

IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

NATCHITOCHEs PARISH HOSPITAL
SERVICE DISTRICT, on behalf of itself
and all others similarly situated,

Plaintiff,

v.

TYCO INTERNATIONAL, LTD.,
TYCO INTERNATIONAL, (U.S.), INC.,
TYCO HEALTHCARE GROUP, L.P.,
THE KENDALL HEALTHCARE
PRODUCTS COMPANY,

Defendants.

CIVIL ACTION NO. 05-12024 PBS

JURY TRIAL DEMANDED

REPLY DECLARATION OF MARGARET E. GUERIN-CALVERT

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I. Introduction

1. In the interest of brevity, I do not here review the analysis presented in my initial report.¹ In this reply I am addressing only the regression analysis presented in Dr. Singer's reply declaration. In my initial report, I criticize Dr. Singer for assuming that reduced concentration *must* lead to reduced prices, without determining whether that theoretical construct fits this context. In particular, Dr. Singer does not take into consideration fundamental aspects of bidding and contracting in this industry that render his assumption problematic.²

2. In his reply declaration, Dr. Singer presents the results of a regression. He claims that this regression demonstrates a positive relationship between concentration and the price-cost margin in this industry, which is supposed to justify his assumption that damages will necessarily result from higher concentration. In particular, Dr. Singer claims that "[i]nspection of the data indicates that the correlation between concentration and price-cost margins is indeed positive, as the NEIO model predicts, and not negative

¹ See the Expert Report of Margaret E. Guerin-Calvert, January 31, 2008. The Plaintiffs' expert, Dr. Hal Singer, has filed two expert reports in this matter. See the Expert Report of Dr. Hal Singer, December 18, 2007 and the Expert Reply Declaration of Dr. Hal Singer, February 15, 2008. I reserve the right to discuss any and all aspects of Dr. Singer's reports in any future testimony that I give.

² As I note in my report: "Even though GPO competition and the aggregation of member purchases may lead to higher industry concentration, because of *ex ante* competition among manufacturers to obtain GPO contracts, higher concentration does not imply that prices have been elevated. (footnote: The concept of competition for the contract and the role of *ex ante* competition on prices is well established in the economics literature. See, *e.g.*, Dennis Carlton and Jeffrey Perloff, *Modern Industrial Organization*, Third Edition, p. 76.) The fundamental assumption underlying Dr. Singer's model is not applicable to the sharps container industry, where GPOs play a role as intermediaries and high concentration and fierce price competition can go hand in hand." ¶49.

Despite Dr. Singer's claim to the contrary (at ¶14 of his reply declaration), I also provide empirical support for that proposition: "Economics literature has indicated that market shares and concentration alone are not sufficient to evaluate the competitive effects in general, including on pricing, in a given industry. (footnote: See, *e.g.*, U.S. DOJ/FTC Horizontal Merger Guidelines, Revised April, 1997 See also Note submitted by the US DOJ and the US FTC to the Competition Committee for Discussion at a meeting held in October 2006, Roundtable on Competition in Bidding Markets, p. 7-8.) In this context, a sole-source award at a GPO, despite potentially leading to a relatively higher degree of concentration, can solicit fierce price competition *ex ante* as firms compete for the substantial sales that contract placement may bring. This notion is supported by the evidence, referenced earlier, showing that manufacturers offer lower prices on products for sole-source contracts than dual-source contracts." ¶83.

or zero as Ms. Guerin-Calvert claims.”³ Dr. Singer is wrong about what inspection of the data indicates. For the reasons discussed here, there are substantial deficiencies with his regression analysis. As a consequence, it provides no empirical basis for the assumption underlying his damage calculation.

II. Dr. Singer’s Regression

3. There are various reasons to discount Dr. Singer’s regression analysis:

- The relevant regression coefficient is not statistically significant at a common threshold level, referred to as the 5% level, but only at the less rigorous 10% level. (*See* Model 1 in the Appendix.) Dr. Singer does not present these results in his reply declaration.

- Dr. Singer’s regression does not “explain” most of the variation in the margin. The summary measure of the explanatory power of the regression is known as the r-square. The r-square of Dr. Singer’s regression is 0.47, which means that 53% – more than half – of the variation in the price-cost margin is explained by something other than the HHI. It is plausible, therefore, that his regression suffers from a “missing variable bias” – which implies that adding another explanatory variable could reduce or eliminate the explanatory power of the HHI.⁴ (*See* Model 1 in the Appendix.⁵)

- Dr. Singer’s regression is based on a very small sample: 7 observations. A sample of that size is not, as a general matter, considered to be a reliable basis for statistical inference of this sort.⁶ In addition, with small samples it may be that the deletion of any one observation can dramatically alter the results. For example, dropping the partial-year

³ Singer Reply Declaration, ¶15.

⁴ *See* William Greene, *Econometric Analysis*, Fifth Edition, 2003, Chapter 8.

⁵ All of the empirical results presented here are based on the data used by Dr. Singer in his regression analysis.

⁶ *See* Rand R. Wilcox, *Fundamental of Modern Statistical Methods*, 2001 for a general discussion of the problems of regression analysis with small samples.

observation, 2007, generates an insignificant regression coefficient.⁷ (See Model 2 in the Appendix.)

4. I also note that Dr. Singer's regression analysis uses profit margins as the dependent variable. It has been long-recognized in the economics literature that profit margins can be problematic as a measure of power over price: higher margins could reflect superior efficiency (lower costs) as well as market power (higher prices), and, therefore, it is necessary to distinguish between those two effects.⁸

5. Because Dr. Singer provides both price and cost data, an empirical evaluation of whether his choice of regression specification affects his results is readily accomplished. With the data provided by Dr. Singer, one can analyze directly the relationship between price and concentration, while controlling for costs. This specification of the regression – with price as the dependent variable and the HHI and cost as the independent variables – does not confound lower costs (and thus higher margins) with higher prices.⁹ With that specification the HHI is no longer statistically significant. (See Model 3 in the Appendix.)

6. I am continuing to analyze Dr. Singer's regression and may offer additional opinions when that analysis is complete.

⁷ In addition, Dr. Singer's prices and costs are based only on Covidien's and BD's data, and only on Covidien's data after October 2006. The 2007 Covidien data Dr. Singer uses extend only through May 2007. It is not clear that these data are representative of the entire industry. I understand that supplemental Covidien data have become available, which may also affect Dr. Singer's analysis.

⁸ Studying the relationship between the structure of an industry and resulting competitive conduct or performance of an industry has long been a core issue of industrial organization. This issue goes by the name of the "structure-conduct-performance" paradigm and dates as least as early as the work of Joseph Bain in the 1950s. See Dennis W. Carlton and Jeffrey M. Perloff, *Modern Industrial Organization*, Fourth Edition, 2005, Chapter 8. In 1973, the economist Harold Demsetz first articulated the inherent problem of drawing inferences about market power from the relationship between profits and concentration. See Harold Demsetz, "Industry Structure, Market Rivalry, and Public Policy," *Journal of Law & Economics*, 1973. In particular, the economic literature has long-recognized the problems associated with inferring market power from profit margins that are based on accounting measures of average variable cost – as opposed to marginal cost. See Franklin M. Fisher, "On the Misuse of the Profits-Sales to Infer Monopoly Power," *Rand Journal of Economics*, 1987. As a general matter, marginal cost as defined by economists is not easily ascertained.

⁹ Prices, not margins, are the appropriate focus of damages analysis; damages can only result from higher prices; higher margins are only relevant if they necessarily imply higher prices. See Leonard W. Weiss, Editor, *Concentration and Price*, 1989, Chapter 1; Carlton and Perloff, *Modern Industrial Organization*, Chapter 8.

III. Summary

7. Dr. Singer's regression is based on limited data and does not generate a statistically significant result at the 5% level. In addition, his results are sensitive to his specification and to the inclusion or exclusion of questionable data. An alternative specification, with price instead of profit as the dependent variable, also refutes his assertion that damages will necessarily result from higher concentration. In sum, it remains the case that Dr. Singer has no empirical basis for the assumption underlying his damage calculation.

I declare that the foregoing is true and correct under the laws of the United States.

A handwritten signature in cursive script, reading "Margaret E. Guerin-Calvert", written over a horizontal line.

Margaret E. Guerin-Calvert

November 14, 2008

Appendix: Regression Models

Model 1: Singer Data; Singer Regression

Model 2: Singer Data Without 2007; Singer Regression

Model 3: Singer Data; Price Regression

The REG Procedure
 Model: MODEL1
 Dependent Variable: MARGIN

Number of Observations Read 7
 Number of Observations Used 7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.00364	0.00364	4.47	0.0882
Error	5	0.00407	0.00081486		
Corrected Total	6	0.00772			

Root MSE 0.02855 R-Square 0.4719
 Dependent Mean 0.53553 Adj R-Sq 0.3663
 Coeff Var 5.33036

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	0.26461	0.12862	2.06	0.0948
HHI	1	0.00006351	0.00003005	2.11	0.0882

The REG Procedure
 Model: MODEL1
 Dependent Variable: MARGIN

Number of Observations Read 6
 Number of Observations Used 6

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.00213	0.00213	2.11	0.2204
Error	4	0.00405	0.00101		
Corrected Total	5	0.00618			

Root MSE	0.03182	R-Square	0.3448
Dependent Mean	0.54157	Adj R-Sq	0.1810
Coeff Var	5.87559		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	0.28135	0.17983	1.56	0.1927
HHI	1	0.00005981	0.00004122	1.45	0.2204

The REG Procedure
 Model: MODEL1
 Dependent Variable: PRICE

Number of Observations Read 7
 Number of Observations Used 7

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	2	0.36286	0.18143	21.11	0.0075
Error	4	0.03437	0.00859		
Corrected Total	6	0.39723			

Root MSE	0.09270	R-Square	0.9135
Dependent Mean	3.79412	Adj R-Sq	0.8702
Coeff Var	2.44315		

Parameter Estimates

Variable	DF	Parameter Estimate	Standard Error	t Value	Pr > t
Intercept	1	4.61571	1.33986	3.44	0.0262
COST	1	0.44821	0.31405	1.43	0.2267
HHI	1	-0.00037835	0.00019454	-1.94	0.1237