported baseline period before the alleged violation is

24   too short; most of the iPod models at issue were not even sold during that period; the differences

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26   [5] Declaration of Roger G. Noll, Ph.D., July 15, 2008 ("Noll Decl."); Deposition of Roger G. Noll, Ph.D., September 19, 2008 ("Noll Dep.").

27   [6] Affidavit of Gary L. French, Ph.D., February 23, 2009 ("French Affidavit"), pp. 34-37.

28   [7] Noll Decl., p. 55.

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1   among the models and their prices are vast; and pricing in this nascent, dynamic industry was

2   affected by too many complex factors that cannot be measured. Professor Noll does not explain

3   how he would estimate the difference in prices between the proposed class period and the

4   "before" period, while controlling for the relevant supply and demand factors. Nor has he

5   proposed a method to determine the dividing line between the "before period" and the period

6   when the conduct at issue allegedly had any effect on pricing.

7   10.   Professor Noll's "yardstick" method, like Dr. French's "yardstick competitive

8   benchmark," would require him to identify products in another market that are sufficiently similar

9   to each of the iPod products in features, functionality, design and costs that they could be used as

10   an appropriate benchmark to determine what the price should have been for each of the iPods

11   absent the alleged anticompetitive conduct. But he has not shown that any products meeting his

12   test exist. To the contrary, he admitted in his deposition that he has doubts about his yardstick

13   method and he conceded that the necessary data may not be available.[8] I believe that Professor

14   Noll's doubts are well founded. Based on my analysis to date, I do not believe this method will

15   work.

16   11.   Professor Noll's third proposed method is to estimate damages by comparing the

17   actual mark-ups (*i.e.*, the difference between price and cost) of iPods to mark-ups for some

18   competitive products. This approach is effectively the same as the yardstick method and faces all

19   the pitfalls of that method.

20   12.   In addition, all three of Professor Noll's proposed methodologies, like those of Dr.

21   French, fail to analyze whether any purchaser paid a net overcharge. He ignores the prices of

22   iTunes Store music even though, under plaintiffs' theory, if iPod prices were higher because of

23   the alleged violation than they would have been in the but-for world (*i.e.*, the world absent the

24   alleged anticompetitive conduct), iTunes Store music prices may have been lower. If so,

25   individuals with large iTunes Store music purchases relative to their iPod purchases may not have

26   paid any *net* overcharge under plaintiffs' theory and thus suffered no injury.

27   _____

28   [8] Noll Dep., pp. 72-73.

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1 **V.   PROFESSOR NOLL'S PROPOSED METHODS WILL NOT WORK**

2   13.   Professor Noll proposed three approaches to estimate competitive benchmark

3 prices: "before-after," "yardstick," and "mark-up."[9] As I discuss below, Dr. French proposed

4 these same basic approaches[10] and each suffers from the same basic flaws this Court found to

5 exist in Dr. French's methods. In addition, Professor Noll, like Dr. French, has not collected any

6 data or shown that common data exist to measure all the relevant supply and demand factors.

7   **A.   Professor Noll's "Before-After" Method Will Not Work**

8   14.   Professor Noll proposes a "before-after" method for estimating damages, which

9 suffers from the same basic flaws as Dr. French's "before-during" or "temporal competitive

10 benchmark" approach.[11] Professor Noll proposes using regressions to "compare iPod prices

11 before and after April 2003."[12] He asserts that his "before-after" regression approach would

12 attempt to quantify the price effect of the challenged conduct by estimating the difference

13 between prices in the proposed class period and prices in the "before" period, while controlling

14 for factors such as "product features, input costs, . . . the stage of the product in its life-cycle . . .

15 [and the] number of permanent downloads that are available on iTMS."[13]

16   15.   As discussed in my June 17, 2009 report, where this type of regression framework

17 is used, it generally includes explanatory variables such as the relevant competitive supply and

18 demand factors along with a "dummy" variable. As I explained, a dummy variable is given a

19 value of zero when it is "off," *i.e.*, before the misconduct occurred, and a value of one when it is

20 "on," *i.e.*, during the misconduct period. The regression estimates a number or a "coefficient" for

21 the dummy variable, reflecting the number of units, or the percentage, by which the price is

22 higher (or lower) when the dummy variable is on, while controlling for other factors.[14] In other

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24 [9] Noll Decl., p. 17.

    [10] French Aff., pp. 34-37.

25 [11] French Aff., pp. 35-37.

26 [12] Noll Decl., p. 55.

27 [13] Noll Decl., p. 55; Noll Dep., p. 70.

28 [14] Burtis Indirect Purchaser Report, pp. 4-8.

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1   words, the dummy variable in such a regression model is intended to attempt to measure the

2   difference between average prices in the class period and average prices outside the class period,

3   controlling for the other variables in the equation, assuming this type of analysis can be used at all

4   in the particular circumstances.

5   16.   However, Professor Noll questioned whether he would use a dummy variable in

6   his regression model to measure the difference between average prices in the class period and

7   average prices outside the class period.[15] Neither in his declaration nor in his deposition has

8   Professor Noll specified any methodology that would *not* rely on a dummy variable but would

9   allow him to quantify the effect of the challenged conduct on prices.

10   17.   I am not aware of any valid before-and-after regression method that could

11   determine damages given the realities of the varying products at issue here as well as the

12   relatively few price changes in the products over time. In fact, as discussed in my June 17, 2009

13   report, I believe that a "before-after" regression model or a "temporal competitive benchmark"

14   analysis would not work here. To obtain a robust and accurate measure of any alleged

15   overcharge, a regression model must be able to account for all of the important factors relevant to

16   determining iPod prices. Otherwise, it has no probative value. The effect of omitted factors or

17   variables is well known in the econometrics literature.[16] At his deposition, Professor Noll agreed

18   that it is important to control for all these factors.[17] Moreover, a key assumption in the "before-

19   after" regression method is that the relationship between prices and their determining factors

20   (other than the alleged misconduct) is known and remains the same.[18] For example, if price is

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22   [15] Noll Dep., p. 198.

23   [16] For example: "the omission of relevant variables can bias the results. If, for example, costs
were high during those periods of alleged wrongful behavior because of the influence of variables

24   not included in the regression model, or if demand grew more inelastic during that period in ways
not captured by the included demand-side variables, then a dummy variable reflecting the likely

25   effect of wrongful behavior might have a large positive coefficient for reasons unrelated to the
existence of the alleged conspiracy." Daniel L. Rubinfeld, *Quantitative Methods in Antitrust, in* 1

26   Issues in Competition Law and Policy 723 (ABA Section of Antitrust Law 2008), p. 726.

27   [17] Noll Dep., p. 70.

28   [18] Burtis Indirect Purchaser Report, pp. 12-14.

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1 assumed to depend on cost and demand changes, it is assumed that price reacts similarly to cost

2 changes, or demand changes, in both the "before" and "after" periods. Without this stability, the

3 model is mis-specified and any estimate of the impact of the alleged violation is invalid.

4 18. These critical requirements for a valid before-after comparison are absent here. As

5 explained in my June 17 report, the relevant supply and demand factors that determine iPod

6 model prices include such things as their capacity, weight, size, design, screen-size, ability to

7 display video or photos, battery life, color, operating system, software capabilities and other

8 product characteristics as well as other market factors.[19] However, similar to Dr. French,

9 Professor Noll has not collected any data or shown that common data exists to measure these

10 factors. Indeed, although Professor Noll conceded (as did Dr. French[20]) that factors such as

11 purchasers' attachment to iPods and "coolness" (*i.e.*, the perception that the iPod is a "cool"

12 product) affect demand, he does not propose any specific method for measuring them.[21] This

13 inability to account for an important determinant of prices would bias an estimate of the alleged

14 overcharge. Similarly, to the extent Professor Noll is not able to measure and control for any

15 other relevant demand or supply factors, or other types of factors such as Apple's pricing strategy,

16 in his regression model, that will further bias his results. Apple's pricing strategy may be more

17 complex than the model envisioned by Professor Noll. Apple's prices of particular iPod products

18 remain constant for relatively long periods of time, when demand and supply factors may be

19 changing. A model that includes demand and supply variables will show that those variables do

20 not influence Apple's prices, but without some explanatory variable to capture Apple's strategy,

21 the model will fail to explain prices at all.

22 19. Moreover, like Dr. French, Professor Noll has not shown that the required stability

23 in the relationship between iPod prices and the relevant supply and demand factors in both the

24 "before" and "after" periods exists here, and I do not believe it does. The period before the

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26 [19] Some of these factors are depicted in Exhibit D, a demonstrative I used at the June 30 evidentiary hearing.

27 [20] French Dep., p. 125.

28 [21] Noll Dep., p. 86.

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1   alleged violation was too short and most of the iPod models at issue were not even sold before

2   April 2003. The first generation of iPod was introduced in October 2001,[22] just 1.5 years before

3   the alleged violation in April 2003. Exhibits 8 and 9 in my June 17 report show that only the first

4   three generations of the original iPod were sold during or before April 2003.[23] The rest of the 43

5   iPod models—including the iPod photo, video, touch, nano and shuffle—were all sold only

6   during the proposed class period.[24] Exhibits E and F to this report are demonstratives I used at

7   the June 30 evidentiary hearing to show the limited price data available in the alleged before

8   period, as compared to the prices charged for the numerous different models sold during the

9   alleged class period.

10   20.   The later iPods sold during the class period differ dramatically in their

11 characteristics, technical capabilities and features from those sold during the asserted "before"

12 period. The importance of these dramatic differences is that to the extent certain features were

13 not present in the "before" period, Professor Noll's proposed "before and after" model is

14 incapable of distinguishing any effect on prices due to the alleged conduct from the effect of a

15 product feature introduced in the class period. Here, the original iPods were substantially larger,

16 heavier, and had less capacity than the models that followed, and the products introduced later

17 were much more advanced with many entirely new features and technical capabilities.[25] In

18 addition to playing music, for example, the iPod touch allows users to play video games, watch

19 videos and full–length feature movies, send and receive e-mail, store and view photographs, and

20 access the internet with wi-fi capability. iPod touch users can wirelessly download applications

21 from the Apple App store, which offers over 65,000 different software products for the iPod

22 _____

    [22] *See* http://www.everymac.com/systems/apple/consumer_electronics/stats/ipod.html

23 [23] Apple iPod mini 4GB was introduced on January 6, 2004. *See*
    http://www.everymac.com/systems/apple/consumer_electronics/stats/ipod_mini.html.

24

25 [24] *See* Exhibit 8 in Burtis expert report of June 17, 2009; also, see Exhibit 9: "Apple Introduces
    iPod Photo," Apple press release, October 26, 2004; "Apple Introduces iPod shuffle," Apple press
26 release, January 11, 2005; "Apple Introduces iPod nano," Apple press release, September 7,
    2005; "Apple Unveils iPod touch," Apple press release, September 5, 2007.

27 [25] *See* http://web.archive.org/web/20011217064651/www.apple.com/ipod/specs.html (*see* Exhibit
    3 in Burtis expert report of June 17, 2009).
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touch.[26] The iPod touch has a 3.5 inch widescreen display and "multi-touch interface," allowing

users to "pinch" the screen to make images larger or smaller or "flick" the screen to change the

image. It automatically senses when its position changes and rotates the image to a landscape

position. The original iPods had none of these additional features and functions. The iPod touch

is 8 millimeters thick, less than half the thickness of the original iPod.[27] To take another example,

as innovative as the original iPod was, the iPod nano was hailed in its own right in 2006 as

"irrevocably alter[ing] the landscape for portable audio players." It took "clean design aesthetics

to a new level [and] brought us the first high-capacity (4GB) flash-based player—and one priced

within reach of the masses, no less."[28]

21.   There were significant variations in iPod prices and these variations in prices

changed over time. For example, in 2003 Apple sold a 15GB iPod with a black-and-white screen

and no video capabilities at a retail price of $399.[29] Compare that to a 16GB iPod touch that is

now sold for three-quarters the price ($299), with all of the latest features as discussed in the

preceding paragraph.[30] Compare those to the iPod shuffle, now sold for $79, which weighs less

than half an ounce and has no display at all, but instead a "voice" that indicates the song and

identity of the performer.[31] The different prices charged for different iPod products demonstrate

the importance of the varying features of the products and the difficulty of accounting for the

different features in any model of but-for iPod prices.

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[26] *See* http://www.apple.com/pr/library/2009/07/14apps.html

[27] See, for example, "Apple Unveils iPod touch," Apple press release, September 5, 2007
(Exhibit 9 in Burtis expert report of June 17, 2009).

[28] 2006 PC World Innovations Awards, ABC News (Exhibit 10 in Burtis expert report of June 17,
2009).

[29] "Apple Introduces New iPods," Apple press release, April 28, 2003 (Exhibit 9 in Burtis expert
report of June 17, 2009).

[30] "Apple Introduces New iPod Touch," Apple press release, September 9, 2008 (Exhibit 9 in
Burtis expert report of June 17, 2009).

[31] "Apple Announces Incredible New iPod Shuffle," Apple press release, March 11, 2009
(Exhibit 9); http://www.apple.com/ipodshuffle/specs.html (Exhibit 3 in Burtis expert report of
June 17, 2009).

1   22.   As with Dr. French's proposal, Professor Noll's before-after approach is also

2   flawed because he has not proposed any method to determine the dividing line between the

3   baseline, or the "before," period and the period when the conduct at issue allegedly had any effect

4   on pricing. He asserts that he will compare prices before and after April 2003, when the iTunes

5   Store was launched. But plaintiffs' theory is that Apple's prices became elevated, not when the

6   iTunes Store was launched, but rather later when a sufficiently large number of customers

7   acquired a sufficiently large number of DRM-encoded songs that they became locked in and, as a

8   result, began to purchase additional iPods rather than competing players.[32] Professor Noll does

9   not address how he will determine that date. The lack of a reliable method to distinguish the

10 "before" period from the class period and assess the effect of the challenged conduct on prices is

11 another reason he cannot validly determine the existence or amount of any damages.

12   **B.   Professor Noll's Yardstick Method Will Not Work**

13   23.   Professor Noll's "yardstick" method would "compare prices for the reference

14 product with prices of other products that have similar costs and functions but that are sold in

15 markets unaffected by the alleged conduct."[33] This is essentially the same approach as

16 Dr. French's proposed "yardstick" method.[34] Professor Noll's own criteria for validity of

17 yardstick products is that they must be: (i) "technically and functionally similar to iPods" and (ii)

18 "subject to similar underlying market forces except for the effects of the anticompetitive acts,"

19 which he said means they must be "sold in markets not affected by anticompetitive acts."[35]

20   24.   Professor Noll understands and has admitted the limitations of this approach. In

21 his deposition, he said he is "least happy about" this method and that he "has more doubts that

22 that one [yardstick] will work than the other two [before-after and mark-up]."[36] He said that the

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24 [32] Reply Memorandum in Support of Plaintiffs' Motion for Class Certification and Appointment
    of Class Counsel at p. 11.

25 [33] Noll Decl., p. 17.

26 [34] French Aff., p. 35.

27 [35] Noll Decl., pp. 17, 56.

28 [36] Noll Dep., pp. 72-73.

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1   "hangup[] is identifying the comparative products."[37] In addition, he acknowledges that this

2   approach depends on his ability to gather from third parties data on "prices, technical

3   specifications and manufacturing costs during the class period"[38] and that "[c]ollecting and

4   analyzing this information would be a major undertaking in terms of complexity, time, and

5   costs."[39] He has not made any attempt to undertake this difficult task. Indeed, he admitted that

6   his approach "requires data that I'm not sure exists."[40]

7   25.   Professor Noll's doubts that he can successfully use this approach are well

8   founded. Professor Noll has identified four candidates for his yardstick comparison,[41] but he

9   provides no economic analysis to show that these yardstick products satisfy his own criteria for

10 validity of a yardstick product. He proposes, for example, to use personal digital assistants

11 (PDAs). But Professor Noll has produced no evidence or examples of PDAs that are comparable

12 to even the original iPods in terms of digital storage capacity, functionality, user interface, size,

13 battery life and design. And Professor Noll admits that PDAs do not have sufficient storage

14 capacity to be used as a digital media player.[42] Nor are PDAs comparable to the later iPod

15 models such as the shuffle and mini (which are used only for playing music) or the iPod touch

16 (which, as discussed above, has a wide variety of uses far beyond what any PDA offers).

17 Professor Noll has similarly failed to show that his other proposed yardstick products—smart

18 mobile telephones, portable CD/DVD players and portable digital players produced by Apple's

19 competitors—satisfy his criteria. He offers no economic analysis to show they have similar costs

20 and functionalities and face similar underlying market forces as iPods. Nor does he show that any

21 of these products have sufficiently similar counterparts to each of the wide variety of iPod

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[37] Noll Dep., p. 72.

[38] Noll Decl., p. 58.

[39] Noll Decl., p. 58.

[40] Noll Dep., p. 73.

[41] Noll Decl., pp. 56-57.

[42] Noll Decl., p. 57.

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1   models, ranging from the original iPods with their relatively small capacity and limited features to

2   products like the current iPod nano, iPod shuffle and iPod touch.

3   26.   Professor Noll is apparently uncertain whether another of his proposed yardstick

4   candidates—other personal media players—would or would not be appropriate. On the one hand,

5   Professor Noll explains that "[n]ormally other products that are sold in the same market can not

6   be used as yardsticks for a reference product."[43] On the other hand, Professor Noll speculates that

7   "conceivably, this case could be an exception."[44] But he has not investigated that issue and offers

8   no opinion that this case is in fact an exception. Whether or not other personal media players

9   could be a yardstick is left unresolved by Professor Noll.

10   27.   Professor Noll has not shown that his yardstick approach will work and, based on

11   my analysis to date, I do not believe it will.

12   **C.**   **Professor Noll's Mark-Up Method Will Not Work**

13   28.   Professor Noll's third proposed method to estimate damages is based on a

14   comparison of actual mark-ups on iPods to mark-ups in the but-for world.[45] To determine mark-

15   ups in the but-for world, he offers two possible approaches. One approach is to use what

16   Professor Noll would consider "typical mark-ups" in the consumer electronics industry and/or

17   Apple's mark-ups in other competitive markets as estimates of iPods' mark-ups in the but-for

18   world. The second approach is to rely on a game theoretic model to estimate mark-ups in the but-

19   for world.

20   29.   Professor Noll's proposal to use "typical mark-ups" in the consumer electronics

21   industry and/or Apple's mark-ups in other competitive markets as yardsticks or benchmarks is

22   effectively the same methodology as his yardstick method and faces all the problems of the

23   yardstick method. As discussed earlier, the validity of a competitive benchmark market critically

24   hinges on the competitive benchmark being similar to the market at issue in all material ways

25

26   [43] Noll Decl., p. 57.

27   [44] Noll Decl., p. 57.

28   [45] Noll Decl., pp. 17, 58-59.

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1   except for the challenged conduct.[46] Indeed, this approach poses even greater difficulties

2   because, to determine mark-up (which is the difference between the cost of a good or service and

3   its selling price), Professor Noll must estimate not just but-for prices but also but-for costs. Just

4   as with his yardstick approach, Professor Noll does not identify any product that could be an

5   appropriate benchmark. He says only that he will look at "typical mark-ups" in the "consumer

6   electronics" industry, which includes everything from big-screen televisions to digital cameras to

7   GPS navigational systems. He does not explain how the profit that Samsung makes on a plasma

8   TV or that Tom Tom, a GPS navigation system seller, makes on a GPS system can provide any

9   basis for estimating the competitive price of iPods. He suggests that Apple's consumer products

10 other than iPods could provide a benchmark. Again, however, he does not specify which of

11 Apple's products in other markets he would consider and whether such products would satisfy the

12 criteria to be yardstick products. As mentioned earlier, Professor Noll admitted in his deposition

13 that he has doubts about whether the yardstick method would work.[47] For the same reasons that

14 applied to the yardstick approach, I do not believe this mark-up method will work.

15   30.   Professor Noll proposes comparing the actual mark-ups for iPods to mark-ups

16 from "a game theoretic model of price formulation in the relevant market."[48] Under this

17 approach, he proposes to first "deduce" what the level of market concentration would have been

18 in the market in which iPods are sold absent the alleged misconduct by looking at "the extent of

19 concentration in other consumer electronic markets."[49] Then he would apply a "theoretical

20 model" to decide what the prices would have been in this hypothesized market.[50]

21   31.   This approach is flawed at both steps. As to the first step, the approach is flawed

22 for the same reasons discussed above. Professor Noll has not identified any "consumer electronic

23 [46] Noll Decl., pp. 17, 56.

24 [47] Noll Dep., pp. 72-73.

25 [48] Noll Decl., p. 58.

26 [49] Noll Decl., p. 59. Market concentration refers to the number of competing firms in a given
    market and the relative size of their respective market shares. In general, the smaller the number
27 of firms and the greater their market shares, the more concentrated the market is.

28 [50] Noll Decl., p. 59.

1   market" at all, let alone one that is sufficiently similar to the market in which iPods are sold to

2   accurately "deduce" what the market concentration should have been. And if he could identify

3   such a market, he provides no basis to think that the iPod's share of its market should be the same

4   as another company's share of whatever other market he may pick.

5   32.   As to the second step, Professor Noll's approach is flawed because he has not

6   identified any "game theoretic" model that could be used to predict prices in a market of the kind

7   at issue here. "Game theoretic" models are theoretical models of interactive decision-making,

8   where the outcome for one participant (or "player") can depend on the actions of all other

9   participants. An individual player chooses a strategy taking into account the choices of other

10   players. But, in thinking about the possible choices, the individual player might recognize that all

11   other participants are also considering his choice, which that individual player must also take into

12   account. Professor Noll's reference to "price formulation" apparently refers to the possible

13   strategies Apple would choose in determining the price of iPods in the but-for world, taking into

14   account the prices and price responses of its rivals in the but-for world.

15   33.   But Professor Noll has not identified any model that could be used to predict

16   Apple's prices. Professor Noll has pointed to a particular game theoretic model, the Cournot

17   model. The Cournot model typically is described as a model in which firms take rivals' decisions

18   as fixed and prices are then determined by the number of firms or the market share of firms in a

19   given market. This model also typically assumes that all firms produce a homogeneous product

20   (that is, there is no product differentiation), the number of firms is fixed, as well as other

21   assumptions. Professor Noll's proposal apparently is to construct some type of Cournot model, as

22   yet unspecified, where Apple makes decisions assuming its competitors' decisions cannot change,

23   and where Apple's prices depend on its market share or on market concentration, more generally.

24   Professor Noll, however, has done no analysis to support using a Counot game theoretic model

25   here. There is no evidence that Apple sets prices consistent with the underlying assumptions of

26   this game theoretic model, or any other model. Given that Professor Noll has done no work here,

27   he cannot legitimately claim that his proposed model would be appropriate for different iPod

28   models or different time periods where different competitors exist or have different strategies.

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1   34.   When asked in his deposition whether he had done this type of analysis in another

2   case, Professor Noll answered he had not done so in another case but that he had used Cournot

3   models in a published paper.[51] Professor Noll's paper on competition among natural gas

4   pipelines titled, "Relative Prices on Regulated Transactions of the Natural Gas Pipelines," relies

5   on a theoretical Cournot model which assumes a market where products from different

6   manufacturers are homogenous and they are all sold at a single market price.[52] Any

7   characterization of prices based on such a theoretical model would only be valid if the

8   assumptions of this model hold. For these assumptions to hold for iPods, Apple would have to

9   sell a single iPod model with a set of features, design, and capabilities that do not change over

10 time. Moreover, Apple's competitors' products would also have to be identical to this iPod

11 model. The assumptions underlying the simple theoretical model in Professor Noll's paper

12 clearly do not hold in the case of iPods. As discussed above, iPods differ significantly in terms of

13 prices, features, characteristics, and how consumers perceive these models relative to each other

14 and relative to other portable digital media players.

15 35.   Professor Noll has failed to specify a game theoretic model of differentiated

16 products that accounts for the economic realities of the market in which iPods are sold.

17 **VI.   PROFESSOR NOLL'S METHODOLOGIES DO NOT CONSIDER THE**

18 **OVERALL EFFECT OR NET INJURY TO INDIVIDUAL PROPOSED CLASS**

19 **MEMBERS**

20 36.   Professor Noll's proposed methods are similar to Dr. French's proposed methods

21 in that all three methods fail to account for the overall effect or net injury to individual proposed

22 class members. As explained in my June 17, 2009 report, plaintiffs' theory is that Apple's use of

23 _____

24 [51] Noll Dep., p. 119. Professor Noll testified that he used the Cournot model in two papers. He
    described one of the papers as relating to intellectual property rights. If he was referring to his

25 paper titled, "Intellectual Property, Antitrust and the New Economy," this paper does not analyze
    a Cournot model. Linda R. Cohen and Roger G. Noll, "Intellectual Property, Antitrust and the

26 New Economy," University of Pittsburgh Law Review 62(3) (Spring 2001): 453-73.

27 [52] Paul W. MacAvoy and Roger G. Noll, "Relative Prices on Regulated Transactions of the
    Natural Gas Pipelines," Journal of Economics and Management Science 4(1) (Spring 1973): 212-

28 234.

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1 proprietary DRM for its music store increased the demand and therefore prices for iPods. It

2 would follow from plaintiffs' theory that some consumers would have elected not to purchase iTS

3 music for the same reason and, to that extent, the demand for and price of iTS music would have

4 decreased due to the use of DRM. Accordingly, to determine whether any consumer paid a **net**

5 overcharge would require an analysis of both the prices of iPod products and the price of iTS

6 music. For example, depending on the amount of any iPod "overcharge" and the amount of any

7 iTS music "undercharge," whether an individual paid a net overcharge would turn on the number

8 of iPods and music files purchased by that individual. Individuals with sufficiently large

9 purchases of music relative to iPods would not have paid a net overcharge, even under plaintiffs'

10 theory and even if they could establish an iPod overcharge. None of Professor Noll's three

11 methods, like Dr. French's three approaches, addresses this issue.

12   I declare under penalty of perjury under the laws of the United States of America that the

13 foregoing is true to the best of my knowledge and belief. Executed on August 31, 2009 in

14 Washington, D.C.

15

16   _____

                                                                      Michelle M. Burtis, Ph.D.

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