

MANAGEMENT PERSPECTIVES ON THE IMPACTS OF NAFTA ON THE U.S.  
TEXTILE AND APPAREL INDUSTRIES

by

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May 2001

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## Introduction

The North American Free Trade Agreement (NAFTA) that was implemented among the United States, Mexico, and Canada on January 1, 1994, opened a new era for the three countries in trade. To date, increased trade among the countries is led by industrial and value added agricultural goods such as textiles and apparel. The agreement is expected to create the largest single market in the world, representing more than 350 million consumers and trade valued at over \$230 billion annually.

Although the industry complex of the three countries has become highly interdependent, the degree of interdependence has been asymmetric. Under recent NAFTA provisions, Mexico is much more dependent on the U.S. to provide high quality textile fabric for its apparel production and exports than is the reverse case. The U.S. has traditionally maintained a positive balance of trade in cotton and textile with both Mexico and Canada. Data from the U.S. International Trade Commission (USITC) reveal that U.S. exports of fibers (including textiles and apparel) to Mexico reached \$5.5 billion in 1999, which shows an increase of about four times the value in 1992. Meanwhile, U.S. imports of fibers from Mexico have jumped by nearly five times during the same period, reaching \$9.6 billion in 1999. Therefore, it appears that the impacts of NAFTA on the U.S. textile and apparel industry complex may have been quite profound, although response to NAFTA policies may be still unfolding.

Barichello *et al.* (1991), observe that although the NAFTA agreement is likely to focus on commodity and merchandise trade flows, close integration of capital, labor, and input markets means that a broader set of issues is inextricably intertwined in the agreement. Flows of capital and investment, particularly into Mexico, are a central concern. Implications for employment and labor migration, impacts on wage rates, social service costs, interest rates, exchange rates, and economic

(especially sectoral) growth rates could be significant. Other issues listed in various literature include environmental concerns, health and safety standards, and regulation of industry (Giancarlo and Meilke, 1992; Seale and Fairchild, 1993; Bhagwati, 1992; Butler, 1992; Grossman and Krueger, 1993; Marchant and Ballenger, 1994). The NAFTA has also placed increased competitive pressures on the U.S. textile and apparel industrial complex. Therefore, it has become necessary to review potential impacts of NAFTA on the magnitude of changes in trade flows, trends in location of manufacturing firms, determine the general competitive position of U.S. textile and apparel industries, and assess the potential implications for the rural communities in which a majority of the industries are located.

In a previous quantitative study to determine the impacts of NAFTA on U.S.-Mexican trade in textiles and apparel, Amponsah and Qin (2000) determined that so as to respond more effectively to the changing global environment and the consumer markets which they serve, U.S. textile and apparel industries have been consolidating their operations by concentrating more on producing and exporting high quality textile products. In order to remain competitive, some larger textile and apparel producers have diverted some of their more labor-intensive apparel production to Mexico for re-exportation to the U.S. market. Amponsah and Qin (2000) conclude that the factors that influence U.S. textile exports to Mexico and apparel imports from Mexico include the U.S.-Mexican exchange rates, U.S. foreign direct investment (FDI) in Mexico, and the tariff rates that Mexico levies on U.S. exports. U.S. FDI in Mexico tends to be explained by the relative costs of capital in both countries, the differential wage rates and to a lesser degree, by the income level in Mexico. The objective of this paper is to provide management perspectives on the impact of NAFTA on the U.S. textile and apparel industries. First, we present a summary overview of the U.S. textile complex. Then we

discuss factors affecting competitiveness of the industry complex. Thirdly, we present the empirical methodology for gauging management perceptions of exporting and the future potential to enhance exports to NAFTA markets. The results and conclusions from the study follow.

### Structure of the U.S. Textile Complex

The textile complex can claim the longest history of any industrial sector in the U.S. Today, the fiber-textile-apparel complex is still the largest manufacturing employer in the U.S. economy, providing jobs for more than 1.5 million workers, or more than 8% of the domestic industrial workforce. When cotton and wool production is included, the number of workers exceeds 1.7 million. Specifically, the textile industry employed an average of 671,000 workers in 1992, and the apparel industry employed 1 million workers. Of those, 65% were women and 35% were minorities (U.S. Department of Commerce, 1993). As depicted in Figure 1, the complex is the largest manufacturing employer in nearly a dozen states, the most important being North Carolina, Pennsylvania, Alabama, Virginia, Tennessee, and California. Moreover, textile and apparel firms are often the primary employers in rural regions, yet the apparel sector is also a major source of jobs in metropolitan areas, particularly in the Middle Atlantic states and California.

Major segments of the textile complex include: (i) the processing of natural fibers and the production of manufactured fibers; (ii) the conversion of those fibers into intermediate textile mill products such as yarns and fabric; and (iii) the manufacture of end-use-products from the intermediate components. End-use products include mainly apparel (and interior and industrial furnishings). Although segments of the textile complex are affected by trade in diverse ways, yet most manufacturers express a common concern for retaining the U.S. market and for remaining competitive in an increasingly challenging global market, of which they are a part.

Emerging multilateral and regional trade agreements, such as NAFTA, seem to have influenced the structure of the textile complex. As U.S. manufacturers strove for advantages over their foreign competitors, new alliances have developed within the U.S. industry. U.S. textile manufacturers have focused on achieving greater speed, efficiency, and high quality production through more integrated relationships within the industry chain. With greater emphasis on fast and continuous flow, vertical integration means that traditional links in the chain are more susceptible to either backward or forward integration than in the past.

#### Factors Affecting Competitiveness

Abbott and Bredhal (1994) demonstrate that in agricultural trade the main measure of competitiveness tends to be price (measured by the elasticity of export demand for agricultural products). Little attention is traditionally paid to market structure and other non-price competitiveness issues. They indicate that non-price factors of competitiveness for semi-processed and consumption-ready products, such as textiles and apparels, are given by a firm's strategy, industry structure, and quality of products rather than natural resource advantages, cost-reducing technology, infrastructure and government trade/domestic policies related to commodities. Indeed, Piercy (1982) confirms two broad categories of non-price factors in product and services.

More recently, as a result of the forces of globalization, the U.S. textile complex has been faced with (i) overcapacity of production, (ii) global financial crises; (iii) emerging multilateral and regional trade agreements (such as the World Trade Organization and NAFTA); (iv) changes in fashion trends and demand; (v) changing prices of cotton; and (vi) cheap imports from NAFTA nations (mainly Mexico). In response, the industry complex has responded by investing heavily in technological advances (automation) to sustain profits while reducing labor requirements and labor

costs. Increased productivity, therefore, means trading greater international competitiveness by U.S. firms with job losses. In 1996, for example, the textiles exports of \$7.8 billion represented 11% of the industry's \$68.9 billion in total sales. Exports to NAFTA partners equaled 44% of all textile exports (USITC, 1997). It is often suggested that overcapacity coupled with ease in substitutability with import products have intensified domestic competition that has contributed in large part to plants closures and greater investment by larger and more diversified firms in Mexico. The desire for exclusive apparel products, transient nature of fashion, and timing or seasonality of production tend to exacerbate competitiveness in the apparel sector.

Sourcing strategies in locating manufacturing plants tend to also influence industry competitiveness. Some sourcing variables include investment in facilities and equipment, production costs, costs and availability of labor, quality control, timing, risks (language, culture, political, etc.) and reliability in the international market. Now, with the inception of NAFTA, especially the "yarn forward" provision, U.S. textile producers are assured that Mexican garment firms will use only North American fabric rather than those from Asian suppliers. Products from Mexico are also guaranteed duty-free entry into the U.S.

The nature of the problem is as follows. The number of U.S. textile operations has been decreasing since the latter part of the 1980s, however, the total output of the U.S. textile mills has been maintained around \$25 billion annually (U.S. Department of Commerce, 2000). The increase in textile output efficiency is mainly driven by advances in production technology that has resulted in employment losses, while at the same time it has fueled increases in capital investment. Therefore, there is a current phenomenon of downsizing of firms. Is this caused by the NAFTA? Additionally, the 1996 Federal Agricultural Improvement and Reform (FAIR) Act has eliminated price protection

for U.S. cotton producers, thus, contributing more to cotton price risk. By shipping U.S. fabrics to Mexico, many U.S. textile manufacturers contract to have their apparels made in lower-wage Mexico to maintain their competitiveness.

### Empirical Framework

Analyses of the listed objectives are based on preliminary results generated from a national survey of 215 textile and apparel manufacturers. They include firms listed under textile mill products (SIC 22) and their 4 digits (SIC 2211 through SIC 2299), apparel and other finished textile products firms (SIC 23) and their 4 digits (SIC 2311 through SIC 2391).

In Section A of the survey, we separate firms into textile and apparel producers because industry type may explain other variables such as export marketing by products. For the purpose of determining brand names produced, especially by apparel producers, the questionnaire includes a question requesting the firms to list the type of products traded. It is also important to determine if, indeed, the firms are involved in exporting. Exporting tends to be associated with larger firms than smaller firms (Casvugil, Bilkey and Tesar, 1979; Casvugil and Nevin, 1981; Withey, 1980; Yaprak, 1985; Casvugil and Naor, 1987). Bonaccorsi (1992) argues that small firms may grow in the domestic market and avoid undertaking a risky activity like exporting. The sources of a firm's export contacts (such as international sources, incoming requests, brokers/middlemen, federal/state sources, foreign government, trade associations, and banks) are important in explaining the level of dependence on export markets for the firm's survival (Yaprak, 1985). Because of the dynamics of global and geopolitical activities, traditionally developed sources of marketing as well as a flexible approaches to sourcing have become very important. The key export destinations are important since this study focuses solely on NAFTA and the markets directly impacted by the agreement. Therefore,

if a respondent checked any other market destinations beside Canada and Mexico, then they were asked to go on to Section B.

The firms were asked to evaluate how market conditions such as the exchange rate of the U.S. dollar (to the peso or Canadian dollar), financial considerations (such as credit, guarantee of payment, etc.), NAFTA product regulations (such as standards, packaging, labelling, etc.), NAFTA policy provisions (such as the elimination of tariffs), and competition in NAFTA markets (from exports of high quality fabrics, etc.) influence their ability to export (Ajami and Khambata; Nelson, 1990; Pattison, 1990). Listed factors were rated using a Likert scale<sup>1</sup>: extremely influential, moderately influential, and not influential.

The type(s) of prior investment (in employee training, mechanization, niche market development, the development of partnerships, product specialization, etc.) made by the firm may strongly influence the firm's willingness to relocate outside of the given community. We also make an assessment of the manager's perception of the effect of NAFTA on the textile manufacturer's export activities as well as the perception of future export prospects in NAFTA markets. The firm's experience (denominated by years it has been in business) and in doing business with Canada or Mexico, and its size (by number of employees and value of total sales versus sales to Canada and Mexico) provide some indication about its ability to compete in the wake of NAFTA. Additional comments about the impact of NAFTA on the textiles and apparels industry are also elicited.

Descriptive statistics compiled from the survey already described are used to explain the structural characteristics of responding textiles and apparel firms. To satisfy the key objective of

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<sup>1</sup>The Likert scale allows surveyed populations to rank their choice of responses from a set of statements. See Emory (1985).



gleaning management perceptions of exporting and the future potential to enhance exports to NAFTA markets, the following methodological approach is presented. First, descriptive statistics on the question "what do you think has been the effect of NAFTA on your company's export activities," will be compiled. An additional question is asked about "what do you believe are the export prospects in NAFTA markets are for your company in the next five years?"

Then we derive the conceptual basis for choice of empirical methods as follows. Responses to the posited questions provide the framework for the theoretical discussion that follows. We believe that a set of explanatory variables gathered in the vector,  $x_i$ , will influence, for example, the probability of realizing positive export growth in NAFTA markets, etc., such that:

$$(1) \quad \text{Prob}(Y = 1) = F(\beta_i x_i)$$

$$\text{Prob}(Y = 0) = 1 - F(\beta_i x_i)$$

The set of parameters  $\beta_i$  reflect the impact of changes in  $x_i$  on the probability. The problem at this point is to devise a suitable model for the right-hand side of the equation. One possibility is the usual linear regression,

$$(2) \quad F(x, \beta) = \beta_i x_i$$

Since  $E[y] = F(x, \beta)$ , we can construct the regression model,

$$y = E[y] + (y - E[y])$$

$$(3) \quad = \beta_i x_i + e$$

But the linear probability model has a number of shortcomings. The error term is heteroscedastic in a way that depends on  $\beta_i$ . Since  $\beta_i x_i + e$  must equal zero or one,  $e$  equals either  $-\beta_i x_i$  or  $1 - \beta_i x_i$ , with probabilities  $1 - F$  and  $F$ , respectively.

Therefore, any proper continuous probability distribution defined over the real line will be

sufficient. We can either use a normal distribution which gives rise to the Probit model or a standard normal distribution which gives a logistic distribution of the form,

$$(4) \quad \text{Prob}(Y = 1) = \frac{e^{\beta_i x_i}}{1 + e^{\beta_i x_i}}$$

The inverse function of the logistic model is particularly easy to obtain (let Prob = P) as:

$$(5) \quad \ln[P/(1 - P)] = \beta_i x_i$$

This function is called the logit of P.

Capps and Kramer (1985), and Pyndick and Rubinfeld (1981) provide good discussions of the methodology underlying the logit model. Greene (1993) also discusses the issue of which type distribution to use. In principle, the logistic distribution resembles the standard normal distribution except in the tails. Therefore, for intermediate values of  $\beta_i x_i$ , the two distributions tend to give similar probabilities. However, the logistic distribution tends to give higher probabilities to  $y = 0$  when  $\beta_i x_i$  is extremely small, and vice versa, than the normal distribution. This is practically difficult to justify since it requires *a priori* knowledge of  $\beta_i$ . However, we can expect different predictions from the two models if the sample contains (1) very few responses (Y's equal to one) or very few non-responses (Y's equal to zero) and (2) very wide variation in an important independent variable, particularly if (1) is also true. Greene (1993) further states that "*there are practical reasons for favoring one or the other in some cases for mathematical convenience, but it is difficult to justify the choice of one distribution or another on theoretical grounds.*" Amemiya (1981) discusses a number of related issues, but as a general proposition, the question is unresolved, it seems not to make much difference.

The probability model is expressed as a regression of the form:

$$E[y] = 0[1 - F(\beta_i x_i)] + 1[F(\beta_i x_i)]$$

$$(6) \quad = F(\beta_i x_i)$$

The logit model is specified using maximum likelihood procedures. Press and Wilson (1978) describe the results from logit analyses as being meaningful and appropriate whether the explanatory variables are multivariate normally distributed, independent and dichotomous (zero-one), or multivariate normal and dichotomous. Thus, the robustness of the logit model coupled with its desirable properties makes it appropriate for this analysis.

The empirical logit model for the effect of NAFTA on textile manufacturers' export activities is specified as follows:

$$(7) \quad \text{Log} [P/(1-P)] = \beta_0 + \beta_1 \text{Mod} + \beta_2 \text{Brand} + \beta_3 \text{Risk} + \beta_4 \text{Eps},$$

where P is the probability of realizing positive export growth in NAFTA markets; (1-P) is the probability of not achieving positive export growth in NAFTA markets, Mod is management's perception of the importance of product modification for NAFTA markets, it ranges from 1 to 5, with 1 being extremely important and 5 being extremely unimportant. Brand is a dummy variable, 1 is to have its own brand and 0 is not to have its own brand. Risk is a variable describing the willingness of the management to take risk. It also ranges from 1 to 5, with 1 being extremely willing to take risk and 5 being extremely unwilling to take risk. Eps is a dummy of export pricing strategy, 1 is to charge a premium for the export market, 0 is not to charge a premium for the export market.

### Survey Results

Of the 215 firms surveyed nationally, 66% were textile manufacturers, 20% were apparel manufacturers, while 14% manufactured both textiles and apparel. About 76% of the textile and

Table 1. Factors Which May Influence Exporters Ability To Export To Canada Or Mexico

<b>Frequency of Citation (%)</b>			
<b>Influencing Factors</b>	<b>Ratings:</b>		
	<b>Extremely Influential</b>	<b>Moderately Influential</b>	<b>Not Influential</b>
The Exchange Rate of the U.S. Dollar	42.3	36.6	21.1
Financial Considerations	43.2	31.2	25.6
NAFTA Product Regulations	24.6	33.6	41.8
NAFTA Policy Provisions	33.1	37.9	29.0
Information About NAFTA Markets	8.3	45.8	45.8
Competition in NAFTA Markets	28.9	42.1	28.9

Table 2. Factors Which May Have Caused Significant Structural Changes In The Companies

<b>Frequency of Citation (%)</b>			
<b>Influencing Factors</b>	<b>Ratings:</b>		
	<b>Extremely Influential</b>	<b>Moderately Influential</b>	<b>Not Influential</b>
Overcapacity of Production	39.4	23.9	36.6
Global Financial Crisis	27.9	32.9	39.3
Multilateral (WTO) and Regional (NAFTA, EU ETC.) Trade Policies	44.8	27.3	27.9
Changes in Fashion Trends and Demand	21.0	31.2	47.8
Price of Cotton	18.7	33.8	47.5
Cheap Imports from NAFTA Nations	64.0	21.7	14.3

19% of apparel manufacturers were involved in exporting. A majority of the firms, over 60%, reported exporting to the NAFTA markets of Mexico and Canada. About 70% of the firms

reported that they developed their own sources of contacts and related information in NAFTA markets.

Table 1 delineates factors which may influence exporters' ability to export to NAFTA markets. Overall, a majority of the managers felt that exchange rates, financial considerations and NAFTA policy provisions, and competition in NAFTA markets were influential in exporters ability to export to Canada and Mexico.

Table 2 delineates also responses to factors that may have caused significant structural changes in the companies. Overall, as expected managers felt that overcapacity, trade policies, changes in fashion trends and demand and cheap imports from NAFTA markets were more influential in explaining structural changes. In fact, 64% and 46% of the managers, respectively, felt that NAFTA has caused domestic operations to downsize. However, 74% indicated that they have not started any alliances or joint venture investment in Mexico since the inception of NAFTA. Additionally, 62% of the managers felt that the cost of production would be the key reason for relocating to Mexico.

### Empirical Results

Table 3. Logistic Model Results for Export Activity

Variable name	Point Estimate	P-value
Intercept	1.85	0.02
Mod	-0.36	0.23
Brand	-0.41	0.42
Risk	-0.46	0.09
Eps	-1.53	0.07

Table 3 provides the results for the empirical results for management perception of textile firms' export activity in NAFTA markets. Besides the intercept, only Risk and eps variables have

significant coefficients. The negative and significant coefficient of the risk variable indicates that management's willingness to take more risk, explain likelihood of the company having positive growth in NAFTA markets. Entering into new markets is likely to be risky, especially at the initial stage. Most American textile companies have historically focused on the domestic market. Therefore NAFTA markets provide a very experience.

The significant and negative coefficient for Eps shows that if a company charges a premium in NAFTA markets, it is unlikely that it has enjoyed a positive growth in NAFTA export markets. NAFTA markets are highly competitive, to expect these new markets to yield additional profits initially is highly unlikely.

The other two variables Mod and Brand are insignificant. Since the U.S. is more technologically advanced in textile production, it sets the trend and standard, rather than following after others. It is understandable why the management believes that it is unnecessary to modify their textile products specifically for NAFTA markets. Since textile is a semi-processed product, the brand name for textile products may not be as important as that of apparel.

A second logistic model is estimated for management's perception on future textile export to NAFTA markets. The functional form is similar to model (1) except the P on the left hand side stands for the probability of believing in a favorable export prospect in NAFTA markets for the company over the next five years. Table 4 summarizes the estimated results.

Table 4. Logistic Model Results for the Perception of Export Prospects to NAFTA Markets

Variable name	Point Estimate	P-value
Intercept	1.17	0.10
Mod	-0.97	0.00
Brand	-0.20	0.70
Risk	0.60	0.04
Eps	0.10	0.89

The negative and significant coefficient for the Mod variable represents management's belief that U.S. textile firms may not be able to maintain the same product type in the next five years. As global textile competition continues to heat up, it may become necessary for the U.S. textile manufacturers to modify their products for NAFTA markets.

Managers of firms who perceive the need to take greater risk in entering new markets are those more likely to view future prospects in exporting to NAFTA markets less favorably. Indeed, about 56% of the respondents reported experiencing a decrease in profits from NAFTA markets since the inception of NAFTA. Those who are more conservative may have reached the conclusion that in order to succeed in NAFTA markets, it may require additional caution. Therefore, those who do not like to take risks may believe that they will have a better chance in future NAFTA markets. The variables for having own brand name and having export pricing strategy do not seem to be significant.

#### Concluding Comments

NAFTA seems to have contributed to have provided further opportunities for U.S. textile manufacturers to expand their export presence by taking advantage of advanced technology in producing yarn and fabric that are destined for Mexican markets. The regional trade agreement

provides protection for the use of U.S. yarns and fabric in the manufacture of apparels at relatively lower labor cost that are returned at relatively no tariff cost to industry participants. This has fueled the competitiveness of the U.S. textile complex. Plants in the U.S. that are unable to automate are forced to close, while the available technology has caused textile firms to downsize. Downsizing has even been greater since the inception of NAFTA.

A majority of textile managers felt that factors such as exchange rate fluctuations, financial considerations, NAFTA policy provisions, and competition in NAFTA markets were important in firms' ability to export to NAFTA markets. Additionally, structural changes in the industry have been fueled in large part by overcapacity, trade policies, changes in fashion trends, and demand for cheap imports from NAFTA markets.

The most important results seem to be that management of U.S. textile manufacturing firms' perception of risks explain the firms' ability to gain in export markets. Generally, therefore, firms who are willing to deal in NAFTA markets must be ready to deal with cultural, financial and other risks in order to succeed in NAFTA markets. Likewise, it may be impossible to benefit from charging premium prices in NAFTA markets, at least at the inception of entry into the market. Additionally, managers perceive that it may be necessary in the future for U.S. textile firms to modify their products to remain competitive in NAFTA markets.



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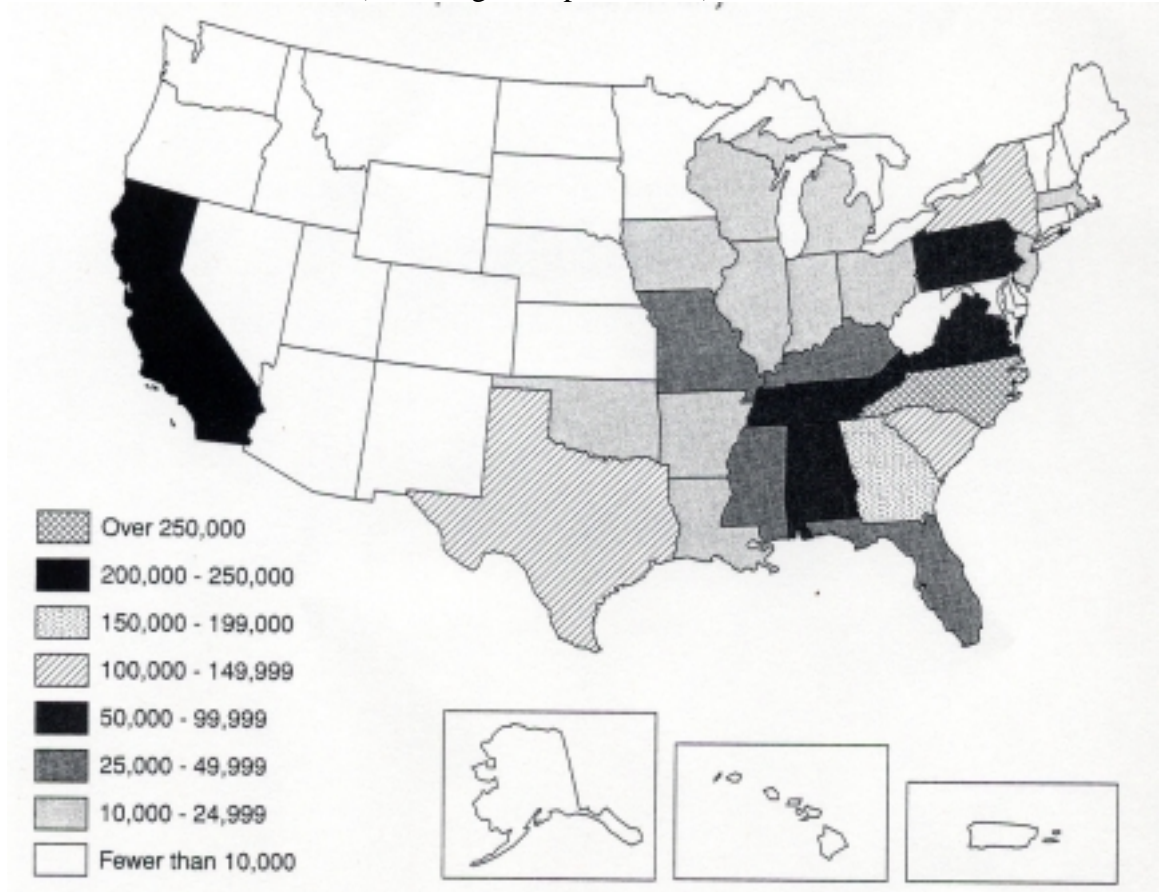
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Figure 1: The Geographic Distribution of Textile and Apparel Employment by State, 1996 (including fiber production)



Source: Bureau of the Census, County business patterns. Washington, D.C.: U.S. Government Printing Office