

THE DENIM MARKET AND COTTON DEMAND

M.A. Messura and D. McLaren

Cotton Incorporated

Raleigh, NC

Abstract

The aim of this paper is to explore the relationship between denim production and U.S. mill consumption. Denim has long been regarded as an important cotton product and denim apparel, because of a surge in its popularity over the last two decades, is a crucial end-use for cotton. It is through examination of the denim market that an understanding of the influence of consumer preference on the demand for raw cotton can be found.

Introduction

Denim has long been recognized as an important component of cotton consumption and similarities between the denim fabric market and cotton market as a whole aid the analysis. The denim fabric market faces a production decision function, the variables taken into account for quantity produced, that includes supply of cotton, residual demand for cotton, consumer prices, consumer preferences, interest rates, and exogenous shock. The decision function for cotton consumption by U.S. textile mills includes the same variables. Denim is also an easily tracked cotton product from both government and survey sources. As an easily identifiable and unique fabric, problems of ambiguity in the definition of the product are avoided.

What is denim? Denim is a broadwoven cotton cloth; woven as opposed to being knitted. The warp, which is the yarn that runs lengthwise on the fabric, is usually dyed indigo-blue and it has a greige, or undyed, filling. On the face, it has a left-hand twill, which means that a diagonal pattern can be seen running from the bottom right to the top left of the fabric. A coarse, single-ply yarn is typical in denim fabric.

Looking at a close-up of a piece of denim fabric, the twill running up and to the left can be seen and the gray warp is visible on the back side of the fabric. Denim can be made in various weights and 14½ ounces per square yard is accepted as the norm for jeans. Lighter denim has appeared at the production level as firms have sought to produce a fabric that is softer to the touch. For the purpose of this paper, all weights of denim have been included.

Discussion

Over the last 24 years, denim production has trended upward.

In response to the wide acceptance of denim jeans at the consumer level since 1973, textile mills began to produce

more denim. A drop in denim production occurred in 1981 and 1982, which was caused by a shortage of indigo dye and a drop in consumer demand due to a concurrent recession. During that period of time, the inventory of raw cotton rose and cotton prices fell. At various times, shortages of denim jeans in the market have occurred, but since this last incident in the early 1980's, when designer jeans were prominent, the supply has been steady.

For the purpose of this paper, denim production in square meters has been converted into 480 pound bales of cotton. Both square meters of denim produced and the amount of cotton used in the production of that denim have trended strongly upward, but in some years, such as 1978, the share of cotton used to produce the denim fabric was only 85%. Over the last fifteen years, however, denim has averaged 96% cotton content. Last year, 2.1 million bales of cotton went into domestic denim production and this year that figure is expected to increase.

Comparing the pattern of denim production to cotton consumption by textile mills in the U.S., the upward trend is again apparent. Over the last ten years, cotton has gained a strong share of the retail market. Cotton's share now standing at 59%, and this is a driving factor for cotton consumption at the mill level. Denim may first appear to be a causative agent in this, but it turns out to be more of a gauge of what is happening in cotton consumption.

Since 1973, the share of cotton consumption that has gone into the production of denim ranged between 13.2% and 20.1%; the mean is 17.6% with a standard deviation of 2.6%. Denim's share of cotton consumption fell to the lower side in the late seventies and early eighties, when indigo dye was short, and rose to the high side over the last ten years. This steady share was an indication that denim is a good gauge of cotton consumption at textile mills as a whole.

Examination of the changes in denim production and cotton consumption reveals that the two do tend to move together. There are some outlying years caused by shocks to the market. In 1995, for example, cotton prices rose to over \$1.00 per pound; cotton consumption fell, but denim production did not. This suggests that denim production is less vulnerable to price shock than other textile products. There are very few instances where denim production has moved in an opposing direction, however.

The correlation between denim production and cotton consumption by textile mills as a whole proves that the two move together. The correlation for the twenty-year period from 1976 to 1996 is very strong, standing at $R = .948$ for denim production and mill consumption. The $R^2 = .898$ for a simple linear regression of the two variables. Moving a step away from fabric production to the manufacture of a specific consumer product, jeans, the correlation remains strong at $R = .928$ for jeans production and mill consumption. This bolsters the view that preferences at the consumer level

reverberate through the system all the way from retail stores to manufacturers, to growers.

When the movement in cotton consumption at the mill level is traced through to denim production to denim garment production to the final sale of the denim articles, we find that the upward trend is repeated. Over the past five years, denim apparel sales increased by about 10% each year, but leveled off to about 3% from 1995 to 1996. These retail sales include products imported into the U.S. and imported apparel has been gaining share of the retail market over the last few years.

On a weight basis, denim made up about 14% of retail sales of apparel in 1997. On the other hand, denim accounts for about 24% of retail sales of cotton apparel in 1997 on a weight basis. Given that cotton's share of the retail market is 59% overall, denim is an important factor.

Cotton Incorporated's Lifestyle Monitor™ is an ongoing research project that tracks consumer preferences and attitudes through a telephone survey of 4,200 households. The research is helpful in determining the direction of consumer trends. Some of the research covers denim because of denim's presence in the market as a whole. As the direction of denim in the retail market may serve as a guide to cotton consumption as a whole, it is useful to look at the Lifestyle Monitor data.

In the third quarter of 1997, the average American consumer had 7 pairs of jeans in his or her closet and 8 other denim garments such as shorts, jackets and shirts or skirts totaling 15 denim garments overall.

Denim is remaining popular even as people age, as evidenced by the number of days per week denim jeans or shorts are worn. This means that denim will not suffer a decline as the relatively small Generation X moves into the decision-making age brackets; baby-boomers, who brought denim into commonly accepted wear, continue to support the consumption end of the denim equation.

The basis of consumer preferences as expressed at the retail counter lies in consumers' perception of a product. So how does the consumer feel about denim? About 73% of consumers enjoy or love wearing denim and out of the remaining 27%, only 2% say that denim is not for them. The Lifestyle Monitor also tracks consumers' feelings about the country of origin of a product. Consumers don't seem to mind purchasing an imported product as long as the price is right. The first consideration in the consumer's mind is price and the second is fiber content, again making the case for denim's importance. Denim is considered a basic good for which there are no perfect substitutes and is relatively inexpensive by weight.

In fact, many denim goods are coming from Mexico and Mexico's share of U.S. imports has increased since NAFTA

came into effect. Denim production capacity in Mexico has increased to reach about half that of the U.S. over the past four years. If denim production serves as an indicator of overall cotton consumption, higher cotton consumption should be present. It is. Cotton consumption in Mexico increased 25.8% over the past year and has trended upward over the past four. Is this bad news for U.S. cotton growers because they are losing the domestic market? No, Mexico's imports of raw cotton have increased and over 95% of its imports are of U.S. cotton. The destination for much of the denim product is definitely the lucrative U.S. retail market. Between 1995 and 1996, U.S. imports of denim fabric from Mexico increased almost fourfold.

Summary

A high correlation between denim production and cotton consumption suggests that denim production can serve as an gauge of cotton consumption, but caution must be taken as cotton consumption going into denim is less susceptible to exogenous shock than is cotton consumption overall. Movement of denim production south of the border may affect future cotton consumption in the U.S., but U.S. exports of raw cotton to Mexico may offset a decline in U.S. consumption. Denim will continue to be important for U.S. cotton demand regardless of the location of denim production.

References

- U.S. Department of Agriculture
- U.S. Department of Commerce, MQ22T.
- U.S. Bureau of the Census.
- Werner International, Reston, VA.
- National Cotton Council, Memphis, TN.

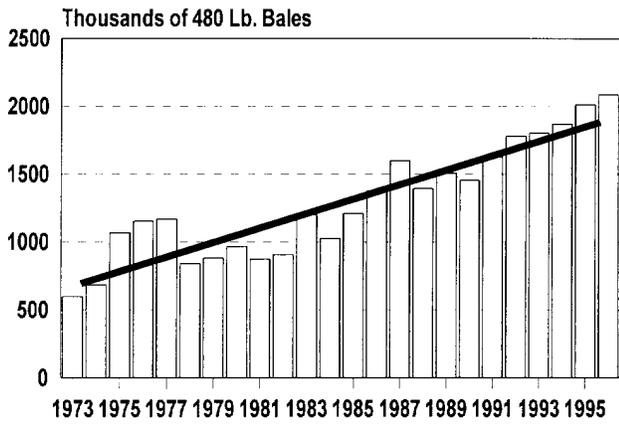
Table 1. Correlation of Cotton Consumption and Denim Fabric Production.

| | Cotton Consumption | Denim Production |
|--------------------|--------------------|------------------|
| Cotton Consumption | 1.000 | .948* |
| Denim Production | .948* | 1.000 |

* Significant at .01

Table 2. Simple Linear Regression of Cotton Consumption and Denim Fabric Production.

| R | R ² | Std. Error |
|------|----------------|------------|
| .948 | .898 | .1287 |



Source: National Cotton Council

Figure 1. Denim Production in the U.S.

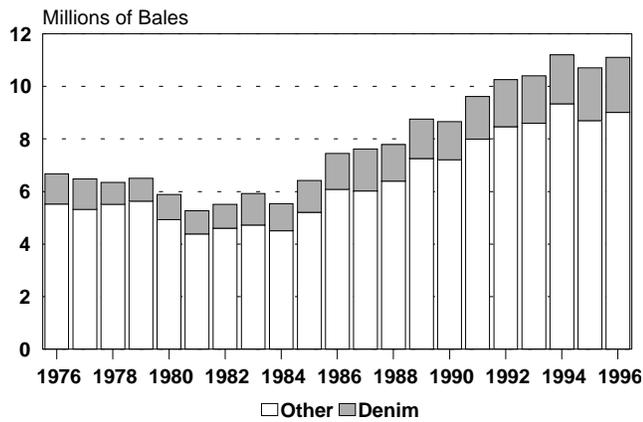
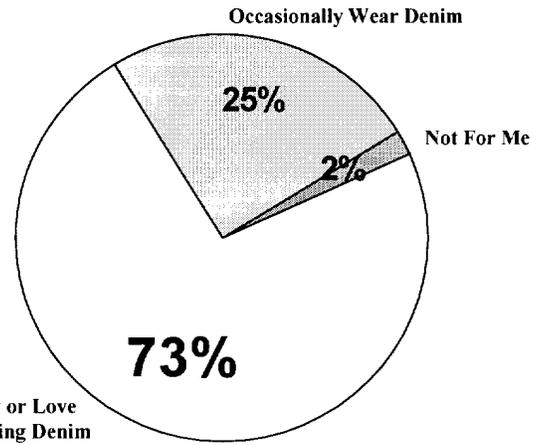
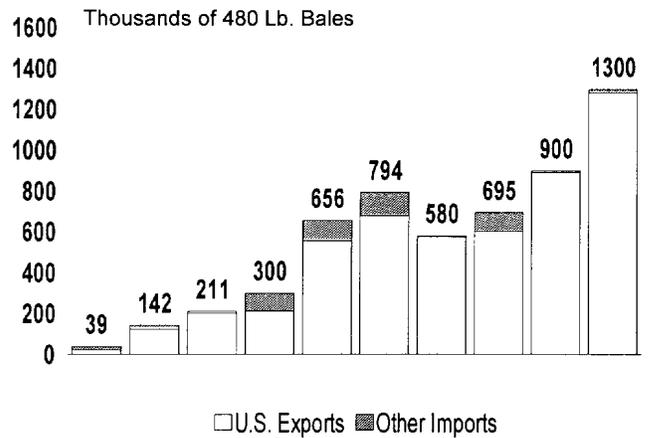


Figure 2. Cotton Consumption by U.S. Textile Mills.
Source: National Cotton Council, USDA, U.S. Census Bureau



Source: Lifestyle Monitor

Figure 3. Consumers' attitudes towards Denim.



Source: USDA

Figure 4. Mexico's Cotton Imports.