Chinese Domestic Textile Demand: Where They Buy Does Matter

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Abstract

This paper examines the effects of distribution channels on demand for apparel, home textiles and other textiles (such as shoes) in urban China. The estimation procedure we use in this study is implemented in three steps. First, we estimate the price/unit value information; second, we estimate the parameters for the demand systems based on QAIDs model; third, we use the J-test and determine the best suitable model for the data set. The results indicate that households spend more on apparel than home textiles and other textile products such as shoes if they purchase textile products from small stores. It also indicates that they would spend more on home textiles and shoes if they purchase from chain stores and supermarkets.

Keywords: Chinese Textile Demand, Distribution Channels, Price and Income

Elasticities, Nonested Tests, LAIDS, QAIDS, LES, QES

JEL Classification: C52, D12, D13

Introduction

The growth of China's textile industry has been one of the dominant factors shaping world cotton and textile markets in recent years. Beginning with 2006, China became the world's leading exporter in clothing while it was ranked third following the EU and the US as one of the world's biggest textile importers. There are several factors contributing to this trend. In addition to two factors--WTO membership for China in December 2001 and the completion of the Multifibre Arrangement's phase out in 2005--which have been broadly discussed in the literature (Andriamananjara, 2004; Brambilla, Khandelwal, and Schott, 2008; Fang and Babcock, 2003; Francois and Spinanger, 2001; Hertel et al., 1996; Nordas, 2004; Rivera et al., 2004), economic growth and population structure changes in China have also been critical factors reshaping the textile market.

With sustained economic growth rates in China broadly widely expected at more than 8% per year for the foreseeable future, living standards for China's vast population are expected to continue to improve, and therefore China's domestic textile market is anticipated to have sustainable growth. China is already the world's second largest consumer market for cotton products, and is slowly closing the gap with respect to the U.S. market in size. Previous studies on consumer demand for textile products have identified household income (Winkor, 1975; Zhang et al., 1999; Jones and Hayes, 2002) as the most important and positive factor for an expansion in textile consumption. This relationship is also evident in China where textile consumption is increasing with increased per-capita income in both urban and rural regions of the country.

Based on the literature, demographic factors that affect textile consumption include household size, age, and urban/rural residency (Zhang et al., 1999 and Vligoen,

1998). Zhang et al. indicate the role of regional differences in textile consumption, as well as the role of age differences, embodied in the preponderance of students in the groups preferring to wear denim. Vilgoen's survey indicates a significant positive relationship between family size and expenditure, and compositional shifts as expenditure on children's clothing increased more rapidly as household size rose. However, the impact of age is non-linear, with the clearest pattern emerging that expenditure declines as the age of the head of household exceeds 55 years. All these factors might have important implications for China as the country has undergone enormous social, economic, and political changes over the past 30 years. China is experiencing increasing levels of migration and has a considerable segment of its population that is aging. Urban population is growing on average by 3.9 percent which is larger than the national average of 0.8 percent while rural population is declining both in proportion and size over time since 1997. In addition to such changes in population structure, due to the dramatic fertility declines during the last 30 years, the proportion of the population at age 60 or older reached 10 percent in year 2000 and is expected to reach 27 percent in 2050 (Riley, 2004).

Various indicators suggested that structure of textile demand in China has significantly changed during the last 20 years: medium-end and high-end demand has significantly increased in both volume and market share. Some consumers have obviously changed their tastes, western styles of clothing are broadly welcomed, and China's WTO accession agreement led to a significant relaxation of restrictions on the establishment of retail enterprises by foreign investors in 2004. Thus, while China's retail sector remains highly fragmented compared with the United States, larger-scale

foreign retailers now account for more than 12 percent of the market (Gerefi and Ong, 2007). Based on the literature, there at least exist three type of consumers: (1) the famous-brand luxury apparel consumption stratum which consists of China's newly rich entrepreneurs—China is expected to surpass Japan as the world's largest market for luxury goods in 2012 (China Post, 2012); (2) the medium-end apparel consumption stratum which mainly consists of working class people in cities and rich farmers in countryside; (3) the low-end apparel consumption stratum which includes mainly citizens with low-level incomes or are even out of work in cities and towns (Abernathy, et al 1999).

To satisfy these different consumption patterns in China, there currently exist several different distribution channels such as department stores, chain/specialty stores, small clothing shops, street market, sports/sporting stores, Brands' discount stores, comprehensive supermarkets and hypermarkets such as JUSCO, Carrefour, and Walmart (Debnam, N. and G. Svinos, 2007).

Given the importance of demographic changes and distribution channels development in Chinese textile consumption, further understanding of textile demand behavior would provide invaluable information to U.S. textile and cotton exporters. This is especially important since China is one of the major textile producers and consumers as well as one of the major cotton importers and U.S. is one of the major textile and cotton exporters in the world.

However, there are few studies that concentrate on Chinese domestic textile consumption, especially on the purchasing places for their textile products. One of the main reasons for limited study in this area is that there are very little reliable data

available in China to study consumer behavior in the textile sector. Recently, the U.S. Cotton Council International undertook an extensive household survey of clothing, home textile, and footwear consumption in 44 cities of 21 provinces in China. This dataset provides us detailed information about demographic and income distribution as well as consumer behavior differences across all regions.

The purpose of this paper therefore is to study the importance of distribution channels in China's textile markets. We investigate two central questions: first, do the demographic variables and different types of stores affect Chinese textile consumption? Second, are income and price elasticities robust to the demand system used in the studies? The contribution of our paper includes two aspects: First, with respect to the methodology, we accounted for the endogenous relationship between unit value and qualities of different textiles; and second, with respect to the results, we do show that consumer behavior differs based on the stores where they tend to purchase their textile products; the elasticities present slightly changes based on the different demand system used in the analysis.

Data and Methodology

Data

A new survey of China's consumers provides the main data source for Chinese textile domestic consumption demand analysis. In 2009, a Foreign Agricultural Service-funded survey was conducted by the U.S. Cotton Council International (CCI), collecting data nation-wide through a local market research firm in China. The data was designed to better understand Chinese consumers' awareness, attitudes, and purchase habits for

textiles of cotton and other fibers. A sample of 4,400 respondent representative of China's urban population was surveyed in 2009. The sample is based on men and women ages 15 to 54 that have lived in their city or county of residence for at least one year (CCI, 2010). The survey includes demographic data associated with clothing and home textiles purchases, as well as prices and income information. Table 1 presents basic statistics for the major variables used in the study. Due to the fact that minimum value of apparel share, home textile share, and, other share are bigger than zero, we did not notice any censored issues in the data set. Four dummy variables are used to represent the four distribution channels: department stores, chain stores, supermarket, and small stores. More than 60% of household surveyed in the sample visited department stores and small stores (clothing shops). In China, clothing in the small clothing shops is largely inexpensive with low quality. However, small fashion boutiques cultivated relational marketing strategies in urban areas to maintain a significant role in the high-end market as well, although with an emphasis on non-branded items (Chew, 2008) Chain stores are relatively new to Chinese consumers. Clothing in those stores is expensive and customers in those stores are relatively rich. Department stores are the most popular places for ordinary people to purchase better quality clothing.

Unit Value Issues

Since we did not have the price information for apparel, home textile, and others, the unit values (calculated by total expenditure divided by quantities) are the only information we can use. The advantages of using the unit values include considering the geographic dispersion and the price differences paid by subgroup (Deaton and Tarozzi, 2000). However, following Deaton (1988), unit value may produce biased estimates of the prices

without considering the quality effects. In terms of Chinese domestic apparel consumption and income inequality issues, the relationship between unit value and quality issues has to be considered before we estimated elasticities. To address this issue, we adopted the methods suggested by Deaton,

(1) $w_i = \alpha_1 + \beta_1 x_i + \gamma_1 z_i + \mu_{1i}$

(2) $\ln V_i = \alpha_2 + \beta_2 x_i + \gamma_2 z_i + u_{2i}$

(3) $\hat{w}_c = \alpha_3 + \phi_3 \ln \hat{V}_i + u_{3i}$

Where w_i is the share of apparel, home textiles, and others in the total textile expenditure, V_i is the unit values, Z_i is a vector of household characteristics, x is the total household expenditure spent on textile, $\hat{w}_c, \hat{V}_i$ are the fitted budget shares and unit values, respectively. To estimate the system, following Deaton, we adopted two stages: first, we estimated equation (1) and (2) simultaneously; second, the imputed unit values and imputed shares are used to estimate the demand system.

Demand System Specification Issues

Figure 1 provides the utility tree of a representative Chinese household. The consumer's utility maximization decision can be decomposed into two separate stages. In the first stage, total expenditure is allocated textile and non-textile items. In the second stage, textile expenditure is then allocated over apparel, home textile, and other textile products.

Demand Systems

Since Stone (1954) first proposed his linear expenditure system, there now exist at least six flexible demand systems in the literature: Linear Almost Ideal Demand System (LAIDS; Deaton and Muellbauer,1980); Linear Expenditure Demand System (LES; Stone, 1954), Quadratic Expenditure System (QES; Pollak and Wales, 1978); Translog

Demand System (TDS, Christensen et al, 1975); the Rotterdam Demand system (RDS; Theil, 1965); and, Quadratic Almost Ideal demand system (NQAIDS, Banks et al., 1997).

To estimate the parameters of the Chinese textile demand system considered, we adopt the LAIDS, LES, NQAIDS and QES. The specification and elasticity formula for those four demand systems are presented as follows.

The LAIDS specification can be represented as follows:

$$(4)\quad w_i = \alpha_i + \sum_j \gamma_{ij} \ln P_j + \beta_i (\ln y - \ln P) + \sum_{ik} \kappa_{ik} R_k + e_{ie}$$

As usual, we used Stone's price index to simplify the *lnP* term:

$$(4.1)\quad \ln P = \sum_j \overline{w}_j \ln P_j$$

The NQAIDS specification used in this study can be represented as follows:

$$(5)\qquad w_i = \alpha_i + \sum_j \gamma_{ij} \ln P_j + \beta_i (\ln y - \ln P) + \frac{\lambda_i}{\prod_j p_j^{\beta_i}} (\ln y - \ln P)^2 + \sum_{ik} \kappa_{ik} R_k + e_i$$

where P is the corresponding price index, w_i is the budget share of the i^{th} textile, ε_i is the error term, and the α's, β's, λ's and κ's are parameters to be estimated. R's are a vector of dummy variables corresponding to different demographic characteristics, purchasing locations. Furthermore, the price index P in equation (1) is defined as:

$$(5.1)\qquad \ln P = \alpha_0 + \sum_j \alpha_j \ln p_j + \frac{1}{2} \sum_j \sum_i \gamma_{ij} \ln p_i \ln p_j \ .$$

The use of equation (5.1) in estimating the budget share equation in (5) implies that the model is truly non-linear. We did not replace (5.1) by any linear approximations because such approximations give rise to additional difficulties (Buse 1994; Green and Alston

1990; Thompson 2004). As usual, adding up, symmetry, and homogeneity are imposed for those two demand systems

The linear expenditure demand system is as follows:

(6) $w_i = a_i p_i / y + b_i(1 - \sum_k a_k p_k / y) + \sum_{ik} \kappa_{ik} R_k + e_i$

The Quadratic expenditure demand system is as follows:

(7)

$$w_i = a_i p_i / y + b_i(1 - \sum_k a_k p_k / y) + (c_i - b_i)\lambda \Pi_k (p_k / y)^{-c_k} (1 - \sum_k a_k p_k / y)^2 + \sum_{ik} \kappa_{ik} R_k + e_i$$

a, b, c, γ's are the parameters to be estimated. As usual, adding up are imposed in these two models.).

The expensive elasticities (ε_i), uncompensated own-price and cross-price elasticities (η_{ij}) associated with the LAIDS model in (4), NQAIDS model in (5), LES model in (6), and QES model in (7) can be calculated using the approach in Green and Alston (1990), Pofahl, Capps, and Clauson (2005), Howe (1977), and Katchova and Chern (2004). The compensated elasticties can be derived following Slutsky relationship.

J-Test

For the nested models such as LAIDS and NQAIDS, a likelihood ratio test can be used to determine the one most suitable specification based on the data set. However, other combinations are not nested, the J test developed by Davidson and MacKinnon (1981) is used to select models with greater explanatory power.

Although the three models have different functional forms and parameters, the variables p, w, and y are the same. As an example, we define two models as f_{LAIDS}, f_{LES}, and then estimate the following compound model:

(8) $w_i = uf_{LAIDS} + (1-u) f_{LES}$

In this model, a test of *u=0* would be a test against the LAIDS model. To estimate the model, following Davidson and MacKinnon's J test (Davidson and MacKinnon, 1981; Katchova and Chern, 2004), first, the parameters in the QES model are estimated; second, the fitted values of the QES model are used in the equation (8) and the parameters in the LAIDS model and *u* are estimated. If the data supports the LAIDS model but does not support the QES model, the coefficient (1-u) should be zero. Asymptotically, the t-ratio for the parameter *u* is distributed as standard normal and standard tables can be used to determine whether the parameter is significant or not. Similarly, we can do the same for other combinations.

Estimation Procedures

To account for all the econometric issues discussed above, the estimation procedure we use in this study is implemented in three steps. First, we estimate the price/unit value information based on equation (1) and (2). Second, we estimate the parameters for the demand systems based on equations (4), (5), (6) and (7) using the expected values of prices/unit values and shares of textile expenditures based on equation (1) and (2); Third, we estimate the *u*'s in equation (8) and determine the best suitable model for the data set. To avoid the possible multi-correlation issues, we adopt different demographic variables as instrumental variables in each stage of the estimation.

Results

Relationship between Income and Textile Expenditure

Table 2 presents the estimated coefficients and associated asymptotic standard errors for the relationship between textile expenditure and income at the household level. In assessing the parameter estimates, most of them are statistically significant at 1%. The income elasticity of textile expenditure indicates that total textile consumption would increase 0.59% with 1% income increase.

It also indicated that households that bought textiles from department store, chain store, and small store spent 0.17%, 0.05% and 0.17% more than those bought from supermarket, respectively.

Significant impacts from family structure (number of kids between 0-5 and number of adults) and location (North/South) are indicated for total textile consumption. Marriage status of the household head also has significant positive effects.

Demand Systems

Table 3-6 presents the parameters estimated based on the four models. The parameters for both purchasing apparel from small stores and for purchasing home textiles from small stores are consistent across the four models: positive/significant in the former case and negative/significant in the latter. The parameters for purchasing other textiles from chain stores are consistent across LAIDS, LES, and NQAIDS, although it is insignificant in the QES. Following the results of both LAIDS and NQAIDS (Table 3 and 4), the dummy variable for chain stores is significant and negative in the apparel share equation; dummy variable for home textile purchasing from small store is significant and negative in the home textiles share equation.

Table 7 presents the elasticities with respect to own and cross prices as well as expenditure evaluated at the sample means. While the elasticities implied by LAIDS model differ, the results are broadly similar among the NQAIDS, LES and QES models. LAIDs yields much higher expenditure and own-price elasticities for apparel than other models. For both home textiles and others (mainly shoes), the expenditure elasticities of most of the models are above unity, but lower for the LAIDS results. Own-price elasticity estimates also indicate that demand for home textiles and others (shoes) is own-price elastic based on three of the models, while only apparel's is more than unity based on LAIDS model. To further check the income factors, we separate our sample as low income, less low, less high and high income groups. Each group includes 25% of the total observations. We further evaluate the price and expenditure elasticities at the sample means for the four groups based on NQAIDS estimation. The results are presented in Table 8. Although we did not see significant elasticity changes across the four groups, we do find there are small changes when we compare elasticities calculated at the low income level and at the high income level. For example, the compensated own price elasticity of apparel is -0.08 for low income category while it is -0.13 in high income category. Surveys of studies of consumers' response to clothing price changes have found a wide range of elasticities, with Cheng (2000) citing a range from -0.19 to -1.96, and Kim (1998) citing a range of -0.79 to -1.75.

Davidson-MacKinnon J-test and Likelihood Ratio Results

Table 9 presents the common coefficient u for the t-test based on equation (9). We found that u is statistically significant different from zero for the NQAIDS-LES and NQAIDS-QES comparison. 1-u is insignificant for those two comparisons. However, both u and 1-

u are significant from zero for the LAIDS-LES, LAIDS-QES comparison. For the LAIDS-NQAIDS, a likelihood ratio test is used since these two models are nested. With the likelihood ratio of -120 for the LAIDS-NQAIDS comparison, this indicates that the NQAIDS model fits the data well and LAIDS is rejected. Therefore we conclude that the NQAIDS is a most suitable model among the four models using this specific data.

Conclusion and policy Implication

This paper has estimated and compared four demand systems for incorporating demographic variables into China's textile demand systems. We have accepted the NQAIDS specification against other three demand specifications based on J-test. Income and price elasticities estimated by the NQAIDS, LES, and QES are similar, but the results from LAIDS differ from the first 3 models. Following the estimation, we found that the textile distribution channels are one of the major indicators of consumers' textile consumption behavior. Following the results of compensated price elasticities of apparel and others (especially shoes), to achieve the same utility level, the amount of money needed for compensating price increasing in high income group would be larger than those in low income group. The NQAIDS model indicates that apparel expenditure is likely to grow less rapidly than income, while that of home textiles and other textiles grows faster.

There are two major policy implications based on the results reported in this paper: first, the results in the paper provide a clear indication of distribution channels that target their specific customers; second, the disaggregated textile expenditure and price elasticity estimates from this article can be used in various analytical procedures (i.e. simulation

models) to evaluate the welfare effects of domestic policies and international trade policies. Quantification of the welfare impacts of domestic policies and international trade policies would be more meaningful if disaggregated textile elasticity estimates are used in simulation models. The compensated elasticities can be used to estimate consumer surplus and other related welfare measurements.

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Figure 1. Utility Tree of Chinese Textile Consumption

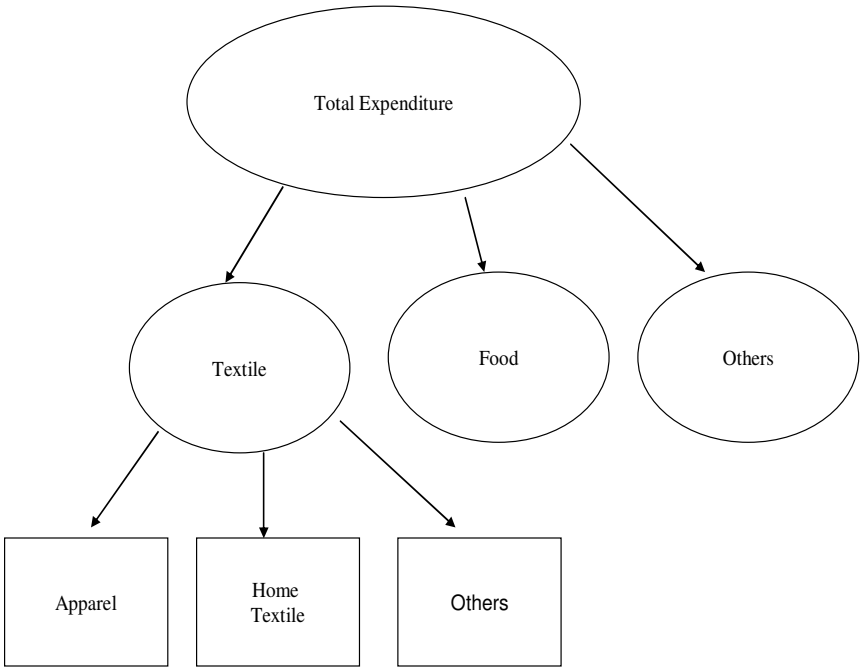

Table 1. Basic Statistics for Major Variables

	unit	Mean	Std Dev	Minimum	Maximum
Total textile expenditure per capita	Yuan	2365.03	2550.20	60	37000
Apparel share		0.58	0.14	0.05	1.00
Home textile share		0.10	0.11	0.01	0.86
Other textile share		0.32	0.12	0.03	0.93
Apparel price	Yuan/unit	924.98	932.54	15	13875.56
Home textile price	Yuan/unit	215.72	62.44	3.9	1083.69
Other textile price	Yuan/unit	593.16	386.40	29.16	5602.48
Bought from depart. stores		0.67	0.47	0	1
Bought from chain stores		0.39	0.49	0	1
Bought from super market		0.43	0.50	0	1
Bought from small stores		0.65	0.48	0	1
North (1 if living in north)		0.25	0.43	0	1
East (1 if living in east)		0.25	0.43	0	1
South (1 if living in south)		0.25	0.43	0	1
Resid (Live > 2 years)		0.94	0.24	0	1
Female (1 if female household head)		0.61	0.49	0	1
Age (age of household head)		40.20	11.31	20	60
Employed (=1 if employed house. head)		0.72	0.45	0	1
Married (=1 if married household Head)		0.26	0.44	0	1
Hsize (# people living in the house)		3.18	1.13	1	17
kid 0-6 (# kids between 0 and 6)		0.20	0.45	0	8
kid 7-14 (# kids between 7 and 14)		0.21	0.44	0	3
adult 15-54 (# adults between 15-54)		2.53	0.92	0	7
old 55 (older than 55)		0.24	0.60	0	5
Edu (more than high school degree)		0.39	0.49	0	1
Wage (=1 if household head is a wage earner)		0.41	0.49	0	1
Labor (# of household labor)		1.99	0.86	0	21
Wave (=1 if the survey conducted in the first wave)		0.5	0.5	0	1
Income (yuan per month, per capita)		4051.59	2324.46	500	10500

Table 2. Linkage between Textile Expenditure and Monthly Income

(Dependent Variable: log (Textile Expenditure))

Parameters	Coefficient	Standard Error
Intercept	2.67*	0.14
Log (Income)	0.59*	0.02
Married	0.08*	0.03
Kids 0-5	0.05*	0.02
Kids 6-15	0.02	0.03
Adult 15-54	-0.07*	0.01
North	0.04*	0.02
South	-0.20*	0.03
East	-0.04	0.03
Bought from Department Stores	0.12*	0.02
Bought from Chain Stores	0.05*	0.02
Bought from Super Market	-0.03	0.02
Bought from Small Stores	0.17*	0.02
Wave	-0.01	0.02
R^2	0.26	

* significant at 1% level.

Table 3. LAIDS Share Equation for Chinese Textile Consumption

	Apparel Share		home Textile Share	
	parameter	Std Error	Parameter	Std Error
intercept	0.896*	0.030	0.077*	0.020
lag(apparel price)	0.028*	0.003		
log(home textile price)	-0.012*	0.002	-0.001	0.002
log(other price)	-0.022*	0.004	-0.001	0.002
North	-0.023*	0.007	-0.005	0.004
South	-0.007	0.007	0.005	0.004
East	0.013*	0.007	-0.010*	0.004
Resid	0.013	0.010	-0.020*	0.006
Age	-0.0008*	0.0003	0.0010*	0.0002
Employ	-0.007	0.006	-0.006	0.004
Married	-0.011	0.007	-0.015*	0.005
Edu	0.005	0.008	-0.006	0.005
Wave	-0.012*	0.005	0.015*	0.003
lnp-ln(totexp)	0.161*	0.004	-0.070*	0.003
bought from Department Store	0.008	0.005	-0.007	0.003
bought from Chain store	-0.017*	0.005	0.002	0.003
Bought from super market	-0.010	0.005	0.007	0.003
bought from small store	0.016*	0.005	-0.016*	0.003

*Significant at 1% level.

Table 4. NQAIDS Share Equation for Chinese Textile Consumption

	apparel Share		home textile share	
	parameter	std error	parameter	Std Error
Intercept	0.8560*	0.0150	0.0438*	0.0106
log(apparel price)	-0.0028	0.0040	0.0014	0.0020
log(home textile price)	0.0014	0.0020	0.0008	0.0017
log(other price)	0.0014	0.0020	-0.0022	0.0020
(log(exp)-LnP)	-0.3237*	0.0075	0.0697*	0.0047
(log(exp)-LnP)2	0.1058*	0.0034	0.0037	0.0025
North	-0.0174*	0.0065	-0.0066	0.0043
south	-0.0056	0.0062	0.0037	0.0043
East	0.0114*	0.0064	-0.0122*	0.0043
Resid	0.0168*	0.0086	-0.0275*	0.0061
Age	-0.0011*	0.0002	0.0008*	0.0002
Employ	-0.0168*	0.0050	-0.0087*	0.0034
Married	-0.0181*	0.0061	-0.0337*	0.0043
Edu	0.0010	0.0073	-0.0067	0.0051
Wave	-0.0218*	0.0045	0.0136*	0.0031
Bought from Department store	0.0066	0.0050	-0.0085*	0.0034
Bought from Chain store	-0.0192*	0.0046	0.0010	0.0032
Bought from super market	-0.0039	0.0045	0.0063	0.0032
Bought from small store	0.0134*	0.0046	-0.0177*	0.0032

* Significant at 1% level.

Table 5. LES Share Equation for Chinese Textile Consumption

	Apparel Share		home Textile Share	
	Parameter	Std Error	Parameter	Std Error
apparel price	0.351*	0.008		
home textile price			-0.237*	0.014
totexp-weighted price	0.487*	0.004	0.103*	0.002
North	12.774*	4.227	-9.480*	3.041
South	1.870	2.579	-1.279	1.857
East	23.419*	4.715	-15.060*	3.388
Resid	-17.901*	5.079	-13.948*	3.577
Age	-0.470*	0.104	0.182*	0.075
Employ	-11.534*	2.715	-3.364*	1.937
Married	-8.566*	3.822	-19.647*	2.739
Edu	-2.254	8.773	-13.169*	6.303
Wave	2.174	2.733	6.411*	1.968
Bought from Department store	-3.080	3.093	2.936	2.205
Bought from chain store	0.636	3.617	-7.519*	2.599
Bought from super market	5.811	3.388	2.205	2.436
Bought from small store	13.558*	3.052	-7.402*	2.188

*Significant at 1% level.

Table 6. QES Share Equation for Chinese Textile Consumption

	apparel share		Home Textile share	
	Parameter	Std Error	Parameter	Std Error
apparel price	0.28*	0.009		
home textile price			-0.181*	0.010
totexp-weighted price	0.535*	0.007	0.082*	0.003
c1	1.196*	0.049	-0.32	0.040
D	-0.020*	0.004		
North	10.597*	4.206	-11.022*	2.924
South	5.506	3.406	-1.243	2.364
East	19.682*	4.723	-15.448*	3.283
Resid	-8.963	5.276	4.900	3.800
Age	-0.301*	0.104	0.389*	0.074
Employ	-6.844*	2.699	1.535	1.899
Married	-3.376	3.859	-9.810*	2.737
Edu	-3.999	8.629	-5.671	5.986
Wave	-4.441	2.840	8.442*	1.978
bought from Department store	-3.834	3.047	7.084*	2.108
bought from chain store	-1.127	3.569	-3.562	2.479
Bought from super market	3.630	3.339	2.863	2.319
bought from small store	12.508*	3.014	-4.677	2.085

* Significant at 1% level.

Table 7. Price Elasticties and Expenditure Elasticties

			LAIDS	NQAIDS	LES	QES
			1.24*	0.78*	0.73*	0.58*
Expenditure		Apparel	(0.006)	(0.01)	(0.007)	(0.007)
		Home	0.05	1.98*	1.41*	0.83*
		Textile	(0.03)	(0.03)	(0.03)	(0.03)
			0.64*	1.28*	1.57*	1.62*
		Others	(0.02)	(0.02)	(0.02)	(0.02)
Uncomp. Price Elasticites						
			-1.14*	-0.56*	-0.91*	-0.94*
	Apparel	Apparel	(0.006)	(0.01)	(0.003)	(0.006)
		Home	-0.03	0.01	0.013*	0.002
		Textile	(0.02)	(0.04)	(0.001)	(0.002)
			0.09	0.07	0.018*	0.01*
		Others	(0.05)	(0.005)	(0.002)	(0.002)
	Home		0.48*	-0.77*	-0.61*	-0.28*
	Textile	Apparel	(0.03)	(0.06)	(0.011)	(0.03)
		Home	-0.73*	-1.02*	-1.18*	-1.21*
		Textile	(0.004)	(0.02)	(0.01)	(0.01)
			0.24*	-0.24*	0.029*	-0.03*
		Others	(0.033)	(0.03)	(0.003)	(0.01)
			0.19*	-0.91*	-0.20*	0.12*
	Others	Apparel	(0.017)	(0.03)	(0.006)	(0.06)
		Home	0.01	0.097	0.008*	0.13*
		Textile	(0.01)	(0.008)	(0.0005)	(0.02)
			-0.84*	-1.002*	-1.06*	-1.47*
		Others	(0.01)	(0.01)	(0.006)	(0.08)
Comp. Price Elasticites						
			-0.42*	-0.11*	-0.49*	-0.60*
	Apparel	Apparel	(0.007)	(0.01)	(0.005)	(0.007)
		Home	-0.03	0.21*	0.15*	0.09*
	Apparel	Textile	(0.02)	(0.03)	(0.03)	(0.03)
			0.11*	0.48*	0.52*	0.53*
	Apparel	Others	(0.02)	(0.02)	(0.02)	(0.02)
	Home		1.20*	-0.32*	-0.19*	0.06*
	Textile	Apparel	(0.03)	(0.04)	(0.02)	(0.04)
		Home	-0.80*	-0.82*	-1.04*	-1.13*
		Textile	(0.005)	(0.03)	(0.02)	(0.02)
			0.40*	0.17*	0.53*	0.49*
		Others	(0.04)	(0.04)	(0.01)	(0.02)
			0.91*	-0.46*	0.22*	0.46*
	Others	Apparel	(0.02)	(0.04)	(0.06)	(0.07)
		Home	0.02	0.30*	0.15*	0.21*
		Textile	(0.02)	(0.05)	(0.03)	(0.02)
			-0.64*	-0.59*	-0.56*	-0.95*
		Others	(0.02)	(0.02)	(0.02)	(0.11)

* Significant at 1% level.

Table 8. Expenditure and price elasticites based on NQAIDS and four income categories

			Low Elasticity	Std Error	Less-Low Elasticity	Std Error	Less-high Elasticity	Std Error	High Elasticity	Std Error
Expenditure Elas.	Apparel		0.68*	0.01	0.91*	0.01	0.74*	0.01	0.79*	0.01
	Home Textile		0.34	1.67	0.02	1.82	0.04	1.72	0.02	1.72
	Others		1.3*	0.01	0.93*	0.01	1.24*	0.01	1.2*	0.02
Uncomp. Price Elas.	Apparel	Apparel	-0.47*	0.02	-0.43*	0.02	-0.49*	0.02	-0.52*	0.01
		Home textile	0.02	0.01	0.008	0.005	0.02	0.01	0.02*	0.005
		Others	0.08*	0.01	0.05*	0.005	0.08*	0.01	0.07*	0.01
	Home textile	Apparel	-0.54*	0.04	-0.64*	0.05	-0.58*	0.04	-0.18*	0.02
		Home textile	-1.02*	0.01	-1.03*	0.02	-1.02*	0.02	-1.02*	0.02
		Others	-0.15*	0.02	-0.1*	0.02	-0.17*	0.02	-0.58*	0.04
	Others	Apparel	-0.68*	0.02	-0.78*	0.03	-0.74*	0.03	-0.86*	0.03
		Home textile	0.06*	0.01	0.14*	0.01	0.07*	0.01	0.09*	0.01
		Others	-1.01*	0.01	-1.11*	0.01	-1.002*	0.01	-0.99*	0.01
Comp. Price Elas.										
	Apparel	Apparel	-0.08*	0.02	-0.04*	0.02	-0.10*	0.02	-0.13*	0.01
		Home textile	0.19*	0.01	0.18*	0.01	0.19*	0.01	0.19*	0.01
		Others	0.50*	0.01	0.47*	0.01	0.50*	0.01	0.49*	0.01
	Home textile	Apparel	-0.15*	0.04	-0.25*	0.05	-0.19*	0.04	-0.21*	0.02
		Home textile	-0.85*	0.01	-0.86*	0.02	-0.85*	0.02	-0.85*	0.02
		others	0.27*	0.02	0.32*	0.02	0.25*	0.02	-0.16*	0.04
	Others	Apparel	-0.29*	0.02	-0.39*	0.03	-0.35*	0.03	-0.47*	0.03
		Home textile	0.23*	0.01	0.31*	0.01	0.24*	0.01	0.26*	0.01
		others	-0.59*	0.01	-0.69*	0.01	-0.59*	0.01	-0.57*	0.01

*Significant at 1% level.

Table 9. J-test for the four models

H0	LAIDS	NQAIDS	LES	QES
LAIDS	--	--	0.24*(0.031)	0.28*(0.028)
NQAIDS	--	--	0.03(0.06)	0.02(0.018)
LES	0.76*(0.031)	0.97*(0.06)	--	--
QES	0.62*(0.028)	0.98* (0.018)	--	--

*indicates prefer the model in the first row instead of the first column. Significant at 1% level.

-- indicates nested model.