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ESTIMATION OF U.S. CONSUMER PURCHASE DECISION AND DEMAND FOR APPAREL: IMPLICATIONS FOR THE APPAREL INDUSTRY

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Abstract

This study employed a two-step estimation procedure that involved a decision model and a censored demand system model for nine categories of apparel. The results of the decision model indicated that garments' own prices, age, female employment, gender, regions, and presence of children significantly influence purchase decisions. Probabilities of purchasing male shirts were positive and own-price inelastic, whereas probabilities of purchasing female jeans, male jeans, male shorts, male slacks, female slacks, skirts, female shorts, and dresses were negative and own-price elastic. The probability of purchasing one garment, generally, was not responsive to price changes of another garment.

Male shirts, male shorts, female jeans, female slacks, skirts, female shorts, and dresses are necessary goods, while male jeans and male slacks are luxury goods. Demands for male shirts and male jeans were price-inelastic and demands for male shorts, male slacks, female slacks, skirts, female shorts, and dresses were price-elastic. Estimated inelastic cross-price elasticities suggest that pricing strategies such as price promotion to increase sale of one garment type would be limited to the targeted products.

Higher expenditure shares were generally associated with higher level of cotton blend. The extent to which expenditure share increased due to higher cotton blends depended on the garment itself. The results further suggested that marketing strategies solely focused on product origins might not increase market share for domestically produced apparel.

Introduction

The apparel industry is an important segment of the U.S. economy. The U.S. Department of Commerce (USDC) evaluated the annual domestic sales and exports of apparel in 2001 at 182 and 6.5 billion dollars, respectively (USDC, 2002). However, U.S. imports of apparel have been increasing in this decade, with a noticeable import surge between 1995 (41 billion dollars) and 2002 (60 billion dollars) (USDC, 2003).

Bremer (1990) attributed the increased flow of foreign textile products into the U.S. market and the lack of competitiveness of the U.S. apparel industry to a loosely regulated international trade system. At the domestic level, some have argued that the fundamental reason for the lack of competitiveness of the U.S. textile industry, in comparison to its Asian counterparts, is that the U.S. firms have based their competitive strategy on reducing cost of production rather than on increasing the quality of their products (Taplin, 1997). It has been argued that an increased focus on identifying the type and quality of products that meet the current and future expectations of the U.S. consumer and developing effective strategies for these products would help improve the competitiveness of the U.S. apparel industry.

Numerous studies, especially in the field of home economics and consumer affairs, have extensively investigated consumer demand for clothing and apparel. Nurum (1989) addressed the dynamic aspect of consumer demand for apparel and found that clothing expenditure was income inelastic but highly dependent on education level, gender, and age, and marital status. DeWeese and Norton (1991) found a direct effect of wife's unearned income (pretax household income less wife's contribution) on apparel expenditures for family members. Lee et al. (1997) studied apparel expenditure patterns among elderly consumers and found an income elasticity of 1.89, suggesting that apparels are luxury goods for elderly consumers. Wagner (1986) analyzed the effects of family characteristics on expenditure for apparel and textile home furnishings and found that demographic variables such as age, marital status, family size, and the presence of a child of six year old or less, had a significant and positive effect on expenditures on both apparel and home furnishings. Race also appeared to be directly and significantly related to apparel and textile home furnishings expenditures. Abdel-Ghany and Schwenk (1993) investigated the relationship between income, household characteristics, and expenditures. The study found that expenditures on apparel were significantly and directly related to permanent income, family size, education, mid-western location, and northeastern location. Income elasticity was estimated at 0.707, which suggests that apparel is income inelastic.

Though these studies have shown the importance of economic and demographic factors on consumer demand, they have analyzed clothing as an aggregate product, thus, are of limited implications to the apparel industry. To meet domestic consumer demand profitably under volatile market conditions, the U.S. apparel industry must clearly understand the determining factors that shape domestic consumption of various apparel products for a long-term vitality of the U.S. apparel industry. Information about the impact of prices, quality attributes, country of origins, and consumer profiles on domestic consumption of various apparel products is critical for designing effective marketing strategy. This study, therefore, seeks to (1) analyze and model the demand for nine apparel products in the U.S, (2) to quantify the relationship between expenditure share of apparel products and different cotton blend levels, and (3) to identify source of demand growth based on consumer profiles and regions. It is hypothesized that the results would provide a better understanding of consumer demand for apparel in the United States.

Methods and Procedures

Modeling consumer demand for apparel is influenced by the frequency of purchase of apparel. It is quite typical for households to make a conscientious decision not to purchase any garment because of unfavorable prevailing prices, seasons, or budget constraint faced at the time of their decision. Pudney (1989) elaborated on this strategic household decision making process and interpreted the absence of purchases as true corner solutions resulting from utility maximization behavior. The frequency of zero expenditure requires a modeling approach that accounts for the purchase decision making process modeled as a probit. The estimation process is a two-step procedure that includes estimation of a decision model and a conditional expenditure model.

Model Specification

The original model is specified as

$$w_{it} = \max\left(0, \bar{w}_{it}\right).$$

$$\bar{w}_{it} = \alpha_i + \tau_i w_{it-1} + z'\delta_i + \sum \gamma_{ij} \ln p_{jt} + \beta_i(d_t) \ln\left(x_t / \pi\left(p_t, d_t\right)\right) + \varepsilon_{it} \quad (1)$$

where $\ln\left(\pi\left(p_t, d_t\right)\right) = \sum_{i}^{N} w_{it} \ln p_{it}$ and $w_{it} = \left(1/H\right) \sum_{1}^{H} \bar{w}_{it}$ are the linear approximation of the Stone price index and the expenditure share of the i^{th} apparel at time t, respectively; $\bar{w}_{it}$ is the expenditure share for i^{th} apparel by a household at time t; $\beta_i(d_t)$ is the coefficient of the log of real expenditure; p_{jt} is the price of the j^{th} garment at period t, x_t is the total expenditure by a household at time t; z is a vector comprising the demographic factors, apparel characteristics, and seasonal dummies; and ε_{it} is a stochastic error term.

It should be noted that the above specified model allows for zero expenditure share of the apparel at time t, which reflects a typical household decision not to purchase any garment at a point in time. It should be further noted that the coefficient $\beta_i(d_t)$ is a function of the socioeconomic and demographic factors that are perceived to have impact on apparel expenditure, which following Blundell et al. (1993), may be defined as:

$$\beta i(dt) = \beta i + \beta iD, \quad (2)$$

where D is a dummy variable indicating household characteristics (i.e., race, presence of children, gender, female employment status). This specification of the parameters of the total expenditure variable in the model accommodates for inferior, complementary, and substitute goods, and provides a consistent framework to account for the effects of socioeconomic, demographic, and seasonal variables on the expenditure shares.

Model Estimation

The expenditure share for male shirts, female jeans, female shorts, female slacks, skirts, dress, male jeans, male shorts, and male slacks were estimated using a two-step procedure. The proposed two-step procedure estimates a conditional mean model and a purchase decision model. The parameters related to the unconditional mean equation are then recovered following a decomposition proposed by McDonald and Moffit (1980). The estimation process involves a probit estimation in the first step and a seemingly unrelated regression (SUR) corrected for sample selection in the second step. This procedure has meaningful empirical implications in terms of understanding the determinants of purchase decision of apparel through the derivation of expenditure and price probability elasticities.

The choice of the variables to include in the probit model is guided by previous studies and includes economic variables such as product price and consumer income and demographic variables such as age category, presence of children, and female

employment. Seasonal and regional differences in expenditure patterns are also captured by seasonal and regional dummies. Product characteristics such as higher cotton blend were hypothesized to increase expenditure share for different garments. The evaluation of this hypothesis enables to classify apparel based on their cotton blend. It is important to note the effects of demographic and product characteristic variables are evaluated through their marginal impacts measured by the magnitude of their respective parameter estimates.

Lastly, the relationships between the share of each category of apparel and the set of variables that impact consumer expenditure for apparel are evaluated. This helps identify regions and various demographic groups with considerable demand growth potential for apparel. This framework also provides the possibility to assess the future of the U.S. apparel industry through the impacts demographic variables such as female employment status, number of children in the household, gender of buyer, age segments, and race. Moreover, the determination of how each garment reacts to price change would enable the apparel industry to make more informed decisions in terms of their pricing strategies and avoid loosing market share. A detailed description of these variables is presented in Table 1.

From the proposed model, hypotheses related to the effects of socioeconomic and demographic variables, seasons, past expenditure shares, prices, and expenditures were tested. The marginal impacts of these variables on the decision and conditional share equations were directly tested from the estimated model using significance test based on the t-statistics. Further, the unconditional marginal effects, price elasticities, and expenditure elasticities were derived and their impacts were assessed based on the magnitude of their estimated values.

The probability elasticity of price (expenditure) measures the percentage change in probability that a household would purchase a garment following a percentage change in garment price (total expenditure in apparel) for the consuming household. The conditional price (expenditure) elasticity is the percentage change in apparel consumption for the consuming household following a percentage change in apparel price (total apparel expenditure). The probability elasticities are derived from the probit estimation, while the conditional elasticities are from the conditional expenditure share model.

A feature of this modeling approach is that the parameter on the expenditure variable in the conditional mean equation varies with respect to household characteristics. Under this specification, the elasticities are function of household characteristics and, therefore, are more reflective of reality. This specification also isolates the effects of household and product characteristics on expenditure shares and helps further the understanding of apparel consumption and its dynamics across socioeconomic and demographics factors.

The Data

The data for this study are based on survey by the American Shoppers Panel, which collects data on end-use consumption of various garments, socioeconomic profiles, and demographic characteristics. The original data set covered 16,000 households surveyed monthly from 1990 to 1999. For the purpose of this study, male shirts (MSHIRT), male jeans (MJEAN), male shorts (MSHORT), male slacks, (MSLACK), female slacks (FSLACK), female jeans (FJEAN), female shorts (FSHORT), skirts (SKIRT), and dresses (DRESS) were retained. Data transformations were conducted to generate the expenditure share variables, price variables, aggregate-level demand, and total expenditure on a quarterly basis. The share variables were directly obtained by dividing expenditure on the i^{th} item by the total expenditure, and the price variables by dividing expenditure by total number of items purchased by household h at time t.

Results

Descriptive Statistics

The sparse nature of the original data set due primarily to infrequent purchases because of the semi-durable nature of apparel led to aggregating the data into a panel with quarterly frequency. The resulting dataset contained 1,880 households with a total of 29,964 observations. A preliminary analysis of the data (Table 2) indicated that 75 percent of household apparel purchases contained 100 percent cotton blend and only 55 percent of these items were domestically produced. Females were the major apparel buyers in the household accounting for 85 percent of all purchases. The majority of household respondents (81 percent) had an average annual income of at least 30,000 dollars and was White-Americans (94 percent).

Descriptive statistics on total expenditures and prices of apparel purchased by consuming households are provided in Table 3. On the average, skirts were the most expensive items with $19.31 per unit, followed by female jeans and male jeans with $18.02 and $17.75, respectively. Among the consuming households, total expenditure on male jeans ($38.51) was the highest, followed by female jeans ($32.10). Male jeans were the mostly bought items followed by male shirts. It is important to point out that the percentages of zero observations are high and vary with respect to garment types.

Price, Expenditure, Demographic, and Product Characteristic Impacts

Table 4 provides price and expenditure elasticities of probability of purchasing apparel products, which capture the effects of changing prices and expenditures on the probability of consumption. Own-price elasticity of probability of purchasing female

jeans is negative and greater than one in absolute value, implying that one-percent increase in price of female jeans would decrease the probability of purchasing the same items by 1.293 percent. Similarly, the probabilities of purchasing male jeans, male shorts, male slacks, female slacks, female shorts, skirts, and dresses were all negative and own-price elastic. The only exception was the probability of purchasing male shirts, which was positive and less than unity. Results also suggest that all probabilities of purchase of apparel are expenditure inelastic. Further results indicate that probability of purchasing male shirts decreases by 0.262 percent following a one-percent increase in total expenditure for apparel, while a one-percent increase in total expenditure results in an increase of the probability of purchasing female jeans, male jeans, male shorts, male slacks, female slacks, skirts, dresses, and female shorts by 0.608, 0.872, 0.577, 0.852, 0.524, 0.561, 0.657, and 0.507 percent, respectively.

Results in Table 5 summarize the overall responsiveness of expenditure share in each category of apparel to price and total expenditure changes. It can be inferred that the demand for male shirts, male shorts, female jeans, female slacks, skirts, female shorts, and dresses are expenditure inelastic, while the unconditional demand for male jeans and male slacks are expenditure elastic. In regard to responsiveness to changes in own-price, it was observed that female shorts, male slacks, female slacks, skirts, dresses, male shorts, male jeans, and female jeans are own-price elastic, while male shirts are own-price inelastic. The unconditional cross-price elasticities were generally negative and less than unity implying that increase in price of one garment would lead to a relatively lower decrease in demand of garment of other type.

The extent to which the derived elasticity estimates relate to those from previous studies is difficult to assess. Such an observation pertains to the nature of the data and to the methods and procedures used to estimate them. However, the elasticity estimates obtained in this study, generally, are within the limits of those outlined in the literature review. Expenditure elasticities found in previous studies ranged between 0.4 and 2.5, while those of own price elasticities were between –1.0 and –2.0, suggesting that apparel expenditures are price elastic. While recent studies have determined that the luxury aspect of apparel product is no longer supported, this study suggests that the classification of apparel as a luxury, necessary, or price sensitive good depends on garment type.

The results of the unconditional marginal effects of demographic and product characteristics on apparel demand are summarized in Table 6. The analysis focused on the total effects of age, income, race, gender, origin of products, and cotton blend. The relatively high magnitude of the effects of these variables was indicative of their potential impacts on apparel demand growth.

The effects of age on apparel demand are difficult to ascertain because this study uses the age of primary buyer, which may not be the primary wearer. However, there is indication that expenditure for female jeans is higher for consumers under the age of 31, while expenditure for male shorts, male shirts, and male jeans appear higher for consumers over the age of 31. Further, it was observed that buyer in the age group 31-55 spend less for skirts, female slacks, female shorts, dresses than buyers of any other age groups. The impact of female employment status was most noticeable with skirts, female slacks, and female shorts. Households with employed females had higher expenditure share for skirts, female slacks, and female shorts. For households with at least one child, expenditure shares of female jeans, female slacks, and dresses were lower, and the expenditure shares of skirts and female shorts were higher than households without children. The effects of gender are significant and illustrate differences in shopping patterns between male and female buyers. While the expenditure shares of female jeans, female slacks, skirts, and female shorts were higher for female buyers compared to male buyers, the expenditure shares of male jeans, male shorts, male slacks, and dresses were lower.

Regarding income levels, there were minimal differences in purchasing habit of apparel items across income categories. However, it is observed that households with higher income levels spend more on female jeans, male shorts, male slacks, female slacks, and skirts. Expenditure shares of male shirts and male jeans appear to decrease with an increase in income level.

The marginal expenditure shares of male shirts for African-American households was 9 percent higher, while expenditure share of male jeans, male shorts, male slacks, and female slacks, and skirts were all lower. The expenditure shares for Asian-American households of male shorts, male slacks, female slacks, skirts, and dresses were higher than their White-American counterparts. Expenditure shares of male shirts, female jeans, female slacks, skirts, and dresses for households of other race were lower than the White-American households.

The evaluation of the unconditional effects of product characteristics revealed that at the exception of male jeans, skirts, and female jeans, product origin was not a determining factor in household apparel expenditure. The results indicated that expenditure shares of male jeans and skirts were generally higher for imported products compared to domestically produced products. Furthermore, the results showed that compared to items with less than 50 percent of cotton blend, expenditure share of male shirts, female jeans, male jeans, male shorts, skirts, dresses, and shorts were higher if products contained 100 percent of cotton, while expenditure share of male slacks was lower.

The effects of seasons on consumer expenditures indicate no significant differences in consumer expenditure patterns between the first and the last quarters of the year. However, consumers appeared spending less on female jeans, male jeans, and female shorts, and more on male shorts in the second and third quarters compared to the last quarter.

Conclusions

The unconditional price and expenditure elasticities and unconditional marginal expenditure shares of the socioeconomic, demographic, and product characteristics variables have direct marketing implications, as they enable marketing managers to make more informed marketing decisions, especially the design of effective marketing mixes. Elasticity estimates and marginal demographic impacts are effective tools to gauge the effectiveness of short-term marketing strategies such as price promotion applied across various population strata.

The effectiveness of any marketing strategies is dependent upon market characteristics such as own- and cross-price elasticities. Price promotion may have the desired effects for apparel that are own-price elastic (i.e., male jeans, male shorts, male slacks, female slacks, female shorts, female jeans, skirts, and dresses). For these products, market shares are expected to rise under a price promotion strategy. However, mark-up pricing has to be designed carefully in order to avoid losing market shares that may not be recovered. Mark-up pricing strategy would be effective for product such as male shirts. Since male shirts are price-inelastic, the gain from price increases for these items would more than offset possible market share loss provided that the prices of their imported counterparts remained unchanged.

Inelastic cross-price elasticities for the majority of the garments in this study are indicative that the effects of pricing policies would be limited to the targeted products. Thus, price promotion or price increase for, say, male shirts would affect market share for male jeans at a lesser proportion.

Gupta (1988) stated that price promotion affects consumer behavior at the category and the brand levels. Consumers may switch to a more expensive brand within the same category of apparel or they may stockpile the same garment types by accelerating their purchase frequency. In this study, information about brand name were not available, thus the effects of price on brand were not quantified although it is reasonable to believe that more stockpiling may take place, simply because of the durable nature of apparel. The derived elasticities only addressed the inter-garments effects with the understanding that price promotions also have inter-brands effects.

Results on unconditional marginal socioeconomic and demographic effects indicated that marketing strategies that promote male jeans, male shorts, male slacks, female slacks, and dresses to consumers over the age of 55 might be effective. In similar way consumers under the age of 31 might be responsive to promotion of male slacks, female slacks, skirts, female shorts, and dresses. There is no indication that expenditure share of male garments increase with female buyers. African-American households appeared to purchase less male jeans, male shorts, male slacks, and female shorts than White-American households. This may indicate differences in tastes, effects of other variables such as income, or sensitivity to prices. Similarly, American households of other race purchased less male shirts, female jeans, female slacks, skirts, female shorts, and dresses. Under these circumstances, marketing campaigns targeting these demographic groups could be a viable strategy to increase consumption of these items. Such a strategy may also be useful to boost consumption of male shirts and female jeans by consumes over 55.

This study shows that consumer expenditures, generally, are not influenced by product origins. Thus, marketing strategies solely focused on product origins may not result in increased market share of domestically produced apparel. The effects of different blends, however, suggested that market share of male and female slacks may be increased if cotton blends in these items were reduced. Moreover, market shares of male shirts, female jeans, male jeans, male shorts, and dresses were higher for items containing 100 percent of cotton blend compared to similar products with lower cotton blend, indicating that for these products higher blends of cotton offer greater utility to consumers.

This study is one of the few that have attempted to model disaggregated consumer demand for apparel using detailed demographic factors. Most of the previous studies in this area have been based on data from consumer expenditure survey and have analyzed clothing as an aggregated product, which limit their marketing implications. However, the interpretation of the findings of this study should be conducted with caution because it is based on a survey that is overwhelmingly comprised of White-American households (94 percent), thus, not representative of the overall U.S. population. Furthermore, the survey data did not include information related to brands, thus, how consumers react to price change was adequately addressed.

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Table 1. Description of the variables used in the analysis.

Variable	Variable Definition
AGE	Continuous variable indicating the age of the buyer from which four age categories were derived (DAGE1 =1 if AGE under 21, and 0 elsewhere, DAGE2 = 1 if AGE between 21 and 30, and 0 elsewhere,DAGE3 = 1 if AGE between 31 and 55, and 0 elsewhere, and DAGE4 = 1 if AGE over 55, and 0 elsewhere).
GENDER	Dummy variable for buyer's gender (1 = female, and 0 = male)
INCOM	Categorical variable that indicates the different income strata within the sample (INCOM1 = 1 if INCOM under $10,000 and 0 elsewhere, INCOM 2 = 1 if INCOM between $10,000 and $20,000 and 0 elsewhere, INCOM3 = 1 if INCOM between = $20,000 to $30,000 and 0 elsewhere, INCOM4 = 1 if INCOM between $30,000 to $45,000 and 0 elsewhere, INCOM5 = 1 if INCOM between $45,000 to $60,000, and 0 elsewhere, and INCOM6 = 1 if INCOM = over $60,000)
HHSZ	Continuous variable indicating household's size
CHILD	Dummy variable indicating presence or absence of children (0 = no children and 1 if presence of children)
RACE	Categorical variable used to create dummy variables for each of the four racial groups (WHITES, AFAMER, ASIANS, and OTHERS)
FEMEMP	Dummy indicating female employment status (0 = female not employed and 1 = employed)
REGION	Categorical variable that indicates the region of residence of the respondent and used to derive four regional dummies (NEAST, SOUTH, MDWEST, and 4 = WEST)
IMPTED	Dummy variable indicating product origins (1 = imported and 0 = domestic)
BLEND	Categorical variable that indicates the different level of cotton blend in the purchased item and used to derive dummy variable for different blends such as (50COTN if cotton blend is less than 50 percent, 62COTN if blend between 50 and 74 percent, 87COTN = if cotton blend between 75 and 99 percent, 100COTN if item is made of 100 percent cotton blend)

Table 2: Frequency distribution of demographic, product characteristics, and seasons.

Variables			Observation	
Description	**Categories**	**Definition**	**Total**	**Percentage**
FEMEMP	UNEMPLOYED	0	11829	39.48
	EMPLOYED	1	18135	60.52
CHILD	NO CHILD	0	8136	27.15
	CHILD	1	21828	72.85
IMPTED	DOMESTIC	0	16600	55.4
	IMPORTED	1	13364	44.6
GENDER	MALE	0	4324	14.43
	FEMALE	1	25640	85.57
REGION	EAST	New England, Middle Atlantic	6792	22.67
	MDWEST	North Central	8893	29.68
	SOUTH	South Atlantic, South Central	9622	32.11
	WEST	Mountain, Pacific	4657	15.54
AGE	AGE1	< 21	1180	3.94
	AGE2	21-30	2713	9.05
	AGE3	30-55	10440	34.84
	AGE4	> 55	9958	33.23
INCOME	INCOM1	< $10,000	543	1.81
	INCOM2	$10,000-$20,000	1653	5.52
	INCOM3	$20,000-$30,000	3935	13.13
	INCOM4	$30,000-$45,000	8733	29.14
	INCOM5	$45,000-$60,000	6792	22.67
	INCOM6	>$60,000	8308	27.72
RACE	ASIANS	Asian-Americans	339	1.13
	AFAMER	African-Americans	949	3.17
	WHITES	White-Americans	28199	94.1
	OTHERS	Other-Americans	477	1.59
BLEND	100COTN	100 percent cotton	22636	75.54
	87COTN	75-99 percent cotton	2937	9.8
	62COTN	50-74 percent cotton	2995	10
	50COTN	<50 percent cotton	1396	4.65
SEASON	FQRTER	First quarter	6956	23.21
	SQRTER	Second quarter	7107	23.72
	TQRTER	Third quarter	8004	26.71
	LQRTER	Fourth quarter	7897	26.35

Table 3. Summary statistics of quantity, price, and expenditure variables.

Variables	Definition	Sample Size	Mean	Standard Deviation
NMSHIRT	Number of male shirts	8757	1.97	1.47
NFJEAN	Number of female jeans	13486	1.82	1.20
NMJEAN	Number of male jeans	15324	2.23	1.58
NMSHORT	Number of male shorts	5473	1.79	1.17
NMSLACK	Number of male slacks	793	1.54	1.08
NFSLACK	Number of female slacks	1390	1.38	0.89
NSKIRT	Number of male skirts	1055	1.16	0.54
NDRESS	Number of dress	1757	1.21	0.67
NFSHORT	Number of female shorts	6084	1.68	1.15
PMSHIRT	Price of male shirts	29964	16.80	4.23
PFJEAN	Price of female jeans	29964	18.02	4.77
PMJEAN	Price of male jeans	29964	17.75	5.36
PMSHORT	Price of male shorts	29964	13.09	2.72
PMSLACK	Price of male slacks	8262	16.97	3.37
PFSLACK	Price of female slacks	13332	14.25	2.77
PSKIRT	Price of male skirts	15963	19.31	4.70
PDRESS	Price of dress	11874	15.74	3.79
PFSHORT	Price of female shorts	29964	13.29	2.77
XMSHIRT	Expenditure on male shirts	8757	29.21	27.13
XFJEAN	Expenditure on female jeans	13486	32.10	25.87
XMJEAN	Expenditure on male jeans	15324	38.51	31.15
XMSHORT	Expenditure on male shorts	5473	23.28	19.25
XMSLACK	Number of male slacks	793	24.92	22.39
XFSLACK	Expenditure on female slacks	1390	18.56	15.41
XSKIRT	Expenditure on male skirts	1055	17.12	13.09
XDRESS	Expenditure on dress	1757	22.05	17.10
XFSHORT	Expenditure on female shorts	6084	22.18	20.56
TEXPEND	Total expenditure	29964	54.85	48.26

Table 4. Price and expenditure elasticities of probability of purchasing apparel.

VARIABLES	MSHIRT	FJEAN	MJEAN	MSHORT	MSLACK	FSLACK	SKIRT	FSHORT	DRESS
PMSHIRT	0.648	0.064	-0.009	0.155	-0.039	-0.026	-0.067	0.141	-0.011
PFJEAN	-0.018	-1.293	-0.089	0.108	0.103	0.127	-0.122	0.063	-0.050
PMJEAN	-0.192	-0.169	-1.420	0.072	-0.272	-0.072	0.130	0.047	-0.052
PMSHORT	0.039	0.097	0.063	-2.005	0.094	-0.089	-0.084	-0.143	-0.007
PMSLACK	-0.275	-0.319	-0.434	-0.294	-2.829	0.093	-0.396	-0.110	-0.023
PFSLACK	0.095	-0.178	-0.063	-0.162	-0.888	-2.447	-0.434	-0.570	-0.007
PSKIRT	0.007	-0.308	0.002	0.163	0.116	0.046	-2.941	0.257	0.114
PFSHORT	0.125	0.020	0.064	0.165	0.068	-0.192	-0.086	-1.928	-0.096
PDRESS	0.028	-0.413	-0.236	-0.148	0.285	-0.074	0.489	-0.325	-2.522
TEXPEND	-0.262	0.608	0.872	0.577	0.852	0.524	0.561	0.507	0.657

Table 5. Unconditional Marshallian price and expenditure elasticities for apparel.

VARIABLES	MSHIRT	FJEAN	MJEAN	MSHORT	MSLACK	FSLACK	SKIRT	FSHORT	DRESS
PMSHIRT	-0.327	0.007	-0.032	-0.025	0.037	-0.020	-0.034	-0.056	0.047
PFJEAN	-0.051	-1.640	-0.217	0.035	-0.004	0.053	-0.188	0.011	-0.042
PMJEAN	-0.178	-0.262	-1.704	0.039	-0.280	-0.182	0.078	-0.013	-0.060
PMSHORT	-0.123	0.011	0.031	-2.170	-0.010	-0.168	-0.185	-0.174	-0.102
PMSLACK	-0.174	-0.434	-0.498	-0.382	-2.674	-0.081	-0.725	-0.269	-0.062
PFSLACK	0.086	-0.254	-0.258	-0.249	-1.002	-2.340	-0.585	-0.567	-0.160
PSKIRT	0.025	-0.392	-0.046	0.013	-0.288	-0.151	-2.256	0.009	-0.134
PFSHORT	-0.069	-0.039	-0.013	0.110	-0.087	-0.208	-0.255	-2.030	-0.110
PDRESS	0.015	-0.379	-0.213	-0.120	0.267	-0.047	0.479	-0.294	-3.383
TEXPEND	0.415	0.987	1.195	0.840	1.073	0.702	0.518	0.738	0.734

Table 6. Unconditional marginal demographic and product characteristic impacts.

VARIABLES	MSHIRT	FJEAN	MJEAN	MSHORT	MSLACK	FSLACK	SKIRT	FSHORT	DRESS
DAGE1	-0.062	0.183	-0.110	-0.109	0.031	0.179	0.769	0.394	0.005
DAGE2	-0.034	0.010	-0.038	-0.069	0.548	0.170	0.604	0.121	0.257
DAGE4	-0.012	-0.082	0.073	0.188	0.185	0.072	0.400	0.006	0.116
FEMEMP	-0.015	0.010	0.005	0.032	-0.068	0.068	0.453	0.074	-0.094
CHILD	0.017	-0.211	0.010	0.121	-0.361	-0.620	-0.011	-0.083	0.350
IMPTED	0.020	0.043	0.193	-0.104	-0.091	0.008	0.589	-0.131	-0.153
GENDER	0.075	0.412	-0.317	-0.432	-0.858	0.899	1.519	0.801	-0.230
NEAST	0.010	-0.010	0.010	-0.106	-0.310	0.001	0.831	-0.192	-0.253
MDWEST	-0.008	-0.022	0.000	-0.056	0.041	0.092	0.730	-0.076	-0.112
SOUTH	0.003	-0.071	-0.035	0.069	-0.214	0.071	1.069	0.033	0.046
INC1	0.295	-0.168	-0.138	-0.176	0.007	0.034	-0.536	-0.270	-1.234
INC2	0.321	-0.020	0.018	-0.265	-0.049	-0.381	-0.467	-0.232	-1.347
INC3	0.121	-0.027	0.092	-0.148	-0.273	-0.385	-0.478	-0.111	-0.213
INC4	0.118	0.011	0.018	-0.115	-0.073	-0.473	-0.144	-0.063	-0.300
INC5	0.021	-0.020	0.050	0.009	0.303	-0.021	-0.090	-0.059	0.078
AFAMER	0.098	-0.005	-0.107	-0.206	-0.401	0.080	0.699	-0.219	1.365
ASIANS	-0.066	0.101	0.007	0.146	1.032	1.169	0.687	-0.161	0.066
OTRACE	-0.309	-0.079	0.156	0.014	0.609	-0.080	-0.131	-0.288	1.309
CTN100	0.202	0.356	0.353	0.523	-0.559	0.172	0.355	0.582	0.775
CTN62	-0.075	-0.041	-0.054	-0.170	-0.301	0.115	-0.175	-0.089	0.025
CTN87	0.019	0.285	0.139	0.272	0.009	0.921	0.061	0.415	0.505
FQRTER	-0.020	-0.028	0.005	-0.032	-0.083	-0.049	-0.057	-0.014	-0.045
SQRTER	0.008	-0.265	-0.290	1.226	-0.095	0.357	-0.141	1.251	0.154
TQRTER	0.035	-0.220	-0.141	1.146	-0.145	0.221	0.123	1.057	0.147