

CT - 2003-005

THE COMPETITION TRIBUNAL

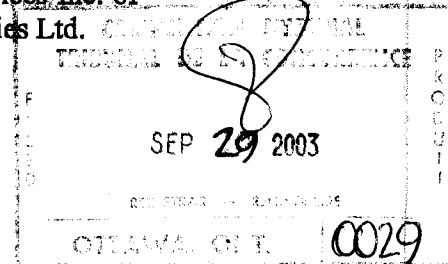
IN THE MATTER OF the *Competition Act*, R.S. 1985, c. C-34; as amended;

IN THE MATTER OF an application by Canadian Waste Services Holdings Inc., Canadian Waste Services Inc. and Waste Management Inc. under s. 106 of the *Competition Act*;

AND IN THE MATTER OF the acquisition by Canadian Waste Services Inc. of the Ridge Landfill in Blenheim, Ontario from Browning-Ferris Industries Ltd.

BETWEEN:

**CANADIAN WASTE SERVICES HOLDINGS INC.,
CANADIAN WASTE SERVICES INC. and
WASTE MANAGEMENT, INC.**



Applicants

- and -

COMMISSIONER OF COMPETITION

Respondent

Affidavit of Michael R. Baye

Sworn September 26, 2003

I, **MICHAEL R. BAYE**, of the City of Bloomington, in the State of Indiana, one of the United States of America, MAKE OATH AND SWEAR:

1. I am the Bert Elwert Professor of Business Economics and Public Policy at Indiana University. My fields of specialization within economics include industrial organization, microeconomic theory, and game theory. From 1988 to the present, I have served intermittently as a consultant to the Antitrust Division of the United States Department of Justice on a variety of mergers within the waste industry.

2. I was retained by the Commissioner of Competition to examine the competitive effects of the acquisition by Canadian Waste Services Inc. ("CWS") of Browning-Ferris Industries Ltd.'s

CT - 2003-005

THE COMPETITION TRIBUNAL

IN THE MATTER OF the *Competition Act*, R.S. 1985, c.C-34; as amended;

IN THE MATTER OF an application by Canadian Waste Services Holdings Inc., Canadian Waste Services Inc. and Waste Management Inc. under s. 106 of the *Competition Act*;

AND IN THE MATTER OF the acquisition by Canadian Waste Services Inc. of the Ridge Landfill in Blenheim, Ontario from Browning-Ferris Industries Ltd.

B E T W E E N:

**Canadian Waste Services Holdings, Inc.,
Canadian Waste Services Inc., and Waste
Management, Inc.**

Applicants

- and -

Commissioner of Competition

Respondent

Affidavit of Michael R. Baye

FRASER MILNER LLP

1 First Canadian Place
100 King Street West, Suite 3900
Toronto, ON M5X 1B2

Donald B. Houston

Tel: 416-863-4620
Fax: 416-863-4592

AFFLECK GREENE ORR LLP

Barristers & Solicitors
One First Canadian Place
Suite 840, P.O. Box 489
Toronto, Ontario M5X 1E5

W. Michael G. Osborne

Tel: (416) 360-5919
Fax: (416) 360-5960

DEPARTMENT OF JUSTICE

Place de Portage, Phase 1
50 Victoria Street, 22nd Floor
Hull, Quebec K1A 0C9

André Brantz

Tel: (819) 997-3325
Fax: (819) 953-9267

Solicitors for the Respondent, the
Commissioner of Competition

Exhibit A: Report of Michael R. Baye, September 26, 2003

I. Qualifications

1. I am the Bert Elwert Professor of Business Economics and Public Policy at Indiana University. I received my B.S. degree in economics from Texas A&M University in 1980 and a Ph. D. in economics from Purdue University in 1983. I received a Fulbright award during 1985-1986 to conduct research and to present lectures on spatial pricing at Erasmus University Rotterdam.
2. I have taught Ph. D. level courses in industrial organization at Texas A&M University, Penn State University, Indiana University, and the New Economic School in Moscow. In addition, I have held visiting appointments at a number of other universities, including Cambridge, Oxford, and Bonn. My fields of specialization within economics include industrial organization, microeconomic theory, and game theory.
3. My research on the economics of pricing has been published in the *American Economic Review*, *Journal of Political Economy*, *Econometrica* and other leading economics journals. I am the author of a best-selling textbook, *Managerial Economics and Business Strategy* (McGraw-Hill, 4th edition, 2003), which has been translated into several languages and is used around the world at both the undergraduate and graduate levels. I am the editor of *Advances in Applied Microeconomics*, and also serve on the editorial boards of the *Economics of Governance* and the *Journal of Public Policy and Marketing*.
4. I have been involved in this case since the fall of 1999, when I was retained by the Canadian Competition Bureau to examine the competitive effects of the acquisition by Canadian Waste Services Inc. (CWS) of Browning-Ferris Industries Ltd. (BFIL). Since that time, I have provided both written reports and oral testimony before the Tribunal in hearings regarding

the initial complaint as well as in the remedy hearing. In addition, from 1988 to the present, I have served intermittently as a consultant to the Antitrust Division of the United States Department of Justice on a variety of mergers within the waste industry.

II. Scope

5. The Bureau has asked me to examine the economic relevance of the “changes in circumstances” alleged by CWS, and in particular whether any of the following allegations by CWS would lead me to change my opinion regarding the anticompetitive effects of CWS’ acquisition of the Ridge landfill: (1) delays in the expansions at the Warwick and Richmond landfills; (2) the absence of any price reductions within southern Ontario for commercial, institutional and industrial (ICI) waste from the Greater Toronto Area (GTA); and (3) the absence of any reductions in shipments of ICI waste from the GTA to Michigan.

III. Summary of Opinions

6. None of these allegations change my fundamental conclusion that disposal prices for ICI waste generated in the GTA and Chatham-Kent Area (CKA) critically depend on whether the Ridge is owned and operated by CWS or an independent competitor. These markets are spatial oligopolies in which a handful of landfills price discriminate among customers based on how close a given customer is to alternative facilities. Giving CWS full control over pricing strategies at the Ridge would eliminate competition between the Ridge and CWS landfills, thereby enhancing CWS’ market power in these markets and permitting it to charge significantly higher tipping fees than would otherwise prevail in these markets.
7. From an economic perspective, it is inappropriate to view changes in variables that CWS can manipulate – such as capacity, prices, and waste flows – as “changes in circumstances.” Doing so creates perverse incentives for firms involved in antitrust litigation to behave

opportunistically, and will lead to moral hazard problems that undermine future antitrust policy.

8. While the likelihood of expansions at Richmond and Warwick were central to my opinions regarding a likely substantial prevention of competition in the GTA market, anticipation of these expansions played no role in my opinions regarding the CKA market, nor are they central to my opinion that the acquisition of the Ridge by CWS would substantially lessen competition for ICI waste from the GTA.
9. CWS does not allege in its *Application* that its proposed expansions at Richmond and Warwick will not take place. Even if this was the case, one is left with the fact that control of the Ridge by CWS would substantially lessen competition in both the GTA and CKA markets. Even in this scenario, divestiture of the Ridge remains the appropriate remedy.
10. The economic reasons underlying these opinions are summarized below.

IV. Economic Critique of CWS' Arguments

A. It is Inappropriate to View Changes in Endogenous Variables as a “Change in Circumstances” in an Attempt to Overturn a Divestiture Order

11. Economists call a variable that is influenced by the actions of an interested party an *endogenous variable*. For example, the number of times a motorist is involved in an accident is endogenous, since it is influenced by his efforts to drive safely. This does not mean that a motorist has complete control over accidents; even a driver who is careful to obey all traffic laws may have an accident due to factors outside of his control. However, a driver who takes unsafe actions – such as speeding or driving while intoxicated – is more likely to have an accident than one who obeys traffic laws.
12. As I noted in the Remedy hearing,

“The level of capacity in southern Ontario is an endogenous variable influenced by the behavior of CWS.” *Report of Michael R. Baye, Remedy Hearing, Paragraph 15a, 23 May 2001.*

13. This circumstance has not changed; as a general matter, time and money are the main requirements for overcoming obstacles that get in the way of CWS’ proposed expansions at the Warwick and Richmond landfills.

14. Furthermore, landfill expansions are not the only economic means by which CWS can create additional capacity for ICI waste from the GTA. I noted in my *Reply* in the Remedy hearing that:

“CWS can increase its own capacity for ICI waste from the GTA by taking in lower volumes of non-GTA waste or by shipping some waste from its own collection operations to landfills that it owns in Michigan... the increase in market power that would result if CWS acquires the Ridge would likely provide it with an incentive to do so.” *Michael R. Baye’s Reply to the Expert Report of Christopher Velluro, 13 June 2001, Paragraph 5b.*

15. In the remedy hearing, CWS proposed a remedy that would have constrained to some extent its pricing behavior until such time that there was no longer any excess capacity in the market. They proposed gaining full control of the Ridge once a capacity shortfall was established.

16. I pointed out in my Remedy Report that, since the amount of capacity in the market is strongly influenced by the actions of CWS, it would be inappropriate for the Tribunal to base antitrust decisions on *ex post* (future) levels of capacity. In particular, I noted that doing so

would lead to *moral hazard*¹ and give CWS sharp incentives to engage in opportunistic behavior to distort observed capacity levels so that it could ultimately gain full control the Ridge and raise prices.

17. In that report, I specifically noted if the Tribunal adopted CWS' proposed remedy, it would be providing CWS with strong incentives to delay proposed expansions, speed up the closure of its existing landfills, or manipulate waste flows among its various disposal facilities in order to "demonstrate" to the Tribunal that its concerns regarding a substantial prevention of competition – which arise when there is excess capacity – were no longer relevant. Once released from antitrust scrutiny, it would then be able to readjust waste flows, follow through with planned expansions, and raise prices to take advantage of the market power gained through complete control of the Ridge landfill.
18. Ultimately, the Tribunal opted against CWS' proposed remedy in favor of complete divestiture of the Ridge. From an economic perspective, however, CWS' current allegations that "circumstances have changed" place the Tribunal and the Commissioner in exactly the same position that would have occurred had the Tribunal accepted their proposed remedy in the first place. In effect, CWS argues in its current *Application* that, since there is no excess capacity in 2003, it should be permitted to gain full control of the Ridge.
19. For reasons similar to those articulated in my 2001 report, economic theory indicates that it is inappropriate to view changes in endogenous variables – variables that are strongly influenced by CWS – as a change in circumstances.

¹ Moral hazard is the economic term referring to a situation where one party takes a "hidden" or "unobservable" action that benefits him or her at the expense of another party. For example, in insurance contracts, the probability of loss is typically endogenous and depends on unobservable effort expended by the insured to avoid a loss. In this context, moral hazard occurs if the insurance contract reduces the incentive of the insured party to take actions to avoid a loss: Hidden actions (reduced effort) benefit the insured at the expense of the insurance company. See, for instance, Michael R. Baye, *Managerial Economics and Business Strategy*, 2003, Chapter 12.

20. A decision by the Tribunal to view changes in prices, waste flows, or delays in capacity expansions as “changes in circumstances” would have broad implications well beyond this case. If the Tribunal establishes a precedent for viewing changes in endogenous variables as changes in circumstances, it would create perverse incentives for future firms subject to divestiture orders. Economic theory indicates the resulting moral hazard would not only undermine future antitrust policy, but potentially lead to countless rounds of litigation. Future firms subject to hold separate orders would have sharp incentives to behave opportunistically and to strategically manipulate business decisions in the short-run.
21. These perverse effects occur regardless of whether CWS has behaved opportunistically in this case.
22. To illustrate, imagine that the Tribunal in this case establishes a precedent for viewing changes in endogenous variables as changes in circumstances. Further suppose a future Tribunal finds that the price charged by a hypothetical profit-maximizing firm would *fall* if it required merging parties to divest an asset. Since the price charged by the hypothetical firm is an endogenous variable – that is, within its control – it would have an economic incentive to delay divestiture of the hold-separate asset through legal proceedings, temporarily *raise* price above current levels, and then file a new application before the Tribunal that “circumstances have changed” because prices have increased, not decreased as predicted by the Tribunal. This strategy – if such a precedent were established in the present case – would enable the hypothetical firm to circuitously gain control of the asset, thereby gaining market power through opportunistic litigation.
23. More generally, when factors contributing to an antitrust authority’s divestiture order are endogenous to the parties – capacities, prices, qualities, sales volumes, and so on – permitting

the parties to claim that *ex post* changes in these variables are “changes in circumstances” would create perverse incentives, undermine antitrust policy, and result in socially inefficient litigation.

24. It is important to stress that I am not asserting – and I have no knowledge – that CWS has taken deliberate actions to delay the expansions at Richmond or Warwick. Except for the potential impact on the current proceedings, their incentive to do so was largely eliminated when the Tribunal chose not to adopt CWS’ proposed remedy.
25. However, the economic theory of moral hazard – which is the heart of the incentive issue – indicates that asymmetric information makes it difficult to know the extent to which observed changes in endogenous variables (such as capacity, prices, or waste flows) are due to strategic actions by an interested party or due to exogenous factors. Indeed, moral hazard stems from the problem of *unobservable* actions, and it is well-known in the economics literature that parties benefiting from such actions have a strong incentive to “hide” them from those adversely affected.

B. *Ex Post* Delays in the Richmond and Warwick Landfill Expansions are Not Economically Relevant “Changes in Circumstances”

26. It is common knowledge that the market for disposal services entails numerous uncertainties. As I indicated in my initial report of 11 October 2000, these risks include not only uncertainties which affect the time and money required to obtain approvals from various government authorities, but a variety of other legal, political, and environmental risks. Numerous events can alter the political and economic landscape, thereby speeding up or delaying attempts to create new landfills or expand existing sites.

27. As I noted in Paragraphs 95 and 97-98 of my initial report, these uncertainties affect market structure by making it difficult for new entrants to enter the market for disposal services. It is well-documented in the economics literature that such barriers to entry enhance the ability of a merged entity to exercise the market power gained through an acquisition.
28. Viewed in this context, delays in the Richmond and Warwick landfill expansions are not changes in the economic environment. Rather, they are manifestations of the uncertainties that make entry into disposal markets difficult, contribute to CWS' market power, and enhance CWS' ability to profitably raise prices if it gained control of the Ridge landfill.
29. More broadly, in the face of uncertainty, *ex post* realizations almost always differ from *ex ante* expectations. For example, relative to expectations formed in 2001, *ex post* increases in 2003 southern Ontario capacity for ICI waste from the GTA have occurred due to realizations of greater capacity at the Petrolia landfill, while *ex post* decreases in 2003 capacity have occurred due to delays in CWS' proposed expansions at the Richmond and Warwick sites. Differences in expected and realized values of random variables are an artifact of uncertainty.
30. It is well-documented in the economics literature that optimal decisions in the face of uncertainty are forward looking, not backward looking. A classic example of suboptimal backward-looking behavior is the *insurance fallacy*. This occurs, for instance, when an individual decides not to renew his homeowner's policy today, simply because his house did not burn down during the past year.
31. Likewise, economic theory indicates that it would be a mistake to permit CWS to gain control of the Ridge today, simply because additional capacity was not realized during the past year.

32. When I wrote my initial report in 2000, it was not certain that additional capacity would be available at the Richmond and Warwick landfills. However, based on evidence at the time, both the Tribunal and I concluded that capacity expansions were likely at these two disposal facilities. Indeed, the expectation – based on CWS documents – was that the expansions would be operational by 2003.
33. *Ex post*, the expansions were not operational by 2003. This does not imply that the expansions are unlikely, nor does it imply that CWS should be permitted to control the Ridge. In light of inherent uncertainties, economic theory indicates that delays in and of themselves are not changes in circumstances.
34. Economic theory dictates that optimal decisions with respect to any future uncertainties in capacities at the Warwick and Richmond landfills be forward looking. As noted in Section A above, a change in an endogenous variable should not be viewed as a change in circumstances. However, if the delays to the expansions are going to be considered, the relevant economic question today is *not* whether there were past delays, but whether it is *no longer* likely that the expansions will take place.
35. While I have no specific expertise to aid the Tribunal in determining the ultimate timing of future expansions, CWS' pleadings in this case *do not* allege that the expansions at Richmond and Warwick have become unlikely. With regard to timing:
- a. In paragraphs 55 and 56 of its current *Application*, CWS anticipates that the Richmond landfill expansion could be operational in 2006 or 2007.
 - b. In paragraphs 69 and 70 of its current *Application*, CWS anticipates that the Warwick landfill expansion could be operational in 2005 or 2006.

36. While there is uncertainty regarding the timing of these expansions, based on forward looking expectations, the decision horizon today regarding the Richmond and Warwick expansions appears similar to when I filed my first report in late 2000.
37. More generally, the point is not the exact date at which additional capacity would be available, but that looking forward from today (late 2003), it has *not* become unlikely that additional capacity will be available at the Richmond and Warwick landfills.
38. While uncertainties inherent in the market have delayed expansions at Richmond and Warwick, from an economic perspective, these delays do not alter my opinion on the matter; nor do they change optimal policy in this case. By arguing that *ex post* delays in the Warwick and Richmond expansions are a change in circumstances, CWS is committing the *insurance fallacy*.
39. Using the optimal forward looking approach, the data provided by CWS in its *Application* (and discussed in Section C below) implies that the economic basis for divestiture is stronger in 2003 than it was in 2001. At the time of the Tribunal's original decision, successful expansions at both the Richmond and Warwick landfills were necessary in order for excess capacity to emerge in the market. Today, due to the unanticipated expansion at the Petrolia landfill, only one of the expansions is required to generate excess capacity in the market for ICI waste from the GTA.

C. Ignoring Endogeneity, Moral Hazard, and Opportunism, Data Provided by CWS in its *Application* Indicates That Divestiture Remains Necessary and Appropriate

40. Based on data in CWS' *Application* in the present case, and considering the economic impact of location and increased concentration on tipping fees in a spatial oligopoly, it is my opinion that divestiture of the Ridge remains necessary and appropriate.

41. Based on data in CWS' Table 2 – but not factoring in anticipated expansions at the Warwick and Richmond landfills – the Tribunal anticipated that in 2003 CWS would control 11.6 percent of market capacity, and that the acquisition of the Ridge would increase its share of capacity to 43.6 percent.
42. Today – again not factoring in anticipated expansions at Warwick and Richmond but taking into account the unanticipated expansions at Petrolia – data in CWS' Table 2 implies that CWS actually controls 22.5 percent of market capacity for ICI waste from the GTA, and the acquisition of the Ridge would increase its share of existing capacity to 50.5 percent.
43. Thus, even ignoring anticipated expansions at Warwick and Richmond and considering only existing capacity, there remains a strong economic basis for a likely substantial lessening of competition.
44. Assuming the expansions at both Warwick and Richmond take place, CWS' data indicate an even stronger economic basis for a likely substantial lessening of competition. In this case, CWS' share of capacity for ICI waste from the GTA increases to 49.8 percent if it does not control the Ridge, and to 68 percent if it is able to acquire the Ridge.
45. In fact, if one corrects CWS' Table 2 to reflect the Tribunal's finding that the relevant capacity at the Essex-Winsor landfill is 100,000 tonnes, as noted in paragraph 109 of the *Commissioner's Response*, CWS' pre- and post-acquisition market shares are greater today than when the Tribunal issued its original decision.
46. Furthermore, CWS notes in Table 2 of its recent *Application* that, due to delays in expansions at Warwick and Richmond, there is currently a 625,881 tonne capacity shortfall at existing prices. However, due to the unanticipated 300,000 tonne capacity expansion at CWS' Petrolia landfill, all that is now required for excess capacity to emerge is for CWS to succeed

in its proposed 694,000 tonne Warwick landfill expansion. In contrast, at the time of the original Tribunal decision, both the Warwick and Richmond expansions had to occur in order for there to be a certainty of excess capacity at existing prices.

47. The fact that CWS' Table 2 shows that only one of the expansions is now required to generate excess capacity at existing prices, coupled with the fact that CWS' pleadings do not indicate that these two expansions are unlikely, also leads me to conclude that there remains a strong likelihood of a substantial prevention of competition.

D. Absence of Declines in Prices or Waste flows to Michigan Are Irrelevant

48. The Tribunal's prediction that tipping fees charged for ICI waste from the GTA would decline, absent CWS' acquisition of the Ridge landfill, was predicated on additional capacity being available at the Richmond and Warwick landfills. Since the capacity has been slower to come on line than indicated in original CWS documents, there is no economic basis for expecting prices to have fallen. The fact that prices have not yet fallen is consistent with both my earlier testimony as well as the Tribunals' findings, as discussed below.

49. The Ridge has yet to be divested, and as such, the "vigorous competitor" required to create a more competitive economic landscape does not yet exist in the market. The hold-separate order under which the Ridge is currently operating was not designed to create a vigorous competitor in the market, but rather to preserve the assets so that, once sold, a new independent owner would be in a position to vigorously compete against CWS. For this reason, the current manager of the Ridge (under the Hold-Separate Order) has limited discretion with respect to contract length and volume, and is obliged to operate the facility in a conservative manner. Thus, since 2000, the Ridge has been operating in a state of "limbo"

rather than as a vigorous competitor. In effect, by delaying divestiture, CWS has delayed competition in both the CKA and GTA markets.

50. The theory of spatial competition on which the Tribunal based its decision indicates that the southern Ontario market is a spatial oligopoly, that CWS enjoys market power, and that its market power was enhanced as a result of eliminating competition from BFIL through the Ridge acquisition. Absent excess capacity, this would lead to higher prices in southern Ontario (the substantial lessening prediction) rather than lower prices (the substantial prevention prediction). As a result of higher prices in southern Ontario, one should not expect to observe a decline in waste flows to Michigan.
51. As discussed in Section E below, CWS has an incentive to attempt to route some of its own waste to its Michigan landfills to free up capacity in southern Ontario that can be sold to local customers at higher prices prevailing due to its market power. An independent, vigorously competing Ridge is required to prevent this from occurring.
52. CWS is a vertically integrated firm, and as discussed in my prior testimony, has incentives to internalize waste flows. In a capacity-constrained environment (such as the current setting), every tonne of its own waste that CWS puts in its own landfills uses up capacity that could otherwise be sold at premium prices. The profit-maximizing strategy is, where feasible, to route its own waste to its more distant sites in Michigan.
53. Economic theory indicates that, if the market for waste were competitive, as argued by previous CWS experts, CWS would have found it optimal to divest the Ridge at the outset rather than to engage in a costly legal battle. The reason is as follows.
54. As noted by the Tribunal, CWS provided no business rationale for the merger; there was no evidence of any synergies or cost savings stemming from CWS' acquisition of the Ridge

landfill. If landfill services were competitively priced, as previously asserted by CWS, tipping fees would reflect marginal cost and be independent of who owns the Ridge landfill. In this competitive scenario, CWS' disposal costs would be the same regardless of whether it sold the Ridge to an independent party and paid the firm a tipping fee equal to marginal cost, or owned the Ridge and paid marginal cost directly. In this competitive scenario, it does not make economic sense to spend money on litigation in an attempt to gain control of a "competitive" asset. Legal expenses merely increase overall costs, and the profit-maximizing strategy is divestiture rather than litigation. The fact that CWS' continues to spend time and money on litigation is economic evidence that the concerns raised by the Tribunal and Commissioner are valid. The economic theory of revealed preference indicates that the economic basis for CWS' attempts to gain control of the Ridge landfill is that it expects the acquisition to permit it to charge higher prices (due to enhanced market power), and that these expected benefits exceed litigation costs.

55. In any event, CWS has successfully delayed the creation of a vigorous competitor, and therefore the fact that the Tribunal's predictions relating to waste flows and prices have not yet been realized is economically irrelevant; they are not economically valid "changes in circumstances."

56. Furthermore, the Tribunal's findings with regard to prices and waste flows are *ceteris paribus* predictions and represent the directional effects of the Ridge acquisition on prices. In any antitrust case, other variables can change in a market to move observed prices in directions opposite to those "predicted" by antitrust authorities. The mere fact that observed prices are higher or lower than predicted is economically irrelevant.

57. To see this, consider the following hypothetical in which an antitrust authority predicts that price would fall to marginal cost, but for a merger. If the initial markup factor is 1.25 (so that the observed price is 1.25 times marginal cost), the antitrust authority is predicting that the markup factor would fall from 1.25 to 1, but for the merger. Suppose marginal cost is initially \$8. Other things equal (that is, *ceteris paribus*), the antitrust authority's prediction is that price will fall from \$10 ($= 1.25 \times \8) to \$8 ($= 1 \times \8), but for the merger. Suppose the merger is blocked and that, several years later, the antitrust authority is correct: Its actions induced competition and price now equals marginal cost. The fact that the antitrust authority was correct in predicting that price would fall to marginal cost does not imply that the observed equilibrium price, a few years after its decision, equals \$8. For instance, if inflation or increases in labor costs increase marginal cost from \$8 to \$10, the new market price will be \$10, which equals the higher marginal cost. Even though the observed market price has remained at \$10, by blocking the merger, the markup factor has declined from 1.25 to 1. Had the merger not been blocked, the markup factor would have remained at 1.25 and (given the higher marginal cost) the market price would have been \$12.50 ($= 1.25 \times \10) instead of \$10. Viewed correctly, the antitrust authority's action resulted in lower prices than would have prevailed in the absence of divestiture. The fact that the price observed several years after the hypothetical decision (\$10) is not lower than the pre-decision price (\$10) is an irrelevant "test" of the validity of the antitrust authority's actions.

58. More generally, this simple hypothetical illustrates that, due to the *ceteris paribus* nature of findings in antitrust decisions, CWS' methodology of using observed pre and post-decision prices to refute the Tribunal's findings is economically flawed.

59. In my opinion, the primary reason for the alleged absence of price declines is that excess capacity has yet to emerge in the market, as discussed earlier.

60. Finally, I note that the excess capacity predicted by the Tribunal is not something that is likely to be observed in the market. Should additional capacity become available at prevailing prices, prices in the market will fall. This will induce customers to substitute away from distant landfills towards southern Ontario facilities, and in equilibrium the observed capacities will equal the higher quantity demanded at these lower prices.

E. While a Substantial Prevention of Competition in the GTA Market is Predicated on the Likelihood of Excess Capacity, the Finding of a Substantial Lessening of Competition is Not

61. The theory of spatial competition, which is the theory I put forth in this case and which was ultimately adopted by the Tribunal, indicates that excess capacity at existing prices is central to a substantial prevention of competition, but not to the substantial lessening of competition. According to this theory, in the presence of excess capacity at existing prices CWS' acquisition of the Ridge would (1) prevent prices from falling – a likely substantial prevention of competition. Furthermore, even in the absence of any excess capacity, CWS' acquisition of the Ridge would (2) cause prices to rise due to the elimination of a vigorous competitor – a likely substantial lessening of competition.

62. In particular, the theory of spatial competition predicts that, even in the absence of excess capacity, the critical location of the Ridge disciplines prices charged at other southern Ontario landfills. The elimination of the Ridge as an independent player in the market enhances the market power of the Ridge and other CWS landfills by reducing competition. In the absence of excess capacity, CWS can profitably exploit this increase in market power by

re-routing some of its own waste to its Michigan landfills or by taking in fewer tonnes of other waste. This frees up space in CWS' southern Ontario landfills which can then be sold at higher prices, thanks to its increase in market power.

63. This circumstance is not new to the case; I wrote in my Remedy Report:

“While excess capacity played a role in the Tribunal’s finding that the acquisition of the Ridge substantially prevents competition (Section 155) in the relevant market for GTA waste, it is not central to the finding of a substantial lessening of competition in either Chatham-Kent or GTA relevant markets...Economic theory indicates that, regardless of whether there is excess capacity in the relevant market, acquisition of the Ridge Landfill would substantially lessen competition.” *Report of Michael R. Baye, Remedy Hearing, May 23, 2001, Paragraph 15b*

64. I summed up the relevant economic theory in my final written report prior to the Tribunal’s

Divestiture Order:

“As noted in my earlier reports...CWS’ ability to profitably raise prices if it acquires the Ridge exists regardless of whether, at current prices, there is a shortage or surplus of capacity in southern Ontario for ICI waste from the GTA.

Price discrimination permits landfills to charge different customers different prices for disposal services, and economic theory indicates that the rents earned from different customers will depend on the outside options of customers (which in turn depends

on the number and locations of competitors). Customers with poor outside options will pay higher prices, while those with better outside options will pay lower prices. In general, a given firm will earn different incremental profits from different customers, and these profits will generally differ across firms.

...[S]patial competition and price discrimination exist not only for different customers wishing to dispose of ICI waste from the GTA, but also for customers wishing to dispose of other types of waste (including waste that can be disposed of in municipal landfills). This, coupled with the fact that government restrictions permit some landfills to accept only local waste while other landfills can accept waste from broader areas, creates differing wedges between rents that different landfills can extract from different customers.

This point is particularly important in southern Ontario because significant volumes of other waste (waste that is not ICI waste from the GTA) flow into the relevant landfills at existing prices. While the Commissioner did not raise competitive concerns in markets for this other waste, the volume of other waste accepted by landfills in the relevant market affects their capacity available for ICI waste from the GTA.

When determining whether there is likely to be excess capacity for ICI waste from the GTA at existing prices (as is

relevant for examining the likely prevention of competition), this other waste can be netted out. This is precisely what the Tribunal did when it concluded that the proposed merger would likely prevent competition in the relevant market. However, in considering price increases (as is relevant for examining whether a substantial lessening of competition is likely), it is inappropriate to net out other waste flows to determine the “marginal landfill.”

More specifically, economic theory indicates that, if it becomes more profitable for a landfill to accept ICI waste from the GTA (due, for example, to an increase in market power), rational landfills will take in less other waste and more ICI waste from the GTA. In this manner, a firm that increases its market power in a spatial market can exercise that power without the resulting loss in volumes that are typically associated with the exercise of market power....

In particular, the Tribunal found that the acquisition of the Ridge would be likely to substantially lessen competition for ICI waste from the GTA. This means that CWS could profitably increase tipping fees on ICI waste from the GTA by a non-trivial amount post merger. This would increase the rents CWS would earn from accepting ICI waste from the GTA relative to the rents it would earn from accepting other waste. In determining whether to accept ICI waste from the GTA or other waste, economic theory

indicates that a rational firm will compare the rents earned from each type of customer relative to its capacity. In the presence of capacity constraints, a firm will accept only the most profitable waste. Since the acquisition of the Ridge results in a discrete increase in CWS' market power for ICI waste from the GTA, but no alleged increase in the market power for non-GTA waste, the increase in market power would provide CWS with an incentive to take in less other waste and more ICI waste from the GTA in order to capitalize on the market power gained by acquiring the Ridge. In this manner, by acquiring the Ridge, CWS could profitably increase tipping fees for ICI waste from the GTA without pushing waste to Green Lane or EWSWA." *Michael R. Baye's Reply to the Expert Report of Christopher Velturo, 13 June 2001, Paragraphs 7; 9-14.*

65. In short, I have previously testified that even in the absence of any excess capacity, acquisition of the Ridge would substantially lessen competition in both the GTA and CKA markets. Nothing in CWS' current *Application* leads me to alter this conclusion.

V. Conclusions

66. For the above reasons, it remains my opinion that allowing CWS to gain control of the Ridge landfill would lead to a likely substantial lessening and prevention of competition in both the GTA and CKA markets, and that divestiture of the Ridge landfill is still the appropriate remedy.

MICHAEL R. BAYE

OFFICE ADDRESS

Department of Business Economics
Kelley School of Business
Indiana University
1309 East Tenth Street
Bloomington, IN 47405-1701

Phone: (812) 855-2779
Fax: (812) 855-3354
E-mail: mbaye@indiana.edu
Home Page: <http://nash-equilibrium.com>

HOME ADDRESS

3777 Cameron Avenue
Bloomington, IN 47401

Phone: (812) 336-6325

PERSONAL

Born 1958; married, two children; U.S. citizen

DEGREES

Ph.D. (Economics), Purdue University, August 1983
M.S. (Economics), Purdue University, December 1981
B.S. (Economics), Texas A&M University, May 1980

FIELDS OF INTEREST

Industrial Organization, Microeconomics, Game Theory and Strategy

PROFESSIONAL EXPERIENCE

Academic Positions:

Bert Elwert Professor of Business Economics & Public Policy, Indiana University, 1997- present
Associate and Full Professor of Economics, Penn State University, 1991-1997
Assistant and Associate Professor of Economics, Texas A&M University, 1985-1991
Assistant Professor of Economics, University of Kentucky, 1983 - 1985

Administrative, Visiting, and Other Positions:

Visiting Researcher, University of Cambridge (Corpus Christi College), 2003
Visiting Researcher, University of Bonn, 2003
Visiting Researcher, University of Cambridge (Trinity College), 2002

Visiting Fellow, University of Oxford (Nuffield College), 2001
Visiting Professor, New Economic School, Moscow, Russia, 1995
Interim Head, Department of Economics, Penn State University, 1994-1995
Advisory Committee, Institute for Policy Research and Evaluation, 1994 - 1995
Fellow, CentER for Economic Research, 1990 - Present
Fulbright Professor, Erasmus University Rotterdam, 1985 - 1986

BOOKS

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Organizing the New Industrial Economy*. Amsterdam: Elsevier/JAI Press, forthcoming 2003.

Michael R. Baye, *Managerial Economics and Business Strategy, 4th Edition*. McGraw-Hill, 2003.

Michael R. Baye, *Student Workbook for Managerial Economics and Business Strategy, 4th Edition*. McGraw-Hill, 2003.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: The Economics of the Internet and E-Commerce*. Amsterdam: Elsevier/JAI Press, 2002.

Michael R. Baye and Jon P. Nelson (eds.), *Advances in Applied Microeconomics: Advertising and Differentiated Products*. Amsterdam: Elsevier/JAI Press, 2001.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Industrial Organization*. Amsterdam: Elsevier/JAI Press, 2000.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Oligopoly*. Greenwich: JAI Press, 1999.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Contests*. Greenwich: JAI Press, 1998.

Michael R. Baye (ed.), *Advances in Applied Microeconomics: Auctions*. Greenwich: JAI Press, 1996.

Michael R. Baye and Dennis W. Jansen. *Money, Banking and Financial Markets: An Economic Approach*. Boston: Houghton-Mifflin, 1995.

Michael R. Baye and Dan A. Black, *Consumer Behavior, Cost-of-Living Measures, and the Income Tax*. New York: Springer-Verlag Lecture Notes in Economics and Mathematical Systems, 1986.

ARTICLES

- Michael R. Baye and John Morgan, "Price Dispersion in the Lab and on the Internet: Theory and Evidence," *Rand Journal of Economics*, forthcoming.
- Michael R. Baye and Heidrun H. Hoppe, "The Strategic Equivalence of Rent-Seeking, Innovation, and Patent-Race Games," *Games and Economic Behavior*, Vol. 44, 2003, pp. 217-226.
- Michael R. Baye, John Morgan, and Patrick Scholten, "Persistent Price Dispersion in Online Markets," in *The New Economy* (D. W. Jansen, Ed.), University of Chicago Press, forthcoming.
- Michael R. Baye, John Morgan, and Patrick Scholten, "The Value of Information in an Online Consumer Electronics Market," *Journal of Public Policy & Marketing*, Vol. 22 (1), Spring 2003, pp. 17-25.
- Michael R. Baye and John Morgan, "Information Gatekeepers and Price Discrimination on the Internet," *Economics Letters*, Vol. 76 (2002), pp. 47-51.
- Michael R. Baye and John Morgan, "Winner-Take-All Price Competition," *Economic Theory*, Vol 19 (2002), pp. 271-282.
- Michael R. Baye and John Morgan, "Information Gatekeepers on the Internet and the Competitiveness of Homogeneous Product Markets," *American Economic Review*, Vol. 91, No. 3 (June 2001), pp. 454-474.
- Michael R. Baye and John Morgan, "A Simple Model of Advertising and Subscription Fees," *Economics Letters*, Vol. 69, No. 3 (2000) pp. 345-351.
- Michael R. Baye and Onsong Shin, "Strategic Behavior in Contests: Comment," *American Economic Review*, Vol. 89, No. 3 (June 1999), pp. 691-693.
- Michael R. Baye and John Morgan, "A Folk Theorem for One-Shot Bertrand Games," *Economics Letters*, Vol. 65 (1999), pp. 59-65.
- Michael R. Baye and Shyh-Fang Ueng, "Commitment and Price Competition in a Differentiated-Product Duopoly," *Journal of Economics*, Vol. 69, No. 1 (1999), pp. 41-52.
- Michael R. Baye, Dan Kovenock, and Casper de Vries, "The Incidence of Overdissipation in Rent-Seeking Contests," *Public Choice*, Vol. 99, No. 3/4 (June 1999), pp. 439-454.

- Michael R. Baye, Robert Maness, and Steven N. Wiggins, "Demand Systems and the 'True' Cost of Living for Pharmaceuticals," *Applied Economics*, Vol. 29 (1997), pp. 1179-1189.
- Michael R. Baye and Dennis W. Jansen, "Repeated Games with Stochastic Discounting," *Economica*, Vol. 63 (1996), pp. 531-541.
- Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "The All-Pay Auction with Complete Information," *Economic Theory*, Vol. 8 (1996), pp. 291-305.
- Michael R. Baye, Keith Crocker, and Jiangdong Ju, "Divisionalization, Franchising, and Divestiture Incentives in Oligopoly," *American Economic Review*, Vol. 86 (March 1996), pp. 223-236.
- Michael R. Baye, Keith Crocker, and Jiangdong Ju, "Divisionalization and Franchising Incentives with Integral Competing Units," *Economics Letters*, Vol. 50, No. 3 (March 1996), pp. 429-436.
- Michael R. Baye, Dan Kovenock, and Casper de Vries, "The Solution to the Tullock Rent-Seeking Game when $R > 2$," *Public Choice*, Vol. 81 (1994), pp. 363-380.
- Michael R. Baye, Ann Gillette, and Casper de Vries, "Limit Orders, Asymmetric Information, and the Formation of Asset Prices With a Computerized Specialist," *Zeitschrift für Nationalökonomie/ Journal of Economics*, Vol. 59, No. 1 (1994), pp. 71-96.
- Michael R. Baye and Dan Kovenock, "How to Sell a Pickup Truck: Beat-or-Pay Advertisements as Facilitating Devices," *International Journal of Industrial Organization*, Vol. 12, No. 1 (1994), pp. 21-33.
- Michael R. Baye and Casper G. de Vries, "An Oligopoly Model of Free Banking: Theory and Tests," *De Economist*, Vol. 141, No. 4, (1993), pp. 497-514.
- Michael R. Baye, Guoqiang Tian, and Jianxin Zhou, "Characterizations of the Existence of Equilibria in Games with Discontinuous and Nonquasiconcave Payoffs," *Review of Economic Studies*, Vol. 60 (October 1993), pp. 935-948.
- Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "Rigging the Lobbying Process: An Application of the All-Pay Auction," *American Economic Review*, Vol. 86 (March 1993), pp. 289-294.
- Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "It Takes Two-to-Tango: Equilibria in a Model of Sales," *Games and Economic Behavior*, Vol. 4 (1992), pp. 493-510.
- Michael R. Baye, Dennis W. Jansen, and Jae-Woo Lee, "Advertising Effects in Complete Demand Systems," *Applied Economics*, Vol. 24 (1992), pp. 1087-1096.

- Michael R. Baye and Casper G. de Vries, "Mixed-Strategy Trade Equilibria," *Canadian Journal of Economics*, Vol. 25, No. 2 (May 1992), pp. 281-293.
- Michael R. Baye and Dennis W. Jansen, "Industry Performance Indices and the Economics of Information: New Perspectives and Caveats," *The Review of Industrial Economics*, Vol. 7, No. 1 (1992), pp. 83-90.
- Michael R. Baye, "Quotas as Commitment in Stackelberg Trade Equilibrium," *Jahrbucher für Nationalökonomie und Statistik*, Vol. 209 (1992), pp. 22-30.
- Michael R. Baye and Dan A. Black, "Income Taxation, Labor Supply, and the Theory of Income-Based Cost-of-Living Indices," *European Economic Review*, Vol. 36 (1992), pp. 83-100.
- Michael R. Baye, Mary E. Deily, and Dennis W. Jansen, "Marginal and Total Production Cost Indices: Theory and Applications," *Journal of Productivity Analysis*, Vol. 2 (1991), pp. 91-102.
- Michael R. Baye and Dan A. Black, "A Differential Measure of the Real Wage Index," *Economics Letters*, Vol. 36 (July 1991), pp. 295-298.
- Michael R. Baye and Thomas F. Cosimano, "Choosing Sides in Matching Games: Nash Equilibrium and Comparative Statics," *Economica*, Vol. 57 (August 1990), pp. 295-298.
- Bernard van Praag and Michael R. Baye, "The Poverty Concept when Prices are Income-Dependent," *Journal of Econometrics*, Vol. 43 (1990), pp. 153-166.
- Paul M. Anglin and Michael R. Baye, "Information Gathering and Cost of Living Differences Among Searchers," *Economics Letters*, Vol. 28 (1988), pp. 247-250.
- Michael R. Baye and Dan A. Black, "The Microeconomic Foundations of Measuring Bracket Creep and Other Tax Changes," *Economic Inquiry*, Vol. 25 (July 1988), pp. 471-484.
- Paul M. Anglin and Michael R. Baye, "Information, Multiprice Search, and Cost-of-Living Index Theory," *Journal of Political Economy*, Vol. 95 (December 1987), pp. 1179-1195.
- Michael R. Baye and Thomas F. Cosimano, "Erratic Monetary Policy and the Dispersion of Commodity Prices," *Journal of Macroeconomics*, Vol. 8 (Spring 1986), pp. 201-259.
- Michael R. Baye, "Population Intervals and the True Cost-of-living Index with Known Price Distributions," *Economics Letters*, Vol. 17 (1985), pp. 257-259.

- Michael R. Baye, "A Note on Price Stability and Consumers' Welfare," *Econometrica*, Vol. 53 (January 1985), pp. 213-217.
- Michael R. Baye, "Price Dispersion and Functional Price Indices," *Econometrica*, Vol. 53 (January 1985), pp. 217-223.
- Michael R. Baye and Darrell F. Parker, "Combining Ridge and Principal Component Regression: A Money Demand Illustration," *Communications in Statistics (Theory and Methods)*, Vol. 13 (1984), pp. 197-205.
- Michael R. Baye and Dan A. Black, "Indexation and the Inflation Tax," *Cato Policy Analysis*, Vol. 39 (July 1984), pp. 1-12.
- Michael R. Baye, "Optimal Adjustments to Restrictions on Advertising: Some Further Comments," *Journal of Industrial Economics*, Vol. 32 (December 1983), pp. 249-251.
- Michael R. Baye, "Optimal Adjustments to Changes in the Price of Advertising," *Journal of Industrial Economics*, Vol. 30 (September 1981), pp. 95-103.
- Michael R. Baye and Darrell F. Parker, "The Consumption Tax and Supply Side Economics: Some Short-Term Revenue Effects," *The Cato Journal*, Vol. 1 (Fall 1981), pp. 629-632.

RECENT WORKING PAPERS

- Michael R. Baye and John Morgan, "Promotion, Brand Awareness, and Price Competition in Large Online Markets."
- Michael R. Baye, John Morgan, and Patrick Scholten, "Price Dispersion in the Small and in the Large: Evidence from an Internet Price Comparison Site."
- Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "Comparative Analysis of Litigation Systems: An Auction Theoretic Approach."
- Maria Arbatskaya and Michael Baye, "Sticky Prices Online: Rate Rigidity and Asymmetric Responses to Cost Shocks in Online Mortgage Markets."
- Michael R. Baye, Dan Kovenock, and Casper G. de Vries, "A General Model of Contests and Auctions."
- Michael R. Baye, John Morgan, and Patrick Scholten, "Temporal Price Dispersion: Evidence from an Online Consumer Electronics Market"
- Michael R. Baye, Rupert Gatti, Paul Kattuman, and John Morgan, "Online Pricing and the Euro Changeover: Cross-Country Comparisons."

TEACHING EXPERIENCE

Courses Taught:

Undergraduate: Economics & Public Policy, Microeconomics, Industrial Organization, Managerial Economics, Principles of Economics, Global Strategy.

MBA: Managerial Economics and Strategy.

Ph.D.: Industrial Organization, Business Strategy, Microeconomic Theory

RECENT UNIVERSITY AWARDS

Outstanding Researcher, Kelley School of Business, 1999-2000

Teaching Excellence Award, Kelley School of Business, 1999-2000

Teaching Excellence Award, Kelley School of Business, 1998-1999

Teaching Excellence Recognition Award, Kelley School of Business, 1997-1998

NATIONAL GRANTS AND AWARDS

Listed in *Who's Who in America* (since 2003)

Listed in *Who's Who in Economics* (since 2002).

Fulbright Lecturer/Research Scholar Grant, Erasmus University, Rotterdam, The Netherlands, December 1985 - August 1986.

National Science Foundation Grant (SES-8410190), Adjusting Data for Distortions in the Measurement of the Cost of Living, October 1984 - March 1986.

EDITORIAL BOARDS AND SERVICE

Editor, *Advances in Applied Microeconomics* (1996 - present)

Editorial Board, *Journal of Economics & Governance* (1999 - present)

Editorial Board, *Journal of Public Policy & Marketing* (2001 - present)

Editorial Board, *Lecture Notes in Economics and Mathematical Systems* (1999 - 2002)

Referee for *American Economic Review*, *Econometrica*, *Rand Journal of Economics*, *Journal of Public Economics*, *Journal of Economic Theory*, *International Journal of Game Theory*, *Journal of Economics and Management Strategy*, *European Journal of Political Economy*, *Journal of Economic Behavior and Organization*, *International Economic Review*, *Journal of Econometrics*, *Annals of the Institute of Statistical Mathematics*, *Economic Inquiry*, *Economics Letters*, *Applied Economics*, *Economic Theory*, *Economica*, *Journal of Industrial Economics*, *Southern Journal of Economics*, *Economic Inquiry*, *International Journal of Industrial Organization*, *Journal of International Economics*, *Journal of Institutional and Theoretical Economics*, *Quarterly Journal of Business and Economics*, National Science Foundation

INVITED LECTURES

Harvard, Cambridge, Oxford, Bonn, Michigan, Cornell, Texas, North Carolina, Federal Trade Commission, U.S. Department of Justice, Florida, VPI, General Motors Research Laboratories, Georgetown, Bureau of Labor Statistics, Indiana, Iowa State, Katholieke Universiteit Leuven, Econometric Institute, Louis Pasteur University, Penn State, Free University of Amsterdam, Southern Methodist University, State University of New York at Buffalo, Syracuse, Tilburg, Netherlands Central Bureau of Statistics, Erasmus University Rotterdam, Texas A&M, University of Amsterdam, Illinois, Karlsruhe, Winthrop, Kentucky, Notre Dame, Western Ontario, West Virginia, Missouri, Wisconsin, Michigan State, University of British Columbia

SELECTED INTERNATIONAL MEETINGS

International Industrial Organization Conference, Boston, April 4-5, 2003. Paper Presented: "Promotion, Brand Awareness, and Price Competition in Large Online Markets."

The Frictionless Economy and the Internet, Erasmus University, Rotterdam, The Netherlands, June 1-2, 2001. Paper Presented: "Price Dispersion in the Small and Large: Evidence from an Internet Price Comparison Site."

World Congress of the Econometric Society, Seattle, Washington, August 2000. Paper presented: "Information Gatekeepers on the Internet and the Competitiveness of Homogeneous Product Markets."

Economic Theory Meetings, Rhodes, Greece, July 1-July 10, 1999. Paper presented: "Information Gatekeepers and the Competitiveness of Homogeneous Product Markets."

Econometric Society, Toulouse France, August 27-August 30, 1997. Paper presented: "Information Transmission, Information Acquisition, and Price Dispersion in 'Thin' Homogeneous Product Markets."

Tinbergen Institute Conference on Contests, Rotterdam, The Netherlands, August 22-23, 1997. Paper presented, "Fee Allocation of Lawyer Services in Litigation."

Econometric Society Summer Meetings, Pasadena California, June 26-June 29, 1997. Paper presented: "Necessary and Sufficient Conditions for Bertrand's Paradox."

American Economic Association Annual Meetings, San Francisco, CA, January 5-7 1996. Paper Discussed: "The Effects of Price Dispersion on Cost-of-Living Indices."

Econometric Society, Boston, MA, January 3-5, 1993. Paper presented: "The Solution to the Tullock Rent-Seeking Game when $R > 2$."

Econometric Society, Brussels, Belgium, August 24-28, 1992. Paper Presented: “Efficient Rent Seeking.”

World Congress of the Econometric Society, August 22-29, 1990, Barcelona, Spain. Paper presented: “The All-Pay Auction with Complete Information.”

Econometric Society, September 4-9, 1989, Munich, West Germany. Paper presented: “Asymmetric Information and the Formation of Asset Prices.”

European Economic Association, September 2-4, 1989, Augsburg, West Germany. Paper presented: “It Takes Two to Tango: Equilibria in a Model of Sales.”

European Economic Association, August 29-September 1, 1988, Bologna Italy. Paper presented: “Mixed-Strategy Trade Equilibria.”

European Economic Association, August 29-September 1, 1988, Bologna Italy. Paper presented: “The Poverty Concept when Prices are Income-Dependent.”

American Economic Association, December 28-30, 1987, Chicago. Paper presented: “Stochastic Bertrand Trade Equilibria.”

Econometric Society, December 28-30, 1986, New Orleans. Paper presented: “Search and Matching Equilibria When the Side of the Match is Endogenous.”

Canadian Economic Association, May 26-30, 1985, Montreal. Paper presented: “Multiprice Search and the Cost of Living.”

Econometric Society, December 28-30, 1982, New York. Paper presented: “A Stochastic Price Index.”

Joint Council on Economic Education, June 20-25, 1982, Harvard University, Boston.

SELECTED CONSULTING CLIENTS

California Franchise Tax Board
Canadian Department of Justice – Competition Law Division
Connecticut Attorney General’s Office
U. S. Department of Justice – Antitrust Division
U. S. Department of Justice – Tax Division
Shell Oil Company
The Kroger Company