IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

NATCHITOCHES PARISH HOSPITAL SERVICE DISTRICT and JM SMITH CORPORATION d/b/a SMITH DRUG COMPANY on behalf of themselves and all others similarly situated, Plaintiffs, v. TYCO INTERNATIONAL, LTD.; TYCO INTERNATIONAL (U.S.), INC.; TYCO HEALTHCARE GROUP, LP; THE KENDALL HEALTHCARE PRODUCTS COMPANY, Defendants.	§	Civil Action No. 05-12024 PBS **JURY TRIAL DEMANDED**

EXPERT REPLY DECLARATION OF PROF. JANUSZ A. ORDOVER IN SUPPORT OF REPLY BRIEF IN SUPPORT OF THE MOTION TO EXCLUDE THE EXPERT REPORT AND OPINIONS OF PROFESSOR EINER ELHAUGE

NOVEMBER 26, 2008

[REDACTED VERSION]

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I. Introduction and Summary of Opinions

1. On October 17, 2008 I filed a declaration ("Initial Daubert Declaration") in connection with Covidien's Daubert motion to exclude the testimony of Professor Einer Elhauge, the Plaintiffs' liability expert.[1] In that declaration, I explained why certain data analyses by Professor Elhauge are flawed and cannot reliably assist the fact finder in determining whether (or not) Covidien's conduct foreclosed its rivals from the U.S. market for sharps containers. Specifically, I explained why Professor Elhauge's comparisons of Covidien's rivals' performance at hospitals allegedly constrained by the challenged contracts ("Affected Hospitals") and unconstrained by the same contracts ("Unaffected Hospitals") – i.e., the "gap analyses" and related work – are vitiated by selection bias and other problems.[2] I explained why, for these reasons, Professor Elhauge's approach is incapable of separating the effects on Covidien's rivals from Covidien's legitimate competitive conduct as opposed to the effects of the putative anticompetitive exclusionary conduct. Without the ability to distinguish between these two effects, Professor Elhauge cannot reliably conclude that the challenged Covidien contracts have, in fact, foreclosed competitors and harmed competition in the sale of sharps containers to hospitals and other health care facilities.

2. The critical premise of Professor Elhauge's methodology is that there is no reason to think that the average hospital in the Affected group is any more likely to favor Covidien for reasons of clinical merit, price, familiarity, or some reason unobservable to the analyst, than is the average hospital in the Unaffected group. Hence, according to Professor Elhauge, any difference in Covidien shares across the Affected and Unaffected groups must be due to the contracts. This premise is entirely incorrect and inconsistent with sound economic thinking.

3. Taking share contracts as an example, hospitals do not randomly select whether or not to take share contracts to purchase sharps containers from Covidien. Instead, hospitals choose what to buy and from whom given their preferences for different vendors, types of products, their needs, the available alternatives, and – of course – the terms offered by the vendors. Hospitals

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[1] *See* Expert Declaration of Professor Janusz A. Ordover in Support of Motion to Exclude the Testimony of Professor Einer Elhauge filed on October 17, 2008 (hereinafter "Initial Daubert Declaration") and Expert Report of Professor Einer Elhauge filed on December 18, 2007 (hereinafter "Elhauge Initial Report") on behalf of Class Plaintiffs in *Natchitoches et al v. Tyco International et al* and Reply Report of Professor Einer Elhauge filed on February 15, 2008 (hereinafter "Elhauge Reply Report").

[2] These categories of hospitals are described in more detail in my Initial Daubert Declaration at par. 6 and in Table 1.

that choose to standardize on Covidien products based entirely on the merits of Covidien's product offerings are more likely to take a share contract since doing so provides them with the lowest prices available from Covidien. On the other hand, hospitals that decide to buy mainly from Covidien's rivals – again for reasons adduced above – would, of course, not take Covidien's share contract. Hence, those hospitals that buy from Covidien using share contracts are, on average, more likely to prefer Covidien products (when faced with the same choices of prices and products) than those that choose not to avail themselves of the discounts provided by Covidien's share commitment contracts. Consequently, even absent Covidien share contracts, rivals' sales to hospitals that choose to utilize the challenged share contracts would be lower than its sales to hospitals that choose not to, everything else being the same. The resulting gap in rivals' sales is the result of hospitals' preferences and legitimate competition, and not a result of any foreclosing effect of the challenged contracts. Nothing in Professor Elhauge's gap analysis is capable of identifying the legitimate source of the gap in rivals' performance between the Affected and Unaffected groups separately from the exclusionary impact (if any) of share contracts. A similar conclusion applies to gap analyses related to the impact of sole-source GPO contracts.

4. As I explained in my Initial Daubert Declaration, this error in Professor Elhauge's gap analysis, i.e., the confounding of the impact of the challenged contracts with the impact of hospitals' preferences, is an instance of a fairly common, yet basic, error in empirical analysis, namely "selection bias." One implication of selection bias in this case is that Professor Elhauge's methodology is hard-wired to find a "gap" – potentially even a substantial gap – regardless of the actual impact of the contracts, because it depresses the rivals' share in the Affected group relative to the Unaffected group.

5. In response to my Declaration and to a declaration submitted by Professor Daniel McFadden, Professor Elhauge on November 14, 2008 submitted a reply declaration ("Elhauge Daubert Declaration").[3] I have been asked by counsel for Covidien to review the Elhauge Daubert Declaration and respond to arguments therein about selection bias and related issues. I conclude that nothing in Professor Elhauge's Daubert Declaration alters my conclusion that the relevant data analyses by Professor Elhauge are undermined by a variety of problems, mostly related to issues of selection bias.

6. Professor Elhauge asserts that his gap analyses are not subject to selection bias and he rests this conclusion on five arguments. None of these arguments are persuasive. First, Professor Elhauge contends that all my analyses depend critically on the assumption that the challenged contracts do not actually affect sales and market shares. This is demonstrably incorrect. I did use in my Initial Daubert Declaration a scenario wherein the contracts had no impact, but this was in order to illustrate the point that the logic of Professor Elhauge's gap analyses would lead to a finding – due to selection bias – of a substantial impact regardless of the actual (even zero) impact of the contracts. In the same Declaration, I also presented an example where the contracts had a negative impact on rivals' sales to illustrate how Professor Elhauge's approach over-estimates the actual impact of the contracts in that situation as well. Elsewhere in my Declaration, I clearly stated that I expect these contracts to have some impact on sales. The problem with Professor Elhauge's analysis lies in the fact that his approach is incapable of reliably identifying the exclusionary impact (if any) of the contracts from the non-exclusionary impact. Even absent the challenged contracts, at least some of the hospitals that took these contracts would likely have purchased from Covidien. These customers were not "foreclosed" to rival sharps container vendors. The trouble with Professor Elhauge's gap analysis is that it is unable to separate out such Covidien customers from customers who would have purchased from rival vendors in the absence of the contracts.

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[3] *See* Declaration of Professor Einer Elhauge filed on November 14, 2008 (hereinafter "Elhauge Daubert Declaration") on behalf of Class Plaintiffs in *Natchitoches et al v. Tyco International et al.* See Declaration of Daniel L. McFadden in Support of Motion to Exclude Expert Report and Opinions of Professor Einer Elhauge filed on October 17, 2008 (hereinafter "McFadden Declaration").

7. A second defense offered by Professor Elhauge is that Covidien's rivals increased sales once they got on contract at Novation in 2005. In his view, this approach of comparing rivals' performance before and after they get on contract at Novation is not susceptible to selection bias, and the increase in rivals' sales following their Novation contract is evidence that Covidien's competitors were indeed foreclosed by sole-source GPO contracts.

8. However, the probative value of the evidence is substantially diminished by the fact that Professor Elhauge's own data indicate that rival vendors' sales to Novation members began accelerating approximately a year *before* they got on contract at Novation. Indeed there is no statistically significant difference between rivals' share growth fourteen months before they were placed on contract and the fourteen months after they got on contract at Novation.[4] Professor Elhauge has supplied no evidence that rivals' sales to Novation members should have grown long before they got on contract. This is strong evidence that factors other than contract status affected rivals' performance at Novation. Professor Elhauge's analysis of sales at Novation cannot identify the effects of these confounding factors. Of course, I do not claim -- and have never claimed -- that Covidien's sole-source contracts have no impact on rivals' sales: that is, Covidien is indeed likely to have a higher share of sales in a GPO in which it has a sole-source contract than in a similar GPO in which is on a dual-source contract. However, as I explained in my Initial Daubert Declaration, such a difference is not tantamount to "foreclosure" of rivals since rivals have been able to compete for sole-source contracts. I conclude that any sales gained by Covidien as a result of its sole-source contract in 2000 at Novation were nothing more than a legitimate benefit from having been chosen by Novation as an endorsed vendor through a competitive bid process.

9. A third argument offered by Professor Elhauge is that his gap analyses related to sole-source contracts are free of selection bias. He claims that the bias is not present because his methodology assigns a hospital to the Affected group only if it purchased from Covidien utilizing the challenged sole-source contracts while it is assigned to the Unaffected group if it rejected such contracts and purchased sharps containers under some other contracting arrangement. However, as I explained in my Initial Daubert Declaration, assigning hospitals based on their

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[4] Complete data is not available later than 14 months after they got on contract.

actual conduct is the root of selection bias that infects his "gap" analyses. In further defense of his "gap" analyses related to GPO sole-source contracts, Professor Elhauge asserts that if a sole-source GPO member stops buying from Covidien and buys entirely from a Covidien rival without a GPO contract, he excludes them from the analysis altogether (as opposed to reclassifying it as Unaffected). As I explain in this declaration, this is further confirmation that his gap analyses are subject to selection bias.

10. A fourth claim made by Professor Elhauge is that his regression analyses obviate selection bias. In his view, these regressions are free of selection bias and the regression results are consistent with his gap analysis charts. The main argument made by Professor Elhauge in this context is that in his regressions, changes in the contract status of a hospital, which happen, for example, when a hospital goes from buying under a Covidien share contract to not buying under such a contract, occur due to changes in exogenous factors such as a share contract reaching the end of its stipulated term. Professor Elhauge argues that hospitals with share contracts do not have the option to terminate those contracts until they reach their stipulated end date, and that his regressions related to share contracts capture increases in rivals' sales as the putative constraint imposed on rivals' ability to sell to hospitals is relaxed once each share contract reaches its stipulated end date. As I understand it, Professor Elhauge's view is that since there is no reason to believe that changes in hospitals' preferences coincide with the end dates of share of contracts, his regressions capture only the effects of the exogenous relaxation of the putative constraints imposed by share contracts as they reach the end of their term.

11. However, as I explain below, share contracts can be terminated without penalty. Economic logic and common sense suggest that they do so because such hospitals determined that rivals provide a better product price-quality combination, given the hospital's needs and the available alternatives (such as staying on the contract or renewing it at expiration). Thus a hospital with a share contract could terminate and switch to a rival if rivals now offer better terms or if the hospital at any point changes its preferences. Nothing in Professor Elhauge's regressions is capable of identifying whether rivals are picking up extra sales due to these factors or whether they are able to sell more because of share contracts have reached the end of their term. Indeed, such identification is not possible since there are no comprehensive data on the record regarding the beginning and end dates of share contracts. Professor Elhauge's regressions in the context of

sole-source contracts are similarly incapable of identifying the exclusionary impact (if any) of such contracts.

12. Finally, Professor Elhauge provides an alternative gap analysis, the "access analysis," which he claims is free of selection bias since hospitals are assigned to the Affected and Unaffected groups based on their access to the pertinent contracts through the GPOs with whom they are affiliated instead of whether or not they actually purchased through the relevant contracts. He also claims that this access approach finds even bigger gaps in rivals' performance. However, as I explain below, Professor Elhauge does not properly implement this "new and improved" version of gap analysis. To properly implement the access approach, it is necessary to first identify each hospital's GPO membership status. When this is done, members of sole-source GPOs can then be assigned to Professor Elhague's Affected group and hospitals that are not members of sole-source GPOs can be assigned to the Unaffected group. Unfortunately, such data are unavailable which means that Professor Elhauge is compelled to infer GPO affiliation based on the GPO contracts utilized by hospitals to buy sharps containers. Once again, this leads Professor Elhauge to assign hospitals to Affected and Unaffected groups based on the actual purchasing behavior of hospitals. As I explain below, this approach renders the analysis unreliable due to the selection bias phenomenon described in my Initial Daubert Declaration.

13. Furthermore, Professor Elhauge's claim that his access approach apparently leads to even larger "gaps" than his old methodology. Unfortunately for Professor Elhauge this finding is due to errors in his implementation of this approach. Correcting for these errors, I find that the gaps estimated by the access approach are *smaller* than what Professor Elhauge estimated in his earlier reports, which is what I would expect to find given that his gap analyses are subject to selection bias and given that the access approach makes some (albeit incomplete) progress toward reducing selection bias.

II. Professor Elhauge's Reply Declaration has failed to refute my overarching conclusion that his "gap analyses" are vitiated by selection bias.

14. In his Reply Declaration, Professor Elhauge provides five arguments as to why his gap analyses are not flawed due to selection bias. Below, I discuss each argument and show why they fail to establish the reliability of the gap analyses.

A. Contrary to Professor Elhauge, my argument of selection bias does not hinge on the assumption that the challenged contracts had no impact on sales.

15. Professor Elhauge claims that my criticisms of selection bias all "hinge" on the assumption that lower prices which Covidien offered as part of the challenged contracts had no impact on buyers' purchases.[5] Prof. Elhauge then contends that it would be economically irrational to offer discounts for such contracts if Covidien did not expect such contracts to alter buyers' conduct.[6]

16. However, nowhere do I say that these contracts have failed to impact sales or that my analysis of selection bias relies on the assumption of no impact. Professor Elhauge's assertions in this regard refer to and rely on a hypothetical example I presented in my Daubert Declaration wherein I examined a scenario where the contracts did not have any impact.[7] I used this "no-impact" scenario as a hypothetical situation to illustrate that even in the absence of any impact of the challenged contracts on rivals' sales, Professor Elhauge's gap analysis would conclude that the challenged contracts nonetheless have had a significant negative effect on Covidien's rivals' sales.[8] In my Initial Daubert Declaration, I made it clear that my conclusions regarding the flaws in Professor Elhague's gap analyses did not rely on the assumption that the contracts had no impact. For example, I noted in the context of the above example: "The introduction of the share contracts is assumed in this hypothetical example to not have any effect on the sales of Covidien. This is intentionally designed to highlight the fact that Professor Elhauge's methodological approach would find a substantial effect from the challenged contracts even when, by construction, there is none. *Of course, setting out the example in this fashion does not imply that I believe these contracts do not influence sales to some extent*"[9] (emphasis added).

17. That my conclusions do not rely on the no-impact assumption is further evidenced by the fact that in my Initial Daubert Declaration I modified the hypothetical "no-impact" scenario by analyzing a scenario where the contracts were indeed assumed to have an impact on rivals' sales. I clearly stated in my Daubert Declaration as follows: "I now modify the hypothetical slightly to

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[5] *See* Elhauge Daubert Declaration at ¶ 3.

[6] *See, e.g.,*Elhauge Daubert Declaration at ¶ 11.

[7] *See* Elhauge Daubert Declaration at fnt. 30.

[8] *See* Initial Daubert Declaration at ¶18.

demonstrate the shortcomings of Professor Elhauge's methodology and the interpretation of the "gap" even when share contracts do have an effect on rivals' sales."[10] Using this modified example, I demonstrated that Professor Elhauge's method leads him to exaggerate the impact of these contracts, precisely because it cannot separate impact from a contract from other factors affecting hospitals' selection of sharps container vendors.[11]

18. Professor Elhauge's misreading of my critique (claiming that it relies on the no-impact assumption) is further demonstrated by my discussion of rivals' performance at Novation before and after they got on contract at Novation. I acknowledged that Covidien may have gained sales at rivals' expenses because of its sole-source position at Novation. I also concluded that such gain in sales does not demonstrate that rivals were "foreclosed" from Novation. This is because, in my view, sales gained by Covidien as a result of its 2000 sole-source contract at Novation were nothing more than a legitimate benefit from having been chosen by Novation as an endorsed vendor through a competitive process.[12]

19. In my Initial Report, I provided an extensive discussion of competition for placement on GPO contracts, including sole-source contracts, and why such "ex ante competition for the contract" is an effective form of competition in this market.[13] Such *ex ante* competition is effective precisely because it elicits price concessions from vendors in return for the expectation that vendors would gain extra sales from a sole-source position. Stated differently, my analysis of *ex ante* competition hinges on the premise that sole-source contracts shift sales to the vendor who wins the competition for such contracts. Thus, I expressly assume sole-source contracts have an impact on sales – the opposite of what Professor Elhauge accuses me of doing. More generally, none of my analyses of selection bias or of merits issues assume that the contracts have had no

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[9] *See* Initial Daubert Declaration at fnt. 16.

[10] *See* Initial Daubert Declaration at ¶19.

[11] *See* Initial Daubert Declaration at ¶¶19-20.

[12] *See* Initial Daubert Declaration at ¶¶32-35.

[13] *See* Expert Report of Janusz Ordover filed on behalf of Covidien on January 31, 2008 (hereinafter, "Ordover Initial Report") at ¶ 67. *See*, also, Benjamin Klein and Kevin M. Murphy, "Exclusive Dealing Intensifies Competition for Distribution," *Antitrust Law Journal*, Volume 75, Number 2.

impact on sales. My point is that selection bias in Professor Elhauge's analyses implies that his estimates exaggerate the impact of these contracts.

B. Professor Elhauge has not demonstrated that rivals were foreclosed from Novation.

20. As another approach to gauging the allegedly exclusionary impact of the challenged contracts, Professor Elhauge examines [redacted] Professor Elhauge contends that between August 2005 and October 2006, the last month for which he has relevant sales data, [redacted][14] I understand that Professor McFadden has analyzed statistically whether there has been an acceleration in the growth of sales following the contract change and has found no support for such an effect.[15]

21. In his Daubert Declaration, Professor Elhauge argues that Professor McFadden employed [redacted][16] For a variety of data reasons, Professor Elhauge claims that although only data from October 2003 to October 2006 should be used, Professor McFadden used data from various other time periods. Professor Elhauge also asserts that when data from the October 2003 to October 2006 period is used, there is a statistically significant acceleration of BD's and Stericycle's markets share growth at Novation following their contracts at Novation in August 2005.[17]

22. Whatever the merits of these assertions regarding data issues, Professor Elhauge's argument is misguided for two reasons. First, any sales gained by Covidien as a result of its sole-source contract in 2000 at Novation were nothing more than a legitimate benefit from having been chosen by Novation as an endorsed vendor through a competitive process, where it clearly could

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[14] *See, e.g.*, Elhauge Initial Report at ¶189.

[15] See, e.g., McFadden Declaration at ¶21.

[16] *See* Elhauge Daubert Declaration at ¶27.

[17] *See* Elhauge Daubert Declaration at ¶28.

have selected BD, for example, as an additional contracted supplier. As with Professor Elhauge's gap analysis of sole-source contracts, his before-and-after analysis of rivals' shares at Novation is misguided in that it is inherently incapable of identifying any anti-competitive foreclosure stemming from Covidien's sole-source contract at Novation. Although Professor Elhauge has, in his various reports, claimed that there is no effective competition for the contract at GPOs and hence sales lost to rivals were, in fact, due to the foreclosing impact of the contracts, to my knowledge, there is no evidence that BD failed to get a fair hearing at Novation when BD, Covidien and other firms bid for contract placement at Novation in 2000. [redacted][18] Hence, even if BD lost some sales due to its lack of a contract at Novation until 2005, that is not evidence of "foreclosure."

23. Professor Elhauge claims [redacted]

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[18] [redacted].

[19] *See* Reply Expert Report of Professor Einer Elhauge filed on February 15, 2008 at ¶44. [redacted].

[20] *See* [redacted] TYN0020687-89 at 88. [redacted]

[redacted][22]

24. I conclude that any sales gained by Covidien as a result of its sole-source contract in 2000 at Novation were nothing more than a legitimate benefit from having been chosen by Novation as an endorsed vendor through a competitive process.

25. In my Initial Daubert Declaration, I noted that the probative value of Professor Elhauge's Novation analysis is further reduced by the fact that – as evidenced in Professor Elhauge's own empirical analysis – rivals' share at Novation began accelerating about a year before Covidien's sole-source contract ended.[23] Nothing in Professor Elhauge's Daubert Declaration rebuts the finding that rivals' share growth at Novation began accelerating *before* the rivals were placed on contract at Novation. Professor Elhauge's claim is that rivals' Novation share growth between September 2005 and October 2006 is statistically significantly higher than their share growth between October 2003 and August 2005 (when BD and Stericycle were placed on contract).[24] Professor Elhauge chooses October 2003 as the start of his "pre-period" because that is the earliest month that he deems to have reliable data.

26. Whatever the merits of this assertion, Professor Elhauge's own data shows rivals' share to be quite flat until around September 2004 when their share growth accelerated. My analysis of Professor Elhauge's estimates of rivals' market shares at Novation shows that there is no statistically significant difference in rivals' share growth in the period from September 2004 and August 2005, before BD and Stericycle were placed on contract at Novation, and in the period from September 2005 and October 2006, following the change in contract status at Novation. Moreover, this conclusion holds regardless of whether rivals' share growth at Novation is considered relative to their share growth at the two control groups (Premier and all non-Novation

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[21] [redacted] *See* TYN0001640-92 at 41-42.

[22] *See* [redacted].

[23] *See* Initial Daubert Report at ¶36.

[24] *See* Elhauge Daubert Declaration at ¶27.

hospitals) proposed by Professor Elhauge or if the analysis is confined to just Novation without a comparison to a control group.[25]

27. This suggests that placement on the Novation contract was not the only reason for why rivals' share at Novation grew. Nothing in Professor Elhauge's analysis enables him separately to identify the effect of the contract change at Novation from these confounding factors.

C. Professor Elhauge has failed to demonstrate that there is no selection bias in his gap analysis of sole-source GPO contracts.

28. In the gap analyses related to sole-source contracts, Professor Elhauge (in his reports filed before his Daubert declaration) classifies as Affected only those members of sole-source GPOs that actually utilize the sole-source contract and purchase from Covidien.[26] All other members of sole-source GPOs who decide not to purchase Covidien containers, for clinical or price reasons, and instead buy from other firms must necessarily purchase entirely off their sole-source contract and are, consequently, included in the Unaffected group if they purchase through a multi-source GPO contracts or are dropped altogether from the analysis if they buy without using any GPO contract.[27]

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[25] A similar conclusion holds if I use a 14-month period for the pre-period and post-period. (Only 14 months of data are available for the post-period.) Specifically, I calculated the average growth in rivals' share from one month to the next in the period prior to the beginning of Covidien's multi-source contract at Novation in September 2005. This "pre-period" consisted of the months from September 2004, when the share of rivals is observed to increase more rapidly, to August 2005. Formally, the average share growth can be written as follows: $[1/(N-1)] * \sum_t (S_t - S_{t-1})$, where St is rivals' share in month t and N is the total number of months in the pre or post period. I then calculated an analogous statistic for the period after rivals were placed on contract at Novation. Thus the "post-period" is 14 months long (beginning in September 2005). Finally, I compared using a t-test the pre- and post- periods average monthly share growth. I find with 95 percent confidence that the average share growth in these two periods were not different. (The same conclusion also obtains at the 90 percent confidence level.) As a sensitivity check, I also considered a pre-period that was symmetric to the post period in terms of number of months. That is, this alternative pre-period consisted of the 14 months prior to September 2005. The results were unaffected by this alternative choice of pre-period. Finally, I performed analogous tests using the two different pre-periods for the average growth in the gap between a) rivals' share at Novation and their share at Premier and b) rivals' share at Novationand their share outside of Novation.

[26] Based on my review of Professor Elhauge's backup programs from his Initial and Reply Reports.

[27] In my Initial Daubert Declaration at ¶ 26, I noted that both types of hospitals are assigned by Professor Elhauge to the Unaffected group. Since then, my further review of Professor Elhauge's data picked up the fact that, as Professor Elhague correctly points out, his methodology drops from the analysis all hospitals that purchase directly from vendors. However, as I explain later in this section, dropping hospitals in this manner introduces selection bias.

29. In his Daubert Declaration, Professor Elhauge claims that his gap analyses of sole-source GPO contracts are, in fact, not subject to selection bias.[28] As a preliminary matter, it is noteworthy that he does not make the same claim regarding his gap analyses related to share contracts. If this is an admission from him that that his gap analysis of the putative impact of share contracts is tainted by selection bias, then Professor Elhauge effectively admits that 75 percent of his gap analyses are potentially flawed. This is so because in six out of his eight analyses in his earlier reports related to liability issues,[29] the Affected and Unaffected groups were defined solely on whether they take or do not take Covidien share contracts.

30. To support Professor Elhauge's claim that his gap analyses related to sole-source contracts is free of selection bias, he first asserts that that his classification is the only appropriate approach. "[B]ecause the relevant issue is the impact of sole-source contracts that foreclosed GPO brokerage service, it is appropriate to include buyers that actually utilized a GPO's brokerage services as being burdened by the foreclosure of that GPO's brokerage services."[30] Later he states that "[T]o measure the exclusionary effects that the terms of the contracts themselves have, it is plainly necessary to classify buyers based on the terms of the contracts through which they actually purchased."[31] Thus Prof. Elhauge acknowledges that his Affected group includes only those members of sole-source GPOs that utilize the sole-source contracts. Thus, for example, when a hospital has the opportunity to utilize Covidien's sole-source contracts (because the hospital is a member of a sole-source GPO) but chooses not to buy under such a contract, Professor Elhauge considers such a hospital not to be Affected by the contract, while a similarly situated hospital (in terms of the contracts available to it) that buys under a sole-source contract is considered by him to Affected (or "burdened" in his terminology) by the contracts.

31. In my view, classifying hospitals based on their actual conduct and not on an exogenous factors, such as the set of contracts available to them, is the reason why Professor Elhauge's gap analyses of the impact of sole-source contracts are affected by self-selection bias. One way to

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[28] *See* Elhauge Daubert Declaration at ¶ 34.

[29] Exhibits 9, 11, 12, 13, 15, and 16 in Professor Elhauge's Initial Report.

[30] *See* Elhauge Daubert Declaration at ¶ 35.

[31] *See* Elhauge Daubert Declaration at ¶ 60.

illustrate the error in Professor Elhauge's logic is to consider what might constitute the appropriate but-for world. In my view, a plausible relevant but-for world would be one in which the challenged contracts are not available to any hospital. In Professor Elhauge's gap analyses, rivals' performance in the but-for world is supposed to be reflected in their performance in the Unaffected group. However, the Unaffected group is comprised mainly of hospitals that were offered the challenged contracts but chose not to take them. This is a very different set of hospitals than the general population of hospitals in that hospitals which are in the Unaffected group are more likely, on average, to favor rivals' products than the average hospital in the entire population of hospitals.

32. In further defense of his gap analyses related to GPO sole-source contracts, Professor Elhauge asserts that if a sole-source GPO member stops buying from Covidien and buys entirely from a Covidien rival without a GPO contract, he excludes it from the analysis altogether (as opposed to reclassifying it as Unaffected).[32] (Since hospitals typically like to standardize all their sharps containers from a single vendor, sharps vendors often win accounts by converting entire hospitals.) [redacted] is a concrete example of this approach. Professor Elhauge classifies [redacted] as Affected from May 2005 until May 2006 because during that period this hospital purchased from Covidien under the Premier sole-source contract. However, starting in June 2006, he drops [redacted] from the Affected group and from the analysis entirely since this hospital switched from Covidien to Stericycle and purchased from Stericycle without a GPO contract.[33]

33. Although Professor Elhauge appears to believe that dropping hospitals in this manner prevents selection bias, it is further confirmation that his gap analyses are subject to selection bias. To see this, consider the options open to a member of a sole-source GPO that wants to switch whole-house to a Covidien rival. If the hospital is not also a member of a multi-source GPO, it must necessarily purchase from the rival without utilizing a GPO contract. In this

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[32] *See* Elhauge Daubert Declaration at ¶ 36.

[33] There are many similar examples. For instance, [redacted] follows a similar pattern as the one mentioned in the text. This hospital was purchasing from Covidien under Covidien's sole-source contract with Novation in the first half of 2004 and then began to purchase from Stericycle in July 2004 without a GPO contract. Professor Elhauge classifies this hospital as affected while it was purchasing from Covidien under the

scenario, Professor Elhauge drops this hospital from the Affected group (and from the analysis altogether). If this hospital is also a member of multi-source GPO where the rival is on contract, it could use that multi-source GPO contract to purchase from the rival. In that case, Professor Elhauge reassigns the hospital from the Affected to the Unaffected group. Hence, *every* hospital in the Affected group who is converted whole-house by a Covidien rival is subsequently removed from the Affected group.[34] In contrast, not all whole-house conversions from Covidien to rivals are dropped from the Unaffected group. To see this, again consider the options available to a multi-source GPO member in the Unaffected group. If such hospital wants to switch from Covidien to a rival sharps vendor, it could utilize that rival's GPO contract to do so. If so, it is remains classified in the Unaffected group. It is only if the hospital buys from the rival without a GPO contract that it is dropped from the Unaffected group (and the analysis altogether).

34. Thus, Professor Elhauge's approach removes rivals' "wins" from the Affected group disproportionately more, thereby artificially depressing his estimate of rivals' success in that group (relative to their success in the Unaffected group). Professor Elhauge's further elucidation of his methodology has only further confirmed that his approach is subject to selection bias.

35. Further adding to selection bias is Professor Elhauge's reassignment of hospitals from the Affected group to the Unaffected group when they stop buying Covidien under a sole-source contract and buy from a rival under a multi-source GPO contract even if there is no change in the contracting choices available to the hospitals. Reassigning hospitals in this manner creates a situation where during periods when a rival is more successful at a hospital, that hospital is assigned to the Unaffected group; when rivals are less successful, the hospital is assigned to the Affected group. This artificially depresses rivals' success at the Affected group. For example, [redacted] purchased Covidien's sharps containers under Covidien's sole-source contract at Premier between September 2005 and December 2006. In this period, it also purchased from Stericycle under Stericycle's contract at Novation. Thus, sales data indicate that this hospital was a member of both Premier (sole-source) and Novation (multi-source). Professor Elhauge classifies this hospital in the Affected group during months when [redacted] is observed

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Novation contract. He drops it from the analysis when this hospital stops using the Novation sole-source contract and purchases the vast majority of its sharps containers from Stericycle.

in the data to be purchasing from Covidien under Premier's sole-source contract but he puts this hospital in the Unaffected group in months when this hospital is not purchasing from Covidien and is observed to be purchasing from Stericycle, under Novation's multi-source contract.[35] The hospital is being shuttled between the Affected and Unaffected groups although there is no change in the contracting choices it faces. Such reassignments contribute to selection bias.

36. A pertinent factual correction relates to the treatment of the [redacted] in Professor Elhauge's analysis. Professor Elhauge claims that although this hospital switched most of its purchases to Daniels in late 2006 when Covidien had a sole-source contract at Premier, he continues to classify this hospital in the Affected group through May 2007, when Premier contracted with Daniels because it continued to purchase some sharps containers from Covidien under the Premier sole-source contract.[36] In fact, starting in the same month as Daniels' sales began, October 2006, Professor Elhauge dropped some of Daniels' sales

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[34] Consistency would require that every Covidien customer who is also a member of a multi-source GPO should be assigned to the Unaffected group.

[35] Another example is [redacted] This hospital is shown in the Covidien and Stericycle sales data to be a member of Healthtrust and Broadlane. According to Professor Elhauge's analysis, this hospital was purchasing from Stericycle under the Broadlane contract from March 2005 to May 2007. This hospital was also observed to be purchasing from Covidien under the Healthtrust sole-source contract in most months during this same period. Professor Elhauge correctly classifies this hospital into the Affected Group in those months that it was purchasing from Covidien, and in doing so using the sole-source contract at Healthtrust. However, he reclassifies this hospital as Unaffected and, hence, moves to the Unaffected Group all of its Stericycle purchases whenever the hospital in a given month stops purchasing from Covidien using Covidien's sole-source contract at Healthtrust. These examples were selected based on an analysis of Professor Elhauge's backup materials in his Daubert Declaration.

[36] *See* Elhauge Daubert Declaration at ¶ 36.

from the analysis[37] although all of Daniels' sales to this hospital should have remained in the Affected group for the reason noted in my Initial Daubert Declaration, i.e., this hospital did not suddenly face a less constrained competitive environment which facilitates switching to a rival.

37. More generally, as I noted in my Initial Daubert declaration, the distortion (due to selection bias) of Professor Elhauge's comparisons of rivals' performance at sole-source GPOs *versus* multi-source GPOs is not the only serious problem with his analysis. In my view, the whole premise on which this comparison rests is misguided. The key premise is that rivals have been foreclosed from vying for GPO contracts and the gap analysis provides an independent *ex post* measure of the effects of that alleged foreclosure. But the evidence provided in my liability report indicates that rivals have not been foreclosed from competing for these contracts and, if anything, that competition has been robustly growing over time. Comparing conditions at multi-source GPOs with those at sole-source GPOs provides no insight as to the presence or absence of anticompetitive foreclosure even if Covidien's share at the sole-source GPO is higher than at some other GPO. This is because Covidien always faced competition from BD for such contracts and happened to prevail in some of these competitions. (And BD prevailed at Broadlane where it had a sole-source contract from 2000-2007.) Higher Covidien shares at GPOs where they have sole-source contracts indicate nothing more than a legitimate and pro-competitive benefit from being chosen by a GPO as an endorsed vendor through a competitive process.

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[37] As I explain in more detail in the Technical Appendix, Professor Elhauge matches the customer bearing the name [redacted] that appears in Daniels' sales data to two Covidien customers – both bearing the same name but their customer IDs and their contracting status differ. One of these customers is listed in Covidien's sales data as not utilizing a GPO contract to purchase from Covidien (i.e., it appears to be a direct purchaser) while the other utilized the Premier GPO contract. Professor Elhauge splits Daniels' sales evenly between these two entities that appear in Covidien sales data. Daniels' sales to the [redacted] who purchases under the Premier contract are assigned to the Affected group during the period when Premier had a sole-source contract with Covidien. However, Daniels' sales to the [redacted] that appears not to use a GPO contract are dropped by Professor Elhauge from the analysis, which is consistent with his policy of dropping sales to hospitals that purchase directly from vendors. Thus one half of Daniels' sales to [redacted] are dropped from the Affected group – although all Daniels' sales are clearly to the [redacted] – thus artificially depressing Daniels' sales to the Affected group. (In my Initial Daubert Declaration, I reported that Professor Elhauge reassigned [redacted] from the Affected to the Unaffected group once it started to buy from Daniels. Since then, my further review of Professor Elhauge's data picked up the fact that, as Professor Elhague correctly points out, he does not reassign [redacted] during the period that Premier had a sole-source contract with Covidien. However, Professor Elhauge drops some Daniels sales to [redacted] and this process of dropping sales leads to selection bias.)

38. Professor Elhauge also claims that the fact that sole-source GPO members who wish to buy from Covidien rivals must necessarily purchase off contract (i.e., through a direct contract with the vendor or through a multi-source GPO contract) demonstrates the anti-competitive impact of these contracts. Whatever the merits of the claim that these contracts are anti-competitive (and I have explained extensively in my various filings that they are actually pro-competitive), Professor Elhauge's gap analyses provides no reliable evidence of such impact for the reasons explained above.

39. More generally, it is important -- when assessing the competitive impact of sole-source contracts -- to note that Professor Elhauge's own estimates offered in his liability reports show that Covidien sole-source contracts covered only a small and declining portion of the sharps container market. For example, according to Professor Elhauge's own analyses the share of market-wide sales to buyers purchasing under Covidien's sole-source contracts declined from around 30 percent in 2001 to around 17 percent in 2007.[38]

D. Professor Elhauge continues to be mistaken in his assertion that his regression analyses obviate selection bias.

40. Professor Elhauge also tries to gauge the extent of foreclosure using regression analysis. He claims that his regression analyses that relate rivals' performance to the presence (or absence) of the challenged contracts are free of the selection bias problem that, as Professor Elhauge appears to acknowledge, may have affected some of his gap analyses.[39] He claims that this analysis is able to track the performance of rivals over time as individual hospitals become subject to -- or freed from -- the challenged Covidien contracts. Professor Elhauge concludes that rivals do "statistically" better when hospitals are free of Covidien's contracts than when they are restricted by such contracts.[40] I understand that Professor McFadden explains the flaws in Professor

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[38] *See* Table 4 in Elhauge Initial Report.

[39] Interestingly, Professor Elhauge does not appear to claim that *all* his regression analyses are free of selection bias. Instead, he appears to confine this claim to just the regressions where he uses data on hospitals that switched their contract status at some point in time. (*See* ¶195 of the Elhauge Initial Report and Elhauge Daubert Declaration at ¶40.) My discussion in this section of Professor Elhauge's regression analyses is applicable to his "switcher" regressions as well as his other regression analyses. (In the regression model utilized by Professor Elhauge, the dependent variable is Covidien's rivals' share of a hospital's purchases of sharps containers each month. The independent variable is a dummy indicator variable that equals 1 if that hospital had purchased through one or more of the challenged contracts in that month; otherwise it equals zero.)

[40] *See, e.g.,* Table 9 in Elhauge Initial Report.

Elhauge's regression analyses in his declaration.[41] Here and in my Initial Daubert Declaration, I only note that Professor Elhauge is wrong in his claim that these analyses are free of selection bias.

41. In my Initial Daubert Declaration, I noted that all that Professor Elhauge's regressions are capable of doing is to establish that when a hospital that initially did not take Covidien share contracts or buy pursuant to a sole-source GPO contract decides at a later point to take such a contract, then its purchases from Covidien increase (and *vice versa*). The regression as it is specified by Professor Elhauge cannot determine the causes of these changes.[42] Professor Elhauge would attribute the fact that the hospital took the challenged contract and the resulting increase in sales to the alleged "coercive" nature of the contract, but this is entirely unsubstantiated by the data he uses; the hospital may have taken the contract because it concluded that the price-quality combination offered by Covidien under its share or sole-source contracts best meets the needs of that hospital at that point in time. For instance, if a hospital that uses BD containers determines at a later point that for whatever reasons it is not satisfied with BD and determines that Covidien's share contracts offers the best price-quality combination, then it will switch and purchase under Covidien's share contract.[43] Such a hospital is not coerced into purchasing from Covidien.

42. Conversely, suppose a hospital that a hospital which buys exclusively from Covidien under a share contract later determines that for clinical reasons it now prefers rivals' products, or that rivals' offerings have become more attractive (due to improved product quality or lower prices). Such a hospital can drop its share contract and switch to a rival. The former is an instance of a change in hospitals' preferences and the latter of a change in the strength of the competing products from which the hospital can choose (i.e., a change in the choice set). Neither determinant of changes in hospitals' decisions can be identified using Professor Elhauge's

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[41] *See, e.g.*, McFadden Declaration at ¶¶ 22-29. I understand that Professor McFadden in a surreply declaration filed concurrently with this report will also describe the various flaws in Professor Elhauge's regressions.

[42] *See, e.g.*, Initial Daubert Report at ¶¶ 30-31.

[43] The record contains examples of such hospitals. The [redacted] is one example. Prior to October 2002, this hospital switched from Covidien to BD, only to switch back to Covidien for "performance and safety reasons." TYN0061224-8 at 5. In most months since Q1 2001, this hospital has been buying Covidien products under a share contract. Professor Elhauge has classified this hospital as Affected in most months since October 2001.

regressions separate and apart from any "coercive" impact (if any) of the challenged contracts.[44] Given that the reasons for the decision from whom to buy or to whom to switch cannot generally be unambiguously identified, the regression analysis cannot answer the ultimate question regarding the foreclosing effects of the challenged contract provisions.

43. Professor Elhauge's primary response is that there is no reason to believe that buyers' preferences changed just as their contract status changed. Specifically, he claims that "Nor is it plausible that buyer preferences radically shifted every time their commitment contracts ended and they were able to switch to a rival, but never shifted during the period of any commitment contract."[45] Thus, Professor Elhague implies that his regression model is estimating an increase in rivals' sales to hospitals due to the share contracts reaching the end of their stipulated term, an increase only possible because the expiration of the contracts enable hospitals to take advantage or rivals' offerings.[46] However, his argument is untenable.

44. Professor Elhauge's argument here takes as it premises, two propositions, neither of which is correct. First, he contends that once a hospital takes a share contract, it is unable to terminate it prior to expiration[47] and thus must wait until the contract reaches its stipulated end before considering switching to alternative vendors. Second, he implies that in his regression model he switches a hospital's contract status from having a Covidien share contract to not having one only because the hospital's share contract with Covidien ended, thus enabling it to drop the share contract and buy from a rival vendor.

45. The principal support for the first proposition provided by Professor Elhauge, i.e., that Covidien share contracts cannot be terminated during their pendency, is that they contain no

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[44] According to Professor Elhauge, hospitals are allegedly "coerced" into taking exclusionary contracts by Covidien because not doing so would entail price "penalties" that hospital members cannot afford to pay. According to him, the hospital would be better off if it could refuse Covidien's contract offer. *See, e.g.*, Elhauge Initial Report at par. 60. Of course, a hospital can refuse Covidien's offer and switch to a rival if, for example, a rival is on contract or if the hospital can go off contract and obtain attractive terms that way.

[45] *See* Elhauge Daubert Declaration at ¶ 42.

[46] Setting aside the analytical issues, it is often the case that even if contracts create periods of exclusivity, such terms are conducive to economic efficiency.

[47] Professor Elhauge declares: "In fact, the buyer contracts were not terminable." *See* Elhauge Daubert Declaration at ¶ 11.

termination clauses.[48] However, these contracts are readily terminable since there is no penalty for termination. [redacted][49]

46. Switching to a rival container vendor at any time imposes no higher costs on a hospital than switching at the end of the share contract. In either case, switching costs are comprised primarily of the cost of changing out wall brackets on which containers are installed. I understand that such costs are relatively small, and they are typically subsidized by the vendor who wins the account.[50] Since these costs are no different if the switch occurs before the end of the share contract or during the contract, there is no economic penalty for dropping the contract at any time prior to expiration. Thus, if a good opportunity to purchase from a rival vendor presents itself before the end of a share contract, a hospital can switch to that vendor.

47. The claim that for the purposes of his regression analysis, Professor Elhauge regression model switches a hospital's contract status from having a Covidien share contract to not having one only because the hospital's share contract with Covidien ended is not correct. Indeed, as a factual matter, this is not how Professor Elhauge actually implements his regression model. To begin with, it is not possible to implement the model in this manner since there is no database that tracks the start and end dates of hospitals' share contracts with Covidien. Instead, Professor Elhauge relies on [redacted]

Using these Covidien sales data, Professor Elhauge infers that a hospital's share contract status changes when, for example, Covidien sales data indicate that the hospital stops purchasing

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[48] *Id.*

[49] *See, e.g.*, [redacted], TYN0001439-87 at 44, and TYN0001641-92 at 49. [redacted]

[50] *See, e.g.*, Ordover Initial Report at fn. 114.

pursuant to a share contract. There is no information in the Covidien sales data about the end date of a share contract.

48. For the reasons noted above, one should not assume, as Professor Elhauge does, that when Covidien sales data indicate that a hospital drops its share contract with Covidien, it did so exactly at its contractual end date. The decision by a hospital to drop its Covidien (or any other) share contract mid-stream is not a random decision. Common sense and economic logic indicate that such decision is motivated either by a change in the hospital's preference or by a change in available offers (a change in the choice set) or both. Thus both economic logic and data indicate that hospitals do drop share contracts mid-stream if they perceive that they would be better off by switching to a rival. When they do, Professor Elhauge alters their share contract status in his regressions, i.e., switches them from the Affected to the Unaffected group.[51] Thus, contrary to Professor Elhauge, his regressions are confounding the allegedly exclusionary impacts of share contracts[52] with changes in hospitals' purchasing behavior due to changes in their preferences and changes in their choice sets (*i.e.*, the relative merits of the products offered by each supplier). Nothing in his regressions enables him to identify the putative exclusionary impact.

49. A similar conclusion applies to Professor Elhauge's regressions that purport to estimate the effects of GPO sole-source contracts on rivals' performance. Professor Elhauge posits that for the purpose of these regressions, a hospital's GPO contract status changes only if that hospital's GPO changes its vendor contracts (i.e., the GPO switches from a sole-source agreement with Covidien to a multi-source agreement or *vice versa*). Since it is likely that most hospitals' GPO affiliations are exogenous to their sharps container purchasing decisions, changes in the GPO contract status variable in Professor Elhauge's regressions are not correlated with changes in hospitals' preferences, in Professor Elhauge's view.[53]

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[51] Evidence of this treatment on the part of Professor Elhauge is demonstrated in the churn analysis described in my original Daubert report at ¶ 11. As I state therein, in this analysis, of the 1,412 hospitals that Professor Elhauge classifies as Affected in all months of 2004 because they purchased sharps containers from Covidien pursuant to share contracts during that year, 276 (or 20 percent of the total) dropped their Covidien share contracts during the 2005-7 period and switched wholly or partially to a rival.

[52] Just to be clear, I am of the view that in this case share contracts are not exclusionary for the reasons expounded in my prior declarations.

[53] *See, e.g.,* Elhauge Daubert Declaration at ¶¶ 42-3.

50. However, this view ignores the fact that changes in GPO contract status are correlated with changes in prices. Professor Elhauge asserts that Covidien's prices to members of multi-source GPOs are about 9-12 percent higher than the prices it charges members of sole-source GPOs.[54] Thus at least some of the increase in the sales of Covidien's rivals estimated by Professor Elhauge's regression after a GPO switches from a sole-source to a multi-source contract is due to the increase in Covidien prices, and this effect is not identified by the regression model since it does not control for prices.[55]

51. Moreover, each hospital's GPO contract status in Professor Elhauge's regressions is not based entirely on the contract status of that hospital's GPO, notwithstanding Professor Elhauge's assertions to the contrary. In fact, Professor Elhauge's treatment of a hospital in his sole-source GPO contract regressions can change even when that hospital's GPO contracts with vendors have not changed at all. For example, as Professor Elhauge asserts, whenever a sole-source GPO member who used to buy from Covidien pursuant to that sole-source GPO's agreement with Covidien subsequently switches to a Covidien rival and buys without a GPO contract (i.e., buys directly) from the rival, then Professor Elhauge drops the hospital from the analysis.[56] To take a specific hospital noted earlier as an example, in his regression analysis, Professor Elhauge classifies [redacted] as Affected from May 2005 until May 2006 because during that period this hospital purchased from Covidien under the Premier sole-source contract. However, starting in June 2006, he drops [redacted] from the Affected group and from the analysis entirely since this hospital switched from Covidien to Stericycle and purchased from Stericycle without a GPO contract.[57]

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[54] *Id.* at ¶¶ 12.

[55] Covidien's relative prices (relative to rivals' prices) – not just the absolute prices – are likely to be higher following a change from a sole-source to a multi-source contract. If anything, rivals' prices are likely to be lower once on contract since GPOs typically require price concessions in return for placement on contract and vendors offer such concessions in anticipation of higher sales once on contract.

[56] See Elhauge Daubert Declaration at ¶ 36.

[57] There are many similar examples. For instance, [redacted] follows a similar pattern as the one mentioned in the text. This hospital was purchasing from Covidien under Covidien's sole-source contract with Novation in the first half of 2004 and then began to purchase from Stericycle in July 2004 without a GPO contract. Professor Elhauge classifies this hospital as affected while it was purchasing from Covidien under the Novation contract. He drops it from the analysis when this hospital stops using the Novation sole-source contract and purchases the vast majority of its sharps containers from Stericycle.

52. Note that in this example, [redacted]s treatment (i.e., whether it is in the Affected group, Unaffected group or out of the analysis altogether) changed in June 2006 despite the fact that in that month there was no change in the sharps container contract status at Premier, which was [redacted]'s GPO. This hospital's contracting conduct changed in June 2006 when it switched to a Covidien rival, and economic logic and common sense suggests that [redacted] likely changed its vendor because it re-evaluated its options and determined that Stericycle offered a better deal. Thus, Professor Elhauge has changed his treatment of this hospital based not on exogenous changes in the GPO contracting environment but likely based on changes in the preferences of or the choices available to the hospital. I have already explained above that this procedure engenders selection bias.

53. Although Professor Elhauge implies that in his regression exercise a hospital's contract status is changed such that it is reassigned from the Affected to the Unaffected group only when the GPO of that hospital changes its contracting arrangements with vendors, as I have already explained earlier, this is not always the case. Professor Elhauge reassigns some hospitals from the Affected group to the Unaffected group when they stop buying Covidien under a sole-source contract and buy from a rival under a multi-source GPO contract -- even if there is no change in the contracting choices available to the hospitals. [redacted] noted earlier is an example of such assignments. Reassigning hospitals in this manner creates a situation where during periods when a Covidien rival is more successful at a hospital, that hospital is assigned to the Unaffected group when rivals are less successful, the hospital is assigned to the Affected group. This artificially depresses rivals' success at the Affected group.

E. Professor Elhauge's analysis of the "Access Approach" is flawed due to selection bias and implementation errors

54. Professor Elhauge provides an alternative approach to gauging the exclusionary effects of Covidien's contracting practices and which he terms the "access approach." He claims that this methodology further supports his views as to the severity of the exclusionary impact. Under this approach, he purports to classify hospitals into Affected and Unaffected groups based solely on their "access" to the challenged contracts. Thus, hospitals that were members of GPOs with the challenged contracts are in the Affected group and members of GPOs without the contracts are in the Unaffected group. Hospitals buy many thousands of products through GPOs and it is unlikely that their purchases of sharps containers alone would determine their GPO affiliation.

Hence, in my view, if it were possible to classify hospitals into Affected and Unaffected groups based on their access to the challenged contracts through their GPO affiliation, then a comparison of rivals' performance based on such a classification is more likely to mitigate the selection bias and hence be methodologically sounder.[58]

55. Professor Elhauge claims that his gap analysis using this "access" approach leads to even larger gaps in rivals' performance between the Affected and Unaffected groups. However, for several reasons, his analysis is undermined by a variety of errors that render it entirely unreliable. The first error is that, due to data limitations, Professor Elhauge continues to assign hospitals to the Affected and Unaffected groups based on hospitals' actual purchasing behavior and not just on their GPO affiliations. As a consequence, selection bias continues to undermine Professor Elhauge's "access" approach. Second, after correcting for several errors in how Professor Elhauge implements the access approach I find that his "access" analysis generates a *smaller* gap than the gap estimated by his initial approach, which is the opposite of what he actually claims.

56. Consider first his "access" analysis of the impact of sole-source contracts. As it turns out, and contrary to Professor Elhauge, this analysis is not a proper implementation of the access approach and it too is suffers from selection bias. In order to properly implement the access approach, one must first allocate hospitals to the appropriate GPOs so that, in the next step, members of sole-source GPOs (for example) can be assigned to the Affected group and hospitals that are not members of sole-source GPOs can be assigned to the Unaffected group. Such allocation is necessary in order to assess the impact of sole-source GPO contracts. However, absent comprehensive data on GPO membership,[59] Professor Elhauge must rely on hospitals' actual

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[58] In another litigation which raised similar issues, *Masimo v. Tyco*, I designed a version of the "access" approach to estimate damages. (Masimo Corp. v. Tyco Healthcare Group LP, CV 02-4770) However, my "access" methodology differed in significant ways from what Professor Elhauge is attempting here. In particular, data on GPO membership of most hospitals were on the record in the *Masimo* matter. Since such data are unavailable here, Professor Elhauge resorts to inferring GPO affiliations of each hospital based on the GPO contracts used by that hospital to purchase sharps containers. As a consequence, Professor Elhauge is not, in fact, assigning hospitals based solely on their GPO affiliations; instead he relies on their purchasing behavior and that leads to selection bias once again (as I explain later in this section). Another important difference between the situation here and that in *Masimo* is that in that matter there were multi-source GPOs that had no Covidien share contracts. These GPOs could serve as reasonable approximations of the but-for world. In this matter, all GPOs either have one or more of the disputed contracts or, in the case of Broadlane, they have a sole-source contract with a Covidien rival.

[59] To my knowledge, the only membership data produced by a GPO consists of a [redacted] Even if comprehensive GPO membership data

purchasing behavior to allocate them into the Affected and Unaffected groups. For example, a hospital is assumed to be a member of a Covidien sole-source GPO in any given month if it is observed (in Covidien's sales data) to have purchased under that GPO's contract in that month or any previous month. The Affected group is populated by all such hospitals. Hospitals that have purchased under both sole-source and multi-source GPOs are also assigned to the Affected group. In the Unaffected group in any given month are hospitals that have up until and including that month never utilized a Covidien sole-source GPO contract, i.e., hospitals that have purchased sharps containers by utilizing some combination of the following channels: (a) multi-source GPO contracts; (b) BD's sole-source contract with Broadlane; and (c) direct contracts with vendors. (Although hospitals that purchased directly from vendors, i.e., without a GPO contract, had been excluded from the analysis altogether in previous gap analyses, Professor Elhauge includes such hospitals in the Unaffected group in the access approach.) Table 1 contains a description of the various categories of hospitals in the Affected and Unaffected groups.

57. This new approach shares a key feature with Professor Elhauge's prior approach: he assigns hospitals to the Unaffected and Affected group based on their purchasing behavior. Consequently, selection bias once again distorts his analysis. Consider first hospitals that purchased under direct contracts with vendors. (Category (c) listed above.) Professor Elhauge assumes that a hospital which historically purchased directly from vendors has had no affiliation with sole-source GPOs. However, this is an unsupported assumption, one that is readily contradicted by the limited information on the record regarding GPO membership. Specifically, a membership roster produced by Novation shows that, for example, [redacted] which Professor Elhauge places in the Unaffected group in 2004 because it had purchased directly from BD in 2003 and 2004, was in fact a member of Novation (which, at the time, was a sole-source GPO).[60]

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were available, an access approach would be problematic here since there are no GPOs that can serve – collectively -- as a plausible benchmark for the but-for world, *i.e.*, GPOs with multiple contracted vendors and no Covidien share contracts.

[60] There are other similar examples in the [redacted]. Were membership rosters from other GPOs with sole-source contracts available, it is likely that yet more examples of this type would be identified.

58. Thus Professor Elhauge is incorrect in his assumption that all direct purchasers in his Unaffected groups are not affiliated with sole-source GPOs. This error potentially introduces selection bias for the reasons explained in my Initial Daubert Declaration. Specifically, members of a GPO where Covidien has a sole-source contract do not randomly decide whether to purchase under that GPO contract. All hospitals that, for clinical or price reasons, decide not to purchase Covidien containers and instead buy from other firms must necessarily purchase entirely off contract through a direct contract or through a multi-source GPO contract (and are, consequently, included in the Unaffected group under the access approach) while those who prefer Covidien products have a very strong incentive to use the GPO contract, given the prices stipulated in the sole-source GPO contract, and thus will be included in the Affected group. Thus, hospitals that buy from Covidien under the sole-source contracts are, on average, more likely to prefer Covidien products than those that choose not to avail themselves of these contracts. The resulting self-selection bias implies that the gap analysis cannot disentangle Covidien sales gained by legitimate competitive conduct from the impact of sole-source contracts.

59. Another source of selection bias comes from the assignment of hospitals that buy consistently through multi-source GPO contracts. All hospitals that as of any given month have purchased entirely through multi-source GPO contracts through that month are placed in that month in the Unaffected group in Professor Elhauge's "access" approach. He assumes that they too are not also members of sole-source GPOs. Evidence on the record contradicts this assumption. For example, [redacted] which Professor Elhauge places in the Unaffected group in 2004 because it had utilized multi-source GPO contracts since 2001 was in fact a member of Novation (which, at the time, was a sole-source GPO).

60. Thus, contrary to Professor Elhauge's assumption, some hospitals that he classifies in the Unaffected group because they purchase through multi-source GPO contracts also belong to sole-source GPOs. Again this introduces selection bias. Hospitals that belong to both sole and multi-source GPOs do not randomly choose which contract to utilize. If a hospital prefers – for clinical or other reasons – Covidien sharps containers, they can choose between the sole-source and multi-source GPOs that they belong to. Very likely, they would choose to utilize the sole-source contract since Covidien offers lower prices under such contracts, and hence they would be assigned by Professor Elhauge to the Affected group. All hospitals that, for clinical or price reasons, decide not to purchase Covidien containers and instead buy from other firms must

necessarily purchase using a direct contract with the vendor or under their multi-source GPO contracts (and are, consequently, included in the Unaffected group).

61. A similar problem arises in the context of Broadlane. This GPO had a sole-source contract with BD between late 2000 and mid-2004, at which point Broadlane added Stericycle. All hospitals that are observed to purchase from BD under its Broadlane contract and not under another contract are assumed not to be affiliated with Covidien sole-source GPOs and placed in the Unaffected group by Professor Elhauge. However, this unsupported assumption is also contradicted by the available evidence. For example, [redacted] which Professor Elhauge places in the Unaffected group in 2004 because it had purchased directly from BD under its Broadlane contract since September 2003 was in fact a member of Novation in 2004 (which, at the time, was a sole-source GPO).

62. The presence of such hospitals in the Unaffected group also potentially introduces selection bias. Hospitals that are members of both Broadlane and a Covidien sole-source GPO are likely to utilize the sole-source GPO contract to purchase from Covidien if they prefer Covidien sharps containers; hence they would be placed in the Affected group by Professor Elhauge. Those who prefer BD products would likely use the Broadlane contract, and these hospitals would be placed in the Unaffected group by Professor Elhauge. (They could use a direct contract with BD. If so, they would also be placed in the Unaffected group.) Again, assignment to the Affected and Unaffected groups is likely to be correlated with hospitals' preferences. Thus, contrary to Professor Elhauge, his access approach has not cured the selection bias that undermines his earlier approach.

63. As for Professor Elhauge's assertion that the access approach produces even larger gaps than his earlier approach, this can be ascribed to errors in his implementation of this approach. In the context of the sole-source analyses, he finds that the access method leads to higher gaps as compared to his initial gap method, but this is because he includes in his access analysis hospitals that purchased sharps containers without utilizing a GPO contract. Such hospitals were excluded from his earlier gap analyses of the impact of sole-source GPO contracts because, in Professor Elhauge's view, the purpose of these analyses is to estimate the effect of sole-source GPO

contracts on hospitals that choose to use GPO brokerage services[61] (i.e., hospitals that rely on GPOs to purchase sharps containers).

64. To stay consistent with this stated goal and to enable an apples-to-apples comparison between the "access" approach and Professor Elhauge's earlier methodology, my staff, under my supervision, re-estimated the gap associated with sole-source contracts using Professor Elhauge's "access" approach -- after dropping hospitals that only purchase under direct contracts. This modified "access" approach reveals that that the estimated gap is, in fact, *smaller* under the "access" approach than under Professor Elhauge's earlier approach.

65. Table 2 compares the results from the earlier method and the modified "access" approach. As shown in this table, in every year, Professor Elhauge's earlier approach (where he assigned hospitals to the Affected and Unaffected groups based entirely on their utilization of the challenged contracts) produces a higher estimated gap than the modified "access" approach. In 2006, the difference is as much as 57 percent. This pattern is consistent with what I would expect to find, to that extent that Professor Elhauge's "access" approach makes some progress in reducing selection bias. Nonetheless, for the reasons explained above, Professor Elhauge's "access" approach is incapable of separating out the effects of selection bias from the allegedly exclusionary impact of sole-source contracts. As such, even my modifications to his access approach leave his sole-source access analysis fundamentally flawed.

66. Professor Elhauge's application of his "access" approach to the assessment of the impact of *share contracts* is also flawed. Professor Elhauge states that he puts in the Affected group, hospitals he believes are members of GPOs where Covidien offered share contracts, *i.e.*, the Affected group purportedly includes only hospitals belonging to GPOs where Covidien is on contract and where it offered share contracts.[62] (*See* Table 1.) Under this approach, for example a hospital that purchases from BD under BD's dual source contract with Premier should be placed in the Affected group even if this hospital did not purchase from Covidien under a

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[61] *See, e.g.*, Elhauge Daubert Declaration at par. 36.

[62] *See, e.g.*, Elhauge Daubert Declaration at ¶ 68. Note that Covidien offers share contracts under all its GPO agreements except at HealthTrust.

Covidien share contract. The reason is that this hospital had "access" to Covidien's share contracts at Premier even if it did not avail itself of the opportunity.

67. Although this is what Professor Elhauge states that he does, this, in fact, is not what he does when he implements this approach. In his actual implementation of the access approach, Professor Elhauge places the hospital in the above scenario into the Unaffected group. To take a concrete example, [redacted] purchased from BD under BD's dual source contract with Premier from October 2001 to April 2005. Although BD's sales data indicate that this hospital used BD's Premier contract to purchase from BD, Professor Elhauge does not use this information to place it into the Affected group. Instead, Professor Elhauge classifies the hospital as Unaffected during this entire period.

68. The reason is that when inferring whether hospitals have access to Covidien's GPO based share contracts, he relies entirely on GPO information in Covidien's sales data, which is inconsistent with Professor Elhauge's assertion in his Daubert Declaration that he uses GPO information in the sales data produced by *all* firms.[63] Since [redacted] did not purchase from Covidien, it does not appear in Covidien's data files and he infers that it did not have access to a GPO offering share contracts. Hence, Professor Elhauge assumes that it purchased directly (i.e., without a GPO contract) from BD and erroneously classifies it as Unaffected. This hospital is not alone in being improperly classified in this manner. A substantial volume of purchases by hospitals in the Unaffected group can be attributed to purchases that would have been categorized as affected had Professor Elhauge incorporated GPO information from the other manufacturers as he claims he did in his Daubert Declaration. Between 2001 and 2006, about 30 percent of sales to the Unaffected group fall into this category.[64]

69. This error potentially introduces selection bias. (As I explain below, this potential source of bias is verified to be an actual source of bias because the estimated gap shrinks when this error is corrected.) Under Professor Elhauge's approach, if [redacted] had opted to utilize Covidien's Premier contract to buy exclusively from Covidien, it would have been classified in the Affected group since its Premier GPO affiliation would be recorded on Covidien sales data (which

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[63] *See, e.g.*, Elhauge Daubert Declaration at ¶ 66.

[64] In Elhauge's "access" Table 2B. *See* Elhauge Daubert Declaration ¶ 39.

Professor Elhauge relies on to identify whether hospitals have access to GPOs with share contracts). However, because it chose to buy exclusively from BD using BD's Premier contract, it is placed in the Unaffected group.

70. Another source of selection bias is related to Broadlane. As with his sole-source gap analysis using the access approach, Professor Elhauge classifies in the Unaffected group in any given month hospitals that are observed to have purchased only under the BD-Broadlane contract through that month. As before, Professor Elhauge assumes that all these hospitals are not affiliated with GPOs that have Covidien share contracts. As I noted above, this assumption is incorrect; some of these hospitals are, in fact, affiliated with such GPOs. Also, as I explained earlier, this introduces selection bias into the analysis.

71. More generally, in his "access" based analyses of share contracts, Professor Elhauge assumes that no hospital in the Unaffected group has available to it Covidien contracts with the type of commitment provisions that he finds objectionable. He must assume this since he classifies these hospitals in the Unaffected group. However, absent data on GPO membership, this is an unsupported assumption, contradicted by the examples noted above. Thus at least some of the hospitals in the Unaffected group would be assigned to the Affected group in a proper implementation of the access approach.

72. As with the gap analyses related to sole-source contracts, Professor Elhauge claims that his "access" approach when used to gauge the impact of share contracts, produces even bigger gaps than his original approach.[65] However, this conclusion is reversed when his error (noted earlier) in how hospitals are classified is corrected. To illustrate the correction implemented, I instructed my staff to reassign [redacted] (a member of Premier) from the Unaffected to the Affected group as well as all other hospitals that were misclassified for the same reason. After these corrections are made, the access approach that Professor Elhauge claims that he follows (but failed to do so in his actual implementation) yields *smaller* estimates of the impact of share contracts than his original estimates.

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[65] *See* Elhauge Daubert Declaration at ¶ 69.

73. Table 3 compares the gap estimates from the two approaches in each year. As shown in this table, and consistent with what is observed in Table 2 in the context of sole-source contracts, in every year, Professor Elhauge's earlier approach produces a higher estimated gap than the modified access approach. In 2006, the difference is as much as 93 percent. This pattern is what I would expect to find if Professor Elhauge's access approach makes some progress in reducing selection bias (since Professor Elhauge's access approach at least attempts to assign hospitals based on their GPO affiliation). Nonetheless, for the reasons explained above, Professor Elhauge's access approach is also incapable of separating out the effects of selection bias from the impact of share contracts. (As such, by no means do I endorse the gaps estimated by the modified approach as providing a reliable estimate of the impact of the share contracts. And as mentioned above, neither do I conclude that the resulting share gaps in my modified sole-source analysis are a reliable estimate of the impact of sole-source contracts.)

74. Tables 4 provides similar comparisons but now for the situation where the Affected group each month consists of hospitals that purchase or had previously purchased from a GPO with a Covidien sole-source contract *and* from a GPO with a Covidien contract containing share provisions. All other hospitals are in the Unaffected group. Table 5 provides similar comparisons but now for the situation where the Affected group each month consists of hospitals that purchase or had previously purchased from a GPO with a Covidien sole-source contract *or* from a GPO with a Covidien contract containing share provisions.[66] All other hospitals are in the Unaffected group. As seen in both tables, in every year, Professor Elhauge's earlier approach produces a higher estimated gap than the modified access approach. As with the results in Tables 2 and 3, I do not endorse the results of my modified access approach in Tables 4 and 5, which continue to be riddled with selection issues. These results merely provide an apples-to-apples comparison of Professor Elhauge's analysis in his earlier Initial and Reply Reports with the new access based approach introduced in his Daubert Declaration.

75. In sum, Professor Elhauge has failed to demonstrate in his Daubert Declaration that his gap analyses and related data work are free of selection bias and are capable of reliably separating the impact of the challenged contracts from the impact of selection bias and legitimate competitive

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[66] In the analyses in both Table 4 and Table 5, a substantial portion of sales to hospitals in the Unaffected group are to members of Broadlane.

actions of Covidien on market shares of its rivals. This is important for assessing the overall merit of Professor Elhauge's analysis of the competitive impact of the pertinent contracts. Central to his argument that these contracts have impeded competition is the proposition that they have materially affected the market performance of Covidien's rivals. [redacted], Professor Elhauge nevertheless maintains that they would have performed even better and substantially more so had the challenged contracts not been present. He concludes that rival suppliers would have exerted a more potent competitive pressure on Covidien in the but-for world.[67] To demonstrate that rivals would indeed have performed much better in the but-for world, Professor Elhauge relies substantially on his gap analyses and related work. If these analyses are, as I believe, incapable of reliably demonstrating that rivals would have performed materially better in the but-for world, then the empirical underpinnings of Professor Elhauge's conclusions regarding the competitive impact of the contracts are substantially undermined and he can no longer confidently conclude that there was harm to competition and to consumers (here hospitals and other health care providers) flowing from these contracts.

I declare that the foregoing is true and correct to the best of my knowledge under the laws of the United States.

Janusz A. Ordover

[67] *See, e.g.*, Elhauge Initial Report at ¶ 34.

Executed on November 26, 2008.

Table 1: Summary of Professor Elhauge's Affected and Unaffected Categories in his "Access" Approach

	Figure 2A	Figure 2B	Figure 2C	Figure 2D
Affected "Access"	Hospitals that purchase or had previously purchased utilizing a contract at a GPO with a Covidien sole-source contract.	Hospitals that purchase or had previously purchased utilizing a contract at a GPO with a Covidien contract containing share provisions (i.e. a contract that allows a hospital to commit to purchasing some minimum percent threshold from Covidien in exchange for discounts).	Hospitals that purchase or had previously purchased utilizing a contract at a GPO with a Covidien sole-source contract *and* utilizing a contract at a GPO with a Covidien contract containing share provisions.	Hospitals that purchase or had previously purchased utilizing a contract at a GPO with a Covidien sole-source contract, or, who purchase or had previously purchased utilizing a contract at a GPO with a Covidien contract containing share provisions.
Unaffected "No Access"	All other hospitals, including (a) hospitals who have always purchased under a multi-source contract, (b) hospitals that have always purchased off GPO contracts, and (c) hospitals that have always purchased through BD's sole-source contract with Broadlane.	All other hospitals including (a) hospitals who have always purchased from Covidien and rivals of Covidien without using GPO contracts; (b) hospitals that have always purchased through BD's sole-source contract with Broadlane, (c) hospitals that have always purchased through Covidien's contract with HealthTrust (after 2004)	All other hospitals	All other hospitals

Table 2 – Sole-Source Gap Analyses: Professor Elhauge's Original Analyses v. the Modified Access Approach

Original Elhauge Approach from his Reply Report (Exhibit 10 [Revised])

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	0%	0%	0%	1%	5%	11%
Rivals' "Unaffected" Share	33%	36%	41%	45%	42%	40%
Gap	33%	36%	40%	44%	37%	29%

Modified Access Approach (Table 2A in Prof. Elhauge's Daubert Reply Report after Dropping Direct Purchasers)

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	1%	2%	2%	4%	14%	25%
Rivals' "Unaffected" Share	32%	36%	40%	46%	46%	43%
Gap	31%	34%	38%	42%	32%	18%

Source: Backup to Elhauge Declaration and Elhauge Reply Report
Notes: (a) Modification to Elhauge's "Access" approach: In any given month, a customer is dropped if they are not purchasing and have not previously purchased through a GPO contract; (b) The gaps estimated by this modified approach are also seriously flawed by selection bias.

Percent Increase in Gap in Prof. Elhauge's Original Approach

2001	2002	2003	2004	2005	2006
6.4%	4.2%	6.1%	3.1%	13.1%	57.1%

Table 3 – Share Contract Gap Analyses: Professor Elhauge's Original Analyses v. the Modified Access Approach

Original Elhauge Approach from his Reply Report (Exhibit 9 [Revised])

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	0%	0%	0%	1%	4%	7%
Rivals' "Unaffected" Share	35%	36%	46%	54%	62%	69%
Gap	35%	36%	46%	53%	58%	62%

Modified "Access" Approach (Table 2B in Prof. Elhauge's Daubert Reply Report after Correcting Certain Errors in GPO Assignment by Professor Elhauge)

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	15%	16%	16%	20%	28%	35%
Rivals' "Unaffected" Share	42%	42%	61%	66%	67%	67%
Gap	27%	26%	45%	46%	39%	32%

Source: Backup to Elhauge Declaration and Elhauge Reply Report
Notes: (a)Modification to Elhauge's "Access" approach: Used GPO information from sales data produced by all vendors – not just Covidien; (b) The gaps estimated by this modified approach are also seriously flawed by selection bias.

Percent Increase in Gap in Prof. Elhauge's Original Approach

2001	2002	2003	2004	2005	2006
28.2%	40.5%	3.7%	14.9%	47.6%	92.8%

Table 4 – Sole-Source and Share Contract Gap Analyses: Professor Elhauge's Original Analyses v. the Modified Access Approach

Original Elhauge Approach from his Reply Report (Exhibit 11 [Revised])

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	0%	0%	0%	1%	4%	10%
Rivals' "Unaffected" Share	47%	48%	57%	67%	73%	79%
Gap	47%	48%	57%	66%	68%	70%

Modified "Access" Approach (Table 2C in Prof. Elhauge's Daubert Reply Report after Dropping Direct Purchasers and Correcting Certain Errors in GPO Assignment by Professor Elhauge)

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	3%	5%	5%	8%	24%	39%
Rivals' "Unaffected" Share	46%	42%	61%	67%	80%	76%
Gap	43%	37%	56%	60%	56%	37%

Source: Backup to Elhauge Declaration and Elhauge Reply Report

Notes: (a) Modification to Elhauge's "Access" approach: Used GPO information from sales data produced by all vendors – not just Covidien; (b) The gaps estimated by this modified approach are also seriously flawed by selection bias.

Percent Increase in Gap in Prof. Elhauge's Original Approach

2001	2002	2003	2004	2005	2006
8.3%	28.2%	2.5%	9.8%	23.0%	88.4%

Table 5 – Sole-Source or Share Contract Gap Analyses: Professor Elhauge's Original Analyses v. the Modified Access Approach

Original Elhauge Approach from his Reply Report (Exhibit 12 [Revised])

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	0%	0%	0%	1%	5%	9%
Rivals' "Unaffected" Share	44%	43%	53%	62%	75%	78%
Gap	44%	43%	53%	60%	70%	70%

Modified "Access" Approach (Table 2D in Prof. Elhauge's Daubert Reply Report after Dropping Direct Purchasers and Correcting Certain Errors in GPO Assignment by Professor Elhauge)

	2001	2002	2003	2004	2005	2006
Rivals' "Affected" Share	14%	16%	16%	20%	27%	35%
Rivals' "Unaffected" Share	46%	42%	61%	67%	80%	76%

Gap	32%	26%	44%	47%	53%	42%

Source: Backup to Elhauge Declaration and Elhauge Reply Report

Notes: (a) Modification to Elhauge's "Access" approach: Used GPO information from sales data produced by all vendors – not just Covidien; (b) The gaps estimated by this modified approach are also seriously flawed by selection bias.

Percent Increase in Gap in Prof. Elhauge's Original Approach

2001	2002	2003	2004	2005	2006
37.8%	62.8%	18.6%	27.2%	32.6%	67.6%

III. Technical Appendix

Professor Elhauge has produced three sets of backup materials corresponding to the data analyses conducted for his filings in this matter (Initial Liability Report on 12-18-07, Reply Report on 2-15-08, and Daubert Declaration 11-14-08). Here I provide a description of how to replicate Professor Elhauge's analyses relevant for the upcoming Daubert hearing as well as additional information on areas of disagreement between Professor Elhauge and myself noted in this Declaration.

I. Setting Up and Executing the Backup Data used by Professor Elhauge

Organization

Professor Elhauge organizes the backup files in the following categories:

1. Data - There are a variety of folders that contain the raw files for the cost and sales data of the various sharps container manufacturers, *e.g.* "Tyco Cost Data".

2. Programs - There is a single folder in each backup production which contains all of Professor Elhauge's STATA programs, *e.g.* "SHARPS programs".

3. Work – A folder by this title contains both Professor Elhauge's original work product, such as his customer match files, and is where his final output is saved.

4. Temp – A folder by this title is where Professor Elhauge saves intermediate files throughout his various analyses.

Execution

In his original liability report, Professor Elhauge produced a file entitled "Full List of Stata Programs.xls." This file provides a brief description of each program produced in the original report's backup. Additionally, "SHARPS Master program.do", produced as part of the original report backup, provides the sequence in which Professor Elhauge's programs should be run. Table A1 below provides a suggested order for running Professor Elhauge's STATA programs.

Table A1 – Suggest Run Order for Professor Elhauge's Do-Files

Original Report	Reply Report	Daubert Declaration
do "Tyco Sales Costs Data"	do "Tyco Sales Costs Data"	do "BD Data 00_02 new v1"
do "Tyco Sales Costs Data	do "Tyco Sales Costs Data	do "BD Data v6"
do "Import Contract Prices"	do "Import Contract Prices"	do "BD Data new v1"
do "Tyco product list v1"	do "Tyco product list v1"	do "BD Data 00_02 v3"
do "Tyco uoms v1"	do "Tyco uoms v1"	do "BD Data Merge v8"
do "Tyco GPOs merge v4"	do "Tyco GPOs merge v4"	do "BD contract prices v4"
do "BD Data 00_02 v1"	do "BD Data 00_02 v1"	do "Daniels Data v4 noJV"
do "BD Data v5"	do "BD Data v5"	do "Daniels Data v4"
do "BD Data new"	do "BD Data new"	do "Products desc Tyco"
do "BD Data 00_02 new"	do "BD Data 00_02 new"	do "Tyco costs distribution"
do "BD Data Merge v5"	do "BD Data Merge v6"	do "Individual Contracts v2"
do "Daniels Data v1"	do "Daniels Data v3"	do "Tyco data"
do "Tyco GPOs v2"	do "Tyco GPOs v2"	do "Tyco GPOs merge v6a"
do "Merge all firms v10"	do "Steri Tyco 2step match v1"	do "Merge all firms v28 noJV
do "Merge all firms v11"	do "Stericycle Data v1"	do "Merge all firms v28"
do "Committed Levels v5"	do "Stericycle Sales v3"	do "Committed Levels v7"
do "BD contract prices v2"	do "Bemis sales"	do "Full committed volume
do "Full committed volume	do "Merge all firms v23"	do "Full committed volume
do "Full committed volume	do "Merge all firms v23 keep"	do "Commitment advantage v1"
do "GPO market shares v5"	do "Committed Levels v6"	do "Economies of Scale v10"
do "Tyco classification v2"	do "BD Data Merge v5"	do "Reusables in GPOs v4"
do "GPO Market Test v1"	do "BD contract prices v2"	do "GPO Market Test v2"
do "Regions market test v3"	do "Full committed volume	do "GPO type advantage v1"
do "Product desc BD"	do "Full committed volume	do "Switchers performance regr
do "Product desc Tyco"	do "Full committed volume v46	do "Switchers panel regr v4"
do "Economies of Scale v5"		do "Growth analysis Figure 3
do "Tyco profit margins"		
do "Exclusivity v1"		
do "Premier tiers"		
do "Daniels GPOs v3"		
do "Switchers performance regr		

Professor Elhauge's STATA programs can be run in sequence provided the file path short-cuts

have been updated. That is, Professor Elhauge references his file structure through a series of programming short-cuts, *i.e.*, using the "global" command in STATA. (See Table A2 for a list of the most relevant programming shortcuts.)

Because Professor Elhauge's reply report and Daubert declaration utilize intermediate files created in his initial liability report, it is recommended that you run the sequence of STATA programs employed in the initial report, followed by the sequence of programs employed in the reply report, followed by those programs utilized by the Daubert declaration.

Table A2 – File Path Shortcuts

Short Cut	File Path
BD0	...\BD Data\BDMASS 00000346
BD1	...\BD Data\BDMASS00000347
BD2	...\BD Data\BDMASS 00000348
BD3	...\BD Data\BDMASS 00000349\SAP
BD4	...\BD Data\BDMASS 00000349\AS400
bemis	...\Bemis Data
costs	...\Tyco Cost Data\Tyco Cost Data (TYN019)
costs06	...\Tyco Cost Data\Tyco Cost Data (TYN068)
daniels	...\SHARPS Daniels\Daniels Sales\DI_Revenue CD_001
daniels2	...\SHARPS Daniels\Daniels Sales\DI_Revenue CD_002
data06	...\Tyco Sales Data (TYN069)
matchdaniels	...\SHARPS data\Work\Daniels Matching
needles	...\BD Data\BDMASS 00000349\AS400
ocr	...\SHARPS data\Work\OCRed price lists
sales	...\Tyco Sales Data (TYN0005, TYN0012516)"
steri	...\Steri Data
temp	...\temp
work	...\SHARPS data\Work

Key Files for Reproducing Professor Elhauge's Simultaneous Comparisons

Full committed volume

A number of Professor Elhauge's analyses are based on the output of following three files: "Full committed volume v34.do" (original report), "Full committed volume v46.do" (reply report), and

"Full committed volume v61.do" (Daubert declaration). These files generate a multitude of calculations, included the underlying calculations of rivals shares presented in his "gap" charts. In Table A3 below I provide a summary of the variables used in those comparisons.

Table A3 – Variables Used in Simultaneous Comparisons

Full committed volume v34.do (Original Report)	Exhibit 9	Affected	DanielsBD_Tyco_comm_r
		Unaffected	DanielsBD_Tyco_nocomm_r
	Exhibit 10	Affected	DanielsBD_Tyco_sole_r
		Unaffected	DanielsBD_Tyco_sole_else_r
	Exhibit 11	Affected	DanielsBD_Tyco_comm_both_r
		Unaffected	DanielsBD_Tyco_comm_both_else_r
	Exhibit 12	Affected	DanielsBD_Tyco_commorboth_r
		Unaffected	DanielsBD_Tyco_commorboth_else_r
Full committed volume v46.do (Reply Report)	Exhibit 9 [Revised]	Affected	DSBD_Tyco_comm_r
		Unaffected	DSBD_Tyco_nocomm_r
	Exhibit 10 [Revised]	Affected	DSBD_Tyco_sole_r
		Unaffected	DSBD_Tyco_sole_else_r
	Exhibit 11 [Revised]	Affected	DSBD_Tyco_comm_both_r
		Unaffected	DSBD_Tyco_comm_both_else_r
	Exhibit 12 [Revised]	Affected	DSBD_Tyco_commorboth_r
		Unaffected	DSBD_Tyco_commorboth_else_r
Full committed volume v61.do (Daubert Reply Declaration)	Table 2A	Access	DSBD_Tyco_sole_r
		No Access	DSBD_Tyco_sole_else_r
	Table 2B	Access	DSBD_Tyco_comm_r
		No Access	DSBD_Tyco_nocomm_r
	Table 2C	Access	DSBD_Tyco_comm_sole_r
		No Access	DSBD_Tyco_comm_sole_else_r
	Table 2D	Access	DSBD_Tyco_commorsole_r
		No Access	DSBD_Tyco_commorsole_else_r

Regressions

The regression results reported in Table 9 of Professor Elhauge's original liability report are generated by "Switchers performance regr v6.do". This regression analysis is updated in Professor Elhauge's reply report using "Switchers performance regr v11.do", and then again in his Daubert declaration using "Switchers performance regr v21.do". In addition, Professor Elhauge conducts a fixed effects regression in his Daubert declaration using "Switchers panel regr v4.do".

Novation Before/After Comparisons

The Rivals' share at Novation reported in "Exhibit 17B [Declaration]" of Elhauge's Daubert declaration is generated using: "Reusables in GPOs v4.do". The relevant variables for the backup to this chart are "DSB_share_NOVATION", "DSB_share_PREMIER", and "DSB_share_noNOVATION".

II. Specific Areas of Disagreement with Professor Elhauge

Access Approach to the Analysis of Share Contracts—Modifying Professor Elhauge's Approach

In ¶ 66 of Professor Elhauge's Daubert Declaration he states the following when assessing the impact of Covidien's GPO contracts with share provisions using his new "access" approach: "I treated a buyer as having such GPO access/affiliation if it was ever listed as being part of that GPO at any previous point in time in the data of *any firm*" (emphasis added). Despite this claim, Professor Elhauge only treats a buyer as having such GPO access/affiliation if it was ever observed as having made a purchase through that GPO at any previous point in time in the Covidien data only. This can be ascertained by inspecting the following line of code from his "Full committed volume v61.do" file:

by id: gen affGPO="`gpo'" if Tyco_majorGPO=="`gpo'"

However, if Professor Elhauge were to align his programming with the text of his report, as I do in this declaration, this line of code should read as follows:

by id: gen affGPO="`gpo'" if Tyco_majorGPO=="`gpo'" | BD_majorGPO=="`gpo'" |

Steri_majorGPO=="`gpo'" | Daniels_majorGPO=="`gpo'"

To take a concrete example, [redacted] purchased from BD under the dual-source Premier contract from October 2001 to April 2005. Although BD's sales data indicate that this hospital used the BD-Premier contract, and is therefore a Premier member having had access to the Covidien-Premier contract, Professor Elhauge does not use this information to place [redacted] into the "access" group. Instead, Professor Elhauge classifies this hospital as not having had access to Covidien's GPO contracts with share provisions. The following table (Table A4) provides more information regarding this hospital.

Table A4

[redacted]

(Elhaugue ID: 104241, [redacted])

Date	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Oct-01	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Nov-01	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Dec-01	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jan-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Feb-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Mar-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Apr-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-May-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jun-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jul-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Aug-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Sep-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Oct-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Nov-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Dec-02	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Feb-03	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Mar-03	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Apr-03	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-May-03	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

1-Jun-03	[redacted]								
1-Jul-03	[redacted]								
1-Aug-03	[redacted]								
1-Sep-03	[redacted]								
1-Oct-03	[redacted]								
1-Nov-03	[redacted]								
1-Dec-03	[redacted]								
1-Jan-04	[redacted]								
1-Feb-04	[redacted]								
1-Mar-04	[redacted]								
1-Apr-04	[redacted]								
1-May-04	[redacted]								
1-Jun-04	[redacted]								
1-Jul-04	[redacted]								
1-Aug-04	[redacted]								
1-Sep-04	[redacted]								
1-Oct-04	[redacted]								
1-Nov-04	[redacted]								
1-Dec-04	[redacted]								
1-Jan-05	[redacted]								
1-Feb-05	[redacted]								
1-Mar-05	[redacted]								
1-Apr-05	[redacted]								

Access Approach to the Analysis of Sole-Source Contracts—Modifying Professor Elhauge's Approach

In Professor Elhauge's "access" approach in the context of sole-source contracts, Professor Elhauge classifies historically direct purchasers (purchasing outside of GPO contracts) as part of the Unaffected group (or, in his parlance, the "no access" group). In my revision of his access analysis, I excluded such hospitals in order enable an apples-to-apples comparison with Professor Elhauge's earlier analyses where direct purchasers were excluded.

Implementing this correction requires two steps. The first is to retain a given customer in the comparison from the moment they begin purchasing through a GPO contract. I do this by

modifying Professor Elhauge's "buys_thru_GPO" variable. This variable tracks purchases that are made through GPO contracts. As a result, in my revisions I make this variable "sticky" in much the same way that Professor Elhauge infers GPO membership for those transactions/observations in which there is no GPO information. Once a hospital purchases through a GPO contract I ensure that "buys_thru_GPO" retains a value of 1.

gsort id date -buys_thru_GPO

replace buys_thru_GPO=buys_thru_GPO[_n-1] if id==id[_n-1] & buys_thru_GPO[_n-1]==1

In the second step, I redefine the sole-source comparison variables such that a hospital purchasing historically outside of GPO contracts is not included in the "no access" group. However, once a hospital has begun GPO purchasing they are no longer excluded form the comparison.

gen DSBD_Tyco_sole=DSBD_sales*sole_source_Tyco

gen Total1_Tyco_sole=total_sales*sole_source_Tyco

gen DSBD_Tyco_sole_else=DSBD_sales*(1-sole_source_Tyco)*buys_thru_GPO

gen Total1_Tyco_sole_else=total_sales*(1-sole_source_Tyco)*buys_thru_GPO

To summarize, a hospital's sales are not included in the simultaneous comparison prior to their participation in the market for GPO services.

[redacted]

The name, [redacted]. Professor Elhauge matches these two customers to the Daniels customer with the name "Children's Hospital of Philadelphia" starting in July 2006 when [redacted] switched to Daniels as its primary vendor. He then assumes that Daniels sells equal amounts to each of the two [redacted] customers in the Covidien sales data. This

is illustrated in Table A5 in this Appendix. The [redacted] is observed in Covidien sales data to be purchasing under the Premier contract. Hence this customer, along with Daniels' (and Covidien's) sales to it, is assigned by Professor Elhauge to the Affected group. In contrast, since the [redacted] is observed in Covidien sales data in 2000 and 2001 to be purchasing without a GPO contract, it (along with Daniels' sales to it) is removed by Professor Elhauge from the analysis altogether. Thus one half of Daniels' sales [redacted] are dropped once [redacted] switches most of its purchases to Daniels – even though all Daniels' sales clearly are to the [redacted], a member of Premier which switched to Daniels during the time that Premier had a sole-source contract with Covidien. This artificially understates Daniels' success in the Affected group.

Further underlining the misallocation by Professor Elhauge of Daniels' sales to [redacted] is inactive during the relevant time period (mid-2006 and thereafter), i.e., it did not purchase anything from Covidien. Indeed, [redacted]. Nonetheless, Professor Elhauge assumes that by mid-2006, one half of all Daniels' sales to [redacted] went to this inactive customer of Covidien.

[redacted]

Date	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jul-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Aug-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Sep-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Oct-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Nov-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Dec-05	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jan-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Feb-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Mar-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Apr-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-May-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jun-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jul-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jul-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Aug-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Aug-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Sep-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Sep-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Oct-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Oct-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Nov-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Nov-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Dec-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Dec-06	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jan-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Jan-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Feb-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

1-Feb-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Mar-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Mar-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Apr-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-Apr-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-May-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
1-May-07	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]