UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION
OFFICE OF ADMINISTRATIVE LAW JUDGES

In the Matter of	**PUBLIC RECORD**
McWANE, INC., **Respondent.**	DOCKET NO. 9351

COMPLAINT COUNSEL'S MOTION FOR *IN CAMERA* TREATMENT OF PORTIONS OF DR. LAURENCE SCHUMANN'S EXPERT REPORTS AND DEMONSTRATIVE EXHIBITS

Complaint Counsel respectfully move the Court for an order extending *in camera* protection for designated portions of the Expert Report of Dr. Laurence Schumann, the Rebuttal Expert Report of Dr. Schumann, and certain demonstrative exhibits relating to Dr. Schumann's rebuttal testimony. Attachment A contains the *in camera* version of Dr. Schumann's Expert Report (CX 2260), and Attachment B contains the *in camera* version of Dr. Schumann's Rebuttal Expert Report (CX 2265), with the confidential materials in brackets and, where possible, highlighted.[1] Attachment C contains the *in camera* version of Dr. Schumann's Rebuttal Testimony Demonstrative Exhibit (CXD 3085) with the confidential materials in braces and bold font. In accordance with Rule 3.45(e) (16 C.F. R. § 3.45(e)), Complaint Counsel files this complete version marked *In Camera* and will concurrently file an redacted version marked Public Record.[2]

[1] We are unable to mark confidential materials in the two reports in bold font, as specified by paragraph 6 of the Scheduling Order, without changing the pagination of the reports and causing confusion in the references to the reports in the trial transcripts.

[2] The Public Record versions will be identified as CX 2260-A (Dr. Schumann's Expert Report), CX 2265-A (Dr. Schumann's Rebuttal Expert Report), and CXD 3085-A (Dr. Schumann's Rebuttal Testimony Exhibit).

Complaint Counsel seeks this protection because the reports and the demonstrative contain citations or specific references to material that the Court already granted *in camera* protection in its Order on Respondent's Motion for *In Camera* Treatment, dated August 17, 2012, or its Order on Non-Parties Motions for *In Camera* Treatment, dated August 17, 2012.

Evidence or testimony is worthy of *in camera* treatment if "its public disclosure will likely result in a clearly defined, serious injury" to party or third party whose documents or testimony is involved. 16 C.F.R. § 3.45(b). Applicants must show that the information is sufficiently secret and sufficiently material to their business that disclosure would result in serious competitive injury. *In re General Foods Corp.*, 95 F.T.C. 352, 355 (1980). In its August 17, 2012, Orders, the Court found that certain materials designated by the Respondent or the third parties met these standards. Based on the Court's findings in its August 17, 2012, Orders, the same materials in Dr. Schuman's reports and his demonstrative exhibits warrant the same protection.

Consistent with the Court's August 17, 2012, Orders, which specified that both Respondent's and the third parties' confidential materials should be given uniform *in camera* treatment for five years, we respectfully suggest that the unredacted versions of Dr. Schumann's Expert Report (CX 2260) and Rebuttal Expert Report (CX 2265) and the Rebuttal Testimony Demonstrative Exhibit (CXD 3085) also be given *in camera* treatment until September 1, 2017.

A proposed order is attached.

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A proposed order is attached.

Dated: October 24, 2012

Respectfully submitted,

s/ Edward Hassi
Edward Hassi, Esq.
Linda Holleran, Esq.
Thomas H. Brock, Esq.
Michael J. Bloom, Esq.
Jeanine K. Balbach, Esq.
J. Alexander Ansaldo, Esq.
Andrew K. Mann, Esq.
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UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION
OFFICE OF ADMINISTRATIVE LAW JUDGES

In the Matter of	)	
	)	DOCKET NO. 9351
McWANE, INC.,	)	
Respondent.	)	
	)	

PROPOSED ORDER ON MOTION FOR *IN CAMERA* TREATMENT OF EXPERT MATERIALS OF DR. LAURENCE SCHUMANN

In consideration of the unopposed motion of Complaint Counsel for *in camera* treatment of designated portions of Dr. Laurence Schumann's Expert Report (CX 2260), Dr. Schumann's Expert Rebuttal Report (CX 2265), and Dr. Schumann's Expert Rebuttal Testimony Demonstrative Exhibit (CXD 3085), it is hereby

ORDERED, that *in camera* treatment, for a period of five years, to expire on September 1, 2017, is GRANTED for the confidential portions of Complaint Counsel's Expert Report of Dr. Laurence Schumann, dated June 15, 2012 (CX 2260); the confidential portions of the Rebuttal Expert Report of Dr. Laurence Schumann, dated July 12, 2012 (CX 2265); and Rebuttal Testimony Exhibit (CXD 3085).

ORDERED:

_____
D. Michael Chappell
Chief Administrative Law Judge

Date:

UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION
OFFICE OF ADMINISTRATIVE LAW JUDGES

In the Matter of	)	
	)	DOCKET NO. 9351
McWANE, INC.,	)	
Respondent.	)	
	)	

STATEMENT REGARDING MEET AND CONFER

Pursuant to Paragraph 4 of the Scheduling Order, Complaint Counsel and Counsel for Respondent McWane, Inc. met and conferred in good faith regarding the issues raised in this motion. Complaint Counsel have been authorized to state that Respondent does not oppose this motion.

Dated: October 24, 2012

Respectfully submitted,

_s/ Edward Hassi
Edward Hassi, Esq.
Linda Holleran, Esq.
Thomas H. Brock, Esq.
Michael J. Bloom, Esq.
Jeanine K. Balbach, Esq.
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CERTIFICATE OF SERVICE

I hereby certify that on October 24, 2012, I filed the foregoing document electronically using the FTC's E-Filing System, which will send notification of such filing to:

Donald S. Clark
Secretary
Federal Trade Commission
600 Pennsylvania Ave., NW
Washington, DC 20580

I also certify that I delivered via electronic mail and hand delivery a copy of the foregoing document to:

The Honorable D. Michael Chappell
Administrative Law Judge
Federal Trade Commission
600 Pennsylvania Ave., NW, Rm. H-110
Washington, DC 20580

I further certify that I delivered via electronic mail a copy of the foregoing document to:

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Counsel for Respondent McWane, Inc.

CERTIFICATE FOR ELECTRONIC FILING

I certify that the electronic copy sent to the Secretary of the Commission is a true and correct copy of the paper original and that I possess a paper original of the signed document that is available for review by the parties and the adjudicator.

October 24, 2012

By: s/ Thomas H. Brock
Attorney

ATTACHMENT A

UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION

In the Matter of	)	
	)	
McWANE, INC.,	)	
	)	
a corporation,	)	**DOCKET NO. 9351**
	)	
Respondent.	)	
	)	

EXPERT REPORT OF LAURENCE SCHUMANN, PH.D.

Expert Report of Laurence Schumann, Ph.D.

Table of Contents

Expert Report of Laurence Schumann

I. Introduction

A. Qualifications

1. I am an economist on the staff of the Federal Trade Commission ("FTC"). In 1986, I earned a Ph.D. in economics from the University of Virginia, where I had earned a B.A. in economics in 1980. My field of specialization is the economics of industrial organization, and throughout my career I have applied industrial organization economics to issues of competition and regulatory analysis.

2. I first joined the staff of the FTC in September 1985. In March 1996, I left the FTC to become a private economic consultant. I rejoined the staff of the FTC in March 2008. During the spring of 1990, I returned to the University of Virginia to teach a course covering the law and economics of antitrust. More recently, I have lectured on the economics of antitrust at international technical assistance workshops and conferences sponsored jointly by the FTC, the U.S. Agency for International Development, and, in certain cases, additional organizations devoted to international economic development.[1] I have authored or coauthored a number of articles that have been published in peer-reviewed journals, and I have previously provided expert economic testimony in Federal District Court and in private arbitration proceedings. A more extensive summary of my professional accomplishments can be found in my *curriculum vitae*, a copy of which is attached as Appendix A to this report.

3. My testimony in this matter reflects my own independent analysis and opinions. As a testifying expert economist retained by the FTC staff, I receive no compensation besides

[1] The FTC's international technical assistance program provides training in antitrust policy, economics, and investigational methods to the staffs of competition enforcement agencies in countries with underdeveloped or transitional economies.

that which I otherwise receive as a government employee. Further, I have reached the highest step of the highest pay grade for which I am eligible as a career federal employee. I cannot receive a promotion or any other increase in compensation in exchange for my testimony or for any particular opinion expressed in my testimony.

B. Background

4. This matter concerns certain business practices and conduct of the sellers of ductile iron pipe fittings ("Fittings") in the United States. Ductile iron is a strong yet highly flexible and elastic form of cast iron in which graphite nodules in the iron take on a spherical shape, unlike the flakes of graphite found in gray iron, the most common form of cast iron. Ductile iron is formed by adding magnesium to the iron, which causes the graphite in the iron to form the spherical nodules that provide ductile iron with its unique properties.[2] Ductile iron is used in the manufacture of pipes, fittings, and related products used in waterworks, principally for the construction and repair of clean water and sewage treatment and transportation systems.

5. Three companies – McWane, Inc. ("McWane"), Sigma Corporation ("Sigma"), and Star Pipe Products, Ltd. ("Star") – supply over 90 percent of the Fittings sold in the U.S.[3] Each serves waterworks customers and their contractors through distributors, which account for roughly 95% of their Fittings sales.[4]

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[2] QIT-Fer et Titane Inc, *Ductile Iron Data for Design Engineers*, Revised and Reprinted (Montreal: Rio Tinto Iron & Titanium, Inc., 1998), pp. 2-9 – 2-11 (available from metalwebnews.org/ftp/didata.pdf and The Ductile Iron Society (http://www.ductile.org/didata/default.htm)). Also see Ductile Iron Pipe Research Association, www.dipra.org, "About Ductile Iron Pipe," http://www.dipra.org/benefits-of-dip/benefits-of-di-pipes/.

[3] SIG – 0002517 – 2528, p. 2520 ("In fittings there are effectively 3 – McWane, Sigma, and Star . . . ."). Also see TU-FTC-0010086 – 10089, p. 10087, "2009 Narrative for Long Range Plan;" TU-FTC-0010434 – 10489, p. 10436, "2009 Budget Waterworks Division, Tyler/Union, Rick Tatman;"

[4] McWane, Sigma, and Star formed the Ductile Iron Fittings Association (DIFRA), the bylaws of which require that "At least ninety-five percent of [a member's] sales of ductile iron fittings must be to a distributor." (SIG-0033693-712, p. 702.)

6. McWane operates or has operated a number of subsidiaries that manufacture (or have manufactured) Fittings in the U.S. Its primary Fittings business unit is Tyler Union, which, until relatively recently was two separate business units that McWane had acquired, the Tyler Pipe Company and the Union Foundry Company. Tyler Xian Xian is a McWane business unit that manufactures Fittings in China, and Clow Water Systems is a McWane unit that sells ductile iron pipe and fittings. To avoid confusion, I will refer to all of McWane's Fittings businesses collectively as McWane.

7. McWane manufactures Fittings in the U.S. and China. Star and Sigma have traditionally been importers of Fittings from [5]

8. After several years of discussions, McWane, Sigma, and Star formed a trade association, the Ductile Iron Fittings Research Association ("DIFRA") in 2007.[6] They were joined by U.S. Pipe, a ductile iron pipe manufacturer that no longer manufactured (and still does not manufacture) Fittings.[7] The primary activity of DIFRA was the collection of data on the tons of Fittings shipped monthly by its members and the dissemination of monthly reports containing the aggregated shipments data (the "DIFRA Reports") to its members.

9. In June of 2008, DIFRA first obtained Fittings shipments data from all of its members. The first submission to DIFRA consisted of total 2006 Fittings shipments and monthly Fittings shipments for all of 2007 and through April of 2008.[8] The monthly DIFRA

[5] In addition to China, India, and Mexico, Star imports Fittings from Brazil and Korea (McCutcheon Deposition, May 16, 2012, pp. 9 – 10).

[6] SIG-0033727 – 33731. Pages 33728 – 33731 consist of DIFRA's Articles of Incorporation. DIFRA was incorporated January 12, 2007, but did not begin operating until early 2008.

[7] U.S. Pipe resold fittings with its pipes that were manufactured by others, primarily Sigma, but also McWane, Star, and other small foundries. In our calculations of total shipments and market shares, shipments by U.S. Pipe of Fittings that they had purchased from McWane, Sigma, and Star were not included to avoid double counting because they were included in McWane, Sigma, and Star shipments.

[8] DIFRA-000497 – 000508. The shipments data collected by DIFRA consisted of shipments in tons.

Reports would allow McWane, Sigma, and Star to determine the monthly changes in their respective market share as well as the combined market share of the two other Fittings suppliers. Accordingly, during periods in which Fittings volume was falling, the Fittings data would allow each supplier to obtain some indication of whether its shipment volume was falling because of decreased demand, which would be indicated by a stable market share, or if its volume was falling because its rivals were cutting prices, which would be indicated by a declining market share.

10. DIFRA continued collecting monthly data and disseminating monthly Reports through the January 15, 2009 DIFRA Report, which provided the aggregated shipments data through December 2008.[9] Thereafter, Sigma and Star declined to provide further shipments data to DIFRA,[10] and DIFRA ceased operating.[11]

11. On February 17, 2009, President Obama signed the American Recovery and Reinvestment Act of 2009 ("ARRA").[12] The ARRA allocated multiple billions of dollars for waterworks projects,[13] but those projects were nearly always limited to the use of only American made iron and steel products.[14] Before passage of the ARRA, 15 – 20 percent of the Fittings sold in the United States were for projects specifying domestic-only Fittings.[15]

[9] SRHW-00007 – 00020, p. 00008.

[10] In May 2009, Sigma again provided its data to DIFRA in a failed effort to reinvigorate it.

[11]

[12] Pub. L. No. 111-5.

[13] See H.R. 1, American Recovery and Reinvestment Act of 2009 (ARRA), §3; Division A.

[14] Section IV below contains more details of the ARRA.

[15] According to McWane, "Adjusting for that tonnage shows that the actual volume of domestic fittings sold to jobs that (at least at the time of that bid) preferred domestic fittings was roughly 20% of the total fittings sold in the U.S. during the 2007-09 period, and only slightly higher in 2010." Memorandum of McWane, Inc. Responding to Commission Staff Questions Regarding the Competitiveness of the Ductile Iron Waterworks Fittings Market in the United States, May 10, 2011, p. 12. Mr. Tatman testified that before the ARRA, sales of Fittings for

12. In reaction to the ARRA, Star announced in June 2009 that it was introducing a line of "Made in America" Fittings. McWane then implemented a program with the intent to block or delay Star's entry.[16] On September 22, 2009, McWane announced in a letter to distributors that it was adopting "a program whereby our [i.e., McWane's] domestic fittings and accessories will be available to customers who elect to *fully support* McWane branded products for their domestic fitting and accessory requirements."[17] By "fully supporting" McWane's domestic Fittings, distributors were expected to purchase all of their domestic Fittings from McWane.[18] Distributors that elected to not support this program faced the potential of the loss of rebates and access to McWane domestic fittings and accessories.

13. Sigma too concluded following the enactment of ARRA that it had to be in the business of selling Made-in-America Fittings.[19] Although McWane had initially rejected Sigma's request to supply its domestic Fittings,[20] in September 2009, McWane agreed to sell domestic fittings to Sigma pursuant to a Master Distribution Agreement ("MDA"). Although McWane offered a 20 percent discount to Sigma under the MDA, this discount only offered Sigma a very small, but at least nonnegative, gross margin. Sigma was not happy with this as

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projects specifying domestic-only Fittings had been 15 – 18 percent. See Tatman IH, July, 21, 2010, pp. 47 – 48, 50, 54, 65, and elsewhere; McWane-007526, slide 11.

[16]

[17] TU-FTC-0010345. Emphasis added.

[18] McWane informed distributors that it viewed purchases of McWane-branded domestic Fittings from Sigma to also reflect support for McWane's domestic Fittings. Consequently, distributors that purchased all of the domestic Fittings either directly from McWane or indirectly through Sigma's sales of McWane-branded domestic Fittings (or both) were considered by McWane to be "fully supporting" its domestic Fittings.

[19] Rona Deposition, May 18, 2012, pp. 219-221; Pais Deposition, May 31, 2012, pp. 345-349.

[20] McWane had offered to sell domestic Fittings to Sigma at a 5 percent discount off of its own prices. (SIG-0001557-1559) However, this discount was so small that Sigma would have lost money on every domestic Fittings sale that it made. Later analysis by McWane indicated that a discount to Sigma 4 times higher than its original 5 percent offer would still result in Sigma's *gross margin* being only 5.7 percent, suggesting that, at best, Sigma might barely break even with respect to its operating income. (TU-FTC-0031557) McWane's original offer to Sigma of a 5 percent discount was not taken seriously by Sigma's management. (SIG-0001557-1559)

well as other terms that McWane required the MDA to include, but Sigma concluded that working with McWane through the MDA was, at least in the near term, a preferred alternative to manufacturing its own domestic Fittings, and was "likely to have the intended effect of marginalizing Star whose ability to deliver jobs will be highly suspect, at least over the next 12 months or so."[21]

C. Assignment

14. I have been asked by the staff of the FTC's Bureau of Competition to perform an economic analysis and provide opinions on the competitive effects of certain actions performed by McWane, Sigma, and Star. In particular, I have been asked to analyze the competitive implications of:

A. The communications among McWane, Sigma, and Star in 2008;

B. The formation of DIFRA and the exchange of aggregate tons shipped data by McWane, Sigma, and Star;

C. McWane's imposition of its "full support program" on distributors of domestically manufactured Fittings; and

D. The MDA.

15. In performing my analysis, I have reviewed business documents provided by McWane, Sigma, Star, and third-parties, including DIFRA, other suppliers of pipe and Fittings, waterworks distributors, and foundries. I have also reviewed Investigational Hearings and depositions of McWane, Sigma, and Star executives, and executives of third-party pipe and fitting suppliers, waterworks distributors, and foundries. I have reviewed the complaints issued by the FTC and the consents agreed to by Sigma and Star. I have also reviewed presentations

[21] SIG-0005011 – 5019, p 5013. The last paragraph on page 5012 discusses the difficulties, risks, and costs of entry, which led Sigma to prefer the alternative MDA despite viewing it as "not entirely to our liking" and "comes with a few other restrictions . . . ."

and white papers submitted by the parties to the Bureau of Competition's staff and management and the pleadings submitted in this litigation. I have interviewed executives from a major waterworks distributor, an independent foundry, and Star. I have read or reviewed relevant economics literature, and I have read or reviewed various books on water distribution systems, water and wastewater engineering, and ductile iron pipe and fittings. Appendix B at the end of my report provides a list of all of the materials that I considered when performing my economic analysis and reaching my opinions.

16. I am continuing to examine material obtained through discovery in this proceeding. Depositions were still being taken as late as June 5 and one or more of the parties to events charged in the Commission's Complaint even now appear to be still producing documents in response to subpoenas. Based on this material, and on any new information relevant to this litigation that comes to my attention subsequent to the filing of this report, I reserve the right to revise or augment my analyses and opinions as I find appropriate.

D. Summary of My Opinions

17. Based on the materials that I have reviewed and the economic analysis presented in this report, I have formed the following opinions:

(a) Sigma, Star and McWane communicated with one another by a variety of methods for the purpose of "stabilizing" falling prices and raising prices to higher levels. During certain periods of time, Fittings prices increased as a result of this communication.

(b) Sigma, Star, and McWane established DIFRA, the Fittings trade association, for the express purpose of fostering coordination and collusion through the exchange of competitively sensitive information. Participation in the DIFRA information

exchange, along with certain communications among the companies, directly resulted in a price-fixing accord.

(c) McWane exercised monopoly power to impose a restrictive dealing, "full support" policy for the purpose of preventing or delaying Star's efficient entry into the domestically manufactured Fittings market. By impeding Star's access to distribution, McWane erected a significant antitrust barrier to entry. As a result, McWane maintained its monopoly power by preventing the degree of competition between McWane and Star that otherwise would have occurred. McWane's exercise of monopoly power caused customers to endure periods in which prices were higher than they otherwise would have been and reduced consumer welfare.

(d) McWane offered Sigma the MDA to avoid the prospect of Sigma's entry into the domestic production of Fittings. If Sigma, like Star, would have entered into the domestic production of Fittings had McWane not agreed to the MDA, or to terms acceptable to Sigma, the MDA eliminated competition between McWane and Sigma that would have acted to lower prices and enhance consumer welfare.

II. The Fittings Markets

18. McWane sells Fittings manufactured in the United States and China to wholesale waterworks distributors throughout the United States.

[2] Since 2009, Star has been selling small quantities of Fittings that it manufactures in the United States through agreements with independent foundries.[23] Before the fourth quarter of 2009, McWane was the sole manufacturer of Fittings of 24 inches or less in the United States.[24]

19. The competitive analysis of a firm's conduct is undertaken within the context of a relevant antitrust market. A relevant antitrust market has two dimensions, a relevant product and a relevant geographic market. The relevant product market reflects consumers' ability and willingness to substitute away from one product to another. The relevant geographic market reflects consumers' ability and willingness to substitute the purchase of the product away from one sourcing area to another. As discussed below, my economic analysis concerns two relevant product markets. The first relevant product market consists of Fittings sold for use without regard to country of origin. The second relevant product market consists of Fittings sold for use when American manufacture is required. That market is relevant for review because a

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[22] Star has imports Fittings from Brazil and Korea. (McCutcheon Deposition, May 16, 2012, pp. 9 – 10).

[23] Q011SP0000282 – 0000285,

[24] See Respondent McWane's Objections and Responses to Complaint Counsel's Requests for Admissions (June 8, 2012) at ¶ 12, p. 10. ACIPCO had been a manufacturer of Fittings (that is, narrow and medium-wide Fittings), but exited in 1995 (narrow) and 2006 (medium). Burns Deposition, May 17, 2012, p. 26. Since that time, it has manufactured only wide-width Fittings of 30 inches or more. Ibid. U.S. Pipe also was once a manufacturer of Fittings, but it exited in 2006 when it closed its Chattanooga facility. Morton Deposition, May 30, 2012**,** p. 10. U.S. Pipe no longer produces any Fittings. Ibid. Griffin Pipe Products also exited the production of MA Fittings. Kuhrts Deposition, May 24, 2012, pp. 11-13.

hypothetical monopolist can target this subset of Fittings customers for discriminatorily high prices. In all events, the relevant geographic is national.

A. Relevant Product Markets

20. A relevant product market consists of a set of close substitute goods or services such that a hypothetical monopolist would need to own all of them to implement profitably a "small but significant and nontransitory increase in price" ("SSNIP"). If a sufficient number of customers would turn to another close substitute product not owned by the hypothetical monopolist and defeat the hypothetical monopolist's attempt to impose a SSNIP, then that additional close substitute would be added to the market. Having added that close substitute to the market, we would repeat the exercise to see if still another close substitute could defeat the hypothetical monopolist's attempt to impose a SSNIP. When no additional product exists that consumers could turn to defeat a SSNIP, then all of the substitute products hypothetically owned by our hypothetical monopolist would compose the set of products that define the relevant product market.[25]

The Fittings Market[26]

21. Ductile iron is a type of cast iron primarily used to transport drinking water and sewage under high pressure conditions in municipal distribution systems and treatment plants. Fittings are attached to the ends of pipes for a variety of reasons. These include changing flow direction, connecting pipes of different sizes, merging two pipelines to one or branching-off one

[25] For discussions of the hypothetical monopolist test applied in the case of mergers, see U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010, Section 4 "Market Definition," pp. 7 – 14. One might wish to also review the Federal Trade Commission & U.S. Department of Justice, *Horizontal Merger Guidelines*, Issued April 2, 1992 & Revised April 8, 1997, pp. 4 – 10.

[26] Unless otherwise noted, the "Fittings market" consists of Fittings sold without regard to country of origin.

pipeline to two, and attaching, plugging, or capping pipes, valves, fire hydrants, or water meters.[27]

22. In high-pressure waterworks applications, Fittings are not only used with ductile iron pipes, but also with polyvinyl chloride ("PVC") pipe and high-density polyethylene ("HDPE") pipe, two types of plastic pipe.[28] PVC and HDPE fittings, however, are not used with ductile iron pipe in similar high-pressure waterworks applications.[29]

23. Because Fittings are nearly always used with PVC or HDPE pipe in high-pressure waterworks applications, and Fittings are always used with ductile iron pipe[30] in high-pressure waterworks applications, neither PVC fittings nor HDPE fittings (or fittings of any other material) constrain Fittings prices.[31] Because no substitute for Fittings exists for use in high-pressure waterworks applications at any price within any relevant range, the appropriate product market definitions in this case are limited to Fittings.

[27] See "Memorandum of McWane, Inc. Responding to Commission Staff Questions Regarding the Competitiveness of the Ductile Iron Waterworks Fittings Market in the United States," May 10, 2011 (White Paper submitted to the FTC Staff), p. 5.

[28] Davis, Mackenzie L., *Water and Wastewater Engineering: Design Principles and Practice*. New York: McGraw-Hill, 2010: pp. 17-11 – 17-12. HD Supply interview, April 12, 1012. Keep in mind that "Fittings" refers strictly to ductile iron pipe fittings. Ductile iron pipe fittings are used with PVC and HDPE pipe in high-pressure waterworks applications, not PVC or HDPE pipe fittings (although these fittings may be used with PVC or HDPE pipe for other applications within a waterworks system or plant).

[29] Davis, *Water and Wastewater Engineering*, p. 17-11, and HD Supply Interview, April 12, 2012.

[30] Tatman IH, July 21, 2010, pp. 28-30.

[31] HD Supply interview, April 12, 2012; Sheley Deposition, April 24, 2012, p. 65; Webb Deposition, May 30, 2012, pp. 63-64.

Common Types of Pipe Fittings

24. Fittings are produced in a wide range of shapes and diameters, which reflect the wide range of applications (paragraph 21) and the wide range of pipe diameters. The diameter of the pipe used in a waterworks project (or a section of a waterworks project) depends on issues related to pipeline design, engineering, and applications.[32] A fitting must have a diameter appropriate for the pipe to which it is to be attached, and a shape or design appropriate for its intended function (for example, changing the direction of the pipeline's flow by 90 degrees). For example, if a 90 degree bend is specified because a plant design requires that at a specific point the flow of water must be redirected by 90 degrees, a contractor or distributor cannot substitute a 22.5 degree bend or a straight reducer (which connects two pipes with different diameters).

25. Accordingly, based on this "demand side" analysis, one could view Fittings of different sizes and types as being in different product markets. Thus, I could separately analyze

[32] Davis, *Waste and Wastewater Engineering*, "Pipe Network Design," pp. 17-10 – 17-22.

the impact of McWane's conduct on each type of Fittings of 24 inch diameter and less, the sizes and types of Fittings that I conclude are implicated by the collusive and monopolistic conduct alleged in the Complaint.

26. In this instance, however, it is neither necessary nor desirable to analyze the competitive effects of the allegedly anticompetitive conduct at issue here for each of these markets. Doing so would be an extended redundant exercise that would provide no more useful information about the competitive implications of the conduct than an analysis of the collection of Fittings having a diameter of 24" and less. For example, if we analyze the competitive effects of McWane's, Sigma's, and Star's business practices with respect to a 4-inch, 90-degree bend, mechanical joint compact Fitting and perform the same analysis for 14-inch, push-on tee compact Fittings, the two analyses are essentially the same. For both products, the factors relevant for a competitive analysis are essentially identical. The primary suppliers, McWane, Sigma, and Star are the same; the customers, primarily waterworks products distributors, are the same; the materials and other inputs required to manufacture the products are the same;[33] and the competitive effects of the allegedly anticompetitive practices will be the same.

27. Accordingly, the competitive analysis of the business practices at issue in this matter will be identical for each size and shape of fitting of 24 inches or less. Thus, rather than redundantly performing the same analysis and finding the same competitive results for each fitting of a specific diameter and shape, I analyze Fittings with a diameter of 24 inches or less as if they were part of a single product market.

[33] They will both require identical inputs such as scrap iron, magnesium, and so forth. They both also require patterns, but the individually sized and shaped products will require individually sized and shaped patterns. This, however, is not relevant to an economic analysis of the allegedly anticompetitive conduct. The patterns can be supplied by the same suppliers and manufactured with the same materials.

28. I do not include fittings with diameters of more than 24 inches ("large Fittings") in the relevant product market for two reasons. First, as I have noted, I conclude that large diameter Fittings are not implicated by McWane's, Sigma's, and Star's conduct. Second, the competitive analysis of large diameter Fittings necessarily differs from that of small- and medium-diameter Fittings. American Cast Iron Pipe Company ("ACIPCO"), a significant producer of ductile iron pipe that also produces large diameter Fittings, is not a producer of Fittings of 24 inches and smaller diameter, nor does ACIPCO have any interest in extending its product scope to include small and medium diameter Fittings.[34]

29. Finally, I note that producers tend to recognize the validity of grouping Fittings into size ranges for the purpose of their own planning and budget analyses.

[35] In addition, when McWane, Sigma, and Star set up DIFRA's information exchange, they determined that shipments information could be usefully aggregated in small, medium, and large diameter categories, with small and medium Fittings being Fittings of 24 inches in diameter and below and large being Fittings of 30 inches and above.[36] Thus, grouping Fittings with different sizes and shapes into distinct size categories is consistent with industry practice. Therefore, for the purpose of my analysis, I group all fittings of 24 inches in diameter and less as a single relevant market as I have explained.

[34] Burns Deposition, May 17, 2012, p. 71. (Jerry Burns is the Division Sales Manager for the ductile iron pipe division of ACIPCO.)

[35]

[36] They further divided each size category into "flanged" and "all other"; however, for the purpose of my economic analysis, differentiating flanged fittings from all other fittings would again add redundancy, diminish the expositional efficiency and clarity, but provide no benefit to the analysis.

30. In all events, I wish to emphasize that combining Fittings of 24 inches and less into a single market does not affect the economic analysis of the conduct at issue in this matter. The identical results would be reached if I separately analyzed each size and shape of Fittings — just many, many times over. Accordingly, hereafter the references to Fittings or the Fittings market will denote ductile iron pipe fittings with diameters of 24 inches or less.

Made-In-America Fittings

31. Domestically manufactured Fittings and imported Fittings are virtually identical in all respects. Both are manufactured with the same materials to meet the same ANSI/AWWA standards.[37] Accordingly, except for those projects in which only domestically manufactured Fittings can meet the specifications, domestically manufactured Fittings and imported Fittings are near perfect substitutes. Indeed, McWane sells blended Fittings consisting of bundles of both domestic and imported Fittings that are priced to compete with the imported fittings of its rivals.[38]

32. Before 2009, 15 to 20 percent of Fittings were sold for use in waterworks projects specifying that the Fittings be made in America.[39] For some municipalities, regional or state authorities, or private businesses, requiring that a waterworks project include the specification of Made-In-America ("MA") Fittings reflects a matter of strong preference and policy. For other municipalities or state agencies, the specification of MA Fittings was (and, in certain states still is) a matter of law. For example, since 1978, in the Commonwealth of Pennsylvania, only iron

[37] ANSI refers to the American National Standards Institute, a private non-profit organization that oversees and accredits standards developed standard-developing industry organizations, government agencies, consumer groups, and others. AWWA refers to the American Water Works Association, "an international nonprofit educational association dedicated to safe water." According to the AWWA, " AWWA Standards Committees have developed more than 160 Standards that provide industry-approved technical guidance for 24 categories of products and processes in municipal water supply." See www.awwa.org and follow its links to information posted under "About AWWA" and "About AWWA Standards" (under "Professional and Technical Resources").

[38] Tatman Deposition, May 10, 2012, pp. 46-47.

[39] See footnote 155.

and steel products made in America can be used in all construction, repair, and maintenance contracts let by public bodies, including the Commonwealth, its political subdivisions, and authorities.[40]

33. The specification of MA Fittings creates a second market, based on price discrimination concerns. For most high-pressure waterworks applications, Fittings manufactured in the United States or abroad compete in the same relevant Fittings product market. McWane sells domestically produced product into this market at prices set by the import product. However, Fittings manufactured abroad cannot substitute for Fittings manufactured domestically whenever MA Fittings is specified. Accordingly, I conclude that two distinct markets are relevant in this matter: a Fittings market consisting of both domestic and imported Fittings and a MA Fittings market consisting of Fittings sold for use in projects in which MA Fittings are specified.[41]

B. Geographic Market

34. The relevant geographic market is defined in a manner analogous to the definition of product market. When defining the relevant geographic market for cases in which suppliers deliver their products or services to customers' locations, one starts with a hypothetical firm that is a monopolist seller of the relevant product in a particular location. If the hypothetical monopolist were to impose a SSNIP on the product and a sufficient number of customers would respond by purchasing the product from another location and, as a result, defeat the SSNIP, then

[40] The Pennsylvania Steel Products Procurement Act, 73 Pa. Stat. §§ 1881-1887. The definition of "steel products" includes cast iron products. When required by law, such as in Pennsylvania or under the ARRA, public waterworks projects will require MA Fittings under virtually all circumstances. Nonetheless, in certain cases, some negotiations over the extent of a MA Fittings specification may occur.

[41] When MA Fittings are specified because of a preference, rather than law, it is possible that, should the price of MA fittings be sufficiently high, Sigma or Star may convince those responsible for the specification to change it and allow imported fittings. Nonetheless, those water utilities that are bound by law to use MA Fittings establish a distinct discrimination market.

this other substitute location should be added to relevant geographic market. Next we consider whether our hypothetical monopolist seller in these two locations could profitably impose a SSNIP, or whether a sufficient number of customers would purchase the product from another substitute location and defeat the SSNIP. When customers can no longer turn to a substitute location to defeat a SSNIP, then the relevant geographic market is the region composed of all the locations in which our hypothetical firm is a monopolist seller of the product.

35. Because Fittings suppliers ship their products nationally from multiple locations, a local distributor can substitute the Fittings of one manufacturer for those of another from virtually any locality in the country. Accordingly, the relevant geographic market is national in scope.[42]

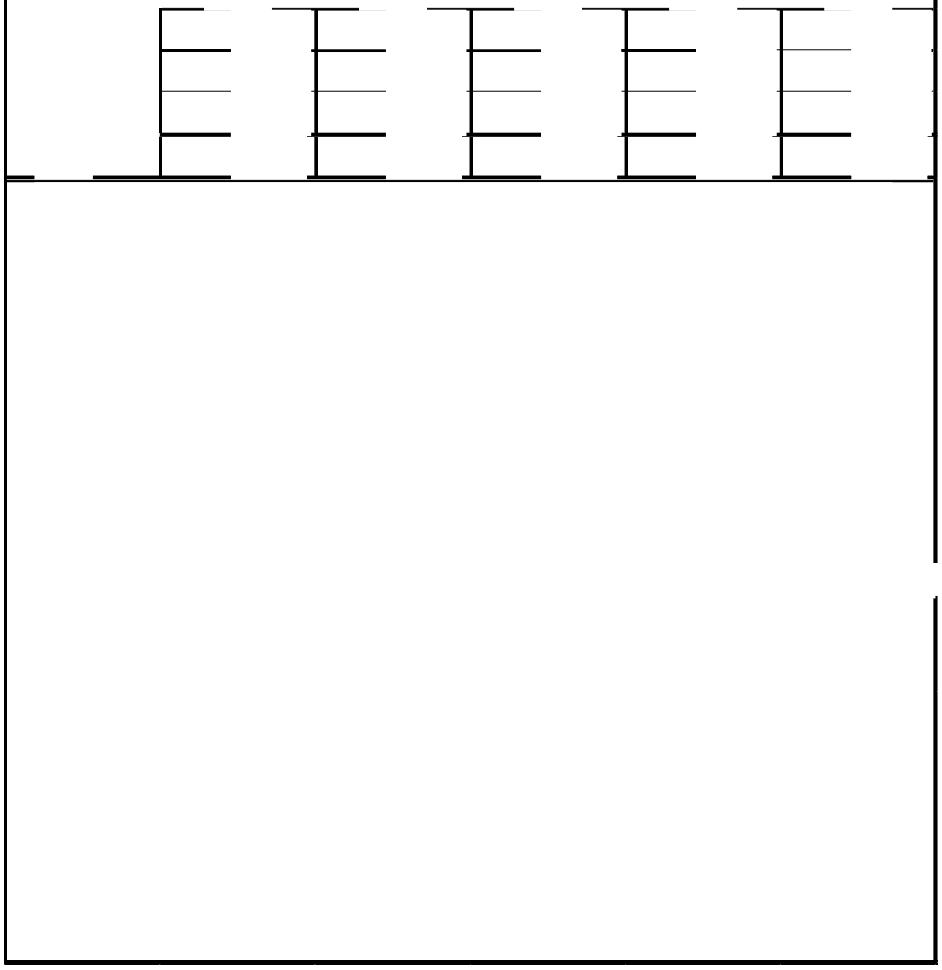
C. Market Structure

36. Table 1 provides market shares for McWane, Sigma, and Star, as well as the Herfindahl-Hirschman Index ("HHI"), the standard measure of market concentration. As a group, McWane, Sigma, and Star, account for more than 95 percent of the Fittings sold in the United States.[43]

[42] Star and Sigma operate more distribution centers than McWane, and differences in freight costs could make one or more suppliers less attractive substitutes in certain localities. Nonetheless, with the suppliers shipping nationally, this issue does not appear to be of any significance, nor has the issue of price discrimination based strictly on the locations of suppliers and their local distributors.

[43] To avoid double counting, Sigma's sales do not include its sales of MA Fittings, which are attributed to McWane.

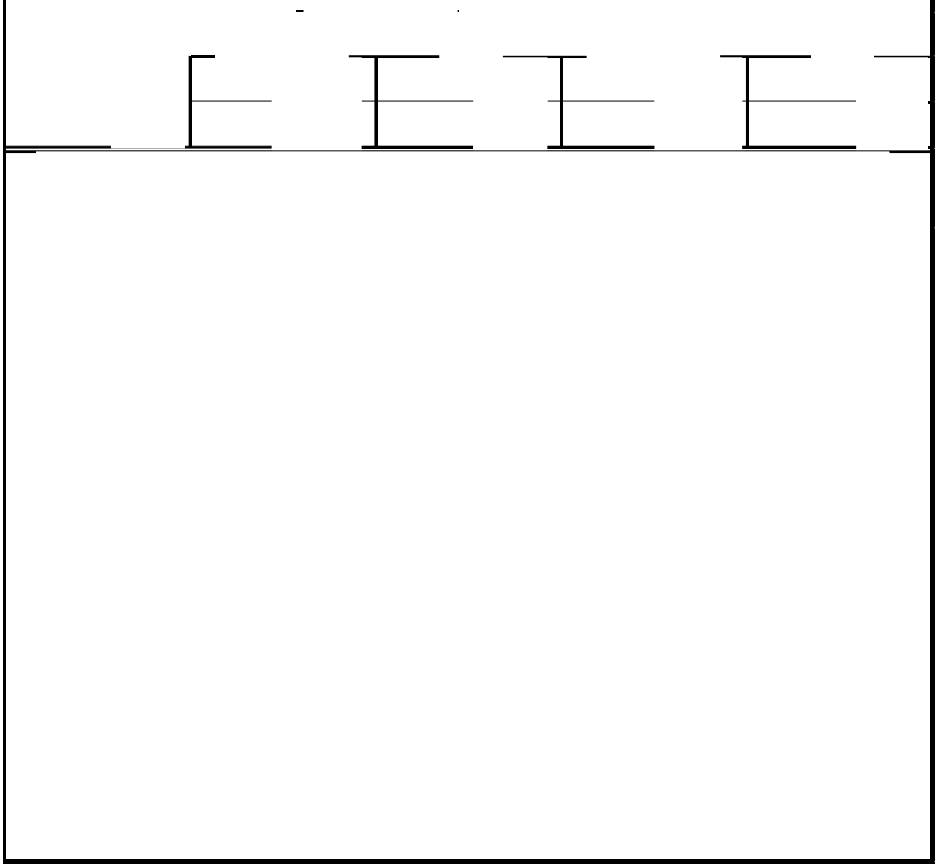
Table 1
Market Shares and Market Concentration
Domestic and Imported Fittings
24 Inches and Less



37. A small group of fringe suppliers import Fittings into the United States. The fringe importers include Serampore Industries ("SIP"), NAPAC, and Genesis Imports and starting in 2009, Electrosteel.[44]

[44]

Table 2
MA Fittings Shipments and Market Shares
Domestic Fittings 24 Inches and Under



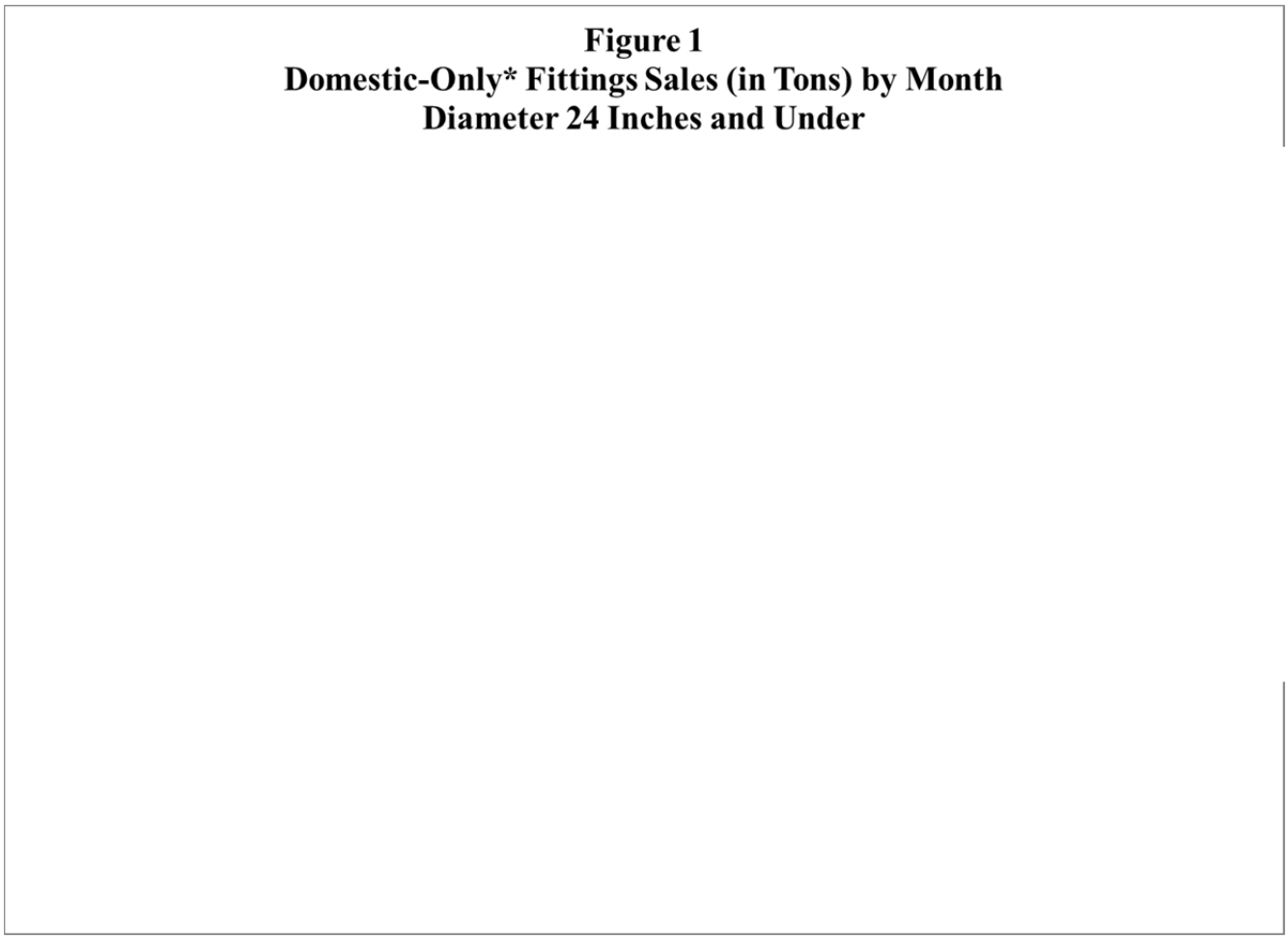
38. The market structure of the MA Fittings market is quite different from that of the Fittings market. For a number of years before 2009, McWane was the sole manufacturer of Fittings in the United States.[45] All Fittings for use in projects specifying MA materials could only be purchased from McWane. That changed in October 2009, when Star first shipped

[45] See Answer of Respondent McWane Inc. to the Federal Trade Commission's Administrative Complaint (Feb. 2, 2012) at ¶ 40.

Fittings manufactured in the United States under tolling contracts with a number of U.S. foundries.[46]

39. As indicated in Table 2, in 2010, Star's shipments in tons represented of total MA Fittings shipments, and grew to in 2011.[47] However, Star saw very little change in its 2011 shipments ( ) from those of 2010 (.

Figure 1
Domestic-Only* Fittings Sales (in Tons) by Month
Diameter 24 Inches and Under



D. Pricing

40. Waterworks projects are local: Typically, a municipality, regional water district, or residential or commercial construction company hires a contractor to extend water and sewer

[46] Star had trivial shipments in September 2009.

[47] Sigma sales of MA Fittings have been attributed to McWane to avoid double counting.

lines to a new residential or commercial development or to construct a new water or sewage treatment plant. Accordingly, waterworks products distributors tend to be local, although the entities may be local offices of national companies. The sales data produced by Sigma, Star, and McWane contains shipments to more than distinct waterworks distributors (*not* branch distribution centers) operating in the United States during 2010.[48] Most of these waterworks distributors are small, local companies with just one or a few distribution yards. But a number of regional distributors with local distribution centers in several states play an important role in Fittings distribution. Finally, there are two very large distributors, HD Supply and Ferguson. They are large, national companies that distribute waterworks products throughout the country. Yet, they sell their waterworks products to contractors and municipalities through local branches. HD Supply operates approximately 215 branches that distribute waterworks products at the local level.[49] Ferguson operates 161 branches throughout the country.[50]

41. The Fittings suppliers sell to distributors through a complex institutional process. A supplier's prices depend first on the supplier's list prices and the supplier's "multipliers." Each supplier publishes list prices for the fittings it sells. Each distributor nominally pays prices based on a discount off of the list prices. The discounts vary by state and region of the country and are publicly announced as "multipliers" that equal 1 minus the discount. Thus, if a particular distributor is located in a state in which distributors receive a 70 percent discount off of a supplier's list price, the multiplier is 0.30. The product of the multiplier and the list price is the

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[48] McWane sales: McWane-007664.xlsx through McWane-007685.xlsx.

[49] Webb Deposition, May 30, 2012, p. 59.

[50] Thees Deposition, June 1, 2012, p. 11.

nominal price of a supplier's fittings, the price a distributor would pay for each fitting if pricing were actually conducted as fittings suppliers would like them to be – completely transparent and stable.[51] McWane published different multiplier maps for its blended fittings, bundles of domestic and imported fittings that compete against imported fittings in the Fittings market, and its domestic fittings, which are sold in the MA Fittings market.[52] It has also published multiplier maps designated for its "program participants" and maps that are not.

42. These nominal prices of fittings can change through either changes in the set of list prices or changes in multipliers. Multipliers tend to change more frequently than list prices. For example, in April 2009 McWane announced that new list prices, LP-5091, would replace the then current list prices, LP-5072, effective May 1, 2009.[53] LP-5072 had been announced on June 4, 2007 and had become effective July 2, 2007.[54] After LP-5072 became effective July 2, 2007, new sets of multipliers became effective later that July, in November 2007, in February 2008, and in July 2008.[55]

43. The price that a distributor actually pays for Fittings tends to differ from the nominal price for a number of reasons. These include: 1.) Special buy programs for some

[51] Tatman Deposition, May 10, 2012, pp. 36-37 (describing McWane's preference for stable prices).

[52] McWane distinguished between "domestic fittings" and "blended fittings" through its May 1, 2009 set of multiplier maps. (McWane-001633-35.) By no later than January 22, 2010, McWane began publishing multiplier maps distinguishing "non-domestic fittings" from "domestic fittings." (McWane-015035-37.) From at least the beginning of 2006, McWane has published separate maps with different multipliers for domestic fittings and for non-domestic fitting or blended fittings. That McWane's publishes a separate map for domestic with different multipliers is consistent with my conclusion that there is a distinct domestic market.

[53] TU-FTC-0010299.

[54] TU-FTC-0010293.

[55] McWane-007642; TU-FTC-0010310; TU-FTC-0023404; TU-FTC-0023405; TU-FTC-0023299; McWane-123857.

customers; 2.) Project discounts and "one-time pricing"; 3.) Corporate rebates and sometimes branch rebates; 4.) Cash discounts; and 5.) Freight terms.[56] McWane's rebate programs can include quarterly rebates and annual rebates offered or negotiated with individual distributors, [57] or offered as general programs to others.

44. A major factor that works to undermine price transparency is "project pricing" or "job pricing."[58] These are additional discounts that suppliers or their sales representatives offer to win bids on specific waterworks projects. This sort of discounting played a key role in the alleged collusive activity of McWane, Star, and Sigma.

E. The Fittings Market From 2007 Through 2011

45. The demand for Fittings is based primarily on the demand for new residential construction, coupled with the demand for public water and sewer systems and treatment plants.[59] As indicated in the graph below, the recent housing recession served to significantly depress the demand for Fittings over the 2007-2009 period, although the demand is clearly seasonal. Peak demand clearly falls materially from 2007 to 2008 and then from 2008 to 2009. With the stimulus spending in 2010, demand increased somewhat above what would be expected from the depressed housing market.

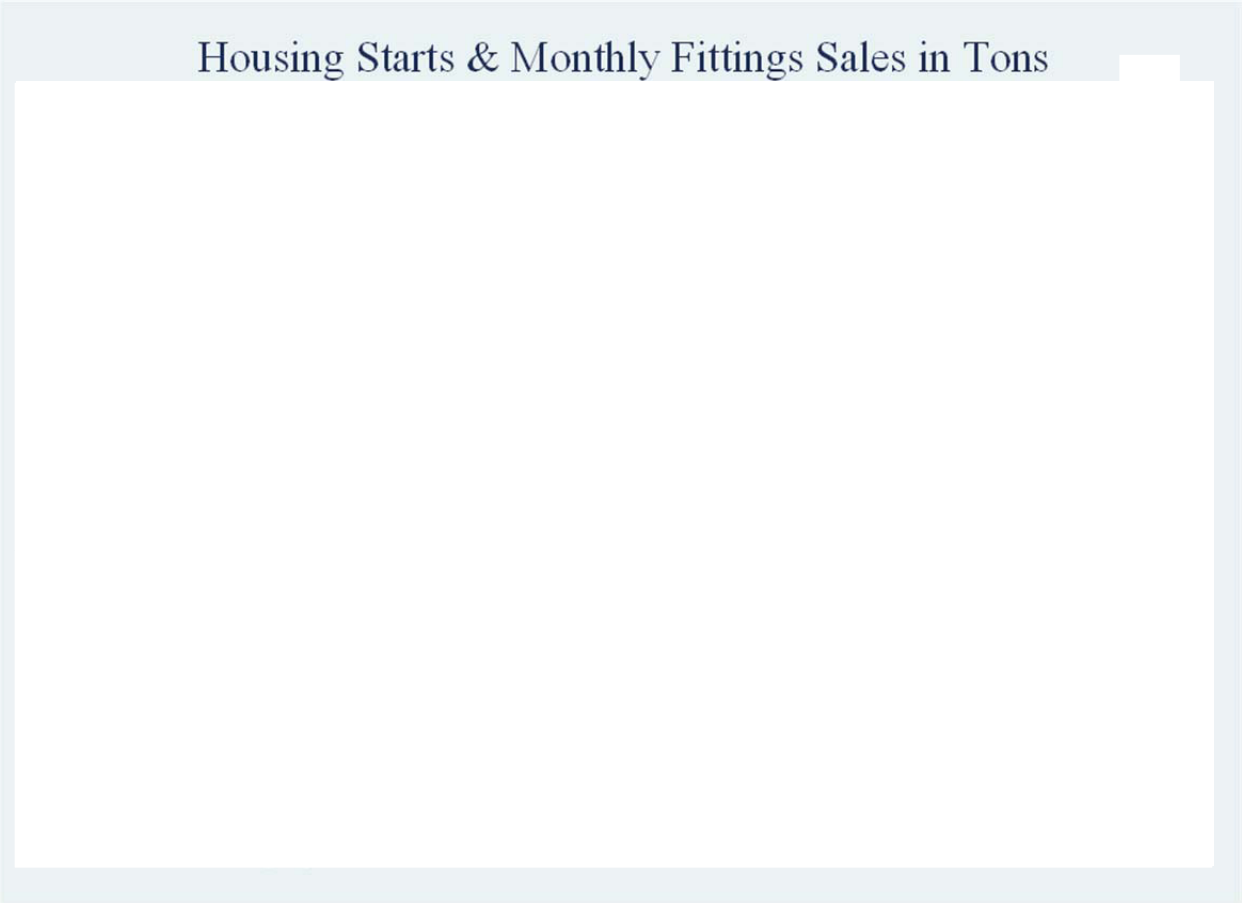
[56] Bhutada Deposition, May 14, 2012, pp. 104-06, 109-10.

[57] TU-FTC-0011285; TU-FTC-0020902.

[58] See SIGTP00000024 – 25, p. 25; SIG-0055257 – 58, p. 58; TU-FTC-0011435 – 48, p. 38;

[59] McCullough IH, August 12, 2010, pp. 121 – 122 (housing starts); United States International Trade Commission, *Certain Ductile Iron Waterworks Fittings From* China, V-5 - V-6 (2003).

Figure 2



III. McWane, Sigma, and Star Fixed Prices for Ductile Iron Fittings

A. Oligopoly and Collusion

46. The market for the sale of Fittings in the United States is an oligopoly. Oligopolies are markets characterized by a few large firms selling all or most of the market's output. As I discussed in the previous section, the dominant sellers, McWane, Sigma, and Star, supply more than 95 percent of the Fittings sold in the United States,[60]

[61]

47. Because there are few firms in an oligopoly, each firm's profit maximizing price and output decision depends on the price, output, and strategic behavior of each of the other firms in the market. Thus, to maximize its profits, an oligopolist must account, in its strategic decision-making, for the likely strategic reactions of other oligopolists. By recognizing their mutual interdependence, firms in oligopolies may be able to develop strategies through observations associated with their ongoing interactions in the market that tend to promote cooperative behavior and diminish competitive behavior. This sort of strategic behavior by firms in an oligopoly may allow them to jointly obtain prices and profits that exceed competitive levels.[62]

48. The term that economists use to denote strategies and business practices that promote cooperation for the purpose of jointly obtaining anticompetitive outcomes is

[60] See Table 1. As previously described, Fittings refers to ductile iron pipe fittings of 24 inches in diameter or less.

[61]

[62] As noted by David Colander, "In oligopolies all decisions, including pricing decisions, are strategic decisions. Collusion is much easier." Colander, David C., *Microeconomics*, 8th ed. (Boston: McGraw-Hill Irwin, 2010), p. 367.

"coordinated interaction." The 2010 *Horizontal Merger Guidelines* defines coordinated interaction as conduct by multiple firms that is profitable for each only as a result of the accommodating reactions of the others. These reactions can dampen a firm's incentive to offer customers better deals by undercutting the extent to which such a move would win business away from rivals. "They also can enhance a firm's incentive to raise prices by assuaging the fear that such a move would lose customers to rivals."[63] As further described in the 2010 Horizontal Merger Guidelines,

> Coordinated interaction includes a range of conduct. Coordinated interaction can involve the explicit negotiation of a common understanding of how firms will compete or refrain from competing. Such conduct typically would itself violate the antitrust laws. Coordinated interaction also can involve a similar common understanding that is not explicitly negotiated but would be enforced by the detection and punishment of deviations that would undermine the coordinated interaction. Coordinated interaction alternatively can involve parallel accommodating conduct not pursuant to a prior understanding. Parallel accommodating conduct includes situations in which each rival's response to competitive moves made by others is individually rational, and not motivated by retaliation or deterrence nor intended to sustain an agreed-upon market outcome, but nevertheless emboldens price increases and weakens competitive incentives to reduce prices or offer customers better terms. Coordinated interaction includes conduct not otherwise condemned by the antitrust laws. [64]

49. There is a fundamental conflict that tends to undermine coordinated interaction by firms in an oligopoly. Jointly, the firms can obtain higher profits through coordination and accommodation. However, if any given firm believes that its rivals have decided to follow strategies to maintain high prices and profits jointly, then it can further increase its profits by secretly shaving its prices and taking business (and profits) away from its rivals. Yet, as firms in

[63] 2010 *Horizontal Merger Guidelines*, Section 7, p. 24. The 2010 *Horizontal Merger Guidelines* concern the approach that the Antitrust Division of the Department of Justice and the Federal Trade Commission take to the investigation and enforcement of antitrust laws with respect to mergers. Nonetheless, this description of coordinated interaction reflects current economic research and consensus on the strategic and potentially anticompetitive behavior of firms in oligopolies generally and is not limited to just merger analysis.

[64] Ibid. Section 7, pp. 24 – 25.

the oligopoly maximize their profits through secret price cutting, market prices fall lowering every firm's prices and profits.

50. Reaching and sustaining coordinated interaction requires that several challenges be overcome. Although speaking specifically of cartelization, Margaret C. Levenstein and Valerie Y. Suslow group into three categories the challenges facing all sellers seeking to coordinate:

A. Selecting and coordinating the behavior of cartel participants on mutually consistent, collusive strategies;

B. Monitoring the behavior of cartel participants to detect and deter defections from these collusive strategies; and

C. Preventing entry (or expansion) by non-cartel firms. [65]

51. George Stigler, in his seminal 1964 article, "A Theory of Oligopoly," significantly advanced the analysis of coordinated interaction.[66] Stigler provided a theory of oligopoly that identified characteristics of markets, products, and firms that promote or impede successful coordination, and thus, the characteristics that make coordinated interaction, including collusion, more or less likely. First, Stigler observed that coordinated interaction requires more

[65] Levenstein, Margaret C. and Valerie Y. Suslow, "What Determines Cartel Success," *Journal of Economic Literature* XLIV (2006), pp. 43 – 95. Levenstein and Suslow survey and analyze a large number of economic studies of cartels. They report that the one paper in their survey that looked at cartel duration found that they lasted on average about 5 years, but with a fairly high variance. Although concentration tended to aid cartel stability, industry associations facilitated cartel formation in less concentrated industries, and by increasing profitability, cartels helped marginal firms survive, which then tended to reduce concentration. Demand instability, particularly unanticipated shocks, undermined cartel stability, but commonly known cyclical fluctuations had little impact on cartel stability. Levenstein and Suslow concluded that, "Successful cartels develop mechanisms for sharing information, making decisions, and manipulating incentives through self-imposed carrots and sticks." (p. 86) Also see, Connor, John M., Price-Fixing Overcharges: Revised 2nd Edition (2010), Social Science Research Network ("SSRN"), available at http://ssrn.com/abstract=1610262.

[66] Stigler, George J., "A Theory of Oligopoly," *Journal of Political Economy* 72 (1964) pp. 44-61. For an extensive discussion of Stigler's "A Theory of Oligopoly" and the influence that it still has on antitrust analysis and enforcement policy, see Carlton, Dennis W. and Sam Peltman, "Introduction to Stigler's Theory of Oligopoly," *Competition Policy International* 6, Autumn 2010, pp. 238 – 251.

than just recognition of interdependence among rivals to succeed. After Stigler, others, particularly George Hay and Daniel Kelly, further analyzed the features of oligopolistic markets that render them more or less conducive to coordination.[67]

52. According to Stigler, Hay and Kelly, and others, these features include: 1.) High concentration; 2.) Few rivals; 3.) Product homogeneity; 4.) Inelastic demand; 5.) Price transparency; 6.) Trade association; 7.) Information exchange; 8.) Unconcentrated buyers; 9.) Barriers to entry; and 10.) Industry social structure.[68] With respect to "Industry Social Structure," Hay and Kelly wrote,

> In the formative stages of a conspiracy, unless it is organized under the aegis of an organization such as the NRA, someone must take the lead in making the contacts and organizing the meetings. Given the illegality of such arrangements some competitors must be coaxed into joining, and a dominant individual will often overcome the inertia and take the lead.[69]

53. Although characteristics such as these may make coordinated interaction more likely, not all of these characteristics are necessary for successful coordination to occur. The critical element that Stigler emphasizes for coordination is not really a characteristic of a market, product, or firm so much as a function of them: the ability to enforce consensus. Stigler notes that if any member of a price agreement can secretly violate it, the firm will gain more profits by doing so than by conforming to it. According to Stigler,

> It is, moreover, surely one of the axioms of human behavior that all agreements whose violation would be profitable to the violator must be enforced. The literature of collusive agreements, ranging from the pools of the 1880's to the electrical conspiracies of recent times, is replete with instances of the collapse of

[67] Hay, George A. and Daniel Kelly, "An Empirical Survey of Price Fixing Conspiracies," *The Journal of Law and Economics* 17 (1974), pp. 13 – 38.

[68] The list here is not intended to be exhaustive, and virtually any undergraduate textbook on Industrial Organization will contain a chapter on coordinated interaction (or collusion) that discusses the many market, product, and firm characteristics that may be conducive to coordination.

[69] Hay and Kelly, p. 16.

> conspiracies because of "secret" price cutting. . . . But no conspiracy can neglect the problem of enforcement.[70]

Because no conspiracy can neglect the problem of enforcement, no conspiracy can neglect the problem of identifying instances or patterns of secret price cutting.

54. Stigler advanced the idea that cartel participants can track changes in sales patterns to detect (and thus deter) competitive pricing in the marketplace. Stigler's model suggests that detection of competitive conduct [i.e., price cutting] is easiest when information on prices and sales is readily available. It is also possible to infer the likelihood of pro-competitive conduct from the totality of the evidence. Such an inference is more likely when the number of buyers served by each competitor is relatively stable (customer switching leads to inference of discount pricing, even though little market share may be lost), the market is relatively stable (buyers grow or shrink slowly, so they are less likely to switch suppliers for reasons unrelated to discounts), and the industry is relatively static (few new buyers exist to disrupt historical business relationships). If pro-competitive conduct can be readily identified and punished, it is less likely to occur in the first place.

55. The limited number of firms in an oligopoly may make it feasible for the firms to communicate and come to mutual understandings through a series of reactions to changes in price or other strategic factors (e.g., capacity or technology). Such communication may allow the rival firms to reach agreements intended to maximize joint profits without explicitly colluding through meetings, phone calls, or other direct means. As Hay and Kelly suggest above (see paragraph 52), with just a few large firms in an oligopoly, social interactions prompted by a dominant or popular personality or by social events at industry conventions or trade shows may give rise to the sort of casual, informal communication that can lead to understandings regarding

[70] Stigler, "A Theory of Oligopoly," p. 46.

prices and pricing behavior. It is important to note that these communications move beyond the purely tacit mechanisms envisioned in independent pricing decisions. By taking explicit actions to communicate in any way, shape, or form prior to unilaterally setting competitive variables, firms may be able to increase the probability of sustaining prices above the competitive level.

56. Barriers to entry prevent or delay competition from entrants that might otherwise undermine coordinated behavior among incumbent firms. As discussed in more detail in Section IV, [71] antitrust barriers to entry may not fully preclude firms from becoming new suppliers in a market, but they delay the growth of entrants and the time they need to reach a minimum efficient scale. By doing so, antitrust barriers to entry impede entrants ability to attain competitive significance in the market.[72]

57. Informal or social communication can promote cooperative behavior by rivals in an oligopoly in a number of ways. It can create personal relationships among managers of rival firms that promote high degrees of predictability and trust. And despite the characterization of informal communication as "cheap talk," Joseph Farrell and Matthew Rabin agree that "talk is cheap" in that "it does not *directly* affect payoffs," but observe that

> given that people respond to it, talk definitely affects payoffs. A misinformed listener will do something that is not optimal for himself and, if their interests are sufficiently aligned, this is bad for the speaker too. In a nutshell, this is how cheap talk can be informative in games, even if players ruthlessly lie when it suits them.[73]

[71] See paragraphs 130 – 132 in Section IV.

[72] For a discussion of the term "antitrust barrier to entry" see Schmalensee, Richard, "Sunk Costs and Antitrust Barriers to Entry," *The American Economic Review*, 94, Papers and Proceedings of the One Hundred Sixteenth Annual Meeting of the American Economic Association, San Diego, CA, January 3-5, 2004 (May 2004), pp. 471-475, p. 471; McAfee, Preston R., Hugo M. Mialon, and Michael A. Williams, "What Is a Barrier to Entry?," *The American Economic Review*, 94, Papers and Proceedings of the One Hundred Sixteenth Annual Meeting of the American Economic Association, San Diego, CA, January 3-5, 2004 (May, 2004), pp. 461-465.

[73] Farrell, Joseph and Matthew Rabin, "Cheap Talk," *Journal of Economic Perspectives* 10 (Summer 1996), pp. 103 – 118. Quoted from page 104 (italics added).

Thus, informal communication, although perhaps just "cheap talk," may convey information that reduces uncertainty and promotes coordination because it helps "align" the interests of otherwise rivalrous firms. By doing so, the talk increases the likelihood that price increases can be successfully imposed and maintained.

58. Uncertainty regarding the behavior of rivals can lead to price cutting by encouraging firms to cheat on their rivals before their rivals can cheat on them. That is, the lack of trust in rivals (as well as the lack of an enforceable agreement) creates or enhances the uncertainty that each firm in an oligopoly faces with respect to the likelihood that a rival will cheat. By promoting trust through the personal relationships that casual social interactions encourage and by promoting casual communication, even if it is only "cheap talk," informal communication reduces uncertainty with respect to rivals' willingness to secretly cut prices, which acts to maintain high prices, which lowers consumer welfare.

59. Firms in a market may also agree on the adoption of certain practices that assist in the creation or maintenance of supra-competitive pricing. Participation in trade association activities may facilitate coordination, including collusion. At the same time, some of these activities can be efficient and beneficial both to firms and consumers. For example, trade associations can support research leading to improved products or lower-cost methods of production. Trade associations may establish standards that benefit consumers by ensuring compatibility or safety, while promoting price competition. Trade associations can also provide training and other professional development activities for members' employees, expose members to existing production technologies and competing suppliers through trade shows, and promote members' goods or services to consumers.

60. Nonetheless, the creation of a trade association may also facilitate collusion by facilitating the exchange of competitively sensitive information and facilitating more general communication among executives of the rival firms in an oligopoly. Indeed, the relationship between trade associations and collusion is a long noted empirical regularity. As discussed by Joseph E. Harrington, Jr.,

> It has been documented that trade associations are used as a cover for cartel meetings, and more to the point, trade associations have been created for that express purpose. For example, the Amino Acid Manufacturers International Association was formed by members of the lysine cartel (Connor 2001) and the Oklahoma Highway Department only started receiving identical bids at procurement auctions some time after the Asphalt Refiners Association was formed (Funderburk 1974).[74]

More recently, trade associations facilitated price fixing in the citric acid industry and the vitamin industry.[75]

61. Game theory provides economists with additional tools to model and analyze strategic coordination among sellers within an oligopoly. Game theory has been defined as, "a mathematical method for analyzing strategic interaction."[76] In industrial organization, game theory is particularly well-suited for modeling and analyzing oligopoly because recognition of mutual interdependence gives rise to profit-maximizing strategies that must incorporate expectations of the profit-maximizing strategies of rivals. By allowing economists to formally

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[74] Harrington, Joseph E. Jr., "Detecting Cartels," *Handbook of Antitrust Economics*, ed. Paolo Buccirossi, (Cambridge: The MIT Press, 2008), Chapter 6, pp. 213 – 258. The section quoted is on p. 220. Citations incorporated in the quote are: Connor, J.M., *Global Price Fixing: Our Customers are the Enemy* (Boston: Kluwer Academic, 2001) and Funderburk, D. R., "Price Fixing in the Liquid-asphalt Industry: Economic Analysis Versus the 'Hot Document,'" *Antitrust Law and Economics Review* (1974), pp. 61 – 74. Also see Levenstein, and Suslow, footnote 65 above.

[75] See Connor, John M., *Global Price Fixing* 2nd ed. (Berlin: Springer-Verlag, 2008). Connor provides detailed descriptions of the Citric Acid Cartel, the Lysine Cartel, and the Vitamin Cartel.

[76] The quote is from the Royal Swedish Academy of Sciences press release announcing its decision to award the 1994 Nobel Prize in Economics to John C. Harsanyi, John F. Nash Jr., and Reinhard Selten. They received the award based on their pioneering analysis of the principal aspect of game theory, the concept of equilibrium, which is used to make predictions about the outcome of strategic interaction. See http://www.nobelprize.org/nobel_prizes/economics/laureates/1994/press.html.

model these strategic interactions among rival oligopolists, game theory has given rise to an extensive literature studying how characteristics of markets and changes in those characteristics, may affect equilibrium prices and consumer welfare.

62. Although game theory can incorporate strategic decision making into its models, its use has certain limitations. The Cournot and Bertrand models of oligopoly, two very early models of oligopoly based on game theory, are "static" single-period games that cannot analyze how repeated interaction affects outcomes.[77] Modern oligopoly theory, therefore, has developed through the analysis of models of repeated games ("supergames") in which oligopolists compete in period after period. By allowing economists to analyze equilibrium strategies over more than a single period, multi-period models provide economists with the tools to develop models that better predict behavior in actual oligopoly markets.

63. One weakness of supergames, however, is that they may allow for an infinite number of equilibriums, some of which may be welfare reducing (i.e., anticompetitive) and others of which may be welfare enhancing (pro-competitive). In addition, the conclusions that are drawn from the models can be very sensitive to small changes in assumptions or parameters of the model. Nevertheless, game theory has provided, and still provides, helpful insight into the effect on prices of different strategies applied in markets having varying characteristics, particularly game theoretic models of oligopoly. They highlight that oligopolists who alter the "rules" of their interaction to facilitate speedier detection and punishment of defectors from the industry profit-maximizing price are more likely than otherwise to gain and maintain supra-

[77] Cournot assumed that an oligopolist sets its output level under the assumption that its rivals' output will not change. Betrand assumed that an oligopolist sets its price under the assumption that its rivals' prices will not change. Although the models appear similar and were both based on the same assumptions of homogeneous goods, a constant marginal cost, and a simple linear demand curve, the equilibrium prices and quantities obtained by the two models are very different. The Cournot equilibrium price and output level lies between the monopoly price and output level and the competitive price and output level, depending on how many firms sell in the oligopoly market. The Betrand equilibrium is the competitive price and output level.

competitive prices.[78] As Stigler, and others, have suggested, economic analysis of market behavior can allow us to detect these problematic agreements.[79]

B. The Fittings Market is Highly Susceptible to Collusion

64. I previously identified market and product conditions and business practices that are conducive to coordination, including explicit collusion. The extensive record in this matter indicates that the Fittings market exhibits many of these characteristics. Accordingly, I conclude that the Fittings market is highly susceptible to collusion.

65. High Concentration: The Fittings market is characterized by very high concentration. As discussed in Section II above and shown in Table 1, the HHI in the Fittings market is very high. For each year over the period 2007 – 2011 the HHI exceeded 3400,[80] and an HHI above 2,500 is classified by federal antitrust enforcement agencies as reflecting a highly concentrated market.[81]

66. Few Rivals: The Fittings market is characterized by few sellers of any significance. McWane, Sigma, and Star supply over 95 percent of Fittings sold in the United

[78] For a discussion of infinitely repeated games and strategies and parameters that promote compliance with collusive understandings among rivals in an oligopoly, see Pepall, Lynne, Daniel J. Richards, and George Norman, *Industrial Organization: Contemporary Theory and Practice*, 2nd ed. (Mason, OH: South-Western – Cengage Learning, 2002), pp. 368 – 374.

[79] See Coate, Malcolm B., "Alive and Kicking: Collusion Theories in Merger Analysis at the Federal Trade Commission," *Competition Policy International* 4 (Autumn 2008), pp. 145 – 174, at pages 150 – 151.

[80] See Table 1.

[81] For a discussion of the degrees of concentration as measured by the HHI, see the *Horizontal Merger Guidelines*, pp. 18 – 19. Although, this particular discussion of the HHI is in the context of merger analysis, the HHI is generally used by economists to measure market concentration for any research or analysis in which market concentration is relevant – not just merger analysis and not just antitrust analysis. Merger analysis incorporates the HHI because mergers raise concentration, and, "The higher the post-merger HHI and the increase in the HHI, the greater are the Agencies' potential competitive concerns. . . ." (p. 19). It is the link between high concentration and the potential for coordinated interaction, particularly in homogeneous product markets, that raises the competitive concerns.

States. The remaining amount, less than 5 percent, is divided among a number of small, fringe companies.[82]

67. Unconcentrated Buyers: Although just a few firms import or produce Fittings, their distributor-customers are often small, local companies. McWane alone has over distinct distributor-customers,[83] and McWane, Star, and Sigma together sold to over distinct distributors (not branches) during 2010.[84] HD Supply and Ferguson are exceptions. These are large national companies that together have about a 50 percent share of the distribution market.[85]

68. Product Homogeneity: Fittings of any particular size or shape are homogeneous commodity products manufactured to meet industry-wide standards.[86] One supplier's 4-inch, 90-degree bend, mechanical joint compact Fittings are virtually identical to any other supplier's 4-inch, 90-degree bend, mechanical joint compact Fittings. Therefore, no incumbent could maintain a nominal consensus price while effectively cheating through the pricing of distinct product features or bundles of features. Nor could an incumbent conceal effective cheating through the addition of new features, the improvement of existing features, or otherwise improving quality, while outwardly appearing to maintain a consensus price.

69. Inelastic Demand: The demand for ductile-iron fittings is highly inelastic over the range of prices germane to Fittings transactions. This is because, for water distribution and

[82] See Table 1.

[83] See "Memorandum of McWane, Inc. Responding to Commission Staff Questions Regarding the Competitiveness of the Ductile Iron Waterworks Fittings Market in the United States," May 10, 2011 [White Paper submitted to the FTC Staff], p. 16, footnote 58. McWane sales data contained over 300 customers (by unique customer number) over the 2007 – 2011 period. McWane-007664.xlsx – McWane-007685.xlsx.

[84] See Sigma sales:

Star sales:
STAR0182054_FTC Docket No. 9351_Confidential.xlsx,
McWane-007664.xlsx through McWane-007685.xlsx.

[85] Thees IH, November 16, 2010, pp. 87-88.

[86] Standards for Fittings were developed jointly by the American National Standards Institute and the American Water Works Association.

treatment systems, no economically relevant or practical substitute for ductile-iron fittings exists. Moreover, Fittings costs represent a very small share of the overall cost of constructing a waterworks system or plant—approximately 5 percent of the total project cost.[87] Finally, decisions to build or repair waterworks systems or treatment plants depend on many factors unrelated to the cost of Fittings. These include such things as 1.) The age and condition of existing water works facilities and pipelines; 2.) The size of the plant to be built; 3.) The rate of growth in the municipality; 4.) The state of local real estate markets, municipal budgets, and so forth.[88]

70. Inelastic demand for Fittings indicates that the rewards from price cutting are likely to be small and the rewards from collusion are likely to be large. As noted by Hay and Kelly, "The more inelastic is industry demand, the greater are the potential rewards to the price fixers."[89]

71. Price Transparency: Transparency of pricing also is conducive to coordination. In particular, transparency of pricing is one way of providing a relatively sure means for rivals to detect cheating on any consensus price, which increases the risk of its punishment and thereby creates a disincentive for such cheating in the first instance. Although list prices and "multipliers" are published, the prices that distributors actually pay are often very different from those implied by the list prices and multipliers.[90] Fittings suppliers offer various types of

[87] Tatman Deposition, May 10, 2012, p. 18 (McWane estimates Fittings represent 5% of the cost of a waterworks job).

[88] McCullough IH, August 12, 2010, pp. 121-122 (housing starts); United States International Trade Commission, *Certain Ductile Iron Waterworks Fittings From China*, V-5 - V-6 (2003).

[89] Hay and Kelly, p. 15.

[90] As I discussed in Section II, nominally, waterworks distributors are charged a price for Fittings that reflects a discount off of the supplier's list price. The multiplier is 1 minus the discount. That is, if a distributor receives a 60 percent discount, then the price they are nominally expected to pay is 40 percent of the supplier's list price. The multiplier in this case is .40.

discounts and rebate programs to distributors. Project pricing, in which a supplier's sales representatives offers additional discounts to distributors to help them win bids for specific projects, has been a common problem often blamed for price "instability."[91]

72. Trade Association: Trade associations can beneficial to both the firms in an industry and consumers. However, trade associations also may facilitate collusion and have been associated with past price fixing conspiracies. DIFRA, the trade association created by Fittings suppliers, is central to the allegations of collusion by McWane, Star, and Sigma.

73. Barriers to Entry: Antitrust barriers to entry may fully preclude firms from becoming new suppliers in a market, or they may delay the growth of entrants and their ability to attain competitive significance. In the Fittings market, distributors provide manufacturers with critical services necessary for success in the market. Building a network of distributors can be a long and arduous task. Existing distributors already have business relationships with incumbent firms, and agreeing to sell the Fittings of a previously unknown firm can pose significant risks to distributors until the entrant has proven its quality and reliability. For an entrant, the time and cost of negotiating sales agreements with a large number of individual distributors located in cities and counties throughout the U.S. limits the speed of entry. Accordingly, this need to develop a network of local distributors could facilitate collusion by acting to keep concentration high, with McWane, Sigma, and Star as the only suppliers of any significance in the market.

74. Industry Social Structure: The Fittings market also exhibits regular interaction and communication among suppliers' senior executives. Certain senior executives at McWane, Sigma, and Star have known each other for many years. Sigma's president, Victor Pais, started

[91] SIGTP00000025 – 26, at 26; SIG-0055257 – 58, at 58; TU-FTC-0011435 – 48, at 38;

Star Pipe and initially was its only employee.[92]

[94] Mr. Pais also has a "mutually trusting and mutually respectful"[95] relationship with Ruffner Page, the CEO of McWane. The two met numerous times in 2007 and 2008 to discuss business opportunities and challenges.[96] The record describes dinners between Star and Sigma executives and McWane and Sigma executives.[97] The record indicates that Mr. Pais is particularly interested in socially engaging executives of McWane and Star to "make peace" and stabilize the markets.[98]

C. McWane, Sigma, and Star Explicitly Colluded

75. McWane, Sigma, and Star took advantage of the characteristics of Fittings and the Fittings market to embark on a course of action that allowed them to collude explicitly. As a result of these actions, McWane, Sigma, and Star at times successfully raised and maintained prices above those that would have otherwise prevailed. As economic theory predicts, cheating ultimately caused the cartel to collapse, but consumers were harmed, nonetheless.

76. Reaching this collusive agreement appears to have involved a multi-stage process in which the firms first agreed to reduce or eliminate discounting. Then they agreed to exchange

[92] Pais IH, July 23, 2010, pp. 7–8.

[93]

[94]

[95] SIG-0002602-610, p. 605.

[96] Pais and Page met numerous times in 2007 and 2008 to discuss business opportunities and challenges. Pais Deposition, May 31, 2012, see e.g. pp. Page Deposition, May 24, 2012, see e.g. pp. 106-110, 240, and

[97] See e.g. Tatman (McWane) dinner with McCutcheon (Star) on Mar. 27, 2008, Tatman Tr; numerous meetings between Pais (Sigma) and Page (McWane), Pais Deposition, May 31, 2012, pp. Pais (Sigma) lunch with McCutcheon (Star) on Feb. 19, 2008, SIG-0058408 and SIG-0053608.

[98] See SIG-0058000-03 at 00 ("We need to earn their TRUST and CONFIDENCE in our plan to improve the industry."); SIGTP00016204-06 ("This is a huge step by SIGMA and Star, in being able to demonstrate our willingness and commitment to strengthen our industry and signal our willingness to grow in an [sic] responsible manner."); McCutcheon IH, October 12, 2010, pp. 226–230.

output information and they collusively fixed prices. The exchange of output information facilitated the agreement by providing the firms a method to assure themselves that rivals actually implemented and maintained the collusively agreed to prices. The agreement collapsed, possibly driven by further declines in demand and discord over the ARRA's Buy American provision.

77. Executives from McWane, Sigma, and Star regularly communicated with each other on strategies to sustain higher Fittings pricing. Their communication was overt at times, taking place at in-person meetings, during conversations over the phone, in e-mails, at trade shows, and over dinner.[99] At other times, the communication was indirect; the firms used price announcements that they would send to customers as a means of sending messages surreptitiously to one another. The communication succeeded in establishing terms of a consensus effort to reduce or eliminate discounting, and the actions undertaken by the firms constituted adherence to it. As discussed in Section II, competition in the Fittings market generally involves discounts off of a nominal price (itself established by the product of the published multiplier and the published list price for the fitting). Multipliers and list prices are transparent, while the various discounts are confidential.[100]

[99] See McCutcheon IH, vol. 2, May 4, 2011, pp. 219 -231; SIG-0054525 (e-mail from Mitchell Rona to Siddharth Bhattacharji and Victor Pais discussing conversation with Rick Tatman, at 526: "He said he hears that some of the new prices in the market are being compromised with deals. He hopes the market will improve and hopes do our part.") Also see, SIG – 0059439 (e-mail from Mitchell Rona to his colleagues at Sigma discussing conversation with Rick Tatman) "Rick was upset by the numbers in Florida and California based on what he has seen from us and Star. He said the .26 and .30 [multipliers] respectively were available from us both without any second thought," McCutcheon Dep. 227:22 – 228:8; McCutcheon IH 257:7 – 258:18 (testifying about having a conversation with Rick Tatman about new price lists); Second Declaration of Factual Statement of Dan McCutcheon (May 25, 2011).

[100] Distributors also may obtain rebates based their quarterly or annual purchases from a specific supplier. Larger distributors may negotiate individually with suppliers to obtain better rebate terms. Thirty-two small distributors formed a buying group, The Distribution Group ("TDG"), to obtain a negotiating position on rebates similar to those of the national distributors, HD Supply and Ferguson.

78. In late 2007, Sigma announced a price increase that would be effective January 2, 2008.[101] Whereas Star quickly followed,[102] McWane held back to the others' dismay.[103] On December 20, 2007 Sigma announced that it was putting its previously announced price increase on hold, indicating that it was doing so because McWane had not followed with a price increase of its own.[104] This pricing episode appears to have inspired McWane executives to consider ways to exploit their mutual dependence through communications with its rivals.[105]

79. On January 30, 2008, Rick Tatman sent an e-mail to Leon McCullough discussing the potential advantages and disadvantages of selling 3 inch to 8 inch Fittings to Sigma at $1,220 per pound.[106] The first item listed under the heading "Potential Advantages" is

> Awareness within Sigma that our costs on the Disa are competitive with China[.] There is a theory that our ability to stabilize the market is tied to our competitor's perception of our cost structure and our ability to sustain aggressive pricing if our share position is threatened.[107]

80. Mr. McCullough replied with an e-mail containing his comments written following each individual item listed.[108] After the first item under "Potential Advantages," he wrote, "This is a good thing,"[109] and on February 1, 2008, Mr. Tatman sent an e-mail to Sigma's Victor Pais with the offer he had described to Mr. McCullough two days before.[110]

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[101] See SIGTP00000011; McWane-002051.

[102] See McWane-002051; SIGTP00000024.

[103] Ibid.

[104] SIGTP00000011.

[105] McWane-002051; TU-FTC-0011435-448, at 438.

[106] McWane-002061.

[107] McWane-002061; see also McWane-002443-44 (Tatman email to Page ("supplying that quote should reinforce the point that with the DISA and our TXX facility we're in a very different competitive cost game than what they've been used to with us.")).

[108] McWane-002063-64.

[109] Ibid. at p. 002063.

[110] SIG-0053397.

81. Although negotiating the deal took some time, word of Sigma's purchase of fittings from McWane and its competitive implications were clearly conveyed to Star as well. Star's Dan McCutcheon viewed the sale exactly as Mr. Tatman expected. In an e-mail to other Star executives he wrote:

> Sigma recently bought 8 t/l's from tyler [McWane] because sigma said "they could buy them for 15% cheaper from tyler than they could get them from china". After the 8t/l's, tyler would not take any more orders. My Guess is tyler took these orders to try to make a point. During the negotiation, tyler stated that they are now the low cost producer and said they could prove it. I think there is some exaggeration in this statement, but I believe the core point.[111]

82. That McWane offered to sell Fittings to Sigma, but, at the same time, refused to consider further orders, might at first appear odd given the difficulty in making any Fittings sales on account of the steep decline in demand. However, as explained above by Mr. Tatman, the purpose of the sale was not to just generate revenue, but to convey to Sigma and Star the implied threat that if they did not agree to transparently reduce their own discounting, McWane's lower costs would allow it to price very aggressively.[112]

83. In seeking the pricing agreement with Star and Sigma, McWane intended to take advantage of the cost pressures facing Sigma and Star on account of the high and rising inflation in China and the rising cost of iron throughout Asia. Because Star and Sigma imported the Fittings that they sold (mostly from China, in the case of Star, and from China and India, in the case of Sigma), the sharply increasing prices in Asia had a disproportionate effect on their costs. Although Tyler imported Fittings manufactured at its Tyler Xian Xian foundry in China, much of

[111] SPP020918 – 20919, p. 20918.

[112] McWane-002061-62.

its production was still in the United States, which was not experiencing the degree of inflation that was occurring in China and India.[113]

84. In effect, McWane managed to communicate its potential power to both of its rivals by making relatively trivial sales to one rival and waiting for that rival to tell the other.

85. McWane understood its cost advantage as well as Sigma's and Star's needs for a price increase.[114] In fact, the sale of Fittings to Sigma followed from a plan McWane had developed to use those advantages to increase prices and drive price stability in the Fittings market.

86. On December 22, 2007, Rick Tatman, McWane VP and General Manager of its Waterworks Fittings Division, emailed his superiors at McWane, including EVP Leon McCullough, explaining his "concept" to "drive stability and rational pricing with the proper communications and actions."[115] This "concept" is detailed in a McWane PowerPoint presentation prepared by Tatman and discussed with his bosses McCullough and Thomas Walton.[116] In it, Tatman describes the necessary communications and actions for McWane to secure industry-wide price increases.[117] These communications and actions are directed to the attainment of supra-competitive pricing outcomes beyond those attainable through unilateral action in recognition of pricing interdependence. One slide in the presentation listed the specific message that McWane intended to convey to Sigma and Star as well as to the Fittings market as a whole:

[113] See, for example, McWane-002051, email of December 22, 2007 from Rick Tatman, McWane VP and General Manager of its Waterworks Fittings Division, to McWane EVP Leon McCullough.

[114] Tatman Deposition, May 10, 2012, pp. 82 – 83.

[115] McWane-002051.

[116]

[117] TU-FTC-0011435 – 448, at 438.

Desired Message to the Market & Competitors

- ❑ **Tyler/Union will be consistent and follow through with what we've formally communicated.**
- ❑ **T/U will encourage/drive both price stability and transparency.**
- ❑ **T/U will adjust multipliers as required to remain competitive within any given market area.** (Consistent Job Pricing will be met with general market actions)
- ❑ **For 2008, we will support net price increases but will do so in stepped or staged increments. A prerequisite for supporting the next increment of price is reasonable stability and transparency at the prior level.**

Due to their now more desperate need for price, I believe that Sigma and Star will mimic and verbally follow any program we publish. However the keys to actual success are:

1. T/U being consistent with what we say for an extended period (> 3 months)
2. Sigma & Star's mgt pulling price authority away from front line sales and customer service personnel to add discipline to the process
3. Support from our major customers to abandon the current process of branches calling multiple suppliers to auction for price. (We'll need face to face meetings)
4. The Big 3 not allowing 3rd tier suppliers like Serampore to disrupt the process

87. The document also contained two alternative "rough drafts" of what would be McWane's January 11, 2008 letter to customers regarding price increases that would be effective February 18, 2008. These draft letters, as well as the final January 11, 2008 letter, contained language clearly intended as a message to Sigma and Star signaling that McWane would not be discounting off their soon to be published list prices, and that additional price increases might be forthcoming if the competitive environment justified raising prices. The McWane presentation indicates that McWane would not increase prices further unless Sigma and Star stopped using discounts to win market share from McWane, and that it intended convey that message to its two competitors by means of its price announcement, which it knew Star and Sigma would easily obtain. Here, the communication is indirect, via public price announcements, but the

communication among competitors is clear, McWane's rivals must cooperate or prices will not increase further. Such communication moves beyond purely the unilateral actions that a firm is expected to undertake in an oligopoly.

88. Star and Sigma each quickly responded to McWane's January customer letter and price increase by announcing price increases that matched McWane's[118] and by taking overt measures to reduce project pricing,[119] including the removal of project pricing authority from line personnel.[120] In so doing, they indirectly communicated back to McWane that they were of one mind, and that further price increases may be imposed without the ordinary risk of market share loss due to cheating on the consensus price.[121] Thus, McWane, Sigma, and Star agreed that Sigma and Star would take measures to reduce or eliminate conduct that undermined cooperative pricing in return for the prospect of future price increases soon thereafter.

89. Sigma documents are rife with references to forgoing profits attainable through project pricing to assure McWane that it could be as forward looking and disciplined as required to enable the imposition and maintenance of supra-competitive prices.[122] And Sigma senior

[118] SIG – 0053393-94; SPP009151-52; TU-FTC-0261470-71 ("Star is raising or matching all fittings numbers to match Tyler effective Feb 18th."); SIG – 0061257-58.

[119] ESP0004665; SPP009151; SIG – 0058464-66;
TU-FTC-0261470 (Star announcement to HD Supply "NO UTILITY PROJECT PRICING NATIONWIDE.").

[120] ESP0004665; TU-FTC-0010942-65 at 0010965.

[121] None of this was lost on McWane. See, for example, TU-FTC-0010113-15, a Tyler/Union (McWane) Executive Report for 1st Q 2008, noting that Star and Sigma project discounting "appears to have died down significantly," that apparently "both have removed pricing authority from the front line . . . , and expressing confidence that Sigma "understand[s] our published position on supporting a list price change . . . ."

[122] See, for example, SIG-0058464, email of January 24, 2008 from Victor Pais to other Sigma senior managers advocating the abandonment of project pricing "TO ELIMINATE THE CONFUSION WE ARE CREATING WITH CUSTOMERS *AND COMPETITORS* . . . ." (emphasis added) And referring to McWane's price increase announcement as, "both a lesson and an opportunity for SIGMA and Star to develop a patient and disciplined Marketing approach and demonstrate to Tyler [McWane] that we are capable of being part of a stable and profitability conscious industry." See also Rybacki Deposition, May 14, 2012, p. 229 (when asked if he recalled in January 2008, that Mr. Pais was asking him to make a committed and serious effort to normalize pricing, Mr. Rybacki testified that "Because Star's pricing was ruining the market; and as a result, it was upsetting the gorilla in the room, which was Tyler, because they're the biggest, McWane's the biggest, and it was obviously hurting us as

managers communicated with Star senior managers to persuade them that Star too needs to reform its conduct to assure McWane that pricing to maximize industry profits will be a win-win-win proposition, despite McWane's historic losses of market share to Star's and/or Sigma's cheating on the consensus price.[123]

90. In taking the actions "desired" by McWane, Star would be acting against its self-interest absent an agreement to increase industry prices. Star's strategy had been to grow share by project pricing.[124] Star knew that in the absence of an agreement, Star would lose market share if it stopped offering discounts.[125] As Star's Matt Minamyer explained in an email to other Star senior managers, "Our goal is to take a price increase and to stop project pricing."[126] But at the same time, he explains,

> don't think we need the price increases, as that is not the case. A price increase will be good for us on the short and long term profit situation but are not vital to our strength. The truth is that we would come out of a price war stronger than ever and with a bigger market share, but we don't think the industry needs that right now.[127]

Minamyer also stated, "What we are doing is what is right for the industry."[128]

91. When asked in an investigational hearing whether advising its personnel and its customers that there will be no more project pricing was, "an unusual step for Star," Minamyer's

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well; and that's the reason why we he wanted us to normalize or try to standardize on the list and multiplier to create some kind of stability . . . ."

[123] McCutcheon IH, October 12, 2010, pp. 226-30; see also Declaration of Factual Statement by Dan McCutcheon (April 28, 2010) (discussing "pressure" on Star to join DIFRA). See also SIG – 0058464-66; SIGTP00016204-06.

[124] McCutcheon Deposition, May 16, 2012, pp. 152-153 (project pricing was a core part of Star's strategy).

[125] Minamyer Deposition, May 9, 2012, pp. 118 – 120.

[126] ESP0004665 – 4666, p. 4665.

[127] Ibid.

[128] Ibid.

superior, Dan McCutcheon, testified that it was, "irrational" and "bizarre."[129] In a Declaration provided to FTC staff, dated May 25, 2011, Mr. McCutcheon further explained:

> Project pricing is a significant part of Star's competitive Strategy and, as the smallest competitor in the market, Star could not afford to cease project pricing and remain competitively viable.[130]

Nevertheless, Star informed its customers that it was ceasing project pricing.[131]

92. Through its sales force, McWane monitored the incidence of project pricing and found that "discounting by both Star and Sigma appears to have died down significantly" and that "both have removed pricing authority from the front line sales team and pushed it up higher within their organizations. Discounting is still available, but it now requires a more structured decision process…"[132]

93. As I previously observed, when McWane announced its January 2008 price increase it held out to Star and Sigma the prospect of further 2008 price increases. Any further price increases, however, would be contingent on Star and Sigma promptly adopting McWane's increase and thereafter maintaining stable and transparent pricing policies.[133] But despite Star and Sigma's agreement, McWane feared that it would not be able to detect cheating on the consensus price. Moreover, although the list prices and multipliers are transparent, the actual transaction prices are not,[134] and given the potential for further declines in new housing starts and

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[129] McCutcheon IH, October 12, 2010, p. 452; see also McCutcheon Deposition, May 16, 2012, pp. 152–53;

[130] Second Declaration of Factual Statement of Dan McCutcheon (May 25, 2011), ¶ 13.

[131] and McWane-002065-66.

[132] McWane-000668-72 (Fittings Dashboard and Tyler/Union Executive Report for 1st Quarter 2008).

[133] See McWane-002051; TU-FTC-0011435; ESP0004665; SIG-0058464; SIG-0058000; TU-FTC-0255098-104; TU-FTC-0010321; SIG-0034424; SIGTP00016204; TU-FTC-0010081; SPP000086;

[134] See Section II, paragraphs 43 – 44.

other construction, McWane would not be able to tell the extent to which its declining sales resulted from an overall decline in the market, cheating by Star or Sigma, or both.

94. The lack of price transparency in conjunction with declining demand ensured that McWane would not be able to overcome what Levenstein and Suslow described as the second impediment to reaching and sustaining collusive agreements, adequately "monitoring the behavior of cartel participants to detect and deter defections from these collusive strategies."[135] It therefore refused to risk a second 2008 price increase without further assurance from Star and Sigma that they would not take advantage of another McWane price increase by again undercutting McWane's prices to grow their sales. For this assurance, McWane required both Sigma and Star to provide sales data to DIFRA before taking further price increases.

95. Trade associations have long been associated with the creation of collusive schemes and conspiracies.[136] Although trade associations may enhance efficiency through such activities as standard setting, consumer education, or research and development of more efficient technologies or best practices, they also may collect and disseminate competitively sensitive information, and promote social interaction among competitors that can foster cooperation or conspiracy.

96. DIFRA's Articles of Incorporation state that it is organized for numerous beneficial purposes. These include: 1.) To provide members with opportunities for "seminars, publications, and other programs and activities" for their education, advancement and for the improvement of the industry; 2.) To "advocate and publicize the needs, interests and merits of the ductile iron fittings industry to industry, the public, and the government;" 3). "To assist in the development and establishment of standards with respect to the ductile iron fittings industry;"

[135] Levenstein and Suslow, p. 44.

[136] See for example, Hay and Kelly, pp. 29-38.

and 4.) "To plan and conduct research and test programs for ductile iron fittings and other products of interest to the ductile iron fittings industry."[137] The record reflects that DIFRA failed to perform any of these activities over the two-year period of DIFRA's effective life, from DIFRA's incorporation on January 12, 2007[138] until the organization effectively ceased operating in January 2009.[139] DIFRA's only activity was the collection of monthly Fittings shipments data from its individual members, and the distribution of the aggregated monthly Fittings shipment data back to them.[140]

97. Tom Brakefield, who at the time was a Sigma employee, had been president of DIFRA, but is currently not sure if he still is because,

"[141] In his deposition, Mr. Brakefield indicated the members were interested in standardization, but never actually did anything about it:

> Q. What actions did DIFRA take to promote the standardization of the fittings?
> A. I don't think we got -- we didn't take any action. We didn't get to that.
> Q. Did DIFRA form a committee to evaluate standards for fittings?
> A. There was discussion of committees being formed and organized and staffed by member people, but none of that took place at all.[142]

Other witnesses involved with DIFRA agreed. With the exception of the collection of members' shipments data and the distribution of the aggregated shipments data back to its members, DIFRA accomplished nothing.[143]

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[137] SIG-0033727 – 33731, The DIFRA Certificate and Articles of Incorporation, January 12, 2007. The purposes of the organization are found on pages 33728 – 33729.

[138] SIG-0033727 – 33731, p. 33727.

[139] Deposition of Tom Brakefield Volume 1, May 4, 2012, p. 10.

[140] The first set of Fittings shipment data collected from its members and later disseminated to them in an aggregated form covered consisted of annual 2006 shipments, and monthly covering the period January 2007 through April 2008. DIFRA finished collecting this first set of data with the submission of Star on June 5, 2008 (Q006SP0000805) and it sent the aggregated data to members on June 17, 2008 (Q006SP0000810).

[141]

[142] Brakefield Deposition Vol. 1, May 4, 2012, p. 95.

98. Mr. Brakefield testified that enthusiasm for DIFRA "really dropped" after the passage of the ARRA in mid-February 2009.[144] Conflicts were raised within DIFRA by the ARRA because it required that the Fittings used in ARRA funded projects be made in America, and, at that time, McWane was the only domestic manufacturer of Fittings. However, Mr. Brakefield testified that DIFRA ceased operating in December 2008 or January 2009, before the passage of the ARRA, but coincident with the decisions of DIFRA's members to cease submitting shipping data to DIFRA.

99. The DIFRA members appear to have made no effort whatsoever to accomplish any of the stated purposes of DIFRA. It is just not credible, in my opinion, to assert that during the period that DIFRA members were deciding what sales or shipments data members would provide, how the spreadsheet template for the data should be designed, and then submitting their data and reviewing DIFRA's shipments reports, the members of DIFRA were incapable of setting-up a single committee for any of the many standard-setting activities they supposedly planned; or, for that matter, to create a single committee to do just one of any of the many beneficial activities that DIFRA's Articles of Incorporation describe as the purposes of the organization.

100. The record strongly indicates that McWane's, Sigma's, and Star's support for DIFRA was expressly for the purpose of monitoring compliance with their price agreements and revealing cheating. This monitoring mechanism was achieved through the only activity DIFRA

[143] Rybacki Deposition, May 14, 2012, pp. 184-185; Pais IH, July 23, 2010, pp. 59-61.

[144] Brakefield Deposition Vol. 1, May 4, 2012, p. 125.

ever undertook, the collection and dissemination of Fittings shipment data provided to DIFRA by McWane, Sigma, and Star.[145]

101. Victor Pais provided an excellent description of how the DIFRA data could be used to help enforce a collusive agreements and fix prices:

> One of the advantages we enjoy in our competitive environment is what we had achieved in the past few years – a consolidation in each of the product ranges. In Fittings, there are effectively 3 – McWane, SIGMA, and Star – and all suffer from the same challenges and there seems to be a great desire to improve the pricing and each one has demonstrated thru a reasonable amount of discipline, even being protective of our respective market share. This is where the monthly market size data produced by DIFRA, an industry association that SIGMA helped to form, with 4 supplier members from Fittings (one, U.S. Pipe, actually is not a producer anymore, but a small player buying almost all of their needs from SIGMA), helps maintain the pricing discipline, as the market and market share data point to a relatively consistent and stable market pattern. It has helped all of us not to allow the sharp market decline to be mistaken as a "loss of market share," which mostly causes price reaction. Our GMs have continued to be strong, throughout the year, even as the volumes have been weak. In fact, the recent reduction in our GMs is more due to the increase in raw material prices which finally caught up with our blended inventory cost in Q3 and Q4, rather than pricing swings![146]

102. Oddly enough, though Mr. Pais describes DIFRA's role in maintaining "pricing discipline," by preventing a sharp market decline from being mistaken as a loss of market share, an activity not mentioned as a purpose of the organization in its Articles of Incorporation, he fails to mention a single activity actually listed in the Articles of Incorporation as a purpose for DIFRA's existence. He says nothing of standard setting, seminars, publications, research programs, or any plans for these activities in the future.

103. With market demand, and therefore prices, falling during the 2008 – 2009 period, collusive behavior required that McWane, Sigma, and Star be able to distinguish between declining revenue caused by decreased demand and declining revenue caused by cheating. The

[145] U.S. Pipe also provided shipment data, but it neither manufactured nor imported Fittings. Instead, U.S. Pipe purchased Fittings, primarily from Sigma, for resale with the pipes it manufactured.

[146] SIG-0002517 – 2528 at 25220.

key to doing so was the market share numbers that each of the three suppliers could calculate from the DIFRA data. If a supplier experienced falling revenues, but stable market share, then the decline in revenue would follow from the decline in overall demand rather than cheating. But, if falling revenue was accompanied by falling market share, then one or more of the rivals must have been cheating.

104. This use of the DIFRA data to monitor rivals' cooperation with collusive prices was never more evident than it was with the release of McWane's June 2008 multiplier increase. In late April 2008, SIGMA sent letters to customers located in different regions of the country announcing that, effective May 19, it would be raising its multipliers "as high as 10 multiplier points" depending on a customer's location.[147] On April 25, 2008, executives from McWane, SIGMA, and Star participated on a conference call to finalize the DIFRA sales reporting rules. They agreed that by May 15, 2008 all would have submitted annual sales data for 2006 and monthly sales data for January 2007 through April 2008. Then on May 7, Star began informing its customers of its own multiplier increases effective May 19, 2008.[148]

105. McWane, however, chose to wait and not announce any price increase until after the receipt of the DIFRA Report. When he learned that Sigma was announcing price increases, Mr. Tatman drafted a letter that would "align with the approach of waiting until the DIFRA data is available before announcing any price actions" and eliminate any "misperceptions [that were] starting to circulate."[149]

106. In a May 7, 2008 letter to distributors (and Sigma and Star), McWane stated,[150]

[147] SPP000083 – 000085, p. 000084.

[148] See ESP0002164, ESP0002166, and ESP0002168.

[149] TU-FTC-0255098-104, pp. 98 and 99.

[150] TU-FTC-0023311, emphasis added.

> Dear Valued Customer,
>
> You have likely heard or read about continued increases in factors of production impacting both domestic and global operations. The foundry industry has been hit particularly hard with sharp increases in scrap iron, alloys and transportation costs. While the financial impact to our business is real, we also recognize there are restrictions as to the level and timing at which pricing can be accommodated in the market.
>
> We are sending this general communication to our waterworks distribution customers to more clearly define our intention in regards to future pricing actions.
>
> *Before announcing any price actions, we carefully analyze all factors including: domestic and global inflation, market and competitive conditions within each region, as well as performance against our own internal metrics.* We anticipate being able to complete our analysis by the end of May. At that point, we will send out letters to each specific region detailing changes, if any, to our current pricing policy.
>
> For planning purposes only, we expect for regions with a change that multipliers will increase in the range of 6% up to 16% effective June 16th.
>
> Sincerely,
>
> Jerry Jansen
> National Sales Manager

107. Although McWane, Sigma, and Star earlier had agreed on a timetable for submitting their shipments data to DIFRA, Star failed to provide its shipments data as scheduled. However, just hours after it received McWane's May 7 letter, Star emailed the DIFRA members that it would submit its data. McWane's letter also caused Star and Sigma to suspend their announced price increases.

108. On June 5, 2008, Star finally sent its sales data to DIFRA. In an e-mail informing DIFRA president Tom Brakefield that it had submitted its data to DIFRA, Star's Dan McCutcheon quoted McWane's May 7 letter verbatim,

> Good morning Mr. President. I just sent our info in. Sorry it took us so long, but we were "carefully analyzing all factors including: domestic and global inflation,

market and competitive conditions within each region, as well as performance against our own internal metrics." (Does that look familiar?)[151]

109. On June 17, DIFRA disseminated its first monthly report. In less than an hour, McWane's Tatman performed a brief analysis of the data which he circulated to his boss McCullough, who forwarded it on to McWane's CEO.[152] Later that same day, McWane announced a price increase, and shortly afterwards Sigma and Star did too.[153]

110. By participating in the DIFRA monthly shipments reports, McWane, Sigma, and Star allowed all three Fittings rivals to monitor changes in their respective market shares and detect secret price cutting. The very day that DIFRA released its first shipments report, McWane rewarded its two rivals by announcing a price increase.[154] The increase was a direct result of DIFRA participation. Shortly thereafter, Star and Sigma followed suit with announcements of their own price increases.[155] Thus, the DIFRA reports worked exactly as predicted. By providing McWane, Sigma, and Star with the sum of their respective shipments each month, each of three firms could monitor their market shares and determine if declines in revenue were the result of declines in demand or price cutting by rivals.

111. In January 2009, when DIFRA sent its members the December 2008 aggregate shipments report, McWane's Rick Tatman wrote Thomas Walton and Leon McCullough, "December was clearly our worst share performance for the year!"[156] In Mr. Tatman's "DIFRA Market Share Analysis" based on the December 2008 DIFRA data, Mr. Tatman found that

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[151] SIG-0033880.

[152] TU-FTC-0266469.

[153] TU-FTC-0010081; SPP000086-87.

[154] See TU-FTC-0010331 – 0010332; TU-FTC-0010083 – 10084.

[155] SPP024887 - SPP024888 and SPP000087. Star's and Sigma's announcements of their price increases indicated that they would both become effective the very same day as McWane's, July 14, 2008.

[156] TU-FTC-0031718.

McWane's December 2008 market share was 41.2 percent, compared to 44.4 percent in December 2007. McWane's market share for all of 2008 was 46.1 percent, compared to 51.0 percent for all of 2007 and 54.9 percent for 2006. Total industry tons had fallen from 134,334 tons in 2006, to 118,953 tons for 2007, to 99,262 tons for 2008.[157] Although the aggregate shipment figures DIFRA data clearly showed that demand had fallen considerably over the 2006 through 2008 period, Mr. Tatman used the data just as Mr. Pais predicted, to determine that McWane's declining revenue was not the result of just declining demand, but also the result of price cutting by Sigma and Star, as evident from McWane's lower market share.[158]

112. In mid-April 2009, McWane announced a new price list and a new set of multipliers, both of which would become effective May 1, 2009. The events that occurred following this announcement illustrate McWane's, Sigma's and Star's total lack of inhibition with respect to communicating directly with rivals to fix prices.

113.

[159] and he showed no qualms about calling his competitors to discuss how Fittings should be priced. He called Dan McCutcheon, Star's Vice President for Sales to try to persuade Star to continue its use of the July 2007 price list,[160] and he appears to have called SIP's VP of Business Development, Bharat Agarwal, for the same purpose.[161]

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[157] TU-FTC-0266255 – 0266263, p. 266257.

[158] See TU-FTC-0266472; SIG-0001553-56; see also SIGTP00016204-06.

[159]

[160] Declaration of Factual Statement By Dan McCutcheon, April 28, 2010.

[161] Ibid., Appendix A. Mr. McCutcheon wrote in his Declaration, "Victor was very angry about the new price list and insisted that Star Pipe publish a letter to the market stating that we will not follow McWane's new price list. He told me that I was the only one who was not agreeing to this strategy, and that I should sign a letter stating that we would all be using the July 2007 price list where import prices were much higher." Appendix A of Mr. McCutcheon's Declaration consists of a letter sent by Mr. Agarwal addressed to "Our Valued Customers" announcing SIP's intention to use the July 2007 prices. See Q010SP0000375 – 383, p. 0375.

114. On April 22, 2009, Star announced that it would revise its price list, effective May 19, 2009, but it did not indicate whether it planned to follow McWane or what changes it planned to make.[162] Star VP Dan McCutcheon testified that his conversation with Sigma's Pais had left him unsure of whether McWane would go forward with its announced price changes.[163]

115. To eliminate this uncertainty, Star's McCutcheon telephoned McWane's Tatman. As Mr. McCutcheon as testified, "In light of my concerns, I contacted Rick Tatman at McWane to confirm McWane's intention to issue a new price list on May 1, 2009."[164] And, "I did have a doubt in the back of my mind – I wanted to make sure before we moved ahead and printed all these price lists, so I called Rick just to make sure."[165] Star's McCutcheon went on:

> So, I picked up the phone and I called him. And I said, I'm only going to ask you one question, are you guys going to come out with a new price list, because I'm getting ready to approve it and spend $25,000 to do it. And he said, we absolutely are, and he says, I'm so sure that I'll pay the $25,000 if we don't. And I said, I appreciate that, nice talking to you, and hung up the phone.[166]

116. Having assured one another they were going ahead with their new pricing, McWane implemented its price changes on May 1, 2009 as it had previously announced it would do, followed shortly thereafter by Star, which adopted substantially the same prices.[167]

D. Conclusion

117. The Fittings market is practically a textbook example of anticompetitive facilitating practices and collusion in an oligopoly. Interdependence leading to agreements to facilitate coordination and collusion, collusion in fact, and then cheating, detection, and finally

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[162] TU-FTC-0031768

[163] Second Declaration of Factual Statement of Dan McCutcheon, May 25, 2011, ¶ 16; McCutcheon Dep. 227:22 – 228:19.

[164] Second Declaration of Factual Statement of Dan McCutcheon, May 25, 2011, ¶ 17.

[165] McCutcheon Deposition, May 16, 2012, pp. 227 – 228.

[166] McCutcheon IH, May 4, 2011, pp. 257 – 258; McCutcheon Deposition, May 16, 2012, pp. 229 – 231.

[167] See McWane's price list, McWane 014242 - 451, and Star's price list, McWane 018123 - 268.

collapse. The only real surprise that characterized the Fittings cartel is just how brazen the price fixing was.

118. Senior executives at McWane, Sigma, and Star regularly communicated with one another, both directly and indirectly, in attempts to end or reduce discounting and stabilize falling prices. They used their trade association, DIFRA, to exchange shipment data so that they could monitor their market shares to detect price cutting, and McWane refused to increase its prices until both Sigma and Star had submitted their shipments data to DIFRA. Star was the last of the three to submit its data to DIFRA, and on the very day that DIFRA sent to its members the report based on this data, McWane announced its price increase, which was soon followed by similar price increases by Sigma and Star. In my opinion, the communication among the three rivals and the use of DIFRA to exchange shipments data directly resulted in these price increases.

119. The events surrounding McWane's announcement of its May 1, 2009 price list illustrates the flagrant discussions of prices among McWane, Sigma, and Star executives. They appear to show no hesitation when it comes to picking-up the phone and calling a rival to discuss prices, and, if called by a rival, they appear quite willing to have these discussions.

IV. McWane Used its Monopoly Power in the "Made in America" Fittings Market to Delay Efficient Entry by Star and Further Sustain Its Monopoly

A. The Economics of Exclusive (or Restrictive) Dealing

120. McWane imposed a form of "exclusive dealing" on waterworks distributors for the express purpose of delaying or preventing Star from entering the MA Fittings market. By unilaterally imposing this form of vertical restraint on waterworks distributors, McWane acted to maintain its monopoly position and monopoly power whenever local, state, or federal regulations required that waterworks projects use only domestically manufactured Fittings and when customers otherwise exhibited a strong preference for MA Fittings.

121. Economists use the term "vertical" to refer to different stages in the production and distribution of a given product. Raw materials suppliers, parts suppliers, manufacturers, distributors, and retailers describe firms that are vertically related. Stages of production that precede any given stage are described as being "upstream" and stages of production that follow any given stage are described as being "downstream." Economists describe a firm that operates at more than one level of a product's production or distribution as a "vertically integrated" firm. For example, a manufacturer that also produces parts for the goods it manufactures or operates an in-house distribution system is vertically integrated.[168] A firm may be vertically integrated in numerous upstream or downstream markets, or essentially not vertically integrated at all.[169]

[168] Firms that produce products that compete against one another at the same vertical stage of production are horizontally related. A horizontal merger, for example, is the acquisition of a competitor. In contrast, a vertical merger is the acquisition of a supplier or customer.

[169] Literally, every firm is vertically integrated to some, though perhaps trivial, degree. An extensive economic literature explores the factors that determine firms' decisions to rely on markets for goods or services that it uses (buying inputs such as fabricated parts from third-party manufacturers or services such as customer assistance through third-party call centers) or relying on vertical integration. More generally, "the theory of the firm" explains why society relies on firms rather than markets to organize economic activity in certain situations and not others. Central to the modern theory of the firm is the role that transaction costs play. Ronald H. Coase explained that the use of the marketplace involves costs and these costs not only help determine the size and nature of firms, but also markets and market structure. If the cost of buying from other firms is relatively low, for example, the firm is more likely to buy inputs from other firms than produce them itself. Economies from vertical integration such as reducing

122. Vertical restrictions are arrangements between firms at different stages of production that limit the ability of an "upstream" supplier or "downstream" customer to operate its business in a certain manner, usually in exchange for access to either the goods or services of the other firm. Many different types of vertical restrictions can be agreed to by vertically related firms. These include territorial restrictions in which a distributor or retailer agrees to operate in specific geographic areas in exchange for the right to sell a manufacturer's products; supply restrictions in which a manufacturer agrees to purchase a minimum amount of an input (or all of its requirements) from a particular supplier; and resale price maintenance, in which a manufacturer might supply goods or services to a retailer for resale to consumers under the restriction that the retailer agrees to sell the good or service for no less than a price specified by the manufacturer (minimum resale price maintenance) or no greater than a price specified by the manufacturer (maximum resale price maintenance).

123. Vertical restrictions can be efficient, reducing costs by eliminating "free riding" by retailers, manufacturers, or consumers; protecting manufacturers' reputations; or preventing post-contractual opportunism. As a result, a vertical restriction can result in greater output and lower prices for consumers.[170]

124. Vertical restrictions, however, are not always benign. As noted by Carlton and Perloff, "in some cases, vertical restrictions (and vertical integration) can be used for

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uncertainty in the supply inputs or coordinating interrelated stages of production of inputs and final products (producing pig iron so that the molten iron can be immediately used to make steel) represent costs of using the marketplace to obtain the inputs. See Coase, Ronald H., "The Nature of the Firm," *Economica* 4 (1937), pp. 386 – 405 and Williamson, Oliver E., *Markets and Hierarchies – Analysis and Antitrust Implications: A Study of the Economics of Internal Organization* (New York: The Free Press, 1975).

[170] Carlton, Dennis W. and Jeffrey M. Perloff, Modern Industrial Organization, 4th ed. (Boston: Pearson Addison Wesley, 2005) pp. 426-27.

anticompetitive purposes. For example, they may be used to cartelize an industry or prevent entry, or otherwise harm rivals by raising rivals' costs."[171]

125. Exclusive dealing is a vertical restraint in which "a manufacturer prevents its distributors from selling competing brands."[172] Typically, under exclusive dealing, firms compete for the right to be the exclusive supplier or seller of a product to a specific customer. Although a particular retailer or distributor may carry just a single manufacturer's product, consumers obtain the benefit of competition among competing manufacturers to obtain the exclusive supply contract. Consumers may also obtain the benefits from competing retailers or distributors, even if each one sells exclusively the products manufactured by just one of multiple competing suppliers.

126. As is the case generally with vertical restrictions, exclusive dealing arrangements can be efficient and can foster competition. They can prevent "free riding" that discourages manufacturers or retailers from investing in promotion and other output enhancing activity.[173] For example, an exclusive supply contract may allow a manufacturer to invest in promoting a retailer's sales or service, which may allow the manufacturer to more effectively compete against other manufacturers selling through other retailers. If the retailer, instead, sold the brands of many manufacturers, then, should any single manufacturer invest resources in promoting the retailer's sales or service, consumers attracted to the retailer by the manufacturer's promotional activities could, once in the retailer's store, purchase a brand of the product produced by a competing manufacturer, but sold by the same retailer. In this case, the manufacturer providing the promotional activities would be essentially providing free promotion to his competitor. To

[171] Ibid., p. 429 (footnote and chapter reference in original is omitted).

[172] Ibid., p. 672.

[173] Ibid., p. 424.

avoid doing so, the manufacture may choose to forgo otherwise economically efficient promotional activities.[174]

127. Exclusive dealing can also create incentives for retailers to be more knowledgeable about a manufacturer's products and better promote and service their sales.[175]

128. Just as a vertical contract can be thought of as a somewhat less restrictive form of vertical merger, a "restrictive" supply contract can be thought of as a somewhat less restrictive form of an exclusive supply contract. A restrictive supply contract may not outright preclude the purchase of an input from one of the supplier's competitors, the restrictions impose costs or otherwise create incentives for the input buyer to purchase exclusively from the contracted supplier. Thus, though not literally exclusive dealing, to the extent that both forms of supply contract achieve the same end, the economic analysis of "restrictive" dealing is essentially the same as that of exclusive dealing.

129. Although restrictive dealing may benefit competition, it, like other vertical restraints, may also be used to enhance or maintain market power. Restrictive dealing can raise barriers to entry by raising distribution costs. As Carlton and Perloff note, "[A]n incumbent can make it difficult or impossible for a rival to enter by tying up scarce distribution channels. Exclusive dealing is one way for manufacturers to tie up distribution."[176] Entry is particularly difficult when economies of scale require an entrant to obtain a certain level of output in order to reach minimum efficient scale. In such a case, an incumbent manufacturer does not need to "tie up" all distributors through restrictive arrangements, just enough that any manufacturer

[174] Ibid.

[175] Ibid., p. 419.

[176] Ibid., p. 430. Carlton and Perloff also note that this sort of strategic behavior can only work if channels of distribution are limited. As I discuss below, water works distributors are essentially the only channel through which Fittings are sold.

attempting to enter would not be able to obtain sufficient distribution services necessary to manufacture and sell that quantity of output required to reach the minimum efficient scale of production.[177]

130. The economic concept of "barrier to entry" has had a somewhat controversial history in its application to antitrust. McAfee, Mialon, and Williams defined what they called an "economic barrier to entry" as "a cost that must be incurred by a new [sic] entrant and that incumbents do not or have not had to incur."[178] However, antitrust analysis and enforcement policies focus strictly on how merger- and non-merger-related business practices affect consumers and consumer welfare. Accordingly, even if, in the long-run, any firm can replicate what incumbents have done and enter the market, if consumers are materially injured during that intervening period by a diminution of competition, the business practice is deemed anticompetitive.

131. The focus of antitrust analysis on consumer welfare gives rise to a more broadly defined concept of an entry barrier, what McAfee *et al.* refer to as an *antitrust barrier to entry*, "a cost that delays entry and thereby reduces [consumer] welfare relative to immediate but

[177] Thousands of different sizes and shapes of Fittings may be used in waterworks projects, but only 100 fittings account for 80 percent of the Fittings sold in the United States and less than 300 fittings account for more than 90 percent (see McWane-007527). Accordingly, even when rarely used sizes and shapes are manufactured as needed, fixed warehouse and inventory costs for both fittings and the patterns used to make molds for the fittings will add to economies of scale in production. Nonetheless, increased production also may significantly lower costs as a firm grows from a relatively small manufacturer to a larger manufacturer. Greater production levels make the use of the most efficient equipment more economical; accordingly, as the scale of production grows, costs decline through the adoption of more efficient production equipment (Interview with Charles Frazier, May 25, 2012). For further discussion of anticompetitive exclusive contracts see, Rasmusen, Eric B., J. Mark Ramseyer, and John S. Wiley, Jr., "Naked Exclusion," *American Economic Review*, December 1991, pp. 1137 – 1145; Segal, Ilya R. and Michael D. Whinston, "Naked Exclusion: Comment," *American Economic Review*, March 2000, pp. 296 – 309; and Simpson, John and Abraham L. Wickelgren, "Naked Exclusion, Efficient Breach, and Downstream Competition," *American Economic Review*, September 2007, pp. 1305 – 1320.

[178] McAfee, Preston R., Hugo M. Mialon, and Michael A. Williams, "What Is a Barrier to Entry?," *The American Economic Review*, 94, Papers and Proceedings of the One Hundred Sixteenth Annual Meeting of the American Economic Association, San Diego, CA, January 3-5, 2004 (May, 2004), pp. 461-465.

equally costly entry."[179] The effect of the singular role of consumer welfare on the concept of barriers to entry is further noted by Richard Schmalensee, "I argue that U.S. antitrust is concerned with consumers' surplus, not overall economic welfare, and that this choice of objective has important implications for the proper definition and assessment of 'antitrust barriers to entry'. . . ."[180]

132. Accordingly, a business practice that delays efficient entry creates an antitrust barrier to entry that may result in harm to consumers.[181] If, absent the business practice, the output of an entrant would grow more quickly than otherwise, allowing the entrant to attain a minimum efficient scale sooner, then the competitive impact of the entrant on prices and, consequently, on consumer welfare, will be achieved sooner. By impeding the ability of the entrant to grow sales, such a business practice ensures that consumers pay higher prices for longer periods of time.[182] In addition, if adoption of the most efficient production methods requires achieving a minimum scale, then business practices that impede the growth of an entrant and hence represent an antitrust barrier to entry, harm consumers further by delaying the

[179] McAfee *et al*., p. 463. McAfee *et al*. define an antitrust barrier to entry as reducing "social" welfare, which is what economists generally are concerned with, but not antitrust enforcement policies. The key distinction between an antitrust barrier to entry and an economic barrier to entry is not affected by the specific concept of welfare in this context, however. The economic barrier to entry concerns the long-run ability of a firm not currently operating in a market to do so in reaction to the presence economic profits. In contrast, an antitrust barrier to entry is a short-run concept. It concerns factors that delay entry and, therefore, allow mergers or other business practices to raise prices above those that would prevail in their absence, imposing costs on consumers that lower consumer welfare even if entry forces prices to return to otherwise prevailing levels in the long-run.

[180] Schmalensee, Richard, "Sunk Costs and Antitrust Barriers to Entry," *The American Economic Review*, 94, Papers and Proceedings of the One Hundred Sixteenth Annual Meeting of the American Economic Association, San Diego, CA, January 3-5, 2004 (May, 2004), pp. 471-475, p. 471.

[181] An antitrust barrier to entry is expected to prevent market forces from deterring anticompetitive effects. Thus, *de minimis* delays in entry are not relevant for antitrust purposes. By efficient entry, I am referring to entry at a minimum efficient scale that allows consumers to obtain the maximum benefits possible from entry. If immediate entry can occur, but only at a scale too small to be competitively significant because a business practices delays the ability of an entrant to obtain the minimum efficient scale, then post-entry, prices will remain high.

[182] Under the *Horizontal Merger Guidelines*, for example, an entrant facing constraints that limit its competitive effectiveness or prevent rapid expansion will not meet the "sufficiency" requirement for entry to be viewed as easy.

entrant's adoption of lower-costs methods of production. With higher costs than otherwise, the ability of the entrant to lower its prices, expand its output, and compete more vigorously with incumbent firms is constrained, further harming consumers.

B. The Need For Distribution Services Affects Entry in the MA Fittings Market

133. Wholesale waterworks distributors provide services that are crucial to the success of a Fittings supplier. Waterworks distributors operate locally, either as independent local companies, regional companies with multiple local branches, or large national companies with local branches throughout the country. Through local operations and the provision of other services, waterworks distributors provide substantial benefits to Fittings suppliers, benefits that substantially lower suppliers' costs.[183] Distributors are compensated for these services through their margin on the fittings product.

134. Each local waterworks distribution operation maintains inventories to service local contractors and municipalities. This reduces the working capital required of Fittings suppliers and reduces the substantial investments in local warehouses and distribution facilities that suppliers would require if they sold directly to all of the many local contractors that construct, expand, and repair waterworks plants and transportation systems for cities and counties throughout the country.[184]

135. Distributors also lower supplier's costs by handling billing and invoicing to local contractors and municipalities,[185] and assume the credit risk from dealing with local contractors.

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[183] McCutcheon IH, October 12, 2010, pp. 41– 42; TU-FTC-0024813 – 815, p. 815; Tatman IH, July 21, 2010, p. 72; Pais IH, July 23, 2010, pp. 42- 43.

[184] Ibid.

[185] Sheley IH, January 11, 2011, p. 120.

136. Waterworks distributors supply contractors and municipalities with a full range of products required for the construction of clean water or sewage treatment plants and clean water or sewage transportation pipelines. The products they supply include ductile iron pipes, fittings, valves, fire hydrants, and accessories, as well as steel and plastic waterworks products and other miscellaneous products used in the construction and maintenance of waterworks projects.

137. Accordingly, one important service provided by a waterworks distributor that benefits both the distributor's customers and its Fittings suppliers is the provision of "one-stop-shopping" to contractors and municipalities.[186] Because the distributor packages bundles of different types of products made from different materials for sale to contractors and municipalities, manufacturers and import suppliers of waterworks products do not need to provide this service themselves. They can specialize in one or more related line of waterworks products and not necessarily be at a competitive disadvantage relative to a manufacturer or import supplier with a more diverse line of different products made from different materials. A supplier of Fittings, for example, may use the services of a waterworks distributor to sell its Fittings alongside ductile iron, PVC, and HDPE pipes or other products manufactured or imported by other firms. Accordingly, a Fittings supplier does not need to manufacture, import, or purchase ductile iron, PVC, or HDPE pipes to package with its Fittings, and it may even realize certain efficiencies from specialization that it could not obtain (or avoid certain costs from diversification that it might incur) if it were to try to diversify into the supply of waterworks products made from PVC, HDPE, or other materials with which it has no history or experience.

[186] McCutcheon IH, October 12, 2010, pp. 41- 42; Bhutada IH, October 12, 2010, pp. 19-20.

138. Thus, the services of waterworks distributors are a vital input into the supply of Fittings. Without the benefits provided by waterworks distributors, the costs of participating in the domestic manufacturing of Fittings, or in the supply of imported Fittings, could well be substantially higher than they are now.

139. If a Fittings supplier were prevented from obtaining the services of distributors outright, it would face an absolute, long-term "economic barrier to entry." Moreover, a business practice that limits an entrant's access to distributors will limit the ability of the firm to sell its products and grow its business. Accordingly, even if access to distribution is not blocked absolutely, an incumbent's business practice that limits an entrant's access to distributors will delay the entrant's ability to grow its sales to the point to which it can have a significant competitive impact on the market.

140. In addition, by constraining the ability of an entrant to grow its sales, such a business practice could significantly delay the point in time at which an entrant will obtain the scale necessary to adopt the most efficient production processes, to the extent that efficient production technologies require a minimum scale of production to implement. In either or both cases, actions by incumbent firms that limit an entrant's access to distribution create an antitrust barrier to entry. Consequently, consumers are harmed by having to pay higher prices for longer periods of time than otherwise.

C. McWane Used Its Monopoly Power to Restrict Star's Access to Distribution for Its MA Fittings

141. McWane executives have testified that, before 2009, waterworks projects that required domestically manufactured Fittings represented approximately 15 to 20 percent of its sales.[187] In February 2009, in the midst of what some commentators have called "the Great

[187] See footnote 155; Tatman IH, July 21, 2010, p. 47.

Recession," Congress passed the ARRA, which allocated approximately $840 billion to spur economic growth and end the recession,[188] and included allocations totaling $7.4 billion for waterworks projects.[189] These funds, however, could be used for waterworks projects only if the iron, steel, and manufactured goods used in these projects were made in America.[190]

142. The record indicates that the executives of McWane, Sigma, and Star anticipated that the ARRA's MA requirement could have a significant impact on both McWane's domestic and imported Fittings sales.[191] As the sole manufacturer of MA Fittings, McWane would be the only Fittings supplier that could offer a full line of imported and domestic Fittings.

[188] http://www.recovery.gov/Transparency/fundingoverview/Pages/fundingbreakdown.aspx . Originally, ARRA expenditures were estimated as $787 billion. This figure was revised to $840 billion in 2011.

[189] The ARRA allocated $4 billion to the Environmental Protection Agency ("EPA") Clean Water State Revolving Fund and $2 billion for grants under section 1452 of the Safe Drinking Water Act (see PUBLIC LAW 111–5—FEB. 17, 2009; 123 STAT. p. 169). The ARRA also allocated an additional $1.4 billion for the cost of direct loans and grants for the rural water, waste water, and waste disposal programs authorized by sections 306 and 310B and described in section 381E(d)(2) of the Consolidated Farm and Rural Development Act (PUBLIC LAW 111–5—FEB. 17, 2009; 123 STAT. page 118).

[190] The ARRA allows for fund recipients to seek a waiver on the made in America provisions, but only when: 1.) Iron, steel, and manufactured goods are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quality; 2.) Inclusion of iron, steel, and manufactured goods produced in the United States will increase the cost of the overall project by more than 25 percent; or 3.) Applying the Buy American requirements of ARRA would be inconsistent with the public interest. (See United States Environmental Protection Agency, *Memorandum From James A. Hanlon, Director, Office of Wastewater Management and Cynthia C. Dougherty, Director, Office of Ground Water and Drinking Water To Water Management Division Directors*, April 28, 2009, p. 4.

[191] McCutcheon IH, October 12, 2010, pp. 101 – 107; SIG-0008050- 8057, p. 8053; SIG-0006431-6433, p. 6432 (Buy American "is a very serious and unexpected handicap and the problem will only get worse as our distributors will align themselves with McWane (the sole domestic fittings supplier) to retain their ability bid on the domestic only jobs. In the process of this alignment, we may lose a portion of the market that is not restricted to domestic simply because McWane will demand a larger share of the business.");

[193] Any expansion of McWane's sales of imported (or blended) Fittings that it would obtain on account of its position as the only domestic manufacturer of Fittings would represent sales lost by Sigma, Star, and fringe importers.

143. The ARRA, therefore, created an incentive for Sigma and Star to enter into domestic production of Fittings, and both companies took steps to study and consider domestic entry. McWane also analyzed the implications of supplying their competitors with MA Fittings and the possibility that Star or Sigma might enter the domestic market. But as late as May 2009, McWane remained confident in its position as the monopoly supplier of MA Fittings, as reflected in a May 29 email from McWane's VP and General Manager for its Fittings business, Rick Tatman, to his boss, Leon McCullough, in which Tatman wrote, "Regardless of whether we structure a relationship with Sigma, Tyler/Union [i.e., McWane] would remain the only true viable source of domestically produced DWIF 3" – 24" . . . ."[194]

144. On June 15, 2009, Star announced the introduction of their "new American Made line of Waterworks Fittings . . ."[195] at the annual convention of the American Water Works Association. McWane executives expressed considerable apprehension over the prospect of Star entering the MA Fittings market. In an e-mail to Rick Tatman shortly after Star's announcement of its entry, McWane Senior Vice President Thomas Walton wrote, "Whether we end up with Star as a complete or incomplete domestic supplier *my chief concern is that the domestic market gets creamed from a pricing standpoint* just like the non-domestic market has

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[194] TU-FTC-0031766 – 31767, p. 31766. Mr. Tatman's use of DWIF in this context is a typographical error. Mr. Tatman uses the acronym DIWF for "ductile iron waterworks fittings," which are the same as "ductile iron pipe fittings."

[195] TU-FTC-0031773 – 31774; and

been driven down in the past. That would dramatically affect our profit potential."[196] Mr. Tatman replied, "*If their [i.e., Star's] claims are ahead of their actual capabilities we need to make sure that they don't reach any critical market mass that will allow them to continue to invest and receive a profitable return.* The difficulty and expense of doing so is somewhat proportional to their product availability and supply costs both of which we have yet to get hard data on."[197] McWane was bent on preventing Star's entry into the MA market in part because "Star would not be a responsible competitor. . . ."[198]

145. On September 22, 2009, before Star began shipping its domestic Fittings, McWane announced that effective October 1, 2009 it was implementing a new domestic fitting and accessory program.[199] The program required any waterworks distributor that wished to sell McWane domestic Fittings and accessory products "to fully support McWane branded products for their domestic fitting and accessory requirements."[200] Distributors that failed to purchase only McWane domestic fittings (i.e., to "fully support" McWane domestic products) "may forgo participation in any unpaid rebates for domestic fittings and accessories" or face delays in shipments of as many as 12 weeks.[201]

146. McWane carefully wrote the program announcement with the words "may" and "or," and there was a mix of interpretations McWane's announcement in the marketplace; but McWane itself concluded that "the market has interpreted the communication in the more hard

[196] TU-FTC-0031436 – 31437, p. 31436 (emphasis added).

[197] TU-FTC-0255547 – 255548, p. 255547 (emphasis added).

[198] McWane-000264, slide 4.

[199] TU-FTC-0010345.

[200] Ibid.

[201] Ibid.

line "will" sense."[202] And that, apparently, is how McWane wanted its program announcement to be understood. In fact, McWane told its sales representatives to quietly convey just that message to its distributors: "What are we going to do if a customer buys Star domestic? We are not going to sell them our domestic ... Once they use Star, they can't EVER buy domestic from us."[203]

147. Almost immediately after the release of the September 22, 2009 announcement by McWane of its "full support" program, distributors that had already requested quotes from Star for domestic Fittings withdrew their requests and told Star that they were no longer interested in purchasing domestic Fittings from the company.[204] Ramesh Bhutada testified that before McWane's announcement, it had received requests for quotes for domestic fittings worth approximately $10 million.[205] The requests were from the two largest waterworks distributors in the country, HD Supply and Ferguson, important regional distributors, such as members of TDG, Mainline, and Winwater, and a variety of independent waterworks distributors.[206] Other distributors have testified that they had intended to purchase some of their domestic fittings requirements from Star, but after McWane's announcement, they decided not to submit requests for quotes from Star.[207]

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[202] TU-FTC-0255188 – 255192, p. 255189.

[203] TU-FTC-0240054-056, p. 055; Pitts IH, October 29, 2010, pp. 76-79, 137-139.

[204] Bhutada Deposition, May 14, 2012, pp. 79-80, 87; E00000787; Q007SP0000118-119; Q011SP0000279; McCutcheon Deposition, May 16, 2012, pp. 245-246; HDSWW001395; Webb IH, November 19, 2010, pp. 198-199; Thees Deposition, June 1, 2012, p. 77; Berry Deposition, June 1, 2012, pp. 131-133.

[205] Bhutada Deposition, May 14, 2012, pp. 79-80.

[206] Ibid., at p. 80; Tatman IH, July 21, 2010, pp. 278-279; Bhutada Deposition, May 14, 2012, pp. 79-80, 87; E00000787; Q007SP0000118-119; Q011SP0000279; McCutcheon Deposition, May 16, 2012, pp. 245-246; HDSWW001395; Webb IH, November 19, 2010, pp. 198-199; Thees Deposition, June 1, 2012, p. 77; Berry Deposition, June 1, 2012, pp. 131-133.

[207] Sheley Deposition, April 24, 2012, p. 135; Prescott Deposition, May 8, 2012, p. 113; Sheley IH, January 11, 2011, pp. 96-97, 142; Morrison IH, February 2, 2011, pp. 72-76, 83-85;

148. On September 23, 2009, HD Supply, the largest waterworks distributor in the country, sent a memorandum to all of its district managers, branch managers, and operations managers instructing them to only buy MA Fittings from McWane or Sigma.[208] Ferguson, the second largest distributor in the country also instructed its district managers and branches to purchase MA Fittings from only McWane and Sigma.[209] Together HD and Ferguson distribute approximately 50 percent of the Fittings sold in the United States.[210]

149. With HD Supply, Ferguson, and regional distributors such as members of TDG, Winwater, and Mainline abiding by McWane's "full support" program, McWane denied Star access to a large portion of the market, and likely among the most efficient means of distribution, the large U.S. and regional, multi-branch distributors.[211]

150. Hajoca experienced the full impact of McWane's "full support" policy. Hajoca has a unique business model. Each of its local branches operates as if they were a local company, with the local manager having the same responsibilities that the owner of a local business would have.[212] Hajoca uses this business model not just for its waterworks distribution business, but for a variety of businesses it owns, all of which have the characteristic of requiring local operations to provide service in local markets.[213] Accordingly, Hajoca's branch managers in its waterworks distribution business had full responsibility for the branch, including choosing suppliers.[214]

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[208] HDSWW001395.

[209] Thees Deposition, June 1, 2012, p. 77.

[210] Thees IH, November 16, 2010, pp. 87-88.

[211] See Ibid. at pp. 89-92; see also McCutcheon IH, October 12, 2010, pp. 49-55.

[212] Pitts IH, Oct. 29, 2010, pp. 68-70; HAJ000043.

[213] Hajoca's other businesses include residential and commercial plumbing, heating and air condition sales and service, pool suppliers, and industrial pipe, valves and fittings. See www.hajoca.com.

[214] Pitts IH, October 29, 2010, p. 68-70; HAJ000043.

151. Hajoca refused to alter its business model after McWane announced its "full support" program.[215] At that time two Hajoca locations needed MA Fittings. One was in Oklahoma and the other in Pennsylvania.[216] Historically the Pennsylvania branch had purchased all of its fittings from McWane because McWane was the only supplier of domestic fittings and in Pennsylvania state law requires the use of domestically produced iron and steel products for all public construction, repair, and maintenance projects.[217]

152. The Hajoca Oklahoma branch decided to purchase domestic fittings from Star. McWane then informed Hajoca that they would be cut-off and lose their rebate for domestic fittings if they did not comply with the "full support" program.[218] Hajoca stood by its own corporate policy to allow individual branches to choose their suppliers.[219]

153. McWane then informed Hajoca that their branches no longer had access to their domestic line of fittings. Hajoca negotiated with McWane to allow any outstanding orders for domestic fittings from the Pennsylvania branch to be placed by December 4, 2009.[220] McWane allowed a little leeway on the date, but no new orders were allowed after approximately December 23, 2009.[221] McWane also instructed Sigma not to sell MA Fittings to Hajoca, as

[215] Pitts Deposition, April 11, 2012, p. 24.

[216] HAJ000055-56.

[217] Pitts IH, October 29, 2010, p. 57.

[218] HAJ000058-59.

[219] Pitts IH, October 29, 2010, pp. 68-70.

[220] HAJ000046.

[221] Roy Pitts testified that McWane gave an extension of "a week or two" after Rick Tatman returned from China (December 9,2010), which would have extended the date out to about December 23, 2009. Pitts IH, October 29, 2010, pp. 123-124.

required by the MDA.[222] In addition to cutting off its MA Fittings to all Hajoca branches, McWane withheld the Hajoca's fourth quarter 2009 domestic rebate for fittings.[223]

154. Hajoca did not regain access to McWane MA Fittings until the following April.[224] McWane ultimately relented and supplied Hajoca branches, except the Oklahoma branch, with MA Fittings even though the Oklahoma branch continued to buy from Star. Nevertheless, Hajoca was denied MA Fittings from McWane for the period of time during which ARRA funded waterworks projects were at their peak.[225]

155. Groeniger & Company is a family-owned waterworks distribution company that operated nine branches before being acquired by Ferguson in 2011.[226] Michael Groeniger, the former owner of Groeniger & Company, testified that before McWane's September 22, 2009 announcement of its "full support" policy for domestic fittings, Groeniger awarded two big domestic-only projects to Star.[227] Mr. Groeniger testified that Star handled these jobs very well, and that he was pleased with the quality of Star's service.[228] Shortly after the McWane policy came out, McWane raised its price on a municipal contract Groeniger had with San Jose Water Company.[229] McWane imposed its price increase despite the traditional industry practice of

[222] TU-FTC-0257648-49.

[223] HAJ000045.

[224] Pitts Deposition, April 11, 2012, pp. 155-158; HAJ00001.

[225] See Figure 1. McWane ultimately relented and settled its dispute with Hajoca. McWane may not thereafter have punished other distributors that purchased Star MA Fittings as harshly. This could be explained by two factors: First, by no later than the end of January 2010, approximately one month after cutting-off Hajoca, McWane knew of the FTC's investigation in this matter (Mr. Tatman sent McWane executives a presentation for use as a reference during a February 24, 2010 conference call with FTC staff, McWane-007527 and McWane-007526. The presentation was first created on January 29, 2010). Second, McWane wanted compliance with its policy—not to have violators who they must punish. One well-publicized punishment of a well-known firm can have a substantial deterrence effect on others, reducing the likelihood that they will violate the policy.

[226] Groeniger Deposition, May 11, 2012, p. 125.

[227] Ibid., pp. 217-218.

[228] Ibid., pp. 224-225.

[229] Ibid., p. 95.

honoring any municipal contracts already in place at agreed upon prices.[230] Although McWane ultimately lowered its price, for six months Groeniger, was forced to pay higher than previously agreed-upon prices to service the San Jose contract.[231]

156. To Groeniger, McWane's "full support" policy, and the threats implied by it, was not unlike a similar policy that McWane had imposed in the 1980's.[232] Mr. Groeniger testified that back in the 80s, McWane had cut Groeniger off from supply for at least a year and possibly as many as three.[233] McWane wanted Groeniger to purchase more of its products, and when Groeniger didn't increase its purchases, McWane cut them off.[234]

157. At the time that McWane announced this domestic program, it sold virtually 100 percent of domestically manufactured Fittings. Any distributor hoping to supply Fittings for a waterworks project funded with ARRA grants or loan guarantees had to purchase from McWane at that time. Accordingly, at that time and continuing until Star was well-positioned to satisfy substantially all of its needs, any distributor that purchased Star Fittings that could have been purchased from McWane would incur substantial risks. If a distributor had to wait for months for a McWane shipment after having purchased domestic Fittings from Star, the delay could severely harm its business relationship with a contractor. Accordingly, distributors have testified that they viewed McWane's September 22, 2009 program announcement as essentially a McWane imposed exclusive distribution requirement.[235]

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[230] Ibid., pp. 92-93.

[231] Ibid., p. 94.

[232] Ibid., pp. 102-104.

[233] Ibid., p. 106. Mr. Groeniger testified, "Year, two years. Maybe three."

[234] Ibid., p. 104.

[235] HDSWW001395; Coryn Deposition, May 16, 2012, p. 114; Prescott Deposition, May 8, 2012, pp. 120-121; Webb Deposition, May 30, 2012, pp. 93-94; Morton Deposition, May 30, 2012 pp. 144-146; USP-FTC_00000008-9; Berry Deposition, June 1, 2012, pp. 164-165.

158. By restricting Star's access to distribution, McWane's "full support" program would, as Mr. Tatman described, "make sure that they don't reach any critical market mass that would allow them to continue to invest and receive a profitable return."[236] Although McWane's "full support" program did not completely prevent Star from selling domestic Fittings, the evidence indicates that distributors that had expressed interest in buying considerable quantities of Star's domestic Fittings before September 22, 2009 withdrew their requests shortly after this date on account of McWane's new policy.[237] Moreover, with HD Supply and Ferguson, which together account for approximately 50 percent of the sales of Fittings nationwide, informing their branches to not purchase domestic fittings from Star on account of the "full support" program, Star was denied access to a large share of the market. With some of the larger regional distributors also being unwilling to purchase domestic fittings from Star's access to the MA Fittings market was greatly limited, slowing its growth and lessening its ability to reach an efficient scale of production. With higher costs and less output than otherwise, McWane's "full support" policy lessened Star's ability to compete with McWane. As a result, prices were higher than otherwise and consumers were harmed.

159. McWane has argued that an efficient rationale for its "full support" program was to avoid "free-riding" by Star and waterworks distributors that would allow Star to focus production on only the most popular fittings while taking advantage of McWane's investments to obtain less popular fittings when necessary.[238] The disingenuous nature of McWane's "free

[236] TU-FTC-0255547 – 255548, p. 255547.

[237] Bhutada Deposition, May 14, 2012, p. 79-80; E00000787; Q007SP000118-119; Q011SP0000279; McCutcheon Deposition, May 16, 2012, pp. 245-246; HDSWW001395; Webb IH, November 19, 2010, pp. 198-199; Thees Deposition, June 1, 2012, p. 77; Berry Deposition, June 1, 2012, pp. 131-133.

[238] See "Memorandum of McWane, Inc. Responding to Commission Staff Questions Regarding the Competitiveness of the Ductile Iron Waterworks Fittings Market in the United States," May 10, 2011 [White Paper submitted to the FTC Staff], p. 28

riding" rationale for its "full support" policy is evident by the fact that had "free riding" by Star and distributors been a legitimate concern, McWane could have eliminated any potential for it to occur in a much less restrictive, exclusionary and anticompetitive way. Rather than requiring "full support" over a distributor's entire purchases of domestic Fittings, McWane could have adopted a policy in which "full support" for its domestic products was required for any project in which any McWane Fittings was used. Such a program would have eliminated any potential for free riding; yet, would have allowed Star to participate in any project through any distributor as long as it was willing and able to supply all domestic fittings specified, which it claimed it was.[239] Such a policy would have ensured that Star or its distributors could not "cherry pick," while not restricting Star's access to the one input necessary for any manufacturer to enter the MA Fittings market: distribution.

160. McWane could implement its "full support" policy only because it had the monopoly power to do so. Had McWane faced efficient competition by other incumbent manufacturers of Fittings, it could not have imposed such a restrictive dealing policy on distributors that would have been unwilling to voluntarily purchase domestic Fittings from only McWane. If distributors felt harmed by McWane's policy, they could have turned to another incumbent supplier of domestic Fittings, had any existed.

161. Any distributor that wanted to only purchase domestic Fittings from McWane was always free to do so. McWane chose to implement the policy even though the distributors would not have chosen to do so themselves. Where economists find efficient exclusive (or restrictive) dealing, both parties benefit because these agreements are generally voluntarily agreed to. A retailer may agree to stock only one brand of a product, but only because the manufacturer offers

[239] TU-FTC-0250485.

the retailer a better deal than any other manufacturer of the product. The manufacturer voluntarily agrees to charge the retailer less (or provide better service, or better quality, or other benefits to the retailer) because it gets the benefits from exclusivity, which may include not only sole access to the retailer's customers, but also the retailer's dedication and enthusiasm for the brand, promotion of the brand, better customer service, or any other "point of sale" benefits the retailer would have incentives to provide the manufacturer, if it were the only brand of the particular product that the retailer stocked.[240]

162. Thus, it is not mere coincidence that McWane's "full support" policy did not cover imported Fittings. As discussed previously, Fittings is a homogeneous product. If McWane had told distributors that they would lose unpaid rebates and have limited access to McWane's products unless they provided "full support" to McWane's imported Fittings, distributors could have easily purchased virtually identical Fittings supplied by Sigma, Star, or any number of the small fringe importers. I strongly suspect that Sigma, Star, or any other importer would have been quite willing to make sales at McWane's expense to distributors that were not willing to "fully support" McWane's imported Fittings.

163. Although Star has obtained some sales, these sales are far below its current ability to supply domestic Fittings, and not sufficient for it to obtain the scale necessary to justify the capital expenditures necessary to build or buy a cost-efficient foundry of its own. Testimony from investigational hearings indicates that Fittings production faces significant economies of scale. For example, McWane's Leon McCullough testified:

[240] Benjamin Klein and Andres Lerner, "The Expanded Economics of Free Riding: How Exclusive Dealing, Prevents Free-Riding and Creates Undivided Loyalty," 74 *Antitrust Law Journal*, 474, 491-496 (2007).

McWane's Richard Tatman concurred with Mr. McCullough, describing significant economies of scale in the production of Fittings:

164. Thus, the testimony of McWane executives as well their statements in documents written during the course of business indicates both that the production of Fittings entails significant economies of scale and that the express purpose of imposing exclusive dealing on distributors was to "eliminate Star as a domestic supplier of fittings."[243]

165. Although McWane may not have (yet) eliminated Star from the domestic Fittings market, its "full support" program has delayed Star's ability to enter the MA Fittings market with competitively significant sales. Moreover, with the economies of scale necessary to obtain a minimum efficient size for its own foundry, Star could lower its costs significantly. The scale to justify a foundry would allow Star to obtain the efficiencies offered by high-volume manufacturing equipment. Equally important, it would enable Star to avoid the inefficiencies

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[243] McWane-017936.

caused by its continued use of others' foundries to manufacture its MA Fittings.

[244]

166. By using its market power to impede Star's growth, McWane also has managed to maintain a level of monopoly power that Star otherwise would have diminished. Accordingly, the ultimate result of McWane's use of its monopoly power to impose its "full support" policy has been to keep the prices of domestic Fittings manufactured for the MA Fittings market higher than otherwise and reducing consumer welfare.

D. Conclusion

167. McWane's "full support" program resulted in Star immediately losing sales by distributors fearing the loss of rebates and access to McWane's MA Fittings. HD Supply and Ferguson, the two largest distributors in the country, and other distributors refused to purchase MA Fittings from Star as a direct result of the "full support" policy. By denying Star the services of distributors that represented such a large share of the U.S. market, McWane erected a barrier to entry the impeded Star's growth and its ability to most efficiently manufacture MA fittings.

168. McWane could not have imposed a "full support" policy without its exercising monopoly power. By implementing its "full support" policy, McWane has been able to maintain monopoly power for longer than otherwise, resulting in higher prices than otherwise.

[244] Bhutada Deposition, May 14, 2012, pp. 73-75, 126-131.

169. By impeding Star's access to distribution and thereby its growth, McWane's "full support" program lowered the degree of competition that otherwise would have existed between McWane and Star. The result was higher prices and lower consumer welfare.

V. McWane Entered the MDA to Eliminate Risk of Independent Sigma Entry; Had Sigma Entered, Competition Would Have Been Enhanced

170. McWane entered the MDA with Sigma to eliminate the risk that Sigma would enter into the MA Fittings market as Star was doing. Had Sigma entered independently, competition would have been enhanced, and consumer welfare increased.

171. After passage of the ARRA, Sigma assured its customers that it would be able to supply them with domestic Fittings.[245] McWane reacted by weighing the risk of independent Sigma entry against supplying Sigma with its domestic Fittings, which McWane regarded as "a choice of evils as having more Domestic suppliers doesn't really increase the size of the pie."[246] On August 18, McWane's Tatman wrote McWane VPs McCullough and Walton, saying he was "not picking up any strong sense that they [Sigma] have a strong alternate path at this point that they'd be willing to invest significant $ into."[247] "As such," Tatman advised, he would "not throw too much $ at this insurance policy [the MDA] . . . ."[248] On September 17, apparently having concluded that the risk of Sigma investing in an alternate path justified the payment of *some* insurance premium, McWane entered the MDA with Sigma.[249]

172. I have been asked by the staff of the Bureau of Competition to consider the competitive effects of the MDA under the assumption that Sigma would have entered into the MA Fittings market as a domestic manufacturer had the MDA not been signed. Under this assumption, the MDA reduced competition in the MA Fittings market that otherwise would have lowered prices and increased consumer welfare.

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[245] Pais IH, July 23, 2010, pp. 140 - 145.

[246] TU-FTC-0258025.

[247] TU-FTC-0265821 – 827, p. 0265821.

[248] Ibid.

[249] SIG-00001-21

173. If Sigma would have entered into the domestic production of Fittings *but for* the MDA, then the MDA would not be characterized properly as a vertical supply agreement in which McWane acted as a supplier of domestic Fittings to a downstream distributor, Sigma. Instead, it would be a characterized properly as a horizontal agreement between McWane and Sigma that imposed significant restrictions on competition between the two companies.

174. The MDA greatly restricted the prices at which Sigma could resell McWane's domestic Fittings. The MDA stated that Sigma could sell McWane's domestic Fittings "at any price it deems appropriate [although] it is the unilateral policy of McWane not to appoint or continue any OEM distributor who resells McWane Domestic Fittings at a price less than 98% of McWane's published pricing on a weighted average basis for all customers and items sold during any given quarterly period…."[250] That is, Sigma could regularly discount McWane's Fittings by no more than 2 percent below McWane's published pricing, irrespective of market conditions, competition from Star for a specific project, or any other factor that might cause Sigma to offer a distributor a price more than 2 percent below McWane's published prices. The MDA also required Sigma to offer a rebate program of 8 percent or greater rebate to any customer that purchased more than $200,000 annually of McWane domestic Fittings or that stocked McWane's domestic Fittings in the normal course of business.[251]

175. The MDA not only controlled Sigma's pricing, but also McWane's. Sigma expressly requested that the same rules on pricing and customers that the MDA required of it apply to McWane.[252] Moreover, McWane sales managers and production executives explicitly requested their salespeople to abide by the restrictions placed on Sigma. "We can't be moving

[250] SIG-00001 - SIG-00021, p. 00002.

[251] SIG-00001 - SIG-00021, p. 00002.

[252] SIG – 0003947.

domestic numbers with our MDA with Sigma. We need to stay stable so let's keep focused on what is happening out there."[253] "Sigma (and in theory Tyler Union [McWane]) is supposed to sell within 98% of the published levels."[254]

176. McWane recognized that having multiple suppliers of domestic Fittings would not significantly increase the overall size of the MA Fittings market, and that an increase in net tonnage of its sales of domestic Fittings for the MA Fittings market would be unlikely.[255] The demand for fittings is derived from the demand for new sewage treatment plants or clean water treatment plants, or new or replacement water and sewage transportation systems. With the price of fittings representing only 5 percent or so of the cost of waterworks projects, prices for Fittings could be well above competitive levels without having a significant effect on the demand for Fittings.

177. At any given time, multiple suppliers of MA Fittings for use in ARRA projects or any other waterworks projects in which they are specified would have been competing for a share of a nearly fixed quantity of MA Fittings demanded for waterworks projects. Star's entry alone raised the concern that the domestic market would "get creamed from a pricing standpoint."[256] Had Sigma also entered the MA Fittings market prices would likely have fallen substantially below the prices McWane had commanded as the sole producer of MA Fittings.

178. Thus, if Sigma had entered into the domestic production of Fittings rather than agreeing to the MDA, consumer welfare would have increased because of the enhanced degree

[253] Tu-FTC-0245518 – 245519, p. 235518 (e-mail from Jerry Jansen to Greg Adams and Marla Drake, October 4, 2009)

[254] TU-FTC-0249663 (e-mail from Rick Tatman to Leon G. McCullough and Thomas Watson, December 13, 2009).

[255] McWane-000264, slide 4.

[256] TU-FTC-0031436 – 31437, p. 31436

of competition in the MA Fittings market that Sigma's entry would have engendered and the resulting lower prices.

VI. Conclusions

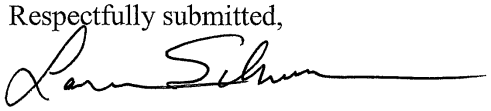
179. Based on my economic analysis, I conclude that Sigma, Star and McWane communicated with one another by a variety of methods for the purpose of "stabilizing" falling prices and raising prices to higher levels. During certain periods of time Fittings prices increased as a result of this communication.

180. I also conclude that McWane, Sigma, and Star formed DIFRA for the purpose of uncovering cheating and "stabilizing" falling prices. To achieve this end, executives from McWane, Sigma, and Star not only used information exchanged through DIFRA, but also communicated with each other. This communication led to McWane raising price upon receipt of the DIFRA data, a price increase that Sigma and Star followed.

181. I further conclude that McWane used its monopoly power in the domestic production of Fittings to prevent or delay Star's efficient entry into the MA Fittings market. It accomplished this end by unilaterally imposing restrictive dealing on distributors, greatly diminishing Star's access to distribution for its products. By exercising its monopoly power in this way, I conclude that McWane was able to maintain monopoly power that otherwise would have been diminished by Star.

182. Lastly, I conclude that, based on the assumption that Sigma would have entered the MA Fittings market but for McWane's offer of the MDA, McWane and Sigma used the MDA to restrict discounting by both firms and to prevent the enhanced degree of competition in the MA Fittings market that Sigma's entry would have engendered.

Respectfully submitted,



Laurence Schumann, Ph.D.

Appendix A

LAURENCE SCHUMANN, PhD
FEDERAL TRADE COMMISSION
BUREAU OF ECONOMICS
600 PENNSYLVANIA AVE., NW
WASHINGTON, DC 20580

- **Education**
  - PhD in Economics, University of Virginia (1986)
  - BA *with Distinction*, Major in Economics, University of Virginia (1980)

Current Position

Federal Trade Commission

Economist, Bureau of Economics
March 2008 – Present

Coordinator – Bureau of Economics Competition Advocacy Program
December 2008 – September 2010

Technical Assistance Missions:

Hue, Vietnam
Competition Law Enforcement: Experiences from Vietnam and the United States, May 13, 2011

Nha Trang, Vietnam
Regional Training Workshop: Legal and Economic Framework for Merger Analysis, May 9 – 11, 2010

Budapest, Hungary
Competition Economics Regional Training Conference, June 1 – 3, 2010

Nairobi, Kenya
Workshop On Antitrust Enforcement And Economics, September 22-24, 2009

Economist, Bureau of Economics
September 1985 – March 1996

Previous Positions

LECG
Senior Managing Economist
June 2006 – February 2008

CRA International
Principal
January 2004 – May 2006

Glassman-Oliver Economic Consultants
Vice President
March 1996–January 2004

Expert Testimony

Confidential Medical Device Arbitration. *Hearing testimony, deposition, and expert report* (2004).

Solaia Technologies LLC v. *Rockwell Automation, Inc. et al.* (Civil Action No. 03 C 0566), U.S. District Court for the District of Illinois, Eastern Division. *Expert report* (2003).

United States of America v. *Boston Scientific Corporation* (Civ. No. 00-12247-PBS), U.S. District Court for the District of Massachusetts. *Trial testimony, deposition, and expert report* (2002).

Sony Electronics, Inc. et al. v. *Soundview Technologies, Inc.* (Lead No.: 3:00CV754 (JBA)), U.S. District Court for the District of Connecticut. *Expert Report and affidavit* (2002).

Angelo Prieto, Trustee of the Brett M. Davis Insurance Trust, and Brett M. Davis, Individually v. *John Hancock Mutual Life Insurance Company, Jim Engram, Individually and Jim Engram & Associates* (Civil Action No. 3:97-CV-2441-H), U.S. District Court for the Northern District of Texas, Dallas Division. *Expert report* (2000).

Sacramento Municipal Utility District v. Campbell Soup Company, American Arbitration Association. *Hearing testimony and deposition* (1999).

Easy Gardner Inc. v. *Dalen Products, Inc.* (Civil Action No. W97-CA261), U.S. District Court for the Western District of Texas, Waco Division. *Expert report* (1998).

Bayou Steel Corporation v. *United Steelworkers of America* et al. (Civil Action No. 95-496-RPM) U.S. District Court for the District of Delaware. *Expert report and deposition* (1997).

Federal Trade Commission v. Boston Scientific Corporation (Civil Action No. 1:95 CV00198) United States District Court for the District of Columbia. *Expert report* (1995).

Publications

"Discriminatory Dealing With Downstream Competitors: Evidence From the Cellular Industry." (with David Reiffen and Michael R. Ward), *The Journal of Industrial Economics* 48, September 2000.

"In the Matter of Weyerhaeuser Company: The Use of a Hold-Separate Order in a Merger with Horizontal and Vertical Effects." (with James D. Reitzes and Robert P. Rogers), *The Journal of Regulatory Economics* 11, May 1997.

"Patterns of Abnormal Returns and the Competitive Effects of Horizontal Mergers." *The Review of Industrial Organization* 8, December 1993.

"The Competitive Effects of Horizontal Mergers in the Hospital Industry: A Closer Look." (With Michael G. Vita), *The Journal of Health Economics* 10, October 1991.

"State Regulation of Takeovers and Shareholder Wealth: The Case of New York's 1985 Takeover Statutes." *The RAND Journal of Economics* 19, winter 1988.

"Industry Structure with Fluctuating Demand." (With David E. Mills), *The American Economic Review* 75, September 1985. Reprinted in *Small Firms and Economic Growth,*

Zoltan J. Acs, ed., 1996, Elgar Reference Collection, International Library of Critical Writings in Economics, vol. 61.

- **Research Reports and Other Papers**

  "An Economic Analysis Of The Draft Small Open-Flame Regulation Of Upholstered Furniture." (with Lloyd E. Oliver). Report submitted to the staff of the U.S. Consumer Product Safety Commission, February 2001.

  "Case Studies of the Price Effects of Horizontal Mergers." (With Robert P. Rogers and James D. Reitzes), Federal Trade Commission, Bureau of Economics Staff Report, April 1992.

  "Comment on Weidenbaum and Vogt's 'Takeovers and Stockholders: Winners and Losers.'" (With Robert Stoner), *California Management Review* (published as a letter to the editor), spring 1988.

  "The Effects of FTC Antitrust Challenges on Rival Firms 1981-1987: An Analysis of the Use of Stock Returns to Determine the Competitive Effects of Horizontal Mergers." Federal Trade Commission, Bureau of Economics Staff Report, November 1989.

- **Teaching Experience**

  - **University of Virginia, Department of Economics**

    Visiting Lecturer, The Law and Economics of Antitrust Policy, January 1990–May 1990

    Instructor, Intermediate Microeconomics, August 1983–May 1984

    Teaching Assistant, Graduate Econometrics, January 1983–May 1983

    Teaching Assistant, Introductory Economics, August 1982–December 1982

    Teaching Assistant, Introductory Economics, August 1981–May 1982

- **Journal Referee**

  The Journal of Industrial Economics

  The Journal of Law and Economics

  The Journal of Law, Economics, & Organization

  The RAND Journal of Economics

Appendix B

Materials Considered

Books

- Carlton, Dennis W. and Perloff, Jeffrey M., Modern Industrial Organization, 4th ed. (Boston: Pearson Addison Wesley, 2005).
- Colander, David C., Microeconomics, 8th ed. (Boston: McGraw-Hill Irwin, 2010).
- Connor, J.M., Global Price Fixing: Our Customers are the Enemy (Boston: Kluwer Academic, 2001).
- Connor, John M., Global Price Fixing 2nd ed. (Berlin: Springer-Verlag, 2008).
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- Pepall, Lynne, Daniel J. Richards, and George Norman, Industrial Organization: Contemporary Theory and Practice, 2nd ed. (Mason, Ohio: South-Western – Cengage Learning, 2002).
- Williamson, Oliver E., Markets and Hierarchies – Analysis and Antitrust Implications: A Study of the Economics of Internal Organization (New York: The Free Press, 1975).

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- Baker, Jonathan, "Market Definition: An Analytical Overview" (2006).
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- Harrington, Joseph E., “Detecting Cartels,” Handbook of Antitrust Economics, ed. Paolo Buccirossi, 213 (2008).
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- Kaplow, Louis, "Direct Versus Communications-Based Prohibitions on Price Fixing," 3 Journal of Legal Analysis, 449 (2011).
- Kirby, Alison "Trade Associations as Information Exchange Mechanisms," 19 RAND Journal of Economics, 138 (1988).
- Klein, Benjamin and Andres Lerner, “The Expanded Economics of Free Riding: How Exclusive Dealing, Prevents Free-Riding and Creates Undivided Loyalty,” 74 Antitrust Law Journal, 474 (2007).
- Kovacic, William E., "The Identification and Proof of Horizontal Agreements Under The Antitrust Laws," 38 Antitrust Bulletin, 5 (1993).
- Kovacic, William E., Robert C. Marshall, and Leslie M. Marx, "Plus Factors and Agreement in Antitrust Law," 110 Michigan Law Review, 393 (2011).
- Lafontaine, Francine "Exclusive Contracts and Vertical Restraints: Empirical Evidence and Public Policy," (September 2005).
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Transcripts and Exhibits	Type
10.11.16 Thees, Bill	IH Tr and Exhibits
11.01.11 Sheley, James	IH Tr and Exhibits
11.02.11 Morrison, Edward	IH Tr and Exhibits
10.12.14 Groeniger, Michael	IH Tr and Exhibits
10.11.19 Webb, Jerry	IH Tr and Exhibits
11.01.13 Coryn, Michael	IH Tr and Exhibits
11.01.04 Prescott, Peter	IH Tr and Exhibits
11.01.28 Gibbs, Roger	IH Tr and Exhibits
10.10.29 Pitts, Roy	IH Tr and Exhibits
11.01.26 Johnson, Wayne	IH Tr and Exhibits
10.08.12 McCullough, Leon	IH Tr and Exhibits
10.07.21 Tatman, Richard	IH Tr and Exhibits
10.08.06 Rona, Mitchell	IH Tr and Exhibits
10.07.23 Pais, Victor	IH Tr and Exhibits
10.06.04 Agarwal, Bharat	IH Tr and Exhibits
10.06.04 Agarwal, Tilak	IH Tr and Exhibits
10.10.12 McCutheon, Dan	IH Tr and Exhibits
10.10.12 Bhutada, Ramesh	IH Tr and Exhibits
11.11.10 Minamyer, Mathew	IH Tr and Exhibits
12.03.16 Haley, Richard	Depo Tr and Exhibits
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12.04.17 Fairbanks, Richard	Depo Tr and Exhibits
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12.04.24 Frazier, Charles	Depo Tr and Exhibits
12.04.24 Gupta, VJ	Depo Tr and Exhibits
12.04.24 Sheley, Dennis	Depo Tr and Exhibits
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12.05.04 Brakefield, Tom	Depo Tr and Exhibits
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12.05.08 Prescott, Everett	Depo Tr and Exhibits
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12.05.31 Walton, Thomas	Depo Tr and Exhibits
12.06.01 Berry, Michael	Depo Tr and Exhibits
12.06.01 Thees, William	Depo Tr and Exhibits

Correspondence

- 2010.05.03 Sigma White Paper
- 2010.09.30 Sigma White Paper
- 2010.10.20 Sigma WP (DIFRA)
- 2010.10.20 Sigma WP (MDA)
- 2011.05.10 McWane White Paper
- 2011.05.12 McWane White Paper
- 2010.06.01 6:32 pm E-mail to Renner from Stargard
- 2011.05.26 Letter to Renner from Stargard re: Available DIWF distributors
- 2012.03.06 Letter to Lavery from Hitsky re: Enclosing US Pipe production
- 2012.03.21 Letter to Brock from Lavery re: US Pipe Documents
- 2012.04.06 3:23 pm E-mail to Holleran from Lavery
- 2012.04.06 3:49 pm E-mail to Holleran from Lavery
- 2012.04.18 1:33 pm E-mail to Holleran from Lavery
- 2012.04.26 7:04 pm E-mail to Bloom from Williams re: Sales Transaction Spreadsheets (FTC-DIPF-03557)
- 2012.04.27 12:22 pm E-mail to Bloom from Williams re: Sales Transaction Spreadsheets (FTC-DIPF-03550)
- 2012.05.10 9:20 am E-mail to Bloom from Leckerman re: Questions re Sigma Product Descriptions (FTC-DIPF-03571)
- 2012.05.10 9:35 pm E-mail to Bloom from Leckerman re: CONFIDENTIAL-- FTC Docket #9351 - Sample Rebate Data from SIGMA (FTC-DIPF-03572)
- 2012.05.14 9:36 am E-mail to Bloom from Lavery

Data	Company
DALLAS_2862759_1.XLS (Star)	Star Pipe
DALLAS_2864221_2.XLS (Star)	Star Pipe
DALLAS_2873056_1.XLS	Star Pipe
Fitting Purchases - 2003 - USP-FTC_00000018	US Pipe/Mueller
Fitting Purchases - 2004 - USP-FTC_00000019	US Pipe/Mueller
Fitting Purchases - 2005 - USP-FTC_00000020	US Pipe/Mueller
Fitting Purchases - 2006 - USP-FTC_00000021	US Pipe/Mueller
Fitting Purchases - 2007 - USP-FTC_00000022	US Pipe/Mueller
Fitting Purchases - 2008 - USP-FTC_00000023	US Pipe/Mueller
Fitting Purchases - 2009 - USP-FTC_00000024	US Pipe/Mueller
Fitting Purchases - 2010 - USP-FTC_00000025	US Pipe/Mueller
Fittings sales - USP-FTC_00000026	US Pipe/Mueller
FTC-SIGMA-000001 (Audit Data).mdb	Sigma
Itemdescription.xls	Sigma
mcwane_sales_data_2008_2010_q1.dta	McWane
McWane-007664.xlsx through McWane-007685.xlsx	McWane
STAR0000001_FTC Docket No. 9351_Confidential.xlsx	Star Pipe
STAR0000008_FTC Docket No. 9351_Confidential.xls	Star Pipe
STAR0182054_FTC Docket No. 9351_Confidential.xlsx	Star Pipe

Commission Documents/ALJ Filings

- Subpoena Duces Tecum Issued to DIFRA, 2010-08-06
- Transcript of Scheduling Conf of 2012.02.13
- McWane-Star - ALJ Designation
- McWane-Star FTC Press Release
- McWane-Star Complaint
- Sigma - Decision and Order
- Sigma - Statement of Commissioner Rosch
- Sigma Agreement
- Sigma Complaint
- Sigma Press Release
- Subpoena Duces Tecum Issued to McWane, 2010-03-17
- Subpoena Duces Tecum Issued to McWane (Modification), 2010-04-02
- Subpoena Duces Tecum Issued to McWane (Modification), 2010-04-30
- Subpoena Ad Testificandum Issued to Tatman (McWane), 2010-06-21
- Subpoena Duces Tecum Issued to Sigma, 2010-03-17
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- Subpoena Duces Tecum Issued to Star, 2010-03-17
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- McWane’s Answer to the Federal Trade Commission’s Administrative Complaint, 2012.02.02
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Miscellaneous

- The Pennsylvania Steel Products Procurement Act, 73 Pa. Stat. §§ 1881-1887
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- 2012.02.09 Complaint in Water Line Supply v. McWane
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- H.R. 1, American Recovery and Reinvestment Act of 2009 (ARRA), Public Law 111-5, Feb. 17, 2009
- Ductile Iron Pipe Research Association, www.dipra.org, "About Ductile Iron Pipe," http://www.dipra.org/benefits-of-dip/benefits-of-di-pipes/
- QIT-Fer et Titane Inc, Ductile Iron Data for Design Engineers, Revised and Reprinted (Montreal: Rio Tinto Iron & Titanium, Inc., 1998), available from metalwebnews.org/ftp/didata.pdf and The Ductile Iron Society (http://www.ductile.org/didata/default.htm)
- http://www.awwa.org
- http://www.census.gov/construction/c30/totpage.html
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- http://www.nobelprize.org/nobel_prizes/economics/laureates/1994/press.html
- http://www.recovery.gov/Transparency/fundingoverview/Pages/fundingbreakdown.aspx
- HD Supply Interview (Jerry Webb and others), Elkridge, MD, April 12, 1012
- Frazier and Frazier Interview (Charles Frazier), May 25, 2012
- Star Pipe Interview (Rishi Bhutada), May 25, 2012

Documents (Beginning Bates Number)	Company
ACIP000003	ACIPCO
ACIP000018	ACIPCO
ACIP000019	ACIPCO
DIFRA-000496	DIFRA
DIFRA-000497	DIFRA
DIFRA-000498	DIFRA
E00000787	Star Pipe
E00002878	Star Pipe
E00002879	Star Pipe
E00006631	Star Pipe
E00006633	Star Pipe
E00006640	Star Pipe
E00006642	Star Pipe
E00007035	Star Pipe
E00007132	Star Pipe
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E00026239	Star Pipe

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E00064108	Star Pipe
E00064110	Star Pipe
E0010379	Star Pipe
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ESP0003054	Star Pipe
ESP0003083	Star Pipe
ESP0003092	Star Pipe
ESP0003143	Star Pipe
ESP0003145	Star Pipe
ESP0004665	Star Pipe
FEI-00000002	Ferguson
FEI-00002420	Ferguson
HAJ00001	Hajoca
HAJ000043	Hajoca
HAJ000045	Hajoca

HAJ000046	Hajoca
HAJ000053	Hajoca
HAJ000055	Hajoca
HAJ000058	Hajoca
HDSWW000001	HD Supply
HDSWW000002	HD Supply
HDSWW000005	HD Supply
HDSWW000006	HD Supply
HDSWW000008	HD Supply
HDSWW000018	HD Supply
HDSWW000019	HD Supply
HDSWW000023	HD Supply
HDSWW000031	HD Supply
HDSWW000033	HD Supply
HDSWW000035	HD Supply
HDSWW000039	HD Supply
HDSWW000042	HD Supply
HDSWW000044	HD Supply
HDSWW000048	HD Supply
HDSWW000053	HD Supply
HDSWW000054	HD Supply
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HDSWW000056	HD Supply
HDSWW000057	HD Supply
HDSWW001395	HD Supply
McWane-000002	McWane
McWane-000044	McWane
McWane-000053	McWane
McWane-000057	McWane
McWane-000061	McWane
McWane-000098	McWane
McWane-000149	McWane
McWane-000177	McWane
McWane-000263	McWane
McWane-000264	McWane
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McWane-000367	McWane
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McWane-000423	McWane
McWane-000449	McWane
McWane-000668	McWane
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McWane-001338	McWane
McWane-001339	McWane

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McWane-001633	McWane
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SRHW-00007	Sellers Richardson
SRHW-00007	Sellers Richardson

SRHW-00021	Sellers Richardson
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Star Pipe Products-Organization Chart	Star Pipe
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TU-FTC-0255530	McWane
TU-FTC-0255547	McWane
TU-FTC-0255547	McWane
TU-FTC-0255716	McWane
TU-FTC-0255770	McWane
TU-FTC-0255789	McWane
TU-FTC-0256407	McWane
TU-FTC-0256408	McWane
TU-FTC-0256487	McWane
TU-FTC-0256507	McWane
TU-FTC-0257225	McWane
TU-FTC-0257648	McWane
TU-FTC-0257657	McWane
TU-FTC-0257762	McWane
TU-FTC-0257851	McWane
TU-FTC-0258025	McWane
TU-FTC-0258026	McWane
TU-FTC-0258195	McWane
TU-FTC-0258217	McWane
TU-FTC-0258218	McWane
TU-FTC-0258394	McWane
TU-FTC-0258520	McWane
TU-FTC-0258948	McWane
TU-FTC-0258988	McWane
TU-FTC-0258994	McWane
TU-FTC-0258996	McWane
TU-FTC-0258997	McWane
TU-FTC-0259468	McWane
TU-FTC-0260477	McWane
TU-FTC-0261470	McWane
TU-FTC-0261564	McWane
TU-FTC-0262075	McWane
TU-FTC-0262682	McWane
TU-FTC-0262702	McWane
TU-FTC-0262803	McWane
TU-FTC-0264044	McWane

TU-FTC-0264533	McWane
TU-FTC-0265429	McWane
TU-FTC-0265575	McWane
TU-FTC-0265601	McWane
TU-FTC-0265821	McWane
TU-FTC-0265841	McWane
TU-FTC-0265981	McWane
TU-FTC-0266018	McWane
TU-FTC-0266186	McWane
TU-FTC-0266187	McWane
TU-FTC-0266189	McWane
TU-FTC-0266200	McWane
TU-FTC-0266224	McWane
TU-FTC-0266253	McWane
TU-FTC-0266255	McWane
TU-FTC-0266317	McWane
TU-FTC-0266338	McWane
TU-FTC-0266340	McWane
TU-FTC-0266344	McWane
TU-FTC-0266349	McWane
TU-FTC-0266351	McWane
TU-FTC-0266363	McWane
TU-FTC-0266364	McWane
TU-FTC-0266372	McWane
TU-FTC-0266400	McWane
TU-FTC-0266469	McWane
TU-FTC-0266472	McWane
TU-FTC0300000	McWane
TU-FTC0300009	McWane
TU-FTC-0700000	McWane
TU-FTC-0700100	McWane
TU-FTC-0700400-402	McWane
TU-FTC-256507	McWane
Tyler LP-5091_002	McWane
US Pipe Chattanooga Tooling - USP-FTC_00000016	US Pipe/Mueller
US Pipe Metalfit Tooling - USP-FTC_00000017	US Pipe/Mueller
USP-FTC_00000008	US Pipe/Mueller
USP-FTC_00000181	US Pipe/Mueller

CERTIFICATE OF SERVICE

This is to certify that on June 15, 2012, I served via courier delivery a copy of the expert report related materials to:

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Counsel for Respondent McWane, Inc.

June 15, 2012

By: 

Michael J. Bloom
Federal Trade Commission
Bureau of Competition

ATTACHMENT B

UNITED STATES OF AMERICA
BEFORE THE FEDERAL TRADE COMMISSION

In the Matter of	)	
	)	
McWANE, INC.,	)	
	)	
a corporation,	)	**DOCKET NO. 9351**
	)	
Respondent.	)	
	)	

REBUTTAL EXPERT REPORT OF LAURENCE SCHUMANN, PH.D.

Rebuttal Expert Report of Laurence Schumann, Ph.D.

Table of Contents

Rebuttal Expert Report of Laurence Schumann

I. Introduction and Summary

1. I am an economist on the staff of the Federal Trade Commission. My qualifications, including my areas of expertise and my *curriculum vitae,* are set forth in the *Expert Report of Laurence Schumann, Ph.D.*, filed on June 15, 2012. I incorporate that documentation by reference.

2. In my Expert Report, I arrived at the following opinions:

   A. The Fittings market is highly concentrated, with few sellers of any significance. It has a large number of unconcentrated buyers and homogeneous products with inelastic demand. Further, the market had a trade association, DIFRA, exhibited significant barriers to entry, and faced a social structure conducive to regular interaction and communication among suppliers' senior executives.

   B. Economic theory and empirical studies indicate that markets with these characteristics are susceptible to collusion.

   C. McWane, Sigma, and Star communicated with one another by a variety of methods for the purpose of "stabilizing" falling prices and raising prices to higher levels.

   D. McWane, Sigma, and Star established DIFRA, the Fittings trade association, for the express purpose of fostering coordination and collusion through the exchange of competitively sensitive information.

E. Participation in the DIFRA information exchange, along with certain communications among the companies, directly resulted in a price-fixing accord.

F. McWane exercised monopoly power to impose its restrictive "full support" program for the purpose of preventing or delaying Star's efficient entry into the Made in America ("MA") Fittings market.

G. By impeding Star's access to distribution, McWane erected a significant antitrust barrier to entry and maintained its monopoly power by preventing the degree of competition between McWane and Star that otherwise would have occurred.

H. McWane's exercise of monopoly power caused customers to endure periods in which prices were higher than they otherwise would have been and reduced consumer welfare.

I. McWane entered the MDA with Sigma to eliminate the risk that Sigma would enter into the MA Fittings market as Star was doing.

J. If Sigma had entered independently, competition would have been enhanced, prices would have been lower, and consumer welfare would have been increased.

3. On June 29, 2012, McWane filed the *Expert Report of Parker Normann, Ph.D.* ("Normann Report"), which seeks to disprove or discredit my conclusions. I have been asked by Complaint Counsel to evaluate and comment on the Normann Report, which I have done. I conclude that the Normann Report is unreliable and deficient for numerous reasons. These include:

A. Dr. Normann's reliance on severely flawed price data that do not reflect the actual transactions prices paid by McWane, Sigma, and Star customers.

B. Dr. Normann's use of simplistic graphical analyses that fail to control for the myriad of factors that affect Fittings' prices besides the degree of collusion or competition. This failure undermines any attempt by Dr. Normann to isolate any price effects of the anticompetitive practices alleged in the complaint and distinguish those effects from the price effects of any of these other factors that affect supply and demand and, consequently, prices.

C. Dr. Normann's failure to follow standard and long accepted practices when performing statistical analysis, particularly with respect to his supposed "hypothesis testing."

D. Dr. Normann's failure to either acknowledge in his analysis or indicate any understanding of the complexities of oligopoly theory and its effects on the determination of collusive cartel behavior.

E. Dr. Normann's "selective" reading of documents, testimony, and other sources composing the record in this matter.

F. Dr. Normann's flawed reading of, and representations of, the analysis contained in my report and the bases for my opinions.

4. The factual, analytical, and methodological errors in Dr. Normann's report undermine his credibility and suggest that his report is intended to advocate rather than enlighten. In what follows, I explain the numerous deficiencies in the Normann Report, and the

reasons that the conclusions that I expressed in the *Expert Report of Laurence Schumann, Ph.D.* ("Schumann Report") remain unchallenged and unchanged.

II. Dr. Normann's "Tests" and Data Analyses Are Not Grounded or Supported by the Factual Record or Economic Theory and Context

5. Dr. Normann fails to generalize the simple economic models he implicitly applies to address the complexities of the Fittings marketplace. His "analysis" comprises little more than a summary of a multitude of graphs, based largely on meaningless price information. He provides little, if any, theoretical context to these summaries. He neither discusses nor recognizes that absent any price-fixing or anticompetitive business practices, the Fittings market was not a perfectly competitive market, but a tight-knit oligopoly in which just three firms represented more than 90 percent of all sales. Accordingly, even if Dr. Normann had meaningful price data and controlled for all of the factors that affect prices, which he assuredly does not, he provides no analysis capable of distinguishing between prices resulting from recognition of the mutual interdependence characteristic of oligopoly and prices resulting from anticompetitive facilitating practices and price fixing agreements. Yet, without this analysis, all of Dr. Normann's graphs, and more generally, any use of the price and other data produced by the parties (which he criticizes me for not using) fails to address the price fixing allegation altogether.

6. Empirical analysis is informative only when interpreted within some sort of theoretical framework. Otherwise, it is just plots or tables of numbers that explain nothing. It is remarkable that Dr. Normann uses the word "oligopoly" just once in his entire report, and that one time, in paragraph 110, is in the context of the MDA, not the price-fixing allegations. Nowhere in his report does Dr. Norman actually discuss oligopoly theory or how any of his vast

number of graphs can distinguish between, or teach us anything about, oligopolistic interdependence versus price fixing. Without a rich understanding of the structure of the Fittings markets and the revealed incentives (and changes in incentives) and intentions of, and demonstrated interactions among, McWane, Sigma, Star, and others, appropriate hypotheses cannot be formulated and, if practicable, tested and interpreted. Indeed, without that understanding, one cannot determine whether proposed hypotheses *can* be tested consistent with sound economic practice, or whether, for example, the required data inputs cannot be "cleaned up" adequately. If not, any test results based on those data are bound to be unreliable.

7. Dr. Normann's reported analyses are not informed by any economic model or by any substantial understanding of the relevant facts. Accordingly his "tests," even had they been methodologically sound, were not capable of shedding light on the conduct of McWane, Sigma, and Star and the performance of the Fittings markets. Beyond that, Dr. Normann's lack of understanding to the limitations of his underlying data blinded him to its unreliability.

8. Dr. Normann faults me for not, like him, doing *stuff* with the data—making tables, charts, and graphs. I thought about it, applied a hard-won understanding of the pricing structure and workings of the industry *and* the qualities of the price data produced by McWane and others, and recognized irremediable problems in the data. Problems like the substantial known errors in McWane's production of price data in this suit (affecting both the magnitude of prices and the classification of sales as open-spec or domestic-spec sales); failure of invoiced prices to reflect inclusion or exclusion of shipping charges or to include rebates; known substantial, but non-systematic, lags between agreement on price terms and actual shipment and invoicing (undermining any effort to associate an invoiced price with an event such as a change in list prices or multipliers or communication among the parties); and the challenges of

identification of and development of statistical controls to account for factors that shift supply and demand. Amazingly, Dr. Normann studiously ignores the effect on output and prices of what has come to be called "the Great Recession," making it impossible for him to evaluate the presence or causes of other possible price effects, and he ignores other factors (like, customer mix and job size, for example) that may change over time, across regions, and so on.[1] I concluded that given these problems, any statistical work I might undertake, irrespective of whether it appeared to support the Complaint or not, necessarily would be unreliable. Having reviewed Dr. Normann's Figures and the related text, I am more convinced than ever of the correctness of my decision.

9. The overall Fittings market (which Dr. Normann refers to as the "open spec market") and the domestic discrimination market (which Dr. Normann refers to as the "domestic-spec" market) were both affected by the recession and the preceding bursting of the residential "housing bubble," which started the steady decline in residential housing starts in 2006, approximately two years before the onset of 2008 recession. In the case of domestic Fittings, this effect was offset to some degree by the ARRA, which increased the demand for infrastructure products, some of which were Fittings used in ARRA funded waterworks projects, and which required that all of the Fittings used in ARRA funded projects be domestically manufactured. Given this material increase in demand for domestic Fittings, the entry conditions for the domestic niche changed materially, with both Star and Sigma considering entry.

[1] Of the 32 Figures in Dr. Normann's report, in only one, Figure 10, does he make any attempt to control for the problems created in his price data by differences in product mix over time. That he does so this one time indicates that he recognizes that the problem exists; yet, in every other analysis that he provides based on price data, he makes no effort to adjust for, or correct, this serious problem in his data and analysis. As discussed below (paragraph 45), Dr. Normann's attempt to correct for changes in product mix over time in Figure 10 is not successful as it creates a very small sample size and imposes potential sample bias.

10. Similarly, in his discussions of the competitive effects of McWane's "full support" program and McWane's MDA, Dr. Normann's report does not recognize the exogenous incentives of Star and Sigma to enter the market. Without an appreciation of Star and Sigma's need to enter the domestic-spec market to avoid loss of sales of their imported Fittings,[2] one cannot begin to properly understand the determination of Star and Sigma to enter, even in the face of weak demand. But exactly that kind of entry is what may be required to shake up a monopolized market that does not invite entry by offering opportunity—at least short of collusion—for earning high profits in the market entered. Again Dr. Normann fails to apply the economically relevant facts, and therefore draws simplistic and wrong conclusions.

11. Dr. Normann similarly fails to appreciate the facts surrounding Buy-American laws and preferences. For that reason, he rejects a domestic-spec, discrimination market, whether limited to purchasers for jobs requiring domestic-spec product by law or including, with them, purchasers for jobs in which domestic-spec product is strongly preferred. Again through simplistic data work, he apparently convinces himself that Buy-America requirements founded in law likely are not "binding," despite a very substantial record that they are binding. Indeed, his own client, McWane, went to great efforts to ensure that distributors and others were well aware that under the ARRA, ARRA-funded waterworks projects were legally required to use only domestically manufactured Fittings.[3] Had he considered the reported experience of the leading producers of Fittings, he could not have fallen into such error.[4] Similarly, he fails to consider the

[2] As I discussed in the Schumann Report, both business documents and testimony establish that Sigma and Star were concerned that if McWane was the only source for domestic Fittings for ARRA funded projects, McWane would exploit that fact to displace Sigma and Star's open-spec sales. They similarly indicate that McWane hoped do just that. TU-FTC-0248965.

[3] See EJ 00022, Tyler Union letter to customers regarding "Clarification on American Recovery and Reinvestment Act of 2009" (April 8, 2009).

[4] Dr. Normann cites as evidence that "Importers regularly tried to 'flip' the spec of a customer from domestic to open" testimony from the investigational hearing of Dan McCutcheon.

facts when he asserts, based on nothing in particular, that price discrimination based on intensity of preference is implausible or that arbitrage would occur. Dr. Normann does not consider that distributors often acquire years of experience working with customers, over which time they have every incentive to learn the customers' needs and preferences. Moreover, his claim of easy arbitrage seems to be pulled from the air alone. Thousands of different combinations of Fittings are offered, some with accessories and customization and some not.

12. Dr. Normann also reaches conclusions as to McWane's market power in the domestic-spec market and the ability of Star (and by implication Sigma) to compete away that power. Again, Dr. Normann's analysis is insufficiently grounded in record fact and economic theory. Economic reasoning applied to the relevant facts leads to the conclusion that McWane likely had some degree of market power in a domestic-spec Fittings market even in the period preceding ARRA. During the period before the ARRA identifiable customers (or classes of customers) were subject to domestic-spec legal requirements or had enduring domestic-spec preferences that only McWane could satisfy. McWane testimony and documents indicate that as much as 20 percent of its sales before the ARRA were of domestic-spec Fittings. McWane met this demand at prices substantially higher than even its own prices for the very same Fittings when sold for open-spec use,[5] under conditions where its sales were protected by antitrust barriers and inelastic demand. Dr. Normann simply does not consider, or reconcile his analysis with, these facts.

13. Nor does Dr. Normann reckon with well-accepted economic models that explain, for example, the competitive significance of Star entry into the domestic-spec market,

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[5] See Leon McCullough Deposition, May 22, 2012, pp. 175 – 176, 179; McWane Multiplier Maps.

notwithstanding that it has *not* yet caused absolute prices to fall; or his own observation that a not-yet-efficient Star prices at, and sometimes below, the prices set by the more efficient incumbent, McWane. This last point alone reflects strong economic evidence that McWane is charging super-competitive prices when selling its domestically manufactured Fittings in the domestic-spec market.

14. In economic analysis, facts matter. A working knowledge of the facts must precede economic theorizing when trying to understand and explain how actual markets operate. Fact-based consideration of potentially relevant economic models should precede the formulation and testing of hypotheses and interpretation of test results. Dr. Normann reckons with a limited knowledge of the economically significant facts and without a workable model and then conducts poorly designed tests—often just eyeball comparisons without so much as a depiction of the trend of potentially confounding variables—using unreliable data inputs. Not surprisingly, his conclusions are wrong.

III. Dr. Normann Bases Conclusions on Flawed and Meaningless "Price" Data

15. When performing my economic analyses and writing my original report, I had access to the pricing data that Dr. Normann used in his report. I decided not to use those data because, in my opinion, the data suffer from serious flaws that render them uninformative and not meaningful. As I describe in detail below, these flaws include an alarmingly high error rate in McWane's data as measured by the fraction of transactions in which the reported (or implied) transaction multiplier exceeds the list multiplier, a circumstance that McWane's own counsel indicated is "most likely an order entry error" because "there is no commercial reason" for such a situation to exist,[6] and the omission of essential information necessary for calculating meaningful

[6] E-mail from William Lavery of Baker & Botts to Michael Bloom, June 5, 2012. See also McCutcheon Deposition, May 16, 2012, pp. 19 – 21; McCutcheon IH, May 4, 2011, pp. 391 – 392.

transactions prices, including rebates and other discounts, and the timing of negotiation of price terms, order entry, and order fulfillment.

16. The analyses of Fittings prices conducted by Dr. Normann are based on data that are fatally flawed. McWane's price data alone are so seriously defective that they would cause any conclusions drawn from the analysis of the price data to be erroneous and misleading.

17. The price data that Dr. Normann uses are not transactions prices. That is, they are not the actual prices paid by customers for the Fittings that they purchase. Moreover, they do not differ from actual transactions prices in any consistent and systematic way. As a result, any comparisons of these prices over time or in any other fashion have little relationship to economic decisions by McWane, Sigma, or Star or any of their customers. Consequently, the graphs and other analyses performed by Dr. Normann are not meaningful and cannot be interpreted as revealing anything with respect to competition, collusion, or any other economic characteristic of the Fittings market.

18. Consider, for example, freight charges. McWane customers often pay for the shipment of Fittings from McWane. Accordingly, one form of discount that McWane provides certain customers is the absorption of all or some portion of freight charges. By paying or discounting freight charges, McWane effectively lowers the prices of its Fittings to a customer. Yet, McWane did not produce freight charges and McWane informed the FTC staff that McWane could not determine which transactions involved freight paid by the customer and which transactions involved freight paid by McWane as a discount to the customer. Without this information, the prices produced by McWane and used by Dr. Normann are not the actual transaction prices paid for Fittings by McWane's customers. Moreover, such discounts are not

applied systematically; accordingly, they cannot be ignored with the excuse that they apply equally or proportionally to all customers for all transactions.

19. Quarterly and/or annual rebates are a customary feature of pricing in the Fittings market. As discussed in the Schumann Report, McWane's rebate programs can include quarterly rebates and annual rebates offered or negotiated with individual distributors, in the cases of relatively high volume national and regional distributors,[7] or offered as general programs to others. McWane's, Sigma's, and Star's rebate programs effectively lower the prices that each distributor pays for Fittings, but they do not apply equally to all customers. Moreover, when a customer purchases Fittings it knows the terms on which quarterly or annual rebates will be based and can factor that information into its calculations of the cost of the purchase. Yet, Dr. Normann's prices do not incorporate rebates, most likely because without having detailed information regarding the terms under which every customer's rebates are calculated as well as each customer's expected quarterly and annual Fittings purchases estimated at the time of each transaction, attributing quarterly and/or annual rebates to any given transaction is not possible. Yet, the transaction price paid by each customer for any given purchase will incorporate the customer's expectations regarding the contribution of the purchase to quarterly or annual rebates.

20. The prices used by Dr. Normann and the graphs and analyses with which he uses these prices are further flawed because Dr. Normann makes no effort to adjust or account for aggregation errors caused by month-to-month differences in both customer mix and order sizes. In both cases, average prices and price indices can rise or fall irrespective of any changes in the degree of competition or collusion.

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[7] TU-FTC-0020902.

21. With respect to customer mix, one must recall that customers in different regions of the country and of different sizes receive different actual prices (nominal prices less project and other discounts and rebates). Even when the extent of discounting declined as a result of collusion, the reductions did not eliminate all discounting.[8] Accordingly, changes in the regional locations and relative sizes of customers from month-to-month will alter average transactions prices or price indices. Without controlling for differences in customer mix, therefore, comparing prices from month to month or over longer periods of time is not meaningful.

22. Month-to-month differences in the mix of order sizes will also tend to cause month-to-month decreases or increases in average prices or price indices irrespective of any changes in the degree of competition or collusion.

.[9] Any particular month or time period in which orders just happen to be particularly larger than average or smaller than average will affect average prices or price indices independently from the price effects caused by collusion or from the breakdown of collusive agreements. Without controlling for changes in the mix of order sizes, changes in aggregated prices or price indices over time cannot distinguish the presence of collusion from the presence of competition.

23. If a major city begins construction on a massive, new water treatment plant in which Fittings are supplied by a national distributor, discounting both on account of the large amount of Fittings required for the project and the involvement of a national distributor may cause average prices to fall.[10] But competitive pricing rather than cartel pricing may have led to

[8] TU-FTC-0010113 – 10115, p. 10113.

[9]

[10] Orders for specific projects can receive special "project pricing" discounts while other orders may not qualify for the project pricing discounts. See e.g. Ramesh Bhutada Deposition, May 14, 2012, pp. 104-106.

an even greater price decline. Without controlling for confounding factors, just one of many being the size of projects and of distributors, the price data are uninformative with respect to the degree of competition.

24. The prices used by Dr. Normann are further flawed by the serious errors contained in the price data. As I discussed earlier in this report, the actual multiplier from a given transaction should not be larger than the list multiplier.[11] Yet, during 2008, the prices reported in the data produced by McWane indicate that McWane's (Tyler's and Union's) transaction multipliers for non-domestic Fittings often exceeded the list multipliers. For example, for products that are clearly identifiable as non-domestic (by the "ND" in their product descriptions), the actual multiplier exceeds the list multiplier 4.27 percent of the time. In 2009, reported transaction multipliers for the clearly identifiable non-domestic "ND" Fittings exceeded non-domestic list multipliers in 10.75 percent of the sales.

25. Domestic-spec Fittings suffer a similar error, compounded by the fact that there is no method to unambiguously identify domestic-spec Fittings . Fittings that McWane manufactures domestically are sold for either domestic-spec projects or as part of blended sales sold for use as, and priced to compete with, imported Fittings sold for open-spec use. McWane's domestically manufactured Fittings sold as part of blended shipments have lower list multipliers than its domestically manufactured Fittings sold for use in domestic-spec projects. Accordingly, I can only calculate a lower bound on the rate at which the actual multiplier of domestic-spec Fittings exceeds the list domestic multipliers. The lower bound is obtained by comparing (only for the purpose of this exercise) all products without an "ND" in their descriptions to the listed domestic multiplier. This set of products will include some domestically manufactured Fittings

[11] See paragraph 15 and footnote 6.

sold as blended Fittings, but they are nonetheless compared to the (higher) domestic list multipliers, thereby artificially reducing the error rate because the blended list multipliers are lower than the domestic-spec list multipliers. Using this classification, actual transaction multipliers for McWane's domestically manufactured Fittings exceeded domestic-spec list multipliers in 9.10 percent of the 2008 sales. In the case of sales of domestically manufactured Fittings sold in 2009, transaction-based multipliers exceeded domestic-spec list multipliers in 6.40 percent of the sales of domestically manufactured Fittings.[12]

26. Although the 4.27 percent error rate in McWane's reported 2008 non-domestic prices may not seem high, the distribution of these errors during 2008 is of crucial importance. Even if one ignores all of the other problems in Dr. Normann's price data previously discussed, the distribution of the multiplier errors in McWane's non-domestic sales data thoroughly undermines Dr. Normann's conclusion that the prices of non-domestic Fittings fell during the period January 2008 through February 2009, which Dr. Normann refers to as the alleged "cartel" period.[13]

27. Although the multiplier errors affect just 4.27 percent of the non-domestic transactions for all of 2008, they occur with stunning frequency at the beginning of 2008. In January 2008, in 21 percent of McWane's non-domestic transactions, the reported transaction

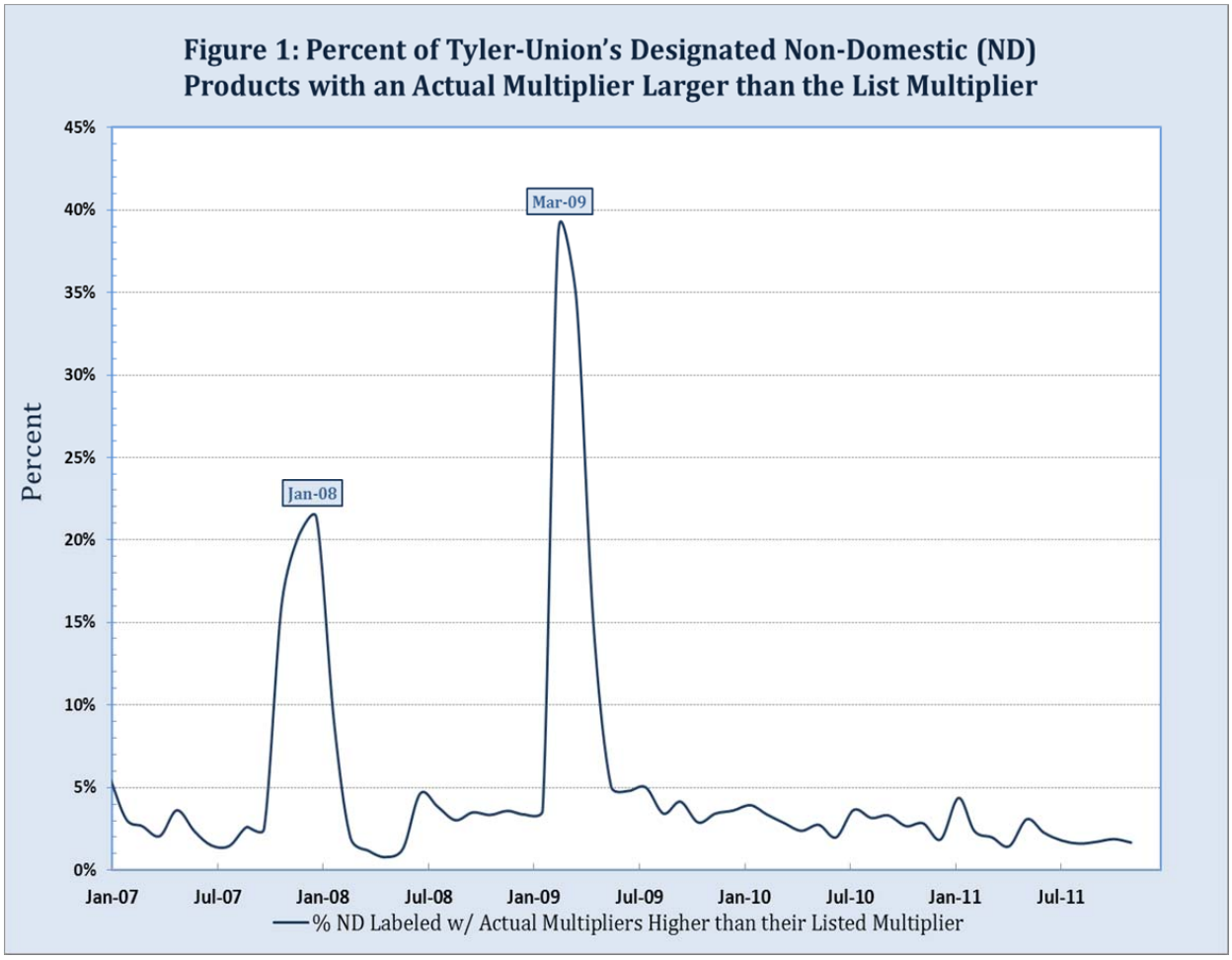
[12] In these calculations, to ensure rounding error in the reported prices does not artificially increase the error rate, I count an actual multiplier as larger than a list multiplier only if the actual multiplier is at least 1.01 times as high as the list multiplier. Further, in instances where a state has more than one list multiplier, I use the larger list multiplier, thereby understating the actual error rate.

[13] It is not clear to me why Dr. Normann asserts that the cartel period extended until February 2009. The DIFRA reports were last distributed in January 2009 and contained shipments data through December 2008. More importantly, both Star and McWane documents indicate that cheating through renewed project pricing efforts was underway no later than the end of 2008 and possibly earlier. See Star email dated Nov. 25, 2008 (We will take every order we can after exhausting all avenues to document the competitors pricing. . . . Do it with a combination of buy plans, short term buys, and project pricing. Do this quietly and selectively and as much under the radar as you can but, if it is necessary, be sure to do it. Go get every order!!!!!") E00064108-09 at 08; TU-FTC-0032428 - 429, McWane document from January 2009 discussing the December 2008 decline in McWane's market share as shown in the January 2009 DIFRA report.

multiplier from actual sales of non-domestic Fittings exceeds the blended list multiplier. The transaction multipliers were as much as 3.3 times greater than the blended list multipliers in January 2008.[14] Not only does this characteristic of the price data indicate that the transaction prices were misreported in one out of every five non-domestic transactions in January 2008, but the misreported multipliers impose an upward bias in the reported transaction prices because the actual multiplier in these transactions and, accordingly, the actual prices, would have been lower than those reported in the data.

28. Further, the extent of the errors might be far worse. Knowing that one out of five of McWane's reported non-domestic multipliers exceeds the list multipliers and overstates Dr. Normann's "transaction prices" in January 2008 suggests that a systematic, non-random factor may be contributing to the reporting errors. It is difficult to believe that errors in 21 percent of the reported multipliers would be caused by pure, random chance. Yet, we can only detect errors when the reported transaction multiplier exceeds the list multiplier. If these errors are caused by a systematic, non-random factor, there may be many additional errors in which the reported transaction multiplier exceeds the actual transaction multiplier, yet is still below the list multiplier. These errors would also cause an upward bias in prices, but we have no way of measuring the extent to which the January 2008 price data contain this sort of error. Figure 1 shows the percentage of reported non-domestic multipliers from actual transactions that exceed the blended list multipliers.

[14] We cannot determine if Sigma's or Star's reported transaction multipliers were greater or less than list multipliers because they did not produce list multipliers for each transaction.



29. The upward bias in the January 2008 multipliers has a significant effect on Dr. Normann's results as illustrated in his Figures 2A and 2B. Dr. Normann concludes that non-domestic prices fell in 2008 by comparing January 2008 prices to July 2008 prices and to February 2009 prices. He claims, therefore, that McWane, Sigma, and Star were not colluding during the period January 2008 through February 2009.[15] Yet, because the McWane price data are so badly flawed and biased upward in January 2008, comparisons of prices from the beginning of 2008 to prices in mid-2008 and early 2009 demonstrate nothing even when we ignore all of the other flaws in Dr. Normann's data. Accordingly, by using "price" data that we

[15] Normann Report, paragraphs 28 – 32, pp. 11 – 13.

know exceeds actual prices at least of the time in January 2008, but which does so only of the time in February 2009, Dr. Normann's conclusion that non-domestic prices fell in 2008 is entirely unsupported by his data analysis.

30. An additional and important flaw in the Dr. Normann's price series relates specifically to Sigma. By letter dated July 3, Sigma sent counsel for McWane and Complaint Counsel a revised data disk, correcting errors in the data Sigma had earlier provided. My initial review of the revised data indicates that the earlier disk overstated Sigma's invoice prices, and overstated them more in January 2008 than in June 2008 or February 2009.[16] This indicates that even if one were to ignore all of the other sources of error in Dr. Normann's price series, his Sigma price series (used in Figure 2B, among others) and all calculations and Figures that incorporate that series (as in Figure 3, among others) are systematically wrong: what may have appeared to Dr. Normann to be a decline in prices during the collusion period, when corrected would appear as a smaller decline or *as an increase in prices during the collusion period.*

31. Dr. Normann criticizes my report for, among other things, failing to use the available pricing data in my analysis. Perhaps if Dr. Normann had studied the record more carefully and developed a minimal understanding of both how transactions are conducted in the relevant Fittings markets and the pricing data produced by the parties, he too would have realized that any analysis or conclusions based on this data would be worthless and misleading. This is the case even without consideration of the additional bias created by the use of Sigma's original data, of which Dr. Normann would not have been aware when he prepared his report.

[16] The market shares calculated in my June 15, 2012, expert report utilized Sigma data. I, however, used tons rather than prices to calculate shares, and the tonnage data in the corrected data set appears to be largely unchanged.

IV. Dr. Normann's Empirical Analyses Do Not Comport with Basic Statistical and Econometric Methods

32. Even if Dr. Normann used actual transaction prices in his analysis, his failure to control for the many factors that directly and substantially impact prices would render his analysis and conclusions of no value in understanding the markets at issue. As stated by the preeminent economist Orley Ashenfelter and his coauthors, "The major issue faced by any attempt to estimate the effect of a merger on price, as with any intervention using nonexperimental data, *is the method used to control for other confounding factors that may also have changed at the time of the event*."[17] Although the quote refers specifically to the estimation of the effect of a merger on price, it notes that this issue applies "with any intervention using nonexperimental data." That is, the issue of controlling for confounding factors is equally applicable and important when estimating the effect of any specific economic event on price. To do so requires that one control for all other factors that might affect price besides the event of interest, at least when data are generated in actual markets rather than in controlled laboratory settings. Only by controlling the "*other confounding factors that may also have changed at the time of the event,*" is the effect of the event of interest isolated from the confounding factors that also affect price. Thus, "*the major issue*" in measuring the impact of an event such as a price-fixing agreement on prices is to properly control for all of the other factors besides the price-fixing agreement that might impact prices. Only by doing so can the effect of the price-fixing agreement be determined.

[17] See Ashenfelter and Hosken, "The Effect of Mergers on Consumer Prices: Evidence from Five Mergers on the Enforcement Margin," *Journal of Law and Economics* 53 (2010) ; Ashenfelter et al., Generating Evidence to Guide Merger Enforcement, CEPS Working Paper No. 183, Princeton University, available at http://www.princeton.edu/ceps/workingpapers/183ashenfelter.pdf; and, for further discussion on the issue, see cites in these articles. Emphasis added.

33. Simple, basic economic theory tells us that a market price is formed by supply and demand. Accordingly, changes in demand and supply conditions affect price. Many factors entirely independent of the degree of competition in a market affect supply and demand and, therefore, price. These include macro-economic factors such as booms and recessions, changes in interest rates, and currency fluctuations. They also include micro-economic factors such as the prices of inputs, the degree of vertical integration, and changes in technology and differences in the technologies used by rivals. In the Fittings market, factors such as the age of waterworks systems and treatment plants in municipalities, municipal finances, housing starts, prices of diesel fuel used by trucking, railroad, and shipping companies; and seasonal factors may affect demand and supply conditions and, therefore, prices. Dr. Normann's analysis of Fittings prices controls for none of these factors, which makes distinguishing between their effects on prices and collusive effects on prices impossible.

34. Dr. Normann's reliance on simple price charts and plots to draw any sort of conclusions in this matter without making any effort to control for the multitude of factors discussed above that affect changes in prices independent of collusion or the degree of competition is simply beyond the pale. A vast economic literature exists that explores the statistical methods and difficulties of identifying collusive prices in light of the many factors that affect supply and demand and drive prices.[18] The whole basis of this multitude of scholarly articles, books, dissertations, and conferences is to develop regression techniques that allow an economist to focus on a particular economic issue such as discerning the effects of alleged

[18] See, for example, Davis, Peter and Eliana Garcés, *Quantitative Techniques for Competition and Antitrust Analysis* (Princeton: Princeton University Press, 2010). A somewhat more limited, but more accessible discussion of these issues can be found in Baker, Jonathan B. and Timothy Bresnahan, "Economic Evidence in Antitrust: Defining Markets and Measuring Market Power," in Buccirossi, Paolo ed., *Handbook of Antitrust Economics* (Cambridge: MIT Press, 2008), Chapter 1, pp. 1 – 42.

collusion on market prices while holding constant the numerous other factors that influence prices and price movements.[19]

35. The full sweep and significance of methodological failings underlying Dr. Normann's opinions is detailed in the next section of this report, including specific critiques of Dr. Normann's Figures and the related text. These significant and pervasive errors warrant the rejection of Dr. Normann's bases for his opinions, and his opinions themselves.

V. Specific Critiques of Dr. Normann's Figures and Related Conclusions

36. Figure 1

Dr. Normann's emphasis on columns b and e in his Figure 1 is inapt, and distracts attention from the anticompetitive intent and consequence of McWane actions, as reflected in McWane own documents. In January 2008, McWane announced adjusted multipliers to increase transaction prices relative to then prevailing transaction prices (by removing headroom/incentive for discounting and thereby facilitating price coordination and price fixing).[20] It conceived of its multiplier adjustment as an effective price increase.[21] In furtherance of the price fixing agreement, it then further raised multipliers as announced in June 2008.[22] In the table below, I have recreated Dr. Normann's Figure 2, but substituted for column (b) the average effective multipliers realized in the fourth quarter of 2007, the referent from which McWane calculated its new multipliers. By doing this, I conform the analysis to the economically significant facts

[19] These issues are not unique to the use of econometric methods in antitrust and competitive analysis. To the contrary, they are ubiquitous in empirical studies of economic phenomena that can be estimated only through simultaneous equation systems such as supply and demand curves that simultaneously determine equilibrium prices or other economic variables that an economist may wish to study. Accordingly, the study of this issues is part of even the most basic, introductory econometric courses and is generally referred to as the "identification problem."

[20] TU-FTC-0010307. The new multipliers were effective as of February 18, 2008.

[21] See TU-FTC-0013802.

[22] See e.g. TU-FTC-0010081 (announcement of price increase to Ferguson Waterworks).

recited above. Because Dr. Normann ignores these facts, he makes inapt comparisons and draws faulty conclusions. Dr. Normann concludes that, "where there are values more than half the states had the same, or lower multipliers in 2008 compared to 2007 contrary to the language in the complaint of 'price increases.'"[23] But had Dr. Normann conducted his analysis consistent with the way McWane saw its own actions, he ought to have seen, as McWane did at the time, that it was increasing prices in all but a half-dozen or so states (signified by the red highlighting). Similarly, he would have seen the comparison over the longer period, in column (e), showing price increases in more than 90 percent of the reported instances (again, signified by the red highlighting). McWane's contemporaneous documents show that it found it "necessary to increase pricing,"[24] and understood itself to have taken a 10 – 12 percent increase in non-domestic Fittings prices "above the current prevailing multiplier levels"[25] effective February 18, 2008, and another approximately eight percent increase effective July 14, 2008.[26] I find McWane's contemporaneous understanding of its pricing actions a more reliable basis for drawing economic findings than Dr. Normann's pepared-for-litigation analysis of two years later.

In addition to being inapt, Dr. Normann's comparison ignores a variety of factors that affect Fittings prices, such as the likely downward pricing pressure caused by the recession of 2008. Without considering the impact of these factors, Dr. Normann cannot speak to the relevant question: how do the observed multipliers compare with the multipliers that would have obtained absent collusion.

[23] Norman Report, paragraph 25.

[24] TU-FTC-0010307.

[25] Ibid.

[26] TU-FTC-0010083.

FIGURE 2
Dr. Normann's Figure 1 Revised

State	Effective Multiplier per Invoiced Prices Last 4 Months of 2007	Multiplier Maps Effective As of: 2/18/2008	7/14/2008	Last 4 Months 2007 vs. 7/14/08
[a]	[b]	[c]	[d]	[e]
AL	0.2327	0.25	0.28	Increased
AK	-	0.42	0.42	
AZ	0.2836	0.30	0.33	Increased
AR	0.3014	0.27	0.30	Decreased
CA	0.2982	0.33	0.33	Increased
CO	0.3039	0.33	0.33	Increased
CT	0.2991	0.31	0.33	Increased
DE	0.2885	0.28	0.28	Decreased
FL	0.2369	0.25	0.28	Increased
GA	0.2169	0.25	0.28	Increased
HI	0.3600	0.36	0.36	Unchanged
ID	0.3586	0.33	0.42	Increased
IL	0.2381 / 0.2823	0.27 / 0.32	0.30 / 0.32	Increased
IN	0.2206	0.25	0.28	Increased
IA	0.2667	0.28	0.30	Increased
KS	0.2387	0.27	0.30	Increased
KY	0.2411	0.25	0.28	Increased
LA	0.2622	0.27	0.30	Increased
ME	-	0.31	0.33	
MD	0.2808	0.28	0.28	Decreased
MA	0.2567	0.31	0.33	Increased
MI	0.3100	0.33	0.33	Increased
MN	0.2640	0.28	0.32	Increased
MS	0.2531	0.27	0.30	Increased
MO	0.2509	0.27	0.30	Increased
MT	0.3039	0.33	0.42	Increased
NE	0.2381	0.27	0.30	Increased
NV	0.2561	0.28	0.33	Increased
NH	0.3103	0.31	0.33	Increased
NJ	0.3244	0.31	0.33	Increased
NM	0.2799	0.30	0.33	Increased
NY	0.2806	0.31	0.33	Increased
NC	0.2321	0.25	0.28	Increased
ND	0.2503	0.28	0.32	Increased
OH	0.2155	0.25	0.28	Increased
OK	0.2323	0.27	0.30	Increased
OR	0.3206	0.42	0.42	Increased
PA	0.3494	0.38	0.40	Increased
RI	0.2800	0.31	0.33	Increased
SC	0.2283	0.25	0.28	Increased
SD	0.2897	0.28	0.32	Increased
TN	0.2435	0.25	0.28	Increased
TX	0.2587	0.28	0.30 / 0.33	Increased
UT	0.3600	0.48	0.48	Increased
VT	0.2600	0.31	0.33	Increased
VA	0.2884	0.28	0.28	Decreased
WA	0.3101	0.42	0.42	Increased
WV	0.2502	0.28	0.28	Increased
WI	0.2994	0.32	0.32	Increased
WY	0.3003	0.33	0.33	Increased

Notes:
Multipliers highlighted in green indicate a multiplier decrease.
Multipliers highlted in red indicate a multiplier increase.
Sources:
Dr. Normann Expert Report, Figure 1
TU-FTC-0013802

37. Figure 2

Dr. Normann's "price series" is wholly unreliable for reasons described in the body of this report, including substantial errors in transaction price data furnished by McWane, which errors were known to Dr. Normann; potential biases in selection of Fittings for his price index; the inability to correct for varied and at times substantial lags between negotiation of price terms and delivery and invoicing of sales, which lags are or should have been known to Dr. Normann; lack of testing of robustness and statistical significance of findings, etc. Every Figure of Dr. Normann's that incorporates his price series is unreliable as a result. See Section III of this report**.**

Figure 2B adds to this underlying infirmity the fact that different errors and biases may infect the McWane, Sigma, and Star data, such that not even the relative movements of Dr. Normann's price series can be trusted. Finally, Dr. Normann substitutes a naive comparison for a meaningful economic analysis, which would have included econometric consideration of the several variables that might affect sales. Dr. Normann implicitly recognizes the importance of considering these variables when he graphs changes in metal and energy costs alongside his price series. Dr. Normann undoubtedly knew that those costs were rising during his relevant period, which would suggest that prices should have been rising, *all other things being equal*.

But we all know that all other things rarely are equal. That is why Dr. Normann's failure to consider the impact of changes in other variables of interest, some of which might have exerted equal or greater *downward* pressure on Fittings prices, would be a grievous error even if one were prepared to accept naive comparisons as analytical aids. Consider housing starts, for example. As Dr. Normann undoubtedly knew, housing starts correlate strongly with Fittings demand *and fell precipitously* during much of his relevant period. All other things being equal,

this would have resulted in a sharp *decline* in Fittings prices. Dr. Normann does not so much as acknowledge the importance of variables other than metal and energy costs. And he certainly does not offer an econometric analysis to explain the predicted interaction of the variables of interest, to enable a comparison of observed transaction prices with transaction prices that would have obtained absent collusion. His one-sided and naive comparison is analytically empty and must be rejected.

38. Figure 3

Here, Dr. Norman appears to have *attempted* some statistical analysis. Using a "fixed basket of Fittings" of his own devise, he purports to have calculated the slopes of the ratios of the average price of open-spec Fittings sold by McWane, Sigma, and Star, and the average price of domestic-spec Fittings sold by McWane. He does this, he says, to perform his "testable hypothesis" that if there were collusion, the price of non-domestic-spec Fittings relative to the price of domestic-spec Fittings should have risen during the collusion period, which would be seen as an upward slope in Figure 3. He finds that it does not, and, therefore, he says, there cannot have been effective collusion.

To begin, Figure 3 incorporates Dr. Normann's unreliable price series, and so is itself unreliable. See Section III of this report. Upon examination of the data underlying Figure 3, I find that Dr. Normann's entire "fixed basket of top selling Fittings" consists of about 25 Fittings, only six of which he codes as medium-sized.[27] Consider what this means: Dr. Normann asks us to reach important conclusions about the entire universe of medium-sized Fittings – consisting of

[27] Dr. Normann does not disclose just how and why he chose these particular Fittings for his sample. Both the absence of that disclosure and the insubstantial size of his sample indicate that the risk of sampling bias in Figure 3 is profound.

literally thousands of Fittings – from "noisy" data relating to just six.[28] And there is no indication that his findings with respect to small-sized Fittings ultimately have any greater validity. Competent hypothesis testing requires that when performing regressions of the kind conducted by Dr. Normann one assess and report standard errors or confidence intervals of the slopes.[29] Dr. Normann reports neither. His lack of statistical testing means, among other things, that he cannot determine whether his slopes are estimated with precision or are wildly inaccurate, nor can he distinguish systematic changes in slope from period to period from random changes.[30]

[28] I am not aware of anything that might have limited Dr. Normann to so small a sample in relation to the total number of small and medium Fittings. His choice to do so seems, at best, odd .

[29] When performing statistical regression analysis, a researcher is measuring the effect of one or more "independent" variables on a particular "dependent variable." That is, one hypothesizes that the dependent variable is a function of one or more independent variables. In the case of Figure 3 in Dr. Normann's report, his slope parameter (or slope "coefficient") measures a time trend – the effect of time on the dependent variable, in this case, Dr. Normann's Fittings price indices based on his baskets of small- and medium-sized Fittings and the ratio of their respective imported price index to their domestic price index. His slope coefficient is the mean (or average) effect of time on this price ratio. That is, it measures how the ratio of imported to domestic price indices of the prices for his baskets of small- and medium-sized Fittings changes over time. To calculate whether the estimated time trend, i.e., the estimated coefficient on the independent variable, time, is statistically different from zero (that is, statistically significant), one requires a the standard error of the estimated coefficient, which is a measure of the dispersion of time around the its mean, the estimated coefficient on time. Accordingly, when economists perform statistical regression analysis, they report not only the estimated coefficient(s), but also the standard error of the coefficient (or the appropriate test statistic, which is a function of the standard error). Alternatively, an economist can provide a confidence interval that shows the range of possible coefficient estimates that can occur with a particular probability. Typically, researchers report the range of coefficients that can be estimated with a 95 percent probability, which is referred to as a 95 percent confidence interval. If zero lies within a 95 percent confidence interval, the estimated coefficient is not generally considered to be statistically significant. If the dependent variable is normally distributed and the regression model includes all of the independent factors that determine the value of the dependent variable, a 95 percent confidence interval around each estimated coefficient will equal approximately the coefficient plus and minus twice its standard error For a basic introduction to regression analysis and hypothesis testing see Economics Committee, Section of Antitrust Law, American Bar Association, *Econometrics: Legal, Practical, and Technical Issues* (Chicago: American Bar Association, 2005), Appendix II: The Basics of Multiple Regression, Parts A – E, pp. 397 – 408.

[30] Given its methodological limitations, even if it were an empirical fact that McWane and other producers had fixed prices, hypothesis testing given Dr. Normann's data very likely would fail to reject the false hypothesis that McWane and the others had not colluded (referred to as the "null" hypothesis in statistics). Specifically, Dr. Normann could have conducted a test of the hypothesis that the slopes across the three periods in Figure 3 are equal, and interpreted a failure to reject that hypothesis as evidence that McWane and other producers had not fixed prices. However, given his data, this test would have what statisticians call "low power," a limited ability to reject false hypotheses. As such, any purported confirmation of the null hypothesis, like Dr. Normann's, is unreliable.

Most statistical testing (of confidence intervals and for other purposes) is based on "the Central Limit Theorem,"[31] and requires far more "observations" than Dr. Normann made. Typically, statisticians prefer at least 30 observations for each time period under consideration, and for some applications prefer still more observations.[32] The slopes upon which Dr. Normann rests his conclusions appear to have been calculated by him using only about a dozen observations for each of the three time periods he considers (pre-collusion, collusion, and post-collusion. Given so few observations, Dr. Normann cannot validly compare the estimated slopes in different time periods unless his data are Normally distributed.[33]

There is a procedure for assessing statistical significance when too few observations are available to apply ordinary procedures based on the Central Limit Theorem. These tests are based on what statisticians refer to as the t-distribution.[34] Dr. Normann does not report having applied any of these either to slopes estimated in Figure 3. But even if he had, tests using the t-distribution are useful only if the underlying data are Normally distributed.[35] There is a statistical test for whether or not data are Normally distributed, a Normal Probability Plot. Dr. Normann does not report having used this or any other test for Normality of distribution, but had

[31] Morris DeGroot, *Probability and Statistics*, 2nd ed., pp. 274 – 275; William H. Greene, *Econometric Analysis*, 3rd ed., pp. 275-277.

[32] See, for example, Peter Kennedy, *A Guide to Econometrics, 5th ed*. page 33, section 2.8; Gerald Keller, *Statistics for Management and Economics*, 9th ed., p. 312.

[33] For a discussion of the Normal distribution, see Appendix A.

[34] The t-distribution is similar in shape to and gives similar confidence intervals and hypothesis tests results as the normal distribution. The t-distribution gives wider standard confidence intervals and less likelihood finding statistical significance than the Normal distribution. The t-distribution is useful when sample sizes are too small to invoke the Central Limit Theorem and use the normal distribution to construct confidence intervals and hypothesis tests. The t-distribution is validly applied only when the underlying data are normally distributed. See, e.g., Gerald Keller, *Statistics for Management and Economics*, 9th ed., p 400, Orley Ashenfelter, Phillip Levine, and David Zimmernan, *Statistics and Econometrics: Methods and Applications*, pp. 146 - 148 (sections 10.3.4 through 10.5).

[35] See footnote 34.

he done so, he would have found that his price ratios are not Normally distributed. See my Appendix A.

Accordingly, Dr. Normann's report does not give any indication that the slopes of either of his graphed lines are significantly different from zero in any time period, let alone significantly different from time period to time period. For that reason alone, his analysis is meaningless. But even had Dr. Normann reported adequate significance findings, his results would remain highly uninformative because, absent Normality and with so few observations, Dr. Normann's test lacks the necessary statistical properties to permit meaningful inferences regarding collusion. For each one of these reasons, his conclusions must be disregarded. Finally, Dr. Normann is "testing" against a cartel model in which coordination is either entirely missing or entirely perfect. That does not describe the collusion I have found.

39. Figure 4

While the question of variation over time of transaction prices from published prices would, if the underlying data were adequate, be an interesting one, Figure 4 incorporates Dr. Normann's unreliable price series. For that reason alone Figure 4, and the conclusions Dr. Normann draws from it, is unreliable and not meaningful. See Section III of this report.

Further, Dr. Normann inexplicably applies his test to only three Fittings out of the 100s offered. Even with adequate underlying data and otherwise flawless methodology, accurately generalizing from these three products to Fittings generally is impossible. Finally, Dr. Normann misunderstands the import of the standard deviation plots. In particular, he fails to appreciate that an increase in standard deviation during the relevant period is not inconsistent with an increase in prices due to collusion. Dr. Normann rightly notes that increased pricing uniformity tends to reduce standard deviation, but he completely ignores the other important determinant of

standard deviation: absolute prices. For example, if prices are rescaled by a factor of two, the standard deviation also would be rescaled by a factor of two.[36] Any change in standard deviation over time is a function of both change in uniformity of price *and change in price itself*. In sum, a larger standard deviation during the collusion period than other periods is as likely to indicate increased pricing as it is to indicate greater variation in pricing, and, for that reason alone, Dr. Normann's test cannot lead to any useful conclusion.

40. Figure 5

Assuming Dr. Normann correctly calculated inventories as displayed in Figure 5, Figure 5 is probative of nothing in particular. To begin, given the inelasticity of Fittings demand, a very slight reduction in available product would support a relatively large reduction in discounting. Such slight reductions may be very difficult to detect. Further, the quantity of Fittings available for purchase can be restricted by means other than inventory build-up. Dr. Normann apparently recognizes as much when, albeit only parenthetically, he notes that his "inventory test" would be meaningless if short-run production is not fixed. For each of these reasons, Dr. Normann's "inventory test" in Figure 5 is meaningless.

Once again, Dr. Normann's hypothesis is ill-suited to the known facts. Dr. Normann graphs McWane's inventory of imported Fittings for June 2007 through June 2008, planning to draw inferences from potentially subtle slopes in his graphed line. But no inferences properly could be drawn from inventory changes during that period because McWane inventories were at that time way out of kilter and undergoing radical adjustments. According to McWane's Ruffner Page, McWane had built up an absurdly large domestic Fittings inventory in the months leading up to August 2007—at which time the McWane senior manager responsible for the build-up and

[36] Greene, William, *Econometric Analysis*, 6th ed., (2008), p. 1021.

McWane parted ways. This distorted McWane's inventorying and sale of imported Fittings through the balance of the year, as McWane found it relatively profitable to burn off its domestic inventory by selling it in lieu of imported Fittings, at imported Fittings prices.[37]

41. Figure 6

In Figure 6, Dr. Normann purports to test for short-term quantity limitation by McWane, Sigma, and Star by examining monthly sales from 2007 - 2010. But what Dr. Normann appears to have done is to cobble together an interpretation of his data that supports his position rather than to have 1.) Articulated a testable hypothesis based on a basic understanding of how the market works in fact; 2.) Formed appropriately modest conclusions based on the test results; and 3.) Confirmed these conclusions through tests of robustness and statistical significance.

Dr. Normann acknowledges that month-to-month comparisons are difficult because of seasonality and changes in demand conditions (differences in market size in different years), but his efforts to control for these variables are simplistic and ineffective. Accordingly, his Figure 6 cannot yield a sound interpretation.[38] An appropriate economic analysis would have incorporated specific variables that in any given month might have affected sales, including, for example, temperature and precipitation, housing starts, information relating to municipal budgets, and so on. Dr. Normann apparently knows this. When his graph shows a large decline in open-spec volume – which might be thought consistent with the withholding quantity hypothesis he seeks to debunk – he identifies (but does not test the impact of) a potentially confounding variable so as to dismiss an inconvenient finding: "this [decline in quantity] for the second half of 2008, . . . is not surprising given the financial crisis." Supply and demand considerations matter, and they are not incorporated in Figure 6, which should be disregarded.

[37] Page Deposition, May 24, 2012, pp. 165-168, 177-178.

[38] In addition, all but the last criticism of Figure 5 are applicable to Figure 6.

42. Figure 7

Figure 7 simply shows the undisputed fact that domestic-spec sales have declined as a percentage of total Fittings sales.

43. Figure 8

Figure 8 required classification of McWane sales as being for open-spec or domestic-spec sales. Dr. Normann's classification of sales was subject to substantial errors in transaction price data furnished by McWane, which errors were known to Dr. Normann.[39] Even so, his conclusion is less than clear. He apparently concludes that "much"– he does not suggest how much – of the domestic spec market is based on preference rather than legal obligation. Certainly, some buyers of domestic-spec Fittings buy them because of preference rather than legal obligation; and others buy them because of legal obligation.[40] As to preference buyers, their number is of less importance than the strength of their preferences.[41] Dr. Normann reported

[39] As Dr. Normann's Appendix B indicates, he recognized that an appreciable portion of McWane sales were identified by McWane as having been sold at transaction prices that were plainly not the true transaction prices (as where identified transaction prices exceeded the published list prices, i.e., the products of the catalog prices and the applicable published multipliers). Dr. Normann reported no effort to understand the importance of these errors, in themselves or as reflections of an unknown quantity of other mistaken sales entries. Instead, he somewhat arbitrarily assigned them to either the open-spec set or the domestic-spec set by determining whether their reported "transaction prices" were less than or equal to the domestic open-spec average price or greater than the domestic open-spec average price and less than, equal to, or greater than the domestic average price. Additionally, although Dr. Norman calculated the average domestic open-spec price and the domestic average price for the same year, month, and size range as the unclassified domestic transaction, he did not do so for the state in which the transaction took place. Because open-spec multipliers and domestic-spec multipliers can vary widely by state, the reliability of this method of classifying the Fittings as either open-spec or domestic-spec Fittings is highly questionable for that reason too.

[40] For example, the American Recovery and Reinvestment Act of 2009 (Pub. L. No. 111-5), at Section 1605. Also, the Pennsylvania Steel Products Procurement Act, 73 Pa. Stat. §§ 1881-1887, requires that iron and steel products made in America be used in all construction, repair, and maintenance contracts let by public bodies, including the Commonwealth, its political subdivisions, and authorities. A New Jersey Statute requires that "every contract for the construction, alteration or repair of any public work in this state shall contain a provision that in the performance of the work the contractor and all subcontractors shall use only domestic materials in the performance of the work." N.J. Stat. § 52:33-3. (The statute does provide for an exception if "it would unreasonably increase the cost.")

[41] Also relevant is whether an appreciable number of preference buyers at the margin can be identified and favored with discriminatorily low prices. In my reports, I present information supporting a price discrimination market. Dr. Normann has presented no contrary information of substance.

no effort to determine the strength of preference of today's preference buyers, but given that historical preference buyers for years now have been shifting to open-spec purchases in response to high domestic-spec prices, it is highly likely that mostly, if not only, high-preference domestic spec buyers remain. Whatever the facts with respect to preference buyers, however, it is important to note that legally obliged purchasers would remain a relevant market. Figure 8 simply does not address that fact.

44. Figure 9

Figure 9 is infected by the previously-discussed errors in the sales data provided by McWane.

Beyond that, Dr. Normann's reasoning from his plot is fatally flawed. Dr. Normann claims that if McWane has market power, that market power would be reflected in higher prices for domestic Fittings in states in which domestic Fittings accounted for a majority of sales, and lower prices for domestic Fittings in states in which only minimal sales of domestic Fittings were made. That is just wrong. Dr. Normann simply assumes away the fact that, as I have indicated elsewhere, we have two well-defined markets. Instead, he reasons as if we were discussing customers with different preferences *within* a single market. All that Dr. Normann's plot in Figure 9 actually shows is that the relative size of the open-spec market and the domestic-spec market varies from state to state. The number of people in a relevant market, whether absolutely or in comparison with the number of people in another relevant market, is simply unrelated to whether market power exists or the amount of monopoly power that can be exercised in any state. Indeed, Dr. Normann's efforts notwithstanding, one cannot make valid cross-sectional comparisons across states given likely variations in supply and demand conditions from state to state. Rather than acknowledging the problem, Dr. Normann simply ignores it. If it shows

anything, Dr. Normann's plot may enable us to infer how many people are subject to McWane's monopoly power, and nothing else.

45. Figure 10

Figure 10 incorporates all of the infirmities of Figure 9: use of Dr. Normann's unreliable price series; failure to account for variation in supply and demand conditions from state to state; and the fundamental illogic of the exercise, because the number of people in a relevant market, whether absolutely or in comparison with the number of people in another relevant market, is simply unrelated to the presence or extent of monopoly power in any state. Nevertheless, Dr. Normann makes an effort to improve Figure 10 by controlling for product mix, reflecting 1.) a shortcoming in Figure 9 that I had not previously mentioned and 2.) Dr. Normann's apparent recognition that product mix is a problem, but, as I have previously pointed out, one that Dr. Normann entirely ignores in his previous analyses. Although Dr. Normann recognizes the problem of product mix in Figure 10, his attempt to address this problem only creates additional ones. These problems arise from Dr. Normann's use of only 16 out of thousands of products from over 40 states to create this plot of average prices. Dr. Normann's report is silent, but the problems of potential sample bias and small sample size are substantial and important. They need to be acknowledged.

46. Figure 11

Dr. Normann's Figure 11 tracks the net income of Tyler Union Waterworks Division of McWane. Dr. Normann apparently believes that the plotted net income is "inconsistent with McWane being able to exercise market power for the sale of Fittings over the relevant time period." But Dr. Normann's measure of net income is for all products of the Waterworks Division, which include not only Fittings of foreign and domestic manufacture, but glands, valve

boxes, jobbing castings, and perhaps other products. Nowhere in his report does Dr. Normann provide or analyze net income attributable to domestic Fittings sales, nor does he attempt to control for shifting product mix either within the domestic Fittings category or across the several Fittings and non-Fittings product categories aggregated in the McWane data he relies on. The upshot of this is that Dr. Normann has not tracked McWane's net income from domestic Fittings sales at all, and for that reason alone Figure 11 should be disregarded as meaningless.

Nonetheless, even had Dr. Normann's graph been of net income from domestic-spec Fittings and controlled for shifting product mix, his conclusion that net average income is trending to "unsustainable negative levels by the end of the decade" would baseless. Dr. Normann arbitrarily assumes, contrary to fact, that the trend in net income is linear over the period 2004-2010. The trend in Figure 11 in the period covering mid-2009-2010 is clearly positive. Apart from this, is an enormous outlier that assuredly lowers the slope of the trend. Yet, Dr. Norman provides no explanation for this, nor does he account for effect of the recession and economic stagnation that began in 2008, or the severe decline in residential housing starts that began in 2006.[42]

Business cycles are called business cycles for a reason: they are cyclical. Accordingly they affect such economic variables as housing starts and municipal revenues in a cyclical fashion, not a linear one. Because the factors that affect Fittings sales and profits are pro-cyclical, Dr. Normann's estimation of a linear time trend is misspecified and, therefore, entirely meaningless. His trend is further misspecified because again Dr. Norman fails to consider any of the multitude of economic factors that might affect profitability in the Fittings industry. Any student that has taken an introductory econometrics class has been taught that the exclusion of any relevant independent (or "explanatory") variable that has any effect on the dependent

[42] See *Housing Starts*, http://www.census.gov/const/www/newresconstindex_excel.html.

variable (in this case, the profitability of McWane's Waterworks Division) in a regression analysis results in biased estimates of the effects of the included variables except in one extreme circumstance.[43] That Dr. Normann excludes all economic variables that might affect the profitability of Fittings besides time would bias his estimated time trend. For this reason alone, Dr. Normann's analysis should be disregarded.

Further, while Dr. Normann purports to track net income, it is the wrong measure in assessing whether a firm is earning monopoly rents. By doing so, Dr. Normann apparently rejects the longstanding, commonly accepted, and fundamental tenet of price theory that under competitive conditions price equals marginal cost.[44] Because under competitive conditions price equals marginal cost, the better measure of profit would have been gross income attributable to domestic Fittings, the revenue generated by the sale of domestic-spec Fittings (net of rebates, freight discounts, and so forth) minus the cost of goods sold for domestic-spec Fittings.

47

Dr. Normann simply fails to consider economically relevant facts indicating that McWane likely enjoyed market power even pre ARRA: the fact that McWane was the sole

[43] Even in this one circumstance in which omitted variables are "orthogonal" to the included variables so that the estimated coefficients are not biased (a condition that is unlikely to occur, especially when a large number of relevant independent variables are omitted, but which requires a highly technical mathematical explanation, which is well beyond the scope of this report) the estimated variances and, accordingly the standard errors of the estimated coefficients, are biased. Thus, when relevant independent variables are omitted from the estimated model, even under the unlikely, single circumstance in which the estimated coefficients are unbiased, biased standard errors "we are still precluded from drawing valid inferences about [the estimated coefficients]. Of course, it is unlikely that in practice the regressors would be orthogonal." See Greene, William H., *Econometric Analysis*, 2nd edition (New York: Macmillan Publishing Co., 1993), pp. 246 - 249. The quote is from p. 247.

[44] See, for example, Buccirossi, Paolo, ed., *Handbook of Antitrust Economics*, MIT Press, 2008. p. 18; Viscusi W.K., Vernon, J.M., Harrington, J.E., *Economics of Regulation and Antitrust, 3rd Ed.*, MIT Press, 2000. p. 258; and Tirole, Jean. *The Theory of Industrial Organization*, MIT Press, 1988. p. 66. Dr. Normann's reference to an article by Drs. Baumol and Swanson is inapt, as the question addressed by Baumol and Swanson is quite different.

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provider of a product for which demand was inelastic and that was protected by antitrust barriers; the fact that it charged significantly more for its domestic-spec Fittings than for its open-spec Fittings; and the fact that a not-yet-efficient Star could price at, and sometimes below, the prices set by the more efficient incumbent, McWane.

47. Figure 12

Although far from clear, I think Dr. Normann seeks through Figure 12 to argue that there has been a shift over time from domestic-spec to open-spec Fittings and that this somehow has market definition or market power implications. Setting aside the substantial counter-shift during the ARRA period (as shown in Figure 12 itself), that appears to be a historical fact. But it has no market definition or market power implications. As I have indicated elsewhere, we have two well-defined markets. All that Dr. Normann's table shows is that the relative size of the open-spec market and the domestic-spec market varies over time. The number of people in a relevant market, whether absolutely or in comparison with the number of people in another relevant market, is simply unrelated to whether, or the amount of, pricing power that can be exercised in that market. Dr. Normann's Figure 12 is incapable of making any contribution to our understanding of the issues here and should be disregarded.

48. Figure 13

In Figure 13, Dr. Normann purports to show a negative correlation between a state's receipt of stimulus funding and increases in domestic-spec Fittings sales relative to open-spec Fittings sales. Dr. Normann's methodology is flawed in that he fails to control for the variety of variables that might influence the relative growth of the domestic-spec and open-spec markets in any given state; variables like prior maintenance of infrastructure, housing starts, and presence of pre-existing domestic-spec preferences and laws. Further, Dr. Normann does not report the magnitude, variation around, or statistical significance of his claimed "negative correlation."

Without such information, Dr. Normann's work is entitled to little if any consideration. I frankly cannot follow his claims from his purported finding of a negative correlation, but what seems obvious is that, contrary to Dr. Normann's claims elsewhere that ARRA was inconsequential, ARRA likely caused substantial growth in the domestic-spec Fittings sales, both absolutely and relative to sales of open-spec Fittings; and that Figure 13 is in no way a useful test for assessing market definition or market power.

In the text accompanying Figure 13 (see paragraph 90 of his report), Dr. Normann states: "If the stimulus funds becomes a large portion of total funding, and the Buy American requirement was binding, greater stimulus dollars should result in a greater domestic share . . . ." By that logic, Dr. Normann should have examined the change in domestic-spec share of all Fittings sales as a function of the ratio of ARRA-funded Fittings purchases to total Fittings purchases. In neither Figure 13 nor Figure 14, which is derived from Figure 13, does Dr. Normann test what he described as his relevant, testable hypothesis.

49. Figure 14

"To be conservative," Dr. Normann says, he ran figure 14, changing his horizontal axis. Now his correlation apparently flips from negative to positive. Rather than recognizing that this result tends to undermine his conclusions from Figure 13, Dr. Normann simply writes it off because "the largest states such as California, Texas, [and] New York all have very modest changes in share."

50. Figure 15

In Figure 15 Dr. Normann illustrates the fact that ARRA waterworks funds accounted for only a small part of total public spending. That is surely correct, but of no economic consequence in examining the issues here.[48]

[48] In his text, Dr. Normann then misstates the terms of the so-called de minimis waiver, which is applicable only for items that comprise a small portion of project cost *and that are "incidental" components, such as nuts,*

51. Figure 16

Dr. Normann's Figure 16 is intended to support his statement that demand for domestic Fittings would not have supported multiple dedicated plants, and that therefore Sigma and Star would not have built or bought a dedicated foundry for the production of domestic Fittings. Star's determination to build or buy a foundry for the production of domestic Fittings belies the notion that rivals of McWane would not have invested in plant. Dr. Normann's finding that if it did so capacity would outstrip demand only means that competition then would have then been especially intense, as each company fought to load and maintain its foundry. As a result, consumer welfare would have increased markedly. Moreover, Sigma entry independent of McWane through means other than ownership of a foundry – through an arrangement with a foundry operator that did not then manufacture Fittings, for example,[49] or an alliance with Star, for further example – also could have injected substantial competition into the domestic-spec market.[50]

52. Figure 17

Figure 17 incorporates Dr. Normann's unreliable price series, and so is itself unreliable. See Section III of this report. In addition, Dr. Normann again undertakes a naive comparison of McWane prices, as he calculates them, and a single variable, a primary input cost index of his

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bolts, other fasteners, tubing, gaskets, etc. [Federal Register Notice, Vol. 74, No. 152 April 10, 2009], and asserts that given that Fittings do constitute a small portion of project cost, "it is reasonable to expect that [they] would be used." In forming that expectation Dr. Normann here, as often elsewhere in his report, simply ignores the wealth of information contrary to his "expectation." Deponents had little or no awareness of any instances in which non-domestic Fittings were sold into domestic-spec jobs under a de minimis waiver. See, for example, Michael Coryn Deposition, May 16, 2012, p. 90; Mark Meyer (Metalfit) Deposition, May 14, 2012, p. 140; Thomas Morton (US Pipe) Deposition, May 30, 2012, p. 131.

[49]

[50] And participation in the domestic-spec market was important to Sigma not merely in its own right, but because it believed that inability to provide domestic Fittings to distributors would make it less likely that they would purchase Sigma's imported Fittings. See, for example, Rona Deposition, May 18, 2012, pp. 219-221; For that reason, after passage of ARRA Sigma assured its customers that it would be able to supply them with domestic Fittings. See, for example, Pais IH, July 23, 2010, pp. 140-145.

devise. As I have previously shown, an econometric analysis accounting for the interplay of variables affecting price, including demand as well as cost shifters, is needed to draw any valid conclusions. Even as a naive comparison, Dr. Normann's failure to identify and plot demand shifters means that he gives an incomplete and, given that demand was dropping or slack during the relevant period, biased impression. Finally, Dr. Normann's analysis seeks to address only whether McWane gained additional market power during the relevant period. As I have explained, McWane enjoyed monopoly power well prior to ARRA, which simply expanded the number of projects subject to its monopoly power.

53. Figure 18

There does not appear to be a Figure 18.

54. Figure 19

Figure 19 is nothing more than an enlarged segment of one of the elements graphed in Figure 11, and is offered for much the same point. Dr. Normann's Figure 19 tracks the net income of Tyler Union Waterworks Division of McWane. Dr. Normann apparently believes that the plotted net income is "inconsistent with McWane being able to exercise market power for the sale of Fittings over the relevant time period." But, as I previously discussed when examining Figure 11, Dr. Normann's measure of net income is for all products of the Waterworks Division, which include not only Fittings of foreign and domestic manufacture, but glands, valve boxes, jobbing castings, and perhaps other products. Dr. Normann nowhere separately reports on net income attributable to domestic Fittings sales, nor does he attempt to control for shifting product mix either within the domestic Fittings category or across the several Fittings and non-Fittings product categories aggregated in the McWane data he relies on. The upshot of this is that Dr. Normann has not tracked McWane's net income from domestic Fittings sales at all, and for that reason alone Figure 19 should be disregarded.

Further, Dr. Normann purports to track net income, but that is the wrong measure in assessing whether a firm is earning monopoly rents. In so doing, Dr. Normann apparently rejects the longstanding, commonly accepted, and fundamental tenet of price theory, that under competitive conditions price equals marginal cost.[51] Because under competitive conditions price equals marginal cost, the better measure of profit would have been gross income (attributable to domestic-spec Fittings), net revenue from the sale of domestic-spec Fittings minus their cost of goods sold.

55. Figure 20

Figure 20 purports to be a graph of Star's share of domestic-spec sales over time. Dr. Normann acknowledges that it is "difficult to establish a metric for measuring the effectiveness of entry based on share," and then proceeds to set up just such a metric based on inapt comparisons of entry by Star into sale of domestic-spec Fittings and other companies' entries into radically different markets. Star had participated competitively and well in the adjacent open-spec Fittings market for years prior to seeking to enter the domestic-spec market. On entering it was seeking to use distribution channels it already had established in the sale of open-spec Fittings. And its entry was into a market in which customers previously had had no alternative seller to McWane. Under those circumstances, it is not surprising that Star grew quite a bit more rapidly than a company seeking to enter the unconcentrated used car market, to take one example. Star's growth, whether looked at in absolute terms or in comparison to that of entrants into very different markets, can tell us little, if anything, about what its growth would

[51] See footnote 43 herein.

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have been had it not been constrained by McWane's restrictive agreements and practices. Finally, Dr. Normann simply ignores all of the information – beginning with the cancellation by distributors of millions of dollars of invitations to Star to bid as an immediate result of McWane's announcement of its "full support" program – that conflicts with the slant he places on his share graph.[55]

56. Figure 21

Dr. Normann's Figure 21 purports to show Star's share of domestic-spec sales in the ten states in which its share is greatest. The relevance of this information is not apparent: in fact, it means that in the forty unlisted states, Star's share is never greater than and may be as low as And Figure 21 tells us nothing about the dollar value or distribution of Star's sales within any state (which I would think would be particularly important to Dr. Normann given his opinion that markets may be local). In particular, it does not alter the fact that Star's share of the U.S. market for domestic-spec product—and I have explained elsewhere why the relevant market is nationwide—was just in 2010 despite Star's much greater share of the open-spec market.

Appendix B provides McWane's and Star's sales in tons of domestic-spec Fittings for all 50 states (plus the District of Columbia and Puerto Rico (for convenience, in this paragraph I will refer to all of them as "states.")). The states, the District of Columbia, and Puerto Rico are listed in descending order of Star's share of sales in tons of domestic-spec Fittings. Star's largest share is in Oklahoma in which its sales represent of the total tons of domestic-spec Fittings sold in the state. Iowa is the tenth state when ranked by Star's share, with of the total tons of domestic-spec Fittings sold in the state. Although Star's shares in these states may look relatively high, looks can be deceiving. The total tons of domestic-spec

[55] For a discussion of this record information, see paragraph 147 of my previous expert report in this matter (*Expert Report of Laurence Schumann, Ph.D.,* filed on June 15, 2012).

Fittings sold by Star in the 10 states in which it has its highest shares represents just of the total tons of domestic-spec Fittings sold in the U.S. Star sold of domestic Fittings in Oklahoma in 2010, its top state in which it has a share. Yet, all of the tons of domestic-spec Fittings sold in Oklahoma, , represent just of the tons of domestic-spec Fittings that were sold in the U.S. in 2010. It is clear from Appendix B that the market shares in each state are irrelevant. Having a large share of the sales in states that have very small shares of the U.S. market does not mean much. It is still the case that Star's sales represent just under of the domestic-spec market.

57. Figures 22 through 24

In Figure 22, Dr. Normann indicates that of distributors purchased domestic-spec Fittings solely from McWane and that of distributors purchased domestic-spec Fittings from Star or Star and McWane both.[56]

In Figure 23, Dr. Normann charts his calculation–unreliable insofar as it incorporates his unreliable price series, that distributors that purchased from McWane alone accounted for of all domestic-spec Fittings purchases and that distributors that purchased from Star or Star and McWane both purchased of all domestic-spec Fittings purchases.

In Figure 24, Dr. Normann performs the same calculation–using the same unreliable price series, but limits his universe to distributors that purchased more than of domestic-spec Fittings summed across Star *and* McWane. He calculates that of the

[56] Remarkably, in Figures 22 and 24, Dr. Normann weights every distributor equally. HD Supply, with its 215 branches spanning much of the country, and Ferguson , with 161 branches across the country are, for him, just two distributors, no different from any other distributor irrespective of the number of its branches, the scope of its geographic coverage, the number or size of customers to which it has meaningful access Every distributor counts as "1." In Figure 23, Dr. Normann may have tried to proxy for this by looking at dollar sales rather than number of distributors, but that proxy is at best incomplete. Further, insofar as Figure 24 is intended as a check on Figure 23 by limiting the analysis to distributors that purchased more than $50,000 of domestic-spec Fittings from Star and/or McWane in 2010, it is anomalous that Dr. Normann doesn't include a similar proxy, at the least, in Figure 24. Again, he treats every distributor, so long as it has the requisite minimum domestic-spec purchases, like every other distributor despite his knowledge of the tremendous variation in distributors' size and scope.

distributors in this universe purchased domestic Fittings only from McWane, and that 56 of the distributors in it purchased domestic Fittings from Star or Star and McWane.

From these Figures, Dr. Normann concludes that Star sold *some* domestic-spec Fittings to numerous distributors, many of which purchased domestic-spec Fittings from McWane as well.[57] But from this, Dr. Normann claims that it must be that McWane did not materially constrain Star's entry (and, by implication, its growth toward efficient scale). This simply does not follow. Dr. Normann does not report any effort to determine whether purchasers of both Star and McWane domestic-spec Fittings tend to purchase significant quantities of Star domestic-spec Fittings or whether, as appears more likely, most purchasers of both Star and McWane domestic-spec Fittings purchase only trivial amounts of Star domestic-spec Fittings.[58] His data are fully consistent with the latter.

Table 1 below illustrates this point, and shows how misleading Dr. Normann's Figures 22, 23, 24 and the related text are. Even if every number that Dr. Normann reports in connection with these Figures is correct, it remains true, as my Table 1 shows, that McWane's 2010 sales, measured in tons of domestic-spec Fittings, were greater than Star's, and that irrespective of the number of distributors purchasing Star's domestic-spec Fittings, their purchases were trivial. This and the remainder of information conveyed in my Table 1 is entirely consistent with my opinion that McWane's "full support" program prevented Star from

[57] The impact of McWane's "full support" program may have been more complete in early 2010 than in the latter part of 2010, when some distributors may have been emboldened to purchase at least some Star domestic-spec Fittings by knowledge of the FTC's investigation in this matter. See e.g. Thomas Morton (VP of Purchasing at US Pipe) Deposition, May 30, 2012, pp. 152-155; Edward Morrison, Jr. IH, February 4, 2011, pp. 78-79. Since Dr. Normann's data are presented for the entire year rather than by month, he obscures any such variation over time.

[58] Nor, for example, does he report any effort to measure Star's access to customers located in specific localities. This seems an odd omission given Dr. Normann's opinion that relevant markets here may include states and localities. In fact, elsewhere in his report Dr. Normann indicates that in 2010 "Star made no domestic sales to DC, HI, ME, NH, VT and no sales of the fixed basket of Fittings to NE and WI. See Notes to Figure 27 in Dr. Normann's Report.

participating in major domestic-spec waterworks projects in 2010 despite the substantial increase in the sales of domestically manufactured Fittings for use to ARRA projects in 2010.

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TABLE 1

McWane's and Star's Sales of Domestic-Spec Fittings in 2010

	McWane		Star	
	Tons	*Share*	*Tons*	*Share*
Total Tons				
Tons Sold to Overlapping Customers				
Tons Sold to Exclusive Customers				

Includes Fittings up to 24".

Dr. Normann seems nonplussed by this possibility, which he seems to acknowledge but somehow concludes that it would be evidence of the ineffectiveness of McWane's "full support" program. That seems quite a stretch. The more plausible explanation is that most of those distributors that purchase domestic-spec Fittings from Star and McWane purchase substantially all of their Fittings from McWane, but a few from Star when McWane is unable to timely provide the specific Fittings required,[59] and that some of them have made furtive purchases of small quantities of Star domestic-spec Fittings, to see if they might gain sufficient confidence in Star to enable them later to openly switch their purchases from McWane to Star.[60] Dr.

[59] McWane's policy allowed for this: "Exceptions are where Tyler Union or Clow Water products are not readily available within normal lead times . . ." TU-FTC-0255188.

[60] The deposition testimony of Dennis Sheley of Illinois Meter is illustrative:

Q. And the stuff that you purchased from Star,

is it all still in inventory for you?

Norman's data simply do not address the real-world adequacy of the distribution opportunities remaining to Star following McWane's announcement of its "full support" program.

58. Figure 25

Figure 25 incorporates Dr. Normann's unreliable price series, and so is itself unreliable. See Section III of this report.

In Figure 25, Dr. Normann presents a purported list of what he calls common domestic-spec Fittings sold both by Star and McWane (subject to the substantial difficulties he acknowledges in matching up Star and McWane Fittings). So to begin, he limits his analysis to domestic-spec Fittings of which Star sold more than nine tons in the period 2009 through 2011 and for which he could find a McWane match. In so doing, he excludes the overwhelming majority of Star and McWane domestic-spec Fittings from his analysis.[61] He finds that as a percentage of its domestic-spec Fittings sales, Star is more concentrated on "the common Fittings" than McWane, although he does not report whether the difference he notes is statistically significant or his findings robust (which is to say, how his findings would be affected if he used somewhat different inclusion/exclusion criteria). For that reason alone, one cannot properly make inferences from the finding. Nevertheless, Dr. Normann concludes that his

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A. No. We've sold it here and there.

Q. Did you ever send Star any bids to respond

to for domestic fittings?

A. No.

Q. Why not?

A. Because I don't want to lose the Tyler line.

Sheley Deposition, April 24, 2012, p. 134.

See also, R. Edward Gibbs Deposition (WinWholesale), May 29, 2012, pp. 37-38.

[61] In addition, Dr. Normann's representation that he is examining sales for the period 2009 through 2011 is improper in two very different respects. First, it is misleading in that he implies that he is reviewing three years of data, whereas Dr. Normann knows there were only trivial Star domestic-spec sales in 2009, all occurring at the very end of that year. Second, because he lumps all sales together rather than examining them at various points in time, he obscures the effect of ordinary product mix variation within each company over time, which might further call in to question his conclusion.

finding is "consistent with" McWane's "prevention-of-cherry-picking" justification for its "full support" program. This is an underwhelming finding, and all the more so given that Dr. Normann's methodology likely purged most of Star's sales of less common Fittings from consideration.

59. Figure 26

In Figure 26, Dr. Normann graphs quarterly Hajoca purchases of domestic-spec Fittings from McWane and from Star for the period 2008 through 2011 and Hajoca's aggregate share of domestic-spec Fittings purchases in the states in which Hajoca made purchases. Dr. Normann claims that if Hajoca was harmed by McWane's "full support" program, that harm would be reflected in lower total volume and share. But Dr. Normann does not correctly answer the question, "lower than what?". The correct answer to that question is, "lower than the volume and share that would have obtained given Star entry but absent the McWane "full support" program and/or its enforcement." But Star's entry and McWane's announcement and enforcement of its "full support" program are substantially contemporaneous events, or at least nearly so.[62] Hence, Dr. Normann has failed to provide a framework in which his hypothesis can be tested meaningfully.

Even were that not so, Dr. Normann's analysis founders on known errors in the classification of McWane sales as open-spec or domestic spec, as I indicated previously, and on Dr. Normann's continued, but improper, insistence on making inferences from inter-temporal comparisons without controlling for varying supply and demand conditions over time. For these reasons too, Dr. Normann's analysis should be rejected.

[62] Further, because there is an unsystematic lag between negotiation of purchases by distributors and order entry and fulfillment by suppliers, one cannot assign effects to specific causes based on temporal relationship (as we often casually do by observing that A always follows immediately upon B, and therefore may be the cause of B).

Finally, and once again, Dr. Normann fails to fully understand and take any guidance from the facts in determining what analyses might be meaningful or in interpretation of his "test" findings. During the relevant period, only two Hajoca branches required domestic-spec Fittings, one in Pennsylvania and the other in Oklahoma.[63] The Pennsylvania branch had a longstanding relationship with McWane, because of Pennsylvania's statutory commitment to Buy-American and McWane's longstanding position as the monopoly supplier of domestic-spec Fittings.[64] The Oklahoma branch, however, decided it would buy Star domestic-spec Fittings. McWane then informed Hajoca that if it did so, McWane would cut Hajoca (not just the Oklahoma branch) off and withhold certain rebates.[65] Hajoca stood by its corporate policy of allowing its branches purchasing autonomy and permitted its Oklahoma branch to buy the Star Fittings.[66] It did, and McWane then informed Hajoca that it was cut-off.

Hajoca was able to negotiate with McWane for fulfillment of outstanding orders from Hajoca's Pennsylvania branch as of about December 23, 2009, but not for acceptance of new orders from any Hajoca branch thereafter or for payment of fourth quarter rebates for domestic-spec purchases, which McWane withheld.[67] It was not until April of 2010 that McWane further relented and allowed Hajoca branches other than the offending Oklahoma branch to again purchase McWane's domestic-spec Fittings.[68] And McWane's willingness to relent may have been a reaction to the fact that it was by then aware that it was under investigation by the FTC for its monopolistic practices.

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[63] HAJ000055-56.

[64] Roy Pitts IH, October 29, 2010, p. 57.

[65] Roy Pitts Deposition, April 11, 2012, pp. 152-153.

[66] Roy Pitts IH, October 29, 2010, pp. 68-70.

[67] HAJ000046.

[68] Roy Pitts Deposition, April 11, 2012, pp. 155-158; HAJ00001.

In paragraph 143 of his Report, Dr. Normann seeks to transmute these facts into something else by claiming that Hajoca's Roy Pitts testified that McWane "came around to our thinking" and did not enforce its "full support" program against Hajoca. According to Dr. Normann, Mr. Pitts' concluded, "no harm, no foul." Of course, Mr. Pitts' testimony indicates, despite Mr. Pitt's wish to placate a critical supplier, that McWane cut off order fulfillment to all Hajoca branches for a period of time during the ARRA period, and continued to refuse to fulfill Oklahoma branch orders beyond that. And as for "No harm, no foul, Dr. Normann ignores the following exchange between Mr. Pitts and McWanes counsel at Mr. Pitts' deposition at page 165:

Mr. Pitts:	I need to clarify something so I can get it right. No harm, no foul, we did lose the first quarter rebate, just to clear that up.
McWane's Counsel:	Let's look at that.
Mr. Pitts:	That would be the foul.

60. Figure 27

Figure 27 incorporates Dr. Normann's unreliable price series, and so is itself unreliable. See Section III of this report.

In Figure 27, Dr. Normann plots, by state, the ratio of Star to McWane prices "for a fixed basket" of domestic-spec Fittings and Star's share of domestic-spec Fittings sales.[69] He finds that the lower Star's prices for the basket of Fittings was relative to McWane's prices for a similar basket of Fittings, the greater was Star's share of domestic-spec Fittings sales.[70] Then, in a footnote (see his footnote 158), he acknowledges that his observed correlation actually is "marginally insignificant" and possibly "spurious." Nevertheless, Dr. Normann infers from his observed (but marginally insignificant and possibly spurious) correlation that Star could have

[69] Or is it, sales of the basket of Fittings? It is not entirely clear from Dr. Normann's narrative.

[70] Ibid.

picked up additional sales by pricing in a "more aggressive" way. Dr. Normann does not report the quantity of additional sales that he believes would have been available to Star nor the size of the difference between Star and McWane prices that would have been necessary to induce those sales notwithstanding McWane's "full support" program.

Again, Dr. Normann's analysis is fraught with methodological problems, including failures to control for differences in supply and demand conditions across states, without which his purported correlation is meaningless, and questions of significance and robustness of his findings. Moreover, in concluding that Star could have obtained additional sales by pricing "more aggressive[ly]," Dr. Normann seemingly forgets that his data concern the difference between Star and McWane prices, not Star prices themselves. For that reason, his failure to consider how McWane would have responded to more aggressive Star pricing further undermines his conclusion. Finally, Dr. Normann's exercise simply does not address the question of relevance here: whether McWane's imposition of its "full support" program improperly raised Star's costs of entry and delayed its emergence as an efficient competitor able to constrain McWane's monopoly of domestic-spec Fittings.

61. Figure 28

Figure 28 incorporates Dr. Normann's unreliable price series, and so is itself unreliable. See Section III of this report.

In Figure 28, Dr. Normann purports to show that Star entry did not affect McWane's domestic-spec Fittings prices during the period 2008 through 2011 (odd in itself in that Star did not announce its entry until June 15, 2009, and had no appreciable 2009 sales). Dr. Normann here makes the same kinds of methodological errors he makes elsewhere, but let us assume that he nevertheless is correct: that Star entry did not affect McWane prices. That is entirely consistent with McWane's continued monopolization of the market through imposition of its

"full support" program. McWane's intent was to avoid undermining its pricing by responding to any competition from Star. That is why it imposed the "full support" program.[71] Dr. Normann's Figure 28 and related text is consistent with McWane's having consigned Star to the margins during 2009 and to date. By not more thoroughly considering the facts and relevant economic theory before setting up his "tests," Dr. Normann is again unable to effectively interpret his own data. If one accepted Dr. Normann's Figure 28 as reliable, one would note that it matches up with a dominant firm model in which the marginalized Star most often will sell what it can at or near prices set by the market leader, here McWane. Once free of the marginalizing restraint of McWane's "full support" program and able to acheive scale efficiencies, Star's incentives will change as will supply conditions relative to demand, exerting substantial downward pricing pressure on both Star and McWane.

62. Figure 29

Dr. Normann's Figure 29 and related text incorporates the same errors as Figure 28 (and numerous other Figures), and should be disregarded as unreliable.

From Figure 29, Dr. Normann finds that McWane's prices, at least for his fixed basket of domestic-spec Fittings, did not vary from state to state with variations in Star's market penetration. From that, he illogically concludes that McWane's "full support" program had no competitive effect.[72] To lend credibility to his test, Dr. Normann claims that there "is a wide

[71] See TU-FTC-0257851 ("To protect our domestic brands and market position we are going to adopt a distributor exclusivity program . . ."); TU-FTC-0255284 ("Avoids the job by job auction scenario within a particular distributor").

[72] He apparently seeks to borrow credibility from elsewhere by claiming that his analysis is similar to the analysis presented by the FTC's expert in *Staples/Office Depot*. While not entirely incorrect, Dr. Normann fails to point out that, while the FTC's expert did perform an analysis based on similar intuition, this type of analysis may suffer from serious deficiencies that could render the results highly unreliable. It is well-known in the economics profession such cross-sectional comparisons suffer from what is known as "omitted variable bias" and may be fundamentally misleading. (See, for example, Hausman, J. A., and Taylor, W. E., "Panel Data and Unobservable Individual Effects", *Econometrica*, Vol. 49 N. 6 (1981) pp. 1377-1398; Baker, Jonathon, "Econometric Analysis in FTC v. Staples", March 31, 1998, available at http://www.ftc.gov/speeches/other/stspch.shtm.)) Therefore, in *Staple/Office Depot*, the FTC's expert performed additional analysis that compared price changes before and after changes in market structure in select markets with price and market structure changes during the same time period in

range in Star's share, ranging from zero in a few states, to as high as in others. Nontheless, greatly undermining Dr. Normann's ability to draw reasonable inferences, even were his test otherwise is well-conceived, is the fact that there are very few data points reflective of more-than-slight Star shares of domestic-spec sales.[73]

Moreover, again, Dr. Normann is unable to effectively interpret his own data because of his disregard of the facts and relevant economic theory. McWane was determined to slow Star's emergence as an efficient competitor; not to start reactively pricing and undercutting its own margins.[74] As long as McWane could inhibit Star's growth and prevent it from acheiving efficient scale, Star's adherence to the dominant firm model made sense. But Star's ability to achieve that scale is a function of its sales nationwide, not its share in any state or locality. In looking at variations in state shares, Dr. Normann entirely misses the point.

63. Figure 30

Dr. Normann's Figure 30 re-runs his Figure 29 analysis, substituting for McWane's domestic-spec prices some kind of average domestic-spec price. The analysis is subject to every flaw I identified in my discussion of Figure 29, and should be disregarded.

64. Figure 31

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control markets. The use of times series and cross-sectional data (referred to as "panel data") enabled the expert to separate out any price effects attributable to entry (the variable of interest) from any attributable to other variables (so-called "confounding varriables"). Dr. Normann performs no such analysis here. Without controlling for confounding variables, one simply cannot assess the impact of a variable of interest: here, the imposition of McWane's "full support" program. Instead of a carefully controlled analysis, Dr. Normann serves up a cross-sectional comparison of McWane prices and Star market shares by state without controlling for any attributes that may also affect prices. In *Staples/Office Depot*, the results in the cross-sectional and panel data studies performed by the FTC's expert were very similar, but that does nothing to mitigate concerns about Dr. Normann's cross-sectional analysis in this matter.

[73] As far as I can tell given the tight packing of observations at shares between zero and five percent, Dr. Normann's "few states" in which Star had a zero share actually number six, whereas his "as high as in others"–the emphasis is mine–applies to only one state, New York, with the next highest share dropping quite far, to about No other share exceeds In all, it appears that in not fewer than 33 instances Star's share does not exceed and in more than half of those it does not exceed

[74] See TU-FTC-0257851 ("To protect our domestic brands and market position we are going to adopt a distributor exclusivity program . . ."); TU-FTC-0255284 ("Avoids the job by job auction scenario within a particular distributor").

In Figure 31, Dr. Normann plots McWane and Star average prices per ton for "a fixed basket" of domestic-spec Fittings. Quite apart from the applicability of many of my previously-noted methodological criticisms, Dr. Normann's data seem to show only that in most, but not all, instances, Star prices its domestic-spec Fittings at or slightly above the prices set by McWane. But he then claims that this somehow shows that McWane lacks monopoly power. That is wrong. It implies, as Dr. Normann did in his discussion of earlier Figures, that it cannot be that an entrant in a monopolized market would be cautious in initiating a price-war with a monopolist with all of the advantages of incumbency. Again, Dr. Normann ignores the facts and relevant economic theory. As previously indicated, Dr. Normann's data are consistent with a dominant firm model in which the marginalized Star most often will sell what it can at or near prices set by the market leader, here McWane. Once free of the marginalizing restraint of McWane's "full support" program and able to acheive scale efficiencies, Star's incentives will change as will supply conditions relative to demand, exerting substantial downward pricing pressure on both Star and McWane.

65. Dr. Normann's Final, Unnumbered Figure

In this Figure on page 81 and in the related text, Dr. Normann looks at all distributors who purchase any Fittings of any origin from either McWane or Star. He finds that among these distributors, six percent purchased domestic spec Fittings only from McWane. Based on that, he concludes that "only six percent of distributors could be considered foreclosed . . . ." In reaching that conclusion, Dr. Normann ignores another six percent of distributors, apparently because the McWane rebates they stood to forfeit if they violated McWane's "full support" policy were less than each.

Again, Dr. Normann works his data without regard for the facts. Every one of those distributors faced the prospect of being cut off from access to needed McWane domestic-spec

Fittings if they purchased other domestic-spec Fittings from Star. Such a lack of access is a daunting prospect–perhaps more so than loss of rebates. Another of the distributors purchased some domestic-spec Fittings from both McWane and Star, but Dr. Normann does not report on the quantity of these Fittings each purchased from Star. Dr. Normann ignores the fact that some, perhaps many or most, of these distributors purchased small quantities of Star domestic-spec Fittings, to fill in where McWane could not timely provide the Fittings needed and/or to gain familiarity with Star's domestic-origin capabilities while seeking to escape McWane's notice.

The largest group of distributors that Dr. Normann includes as not foreclosed are firms that made no McWane purchases and so were not affected by McWane's imposition of its "full support" program. That sounds impressive, until one considers that the time period of Dr. Normann's analysis is 2007 through 2010. The significance of that time period is that these distributors appear not to have been material purchasers in the relevant domestic-spec market at all. They cannot have been, or they would have had to purchased domestic-spec Fittings from McWane in 2007, 2008, and 2009, during which time McWane was the only supplier available to them. Saying that these distributors (if that is a proper characterization at all) were not foreclosed by McWane's "full support" program is like saying that distributors of groceries were not foreclosed by McWane's program: true, but ninformative and irrelevant. Dr. Normann's Final, Unnumbered Figure simply does not speak meaningfully to the issues in this suit.

VI. Dr. Normann's Response to the Schumann Report

66. Dr. Normann criticizes my report for not offering testable theory or analysis with respect to collusion or exclusive distribution. Ironically, these criticisms include my failure "to examine actual transaction prices" in addition to my failure to examine the incidence of job

pricing or prices relative to input costs.[75] Among other things, he also criticizes my failure to provide "graphs, charts, or analyses of any kind regarding pricing."[76] He goes so far as to assert that my "entire conclusion rests on his opinion derived from a review of the documents."

67. I have already discussed at length the extensive deficiencies in the price data produced by the parties. Just as I have not examined, studied, analyzed, graphed , or charted transaction prices, Dr. Normann has failed to examine, study, analyze, graph, or chart transaction prices. Perhaps if Dr. Normann had reviewed, examined, and studied the documents and testimony more carefully he would not have submitted an 85 page summary of, among other things, his failure to understand how transactions are undertaken in the relevant markets and why actual transaction prices bear no relation to the prices that he has examined, analyzed, graphed, and charted.

68. I freely admit that without meaningful price data, I relied heavily on facts developed by the record in this case to test if the economic theories of oligopoly and collusion that I discussed at length in my report were applicable to the relevant markets and consistent with the business practices adopted by McWane, Star, and Sigma. Indeed, throughout my career I have found that facts can be extremely informative with regard to markets and the competitive behavior of firms operating in those markets.

69. Dr. Normann also criticizes my report for my analysis of market definition. This criticism is based on Dr. Normann's mischaracterization of the markets that I define and the analysis on which I base my opinions regarding market definition. Dr. Normann views appear inconsistent with the discussion in the *2010 Horizontal Merger Guidelines* on Product Market

[75] Normann Report, paragraph 164.

[76] Ibid.

Definition with Targeted Customers.[77] Dr. Normann claims that I conclude that domestic Fittings represent a separate product market from imported Fittings.[78] That characterization of my opinion is not true.

70. In my report, I conclude that two markets are relevant in this matter. One consists of both domestic and imported Fittings when a project's specifications allow Fittings manufactured in any location to be used in a waterworks project. The second relevant market consists of domestic Fittings, *but only when project specifications require that only domestically manufactured Fittings can be used in the waterworks project.* Such domestic-only specifications can be required by law. For example, the American Recovery and Reinvestment Act of 2009 ("ARRA") required that only domestically manufactured Fittings could be used in ARRA funded waterworks projects.[79] In the Commonwealth of Pennsylvania, only iron and steel products made in America can be used in all construction, repair, and maintenance contracts let by public bodies, including the Commonwealth, its political subdivisions, and authorities.[80] Similarly, a New Jersey statute requires that "every contract for the construction, alteration or repair of any public work in this state shall contain a provision that in the performance of the work the contractor and all subcontractors shall use only domestic materials in the performance of the work."[81] Domestic-only specifications are also be required by certain municipalities and can be required purely as a result of the strong preferences of regional or state authorities or private

[77] U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines*, August 19, 2010, Section 4.1.4.

[78] Norman Report, paragraph 170.

[79] See ARRA (2009), Section 1605.

[80] The Pennsylvania Steel Products Procurement Act, 73 Pa. Stat. §§ 1881-1887. The definition of "steel products" includes cast iron products. When required by law, such as in Pennsylvania or under the ARRA, public waterworks projects will require MA Fittings under virtually all circumstances. Nonetheless, in certain cases, some negotiations over the extent of a MA Fittings specification may occur.

[81] N.J. Stat. § 52:33-3.

businesses.[82] Dr. Normann does not seem to understand that when domestically manufactured Fittings are the only Fittings that can be used in a waterworks project, *then imported Fittings are not a substitute product.* Because imported Fittings cannot substitute for domestic Fittings when only domestic Fittings can be used in a project, the ability of a hypothetical monopolist to price discriminate defines a separate Made in America Fittings market when only domestically manufactured Fittings can be used in a project.

71. Dr. Normann discusses at length how imported and domestic Fittings are essentially identical; that imported Fittings replaced domestic Fittings when they entered the U.S. market; and that, in my report, the only state that I mention as having a law requiring the use of domestic Fittings in public waterworks projects is Pennsylvania. Each of these points is absolutely correct and absolutely irrelevant. In some cases in which preferences rather than law resulted in domestic-only specifications in waterworks projects, Fittings importers have successfully persuaded municipalities, water authorities, and businesses responsible for the domestic-only specifications to change the specifications to allow for the use of imported Fittings. This is also irrelevant. If a waterworks project *requires* that only domestically manufactured Fittings be used, for whatever reason such a requirement may exist, imported Fittings do not and cannot substitute for domestic Fittings. If an importer can have the specification changed, then it is no longer the case that only domestically manufactured Fittings can be used in the project. But, as long as it is the case that only domestically manufactured Fittings can be used in a particular waterworks project, then imported Fittings are not substitutes

[82] See also the testimony of several witnesses in this matter, who in addition to Pennsylvania, identify the Northeast, Maryland, Utah, Illinois, and Texas as areas with domestic specifications, including Ramesh Bhutada IH, October 12, 2010, pp. 31-32; Dan McCutcheon IH, October 12, 2010, pp. 83-84; Richard Tatman IH, July 21, 2010 pp. 46-48; and Bill Thees IH, November 16, 2010, p. 48; "Buy America Works: Longstanding United States Policy Enhances the Job Creating Effect of Government Spending," February 2010, available at http://www.mcwanebuyamerican.com/pdfs/buyamericanworks.pdf ("To date, more than 500 local, state and municipal governments have passed "Buy America" resolutions of their own, pledging to ensure that American-made materials are used to the fullest extent possible in infrastructure projects funded by the Recovery Act." p. 4.)

for domestically manufactured Fittings. In such a case, a hypothetical monopolist of domestic Fittings can charge higher prices than it would be able to charge if it faced competition from imported Fittings. Accordingly, for those waterworks projects in which only domestically manufactured Fittings can be used, domestic Fittings compose a second market. This basic application of the hypothetical monopolist analysis of market definition in the presence of price discrimination does not suggest that imported Fittings do not compete with domestic Fittings, as Dr. Normann falsely characterizes my opinion. It does indicate, however, that when imported Fittings *cannot* compete with domestic Fittings because only domestic Fittings can be used in a project then, *in that case*, domestic Fittings compose a distinct market.[83]

72. Dr. Normann is also badly confused on geographic market definition. He claims that the use of local preference or law in the determination of product market mandates a local geographic market.[84] This is simply wrong. Any domestic manufacturer can sell in any local community mandating domestic product and thus the appropriate geographic market is national irrespective of either local laws or preferences that govern product market definition.

73. Dr. Normann argues that I am wrong in concluding that there are substantial antitrust barriers to entry in the Fittings markets, and that these barriers facilitate collusion. He seemingly disregards all of the IH and deposition testimony indicating the importance and difficulty of establishing a distribution network.[85] He instead asserts that there are no such barriers, basing that assertion on his claim that Sigma and Star combined Fittings sales grew from about 30 percent of the market to about 50 percent between 2003 and 2008, and on his claim that Star "captured almost a 15 percent share [of domestic-spec sales] within 18 months [of

[83] Dr. Normann also criticizes my analysis of market definition

[84] Norman Report, paragraph 173.

[85] See, for example, Coryn IH, Jan. 13, 2011, pp. 44, 102 – 103; Groeniger IH, Dec. 14, 2010, pp. 61 – 63, 82; Groeniger Deposition, May 11, 2012, pp. 155 – 158; Prescott Deposition, May 8, 2012, p.24; Sheley IH, Jan. 11, 2010, pp. 60, 116.

entry into that market], reached 20 percent or more for several states, and sold domestic product to more than 100 distributors in 2010." This is a liberal mix of misstatement and misdirection. Sigma and Star did not achieve their "modest"—Dr. Normann's characterization—2003 shares of the Fittings market until some 18 and 26 years, respectively, after entry. That is hardly consistent with ease of entry. Dr. Normann's statement that Star "reached 20 percent or more [of domestic-spec sales] in several states" is belied by his own Figure 21, which shows that only in two states did its share exceed , and only in five, did it exceed . Figure 21 shows that in 43 states its share was not greater than and possibly as low as Moreover, such domestic-spec sales as Star has been able to gather is a function of the wide-reaching distribution system it has built up in its nearly 30 years of Fittings sales in the U.S. Only two firms other than McWane enjoy such Fittings distribution capability, Sigma and Star. That is what distinguishes them from other Fittings providers, like Electrosteel, which, though substantial international firms, have been unable to develop U.S. distribution and so failed to become a noteworthy market participant.[86]

74. Dr. Normann also criticizes my report by claiming to show that prices did not increase following McWane's January 11, 2008 letter announcing its price increase effective February 18, 2008. As I have already discussed, Dr. Normann's analysis purporting to show that prices did not increase in 2008 is based on extraordinarily flawed and meaningless price data. On the other hand, Rick Tatman states in the Tyler/Union Executive Report for 1st Quarter 2008, "Based upon our competitive feedback log, the level of multiplier discounting by both Star and Sigma appears to have died down significantly."[87] Significant reductions in discounting tend to suggest increases in transaction prices. Moreover, in my view, the opinions expressed by Mr. Tatman in documents created in the course of business in 2008 are considerably more credible

[86] See Swalley Deposition, May2, 2012, pp. 41, 108, 126 , and 152 - 153.

[87] TU-FTC-0010113 – l 0115, at 10113.

descriptions of the state of the Fittings market in early 2008 than any graph created in 2012 by Dr. Normann, particularly in light of the meaningless "price" data on which Dr. Norman bases his opinions.

75. Dr. Normann claims that my report has no testable theory re: collusion or exclusive distribution and no pricing analysis or graphs. I discussed the reliability of pricing data earlier. Documents and testimony paint a compelling picture of attempts to coordinate pricing and belief of success, albeit temporary. Furthermore, each section of the report does have testable implications. For example, the exclusive distribution policy, if effective, implies Star's share of the domestic market in 2010 and 2011 was lower than it would have been absent the policy. Neither Dr. Normann nor I can observe the "but-for" world directly, so there is no direct test on this point. I find it compelling that Star testified it had/has trouble getting distribution, that at least one distributor testified he would have bought from Star but for the policy, and that other distributors reduced or eliminated their domestic purchases from Star after McWane announced its distribution policy. In contrast, Dr. Normann concludes that the policy had no effect because Star's market share "grew steadily" (para. 124), had "strong sales in some states" (para. 129) and "had access to distributors" (section heading, p. 59). None of these are sufficient to show that McWane's policy had little to no effect on Star.

76. Dr. Normann claims I do not discuss market power in a meaningful way or test for market power. Market power is the ability to maintain price above the competitive level for a material period of time. It can be measured by direct evidence or inferred from structural analysis. Market power is created in the overall Fittings market when McWane, Sigma, and Star agreed to coordinate their pricing policy, an agreement policed by an exchange of share data through DIFRA. Not surprisingly, this market power dissipated when the Big Three cheated on their agreement. Market power is inferred for the domestic niche from the monopoly share of

McWane. Given the significant difference in price between the blended and the domestic-only Fittings evidence in McWane's documents, some market power is exercised in this market.

77. Dr. Normann claims that the DIFRA data are not sufficient to allow McWane, Sigma, and Star to collude. As pricing is extremely complicated, the firms cannot reach a price agreement unless it is possible to police the agreement with share information. As the product is reasonably standardized, unit sales are sufficient to allow the calculation of market shares. Each competitor only needs to know if its share has declined materially to detect competitive behavior on the part of its rivals. McWane's demand for participation in DIFRA and Sigma and Star's acquiescence to it facilitated the price agreement. In fact, on the very day the DIFRA data arrived at McWane, a price increase was announced.[88]

78. Dr. Normann claims I provide no evidence on size of domestic market or the strength of preferences. This allegation fails to recognize the clear evidence in the record that customers paid more for domestic Fittings when jobs required domestic Fittings than they did when the bids were open (and McWane sent a domestic fitting priced as an imported fitting (as a blended product). The size of the domestic market was well defined by the tons of product sold as domestic. McWane tracks this number in their business.

79. Dr. Normann claims I ignore the large number of non-McWane distributors. All of these ignored distributors were not accepted as McWane customers prior to Star's entry. Hence none of the firms had much experience dealing with the customers that required domestic product. No evidence exists to suggest that these entrant distributors were as effectively as the distributors with a long history of selling domestic Fittings. Star's sales of 2-24 inch Fittings to these non-McWane distributors were relatively small. Dr. Normann also argues that purchasers

[88] See Q006SP0000810 (email of June 17, 2008 containing transmission of the DIFRA report); TU-FTC-0266469 (Tatman email of June 17, 2008 at 3:20 pm sent to his colleagues at McWane summarizing DIFRA data); TU-FTC-0010081 (Tatman email of June 17, 2008 at 6:26 pm sent to Ferguson announcing price increase).

of small amounts of Star domestic Fittings should have been most vulnerable to McWane's exclusive dealing program. My report was clear that the restrictive dealing policy was considered exclusive by a range of customers. Under an exclusive program, purchasing from Star would lead to termination from McWane's distribution system. Exceptions existed in the restrictive/exclusive distribution program and these were understood by the customers.

80. Dr. Normann claims that McWane had no monopoly power in domestic-spec Fittings because distributors could have turned to fringe suppliers or entrants for 100 percent of required domestic product. This is totally unclear. In the broader Fittings market the testimony is clear a price fixing agreement was needed to raise price. McWane had no market power. Fringe distributors existed, but for the reasons detailed above would be unable to offset the immediate effects of a price fixing agreement. It was the presence of Sigma and Star that prevented McWane from imposing exclusive distribution on the broad market.

81. With regard to the MDA, whether or not Sigma would have entered the domestic-spec market but for the MDA certainly is a question of interest. But McWane's intent in entering the MDA also is a question of interest. McWane entered the MDA to head off a competitive threat from Sigma. Although the intensity of McWane's concern varied over time, even at the last, McWane recognized that Sigma might enter and disrupt its monopoly. McWane's Tatman, writing McWane EVP McCullough and Sr. VP Walton, indicates that "Unless there's something going on with [Sigma and] Mueller, I'm not picking up any strong sense that [Sigma has] a strong alternate path at this point that they'd be willing to invest significant $ into."[89] But he sees enough risk of Sigma entry to buy an "insurance policy" against independent (of McWane) Sigma entry in the form of the MDA, provided that McWane

[89] TU-FTC-0265821.

does not have to "throw[] too much $ at" it.[90] McWane senior management considered Tatman's email and all other available information and went ahead and bought that insurance policy. They headed off a meaningful risk of independent Sigma entry, however one assesses its magnitude. And in concluding that Sigma could not have entered expeditiously, Dr. Normann ignores both the example of Star and the possibility that Sigma entry

(as Tatman recognized), and the possibility that Sigma might have entered in alliance with Star or perhaps others.

82. Neither I nor Dr. Normann perform any statistical test to calculate the precise impact on market prices that would have resulted from independent Sigma entry. That could not be done without making a variety of assumptions about speed, scope, and scale of that entry. It requires no such tests, however, to observe that increased capacity chasing essentially fixed demand tends to result in reduced prices. That says nothing of the added service competition an independent Sigma would have introduced to the market.

VII. Conclusions

83. Dr. Normann formulates and tests various hypotheses and interprets his test results without grounding either in relevant economic theory and known facts. As a result, his hypotheses typically are poorly matched to the questions of importance in this litigation, and his interpretations often are flawed. In effect, he often asks the wrong questions and even as to them provides the wrong answers, as reflected in a wealth of conflicting real-time documents and substantial testimony that he just ignores.

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[90] Ibid.

[91] see also Victor Pais IH, July 23, 2010, p. 140 (Q. So would it be fair to say, sir, that you had two important customers that owned foundries, that had expertise casting fittings domestically that were working cooperatively with you as part of the effort to set up domestic production? A. Yes. Q. Is all that fair to say? A. Yes.)

84. Setting these objections to the side for the moment, Dr. Normann's "hypothesis testing" is methodologically flawed in numerous and important ways, and is wholly unreliable. Much of it rests on Dr. Normann's price series, which he knew or should have known did not accurately measure actual Fittings sales prices, whether for open-spec Fittings or domestic-spec Fittings (between which it cannot accurately discriminate). Given the numerous sources of measurement error underlying these price series that I have identified in this report, every finding derived from them is inherently unreliable and should be rejected.

85. Further, Dr. Normann, in all but one instance, limits his testing to naïve comparisons that do not even identify, never mind address, numerous other sources of gross error, again identified in this report. Among these, he does not control for any of the variables that can be causes of the effect he purports to observe. Without controls for such things as the impact of the crushing decline in housing starts leading and continuing into the Great Recession, one simply cannot discern the effects of other variables of interest, like collusion or monopolistic practices. Earlier in this report, I further detailed the many flaws infecting each of the "Figures" and related text in Dr. Normann's report. The upshot of my critique is that they are not relevant or, to the extent relevant, otherwise unreliable several times over.

86. Dr. Normann's criticisms of my report are based on his own deeply flawed analyses and on his failure to understand or account for the relevant economic models, economically significant facts, and my contentions.

87. Nothing in Dr. Normann's report undermines the opinions that I reached in my initial report. Most importantly, I remain of the opinion that McWane, Sigma, and Star agreed to facilitating and price fixing accords, to reduce discounting and increase prices for Fittings, and that McWane used its monopoly power in the domestic-spec Fittings market to inhibit competitively significant entry, using its "full support" program to restrain competition with Star

and any other would-be entrant, and the MDA as an insurance policy against competition from an independent Sigma.

Respectfully submitted,

Laurence Schumann, Ph.D.

July 12, 2012

Appendix A

Prices of Dr. Normann's "Fixed Basket of Fittings" Are Not Normally Distributed

A simple construct that allows one to judge whether data are normally distributed is a normal probability plot. If data are normal, the normal probability plot should lie on a straight line. The figure below shows a normal probability plot for the prices in Dr. Normann's basket, along with a straight line. As can be seen, the plot is anything but straight, indicating that prices are not normal. Further, the Shapiro-Wilk test for normality rejects the hypothesis that the prices are normally distributed.

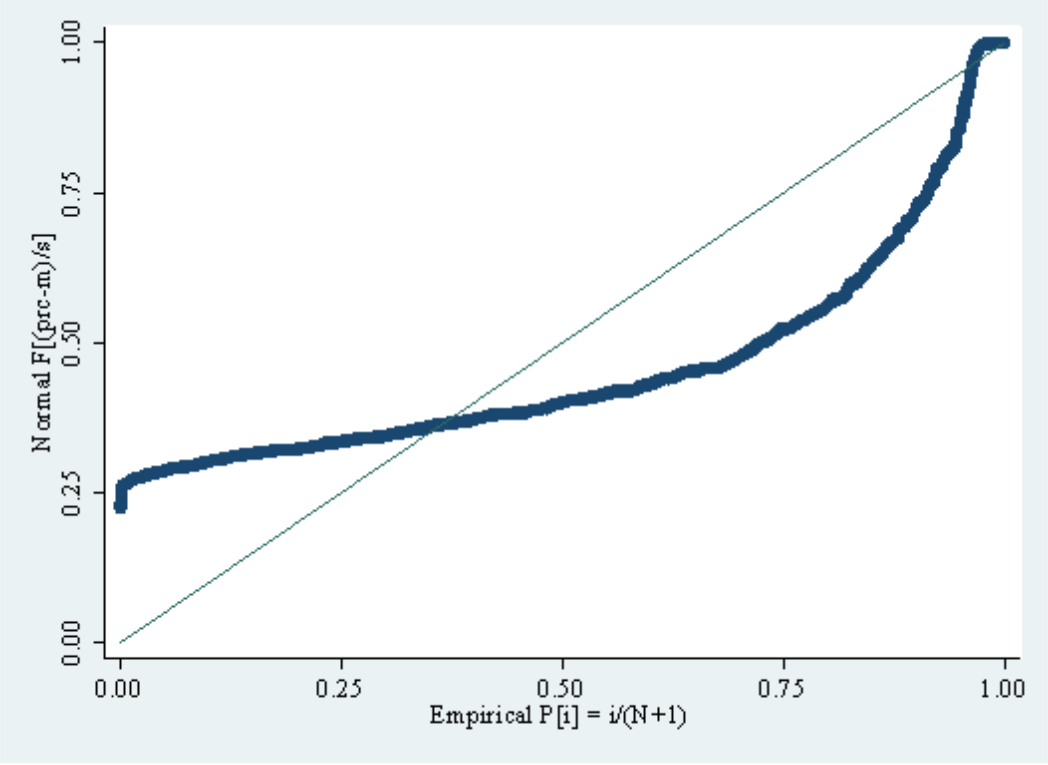


Table: Shapiro-Wilk Test for Normality on Actual Prices

```
. swilk prc if basket == 1

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
         prc | 231417    0.46643    2.8e+04    28.952    0.00000

.
. swilk prc

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
         prc |1923703    0.32411    9.3e+04    32.429    0.00000
```

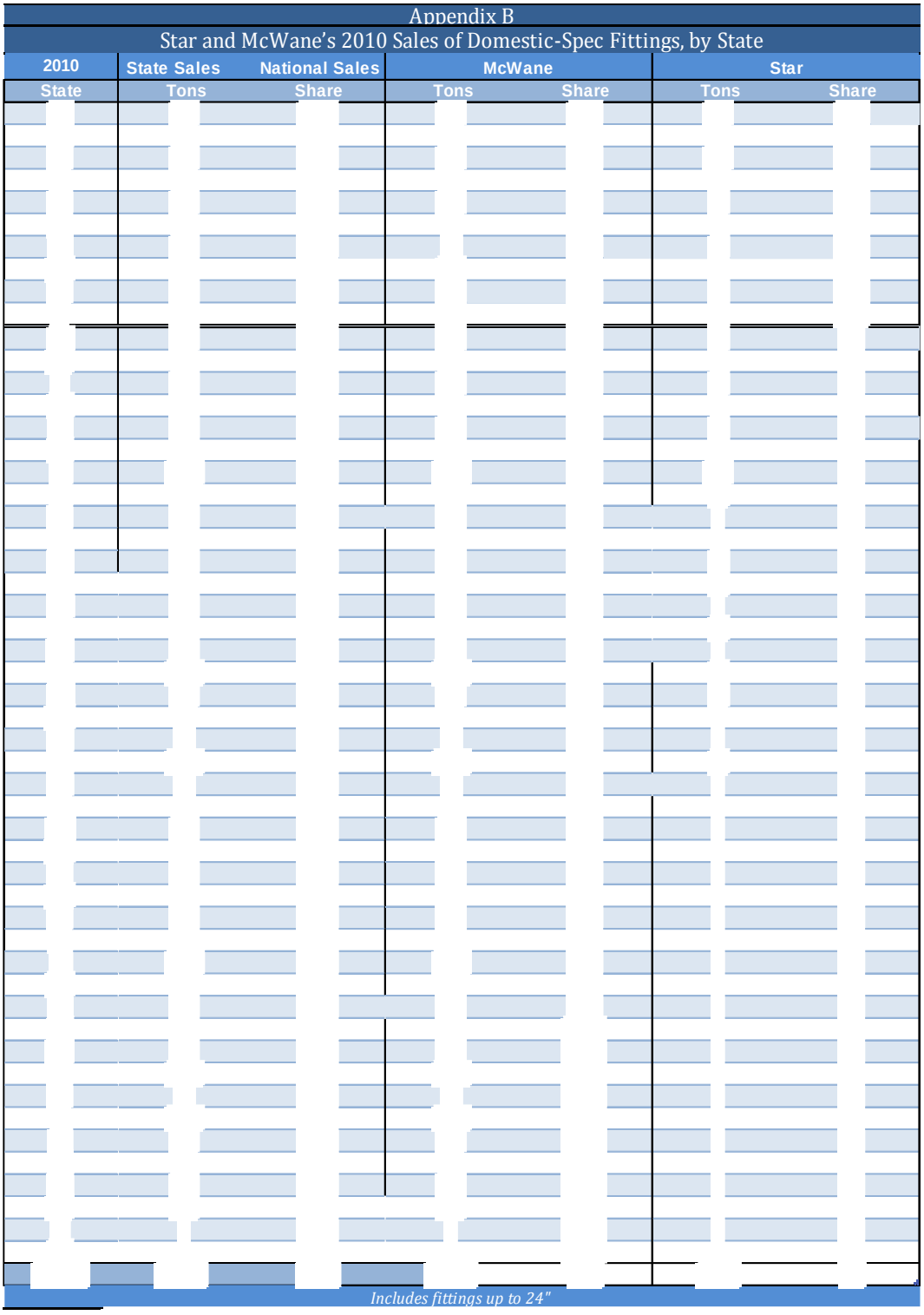
Because the actual input into Dr. Normann's regressions is monthly aggregated prices, I also tested whether the monthly aggregated prices are normally distributed. For both small and medium Fittings, the Shapiro-Wilk test rejects that the monthly aggregated prices are normally distributed. Therefore, statistical tests and confidence intervals based on the t-distribution are invalid.

Table: Shapiro-Wilk Test for Normality on Dr. Normann's Aggregated Prices, Small and Medium Fittings

```
. swilk small

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
       small |     48    0.91593      3.829     2.856    0.00214

. swilk medium

                  Shapiro-Wilk W test for normal data

    Variable |    Obs       W           V         z       Prob>z
-------------+--------------------------------------------------
      medium |     48    0.93470      2.974     2.319    0.01021
```

Appendix B

Star's and McWane's 2010 Sales of Domestic-Spec Fittings by State



Appendix B

Star and McWane's 2010 Sales of Domestic-Spec Fittings, by State

2010	State Sales		National Sales	McWane		Star	
State	Tons		Share	Tons	Share	Tons	Share

Includes fittings up to 24"

Sources: Sources:

McWane sales: McWane-007664.xlsx through McWane-007685.xlsx;

Appendix C

Materials Considered

Books and Articles

- Ashenfelter and Hosken, "The Effect of Mergers on Consumer Prices: Evidence from Five Mergers on the Enforcement Margin," *Journal of Law and Economics* 53 (2010).
- Ashenfelter, Orley, Phillip Levine, and David Zimmerman, *Statistics and Econometrics: Methods and Applications* (2006).
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Transcripts and Exhibits	**Type**
10.11.16 Thees, Bill	IH Tr and Exhibits
11.01.11 Sheley, Dennis	IH Tr and Exhibits
11.02.11 Morrison, Edward	IH Tr and Exhibits
10.12.14 Groeniger, Michael	IH Tr and Exhibits
11.01.13 Coryn, Michael	IH Tr and Exhibits
10.10.29 Pitts, Roy	IH Tr and Exhibits
10.08.12 McCullough, Leon	IH Tr and Exhibits
10.07.21 Taman, Richard	IH Tr and Exhibits

10.08.06 Rona, Mitchell	IH Tr and Exhibits
10.07.23 Pais, Victor	IH Tr and Exhibits
10.06.04 Agarwal, Bharat	IH Tr and Exhibits
10.10.12 McCutheon, Dan	IH Tr and Exhibits
10.10.12 Bhutada, Ramesh	IH Tr and Exhibits
11.05.04 McCutheon, Dan	IH Tr and Exhibits
12.04.11 Pitts, Roy	Depo Tr and Exhibits
12.04.17 Fairbanks, Richard	Depo Tr and Exhibits
12.04.24 Sheley, Dennis	Depo Tr and Exhibits
12.04.30 Morrison, Edward	Depo Tr and Exhibits
12.05.02 Swalley, Danny	Depo Tr and Exhibits
12.05.10 Tatman, Richard	Depo Tr and Exhibits
12.05.11 Groeniger, Michael	Depo Tr and Exhibits
12.05.14 Meyer, Mark	Depo Tr and Exhibits
12.05.14 Bhutada, Ramesh	Depo Tr and Exhibits
12.05.16 Coryn, Michael	Depo Tr and Exhibits
12.05.16 McCutcheon, Dan	Depo Tr and Exhibits
12.05.17 Burns, Jerry	Depo Tr and Exhibits
12.05.18 Rona, Mitchell	Depo Tr and Exhibits
12.05.22 McCullough, Leon	Depo Tr and Exhibits
12.05.24 Page, Ruffner	Depo Tr and Exhibits
12.05.25 Bharat, Agarwal	Depo Tr and Exhibits
12.05.29 Gibbs, R. Edward	Depo Tr and Exhibits
12.05.30 Morton, Thomas	Depo Tr and Exhibits
12.05.31 Pais, Victor	Depo Tr and Exhibits

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- 2012.04.18 1:33 pm E-mail to Holleran from Lavery
- 2012.05.14 9:36 am E-mail to Bloom from Lavery
- 2012.06.05 12:05 pm E-mail to Bloom from Lavery

Data	**Company**
FTC-SIGMA-000001 (Audit Data).mdb	Sigma
McWane-007664.xlsx through McWane-007685.xlsx	McWane
http://www.census.gov/const/www/newresconstindex_excel.htm	Census Department
McWane Multiplier Maps: McWane-007594 - 007662	McWane
Sigma corrected sales data (Jul 3, 2012), "FTC-Sales Data Reworked"	Sigma
SalesData.mdb	Sigma
Tu-Ftc-0013802.xls	McWane
Top 46 Star Domestic Products Edited for Input.xlsx	Normann file
McWane and Star Price by Ton by size - Fixed Basket.xlsx	Normann file

Commission Documents/ALJ Filings

- McWane-Star Complaint
- Expert Report of Laurence Schumann, Ph.D. (June 15, 2012)
- Expert Report of Parker Normann, Ph.D. (June 29, 2012)

Miscellaneous

- U.S. Department of Justice and Federal Trade Commission, Horizontal Merger Guidelines, August 19, 2010.
- New Jersey Statute - Title 52:33-3, Provision in contract; exception of particular materials.
- The Pennsylvania Steel Products Procurement Act, 73 Pa. Stat. §§ 1881-1887.
- H.R. 1, American Recovery and Reinvestment Act of 2009 (ARRA), Public Law 111-5, Feb. 17, 2009.
- Federal Register Notice, Vol. 74, No. 152 at 39959, April 10, 2009.
- Buy America Works: Longstanding United States Policy Enhances the Job Creating Effect of Government Spending, February 2010, available at http://www.mcwanebuyamerican.com/pdfs/buyamericanworks.pdf.

Documents (Beginning Bates Number)	Company
EJ 00022	EJ Group - East Jordan
E00064108	Star Pipe
HAJ000046	Hajoca
McWane-010391	McWane
Q006SP0000810	Star Pipe
STAR0286859	Star Pipe
STAR0255981	Star Pipe
STAR0274293	Star Pipe
TU-FTC-0010081	McWane
TU-FTC-0010083	McWane
TU-FTC-0010113	McWane
TU-FTC-0010145	McWane
TU-FTC-0010147	McWane
TU-FTC-0010201	McWane
TU-FTC-0010307	McWane
TU-FTC-0011285	McWane
Tu-Ftc-0013802	McWane
TU-FTC-0020902	McWane
TU-FTC-0031436	McWane
TU-FTC-0032360	McWane
TU-FTC-0032428	McWane
TU-FTC-0248965	McWane
TU-FTC-0255188	McWane
TU-FTC-0255284	McWane
TU-FTC-0257851	McWane
TU-FTC-0265821	McWane
TU-FTC-0266469	McWane
Tyler Union Waterworks Fittings Fin. Stmts	US Pipe/Mueller
USP-FTC_00000041	US Pipe/Mueller

CERTIFICATE OF SERVICE

This is to certify that on July 12, 2012, I served via electronic mail a copy of the foregoing expert report and related materials to:

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Counsel for Respondent McWane, Inc.

July 12, 2012

By: _____
Michael J. Bloom
Federal Trade Commission
Bureau of Competition

ATTACHMENT C

REBUTTAL TESTIMONY OF LAURENCE SCHUMANN, PH.D.

In the Matter of McWane, Inc.

FTC Docket No. 9351

Conclusions: The Normann Report is Unreliable and Deficient

- Relies on severely flawed price data that do not reflect actual transaction prices
- Simplistic graphical analyses fail to control for other factors that affect Fittings' prices
- Fails to follow standard and long accepted practices when performing data analysis and testing

Conclusions: The Normann Report is Unreliable and Deficient

- Fails to address oligopoly theory and its effects on determination of collusive behavior
- Flawed reading of, and representations of, analyses contained in my June 15, 2012, report and bases for my opinion

Critique of Normann Report Tests and Data Analyses

- No theoretical framework within which to interpret Normann's empirical analyses
- Normann does not discuss oligopoly theory or oligopolistic interdependence and its role in price fixing
- Without an appropriate theory, hypotheses cannot be formulated and tested

Critique of Normann Report Tests and Data Analyses

- A fact-based consideration of potentially relevant economic models should precede formulation and testing of hypotheses and interpretation of test results
- Fails to use a working knowledge of the facts for this purpose

Problems with the Price Data

- Not transaction data
  - Does not reflect discounts below multiplier discounts
    - E.g. freight, cash discounts, extended terms, rebates
- Timing issue
  - Prices are set weeks, months, sometimes many months before shipments
- Month to month changes in product or customer mix

Errors in the Data

- Substantial *known* error rates in the price data; for products marked "ND" for non domestic:
  - 2008: actual multiplier exceeds list 4.27 % of time
  - 2009: actual multiplier exceeds list 10.75 % of time
- *Known* errors are not evenly distributed through the years
  - January 2008: 21% *known* error rate
- Errors create upward bias in January 2008 price data

Errors in Data

- McWane's Counsel wrote:

  . . . there is no commercial reason as to why an order would be booked above the published multiplier at the time of order entry. This was most likely an order entry error where the inside person applied the incorrect price policy to the order. In that case, there would most likely be a credit applied as [sic] some future point when the error was caught during payment processing. (CX 2552)

- LS Rebuttal Report Figure 1 shows serious January 2008 *known* error rate (21%)

- Dr. Normann only looked at errors in which multiplier was greater than or equal to 1 but didn't consider multipliers greater than list

Errors in Data

- Substantial *known* error rates in the price data; for domestically manufactured products (which can be sold at domestic or import prices):
  - 2008: Actual transaction multipliers for domestic exceed list for domestic 9.10 % of the time
  - 2009: Actual transaction multipliers for domestic exceed list for domestic 6.40 % of the time

Other Notes on Errors in Data

- I can only detect errors where the reported transaction multiplier exceeds the list multiplier
- I can't detect errors where transaction multiplier exceeds the actual transaction multiplier yet is still below the list multiplier
- Such errors also would create an upward bias on price

Errors in Classification of Domestic vs. Non Domestic

- There is no method to unambiguously identify domestic-spec Fittings
  - Leads to errors in classification of domestic vs. non domestic
- If product is incorrectly classified, that will bias average price

Problems with Techniques

- Fails to report tests for robustness
  - E.g. Figure 2A/B, timing of collusion
- Problems in hypothesis testing
  - Fails to report test statistics and confidence intervals
- Fails to identify and control for other factors that shift supply and demand

Econometric Analysis

- To measure impact of an event (such as price-fixing agreement) on prices, one must control for all other factors besides the agreement that might impact prices
- Only by doing so can the effect of price-fixing agreement be determined
- Dr. Normann uses no acceptable method for controlling for confounding factors

Analyses Fail to Control for Confounding Factors

- Market price is formed by supply and demand
- Change in supply and demand affect price
- Factors other than the degree of competition in a market affect price
  - E.g. macroeconomic factors such as booms and recessions, changes in interest rates, currency fluctuations
  - E.g. microeconomic factors such as input prices, changes in technology, changes in prices of complementary goods

Factors Specific to Fittings Market

- Many factors can affect supply and demand and therefore prices in the Fittings market:
  - E.g. age of waterworks systems and treatment plants, municipal finances, housing starts, prices of diesel fuel used by trucking, railroad, and shipping companies, and seasonal factors
- Dr. Normann's analysis of Fittings prices controls for none of these factors

Figure 1

- Compares new 2008 list multipliers to 2007 list multipliers
- I recreated Dr. Normann's Figure 1 with the average effective multipliers in 4th quarter 2007 (CX 1664) instead of the list multipliers of 2007
- I show prices were increasing in 39 states (versus Normann's 14 states)
  - See LS Rebuttal Report Figure 2

Figures 2A and 2B

- Shows indices of price changes over time
- Price series data is wholly unreliable
  - Substantial *known* errors in transaction price data
  - Potential biases in selection of Fittings for his price index
  - No correction for varied and unknown lags between negotiation of prices and invoicing
  - Lack of control variables
  - No reported robustness testing
  - No reported statistical testing

Correction to Sigma data

- By letter dated July 3, 2012, counsel for Sigma sent corrected Sigma data
  - Corrected data was received after Dr. Normann submitted his expert report
- Dr. Normann's initial analysis showed 19% decline from January 2008 to February 2009; corrected data shows a price increase in same period

Figures 2A and 2B

- In Figure 2B, different errors and biases may infect the data
  - Relative movements of the price series cannot be trusted
  - LS Rebuttal Report Figure 1 demonstrates Jan 2008 *known* McWane errors
- Graph of changes in metal and energy costs along with price series does nothing to explain price series
  - Fails to consider changes in other variables of interest (i.e. demand factors)
  - LS Report Figure 2 shows housing starts

Figures 2A and 2B

- When one changes date of collusion period to be consistent with complaint allegations and evidence, data show McWane, Sigma, and Star price increases

Figure 3

- Plots ratio of average price of open spec to domestic spec to check for a price increase
- Incorporates unreliable price series data and ignores confounding factors
- Data from a fixed basket of only 24 “top selling Fittings” only 6 of which are medium
  - Small non random sample creates risk of bias
- Does not assess and report standard errors or confidence intervals of the slopes
  - Cannot determine if slopes are estimated with precision or are wildly inaccurate
  - Cannot distinguish between systematic and random changes from period to period

Figure 4

- Purports to show variation of transaction prices
- Incorporates unreliable price series data and ignores confounding factors
- Reports application of test to only 3 Fittings out of more than a thousand
- An increase in standard deviation is not inconsistent with an increase in prices due to collusion
  - Any change in price over time could indicate uniformity in price OR change in price itself

Figure 5

- Probative of nothing in particular
- Plots McWane's non domestic inventory
- Given inelasticity of demand for Fittings, a slight reduction in available product can support large reduction in discounting
  - May be undetectable using even sophisticated methodology
- Dr. Normann acknowledges if short-run production is not fixed, this figure is meaningless
  - Short-run production is not fixed

Figure 6

- Compares monthly open-spec sales; purports to test for short-term quantity limitation
- No controls for changes in demand and supply conditions across years
- Doesn’t report robustness and statistical significance tests

Figure 7

- Shows domestic share of market
- If domestic-spec sales declined as a percentage of total Fittings sales, so what?

Figure 8

- Shows cumulative volume of McWane's domestic sales in 2008, ranked by state share of domestic product
- Hypothesis that much of market is preference based is flawed
- Requires classification of McWane sales as open-spec or domestic
  - Classification of sales subject to substantial errors in price series data
- Strength of preference more important than number of preference buyers
  - Size of the market tells us nothing about competition within it
- Figure does not show anything about purchasers legally obliged to purchase domestic

Figure 9

- Purports to show slight negative correlation between McWane's prices and market share
- Hypothesis is flawed
  - Presupposes single market
  - Faulty logic that the number of people in a relevant market is related to the presence of monopoly power in a state
- Incorporates unreliable McWane price series data
- Plot only shows that domestic share varies from state to state
- Ignores fact that supply and demand conditions vary from state to state
  - Dr. Normann acknowledges failure to control for product mix

Figure 10

- Purports to improve Figure 9 by controlling for product mix
- Hypothesis is flawed
  - Presupposes single market
  - Faulty logic that the number of people in a relevant market is related to the presence of monopoly power in a state
- Incorporates unreliable McWane price series data
- Fails to account for variation in supply and demand from state to state
- Uses only 16 out of thousands of products to attempt to control for *acknowledged* product mix problem

Figure 11

- Plots *net income* for all products of Waterworks Division (Fittings of both foreign and domestic manufacture, glands, valve boxes, jobbing castings)
  - Does not control for shifting product mix
- Should study *gross income* attributable to domestic Fittings; increases by over 50 percent from 2008 to 2009
- Does not control for business cycle; trend is positive in late period
- Fails to consider facts indicative of monopoly power

Figure 12

- Purports to show a decrease in market power due to a shift over time from domestic-spec to open-spec
- Only shows that relative size of the open-spec and domestic-spec market varies over time
- Market size tells us nothing about market power

Figure 13

- Purports to show negative correlation between state's receipt of stimulus funding and increases in domestic-spec sales relative to open-spec sales
- Figure not useful test for market definition or market power
- Fails to control for variables that influence relative growth of domestic-spec and open-spec markets in any given state
  - E.g. prior maintenance of infrastructure, housing starts, presence of domestic-spec preferences and laws
- Does not report magnitude, variation around, or statistical significance of his claimed "negative correlation"

Figure 14

- Repeats Figure 13 but changes horizontal axis to ARRA SRF receipts as % of state GDP
- Figure not useful test for market definition or market power
- Correlation flips from negative to positive, undermining Dr. Normann's conclusions from Figure 13

Figure 15

- Illustrates the fact that ARRA waterworks funds accounted for only a small part of total public spending
- This fact is of no economic consequence in examining relevant market and market power issues

Figure 16

- Purports to support claim that Sigma and Star would not have built or bought dedicated foundries for domestic production
- Ignores Star's determination to build or buy a foundry
- If capacity outstripped demand, price competition would have been intense
  - Consumer welfare would have increased
- Sigma entry through arrangement with contract foundry or with Star would have increased competition

Figure 17

- Analysis purports to examine whether McWane gained additional market power during the ARRA period, but McWane already had monopoly power
- Uses the unreliable price series data
- Compares domestic prices to only a single variable – a cost index
- Does not conduct an econometric analysis including demand and cost shifters

Figure 19

- Plots *net profits* for all products of Waterworks Division (Fittings of both foreign and domestic manufacture, glands, valve boxes, jobbing castings)
  - Does not control for shifting product mix
- Purports to show that the plotted net profits is inconsistent with exercise of market power
- Should study *gross income* attributable to domestic Fittings; increases by over 50 percent from 2008 to 2010
- Does not control for business cycle; trend is positive in late period

Figure 20

- Purports to show Star's share of domestic-spec sales and equates growth with absence of imposed restraint
- Dr. Normann acknowledges difficulty in measuring effectiveness of entry based on share
  - But then purports to do just that
- Star's growth tells little, if anything, about what growth would have been absent constraint

Figure 21

- Shows Star's share of domestic-spec sales in 10 states in which its share is the greatest
- Total tons of domestic-spec Fittings sold by Star in the 10 states represent just **{ }** of the total tons of domestic-spec Fittings sold in U.S.
  - Having large share of state that is small part of U.S. market does not mean much
  - Appendix B (in camera) of LS Rebuttal Report provides data on Star's sales of domestic spec

Figures 22, 23, and 24

- Figures show variations on a theme about 2010 domestic purchases from Star or McWane
  - Figure 22 – number of customers
  - Figure 23 – sales to distributors
  - Figure 24 – number of customers purchasing over $50,000
- Uses unreliable price series data and ignores confounding factors

Figures 22, 23, and 24

- Does not report whether purchasers of both Star and McWane domestic tend to purchase substantial quantities or trivial quantities of Star domestic
- In Figure 24, $50,000 is purchases summed across Star *and* McWane
- Data are consistent with purchasing very small quantities from Star and ultimately uninformative

Figures 22, 23, and 24

- McWane's 2010 sales of domestic-spec Fittings were 19 times greater than Star's
- LS Rebuttal Report Table 1 contains further detail on McWane and Star's 2010 sales

Figure 25

- List of common domestic-spec Fittings purports to show Star is more concentrated on common Fittings
- Subject to open-spec/domestic-spec classification error
- Limits analysis to domestic-spec of which Star sold more than 9 tons and for which Dr. Normann could find a McWane match
- Excludes the majority of Fittings (including Star's sales of less common Fittings) from his analysis
- Finding not surprising given that Dr. Normann's methodology likely purged from consideration most of Star's sales of less common Fittings

Figure 26

- Purports to show that Hajoca was not harmed by full support program because volume and share were not lower
- Subject to open-spec/domestic-spec classification error
- Ignores confounding demand and supply factors
- What was “but for world?” Was Hajoca’s share lower than it otherwise would have been?
  - Need to consider what volume Hajoca would have reached given ARRA and Star’s entry in absence of full support program

Figure 27

- Purports to show that if Star had lowered its prices, it would have increased its volume
- Incorporates unreliable price series data
- Fails to control for differences in supply and demand conditions across states
- Acknowledges correlation is “marginally insignificant” and possibly “spurious”

Figure 28

- Purports to show Star entry did not affect McWane's domestic-spec prices
- Incorporates unreliable price series data and ignores confounding factors
- Finding consistent with McWane's continued monopolization of the market through full support program

Figure 29

- Purports to find that McWane's prices for fixed basket of domestic-spec did not vary from state to state with variations in Star's share in the state
- Incorporates unreliable price series data and ignores confounding factors
- Finding consistent with monopolization
  - With the full support policy, McWane was not reactively pricing but slowing Star's emergence as a competitor
- Obtaining scale to be efficient is a function of achieving sales nationwide, not in any state or locality

Figure 30

- Re-runs Figure 29 analysis with an average domestic-spec price
- Criticisms applicable to Figure 29 apply here as well

Figure 31

- Purports to show McWane lacks monopoly power by plotting McWane and Star average prices per ton for fixed basket of domestic-spec
- Incorporates unreliable price series data and ignores confounding factors
- Ignores economic theory:
  - In a market with a dominant firm, a marginalized competitor will sell what it can at prices near those set by the market leader

Un-numbered Figure (page 81)

- Purports to find that { } purchased domestic-spec only from McWane
- Ignores another { } of distributors who stood to lose only small rebates but faced the risk of losing access
- Ignores for { } the extent of purchases from Star
  - Excepted purchases under policy
  - Small under-radar purchases
- Remaining { } are distributors who did not materially participate in domestic spec market until at least last months of 2009 and perhaps throughout 2010

Conclusions

- Dr. Normann's "tests" are not grounded in relevant economic theory
- Uses unreliable price series data
- Does not control for relevant variables
- The conclusions expressed in my June 15, 2012, Expert Report remain unchallenged and unchanged