AMERICAN TEXTILE
MANUFACTURERS INSTITUTE

February 1, 2001

Mr. Dale Ray
Directorate for Economic Analysis
U.S. Consumer Product Safety Commission
Washington, DC 20207

Re: Economic Impact Study

Dear Dale:

As promised, enclosed is a copy of the report "An Economic Analysis of the Draft Small Open-Flame Regulation of Upholstered Furniture" authored by Glassman-Oliver Economic Consultants, Inc. This study was prepared at the request of ATMI, the Decorative Fabrics Association, the American Fiber Manufacturers Association, the National Cotton Council, the Coalition of Converters of Decorative Fabrics, and the American Society of Interior Designers.

Our study was prepared in three parts: the first is an evaluation of the CPSC's analysis of the small open-flame draft proposed rule released by the agency in the 1997 briefing package; the second is a survey of the costs to the textile industry of the draft proposed rule, and finally Glassman-Oliver's estimate of costs to consumers based on the draft proposed rule.

We understand that these estimates may change after the CPSC releases the next briefing package on this rulemaking if the package is substantially different from the one released in 1997. However, the textile industry needed to examine the costs and benefits of this potential rulemaking based on currently available information.

We look forward to meeting with you and your staff on February 6, 2001. If you have any questions or need additional information prior to our meeting, please call me at 202-862-0518.

Sincerely,

Patty Adair

Patty Adair
Assistant Director,
Textile Products & Standards

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AN ECONOMIC ANALYSIS OF THE DRAFT SMALL OPEN-FLAME REGULATION OF UPHOLSTERED FURNITURE

February 2001

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AN ECONOMIC ANALYSIS OF THE DRAFT SMALL OPEN-FLAME REGULATION OF UPHOLSTERED FURNITURE

Executive Summary

In October 1997, the staff of the Consumer Product Safety Commission (the "Staff") released a briefing package describing its draft proposed small open-flame regulation of upholstered furniture.[1] As part of that briefing package, the Staff included an analysis of the economic benefits and costs of the draft regulation. Glassman-Oliver Economic Consultants, Inc. ("Glassman-Oliver") has been asked by the American Textile Manufacturers Institute, the Decorative Fabric Association, the Coalition of Converters of Decorative Fabrics, the American Fiber Manufacturers Association, the National Cotton Council and the American Society of Interior Designers to review the Staff's analysis. This report contains Glassman-Oliver's critique of the Staff's economic analysis. The report also contains Glassman-Oliver's own estimate of certain costs that consumers will bear as a result of the draft proposed regulation and detailed discussions of other significant costs that could not be quantified.

Although the draft proposed regulation ostensibly concerns the regulation of upholstered furniture, the standard places the burden of fire prevention on the upholstery fabric industry. The draft proposal does not address the flammability of the major fuel source of upholstered furniture fires, the foam. Instead, the upholstery fabric is relied upon

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[1] *Upholstered Furniture Flammability: Regulatory Options For Small Open Flame and Smoking Material Ignited Fires*, Dale R. Ray, Project Manager, Directorate for Economic Analysis, Consumer Product Safety Commission, October 1997 (released October 24, 1997).

as the only line of defense against small open-flame ignition. The draft regulation does not explicitly specify how its standard should be met; however, the upholstery fabric industry believes that the only method or technology available now or in the foreseeable future that can meet the draft proposed standard involves the backcoating of upholstery fabric with fire retardant chemicals held in a latex medium.

The Staff based much of its analysis on the experience in the U.K. with a similar, though less stringent, regulation of upholstered furniture. In contrast, the facts and data on which we have based our analysis primarily come from a survey by Glassman-Oliver of the various segments of the U.S. upholstery fabric industry. This survey obtained extensive information from upholstery fabric mills, fabric finishers, fabric converters and fabric wholesalers. We also conducted extensive interviews and discussions with industry representatives and organizations.

Cost/benefit analysis is an important tool for determining the appropriateness of public policies intended to benefit the public. We have concluded, however, that the cost/benefit analysis of the draft proposed small open-flame regulation by the Staff does not appropriately estimate the costs that this proposed regulation will impose on consumers, nor does it appropriately estimate the benefits that the regulation will provide. We find that the Staff has not fully considered substantial costs that this regulation will create and greatly underestimates the costs that are considered. Further, the Staff substantially overestimates the benefits that the draft proposal will provide and improperly attributes benefits to the regulation that are unlikely to materialize or that can be achieved through alternative, less costly methods.

If regulations are to improve the welfare of consumers then the benefits afforded consumers by the regulations must exceed the costs. Our analysis strongly indicates that the

draft proposed small open-flame regulation of upholstered furniture does not satisfy this obligation.

The Staff's analysis of the benefits of the draft proposed regulation fails to consider the effects of the installed base of untreated furniture on the realization of benefits. Should the draft proposal be adopted, many years would pass before a significant portion of the furniture in use would meet the proposed standard. The Staff, however, measures benefits in the early years of the regulation as if the upholstery fabric on all furniture had a fire retardant ("FR") backcoating, which greatly overstates the potential benefits that might be obtained.

The Staff also estimates benefits assuming that they extend equally throughout the lifetime of each piece of furniture. The Staff does not consider that the everyday use of the furniture, vacuuming and cleaning the furniture, and many other factors may cause the FR backcoating to deteriorate over time. Furniture that passes the standard when new may provide little fire protection during much of its useful life. Not only does the Staff assume the benefits afforded each piece of furniture will last throughout the lifetime of the furniture, the Staff also discounts future benefits at a rate of just 2.5 percent, far below consumers' actual opportunity costs.

Finally, it is important to note the role of cigarette-related benefits in the Staff's cost/benefit analysis. Without providing any technical or scientific support, the Staff assumes that the draft small open-flame proposal will provide substantial benefits by significantly reducing cigarette-ignited upholstered furniture fires. ***Without the assumed cigarette-related benefits, the draft proposal does not pass the Staff's own cost/benefit test. Moreover, these benefits are assumed to be so great that the draft proposal would pass the Staff's cost benefit test even if the benefits from preventing small open-flame ignitions of***

upholstered furniture were zero! In this sense, the Staff treats the draft proposal as a cigarette-related regulation of upholstered furniture, not a small open-flame regulation of upholstered furniture.

The Staff's assumption that the regulation will reduce cigarette-ignited fires is questionable. Tests conducted by an independent lab indicate that the FR latex backcoatings that tend to prevent small open-flame ignition of upholstered furniture may actually promote the ignition of upholstered furniture by smoldering cigarettes by reducing upholstery fabrics' resistance to this type of ignition source. Thus, not only are the cigarette-related benefits assumed by the Staff unwarranted, cigarette-related costs imposed by the regulation may be more likely.

It is, however, quite likely that the cigarette related benefits attributed to the draft proposed small open-flame regulation can be achieved through much less expensive methods. The states and the cigarette industry are, to a large degree, far ahead of the Consumer Product Safety Commission on this issue. Philip Morris USA, the nation's largest cigarette manufacturer, is already selling cigarettes manufactured with a new patented cigarette paper designed to self-extinguish when not being actively smoked. The company began shipping Merit brand cigarettes manufactured with this paper on July 17, 2000 and began a nationwide retail sales campaign in September 2000. The state of New York has already adopted legislation requiring that by July 2003 all cigarettes sold in the state be self-extinguishing when not actively smoked. California lawmakers, as well as lawmakers in other states, are currently considering similar legislation. Thus, it is quite likely that before a small open-flame regulation of upholstered fabric could become effective, the actions of cigarette manufacturers and state (or federal) laws requiring the sale of self-extinguishing cigarettes would have already significantly reduced the deaths and property damages

currently caused by cigarette-ignited upholstered furniture fires.

The analysis of the Staff also substantially underestimates the cost that the draft proposed regulation will place on the fabric industry and, ultimately, on consumers. Current charges for non-FR backcoating of upholstery fabric indicate that the cost for FR backcoating will be substantially greater than the cost assumed by the Staff. Smaller and medium-sized fabric mills often produce fabric in relatively short runs and wholesalers often sell fabric on a "cut-order" basis in very short lengths (as little as less than 10 linear yards). Converters also sell in small volumes. Accordingly, compliance testing will need to be performed at a much greater frequency and at a much higher cost than that assumed by the Staff. Our estimates indicate that these two services (applying the FR backcoating and testing for compliance) alone will cost approximately $2 billion per year more than the total annual cost estimated by the Staff.

Upholstery fabric is used to produce draperies, pillows, throws and other products besides furniture. Fabric used for these products will not require an FR backcoating under the draft proposed regulation. The FR backcoating will also not be required for upholstery fabrics exported to countries other than the U.K. Accordingly, fabric mills may need to produce both FR treated and untreated upholstery fabric. Since FR chemicals will affect many quality characteristics of fabric such as abrasion resistance and color fastness, warranty obligations and quality control concerns for FR-backcoated fabrics will require additional testing for these characteristics. Testing these quality characteristics of the FR-backcoated versions of the enormous number of different upholstery fabrics currently produced and testing FR backcoated versions of newly introduced fabrics (in addition to non-FR backcoated versions that will need testing) will add considerably to the cost of the draft

proposed regulation. Yet, the costs of additional tests for quality characteristics of the FR backcoated fabrics have been entirely overlooked by the Staff.

In addition to applying the FR backcoating and testing the FR backcoated fabrics, the draft proposal will impose many other costs that have not been considered by the Staff. The enormous increase in the use of latex and FR chemicals engendered by the regulation will likely necessitate large investments in water and air pollution abatement equipment. Even with these investments, as the FR backcoatings degrade over time, large quantities of fire retardant chemicals may contaminate the environment. Fabric mills, fabric wholesalers and furniture manufacturers will also need to protect workers from exposure to FR chemicals and will face greater regulatory compliance costs.

The accumulation of FR chemicals in the environment also creates risks and the potential for substantial future costs. Evidence indicates that certain commonly used FR chemicals accumulate in the tissues of sea animals. The Staff's position with regard to this issue appears to be somewhat inconsistent with the position taken by other federal agencies regarding chemicals with similar problems. The U.S. Environmental Protection Agency ("EPA") has expressed considerable concern over the impact of persistent, bioaccumulative chemicals.[2] For example, in May 2000, following negotiations with the EPA, the 3M Corporation withdrew from the market its very popular ScotchGard brand product because its main ingredient, perfluorooctanyl sulfonate ("PFOS") was found to accumulate in human and animal tissue. The withdrawal of this product, which represented about $300 million in annual sales, was made despite the absence of evidence that PFOS causes harm. According

[2] See, for example, "Persistent, Bioaccumulative and Toxic (PBT) Chemicals Initiative," Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency (http://www.epa.gov/pbt/index.htm).

to Charles Auer, director of the EPA's chemical control division, "It is important to understand that we are not aware of any danger that PFOS chemistry is causing. The bigger issue is what might have happened in the future if the company had continued to make the stuff."[3]

Since an FR backcoating will affect the feel or "hand" of a fabric as well as its color, the sample fabric books located in virtually every furniture store, re-upholstery store, and fabric showroom will need to be replaced. Since upholstery fabric is used for many products besides furniture, not all upholstery fabric sold will have an FR backcoating. Fabric converters, wholesalers and mills will need to produce sample fabric books for both FR-backcoated and non-FR backcoated versions of their product lines. Moreover, in addition to the cost of replacing sample books, the regulation will necessitate that fabric mills, converters and wholesalers provide FR-backcoated as well as non-FR backcoated sample "memos" and showroom samples. The draft proposed regulation will likely impose costs of hundreds of millions of dollars just through its effects on the costs of sample fabric books, sample memos and showroom samples.

In addition to these and many other sources of explicit costs that would be created by the draft proposed regulation, consumers will be disadvantaged further. Some of the finest, softest, most luxurious fabrics will either not be able to pass the standard or will require such a heavy latex backcoating to pass that those characteristics that make the fabrics highly valued would be completely lost. Either way, these fabrics will not be available to consumer as furniture upholstery should the draft proposed regulation be adopted. Nor will consumers be able to use these fine fabrics for draperies or pillows should they wish to match the

[3] "ScotchGard Scotched: Repellent builds up in people and animals," HealthScout.com, May 17, 2000.

drapery or pillow fabric to their upholstery fabric.

Finally, we note that the burden of the regulation will not be borne evenly throughout the economy. Poorer households and smaller firms may bear a disproportionate share. Households with less income are more likely to buy less expensive furniture manufactured with less expensive fabric, and the effect of the regulation on the cost of cheaper fabrics will be very large. A $2.70 per linear yard backcoating on a less expensive fabric that currently wholesales for $4 a linear yard raises the fabric cost of furniture manufacturers by nearly 70 percent. This increase in the cost of one of the major cost components of upholstered furniture will be marked up by the furniture manufacturers and retailers, and will likely result in a significant increase in the cost of furniture. As a result, rather than purchase new FR treated furniture, poorer families will be more likely to keep older furniture longer or buy used furniture. The result will be that poorer households, which the Staff identifies as the households most likely to experience an upholstery fire caused by a small open flame, will receive far less of the benefits from the draft proposal than will more affluent families, which the Staff identifies as households unlikely to experience upholstered furniture fires caused by small open flames.

The burden on smaller firms will also be disproportionately large. Substantial fixed costs created by the regulation, such as those costs related to air and water pollution, worker safety and other regulatory matters, will be a greater burden on smaller firms that will be spreading these costs over far less output. Smaller mills, for example, often produce fabric in much smaller runs than the large integrated mills. As a result, compliance testing per linear yard of fabric produced will be much greater for smaller than larger mills. Finally, the future of many smaller and mid-sized mills will be in the hands of third-party fabric finishers that might not be willing to undertake the expense and risk of meeting the tremendous increase in

demand for latex backcoating impregnated with potentially toxic fire retardant chemicals.

Wholesalers and converters also tend to be comparatively small firms (relative to the very large mills) and will also face a disproportionately large burden as a result of the draft proposed rule. The wholesalers and converters often sell very small cuts of upholstery fabric and depend on third-party firms for fabric finishing, just as the smaller and mid-sized mills do.

The following tables summarize our concerns with the Staff's analysis. Table ES-1 summarizes those factors left out of the Staff's analysis that, when appropriately taken into consideration, greatly reduce the benefits provided by the draft proposal. Table ES-2 summarizes those factors left out of the Staff's analysis that, when appropriately taken into account, indicate that the cost of the draft proposal will be substantially greater than the cost estimated by the Staff.

TABLE ES-1
Factors Reducing the Estimated Benefit of the Staff's Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
1.	Installed base of untreated furniture.	The installed base of untreated furniture will greatly delay the realization of most of the benefits from the draft proposal. However, the costs imposed by the draft proposal would be incurred immediately upon promulgation of the regulation.
2.	The Staff uses a discount rate of only 2.5 percent.	This discount rate does not reflect consumers' opportunity costs and, therefore, does not measure their time preferences with respect to cash flows. An appropriate discount rate will be higher than the rate used by the Staff and will, therefore, substantially lower the benefit estimate.
3.	FR backcoating sufficient to pass the draft proposed test will last only a fraction of the life of many pieces of upholstered furniture.	The Staff calculates benefits assuming that the economic benefit of its proposal will last throughout the average lifetime of a piece of furniture. Since use of the furniture, vacuuming and cleaning, spilling liquids, and many other factors may cause the backcoating to deteriorate after just a few years, the benefits of the proposal may last just a fraction of the life of many pieces of furniture.
4.	The Staff's proposal does not address the cause of most upholstery fires ignited with small open-flames: children playing with matches and lighters.	Fires that now begin on upholstered furniture may begin on some other flammable household item, as children continue to play with matches and lighters.
5.	There is no scientific foundation for the assumed benefits from fewer cigarette-ignited fires, and the Staff has not considered less burdensome means of further lowering the incidence of cigarette-ignited fires.	Latex FR backcoating reduces resistance to smoldering cigarette fires on some fabrics. Cigarette manufacturers and state legislators are already working to ensure the use of self-extinguishing cigarettes. Yet, without the assumed cigarette-related benefits, the Staff's proposal does not pass its own cost/benefit test. With these assumed benefits, the Staff's proposal will pass the Staff's cost/benefit test even if the benefit from reducing small open-flame upholstery fires is zero.

TABLE ES-2
Factors Increasing the Cost of the Staff's Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
1.	Cost of applying FR backcoating in the U.S. is already significantly higher than the cost assumed by the Staff.	The Staff uses $1.00 to $1.25 per linear yard as the expected cost of the FR backcoating to furniture manufacturers based on the experience in the U.K.. Actual costs in the U.S. can be $2.50 for this service. The cost per linear yard can be much higher for small mills, converters and wholesalers that might require FR backcoating for very small runs or cuts of fabric and face fixed minimum FR application charges.
2.	Fabric testing for compliance with the draft proposal will likely cost substantially more than the Staff assumes.	Since small fabric manufacturers produce fabric runs in lengths of as small as 25 yards, on average, testing will take place much more often than every 1,000 yards. Converters and wholesalers that sell cuts of fabric as small as 10 linear yards will also face much more frequent testing than every 1,000 yards. Further, the cost per test assumed by the Staff is a small fraction of the actual cost.
3.	The tremendous increase in the use of FR chemicals will significantly affect water and air pollution, and the disposal of scrap and imperfect fabric.	Fabric manufacturers that do their own finishing and finishers will need to invest substantial amounts of capital in pollution abatement equipment, will face higher disposal costs, and will lose substantial income from the lost sale of imperfect upholstery fabrics.
4.	Firms will need to protect workers who handle upholstery fabric from a variety of safety concerns.	OSHA and similar state agencies will be much more involved in the oversight of fabric production and finishing. Firms involved in these activities will face greater regulatory compliance costs as they need to offer greater protection to workers and face more workplace rules. Written programs and training would have to be established. Engineering controls and protective equipment would need to be purchased.
5.	Little is known about the toxicity of FR chemicals, particularly with regard to long-term exposure.	The Staff's draft proposal could impose significant hazards to workers and consumers and expose firms throughout the upholstery fabric and furniture industries to tremendous legal liabilities.
6.	Promulgation of the Staff's draft proposal will greatly increase the exposure of all firms in the upholstery fabric and furniture business to product liability litigation.	Any household fire caused by a small open flame or a cigarette will expose firms to the charge that the furniture (or fabric) did not comply with the small open-flame rule. To defend against such charges, records of fabric tests will have to be maintained for the life of each piece of furniture. Even if the firms are ultimately cleared of the charges, their legal costs could be enormous.

TABLE ES-2
(continued)
Factors Increasing the Cost of the Staff's Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
7.	All showroom samples, sample pieces and sample books will need to be replaced or duplicated.	FR backcoating will affect the feel and color of fabric and make existing sample books and sample pieces unrepresentative of the treated fabric. Since not all upholstery fabric is used for furniture, both treated and untreated upholstery fabric will be available. With sample books costing an average of $40 each, duplicating sample books and showroom samples with FR backcoated versions of upholstery fabrics will add at least many tens of millions of dollars to the cost of the Staff's draft proposal, and possibly much more.
8.	Consumers will not be able to purchase many of the most highly-valued decorative upholstery fabrics currently available.	Many fabrics that consist of 75 percent or more of silk or cellulosic fibers (cotton, linen or rayon) or fabrics that are highly textured (e.g., chenilles) will likely not pass the draft test even with a backcoating and will, therefore, no longer be available. In order to lower costs, fabric manufacturers will likely discontinue production of some SKUs that can pass the draft test.
9.	Inventory and delivery costs will increase.	Fabric manufacturers that do their own finishing, finishers and wholesalers might need to keep two inventories of each upholstery fabric: one that has an FR backcoating for use as furniture upholstery fabric and a second that does not have an FR backcoating for export and for use as draperies, bedspreads, pillows and other non-furniture items. The added time required to send fabric to finishers will lengthen the period between production of a fabric and delivery to a customer, further increasing inventory costs. Freight for shipment to finishers will increase delivery costs.

Table of Contents

List of Figures

List of Tables

AN ECONOMIC ANALYSIS OF THE DRAFT SMALL OPEN-FLAME REGULATION OF UPHOLSTERED FURNITURE

Chapter 1: Introduction

Glassman-Oliver Economic Consultants, Inc. has been providing expert analysis on important economic issues for nearly a quarter of a century. Our economic analyses have been used by clients in a wide variety of regulatory proceedings, including previous rulemaking proceedings of the U.S. Consumer Product Safety Commission ("CPSC") and other federal agencies.

Glassman-Oliver Economic Consultants, Inc. ("Glassman-Oliver") has been asked by the American Textile Manufacturers Institute, the Decorative Fabric Association, the Coalition of Converters of Decorative Fabrics, the American Fiber Manufacturers Association, the National Cotton Council and the American Society of Interior Designers to review the analysis of the Staff of the CPSC ("Staff") with regard to the economic cost and benefit of the Staff's draft proposed small open-flame regulation of upholstered furniture. In addition, Glassman-Oliver has been asked to analyze the cost that the draft proposed regulation would impose on the industry and, ultimately, on consumers should it be adopted.

The process that ultimately resulted in the Staff's proposed draft small open-flame regulation of upholstered furniture began in 1993 with a petition to the CPSC by the National Association of State Fire Marshals ("NASFM"). This petition requested that the CPSC

initiate a proceeding to regulate upholstered furniture in order to protect the public from upholstered furniture fires ignited by cigarettes and other smoking material, large open flames and small open flames. Ultimately, the CPSC denied the NASFM's request regarding the hazards of large open flames and deferred the NASFM's request regarding cigarettes and smoking materials, pending the Staff's review of voluntary industry actions.

In its advance notice of proposed rulemaking, published in the June 15, 1994 *Federal Register*, the CPSC expressed its concern that upholstered furniture fires caused by the small open flames of matches, lighters and candles might cause an unreasonable risk to the public. Accordingly, the CSPC announced its decision to direct the Staff to develop a proposal for a small open-flame regulation of upholstered furniture. On October 24, 1997, the CPSC released a briefing package describing the Staff's draft proposed small open-flame rule and providing various studies and analyses in support of the draft proposed rule.[1]

The draft proposed small open-flame regulation specifies both a performance standard and a testing method for compliance with the performance standard. The performance standard requires that following a 20 second application of a gas flame, (1) seating areas and dust cover materials self-extinguish within 2 minutes after the flame is removed and (2) no flaming or glowing shall progress to any edge of the test specimen. Since the test specified is a test of upholstery cover materials, the draft proposed regulation is essentially a regulation of upholstery fabric rather than upholstered furniture.

As a performance-based standard, the draft proposal does not specify the means by

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[1] *Upholstered Furniture Flammability: Regulatory Options For Small Open Flame and Smoking Material Ignited Fires*, Dale R. Ray, Project Manager, Directorate for Economic Analysis, Consumer Product Safety Commission, October 1997 (released October 24, 1997).

which the standard must be met. Accordingly, the draft proposal does not specify that a fire retardant ("FR") latex backcoating *must* be applied to upholstery fabric to comply. Nonetheless, as noted in testimony by Roger Berkley, Chairman of the American Textile Manufacturers Institute's ("ATMI") upholstery fabrics committee, "available technology makes it highly unlikely that most upholstery fabrics will pass the test without FR backcoating."[2]

As part of the briefing package, the CPSC included a paper analyzing the economic impact of the draft proposed regulation. In this report, we review and analyze the economic analysis performed by the Staff. Although we strongly believe that an analysis of the economic costs and benefits of a proposed regulation is an important step in the evaluation of the proposed regulation, we have found the economic analysis performed by the Staff to be deficient in a number of important areas.

In this report, we also provide our own estimates of some of the economic costs that the draft proposed rule would impose. Our review of the Staff's analysis indicates that the Staff substantially underestimates the true economic cost of this draft proposed regulation and substantially overestimates its economic benefit. Moreover, we believe that a re-examination of the economic cost and benefit of the draft proposed regulation that takes into account the comments that we provide will find that the economic cost of the Staff's draft proposal substantially exceeds its economic benefit.

The Staff's analysis of the benefits of the draft proposed regulation fails to consider the effects of the installed base of untreated furniture on the realization of benefits. The Staff

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[2] Roger Berkley, "Comments of the American Textile Manufacturers Institute (ATMI) Before the Subcommittee of Flame-Retardant Chemicals, Committee of Toxicology," National Research Council, July 29, 1999.

implicitly assumes that the annual benefits of the regulation will be as great in the years immediately following promulgation of the rule, when very little furniture in use has been treated with FR chemicals, as it will be years later, when virtually all furniture has been treated. Although many years might pass before the potential benefits of the draft proposal could be realized, the costs will be realized immediately.

The Staff also estimates benefits assuming that they last equally throughout the lifetime of each piece of furniture. The Staff does not consider that the everyday use of the furniture, vacuuming and cleaning the furniture, and many other factors will likely cause the FR backcoating to deteriorate over time. Furniture that passes the standard when new may provide little fire protection during much of its useful life. Not only does the Staff assume the benefits afforded each piece of furniture will last throughout the lifetime of the furniture, the Staff also discounts future benefits at a rate of just 2.5 percent, far below consumers' actual opportunity costs.

Without providing any technical or scientific support, the Staff assumes that the draft small open-flame proposal will provide substantial benefits by significantly reducing the number of cigarette-ignited upholstered furniture fires in addition to reducing the number of small open-flame ignited upholstered furniture fires. Tests conducted by an independent lab indicate that the FR latex backcoatings that tend to prevent small open-flame ignition of upholstered furniture may actually promote the ignition of upholstered furniture by smoldering cigarettes by reducing upholstery fabrics' resistance to this type of ignition source.[3] Yet, without the assumed cigarette-related benefits, the draft proposal does not pass

[3] The tests were conducted by the Grundy Textile Evaluation Laboratory at the Philadelphia College of Textiles and Sciences.

the Staff's own cost/benefit test. Moreover, these benefits are assumed to be so great that the draft proposal would pass the Staff's cost benefit test even if the benefits from preventing small open-flame ignitions of upholstered furniture were zero. In this sense, the Staff treats the draft proposal as a cigarette-related regulation of upholstered furniture, not a small open-flame regulation of upholstered furniture. Such an approach disregards the CPSC's decision to defer action regarding a mandatory cigarette-ignition regulation for upholstered furniture.[4]

Events since the release of the Staff's analysis indicate that the cigarette-related benefits of the draft proposed rule can be achieved at a much lower cost through alternative methods. In particular, Philip Morris USA, the nation's largest manufacturer of cigarettes, has begun producing its Merit brand cigarettes with a new patented cigarette paper designed to self-extinguish when not actively smoked. The state of New York has already adopted legislation requiring that all cigarettes sold in the state after July 1, 2003 be self-extinguishing. Other states, including California, are considering similar legislation. To the extent that requiring self-extinguishing cigarettes imposes any additional costs on consumers, those costs are fully borne by those consumers creating the risk of cigarette-ignited fires – cigarette smokers. Under the Staff's draft proposed rule, all consumers of new upholstered furniture must bear the financial burden of the regulation, whether they contribute to the risk of cigarette-ignited fires or not.

Our estimate of the cost of the draft proposed rule is based, in part, on cost data drawn from our survey of firms participating in the manufacture and distribution of upholstery fabric. In addition to our industry survey, we conducted interviews with many

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[4] See "Upholstered Furniture Flammability: Regulatory Options for Small Open Flame & Smoking Material Ignited Fires," CPSC, October 1997, p. i.

executives of firms that participate in the upholstery fabric industry.

Our analysis indicates that the cost to consumers of just applying the FR backcoating and testing fabrics for compliance with the draft proposed standard will exceed the cost estimated by the Staff by more than $2 billion per year. Further, the draft proposed rule, if adopted, would impose many additional costs that are entirely overlooked by the Staff. Among these additional costs are substantial expenditures on air and water pollution abatement equipment and higher scrap disposal costs. Despite these expenditures, as the latex backcoatings break down over time, the environment will suffer a tremendous increase in potentially harmful fire retardant chemicals.

Chapter 2 of this report provides a discussion of the upholstery fabric industry. This industry is particularly complex; yet, without an understanding of its complexity one cannot fully understand the costs that the draft proposed regulation will impose. Chapter 3 describes our survey of the upholstery fabric industry. The results of this survey form the factual basis for much of our analysis. Chapter 4 consists of a detailed review of the cost/benefit analysis performed by the Staff, and Chapter 5 provides estimates of some of the costs that consumers will incur should the draft proposal be adopted. Chapter 6 provides a summary of the report and our conclusions.

Chapter 2: The Upholstery Fabric Industry

Although the Staff's draft proposal nominally concerns the flammability of upholstered furniture, the draft proposed test focuses on upholstery fabrics treated with FR chemicals. Accordingly, to fully comprehend the costs that the Staff's proposal may impose, one must understand the complexity of the upholstery fabric industry.

The fabric used to upholster residential furniture reaches the market through two distribution chains: the fabric mill distribution chain and the converter distribution chain. Figures 1 and 2, respectively, illustrate each of these distribution channels. The fabric mill distribution chain begins with the farmers, ranchers and importers that bring natural fibers to market and the oil, chemical and forest products companies that produce synthetic fibers. Natural fibers and certain synthetic fibers are shipped to spinning mills. Most synthetic fibers are shipped to texturizers and/or yarn processors. These three groups supply yarn to fabric mills. The yarn is either used as delivered or dyed. Dying can be performed either in-house or by third-party dyers. Undyed yarns are either incorporated by fabric manufacturers into fabrics in that form or used to produce unfinished fabrics (i.e., greige goods) that then enter the converter distribution chain.

Many fabrics used in the upholstery industry are finished. Larger fabric mills may be vertically integrated, finishing the fabrics in-house. Many mills, however, send fabrics to third-party finishers. After finishing the upholstery fabric, the mills or finishers ship most of the fabric to furniture manufacturers. Some fabric is also shipped to fabric wholesalers (sometimes referred to as jobbers) that collect fabric from many sources, both domestic and

foreign. Sample book makers produce sample books of the fabric collections, which are distributed throughout the fabric and furniture distribution chains.

Approximately 30,000 designers are registered with the American Society of Interior Designers ("ASID"), and many more people function as designers without this affiliation.[5] At the request of their clients, designers send fabrics selected from the sample books to furniture manufacturers to be used to produce custom upholstery and other finished goods such as bedspreads, throws, throw pillows, draperies and so forth. It is important to note that the same fabric that is used to upholster furniture may also be used to produce these other finished goods, and neither fabric manufacturers, finishers, converters nor wholesalers may know what end-product will be produced with a particular piece of fabric.

Wholesalers sell primarily to interior designers on a "customers own merchandise" or "customers own material" ("COM") basis. They may also sell fabric to furniture manufacturers because some fabrics sold by wholesalers are offered on an exclusive license basis. Wholesalers also ship fabrics to fabric retailers. Fabric retailers represent a growing segment of the distribution system consisting of major national chains, regional chains and one-store operations. Fabric retailers sell directly to consumers that use the fabric to produce a wide variety of finished goods at home.

As shown in Figure 2, the converter distribution chain begins with greige goods sold by fabric mills to converters. The converters create artistic designs for the fabrics, which are incorporated in the greige goods by independent printers, dyers and fabric mills. The converted fabric is then sent to finishers before being shipped by the converters to furniture

[5] We have been advised that there are in excess of 80,000 (and perhaps as many as 300,000) individuals in the U.S. who provide interior design services, but are not members of the ASID.

manufacturers, wholesalers and retailers. Recently, some of the larger wholesalers have diversified into converting, and some converters have begun to offer services that have traditionally been the domain of wholesalers.

Figure 1

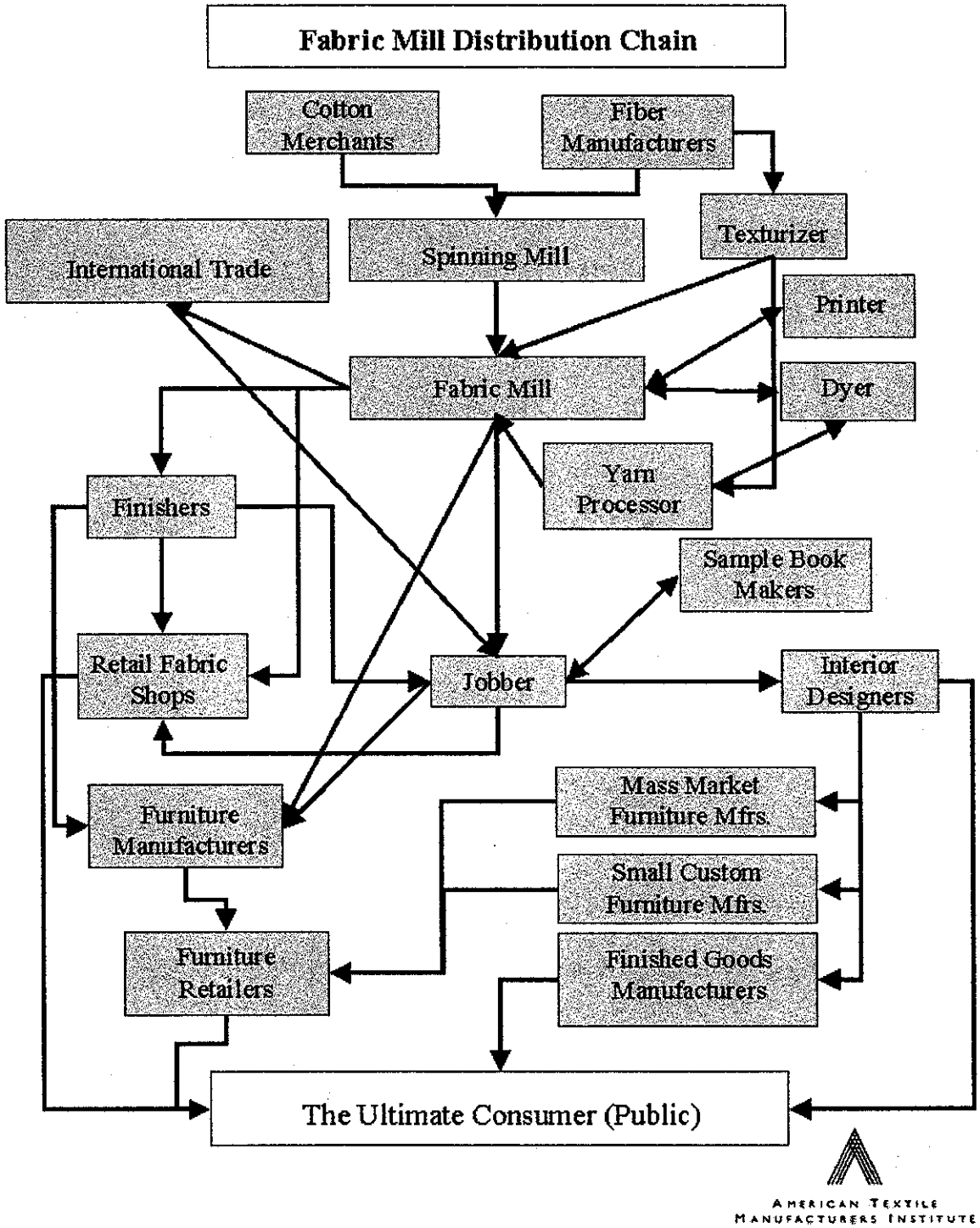
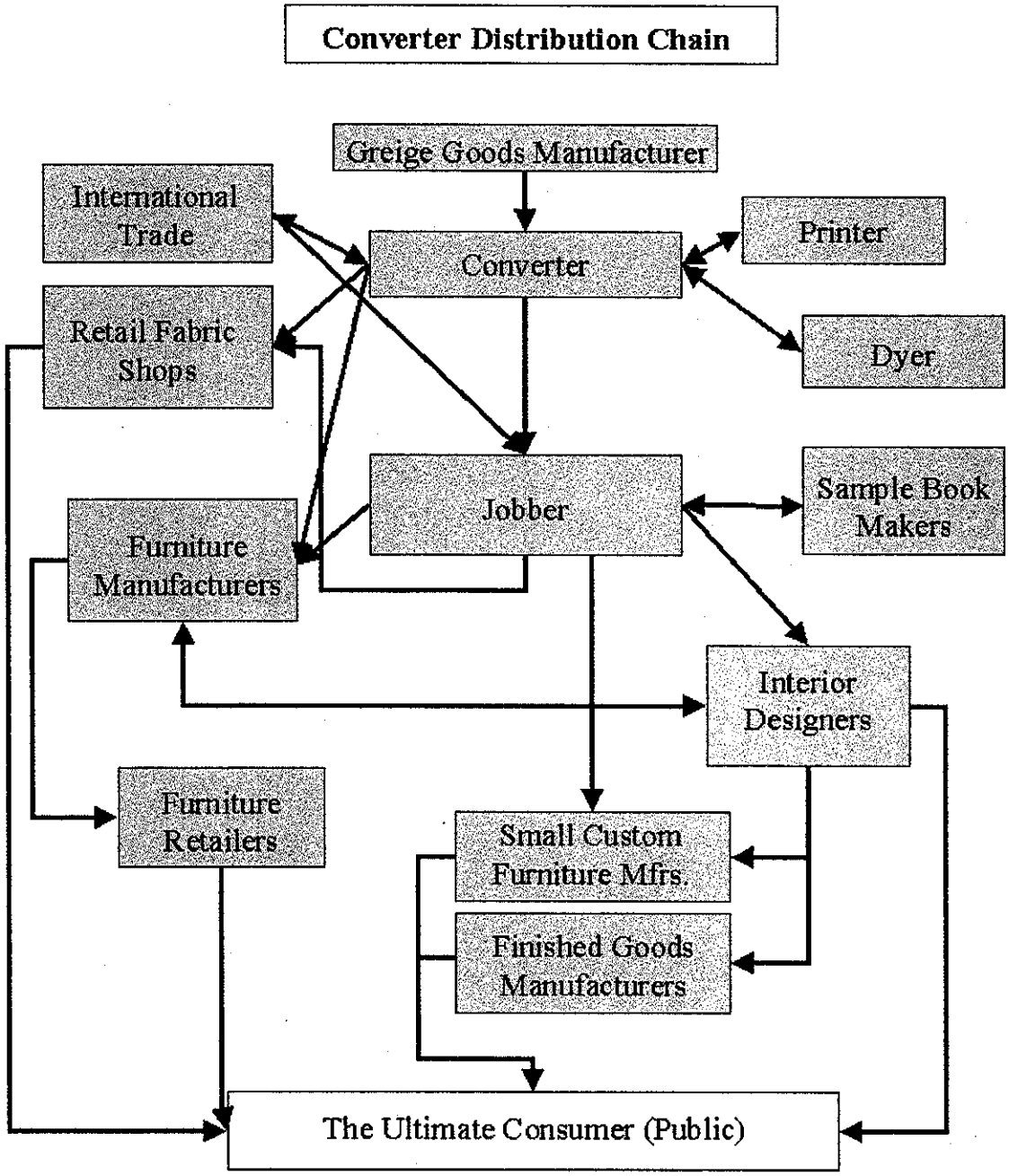

Fabric Mill Distribution Chain
Cotton Merchants
Fiber Manufacturers
Texturizer
International Trade
Spinning Mill
Printer
Fabric Mill
Dyer
Yarn Processor
Finishers
Sample Book Makers
Retail Fabric Shops
Jobber
Interior Designers
Mass Market Furniture Mfrs.
Furniture Manufacturers
Small Custom Furniture Mfrs.
Furniture Retailers
Finished Goods Manufacturers
The Ultimate Consumer (Public)
American Textile Manufacturers Institute

Figure 2



AMERICAN TEXTILE MANUFACTURERS INSTITUTE

Chapter 3: The Survey of the Upholstery Fabric Industry

Important elements of our review of the economic analysis provided by the Staff concern the Staff's adoption of various assumptions that do not accurately reflect the costs faced by firms participating in the U.S. upholstery fabric industry. In order to analyze these issues, we conducted numerous interviews and meetings with participants in the U.S. upholstery fabric industry. We also conducted a broad survey of firms participating in each of the four stages of upholstery fabric production and distribution: mills, finishers, converters and wholesalers. The surveys were distributed in the spring and summer of 1999 and requested data for 1998. The intention of the survey was to develop a factual basis for assessing the actual costs faced by all segments of the upholstery fabric industry in the U.S.

The surveys were written by Glassman-Oliver and distributed by three of the trade associations that retained Glassman-Oliver for this study. Glassman-Oliver collected the finished surveys and tallied the responses. The American Textile Manufacturers Institute distributed the survey to its member fabric mills, to certain major fabric mills that are not members and to major independent fabric finishers. The Decorative Fabric Association distributed the survey to each of its member fabric wholesalers, and the Coalition of Converters of Decorative Fabrics distributed the survey to each of its member fabric converters.

In total, surveys were distributed to 95 firms. Of these 95 firms, 21 were fabric mills, 4 were independent fabric finishers, 17 were fabric converters, and 53 were fabric wholesalers. Fifty-five firms returned completed surveys: 14 mills, 2 finishers, 8 converters

and 31 wholesalers. The Appendix located at the end of this report contains the survey questions sent to each industry segment.

Although the 14 mills responding to the survey represent a small portion of the total number of domestic fabric mills, they account for a disproportionately large share of total industry output. The 14 fabric mills responding to our survey produced 420.4 million square yards (280.3 million linear yards) of upholstery fabric in 1998. In addition, converters purchased approximately 139.5 million square yards (93 million linear yards) of unfinished greige goods that were converted to and sold as upholstery fabric.[6] Thus, the survey captured approximately 560 million square yards of upholstery fabric or nearly *88 percent* of 637.5 million square yards of woven upholstery fabric produced domestically during 1998.[7]

The fabric mills, converters and wholesalers responding to the survey sold approximately $2.2 billion of residential upholstery fabrics in 1998 and employed more than 21,000 workers. The 14 fabric mills sold $1.3 billion of residential upholstery fabric and employed 12,488 workers in the production of residential upholstery fabric. The 8 fabric converters that responded to the survey sold $0.5 billion of residential upholstery fabric in 1998 and employed 4,048 workers. The 31 fabric wholesalers sold approximately 9 million linear yards of residential upholstery fabric in 1998 worth $0.4 billion and employed 4,520 workers.[8]

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[6] The converters responding to the survey sold approximately 102 million linear yards of upholstery fabric in 1998. Of this amount, approximately 7 million linear yards were imported and approximately 2 million linear yards were finished upholstery fabric purchased from mills.

[7] The source for the total amount of woven upholstery fabric is the U.S. Bureau of the Census as cited in the March 2000 issue of Textile HiLights (published quarterly by the ATMI), p. 11.

[8] Although dollar sales by wholesalers represent 18 percent of total industry sales by the firms in our survey, sales in linear yards represent just 1.6 percent. The large discrepancy between wholesalers' share of the market when measured in linear yards and their share of the market when measured in dollars arises from their specialization in the more expensive and highly luxurious fabrics.

Chapter 4: A Critique of The Economic Analysis of The Staff of The U.S. Consumer Product Safety Commission

A formal analysis of the economic cost and the economic benefit of a proposed regulation of commerce and industry is an important method for evaluating the regulation's merit. To that end, we have carefully considered the methods, assumptions and conclusions of the cost/benefit analysis undertaken by the Staff with regard to the draft proposal to address upholstered furniture fires ignited by small open flames. The Staff's economic analysis, "Economic Considerations of Options for Addressing Small Open Flame Ignitions of Upholstered Furniture," was written by Charles L. Smith, Directorate for Economic Analysis, U.S. Consumer Product Safety Commission, and is hereafter referred to as the "Smith Study."

Our analysis of this effort indicates that the Smith Study substantially underestimates the true economic cost of the draft proposed regulation and substantially overestimates its economic benefit. Moreover, we believe that a re-examination of the economic cost and benefit of the draft proposed regulation that takes into account the comments that we provide will find that the economic cost of the draft proposal significantly exceeds its economic benefit.

I. Staff's Benefit Estimate

In the Smith Study, the Staff provides its estimate of the annual economic benefit of the draft proposed regulation. To calculate the benefit, the Staff first estimates the annual economic benefit from preventing small open-flame upholstered furniture fires. The Staff estimates that the draft proposed regulation potentially will prevent $470 million of economic

losses per year. This estimate presumes that the regulation will annually save 75 lives, 350 injuries and $35 million in property damage.[9]

Next, the Staff divides this benefit by its estimate of the total number of pieces of upholstered furniture in use that is affected by the rule, 360 million pieces of furniture. Accordingly, the Staff determines the benefit per piece of furniture affected by the rule to be approximately $1.30. Assuming that the average life of each piece of furniture is 14 years, the Staff calculates the present value of the rule to be $16 per piece of furniture. Hence, if 20 million pieces of upholstered furniture subject to the draft proposed rule are produced each year and the rule is 100 percent effective, the present value of the benefits embodied in the furniture produced during each year is $320 million, according to the Staff. The Staff's cost/benefit analysis assumes that the rule will be 80 percent effective and will, therefore, confer a benefit of $256 million for furniture purchased each year.[10] This calculation, however, greatly overestimates the benefits of the rule for a variety of reasons that are described below.

To reach the final benefit estimate for the draft proposal, the Staff further assumes that the draft proposed regulation will provide between $570 and $690 million dollars of additional benefits each year by reducing cigarette-ignited fires by 50 percent. The appropriateness of this crucial assumption is also discussed in detail below.

A. Effects of the Installed Base of Untreated Furniture

Consider the benefit of the rule in the first year following its promulgation. At that time, virtually all upholstered furniture in use will not contain FR backcoated fabric. To

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[9] The Staff determined, based on national fire data from 1990 through 1994, that 100 deaths per year were attributable to upholstery fires caused by small open-flames. Twenty-five of these deaths were predicted to be saved each year by the CPSC's rule on child-resistant lighters, which went into effect in 1994.

[10] Smith Study, p. 17.

gauge just how small the benefit of the regulation will be during its first year, assume that all furniture lasts 14 years (the average life assumed by the Staff) and the age distribution of furniture is such that one-fourteenth of the outstanding furniture is replaced each year. Further assume that the rule is 100 percent effective (the Staff assumes that rule is 80 percent effective). Then, in the first year of the rule, the maximum benefit will only be approximately $33.6 million or one-fourteenth of $470 million, since thirteen-fourteenths of all furniture outstanding would not have any FR backcoating and would, therefore, not prevent small open-flame upholstery fires.[11] Thus, in the first year that the rule is in effect, the expected benefit per piece of furniture outstanding is not $1.30 ($470 million divided by 360 million pieces of furniture), but just $0.09 ($33.6 million divided by 360 million pieces of furniture). Similarly, the maximum benefit in the second year will be just $67.1 million (2/14ths of $470 million), and so on. Not until essentially all outstanding upholstered furniture prone to small open-flame fires has been replaced by furniture with fabric having FR backcoating could the full $470 million of potential savings be realized. Accordingly, the benefit of the rule over the life of furniture produced during the rule's first year will be less than $8, not the $16 calculated by the Staff, and it will take 14 years before the annual benefit of $256 million that is used in the Staff's cost/benefit analysis could finally be reached. In contrast, the cost imposed by the rule will be just as high for the 20 million pieces of furniture produced in the first year as it will be in any other year.

Even these adjusted numbers may overstate the true economic benefit of the rule. Although some households may replace all of their upholstered furniture at one time, many households replace individual pieces, one at a time, over a number of years. Others replace

[11] If the rule were only 80 percent effective as assumed by the Staff, this benefit would fall to approximately

groups of furniture (e.g., a matching sofa and chair, or a dining room set) one group at a time. Accordingly, even if a household has purchased a new piece of upholstered furniture during the first year that the rule is in effect (or the second or third), an upholstery fire could start on some other older piece of upholstered furniture that has not yet been replaced. The benefit of the rule actually realized by this particular household would be $0, not the $16 calculated by the Staff based on the purchase of one piece of FR backcoated upholstery.

B. The Staff's Choice of the Discount Rate

Even when we recognize that the rule will confer small benefits in its early years on account of the large installed base of untreated upholstery, our $8 estimate for the first year still greatly overstates the economic benefits of the proposal. The $8 figure is calculated using the same 2.5 percent discount rate adopted by the Staff, and this discount rate is substantially lower than rates commonly used by economists and financial analysts to calculate the present value of a future stream of benefits or costs.

A discount rate should properly reflect the opportunity cost of consumption in one period versus consumption in future periods, since it is the opportunity cost that determines consumers' time preferences. That is, if a consumer can earn 10 percent on an investment, then $100 received in one year is worth just $91 today (i.e., $91 invested today at 10 percent interest will equal $100 in one year). Hence, such a consumer will be indifferent between receiving $91 today or $100 in one year. Thus, for this consumer, the *discounted present value* of $100 received in one year is $91, the appropriate discount rate being the consumer's 10 percent opportunity cost.[12] Homeowners often have mortgages and home equity loans

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$26.9 million.

[12] To adopt the Staff's discount rate of just 2.5 percent is to assume that consumers are indifferent between receiving $78.12 today and receiving $100 ***ten*** years from now.

charging 7 to 9 percent. Even consumers that carry no debt can typically earn 5 percent or more per year through money market funds and 10 percent or more per year through stock investments, particularly when those investments are made for a 14-year period. Many consumers carrying credit card debt often face an opportunity cost of 16 to 18 percent (or more) per year. Accordingly, a furniture consumer's "time preference for a stream of costs or benefits realized in future years"[13] will greatly exceed the 2.5 percent assumed by the Staff.

When the discount rate used to calculate the present value of the stream of benefits from the draft proposed rule is increased to a more appropriate, yet still highly conservative, 5 percent level, the $8 of benefits declines to $6.51; using a 10 percent discount rate, this benefit falls to less than $5. Similarly, using a 5 percent discount rate, the benefit calculated by the Staff falls to approximately $13.57 from approximately $16; using a 10 percent discount rate, the benefit falls to $10.58.

C. Durability of Backcoating

Even if we ignore all of the previously discussed problems with the Staff's benefit calculations, these calculations still grossly overestimate the potential benefits from the Staff's draft proposed small open-flame regulation of upholstered furniture. The $16 estimated benefit embedded in each piece of furniture produced under the Staff's draft proposed rule is calculated under the assumption that the FR backcoating will provide the same economic benefit throughout the entire life of each piece of furniture. This assumption is, however, highly questionable. The backcoating medium that would contain the FR chemicals is latex, and a latex backcoating is susceptible to breaking down over time as the furniture is used. A piece of furniture produced with a fabric that passes the Staff's draft

[13] See page 8, footnote 16 in the Smith Study.

proposed test when it is manufactured may provide little, if any, fire protection after relatively few years. Cleaning, vacuuming and just everyday use will likely cause the backcoating to crack, chip and break down over time.

At the request of the American Textile Manufacturers Institute ("ATMI"), Diversified Testing Laboratories, Inc. studied five samples of FR backcoated upholstery fabric that passed the British Standards Institution "Fire Test for Furniture" ("the U.K. standard").[14] The fabric samples were washed in accordance with AATCC 135-1995, using one laundering cycle.[15] After just one washing, two of the five samples failed the test for compliance with the U.K. standard.

Should the FR backcoating provide protection for as much as half of the 14 year life of a typical piece of furniture, the embedded benefit in each piece of furniture falls from approximately $16 to $8.50, using the Staff's 2.5 percent discount rate. When we take into account the effect of installed base of untreated upholstery, this benefit falls to only $2.36 from the $8 discussed above. If we use the more appropriate discount rates of 5 percent and 10 percent, the benefit falls to only $2.15 and $1.81, respectively. These imply total benefits of only $43.0 million and $36.2 million, even if the Staff's draft proposed rule is 100 percent effective. Should the FR treated upholstery be only 80 percent effective at preventing upholstery fires started with small open flames (as assumed by the Staff), then these benefits fall to just $34.4 million and $29.0 million.

The impact of the factors discussed in sections **A**, **B** and **C** on the Staff's benefit

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[14] The U.K. standard became effective in the U.K. in 1988, and the Staff based much of its analysis on the experience in the U.K. with this regulation.

[15] The washing took place under the machines' normal cycle with a wash temperature of 105 degrees Fahrenheit. The fabric was tumble dried on the delicate setting. After washing and drying, the sample was tested in accordance with BS 5852.

analysis is summarized in Table 1. Assuming, as the Staff does, that the draft proposed regulation will be 80 percent effective, we find that the expected benefit from the draft regulation in the year following its implementation is a very small fraction of the benefit estimated by the Staff. Although the expected benefit will rise over time as more and more untreated furniture is replaced, not until essentially all untreated upholstered furniture is replaced by FR treated furniture will the full benefits of the regulation be realized. Even at that time, the realized annual benefits will fall short of the Staff's estimates due to the inappropriate discount rate used in the Staff's analysis and the deterioration of the FR backcoating over the life of each piece of furniture.

TABLE 1

Corrected Benefit Calculations for Furniture Produced in First Year of Regulation

	Benefit Per Piece	Total Benefit at 80% Effectiveness
Staff Estimate of Benefit	**$16.00**	**$256.0 million**
Effects of Installed Base of Untreated Furniture in Year 1 and Calculated Using The Staff's Discount Rate of 2.5 Percent.	$ 8.00	$128.0 million
Effects of Installed Base of Untreated Furniture in Year 1 and Calculated Using a Discount Rate of 5 percent.	$ 6.51	$104.0 million
Effects of Installed Base of Untreated Furniture in Year 1 and Calculated Using a Discount Rate of 10 percent.	$ 5.00	$ 80.0 million
Effects of Installed Base of Untreated Furniture in Year 1, Seven Year Durability Of Backcoating, and Calculated Using a Discount Rate of 5 Percent.	$ 2.15	$ 34.4 million
Effects of Installed Base of Untreated Furniture in Year 1, Seven Year Durability Of Backcoating, and Calculated Using a Discount Rate of 10 Percent.	$ 1.81	$ 29.0 million

D. The Cause of Upholstered Furniture Fires

A large portion of the annual benefit from the draft proposed regulation is attributed to the saving of lives; however, even if the draft proposed regulation were 100 percent effective in preventing upholstery fires caused by small open-flames, only a fraction of the

deaths caused each year by this sort of fire might be prevented. As recognized by the Staff, a substantial number of upholstered furniture fires are caused by children playing with matches and lighters. Nothing about this proposal will affect children's behavior. Should the regulation be adopted, fires that now begin on upholstered furniture may begin on any of the multitude of things found inside a house that can ignite when unsupervised children play with lighters and matches. Accordingly, some deaths that would now be attributed to upholstery fires will still occur following adoption of the draft proposed regulation. All that will change will be the classification of the source of these fires in fire statistics.

In addition, the Staff appears to assume that benefits will accrue evenly across the economic spectrum. This assumption is highly unlikely to be correct. Data provided to the Staff indicate that a disproportionate number of upholstered furniture fires occur in the homes of families in the lower socio-economic strata.[16] Poorer households, however, are more likely to purchase used furniture or receive used furniture donated through charitable organizations. Further, raising the price of new furniture can be expected to induce more lower-income families to purchase used furniture and increase the average lifetime of older, untreated furniture. Higher furniture prices would also increase the use of slipcovers or loose fabric "throws" as less expensive alternatives to the purchase of new furniture. Such loose fabrics are not covered by the draft proposal, and may actually be more likely to ignite than most upholstery fabrics. Since the families most likely to have upholstered furniture fires and realize fire-related deaths and damages are the families least likely to have new FR

[16] See "Small Open Flame Ignitions of Upholstered Furniture: Final Report, CPSC Directorate of Epidemiology and Health Sciences, Division of Hazard Analysis," September 1997. According to the report (p. 18), 33 percent of the fires studied were in households with an annual income of less than $15,000 and 79 percent were in households with annual incomes of less than $35,000. Not surprisingly, the education level of the heads of households prone to small open-flame upholstery fires was also low. Over 31 percent of these fires were in households headed by someone with less than a high school education and approximately 66 percent were headed by someone with a high school education or less. The remaining 34 percent of the fires took place in households headed by someone with some college education. Not a single fire in the sample took place in a household headed by someone with a college degree.

treated furniture, the Staff's benefit calculations overstate the actual benefits that one can expect from the draft regulation, even if we ignore all of the other sources of overstated benefits discussed above.

E. Cigarette-Related Benefits

Perhaps most revealing of the questionable nature of the Staff's benefit analysis is its heavy dependence on cigarette-related benefits. ***Without the assumed benefits derived from the presumed reduction in cigarette-related fires, the draft proposed small open-flame regulation of upholstered furniture does not pass the Staff's own cost/benefit test. Moreover, the assumed cigarette-related benefits are so great that even if the rule was completely ineffective at preventing small open-flame fires, the rule would pass the Staff's cost/benefit test!***

In this sense, it is a misstatement to refer to the Staff's draft rule as one intended to address small open-flame ignitions of upholstered furniture. It is instead a rule addressing cigarette-ignited upholstered furniture fires. Yet, the CPSC has specifically directed its staff to defer action on upholstered furniture regulations intended to address cigarette-ignited fires.

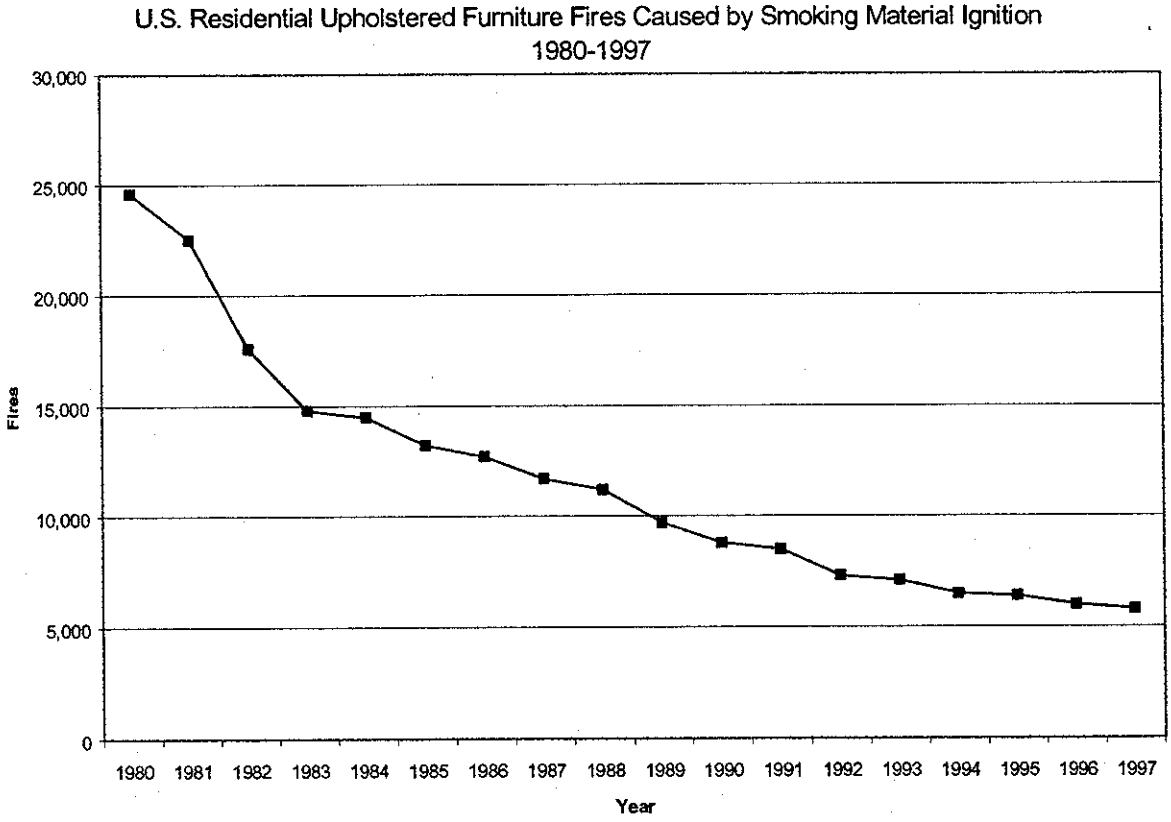
According to the Staff's own analysis, approximately 90 percent of the dollar volume of upholstered furniture is manufactured according to the *voluntary* guidelines for resistance to cigarette-ignited fires specified by the Upholstered Furniture Action Council ("UFAC").[17] As further noted by the UFAC, "Household fires from smoldering ignition have been reduced substantially since [UFAC's] inception. According to the latest figures (1978-1994) there has been a 76.8 percent decline in the number of upholstered furniture fires from cigarette

[17] "Cigarette Ignition Propensity of Upholstered Furniture," Charles Smith and Linda Fansler, November 1996 (tab K in the October 1997 briefing package). Fabrics that pass the UFAC test for resistance to cigarette-ignited fires are classified as UFAC Class 1 fabrics; all others are classified as Class 2 fabrics.

ignition."[18]

The decline in the number of upholstered furniture fires caused by smoking material ignition over the period 1980 through 1997 is illustrated in Figure 3.[19] Despite the already demonstrated success of the voluntary UFAC guidelines, the Staff also asserts that the draft proposed regulation will further reduce smoldering upholstery fires caused by cigarettes. Indeed, the Staff claims that "it is reasonable to expect that at least 50 percent of the cigarette-ignited fire losses would be prevented."[20] The Staff, however, provides no technical or scientific evidence to support this assertion.

Figure 3



[18] UFAC press release, "The Safest Way to Fight Fire is to Prevent It," available at the UFAC internet site, www.homefurnish.com/UFAC.

[19] Source: U.S. Consumer Product Safety Commission, Residential Fire Loss Estimates (various years).

[20] See page 17 of the Smith Study.

Evidence does exist, however, that tends to contradict the Staff's "reasonable" expectations concerning these cigarette-related benefits of the draft small open-flame regulation. At the request of ATMI, the Grundy Textile Evaluation Laboratory at the Philadelphia College of Textiles and Sciences recently studied samples of 30 different upholstery fabrics. Each fabric sample was commercially treated with an FR latex backcoating by a British manufacturer that supplies numerous customers with fabrics complying with the U.K. standard. These treatments were similar to what would be required to pass the Staff's draft proposal. The study found that five of the 30 sample fabrics became less resistant to cigarette ignition after the FR backcoating was applied, changing from UFAC Class 1 before to UFAC Class 2 afterwards. UFAC Class 1 fabrics are fabrics that meet the UFAC standard for fire resistance. Fabrics that do not meet this standard are UFAC Class 2. Thus, the application of FR backcoating that prevents upholstery fires caused by small open flames caused five of the tested fabrics to lose their resistance to ignition from smoldering cigarettes. Although one Class 2 fabric did become Class 1 following the application of the FR backcoating, overall these results make highly suspect the Staff's assumed cigarette-related benefits of the draft proposal. They indicate that the draft proposed regulation may actually promote some upholstery fires by making fabrics more susceptible to fires caused by smoldering sources, such as cigarettes, rather than open flames.

Cigarette-ignited fires have been declining continuously over the last twenty years, and the resistance of upholstered furniture to cigarette ignition has increased substantially. The improvement in the resistance of upholstered furniture to cigarette ignition is based on *voluntary* UFAC recommendations. CPSC's own analysis of the UFAC program has already shown that a mandatory cigarette standard is unnecessary. Moreover, the Staff has noted

that "ignitability estimates suggest a continuing improvement in observed levels of cigarette ignition resistance"[21] from the increased use of the voluntary UFAC standards. If these standards are a less burdensome means toward further reduction in cigarette-ignited upholstery fires or if some other less burdensome means of reducing this sort of fire exists, then there does not appear to be any basis for attributing cigarette-related benefits to the Staff's draft proposed small open-flame rule. Since the application of an FR latex backcoating may actually increase the likelihood of ignition from a smoldering cigarette, the assumption that these benefits will materialize is, itself, highly questionable.

Since the release of the Staff's analysis, other events have occurred that indicate that the use of cigarette related benefits is not appropriate in the evaluation of the proposed draft small open-flame rule. In particular, Philip Morris USA, the nation's largest cigarette manufacturer, has already begun nationwide distribution of cigarettes manufactured with a new patented cigarette paper designed to self-extinguish when not being actively smoked. The company began shipping Merit brand cigarettes manufactured with this paper on July 17, 2000 and began a nationwide retail sales campaign in September 2000.[22] The state of New York has already adopted legislation requiring that by July 2003 all cigarettes sold in the state be self-extinguishing when not actively smoked. California lawmakers are currently considering similar legislation.[23] Thus, it is quite likely that before a small open-flame regulation of upholstered fabric could become effective, the actions of cigarette manufacturers and state (or federal) laws requiring the sale of self-extinguishing cigarettes

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21 Ronald L. Medford, Assistant Executive Director for Hazard Identification and Reduction, and Dale R. Ray, Project Manager, Memorandum to the Commission, October 24, 1997, p. 55.

22 See "Philip Morris U.S.A. To Launch New Cigarette Paper Nationwide On All Merit Cigarettes" (http://www.philipmorrisusa.com/company_news/company_news.asp?Press_ID=52), July 12, 2000.

23 See, for example, "NY to Require Fire-Safe Cigarettes," National Volunteer Fire Council (http://www.nvfc.org/hn_firesafecigarettes.html), June 20, 2000. This article is based on reports filed by

would have already significantly reduced the deaths and property damage currently caused by cigarette-ignited upholstered furniture fires. Moreover, these reductions in deaths and property damage will be achieved at a far lower cost to consumers than the cost imposed by the draft proposed small-open flame regulation of upholstery fabric.

F. Summary of Benefits

Table 2 summarizes many of the factors that the Staff did not consider that substantially reduce the potential benefits that can be realized from the Staff's proposal. For the benefit calculation to be meaningful, the Staff must account for the following factors: 1) the large installed base of untreated furniture will delay for many years the realization of much of the benefit of the regulation; 2) the discount rate must reflect consumers' opportunity costs if it is to capture their time preferences; 3) the deterioration of the FR backcoating over the life of upholstered furniture will cause the benefits to diminish over time; 4) the behavior of children will not change on account of the rule, so children will continue to play with lighters and matches and continue to start fires; and 5) the benefits attributed to the Staff's proposal from a reduction in cigarette-ignited fires are unsupported.

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the Associated Press and was published in various newspapers throughout the country.

TABLE 2
Factors Reducing the Estimated Benefit of the Staff=s Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
1.	Installed base of untreated furniture.	The installed base of untreated furniture will greatly delay the realization of most of the benefits from the draft proposal. However, the costs imposed by the draft proposal would be incurred immediately upon promulgation of the regulation.
2.	Staff uses a discount rate of only 2.5 percent.	This discount rate does not reflect consumers' opportunity costs and, therefore, does not measure their time preferences with respect to cash flows. An appropriate discount rate will be higher than the rate used by the Staff and will, therefore, substantially lower the benefit estimate.
3.	FR backcoating sufficient to pass the draft proposed test will last only a fraction of the life of many pieces of upholstered furniture.	The Staff calculates benefits assuming that the economic benefit of its proposal will last throughout the average lifetime of a piece of furniture. Since use of the furniture, vacuuming and cleaning, spilling liquids, and many other factors may cause the backcoating to deteriorate after just a few years, the benefits of the proposal may last just a fraction of the life of many pieces of furniture.
4.	The Staff's proposal does not address the cause of most upholstery fires ignited with small open-flames: children playing with matches and lighters.	Fires that now begin on upholstered furniture will begin on some other flammable household item, as children continue to play with matches and lighters.
5.	There is no scientific foundation for the assumed benefits from fewer cigarette-ignited fires, and the Staff has not considered less burdensome means of further lowering the incidence of cigarette-ignited fires.	Latex FR backcoating reduces resistance to smoldering cigarette fires on some fabrics. Cigarette manufacturers and state legislators are already working to ensure the use of self-extinguishing cigarettes. Yet, without the assumed cigarette-related benefits the Staff's proposal does not pass its own cost/benefit test. With these assumed benefits, the Staff's proposal will pass the Staff's cost/benefit test even if the benefit from reducing small open-flame upholstery fires is zero.

II. Staff's Cost Estimate

A. Treatment and Testing Costs

The Staff calculates the cost side of its cost/benefit analysis by estimating the increase in the retail price of upholstered furniture caused by the added costs of applying FR to upholstery fabric and testing the fabric for compliance with the rule. The Staff estimates that furniture manufactures will pay $1.00 to $1.25 extra per linear yard of upholstery fabric, most of which represents treatment costs.[24] Using the quantities of fabrics required of upholstered chairs and sofas, the Staff estimates that the cost of the regulation to consumers will be $460 million to $720 million annually.[25]

The cost of the draft proposed regulation to furniture manufacturers is based primarily on interviews with market participants in the U.K. that have dealt with a similar regulation. There are, however, fabric finishers in the U.S. that already apply FR backcoating that meets the U.K. standard.[26] One leading finisher, for example, charges $2.50 per yard to apply an FR backcoating meeting the British standard.[27] Additional market-based information exists that indicates that the cost of applying FR backcoating will likely be significantly higher than the cost assumed by the Staff.

In particular, a large portion of the upholstery fabric already receives a latex

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[24] Smith Study, p. 12.

[25] Smith Study, p. 17.

[26] Most fabric exported from the U.S. to the U.K. is backcoated in the U.K., but small quantities of fabric are exported to the U.K. with the FR backcoating already applied.

[27] Of four major fabric finishers that received our survey, only two responded. Of these two, one applied FR backcoating at the rate of $2.50 per linear yard, and the other did not provide this service. At least one of the finishers that did not respond to the survey also applies FR backcoating, according to industry participants.

backcoating.[28] This backcoating is usually applied to make the fabric easier to work with when being cut and sewed by furniture manufacturers. The latex used for this purpose is applied in a much thinner coat then what is necessary for use as a medium for FR chemicals. The thickness of the latex currently used depends largely on the quality of the fabric being backcoated. Denser, higher pick fabrics, require very thin coats of latex – some as low as one-half to one ounce per linear yard.[29] Lower quality fabrics require thicker coats of latex. Industry experts consulted by Glassman-Oliver believe that, on average, approximately 2 to 2.5 ounces of latex per linear yard is applied to the upholstery fabric that is currently backcoated. Our survey indicates that the average cost for this backcoating is $0.71 per linear yard.

According to industry experts, an effective FR backcoating will require approximately 6 ounces of latex per linear yard to pass the draft test proposed by the Staff. This would imply that the amount of latex applied per linear yard would need to be between 2.4 and 3 times greater than what is currently applied. Accordingly, the cost of applying the latex alone, without any consideration of the cost of the FR chemicals, would increase to $1.70 (2.4 times $0.71) and $2.13 (3 times $0.71) per linear yard to apply. With the FR chemicals, we estimate that the cost of applying the FR backcoating will be roughly between $1.75 and $2.20 per linear yard, or on the order of twice as expensive as assumed by the Staff

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[28] Industry experts estimate that approximately 50 percent of upholstery fabrics are backcoated. (See "ATMI Post Hearing Comments on Toxicity of Flame Retardant Chemical Treatments for Upholstery Fabrics," Submitted to the Office of the Secretary, U.S. Consumer Product Safety Commission, August 3, 1998, p. 8.)

[29] Most of the very high quality fabrics that tend to be sold through wholesalers do not require any backcoating. In addition, certain weaves (such as highly textured chenilles) also do not generally require a backcoating.

in its analysis.[30]

Should a fabric manufacturer earn a 33 percent gross margin on the FR backcoated fabric that it sells to a furniture manufacturer, the cost per yard to the furniture manufacturer rises to between $2.62 and $3.30 per linear yard. Moreover, should furniture manufacturers earn a 33 percent gross margin, retailers ultimately pay between $3.93 and $4.95 per linear yard, and consumers will pay between $5.90 and $7.43 per linear yard on account of the retailers' margin. Even when we account for the cost of the backcoating that fabrics currently receive, the net increase to the consumer is between $4.68 and $6.21 per linear yard of fabric, on average.[31] Finally, some fabrics may require more than one application of the FR backcoating to pass the Staff's draft test. If a particular fabric requires two applications, the cost per linear yard doubles.

These costs, however, still greatly underestimate the cost per linear yard that furniture manufacturers will face should the Staff's draft proposal be implemented. Although these figures should reflect the *current* economic cost per yard of the FR backcoating, they do not fully reflect all of the costs that will be incurred. One reason for this discrepancy is that currently in the U.S. just a very small amount of residential upholstery fabric is backcoated with FR chemicals. Thus, finishers and integrated fabric mills that apply backcoating do not

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[30] Finishers typically charge minimum prices for their services such as backcoating. Industry experts have indicated to us that these minimum charges are typically $95 per service. Accordingly, a small mill or wholesaler that needed an FR backcoating for a cut of just 10 linear yards of fabric would pay $9.50 per linear yard, not $1.75 to $2.20. Further, a finisher will require an additional 2 to 2.5 linear yards of fabric just to thread through a backcoating machine. This waste will also substantially increase the cost of backcoating a small cut of fabric, particularly in light of the fact that it is the more expensive fabrics that tend to be sold in small cuts.

[31] As discussed above, the average cost of the latex backcoating currently applied to upholstery fabrics is $0.71 per linear yard, and approximately 50 percent of upholstery fabric receives some sort of latex backcoating (see footnote 28). With the mills, furniture manufacturers and retailers earning a 33 percent gross margin, consumers pay, on average, $1.22 per linear yard for this backcoating ($0.36 per linear yard marked up to $0.54 to the furniture manufacture, further marked up to $0.81 to the retailer, and finally, marked up to $1.22 to the consumer).

face various costs that would arise if essentially all residential upholstery fabric required FR backcoating. For example, since such a small fraction of upholstery fabric is currently backcoated with FR chemicals, the amount of FR chemical effluents created by backcoating is minuscule.[32] This will not be the case, however, should essentially all upholstery fabric sold in the U.S. require FR backcoating. Dealing with these chemical effluents may impose significant costs (these costs are discussed separately below). Similarly, many other costs that are not currently reflected in the price of FR backcoating will be created should the Staff's draft proposal be adopted.

The Staff's estimate of the costs of testing fabric for compliance with the draft proposed rule also appear to be significantly understated. First, the Staff calculates this estimate on the assumption that 190 to 230 million linear yards of fabric are used each year to produce upholstered furniture. This assumption is unreasonably low.

As noted by the Staff, 533.5 million square yards of woven upholstery fabric were produced in 1996.[33] This translates into approximately 356 million linear yards.[34] In 1999, 642.5 million square yards (428 million linear yards) of woven upholstery fabric were produced in the U.S.[35] Although not all woven upholstery fabric is used to upholster furniture, a large percentage is used for this purpose. Further, these statistics do not include imported upholstery fabrics. The fabric mills, converters and wholesalers that responded to

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[32] Currently, the only residential upholstery fabric that receives an FR backcoating in the U.S. is a small portion of the fabric exported to the U.K. Most upholstery fabrics exported to the U.K. receive FR backcoating in the U.K.

[33] See page 6 of the Smith Study. This figure was later revised upward to 546.5 million square yards.

[34] Upholstery fabric is produced in a standard width of 54 inches; hence, one linear yard of upholstery fabric is 1 yard long and 1.5 yards (i.e., 54 inches) wide. Thus, one linear yard equals 1.5 square yards and 1 square yard equals 2/3 linear yard.

[35] U.S. Bureau of the Census as cited in the March 2000 issue of Textile HiLights (published quarterly by the ATMI), p. 11.

our survey imported an additional 17.1 million square yards (11.4 million linear yards) of upholstery fabric in 1998.

Since a significant portion of upholstery fabric is sold through third-party wholesalers and converters, the manufacturer or finisher often does not know which fabric is to be used for furniture and which fabric is to be used for something else. Moreover, converters selling to wholesalers and wholesalers selling to interior designers will also often not know how a cut of fabric will ultimately be used. In addition, since backcoating can alter the color of fabric, should consumers wish to match their furniture fabric to the fabric used for drapery, pillows or other items, they may need to use FR treated fabric for these other items even though such use would not be required under the draft regulation. Fabric manufacturers, converters and wholesalers, therefore, will likely need to backcoat a large portion of the upholstery fabric that is ultimately not used to upholster furniture.

Even if we ignore the products other than furniture that are produced with upholstery fabric, the 190 to 230 million linear yards per year assumed by the Staff to calculate testing costs is unreasonably low. The results of our industry survey indicate that in 1998 the fabric mills, converters and wholesalers that participated in the survey shipped approximately 268 million linear yards of upholstery fabric directly to furniture manufacturers. When we account for the fact that not all mills, converters and wholesalers responded to our survey, the actual amount of fabric shipped to furniture manufacturers in 1998 is likely to be much higher. Since our survey accounts for approximately 88 percent of all upholstery fabric produced, we would expect that approximately 305 million linear yards of upholstery fabric would have been shipped directly to furniture manufacturers. Should we then recognize that some of the goods produced with upholstery fabric other than furniture will ultimately be

manufactured with FR backcoated upholstery fabric, the actual quantity of upholstery fabric that will be FR backcoated will be higher.

The Staff further underestimates testing costs by assuming that testing can occur every 1,000 linear yards of production. This might be appropriate for the few very large producers of fabric that produce tens of thousands of linear yards of a single fabric, but it is certainly not appropriate for the many small fabric manufacturers that produce fabric in much shorter runs or for converters and wholesalers. The vast majority of firms manufacturing upholstery fabric each produce a tiny fraction of total industry output.[36] Many smaller producers of upholstery fabric specialize in high-end decorative fabrics. These small mills often produce particular fabrics in runs of only 55 linear yards, and sometimes they will produce fabric in runs of 25 linear yards or less.[37] Each of these production runs will have different characteristics and require separate testing. Wholesalers also generally sell fabrics in very small cuts. It is not uncommon for a wholesaler to sell through an interior designer cuts as small as 10 linear yards for use as upholstery on a single piece of furniture. Testing such small quantities of fabric may involve fixed minimum charges that could dramatically increase the average cost per linear yard for the tests.

The flammability of a particular fabric depends on a number of characteristics of the fabric. These include such factors as: 1) the types of fibers contained in the yarns (e.g., polyester, cotton, rayon); 2) the particular blend of fibers (e.g., 60 percent cotton/40 percent polyester, 35 percent cotton/65 percent polyester); 3) the type of weave (e.g., loosely woven fabric of any particular blend will generally perform differently than more tightly woven

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[36] As noted by the Staff in the Smith Study (page 5), although there are more than 100 upholstery fabric mills in the U.S., in 1993 the top 15 mills represented 80 percent of the industry's sales.

[37] Fabric woven on a "per order" basis could be produced in runs as small as 10 linear yards.

fabric); 4) the texture of the fabric (e.g., a chenille will perform differently than a flat woven fabric); 5) the fabric weight (a heavy-weight fabric will perform differently than a light-weight fabric); and 6) the color of the fabric (different pigments can affect flammability in distinct ways). Since these factors represent the essential characteristics that differentiate one SKU from another, virtually all SKUs backcoated by an upholstery fabric manufacturer or finisher will have to be tested for compliance with the draft small open-flame regulation.[38] Accordingly, if a small manufacturer of decorative fabrics typically has runs of 55 linear yards, his testing costs per linear yard will be at least 18 times larger than the testing costs incurred by one of the few major manufacturers with typical runs in multiples of 1,000 linear yards.

Further, the cost for each test of a fabric sample assumed by the Staff appears to be unreasonably low. According to the Staff, "***Available information*** indicates that outside laboratories might charge $50 to $75 to conduct each seating area test."[39] Later, the Staff states that assuming these tests are run every 1,000 linear yards, 190,000 to 230,000 seating area tests would be necessary, and "[t]otal production run testing costs attributable to the draft standard could range from about $2 to $3 million (including about $1 million for fabric costs), assuming company employees were responsible for testing." Thus, the Staff assumes

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[38] SKU stands for "stock keeping unit," and is a term commonly used in many industries to designate an individual product sold by a firm. Often a manufacturer's SKUs are distinguished by their packaging. For example, a single-serving 7 ounce can of chicken soup would be a particular SKU produced by a soup manufacturer and a 15 ounce can of the same chicken soup would be another SKU produced by that manufacturer. With regard to fabric, a particular manufacturer's SKUs will be distinguished by the characteristics of the fabric. A particular blend, with a particular weave, a particular print and a particular color would be one SKU. The same blend with the same weave and print, but in a different color, would be another distinct SKU.

[39] See page 11 of the Smith Study (emphasis added).

that laboratory tests that cost $50 to $75 when conducted by an outside lab cost only $4.35 to $10.53 when conducted by a fabric manufacturer.[40]

The Staff, however, offers no justification for assuming that the economic cost of tests conducted in-house will be any lower than the economic cost of tests conducted by third-party laboratories. There is no reason to expect that fabric manufacturers are able to hire laboratory technicians for less pay than third-party laboratories, or that fabric manufacturers face lower capital costs than those faced by laboratories. To the best of our knowledge, testing laboratories operate in competitive markets and face the same competitive labor market for laboratory technicians and the same competitive capital market as fabric manufacturers. In many industries, specialization and economies of scale create efficiencies that allow for lower costs. To the extent that such circumstances exist in laboratory testing, the use of third-party laboratories for testing may be less costly for many small fabric manufacturers than the use of in-house testing.

Accordingly, we see no basis for assuming that the economic cost of performing laboratory tests in an outside laboratory is any greater than the economic cost of performing the same tests in-house. Certainly, when available information indicates a cost of $50 to $75 per test for an outside laboratory, the simple assertion that the same tests cost only $4.35 to $10.53 when conducted in-house requires some justification.

In addition, only the very largest fabric mills currently perform testing in-house since only these firms produce fabric in sufficient volume to justify the expense of in-house testing

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[40] The Staff assumes that the value of the fabric used in the tests is $1 million; therefore, the total cost of testing the fabric is assumed to be $1 million to $2 million. Thus, the lowest possible cost per test would be based on 230,000 tests totaling $1 million or $4.35 each, on average; the highest possible cost per test would be based on 190,000 tests totaling $2 million or $10.53 each, on average. Of course, as we discussed above, should the draft proposed rule be adopted, many more than 190,000 to 230,000 tests per year will be required.

facilities. Most firms in the industry, whether mills, converters or wholesalers, currently rely on third-party firms for testing and will not likely have the resources to develop in-house testing facilities should the draft proposal be adopted.

Even the $50 to $75 per test charges referred to by the Staff appear to be unrealistically low. In our survey of major fabric mills, six mills report exporting FR backcoated upholstery fabric to the U.K.[41] The average cost for compliance testing reported by these firms is $135 per test. ***In addition, these firms report that only 55.5 percent of the tested fabric passed the test the first time.***

Testing fabric for compliance with the small open-flame regulation is just one of many tests that will have to be conducted on upholstery fabric should the Staff's draft proposal be approved by the CPSC. The FR chemicals contained within a latex backcoating tend to migrate into the fibers of the fabric, and they can affect many dimensions of fabric quality. These include such characteristics as color fastness, light fastness and abrasion resistance. Moreover, the many factors that affect a fabric's flammability will also determine how FR chemicals alter these quality-related characteristics of fabric. Since these characteristics of a fabric must be known by the manufacturer in order to guarantee quality to customers and provide warranties, the draft regulation will also force fabric producers to test each SKU for each of these characteristics of quality.

Our analysis assumes that approximately 25 to 30 percent of upholstery fabric will not receive an FR backcoating under the draft proposed regulation. The Staff's analysis assumes that as much as 50 percent of upholstery fabric will not receive an FR backcoating

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[41] Generally, mills export upholstery fabric to the U.K. that has not received an FR backcoating. The FR backcoating, and compliance testing is, in these cases, the responsibility of the importer in the U.K.

should the draft proposal be adopted. The upholstery fabric that is not FR backcoated will be the fabric used to produce such products as draperies, pillows and throws as well as the fabric exported to countries other than the U.K. Accordingly, many, if not all, SKUs of upholstery fabric will be produced in both FR backcoated and non-FR backcoated versions, and each of these versions will have to receive tests for the various quality characteristics. Thus, in addition to the up-front cost of re-testing all existing SKUs for such things as abrasion resistance and color fastness following FR backcoating, the annual costs for testing newly introduced fabrics for these quality characteristics will double since tests will need to be performed on both FR backcoated and non-FR backcoated versions.

Tests for these quality characteristics can be quite expensive. Our survey of fabric mills indicated that, on average, abrasion tests cost $67.40, UFAC compliance tests cost $40.00 and color fastness tests cost $35.00. Accordingly, the testing costs imposed by the draft regulation will be many orders of magnitude greater than that estimated by the Staff.

Besides incurring the costs of treatment and testing that the Staff considers, upholstery fabric producers and finishers will face substantial additional costs. Unfortunately, whereas the Staff merely underestimated treatment and testing costs, these additional costs were totally omitted from the Staff's cost analysis. These include: 1) the cost of capital investments required for water and air pollution abatement; 2) the costs associated with obtaining new EPA permits; 3) the added cost of disposing of FR treated scrap fabric; 4) additional costs associated with fabric books, sample pieces and showroom samples; 5) increased liability costs; and 6) added inventory and delivery costs.

Many of these costs will also be incurred by fabric converters, wholesalers and furniture manufacturers. The replacement of sample fabric books, sample pieces and showroom samples could cost mills, wholesalers, converters, fabric retailers, furniture

retailers and re-upholsterers hundreds of millions of dollars. Along with ultimately paying for all of these added costs, consumers will also bear the cost of no longer being able to purchase many highly-valued decorative upholstery fabrics altogether.

B. Environmental, Health and Safety Regulatory Costs

A regulation requiring upholstered furniture sold in the U.S. to be manufactured with FR backcoated fabrics will significantly affect air and water pollution and solid waste disposal throughout the fabric, fabric finishing and furniture industries. Some components of an FR latex backcoating have already been deemed as possibly toxic by some authorities. Some of the components of latex have also been designated as hazardous air pollutants that could be released during the production of the latex, the drying of the backcoating on fabric, the disposal of latex wasted in the application of the backcoating and the disposal of scrap backcoated fabric. The Staff's draft regulation will, therefore, impose significant regulatory costs involving a myriad of regulations enforced by the U.S. Environmental Protection Agency ("EPA"), the U.S. Occupational Safety and Health Administration ("OSHA") and environmental and safety regulatory agencies in each state.

Water is regularly required to clean the backcoating equipment of excess latex, to clean tools and to clean production areas. Should the Staff's draft proposal be adopted, waste water from production facilities could contain relatively substantial quantities of latex and FR chemicals. Firms would have to test waste water for hazardous waste material, and the substantial increase in FR latex that the draft proposal would engender would likely change the status of an upholstery finishing facility from a small quantity generator to a large quantity generator of hazardous waste. Fabric finishers and integrated mills could be required to obtain new federal and state water permits and make substantial capital investments in equipment to clean waste water. In some areas, effluent restrictions may

preclude FR upholstery finishing altogether.

Extensive use of FR backcoating on upholstery fabrics will also require fabric producers and finishers to make significant new investments in air pollution abatement equipment. After backcoating is applied to a fabric, the treated fabric is dried in an oven. Drying the latex is a necessary and integral step in the process of applying backcoating to fabrics. The latex medium that contains the FR chemicals, however, releases "volatile organic compounds" and "hazardous air pollutants" during the drying process. Should the Staff's draft proposal be adopted, the tremendous increase in the use of backcoating on upholstery fabrics will require fabric producers and finishers to receive new federal and state air permits. Moreover, since upholstery fabric production and finishing is concentrated in relatively few regions of the country, the air quality in these regions could significantly deteriorate without substantial investments by fabric manufacturers and finishers.

The disposal of scrap fabric will also become much more difficult and costly should the Staff's draft proposal be adopted. Currently, fabric scrap can be disposed of in a variety of ways. It can be sent to landfills, incinerated or shredded and processed into fiber filling for such products as children's stuffed toys. If the scrap contains a hazardous or reportable waste or the disposal process produces hazardous waste, a solid waste permit could be required. Scrap fabric treated with FR backcoating would have to be evaluated to determine if it must be disposed of in a lined or hazardous material landfill.

Should the draft proposed regulation be adopted, incineration and recycling may no longer be available as methods of scrap disposal or they may become economically infeasible. Incineration could cause the release into the air of components of latex that are already designated as hazardous air pollutants. It could also require firms to obtain new federal and state air permits and make costly investments in air pollution abatement

equipment. Latex backcoating may make scrap fabric unsuitable for shredding, and manufacturers may be unwilling to stuff children's toys and other products with fiber filling containing potentially hazardous chemicals. Further, although the FR backcoating can be removed from scrap, doing so would simply convert a solid waste pollution problem into a water pollution problem. Thus, current and relatively low cost means of disposing of scrap residential upholstery fabric may no longer be available should essentially all residential upholstery fabrics be treated with FR backcoating, increasing the costs borne by the upholstery fabric industry, the furniture industry and, ultimately, by consumers.

Disposal of "imperfect" upholstery fabric will also be more difficult and costly. Currently, a substantial market exists for imperfect upholstery fabric. When imperfections are localized, they can often be cut from larger rolls of fabric and used for covering sofa pillows, for example. Imperfect fabric is also sold for many uses to customers who are unconcerned with small imperfections on otherwise quality fabrics. Although the market for imperfect fabrics may not permit fabric manufacturers to fully recover their costs, this market greatly reduces the losses that imperfect products would otherwise impose. If, however, upholstery fabric is backcoated with FR chemicals, it might not be suitable for many of the applications for which imperfect fabric is currently used. Further, some countries to which imperfect fabric is currently shipped may not allow the importation of fabric backcoated with FR chemicals because of environmental or health concerns. In addition, adoption of the Staff's draft proposal will create a whole new class of imperfect upholstery fabric: fabric that does not pass the required test despite being backcoated, although otherwise first-quality upholstery fabric.

In addition to the costs of complying with environmental regulations, industry participants will need to bear the costs of protecting workers. Throughout the upholstery

fabric and furniture production and distribution chains, the exposure of workers to FR chemicals will require strict adherence to many additional workplace rules and regulations established by OSHA and similar state agencies. Firms would need to ensure that "permissible exposure limits" are met. Written programs and training would have to be established, and engineering controls and protective equipment would need to be purchased. These costs will be incurred by integrated mills that apply their own backcoating and independent fabric finishing firms. They would also affect furniture manufacturers, furniture re-upholsterers, and fabric wholesalers whose workers would handle the treated fabric. Ultimately, these costs will be borne by consumers who will pay more for upholstered furniture.

C. The Potential Toxicity of FR Chemicals

The potential for toxic or carcinogenic effects of FR chemicals is not well understood and is highly controversial. Glassman-Oliver does not offer an independent opinion on the toxicity of these chemicals except to note that should these chemicals prove to be toxic or carcinogenic, the industry and consumers may bear substantial costs that have not been incorporated into the Staff's analysis. Indeed, firms such as asbestos manufacturers have been forced into bankruptcy due to the liability for toxic and carcinogenic effects of products produced decades earlier when these effects were not well understood.

The National Research Council, a part of the National Academy of Sciences, recently published a study entitled *Toxicological Risks of Selected Flame-Retardant Chemicals.*[42] This study, performed at the request of Congress, reviewed the toxicological and exposure

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[42] *Toxicological Risks of Selected Flame-Retardant Chemicals, Subcommittee on Flame-Retardant Chemicals, Committee on Toxicology, National Research Council* (Washington, D.C.: National Academy Press, 2000).

data on 16 fire retardant chemicals. Eight of these chemicals were found to pose "minimal risk to human health."[43] Unfortunately, according to industry experts consulted by Glassman-Oliver, no durable, commercially viable fire-retardant system exists that can use only one or more of the 8 fire-retardant chemicals deemed safe. For example, the bromine based chemicals (hexabromocyclododecane, decabromodiphenyl oxide) that are among the eight safe chemicals currently can be used effectively only in combination with antimony compounds (antimony trioxide, antimony pentoxide) that are not deemed as posing "minimal risk to human health." Moreover, even if exposure to FR chemicals is not a toxic hazard to humans, it may very well be toxic to other species in the food chain.

Some of the chemicals used in an FR latex backcoating are already designated as cancer and reproductive hazards under California Proposition 65. These chemicals include antimony trioxide, di (2-ethyl hexyl) phthalate, vinyl chloride, arsenic, lead and ethyl acrylate. If the Staff's draft proposed regulation were to be adopted, upholstered furniture sold in California, as well as any other product produced with FR backcoated upholstery fabric, would be required to be labeled a hazardous product. In many countries to which we export upholstery fabrics, FR backcoating is neither required nor desired because of environmental and toxicity concerns.[44]

The adoption of the Staff's draft small open-flame rule may result in the exposure to FR chemicals by workers and consumers. People may be exposed to these chemicals

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[43] These 8 minimal risk fire-retardant chemicals are hexabromocyclododecane, decabromodiphenyl oxide, alumina trihydrate, magnesium hydroxide, zinc borate, ammonium polyphosphates, phosphonic acid, and tetrakis hydroxymethyl phosphonium chloride.

[44] The European Union has rejected a European-wide regulation similar to the one in the U.K. on account of the environmental impact of FR chemicals. Indeed, Germany, for example, requires a special permit for the disposal of furniture or fabric containing FR chemicals because of the potential toxicity and environmental hazard that such fabric poses.

through dermal contact, inhalation and even ingestion. Since fabric is sold in rolls, its top surface may come in contact with its back for a long period of time. In addition, latex backcoating is applied as a liquid and can seep through the threads of loosely woven fabrics. Thus, even consumers who only touch the surface of the fabric may be potentially exposed to FR chemicals. Workers for fabric wholesalers, furniture manufacturers and re-upholsters that work with cut fabric pieces will also be exposed to the inside of the cut backcoating and to dust containing the backcoating.

In addition, the backing on the fabric may break down over time as the fabric wears. Cleaning and vacuuming the fabric can damage the integrity of the backcoating, accelerating the aging process. As the backcoating breaks down over time, consumers will be exposed to dust containing FR chemicals. Moreover, it is not uncommon for young children (particularly teething babies) and pets to chew on upholstery. The ingestion of FR chemicals by young children may create the potential for harmful results even if the chemicals are generally safe for adults.

Further, as the latex on FR treated upholstery breaks down through wear and cleaning, the concentration of the FR chemicals in the environment will rise. The release of FR chemicals into the water supply could pose a significant hazard. For example, these chemicals have been found to accumulate in the tissues of sea animals. A recent article in the *New York Times* reports that Dutch scientists have discovered FR chemicals "in the tissue of whales that normally feed in deep waters of the Atlantic Ocean." According to the article,

> While these chemicals can be useful to consumers, they appear to be resilient and harmful in nature. Scientists say they behave much like PCB's and DDT, which were banned for their toxicity...
>
> "The study showed that we are seeing warning signals that more serious problems may be ahead," said Jacob de Boer, of

> the Netherlands Institute for Fisheries Research, who led the team that analyzed the whale tissue.[45]

Should the Staff's draft proposal be adopted, the tremendous increase in the use of FR chemicals will only add to what may become a serious environmental concern.[46]

Indeed, the Staff's position with regard to FR chemicals appears to be somewhat inconsistent with the position taken by other federal agencies regarding chemicals with similar problems. The EPA has expressed considerable concern over the impact of persistent, bioaccumulative chemicals.[47] For example, in May, 2000, following negotiations with the EPA, the 3M Corporation withdrew from the market its very popular ScotchGard brand product because its main ingredient, perfluorooctanyl sulfonate ("PFOS") was found to accumulate in human and animal tissue. The withdrawal of this product, which represented about $300 million in annual sales, was made despite the absence of evidence that PFOS causes harm. According to Charles Auer, director of the EPA's chemical control division, "It is important to understand that we are not aware of any danger that PFOS chemistry is causing. The bigger issue is what might have happened in the future if the company had continued to make the stuff."[48]

D. Product Liability Costs

The potential toxicity of FR chemicals also may expose all firms throughout the supply chain (fabric mills, fabric finishers, wholesalers, converters and furniture

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45 Marlise Simmons, *The New York Times*, Sunday, August 30, 1998.

46 Greenpeace International has also raised concerns over brominated flame retardants and other "persistent organic pollutants." See The Tip of the Iceberg: State of Knowledge on Persistent Organic Pollutants in Europe and the Arctic, Greenpeace International, August 1999. Chapter 3 of this study reports that flame retardants have been found in the tissue of dolphins and seals as well as whales.

47 See, for example, "Persistent, Bioaccumulative and Toxic (PBT) Chemicals Initiative," Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency (http://www.epa.gov/pbt/index.htm).

48 "ScotchGard Scotched: Repellent builds up in people and animals," HealthScout.com, May 17, 2000.

manufacturers) to increased risks of legal liabilities. Should these chemicals be found to be toxic over long periods of exposure, then these costs may not materialize for many decades. Yet, should the cost materialize, they potentially could be so large as to bankrupt many firms. These potential liabilities represent a real and current cost to all firms in the upholstery fabric and upholstered furniture supply chains since the risk that these chemicals could someday be found to be toxic will raise the insurance rates of these firms (and, in turn, prices to consumers) now. Even if there is no definitive evidence of toxicity to humans, the industry faces the risk that workers or consumers could blame future illnesses on exposure to FR chemicals. Even if these firms ultimately win these cases, such litigation, even when baseless, can impose very high legal costs.

Even apart from the issue of FR chemical toxicity, the Staff's draft proposed regulation may expose firms participating at all stages of the upholstery fabric and furniture industries to tremendous liability risks. Anytime a fire occurs, any and all of these firms could be held liable. As we already discussed, everyday use of furniture will cause the FR backcoating to deteriorate and become less effective. Protecting themselves against product liability litigation could require firms to maintain enormous amounts of records establishing that the particular piece of upholstery fabric used to produce a particular piece of furniture passed the small open-flame test years before a fire took place. Even if industry participants can establish these facts, they face the prospect that a given jury will view the industry as having the "deep pockets" for compensation.

E. Sample Books and Promotional Costs

Although easy to overlook, the cost of the Staff's proposal on the marketing of upholstered furniture and upholstery fabric may be quite significant. In virtually every furniture store, one will see many racks of books containing hundreds, if not thousands, of

swatches of upholstery fabrics -- hundreds of different blends, with different weaves, different textures, different patterns, different colors and different price ranges. Similar rows of sample fabric books can be found in the showrooms of wholesalers, the offices of interior designers, and in the stores of fabric retailers and re-upholsters. In addition, fabric wholesalers have showrooms and warehouses full of sample swatches, somewhat larger sample "memos" and large showroom sample pieces.[49] Since an FR backcoating will significantly affect the color, feel and drape of a piece of fabric, virtually every showroom sample, sample memo, sample book and swatch will need to be replaced or duplicated. This cost could be in the hundreds of millions of dollars.

Furniture manufacturers may also incur additional promotional and marketing costs in order to maintain demand for furniture that is stiffer, less comfortable and more expensive due to the FR backcoating. In its cost/benefit analysis, the Staff notes that these additional promotional expenditures were incurred in the U.K., but makes no effort to estimate the magnitude of these costs and include them in its analysis.[50]

F. Fewer Choices For Consumers

The enormous variety of fibers, blends, colors, textures and designs used to manufacture upholstery fabrics reflects the broad variation in consumers' tastes and desires, as well as the enormous value that consumers place on choice. Should the draft proposed small open-flame regulation of upholstery fabric be adopted, much of this value would be lost.

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[49] Sample memos are larger swatches of sample fabric that can be sent to interior decorators or ultimate consumers for examination. Showroom samples or "pieces" are much larger sheets of fabric that hang from tall racks in a fabric showroom.

[50] See page 13 of the Smith Study.

Should the draft proposed regulation be adopted, some UFAC Class 2 fabrics would not be able to pass the Staff's draft proposed test even with an FR chemical backcoating or would require a backcoating so thick that those characteristics that generate demand for them would be lost. These fabrics, which include some of the most luxurious and highly valued fabrics sold, would, therefore, no longer be available to consumers. Accordingly, the draft proposed rule could potentially eliminate many fine decorative upholstery fabrics altogether.

In the case of less expensive fabrics, consumers will likely see fewer varieties of blends, weaves, textures and colors. Since flammability characteristics will vary on account of all of these factors, fabric mills, converters and wholesalers will be able (and likely) to lower their testing costs by producing or carrying fewer SKUs and, hence, denying consumers many of the choices that are currently available.

Further, latex backcoating can alter the color of fabric. Accordingly, if a consumer desires to match the fabric used to upholster furniture with the fabric used to make draperies and throw pillows, the consumer may have to use FR treated fabric for all three. The cost of the regulation, therefore, will be greater than merely a multiple of the amount of fabric used to manufacture upholstered furniture, as assumed by the Staff, since draperies, throw pillows and other products that use upholstery fabric may also be sold with the FR treated fabric.

G. Inventory and Delivery Costs

The draft proposed small open-flame regulation of upholstered furniture will impose additional inventory and delivery costs on the production and distribution segments of the upholstery fabric industry. Since some upholstery fabric will be used in applications that do not require backcoating, inventory costs may increase since manufacturers, finishers and wholesalers may need to carry particular fabrics in both backcoated and non-backcoated versions. Not only will the amount of fabric held in inventory increase, but new warehouse

and storage space may also need to be built. These costs could be particularly burdensome on manufacturers, finishers, and wholesalers that export significant amounts of fabric to countries other than the U.K. Many countries, particularly in Europe, will not accept FR treated upholstery fabrics or impose significant costs if such fabrics are used.[51]

Further, the time that production is held in inventory will increase significantly. Currently, fabric produced one day might ship out to the customer the next day. Under the draft proposed regulation, the same fabric will need to be held in the warehouse for three or more days while tests for compliance are conducted. This alone could increase by many fold the amount of warehouse space required to store upholstery fabric by fabric finishers and integrated manufacturers.

Delivery costs will also increase as a result of the proposal. Since smaller upholstery manufacturers generally produce smaller runs of fabric, they often can offer wholesalers and furniture manufacturers much faster turn-around on fabric orders. Whereas a very large manufacturer may take a number of months to fill an order, many smaller manufacturers can offer turn-around in a matter of days or a few weeks. If these smaller manufacturers do not have the volume or financial resources to justify the capital investments required to perform backcoating or testing in-house, their fabric will have to be sent to third-party finishers for backcoating before it can be sent to wholesalers or furniture manufacturers. This will impose substantial delays and additional costs on shipments. In addition, the delays created by the draft proposed regulation will further increase inventory costs since the time between production and sale of a given roll of fabric will increase.

Since the cost-per-yard of the smaller fabric manufacturers tends to be higher than the

[51] See footnote 44 on page 30.

cost-per-yard of the very large fabric manufacturers, the ability to offer "just-in-time" supply is a vital competitive advantage that allows many smaller manufacturers to survive despite higher costs. If the smaller fabric manufacturers are no longer able to provide this highly-valued service, some may not survive.

The position of wholesalers and converters is similar to that of the smaller fabric mills. Wholesalers and converters also must rely on third-party finishers for backcoating and third-part labs for testing. The additional freight costs and the increase in the time between the purchase of inventory and the delivery of inventory to customers will create significant costs to these types of businesses.

Furniture manufacturers may also incur additional inventory costs. Since the proposal will introduce delays in the delivery of upholstery fabric, furniture manufacturers will require larger inventories of upholstery fabric. Since inventories represent outlays that are not earning a return, greater inventories represent a very real economic cost to these firms.

H. Summary of Costs

As summarized in Table 3, the Staff's cost analysis of its draft regulation of upholstered furniture certainly underestimates the economic cost that this proposal will impose should it be accepted by the CPSC. Many factors that will increase the cost of the Staff's draft proposal are not included in the Staff's analysis. Moreover, even the additional costs that we consider do not fully reflect all of the costs that the draft proposed regulation will impose on the upholstery fabric industry and, ultimately, on consumers.

TABLE 3
Factors Increasing the Cost of the Staff's Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
1.	Cost of applying FR backcoating in the U.S. is already significantly higher than the cost assumed by the Staff.	The Staff uses $1.00 to $1.25 per linear yard as the expected cost of the FR backcoating to furniture manufacturers based on the experience in the U.K.. Actual costs in the U.S. can be $2.50 for this service. The cost per linear yard can be much higher for small mills, converters and wholesalers that might require FR backcoating for very small runs or cuts of fabric and face fixed minimum FR application charges.
2.	Fabric testing for compliance with the draft proposal will likely cost substantially more than the Staff assumes.	Since small fabric manufacturers produce fabric runs in lengths of as small as 25 yards, on average, testing will take place much more often than every 1,000 yards. Converters and wholesalers that sell cuts of fabric as small as 10 linear yards will also face much more frequent testing than every 1,000 yards. Further the cost per test assumed by the Staff is a small fraction of the actual costs.
3.	The tremendous increase in the use of FR chemicals will significantly affect water and air pollution, and the disposal of scrap and imperfect fabric.	Fabric manufacturers that do their own finishing and finishers will need to invest substantial amounts of capital in pollution abatement equipment, will face higher disposal costs, and will lose substantial income from the lost sale of imperfect upholstery fabrics.
4.	Firms will need to protect workers who handle upholstery fabric from a variety of safety concerns.	OSHA and similar state agencies will be much more involved in the oversight of fabric production and finishing. Firms involved in these activities will face greater regulatory compliance costs as they need to offer greater protection to workers and face more workplace rules. Written programs and training would have to be established. Engineering controls and protective equipment would need to be purchased.
5.	Little is known about the toxicity of FR chemicals, particularly with regard to long-term exposure.	The Staff's draft proposal could impose significant hazards to workers and consumers and expose firms throughout the upholstery fabric and furniture industries to tremendous legal liabilities.
6.	Promulgation of the Staff's draft proposal will greatly increase the exposure of all firms in the upholstery fabric and furniture business to product liability litigation.	Any household fire caused by a small open flame or a cigarette will expose firms to the charge that the furniture (or fabric) did not comply with the small open-flame rule. To defend against such charges, records of fabric tests will have to be maintained for the life of each piece of furniture. Even if the firms are ultimately cleared of the charges, their legal costs could be enormous.

TABLE 3
(continued)
Factors Increasing the Cost of the Staff's Draft Small Open-Flame Regulation of Upholstered Furniture

	Factor	Effect
7.	All showroom samples, sample pieces and sample books will need to be replaced or duplicated.	FR backcoating will affect the feel and color of fabric and make existing sample books and sample pieces unrepresentative of the treated fabric. Since not all upholstery fabric is used for furniture, both treated and untreated upholstery fabric will be available. With sample books costing an average of $40 each, duplicating sample books and showroom samples with FR backcoated versions of upholstery fabrics will add at least many tens of millions of dollars to the cost of the Staff's draft proposal, and possibly much more.
8.	Consumers will not be able to purchase many of the most highly-valued decorative upholstery fabrics currently available.	Many fabrics that consist of 75 percent or more of silk or cellulosic fibers (cotton, linen or rayon) or fabrics that are highly textured (e.g., chenilles) will likely not pass the draft test even with a backcoating and will, therefore, no longer be available. In order to lower costs, fabric manufacturers will likely discontinue production of some SKUs that can pass the draft test.
9.	Inventory and delivery costs will increase.	Fabric manufacturers that do their own finishing, finishers and wholesalers might need to keep two inventories of each upholstery fabric: one that has an FR backcoating for use as furniture upholstery fabric and a second that does not have an FR backcoating for use as draperies, bedspreads, pillows and other non-furniture items, and for export. The added time required to send fabric to finishers will lengthen the time between production of a fabric and delivery to a customer, further increasing inventory costs. Freight for shipment to finishers will increase delivery costs.

III. Socioeconomic Effects

Although the effect of a draft proposed regulation on income distribution does not involve economic costs or efficiency, the recognition and consideration of distributional effects are still generally important elements in the determination of appropriate public policy. Ultimately, the added cost of producing upholstered furniture that is generated by the draft proposed small open-flame regulation of upholstery fabric will be borne by consumers through higher prices. These price increases, however, will have a widely varying impact across households of disparate economic status. Moreover, although poorer households are much more likely to experience upholstered furniture fires caused by small open flames than more affluent households,[52] they will likely benefit least from the draft proposed regulation.

Households with less income are more likely to buy less expensive furniture manufactured with less expensive fabric, and the effect of the regulation on the cost of cheaper fabrics will be very large. A $2.70 per linear yard backcoating on a less expensive fabric that currently wholesales for $4 a linear yard raises the fabric cost of furniture manufacturers by nearly 70 percent. This increase in the cost of one of the major cost components of upholstered furniture will be marked up by the furniture manufacturers and retailers, and likely result in a significant increase in the price of furniture.

As a result, rather than purchase new FR treated furniture, poorer families will be more likely to keep older furniture longer and increase the use of slipcovers or loose fabric "throws" as less expensive alternatives to the purchase of new furniture. Raising the price of new furniture can be also expected to induce more lower-income families to purchase used furniture rather than new. These tendencies will not only delay the average time at which

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[52] See footnote 16.

poorer households first obtain FR treated furniture, but will also lower the average effectiveness of the FR treated furniture that poorer households eventually obtain, since the FR treatment will likely deteriorate over time. Moreover, any increase in the use of throws as an alternative to the purchase of new furniture may actually increase the likelihood of an upholstered furniture fire. Such loose fabrics are not covered by the draft proposal, and may actually be more likely to ignite than most upholstery fabrics. Accordingly, poorer households, which the Staff identifies as the households most likely to experience an upholstery fire caused by a small open flame, will receive far less of the benefits from the draft proposal than will more affluent families, which the Staff identifies as households unlikely to experience upholstered furniture fires caused by small open flames.

The effects of the Staff's draft proposed regulation are also likely to have disparate effects on industry participants based on size. Many of the costs created by the Staff's proposal, such as pollution abatement costs, are fixed costs. These costs will be much less burdensome on the large integrated mills than on smaller, more specialized mills, since the large mills will spread these costs over much greater output. Moreover, most of the larger firms in the industry already have significant staff and resources devoted to legal and regulatory compliance matters, and experience dealing with these issues. Larger firms also tend to have access to less expensive capital, which will lower the costs that they bear.

Further, since small mills tend to produce fabric in smaller runs than very large mills, testing costs per linear yard of fabric produced will be much higher for smaller mills. The same is true of converters and wholesalers that often sell fabrics in small quantities. Accordingly, one likely effect of the regulation will be to greatly diminish the number of small and privately owned fabric mills, wholesalers, and converters. Many of these smaller firms will either go out of business or be purchased by larger competitors.

Another characteristic of the industry that may jeopardize smaller and mid-sized firms is their dependence on third-party finishers. Although a number of the largest mills in the country perform fabric finishing in-house, most fabric mills ship their fabrics to firms that specialize in fabric finishing. Converters and wholesalers, which also do not have the ability to finish goods in-house, do the same. With the quantity of latex applied to upholstery fabric increasing two to three times upon implementation of the draft proposed regulation, the ability of smaller and mid-sized firms to survive will depend on the willingness and financial ability of finishers to make substantial investments in new backcoating capacity.

The fabric finishers that responded to our survey indicated that a 200 percent increase in latex backcoating would require capacity to increase from 11 backcoating lines to 25 backcoating lines. Each line costs approximately $775,000 to purchase, ship and install, indicating that the cost of the 14 additional lines would be about $10.85 million.

In addition to the new backcoating equipment, both firms indicated that their plants would require expansion to house these new latex backcoating lines, adding additional costs likely be in the range of multiple millions of dollars.[53] The fabric finishers will also likely require substantial new investments in water and air pollution abatement equipment and face substantially higher liability risks. Further, certain fabric finishers have indicated to industry participants a reluctance to work with short runs, particularly of high-end fabrics. The short runs require adjustments to equipment, and finishers have expressed fears of liability for ruining expensive fabrics as a result of the backcoating process.

[53] Of the finishing firms responding to the survey, only one provided an estimate of the cost of plant expansion. To add just two new lines, this firm estimated plant expansion would cost $1.4 million.

If new capacity is viewed as too risky or too expensive given the size and financial position of fabric finishers, then the cost of backcoating and the time delays required for backcoating may increase considerably. If applying an FR backcoating to small cuts of highly expensive fabrics is also viewed as very risky, this service may not be offered or offered only at very high prices. The result will be to put all mills, converters and wholesalers that depend on third-party finishers at a substantial competitive disadvantage vis a vis the large, major integrated mills. The likely effect will be greater industry consolidation and fewer small, independent firms.

Chapter 5: A Partial Calculation of the Economic Cost of the Draft Proposed Small Open-Flame Regulation of Upholstered Furniture

As indicated in the previous chapter, the economic cost of the Staff's draft proposed small open-flame regulation of upholstered furniture will be substantially greater than the cost estimated by the Staff. Estimating the impact of certain factors contributing to the cost of the draft proposal is straight forward; estimating the impact of other factors is not. For example, as we discuss below, an accurate estimate of the cost of the additional pollution abatement equipment that will be necessary following the adoption of the draft proposal would require a separate analysis of each plant that would be applying FR backcoating to upholstery fabrics. Such an extensive analysis is beyond the scope of this report.

In general, the extent and type of costs that the draft proposal will create will depend on independent decisions made by each firm in the industry. Firms that incur certain costs by responding to the draft proposed regulation in one way may avoid other costs that they would incur if they responded in some alternative fashion. Additional freight charges are a good example. Wholesalers sell a smaller percentage of their upholstery fabric to furniture manufacturers than do fabric mills. As a result, a wholesaler could choose to purchase only non-FR backcoated fabrics from mills and converters and have these fabrics FR backcoated as needed when supplied to furniture manufacturers. Alternatively, the wholesaler could purchase both FR backcoated and non-FR backcoated fabrics from the mills. If the wholesaler chooses the first alternative, he will face extremely high costs for freight and for backcoating since only very small cuts of fabric will be shipped at a time for FR backcoating. If the wholesaler chooses the other alternative, he will save money on freight but face much higher inventory and warehouse costs. We can assume that the wholesaler will make the

choice that he expects will be the least expensive, but that particular choice will depend on many firm specific factors. Different firms will respond differently depending upon their particular circumstances, as well as on the design choices made by consumers and interior designers. Thus, estimating that the draft proposed regulation will create $X of added freight costs and $Y of added warehousing costs is generally not possible.

Nonetheless, below we provide estimates of the cost of the draft regulation for those factors where such estimates are possible. For other factors, such as pollution abatement, we provide data to put in perspective the likely magnitude of the potential costs. Wherever possible, we have relied on actual costs as indicated in our survey of industry participants. Otherwise, we have relied on the estimates of industry experts that we have obtained through numerous interviews and discussions.

I. Application of FR Backcoating

Residential upholstery fabric can be used to produce many goods besides upholstered furniture. The majority of this fabric, however, is used to produce furniture. Of the $1.3 billion of residential upholstery fabric produced in 1998 by the 14 mills that responded to our survey, over 83 percent (approximately $1.1 billion) was sold directly to furniture manufacturers. This represented approximately 235 million linear yards of residential upholstery fabric (87.7 percent of all upholstery fabric shipped to furniture manufacturers). The seven fabric converters that responded to our survey shipped another 28 million linear yards of upholstery fabric directly to furniture manufacturers (approximately 10.4 percent of the total) worth approximately $125 million, and the 30 wholesalers shipped over 5 million linear yards of upholster fabric to furniture manufacturers (1.8 percent) worth approximately

$185 million.[54] The mills, converters and wholesalers that responded to our survey together shipped approximately 268 million linear yards of upholstery fabric to furniture manufacturers in 1998. Since our survey captured approximately 88 percent of the upholstery fabric produced in the U.S. during 1998, we assume that approximately 305 million linear yards of upholstery fabric will receive an FR backcoating.

An FR backcoating on fabric will affect its color and feel. Accordingly, consumers that want to match the fabric used for draperies, pillows or other items to the fabric used to upholster their furniture may need to use FR backcoated fabric for these goods also. Thus, a portion of upholstery fabric used for purposes other than furniture will still require the FR backcoating. Thus, our assumption of 305 million linear yards is quite conservative.

As we discussed in Chapter 4, a market-based estimate of the additional cost of the FR backcoating to the ultimate consumers of furniture would range from $4.68 to $6.21 per linear yard (see page 30). At this rate, should 305 million linear yards of upholstery fabric be treated each year, the cost that consumers will ultimately bear for the application of the FR backcoating will be between $1.427 billion and $1.894 billion per year.

The estimated 305 million linear yards of upholstery used to manufacture furniture in 1998 represents approximately 72 percent of 425 million linear yards (637.5 million square yards) of upholstery fabric produced in 1998. If, say, 25 percent of the remaining upholstery fabric ultimately receives an FR backcoating, then 335 million linear yards of upholstery fabric will receive FR backcoating. The cost of applying the backcoating will rise to between $1.568 billion and $2.080 billion per year.

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[54] Approximately 96 percent of wholesalers' shipments of residential upholstery fabric to furniture manufacturers were shipments made on behalf of interior designers or other customers of the wholesalers. The rest represents sales made directly to the furniture manufacturers.

TABLE 4

Estimated Cost of Applying FR Backcoating

	Lower Range Estimate	Upper Range Estimate
305 million linear yards	**$1.427 billion**	**$1.894 billion**
335 million linear yards	**$1.568 billion**	**$2.080 billion**

II. Testing Costs

The Staff assumed that testing for compliance with the draft proposed rule could be conducted every 1,000 linear yards of production. Although this assumption may be reasonable for the production of the larger mills that often produce fabric in runs of 1,000 linear yards and more, it is not appropriate for the vast number of smaller, specialized mills that produce fabric in much shorter runs, or for converters and wholesalers. Small mills often produce fabric in runs of 55 linear yards or less, and made-to-order upholstery fabric can be produced in runs of as little as 10 linear yards. Wholesalers and converters often sell fabrics in cuts as small as 10 linear yards or less. Since each run would require testing for compliance, should the draft proposal be implemented the number of tests required will greatly exceed the number assumed by the Staff. For the purposes of estimating testing costs, we assume that 80 percent of the FR backcoated upholstery fabric is produced in runs of 1,000 linear yards or more and that 20 percent is produced in runs of 55 linear yards.[55]

The cost for each compliance test will also greatly exceed the assumptions of the Staff. Six of the firms responding to our survey export fabric to the U.K. that is FR backcoated and tested for compliance in the U.S. Four of these firms provided their costs per test for compliance with the U.K. standard, which averaged $135 per test. Although the U.K.

[55] This assumption is based on interviews and discussions with industry executives pertaining to the typical production runs of the major mills and the many smaller mills. Also see the Smith Study, p. 5.

test is not identical to the draft proposed test, industry experts believe the costs will be comparable. To be conservative, however, we estimate the cost of compliance testing using a cost of $100 per test. Table 5 reports our estimate of the ultimate cost to consumers of compliance testing for the draft proposed standard.

TABLE 5

Estimated Cost of Compliance Testing

	Number of Tests	Charge Per Test	33% Gross Margin by Mill	33% Gross Margin by Furniture Manufacturer	33% Gross Margin by Retailer	Cost to Consumers
1. **305 million linear yards**						
80% - 1,000 linear yard runs	244,000	$100	$150	$225	$337.50	$ 82,350,000
20% - 55 linear yard runs	1,109,091	$100	$150	$225	$337.50	$374,318,212
TOTAL COST	1,353,091					**$456,668,212**
2. **335 million linear yards**						
80% - 1,000 linear yard runs	268,000	$100	$150	$225	$337.50	$90,450,000
20% - 55 linear yard runs	1,218,182	$100	$150	$225	$337.50	$411,136,425
TOTAL COST	1,486,182					**$501,586,425**

Together, the costs of applying the FR backcoating and testing for compliance with the draft standard would cost between $1.884 and $2.351 billion should 305 million linear yards of fabric receive FR backcoating and between $2.070 and $2.582 billion should 335 million linear yards of fabric receive FR backcoating.

Table 5 likely underestimates the cost of testing for compliance with the draft proposed standard by a significant amount. Our survey indicated that only 55.5 percent of the fabric tested passed the U.K. standard the first time. Thus, nearly half of the fabric required re-testing for compliance. Many of these fabrics also required a second FR backcoating to pass the compliance test. If the failure rate were to fall to only 25 percent under the draft proposed rule, testing costs would rise to between $571 and $627 million. If 25 percent of the tested fabric requires a second application of the FR backcoating as well as

re-testing, the costs for the application and compliance testing of the FR backcoated fabrics would rise to between $2.355 billion and $2.938 billion should 305 million linear yards be backcoated, and between $2.587 billion and $3.227 billion should 335 million linear yards be FR backcoated.

TABLE 6

Total Annual Cost for Application and Compliance Testing of FR Backcoated Fabrics (25 Percent Failure Rate)

	Lower Range Estimate	Upper Range Estimate
305 million linear yards		
Application Cost	$1.784 billion	$2,368 billion
Testing Cost	$571 million	$571 million
TOTAL COST	**$2.355 billion**	**$2.938 billion**
335 million linear yards		
Application Cost	$1.960 billion	$2.600 billion
Testing Cost	$627 million	$627 million
TOTAL COST	**$2.587 billion**	**$3.227 billion**

These estimated costs for applying and testing the FR backcoating could be quite conservative depending on when in the production and distribution process the fabric receives the FR backcoating. Wholesalers, for example, generally sell upholstery fabric in lengths that are very small fractions of the lengths of the rolls of fabric produced by the fabric mills. Of the more than 9 million linear yards of upholstery fabric sold by the wholesalers responding to our survey, approximately 2.4 million linear yards were sold in "cuts" of 10 linear yards or less, and 5.3 million linear yards were sold in cuts of 25 linear yards or less. The average cut of fabric sold by the wholesalers responding was just 14 linear yards.

Further, 3.6 million linear yards of upholstery fabric sold by the wholesalers were imported. Should the proposed draft regulation be adopted, the imported fabric will need to

be FR backcoated and tested by the wholesalers, and since this fabric is used for purposes other than manufacturing furniture, the imported fabric could not be backcoated *en masse*. Wholesalers would, therefore, have to ship to finishers for FR backcoating fabric in cuts that could be less than 10 linear yards and then have these cuts tested for compliance before being shipped to a furniture manufacturer. Thus, the number of compliance tests are likely to be higher than we have assumed. Further, finishers may charge more per yard to apply an FR backcoating to such small cuts of fabric. If the failure rate approaches the 55.5 percent rate currently experienced when fabric is tested for compliance with the U.K. standard, then the annual costs for application and compliance testing will be much greater than we have estimated.

Despite these conservative assumptions, our estimates of the annual cost for applying FR backcoating to upholstery fabrics and testing for compliance with the draft proposed rule are on the order of ***$2 billion per year*** greater than the Staff's estimates. The Staff determined that the total annual cost to consumers of the draft proposed regulation would be just $460 to $720 million. Our estimates range from $2.355 billion to $3.227 billion just for the application of the FR backcoating and compliance testing. As we have discussed at length, these are just two of many sources of additional costs that the draft proposed rule will impose.

The total cost for testing the upholstery fabric will be far greater than merely the cost of testing for compliance with the proposed standard. As we discussed in the previous chapter, an FR backcoating may alter many aspects of a fabric's quality such as abrasion resistance, light and color fastness and UFAC compliance. Most mills will test these characteristics of each style and color of a fabric upon initial production. Should the draft proposal be adopted, every existing style and color – that is, every SKU – in each mill's

product line will have to be re-tested for the effects of the FR backcoating on the many characteristics of fabric quality. In addition, as new SKUs are introduced, separate quality testing will have to be performed on both FR backcoated and non-FR backcoated versions of the fabric.

Of the 14 fabric mills that participated in our survey, nine provided data on the number of SKUs in their product lines and the number of new SKUs introduced. The product lines for these nine mills included over 255,000 SKUs in 1998. These firms also introduced just under 54,000 new SKUs during the year.

FR-backcoated versions of 255,000 SKUs in these firms' product lines would need to be tested for the various aspects of quality that the mills guarantee. Each year, the FR backcoated versions of the approximate 54,000 new SKUs would need to be tested in addition to the non-FR backcoated versions currently tested. The average cost per test for abrasion resistance, color fastness and UFAC compliance is $67, $35 and $40 respectively. Thus, should the draft proposal be adopted, these nine firms will initially spend over $36 million dollars to test the FR backcoated versions of their currently outstanding SKUs for abrasion resistance, color fastness and UFAC compliance. In addition, each year these firms will spend approximately $7.7 million as new SKUs are introduced.[56]

III. Sample Fabric Books and Memos

As we discussed in Chapter 4, if one walks into a furniture store, a furniture re-upholsterer, the office of an interior designer or a fabric showroom, one is likely to see rows of books containing swatches of upholstery fabrics. Since FR backcoating will alter the color

[56] Fabric mills would be able to reduce their testing costs following the adoption of the draft proposal by reducing the number of different SKUs that they produce. In this case, however, consumers would bear the cost of fewer choices of weaves, fiber blends, fabric designs and fabric colors.

and feel of fabric, currently circulating sample fabric books will need to be replaced should the draft proposed rule be implemented. Moreover, since upholstery fabric is used for goods other than upholstered furniture, and since some consumers may be reluctant to use FR backcoated fabrics when it is not required, fabric mills and wholesalers may need to circulate two sets of sample fabric books – one set with FR backcoated fabric and one set with untreated fabric.[57] In addition to sample fabric books, sample swatches, sample memos and showroom samples may need to be either replaced or duplicated. The total cost for replacing or duplicating sample fabric books, sample swatches, sample memos and showroom samples may be in the hundreds of millions of dollars.

The annual cost of either replacing current books or issuing two sets of books alone may be many tens of millions of dollars or more.[58] For example, the fabric wholesalers responding to our survey produced over 730,000 sample fabric books in 1998 at a cost of nearly $31 million dollars. If wholesalers need to provided sample books for both FR treated and untreated fabrics, these wholesalers would face additional costs of approximately $31 million per year attributable directly to the small open-flame rule. In addition to the two sets of sample books produced each year on an ongoing basis, sample books with FR treated fabrics would have to be produced to correspond to currently circulating sample books that do not have FR treated fabrics. Since, on average, sample fabric books circulate for approximately 4.5 years, this represents a one-time cost of approximately $140 million for the approximately 3.29 million sample books currently in circulation by fabric wholesalers.

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[57] The treatment of all upholstery fabric with an FR backcoating is also not plausible because of the effect of the heavy latex backcoating on the stiffness of the fabric. Draperies, for example, would not properly drape if they received an FR backcoating.

[58] These costs could be avoided if only FR treated upholstery fabrics were sold so that all products produced with upholstery fabrics would use FR treated fabrics. If this were the case, however, the amount of

These additional costs for new sample books are very conservative since they only reflect the annual production of sample fabric books for the fabric wholesalers that responded to our survey, and do not reflect the added costs to those wholesalers that did not respond to the survey, as well as similar costs that will be incurred by fabric mills and converters. Further, the added costs associated with FR backcoating will increase the cost of the fabrics used to create sample books and, as a result, increase the cost of producing each sample book.

In addition to fabric sample books, fabric wholesalers also keep in inventory sample memos, which are larger swatches of sample fabric that can be sent to interior decorators or ultimate consumers for examination. The fabric wholesalers responding to our survey held over $22 million of sample memos in inventory during 1998. This cost would double if the wholesalers needed to have on hand sample memos for both FR treated and untreated fabric.

Storage costs for sample memos would also increase considerably. The wholesalers that responded to our survey indicated that they currently devote 231,000 square feet of showroom space to the storage of sample memos. Showroom space is particularly expensive, an average of $35.19 per square foot per year. Doubling this space to accommodate twice the number of sample memos (i.e., memos in both FR backcoated and non-FR backcoated versions of the fabrics) could potentially add over $8.1 million dollars of costs per year just to the wholesalers that responded to our survey. The industry-wide increase in the costs of storing sample memos is likely to be much higher.

The fabric wholesalers that responded to our survey operated 459 showrooms throughout the U.S. These showrooms displayed sample pieces of residential upholstery fabrics that were worth over $31 million. Should the proposed draft rule be adopted, the cost

upholstery fabrics treated with FR backcoatings would increase by more that 100 million linear yards. Moreover, if this were the case, the cost of the regulation would be substantially greater than our estimate.

of the inventory used just for display may double. Wholesalers may need to display both FR backcoated fabric and non-FR backcoated fabric due to the effects that the backcoating will have on the appearance and feel of the fabrics and the fact that not all residential upholstery fabric is used to upholster furniture. Depending on the timing of the introduction of new SKUs and the discontinuance of existing SKUs, part of this additional $31 million will be a recurring annual addition to costs, and part may add to costs only over some number of years.[59]

IV. Pollution Abatement Costs

If the draft proposed small open-flame rule were adopted, the quantity of latex applied as upholstery fabric backcoating will increase 2 to 3 fold. The latex contains volatile organic chemicals (VOCs) that are released into the air as the latex dries. Although the quantity of VOCs released under the draft proposed regulation will surely increase, determining in advance the cost of air pollution abatement equipment under the regulation is extremely difficult. Regulations of VOCs vary considerably across states and even within states.

Whether a particular finishing plant will require additional air pollution abatement equipment will depend on such factors as: 1) which state the plant is located; 2) which city or town within the state the plant is located; 3) the current levels of VOCs released by the plant; and 4) the maximum levels of VOCs allowed by the plant's permits. Thus, for example, a finishing plant located in Rocky Mount, NC faces much more stringent air quality standards than a comparable plant located in Burlington, NC due to differences in local

[59] If, for example, approximately one-quarter of existing SKUs are replaced with new SKUs each year, then currently the showrooms add about $7.5 million in new stock to their showroom displays annually. Should the draft proposal be adopted and showrooms need both FR backcoated and non-FR backcoated showroom displays, this annual cost would increase to about $15 million.

regulations. A plant that is currently producing the maximum VOCs allowed by its permit will certainly have to invest in additional air pollution abatement equipment should it increase its use of latex backcoating by 2 to 3 times. A plant that is producing a relatively small fraction of the VOCs allowed under its permits may not have to invest in new pollution control equipment or may have to make only a small investment in such equipment.

Similar difficulties exist in trying to estimate the cost of water pollution abatement equipment caused by the Staff's draft proposed regulation. A 2 to 3 fold increase in the amount of latex applied to upholstery fabric will surely increase the amount of solids in waste water. The amount of FR chemicals such as antimony in waste water will also significantly increase under the draft proposed regulation. The cost of treating the waste water will depend on the same sort of factors that will determine the cost of treating air pollutants – the location of the plant, the amount of water pollution currently produced by the plant and the amount of water pollution allowed to be released by the plant under its permits.

It is worth noting here that in those instances in which a plant does not have to invest in pollution abatement equipment, the draft proposed rule may still inflict potentially significant social costs related to pollution. If a plant is currently producing effluents at such low levels that it can remain below permitted levels should the quantity of latex applied to upholstery fabric increase 2 to the 3 times, then the draft proposed regulation will lead to an increase in effluents released into the air and water at that plant. To the extent that the release of additional VOCs into the air and the release of potentially harmful chemicals into the water supply is harmful, then the draft proposed regulation will most likely create additional harm to the environment. Moreover, the draft proposed regulation will lead to an increase in air and water pollution at all backcoating plants except those that are now producing the full allotment of effluents allowed under their air and water pollution permits.

Although estimating the cost of the pollution abatement equipment required under the draft proposed regulation would require a case by case, plant by plant, analysis that is beyond the scope of this report, these costs are likely to be quite significant. One major integrated mill has estimated that its fabric finishing plant would require a $1.5 million investment in air and water pollution abatement equipment should the firm be required to apply FR backcoating to all of its upholstery fabric. To put this cost into perspective, it should be noted that this particular finishing plant has only 2 latex backcoating lines. The integrated mills and independent fabric finishers that responded to our survey together operate 55 latex backcoating lines, and should the draft proposal be adopted, the number of latex backcoating lines operating in the U.S. will increase significantly. As noted above, should the draft proposed regulation be adopted, the amount of latex applied to upholstery fabric would increase 2 to 3 times. The mills and independent fabric finishers that responded to our survey estimated that a 200 percent increase in backcoating would require 51 additional backcoating lines.

V. Freight

To the extent that upholstery fabrics already receive various finishing applications, there will generally not be incremental freight charges resulting from the adoption of the draft proposed regulation.[60] Two exceptions will arise, however. Since products other than upholstered furniture are produced with upholstery fabrics, fabric wholesalers may need to inventory both FR backcoated and non-FR backcoated versions of particular fabric styles. If an FR-backcoated version of a fabric is out of stock, a wholesaler might potentially send a

[60] This will not always be the case. Some smaller mills may perform finishing in-house on fabrics that do not currently require latex backcoating. Such mills may have to send these fabrics to third-party finishers for FR backcoating should the draft proposal be adopted. The cost of shipping this fabric for backcoating would represent an added freight cost created by the regulation.

non-FR backcoated cut to a finisher for the application of the backcoating. In this case, the extra freight would represent an additional cost of the regulation. Wholesalers that sell little upholstery fabric to furniture manufacturers may not inventory FR backcoated upholstery fabrics at all. These wholesalers would also incur additional freight costs on account of the regulation should they need to have fabric FR backcoated.

Imported residential upholstery fabric represents another source of added freight costs. No country other than the U.K. requires FR backcoating on upholstery fabrics. Accordingly, imported finished upholstery fabrics from all countries besides the U.K. will need to be FR backcoated. The fabric mills that responded to our survey imported approximately 1 million linear yards of finished residential upholstery fabric in 1998. The fabric converters imported an additional 6.8 million linear yards of residential upholstery fabric, and the fabric wholesalers imported 3.6 million additional linear yards of residential upholstery fabrics in 1998. The average cost for the mills to ship fabric for finishing was $0.10 per linear yard, and the average cost for the converters to ship fabric to finishers was $0.11 per linear yard. The wholesalers incur much higher shipping costs per linear yard since they ship much smaller cuts of fabric at a time. Their shipping costs averaged $0.44 per linear yard. The mills shipped approximately 84 percent of their residential upholstery fabric to furniture manufacturers. The converters shipped approximately 22 percent of their residential upholstery fabric to furniture manufacturers, and wholesalers shipped approximately 58 percent of their residential upholstery fabric to furniture manufacturers.[61] Assuming that these percentages apply equally to imported fabrics, the added freight costs

[61] The shipments by mills and converters to furniture manufacturers represented sales to the furniture manufacturers. In the case of the fabric wholesalers, shipments to furniture manufacturers were nearly all made on a COM basis on behalf of interior designers rather than direct sales to the furniture manufacturers. Nonetheless, these shipments were made so that the fabrics would be used to upholster furniture.

for backcoating the imported fabrics will be approximately $1.2 million per year.

VI. Inventory Costs

The application of FR backcoating and the drying and curing process required after application could add 2 to 3 days to the time it takes for fabric to move from the mill to the finisher and ultimately to the furniture manufacturer or wholesaler. For certain fabrics, such as imported fabrics, that do not currently need to be shipped for finishing, the added time required to ship the fabrics, apply the FR backcoating and dry and cure the backcoating could add a week or more to the time that it takes for the fabric to be received by the customer or furniture manufacturer. These added days represent delays in payments to the mills or wholesalers selling the fabric, which in turn, represent added costs.

Chapter 6: Summary and Conclusions

Cost/benefit analysis can be an important tool to ensure that private and governmental decisions are made so as to use limited resources efficiently. The Staff has attempted to perform such an analysis. Nonetheless, we find that the Staff's analysis of the potential costs and benefits of the draft proposed small open-flame regulation of upholstered furniture does not accurately measure the impact that this regulation would have on consumers and firms should it be adopted.

We find that the analysis of the draft proposal by the Staff greatly exaggerates the potential benefits of the draft proposal while overlooking many costs that this regulation would impose. Further, the costs that the Staff does consider are assumed to be at levels far below those actually faced by the upholstery fabric industry. Our re-estimation of the costs created by ***just*** the application of the FR backcoating to the fabric and the testing of the treated fabrics for compliance with the draft proposed standard indicates that the Staff underestimates these costs by approximately ***$2 billion per year***. These costs, however, represent only a portion of the total costs that the draft proposal would impose on the fabric industry and, ultimately, on consumers.

Apart from the explicit out-of-pocket costs that the regulation would impose, consumers would suffer further on account of the regulation. In particular, many fabrics will not pass the draft proposed standard even with an FR backcoating. Many of the finest, most luxurious and highly valued cotton, silk, linen and rayon fabrics will likely not pass, as well many chenilles, washed fabrics and boucles of various fiber blends. Under the regulation, consumers would no longer be able to purchase furniture manufactured with these fabrics.

Finally, the Staff does not consider the socio-economic impact of the draft proposed

regulation. The impact of the draft proposal on the cost of otherwise inexpensive furniture may be quite large and represent a large financial burden on poorer households. Yet, it is poorer households that the Staff identifies as the group most likely to experience an upholstered furniture fire ignited by a small open flame. The increase in the cost for new furniture may induce lower income households to keep older furniture longer or purchase used furniture, which will diminish the benefits that these households would otherwise receive from the draft proposed regulation.

The draft proposed regulation will likely have a much greater impact on smaller firms than on larger ones. Smaller mills, for example, often produce fabric in much smaller runs than the large integrated mills. Wholesalers, which also tend to be smaller firms, often sell very small cuts of fabric. As a result, compliance testing per linear yard of fabric produced will be much greater for the smaller firms in the industry than the larger, integrated mills. The added fixed costs, such as those costs related to air and water pollution, worker safety and other regulatory matters, will also be a greater burden on smaller firms since they will be spread over far less output. Finally, the future survival of wholesalers, converters and many mid-sized and smaller mills will be in the hands of third-party fabric finishers that might not be willing to undertake the expense and risk of meeting the tremendous increase in demand for latex backcoating impregnated with potentially toxic fire retardant chemicals.

For cost/benefit analysis to provide guidance to policy makers, the costs and benefits of proposed regulations must be calculated as accurately as possible based on sound economic principles and market realities. Our analysis of the Staff's estimate of the costs and benefits of the draft proposed small open-flame regulation of upholstered furniture indicates that the Staff has not satisfied this responsibility. Moreover, if regulations are to improve the welfare of consumers, then it must be the case that the benefits afforded consumers by the

regulations exceed the costs that the regulations generate. Our analysis strongly indicates that the draft proposed small open-flame regulation of upholstered furniture fails to meet this obligation.

Appendix I

Upholstery Fabric Industry Survey Questions:

Fabric Mills, Fabric Finishers, Fabric Converters and Fabric Wholesalers

Appendix I

Survey of Fabric Mills

All Mills should answer questions in Part A. Mills that also apply any latex backcoating in-house should also answer Part B.

Part A.

Sales

A1. Total 1998 dollar sales of residential upholstery fabric._____

A2. Total 1998 dollar sales of residential upholstery fabric to furniture manufacturers.
_____

A3. Total 1998 dollar sales of residential upholstery fabric to wholesalers (i.e., jobbers).
_____

A4. Total 1998 dollar sales of residential upholstery fabric to converters.
_____

Production and Employment

A5. How many linear yards of residential upholstery fabric were produced during 1998?
_____

A6. On average, how many different SKUs of residential upholstery fabric did you produce each week during 1998? _____

A6a. How many SKUs are in your product line in 1998? _____
A6b. How many new SKUs did you introduce in 1998? _____

(Questions A6a and A6b were added as follow-up questions)

A7. What percentage of the residential upholster fabric produced during 1998 was made from 75% or more of cellulosic fibers (i.e., cotton, rayon and/or linen) or silk?
_____

A8. Approximately what percentage of the residential upholstery fabric that you produced during 1998 did ***not*** meet the UFAC Class 1 standard for fire resistance?
_____

A9. How many linear yards of your residential upholstery fabric production were subjected to softening (wet or dry, mechanical or chemical) during the last year?
_____

A10. Do you expect that over the next year the answer to question 9 will
a. Increase (by approximately how much? _____)
b. Decrease (by approximately how much?_____)
c. Be unchanged

A11. Please provide total employment for your residential upholstery fabric business as of December 31, 1998 (including production workers, managers, support staff and any other worker whose job could be endangered should your firm's production of residential upholstery fabric decline significantly).

a. full-time_____
b. part-time_____
c. contract _____

Current Use of Backcoating

A12. How many linear yards of your residential upholstery fabric production received a latex backcoating (either an FR or non-FR latex backcoating) during the last year?

_____

A13. What percentage of your answer to question 12 was performed in-house?

_____

A14. If any of the latex backcoating was performed by third-party backcoaters, what was the average cost per linear yard for the latex backcoating? _____

A15. If any of the latex backcoating was performed by third-party backcoaters, what was the average cost per linear yard to ship the fabric to the backcoaters?

_____

Exports And Imports

A16. How many linear yards of residential upholstery fabric did you export during 1998?

	Greige Goods	Finished Goods
a. In dollars	_____	_____
b. In linear yards	_____	_____

A17. How many linear yards of residential upholstery fabric did you export to the U.K. during 1998?

	Greige Goods	Finished Goods
a. In dollars	_____	_____
b. In linear yards	_____	_____

A18. How much residential upholstery fabric did your firm import for resale in the U.S. during 1998?

	Greige Goods	Finished Goods
a. In dollars	_____	_____
b. In linear yards	_____	_____

Testing Costs

A19. Please indicate whether the following tests are conducted in-house or by third-party labs. If the test is conducted by a third-party, indicate the average cost per test.

Test	A. In-House/B. Outside Lab (Please circle A. or B.)		Average Cost Per Test
Abrasion	**A.**	**B.**	
Color Fastness	**A.**	**B.**	
UFAC Compliance	**A.**	**B.**	

A20. If you export fabric to the U.K. that is FR backcoated in the U.S., please indicate whether the fabric is tested for compliance with the U.K. standard in-house, by a third-party lab, or by a third-party finisher. If the test is not conducted in-house, please indicate the average cost for having the test performed by a third-party.

Test	A. In-House / B. Outside Lab / C. Finisher (Please circle A., B. or C.)	Average Cost Per Test
Compliance with U.K. FR Standard	**A. B. C.**	

A21. On average, what percentage of the fabric passes the U.K. test the first time it is tested?

_____

Warehouse Space

A22. Total square feet of warehouse space used to store residential upholstery fabric.

_____

A23. Average cost per square foot of warehouse space used to store residential upholstery fabric. _____

A24. On average, approximately how many linear yards of residential upholstery fabric is stored in your warehouse at any given time. _____

A25. What would be your estimated cost per square foot to expand your current warehouse space devoted to residential upholstery fabric (cost should be all inclusive: land, materials, labor etc.)? _____

Part B. Please answer this section if the firm applies latex backcoating in-house.

Production and Capacity

B1. What is your total number of lines owned or leased during 1998 that were capable of applying a latex backcoating to residential upholstery fabric? _____

B2. Can these lines be used to apply any other types of backcoatings to fabric?
A. Yes B. No (Please circle appropriate answer.)

B3. If this equipment can be used for other purposes, what are these other applications?

_____

_____

_____

B4. If this equipment can be used for other purposes, approximately what percent of its use in 1998 was in the application of latex backcoatings?_____

B5. Approximately what percent of the use of this equipment during 1998 was for the latex backcoating of fabric suitable for residential upholstery? _____

B6. What is your estimated annual latex backcoating capacity per line (assuming fabric of average weight and blend)? _____

B7. What is your firm's total estimated annual latex backcoating capacity (assuming fabric of average weight and blend)? _____

B8. What is the average length of time for delivery and installation of a new latex backcoating line? _____

B9. What is the average cost, including shipping and installation, of a new latex backcoating line? _____

B10. If the demand for latex backcoating were to increase by the following percentages, please indicate 1) whether your firm would have to increase the number of lines of backcoaters owned or leased and, if so, how many additional backcoating lines would be necessary; 2) if you would have to expand your plant to accommodate the new capacity; and 3) the estimated cost of such an expansion.

Increase In Backcoating Demand	Number Of Additional Lines Required To Meet New Demand	Would Your Plant Need Expansion To Accommodate The New Line(s).	Estimated Cost Of Plant Expansion
25%			
50%			
100%			
200%			

Survey of Fabric Finishers

Sales

1. What were your total sales dollars for latex backcoating for 1998?
   _____

2. Does your firm provide fire retardant ("FR") latex backcoating to meet the U.K. standard for residential upholstery?
   A. Yes B. No (Please circle appropriate answer.)

If the answer to 2 is "No" then please go to question 7.

3. What were your total 1998 sales dollars for FR backcoating to meet the U.K. standard?_____

4. Does the firm charge a fixed minimum price for FR backcoating to meet the U.K. standard? **A. Yes B. No.**

5. If the answer to question 4 is **Yes**, then what is the fixed minimum charge for FR backcoating to meet the U.K. standard? _____

6. What is the charge per linear yard for applying FR backcoating to meet the U.K. standard? If the charge per yard varies depending on the number of linear yards being backcoated, please attach your full schedule of charges.
   _____

7. Does the firm charge a fixed minimum price for applying a non-FR latex backcoating? **A. Yes B. No.**

8. If the answer to question 7 is **Yes**, then what is the fixed minimum charge for applying non-FR latex backcoating? _____

Capacity

9. How many linear yards of fabric received a latex backcoating during 1998?
   _____

10. What percentage of the answer to question 7 consisted of fabric suitable for use as residential upholstery fabric? _____

11. What is your total number of lines currently owned or leased that are capable of applying a latex backcoating to residential upholstery fabric? _____

12. Can these lines be used to apply any other types of backcoatings to fabric?
    A. Yes B. No (Please circle appropriate answer.)

13. If this equipment can be used for other purposes, what are these other applications?
    _____
    _____
    _____

14. If this equipment can be used for other purposes, approximately what percent of its use in 1998 was in the application of latex backcoatings?_____

15. Approximately what percent of the use of this equipment during 1998 was for the latex backcoating of fabric suitable for residential upholstery? _____

16. What is your estimated annual latex backcoating capacity per line (assuming fabric of average weight and blend)? _____

17. What is your firm's total estimated annual latex backcoating capacity (assuming fabric of average weight and blend)? _____

18. What is the average length of time for delivery and installation of a new latex backcoating line? _____

19. What is the average cost, including shipping and installation, of a new latex backcoating line? _____

20. If the demand for latex backcoating were to increase by the following percentages, please indicate 1) whether your firm would have to increase the number of lines of backcoaters owned or leased and, if so, how many additional backcoating lines would be necessary; 2) if you would have to expand your plant to accommodate the new capacity; and 3) the estimated cost of such an expansion.

Increase In Backcoating Demand	Number Of Additional Lines Required To Meet New Demand	Would Your Plant Need Expansion To Accommodate The New Line(s).	Estimated Cost Of Plant Expansion
25%			
50%			
100%			
200%			

Survey of Converters

Sales and Employment

1. Total 1998 sales

   a. In dollars _____
   b. In linear yards _____

2. Total 1998 sales of residential upholstery fabric.

   a. In dollars _____
   b. In linear yards _____

3. Total 1998 sales of residential upholstery fabric to furniture manufacturers.

   a. In dollars _____
   b. In linear yards _____

4. Total 1998 sales of residential upholstery fabric to wholesale distributors (i.e., jobbers).

   a. In dollars _____
   b. In linear yards _____

5. Total 1998 sales of residential upholstery fabric to fabric retailers.

   a. In dollars _____
   b. In linear yards _____

6. Please identify the industry or industry segment of any residential upholstery fabric customers not covered in questions 3, 4 and 5.

   _____
   _____

7. Total 1998 sales of residential upholstery fabric made from 75 percent or more of silk or cellulosic fibers (i.e., cotton, rayon and/or linen). _____

8. Total 1998 sales of residential upholstery fabric that did not comply with the UFAC standard. _____

9. Total employment as of December 31, 1998.

   a. full-time _____
   b. part-time _____
   c. contract _____

Imports/Exports

10. Total 1998 imports of residential upholstery fabric.

    a. In dollars _____
    b. In linear yards of fabric. _____

11. Total 1998 imports of residential upholstery fabric made from 75 percent or more of silk or cellulosic fibers (i.e., cotton, rayon and/or linen). _____

12. Does the firm test imported fabrics for UFAC compliance? (Please circle the appropriate letter.) **A. Yes** **B. No**

13. If the answer to C12 is **A. Yes**, then please indicate the percentage of imported fabrics that complied with the UFAC standard in 1998, otherwise go to question C14. _____

14. Total 1998 exports of residential upholstery fabric.

    a. In dollars _____
    b. In linear yards of fabric. _____

15. Total 1998 exports of residential upholstery fabric to the U.K.

    a. In dollars _____
    b. In linear yards of fabric. _____

16. Total 1998 exports of residential upholstery fabric to the U.K. that were treated for with FR backcoating in the U.S.

    a. In dollars _____
    b. In linear yards of fabric. _____

17. Average price per linear yard charged by finishers for FR backcoating to meet the U.K. standard. _____

18. Average fixed minimum price charged by finishers for FR backcoating to meet the U.K. standard. _____

19. Average shipping distance to finishers that will apply FR backcoating to meet the U.K. standard. _____

20. Average cost per linear yard of shipping fabric to finishers._____

Testing Costs

21. Please indicate how often residential upholstery fabric is tested for

    a. durability _____
    b. color fastness _____
    c. UFAC compliance _____

22. Please indicate whether the following tests are conducted in-house or by third-party labs. If the test is conducted by a third-party, indicate the average cost per test.

Test	A. In-House / B. Outside Lab (Please circle A. or B.)		Average Cost Per Test
Durability	**A.**	**B.**	
Color Fastness	**A.**	**B.**	
UFAC Compliance	**A.**	**B.**	

Finishing

23. Total 1998 shipments of residential upholstery fabric to third-party finishers for any type of fabric treatment (in linear yards). _____

24. Average shipping distance to third-party finishers. _____

25. Average cost per linear yard for shipping residential upholstery fabric to finishers. _____

26. Total number of firms from which finishing services were purchased during 1998. _____

27. Please list services purchased from third-party finishers.

_____
_____
_____
_____
_____
_____
_____

Warehouse Space

28. Total square feet of warehouse space used to store residential upholstery fabric. _____

29. Average cost per square foot of warehouse space used to store residential upholstery fabric. _____

30. On average, approximately how many linear yards of residential upholstery fabric are stored in your warehouse at any given time. _____

Survey of Fabric Wholesalers

Sales and Employment

1. Total 1998 sales in dollars. _____

2. Total 1998 sales of residential upholstery fabric.

   a. In dollars _____
   b. In linear yards of fabric. _____

3. Total 1998 sales of residential upholstery fabric directly to furniture manufacturers.

   a. In dollars _____
   b. In linear yards of fabric. _____

4. Total 1998 shipments of residential upholstery fabric to furniture manufacturers on behalf of decorators or other customers.

   a. In dollars _____
   b. In linear yards of fabric. _____

5. Average number of linear yards of residential upholstery fabric sold per cut to each customer in 1998. _____

6. Please indicate the amount of 1998 sales and the number of 1998 sales for each cut designated below.

Length of Upholstery Fabric	Total Sales in Dollars	Total Sales in Linear Yards	Total Number of Sales
10 Linear Yards Or Less			
11 To 25 Linear Yards			
26 To 55 Linear Yards			
Greater Than 55 Linear Yards			

7. Total 1998 sales of residential upholstery fabric that did not comply with the UFAC standard.
   a. In dollars _____
   b. In linear yards of fabric. _____

8. Total 1998 sales of residential upholstery fabric made from 75 percent or more of silk or cellulosic fibers (i.e., cotton, rayon and/or linen).

   a. In dollars _____
   b. In linear yards of fabric. _____

9. Total employment as of December 31, 1998.

   a. full-time _____
   b. part-time _____
   c. contract _____

Imports/Exports

10. Total 1998 imports of residential upholstery fabric.

    a. In dollars _____
    b. In linear yards of fabric. _____

11. Total 1998 imports of residential upholstery fabric that did not comply with the UFAC standard.

    a. In dollars _____
    b. In linear yards of fabric. _____

12. Total 1998 imports of residential upholstery fabric made from 75 percent or more of silk or cellulosic fibers (i.e., cotton, rayon and/or linen).

    a. In dollars _____
    b. In linear yards of fabric. _____

13. Total 1998 exports of residential upholstery fabric, excluding exports to the U.K.

    a. In dollars _____
    b. In linear yards of fabric. _____

14. Total 1998 exports of residential upholstery fabric to the U.K.

    a. In dollars _____
    b. In linear yards of fabric. _____

15. Total 1998 exports to the U.K. that were treated for with FR backcoating in the U.S.

    a. In dollars _____
    b. In linear yards of fabric. _____

16. Average price per linear yard charged by finishers for FR backcoating to meet the U.K. standard. _____

17. Average fixed minimum price charged by finishers for FR backcoating to meet the U.K. standard. _____

18. Average shipping distance to finishers that will apply FR backcoating to meet the U.K. standard. _____

19. Average cost per linear yard of shipping fabric to finishers._____

Samples

20. Total number of sample fabric books produced during 1998. _____

21. Total cost of producing sample books in 1998. _____

22. Average length of time that a sample book is in circulation. _____

23. Total number of sample memos of residential upholstery fabric currently held in inventory. _____

24. Size (or average size if size varies) of each sample memo held in inventory.
_____

25. Estimated value (actual value if known) of sample memos currently held in inventory. _____

26. Total number of square feet of warehouse space required to store sample memos of residential upholstery fabric (not including storage space in showrooms).
_____

27. Average cost per square foot of warehouse space. _____

Showrooms

28. Total number of showrooms in the United States. _____

29. Total value of residential upholstery fabric inventory on display in showrooms.
_____

30. Total number of square feet of showroom space devoted to fabrics suitable for upholstery. _____

31. Average cost per square foot of showroom space. _____

32. Total number of square feet of space required to store sample memos of residential upholstery fabric at showroom(s). _____

Warehouse Space

33. Total square feet of warehouse space used to store residential upholstery fabric.
_____

34. Average cost per square foot of warehouse space used to store residential upholstery fabric. _____

35. On average, approximately how many linear yards of residential upholstery fabric is stored in your warehouse(s) at any given time. _____

Finishing

36. Total 1998 shipments of residential upholstery fabric to finishers for any type of fabric treatment (in linear yards). _____

37. Average shipping distance to finishers. _____

38. Average number of additional days required to apply FR backcoating and deliver to customers? _____

39. Average cost per linear yard for shipping residential upholstery fabric to finishers.
_____

40. Total number of firms from which finishing services were purchased during 1998.
_____

Appendix II

June 2000

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PROFESSIONAL EXPERIENCE

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Washington, D.C.
1976 to Present

Provides professional economic consulting to government and business, primarily dealing with the effects of mergers, business acts and practices (including international trade practices) and governmental regulations, and in estimation of damages. Assistance frequently involves review of internal documents and studies, analyses of factual situations and industry trends, preparation of opinions and expert testimony. Expert opinions have been rendered on dozens of occasions to state and federal governmental groups, businesses, hospitals, individuals, trade associations, U.S. District Courts and regulatory agencies such as the Federal Trade Commission, Consumer Product Safety Commission, International Joint Commission, state Certificate of Need Appeals Board, International Trade Commission, U.S. Department of Commerce (ITA) and the European Commission (DG IV). Supervises operation of firm of around 40 employees and is one of the founders of the firm.

Deputy Assistant Director
for Economic Evidence
Bureau of Economics
Federal Trade Commission
Washington, D.C. 20850
July 1975 to December 1976

Assisted in the supervision of about 40 professional economists in their input into the Commission's antitrust and consumer protection cases and investigations, which represented substantially all of the Commission's economists assigned to such matters. Chairman of the Commission's Merger Screening Committee, which evaluated all announced mergers and acquisitions and reviewed all requests for merger investigations, from September 1975 until November 1976. Member of the Commission's Evaluation Committees which reviewed and initiated requests for legal investigations in the antitrust and consumer protection area which did not deal with mergers. Chairman of the Food Group, a group of about fifteen economists studying competitive problems in the food manufacturing industry. Supervised the economic input into the Commission's Health Care Program (including initiation of the program) and all matters dealing with insurance industry. Acting Assistant Director in the absence of the Assistant Director. Represented the Bureau of Economics at conferences and seminars outside of the Agency as well as at meetings of the Commission itself.

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March 1970 to June 1975
January 1965 to October 1965*/

Chief economist on over fifty antitrust and consumer protection cases and investigations, including the monopoly case against the Xerox Corporation, and the industry-wide investigation of the Title Insurance industry. Chief Economist on virtually all insurance matters which were investigated by FTC during this period. Acted as witness and participated in the cross-examination of economic, marketing and statistical experts. Supervised the Commission's Premerger Notification Program for about a year and a half. Participated in economic study groups evaluating competitive problems and assisted in the development of economic studies. Co-author of a large, unpublished study of the Plastics Industry. Permanent member of the Commission's Merger Screening Committee and Antitrust Evaluation Committee. Acting Division Chief in the absence of the Division Chief, Economic Evidence.

*/ Military Service, 1966 to 1970 (Captain, U.S. Army Artillery).

Student Trainee in Economics
Division of Economic Evidence
Bureau of Economics
Federal Trade Commission
Washington, D.C. 20850
June 1962 to January 1965 (part-time)

Participated in a large number of Commission activities including preparing economic exhibits for trial (especially in antitrust cases involving the bread, milk, cement and truck trailer industries), doing a wide variety of statistical compilations and acting as a research assistant in economic studies of numerous industries, including a large study of passenger automobile tire prices.

PROFESSIONAL ASSOCIATIONS

American Bar Association*/
American Economic Association
Atlantic Economic Society
American Law and Economic Association
District of Columbia Bar Association (Inactive)
Eastern Economic Association
Industrial Organization Society
Royal Economic Society
Southern Economic Association
Western Economic Association

*/ Economist Member, Advisory Panel to the ABA Antitrust Economics Committee.

ACADEMIC TRAINING AND DEGREES

Institution Attended	Dates Attended	Degrees
Marietta College Marietta, Ohio	9/60 - 6/61	--
George Washington Univ. Washington, D.C.	9/61 - 1/65	B.A. (Economics)
George Washington Univ. Washington, D.C.	2/65 - 8/65 2/70 - 6/72	--*/
Washington College of Law, American Univ. Washington, D.C.	8/71 - 5/75	J.D.

*/ Completed all requirements for an M.A. (Economics) except for thesis.

HONORS AND AWARDS

Nominee for Chairman's Award, Federal Trade Commission
Superior Service Award, Federal Trade Commission

PUBLICATIONS

Publications include an article entitled, "A.C. Nielsen Market Share Data" (co-author), presented before the American Economic Association and published in 47 Antitrust L.J. 1067 (1979); a monograph entitled "Analysis of the Proposed Flammability Standards for Upholstered Furniture" (co-author); an article dealing with competitive problems in health care delivery entitled "Insurance," Antitrust in the Health Care Field (National Health Publishing), 1979), pp. 180-185; and a monograph entitled, "Economic Analysis of Phosphate Control: Detergent Phosphate Limitations vs. Wastewater Treatment" (co-author). Supplied well over a hundred written reports containing economic analyses of competitive and regulatory issues which have been submitted on behalf of the firm's clients, usually on a confidential basis. Numerous speeches and briefings to economists, lawyers and others on issues concerning antitrust economics.

EXPERT TESTIMONY

Trial testimony for the U.S. Federal Trade Commission, In the Matter of the American General Insurance Company, 1974.

Affidavit testimony for the U.S. Federal Trade Commission, In the Matter of Food Town Stores, Inc., and Lowe's Food Stores, Inc., in the U.S. District Court for the Middle District of North Carolina, 1976.

Deposition testimony for McDonald's Corporation, Barby's Frosted Foods, Inc. v. McDonald's Corporation, et al., in the U.S. District Court for the District of New Jersey, 1977.

Trial testimony of behalf of Consolidated Foods Corporation in U.S. v. Consolidated Foods Corporation and Chef Pierre, in the U.S. District Court for the Eastern District of Pennsylvania, 1978.

Deposition and trial testimony for the Kroger Company In the Matter of the Kroger Company (U.S. Federal Trade Commission Proceeding), 1979.

Deposition testimony for the Defendants, In Re: Corrugated Container Antitrust Litigation, in the U.S. District Court for the Southern District of Texas, 1980.

Testimony for The Soap and Detergent Association before International Joint Commission, Hearing on the Report of the Phosphate Management Strategies Task Force, 1980.
Deposition testimony for Olin Ski Company, in Maiocco v. Olin Ski Co., Inc, in the District Court for the Eastern District of Pennsylvania, 1981.

Deposition and trial testimony for Spindelfabrik Suessen in Platt Saco Lowell, Ltd., et al. v. Spindelfabrik Suessen-Schurr Stahlecker & Grill GmbH, et al., in the District Court for the Western Division of the Northern District of Illinois, 1983.

Affidavit testimony for the Defendants, In Re: Shopping Carts Antitrust Litigation in the U.S. District Court for the Southern District of New York, 1982.

Deposition testimony for Westvaco Corporation, In Re: Corrugated Container Antitrust Litigation (Opt-out litigation), in the U.S. District Court for the Southern District of Texas, 1982.

Testimony for Sanyo Special Steel Co., Ltd., U.S. Department of Commerce, International Trade Administration, Hearings on Certain Steel Pipe and Tubes from Japan, 1982.

Trial testimony for International Telephone & Telegraph Corporation, U.S. International Trade Commission, In the Matter of Certain Rotary Wheel Printing Systems, 1984.

Affidavit testimony for WECK GmbH u. Co., U.S. International Trade Commission, In the Matter of Certain Glass Construction Blocks, 1984.

Deposition and trial testimony on behalf of Mag Instrument, Inc., U.S. International Trade Commission, In the Matter of Certain Small Aluminum Flashlights and Components Thereof, 1987. Further submission of a written "Declaration" to the International Trade Commission, 1987.

Affidavit testimony for Turner Outdoor Advertising, Ltd. in U.S. v. Lewis M. Manderson, Jr. and Patrick Media Group of Atlanta, inc., in the U.S. District Court for the Northern District of Georgia, 1987.

Testimony on behalf of James River Corporation of Virginia and Princeton Packaging, Inc. before the U.S. Federal Trade Commission, In the Matter of James River/Princeton Packaging, 1988.

Affidavit testimony for Alamo Rent-A-Car, Inc. in The Hertz Corporation v. Alamo Rent-A-Car, Inc. in the U.S. District Court for the Central District of California, 1989.

Deposition testimony on behalf of Mars, Inc. in Bodie-Rickett and Associates et al. v. Mars, Inc. et al. in the U.S. District Court for the Western District of Tennessee, Western Division, 1990.

Affidavit testimony submitted to the Certificate of Need Appeals Board, Department of Health and Social Services, State of Delaware, In the Matter of St. Francis Hospital, Appeal of Decision Regarding Certificate of Need, 1992.

Deposition testimony on behalf of the Defendants in Richard A. Bolt and Richard A. Bolt, M.D., P.A. v. Halifax Hospital Medical Center, et al. in the U.S. District Court for the Middle District of Florida, 1991 and 1994.

Affidavit testimony on behalf of Ameron, Inc. in Ameron, Inc. v. Total Containment, Inc. et al., U.S. District Court for the Central District of California, August 15, 1995.

Deposition testimony (August 29-30, 1995) and affidavit testimony (October 18, 1995 and November 14, 1995) on behalf of Acoustical Distributors, Inc. in Acoustical Distributors, Inc. v. Armstrong World Industries, Inc. and Cain & Bultman, Inc. in the U.S. District Court for the Middle District of Florida, Orlando Division.

Deposition testimony (September 26, 1996) and trial testimony (October 13-14, 1996) for the Defendants in HTI Health Services, Inc. v. Quorum Health Group, Inc., River Region Medical Corporation, and Vicksburg Clinic, P.A. in the U.S. District Court for the Southern District of Mississippi, Western Division.

Affidavit testimony (January 17, 1997 and February 4, 1997) and deposition testimony (February 5, 1997) on behalf of Campbell Soup Co. in Campbell Soup Company v. Daniel J. O'Neill in the U.S. District Court for the District of New Jersey.

Testimony (August 6, 1997) on behalf of ARCO Chemical Co. in Hearing before European Commission, Directorate General IV - Competition, Case No. IV/36.233 - ARCO/Repsol.

Affidavit testimony (April 3, 1998; May 5, 1998; and May 14, 1998) and deposition testimony (May 11, 1998) on behalf of Fort James Corporation, In Re: Commercial Tissue Products Antitrust Litigation in the U.S. District Court for the Northern District of Florida, Gainesville Division.

Trial testimony (March 31, 1999 and April 5, 1999) on behalf of Braun and Gillette in Braun, Inc. and The Gillette Company v. Optiva Corporation in the U.S. District Court for the Southern District of New York.

Deposition testimony (August 27, 1999) on behalf of the Delaware State Waste Authority in Jenifer/National Solid Waste, et al. V. Delaware Solid Waste Authority in the U.S. District Court for the District of Delaware.

Deposition testimony (June 22, 2000) on behalf of Benesch, Friedlander in AutoVideo Productions Co., Inc. v. Benesch, Friedlander, Coplan & Aronoff, LLP, et al. in the District Court for the Southern District of New York.

Appendix III

Curriculum Vitae of Laurence Schumann

LAURENCE SCHUMANN

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Suite 405
1828 L Street, N.W.
Washington, D.C. 20036

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EDUCATION

UNIVERSITY OF VIRGINIA, 1986
Ph.D. in Economics
Fields: Industrial Organization and Econometrics

UNIVERSITY OF VIRGINIA, 1980
B.A. in Economics, *With Distinction*

PROFESSIONAL EXPERIENCE

GLASSMAN-OLIVER ECONOMIC CONSULTANTS, INC.

Vice President
March 1996 - Present

Provide economic analysis of competitive issues for private antitrust litigation and for proceedings before state, federal, and international antitrust enforcement agencies. Assess the effects on market performance of mergers, business practices, and government regulation. Calculate economic damages for a broad range of litigation including antitrust, false advertising, patent, labor and contract disputes.

I have provided expert counsel and testimony with regard to the calculation of economic damages. I have provided expert advice to clients involved in mergers and other corporate acquisitions in the U.S. and abroad. I have provided expert economic counsel in antitrust matters reviewed by the Federal Trade Commission, the U.S. Department of Justice, the Office of the California Attorney General, and the Commission of the European Communities. I have provided expert economic counsel to firms involved in both criminal and civil antitrust litigation.

FEDERAL TRADE COMMISSION
Bureau of Economics

September 1985 - March 1996

Staff Economist
Division of Economic Policy Analysis
June 1986 - March 1996

Conducted independent economic research regarding the competitive effects of state and federal regulation of markets, including studies of the economic effects of federal antitrust enforcement polices and state regulation of mergers and acquisitions. Submitted comments on behalf of the Federal Trade Commission's Bureau of Economics to various state and federal regulatory bodies describing the economic costs and benefits of proposed laws and regulations, and their potential effects on competition and economic efficiency. Provided economic analysis in support of antitrust investigations as a staff economist and as an expert witness (see below).

Staff Economist
Division of Antitrust
September 1985 - June 1986

Provided economic analysis in support of antitrust investigations of mergers and horizontal restraints.

UNIVERSITY OF VIRGINIA
Department of Economics

Visiting Lecturer
January 1990 - May 1990

Taught undergraduate course on the law and economics of antitrust policy.

Instructor
September 1983 - May 1984

Taught undergraduate intermediate microeconomics.

Teaching Assistant
September 1981 - May 1983

Teaching assistant for introductory economics and graduate econometrics courses.

EXPERT TESTIMONY

Hearing testimony on behalf of Campbell Soup Company in *Sacramento Municipal Utility District v. Campbell Soup Company*, American Arbitration Association, July 1999.

Deposition testimony on behalf of Campbell Soup Company in *Sacramento Municipal Utility District v. Campbell Soup Company*, American Arbitration Association, July 1999.

Affidavit testimony on behalf of Easy Gardner, Inc., *Easy Gardner Inc. vs. Dalen Products, Inc.* (Civil Action No. W97-CA261), U.S. District Court for the Western District of Texas, Waco Division, March 1998.

Deposition testimony on behalf of Bayou Steel, *Bayou Steel Corporation vs. United Steelworkers of America* et al. (Civil Action No. 95-496-RPM)U.S. District Court for the District of Delaware, 1997.

Affidavit testimony on behalf of the Federal Trade Commission, *Federal Trade Commission v. Boston Scientific Corporation* (Civil Action No. 1:95CV00198-HHG), U.S. District Court for the District of Columbia, 1995.

Various presentations before the staff of the Federal Trade Commission, the Department of Justice, and the California Attorney General with regard to antitrust investigations.

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.

REPORTS AND OTHER PAPERS

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.

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.

"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.

State Regulation of Takeovers and Shareholder Wealth: The Effects of New York's 1985 Takeover Statutes, Federal Trade Commission, Bureau of Economics Staff Report, March 1987.