Trends in the use of premium and discount cigarette brands: findings from the ITC US Surveys (2002–2011)

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ABSTRACT

Objective The purpose of this paper was to examine trends in the use of premium and discount cigarette brands and determine correlates of type of brand used and brand switching.

Methods Data from the International Tobacco Control (ITC) US adult smoker cohort survey were analysed. The total study sample included 6669 adult cigarette smokers recruited and followed from 2002 to 2011 over eight different survey waves. Each survey wave included an average of 1700 smokers per survey with replenishment of those lost to follow-up.

Results Over the eight survey waves, a total of 260 different cigarette brands were reported by smokers, of which 17% were classified as premium and 83% as discount brands. Marlboro, Newport, and Camel were the most popular premium brands reported by smokers in our sample over all eight survey waves. The percentage of smokers using discount brands increased between 2002 and 2011, with a marked increase in brand switching from premium to discount cigarettes observed after 2009 corresponding to the $0.61 increase in the federal excise tax on cigarettes. Cigarette brand preferences varied by age group and income levels with younger, higher income smokers more likely to report smoking premium brand cigarettes, while older, middle and lower income, heavier smokers were more likely to report using discount brands.

Conclusions Our data suggest that demographic and smoking trends favour the continued growth of low priced cigarette brands. From a tobacco control perspective, the findings from this study suggest that governments should consider enacting stronger minimum pricing laws in order to keep the base price of cigarettes high, since aggressive price marketing will likely continue to be used by manufacturers to compete for the shrinking pool of remaining smokers in the population.

INTRODUCTION

It is well recognised in economic theory, as well as in everyday life, that purchasing decisions are influenced by price and disposable income. This principle applies to the sale of cigarettes as it does other consumer goods. Studies have repeatedly illustrated that a 10% increase in the price of cigarettes typically results in a 2.5–5% decrease in cigarette consumption.[1–3] The affordability of cigarettes can influence smoking behaviour by encouraging smoking cessation and reducing the amount smoked per day. Affordability may also prompt smokers to find ways of purchasing cigarettes less expensively, such as purchasing from untaxed sources and purchasing cheaper brands.[4 5]

Image-based cigarette marketing of the 1980s connected premium cigarette brands with a lifestyle that appealed to consumers who aspired to achieve this lifestyle.[6 7] However, premium cigarettes often came at a higher price. As a result, cigarette manufacturers began to differentiate products based upon price as well as image, and discount cigarettes rose in popularity in the USA.[8] The discount market grew to over one-third of the overall US, market between 1980 and 1993 by appealing primarily to older, middle-income and lower-income heavier smokers who were not especially concerned about product image.[9 10] Premium cigarette manufacturers responded to the growth of discount brands by cutting the price of their premium brands in the 1990s, thereby lessening the price differential between premium and discount cigarettes.[11] While this change in cigarette pricing reduced the share of discount brands consumed, discount brands were able to maintain about one-quarter of the cigarette market over the next decade.[12]

This paper presents data from the International Tobacco Control (ITC), USA, adult smoker cohort survey conducted between 2002 and 2011 to examine trends in the use of premium and discount cigarette brands, correlates of type of brand used, as well as brand switching. Because of the timing of our cohort surveys, the ITC Survey data also allowed us to examine how the 2009 increase in the federal excise tax (FET) on cigarettes affected the use of premium and discount brands.

METHODS

Study design and sample

The data for this paper come from a nationally representative sample of 6669 adult current smokers who were recruited and surveyed between 2002 and 2011 as part of the ITC US adult smoker cohort survey. Standardised telephone interviews were conducted annually. At initial enrolment, survey participants included adult smokers (18 years of age and older) who reported that they had smoked at least 100 cigarettes in their lifetime and had smoked at least one cigarette in the past 30 days. Probability sampling methods were used to recruit the sample using random-digit dialling. If multiple adult smokers were present in the home,

the next-birthday method was used to select the respondent. Survey participants who were lost to follow-up in subsequent survey waves were replenished using the same procedures as the original recruitment, thus maintaining a sample size of around 1700 participants per wave. In this paper, we have eight waves of survey data available for analysis, giving a total of seven consecutive baseline-outcome 'wave pairs'. More specifically, this sample consists of both cohorts of adult current smokers followed over time and replenishment samples of smokers recruited to replace those lost to follow-up at each survey wave. This process was used to maintain a sample size of 1500–2000 participants per wave. The average attrition rate was 35% for each survey wave. Further details of survey methodology can be found elsewhere.[13 14]

Measures

Cigarette brand use

In each survey, smokers were asked whether they smoked factory-made cigarettes, and, if they answered 'yes', we asked whether they had a regular cigarette brand and to give the name of the cigarette brand. Interviewers selected the brand from a predefined cigarette brand list. If the brand was not on the list, the interviewer was instructed to write down the brand name provided by the respondent. The existence of brands not found on the predefined list was verified using online resources. If the brand was found it was added to our brand list. Cigarette brand lists were updated for each survey wave.

Brand categorisation

We coded cigarette brands reported by survey participants into two categories: premium and discount. By definition, a premium product is one that is perceived to have a higher value than one that is merely marketed as a discount product.[15] However, reliance on price alone to classify brands as either premium or discount can yield misleading results since we found instances where premium brands such as Marlboro were priced below the average price of many discount brands. Since cigarettes are fairly uniform in construction, the perceived value of a brand has more to do with the advertising image that the manufacturer associates with the brand than with the actual price product itself. Thus, in coding cigarette brands reported by survey participants as either premium or discount, we relied upon the representations made by the cigarette manufacturers themselves found either on their websites or in trade publications. Online supplementary appendix 1 shows how different brands were classified as either premium or discount in this study.

Brand switching

Brand switching was defined as changing the named cigarette brand family between survey waves.

Data analysis

Descriptive statistics were used to characterise trends in premium and discount brands and brand switching over different survey waves. Generalised estimating equations (GEE) were used to account for repeated measures when (1) estimating the adjusted wave specific prevalence rates for brand value categories, (2) testing for trends in brand switching, premium and discount brand use, and (3) modelling the characteristics of smokers such as gender, age, household income (ie, defined as low ≤US$29 999; medium=30 000–US$59 999; or high≥US $60 000), nicotine dependence (ie, measured by heaviness of smoking index (scored 0–6) and categorised as either low=≤4, or high >4), and geographic location (ie, northeast, south, midwest, west) with brand switching and specific patterns of brand switching (ie, discount to discount, premium to premium and premium to discount). All models used a binomial distribution with logit link. An unstructured working correlation matrix was used to account for within-subject correlation We used an unstructured correlation matrix because we believe that the correlation between different time points is not the same (as assumed with an exchangeable correlation structure) and also because the within-subject correlation does not depend on timing between measurements (as assumed in the autoregressive

Table 1 Baseline demographic characteristics of ITC US sample (n=6669)

Characteristic	n Mean (range)	Per cent
Sex		
Male	3032	(46.5)
Female	3637	(54.5)
Age (yrs)		
18–24	749	(11.2)
25–44	1710	(25.6)
40–54	2436	(36.5)
55+	1774	(26.6)
Race		
Black	668	(10.1)
Other	813	(12.2)
White	5163	(77.7)
Income*		
Low	2454	(37.0)
Moderate	2182	(32.9)
High	1542	(23.3)
No answer	454	(6.9)
Education†		
Low	3037	(45.6)
Moderate	5584	(38.2)
High	6657	(16.1)
No answer	12	(0.2)
Number of participants recruited by survey wave		
Wave 1	2140	(32.1)
Wave 2	684	(10.3)
Wave 3	889	(13.3)
Wave 4	742	(11.1)
Wave 5	745	(11.1)
Wave 6	711	(10.7)
Wave 7	382	(5.7)
Wave 8	376	(5.6)
Number of surveys completed by participants		
1	2969	44.5
2	1519	22.8
3	876	13.1
4	498	7.5
5	319	4.8
6	212	3.2
7	124	1.9
8	152	2.3

*Income defined as low=≤US$29 999; medium=US$30 000–US$59 999; high ≥US $60 000.
†Education defined as low: ≤high school; moderate=some college/tech/trade school; high=college graduate degree or higher.
ITC, International Tobacco Control.

correlation structure). It also seemed unreasonable to assume there was no correlation within subjects, as is assumed in an independent correlation structure. An exchangeable correlation structure was used in cases where a model did not converge using an unstructured correlation structure, since GEE models are robust to misspecification.

Self-reported cigarette pack prices were adjusted for inflation to the year 2011.[16] All analyses were performed in SAS V.9.3.[17]

RESULTS

Characteristics of respondents

Table 1 shows the characteristics of the smokers in the sample. The characteristics of the study participants in the ITC cohort survey mirror that of US adult smokers, with the exception of a slight over-representation of females in the sample.[13] The majority of participants were recruited at Wave 1, with fewer added in the replenishment samples in subsequent survey waves.

Premium and discount brands

Between 2002 and 2011, we identified 260 different cigarette brand families, of which 17% were classified as premium brands with the remainder as discount brands. Figure 1 displays the prevalence and average price for premium and discount brand cigarettes in each survey wave adjusted for time-in-sample, age, gender and reported daily smoking. The percentage of smokers using discount brands increased from 25% in 2002 to 31% in 2011, with the greatest change occurring from wave 7 and 8 (27.1% vs 31.0%; p=0.0053).

Table 2 summarises the characteristics of those smoking discount cigarette brands. By comparison with those smoking premium brand cigarettes, those who reported smoking a discount brand cigarette tended to women, older, had lower household incomes, had less education, and scored higher in terms of nicotine dependence as measured by the heaviness of smoking index. Discount brands were more frequently reported by survey participants in the south and midwest, while premium brands were more commonly reported by smokers in the northeast and in the west.

Brand switching

Figure 2 shows the rate of brand switching between survey waves adjusted for time-in-sample, age, gender and reported daily smoking. After an initial increase in brand switching from 2002 to 2004, the rate of brand switching stabilised until 2009 when it increased again. Factors associated with brand switching were younger age (18–24 years of age), lower household income, and use of a discount brand (data not shown). The odds of switching brands was 76% greater in wave 8 compared with waves 2–7 (p<0.01). Additionally, the sharpest increase was between waves 7 and 8 (14.6 vs 23.2; p<0.01), with the odds of switching in wave 8 being 91% greater than in wave 7 (p<0.01). This coincides with the FET increase. The adjusted prevalence of switching from a premium to a discount was relatively flat from waves 2 to 5, but increased from wave 5 to 8, from 3.5% to 7.5%. Although the overall increase for the study period was not statistically significant (p=0.10), the difference in the prevalence was greatest between waves 7 and 8 and approached statistical significance (4.6% vs 7.5%; p=0.05).

About 23% of participants followed over multiple survey waves reported switching brands at least one time. Participants followed over multiple survey waves could potentially display multiple patterns of brand switching. Observed switching patterns included switching from one discount brand to another discount brand (348/838; 41.5%), switching from a premium brand to a discount brand (269/838; 32.1%), switching from a premium brand to another premium brand (269/838; 26.0%), and switching from a discount to a premium (131/838; 15.6%).

Table 3 shows the results of our GEE models predicting the characteristics of smokers switching from a discount brand to another discount brand; from a premium brand to a discount brand; from a premium brand to another premium brand; and from a discount to premium brand. Smokers who switched from one discount cigarette brand to another discount brand tended to be older, to have lower or middle household incomes, and to live in the south. Smokers who switched from one premium brand cigarette to another premium brand were younger (18–24 years of age), had higher household incomes, and were most likely to live in the west. Smokers who switched from a premium brand cigarette to a discount brand had lower household incomes. Smokers who switched from a discount to a premium were more likely to have low income and be of moderate educational attainment. Smokers of Marlboro, Newport and Camel tended to switch less often than smokers of other brands (data not shown).

DISCUSSION

The results from this study reveal that adult smoker cigarette brand preferences have shifted over the past decade with an

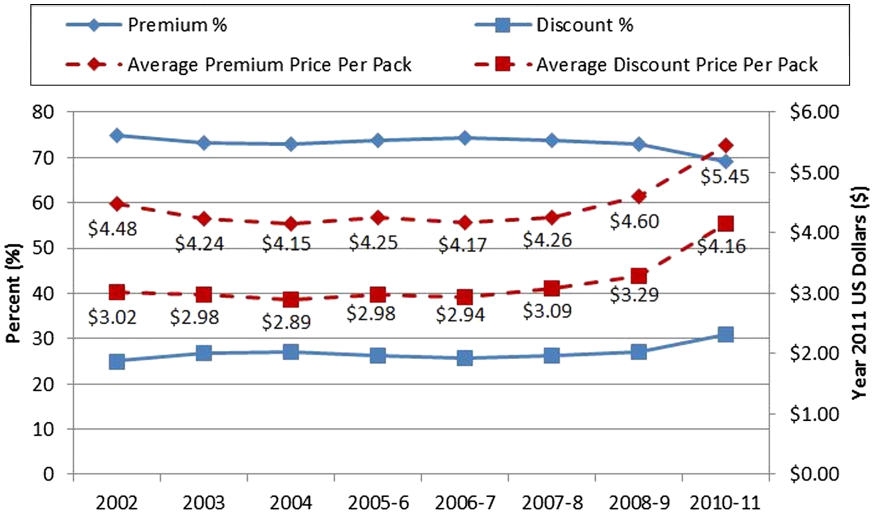

Figure 1 Average price per pack and percent smoking premium and discount cigarette by survey wave*. *The average price per pack is among both carton and single pack purchases, and is adjusted to 2011 US dollars.

Table 2 Characteristics of those who report smoking discount brand cigarettes*

Variables	OR	95% CI
Sex		
Females vs males	1.15	(1.01 to 1.30)
Age (yrs)		
25–39 vs 18–24	2.34	(1.71 to 3.22)
40–54 vs 18–24	5.56	(4.13 to 7.50)
55-max vs 18–24	9.47	(6.99 to 12.84)
Race		
Other vs White	0.74	(0.59 to 0.91)
Black vs White	0.37	(0.29 to 0.48)
Income†		
Low vs high	3.10	(2.57 to 3.73)
Middle vs high	1.77	(1.46 to 2.13)
No answer vs high	2.34	(1.74 to 3.15)
Nicotine dependence‡		
≥4 vs <4	1.14	(1.02 to 1.27)
Smoking		
Daily vs non-daily	1.18	(0.92 to 1.53)
Region		
Midwest vs west	1.33	(1.10 to 1.61)
Northeast vs west	1.03	(0.84 to 1.27)
South vs west	1.58	(1.31 to 1.90)
Education§		
Moderate vs low	0.97	(0.84 to 1.12)
High vs low	0.66	(0.54 to 0.80)
Wave		
Wave 2 vs 1	1.13	(1.02 to 1.25)
Wave 3 vs 1	1.16	(1.03 to 1.30)
Wave 4 vs 1	1.14	(0.99 to 1.31)
Wave 5 vs 1	1.13	(0.97 to 1.33)
Wave 6 vs 1	1.16	(0.98 to 1.36)
Wave 7 vs 1	1.22	(1.01 to 1.49)
Wave 8 vs 1	1.59	(1.25 to 2.02)

Note that the April 2009 federal excise tax increase occurred between survey waves 7 and 8.
*Adjusted for time-in-sample.
†Income defined as low=≤US$29 999; medium=US$30 000–US$59 999, or high≥US $60 000.
‡Nicotine dependence measured by heaviness of smoking index (scored 0–6) and categorised as either low=<4, or high ≥4.
§Education defined as low: ≤high school; moderate=some college/tech/trade school. High=college graduate degree or higher.

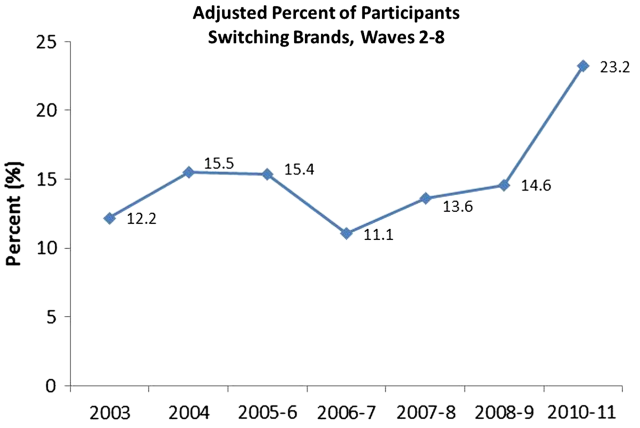

Figure 2 Prevalence of brand switching between survey waves*. *Switching rate is adjusted for time-in-sample, age, gender and reported daily smoking.

increase in the use of discount cigarette brands, especially after the US$0.61 increase in the FET on cigarettes in 2009. This finding is consistent with that found by Tauras *et al* in the decade prior to this study.[6] However, our finding regarding the growth of discount brands after the 2009 FET increase on cigarettes was unexpected since we had anticipated a drop in the sales of discount brand cigarettes since the relative price of discount brands were affected to a larger degree compared with that of higher-priced premium brands. It is possible that the aggressive price marketing of premium brands coupled with stricter marketing restrictions have lowered the perceived value of some premium brands. From this perspective, when consumers are confronted with paying higher prices for their cigarettes because of a tax increase, they are more willing to switch to a discount (price marketed only) brand.

Our data also suggest that demographic and smoking trends favour the continued growth of low-priced cigarette brands since there are fewer young people taking up smoking compared to previous generations, and the resulting pool of smokers is increasingly made up of older, middle-income and lower-income individuals who are less influenced by brand image and more prone to switch to discount brands. Once a smoker switches to a discount brand, our data suggest that they typically stay within the discount brand category, although they may switch between different discounted brands. Perhaps in recognition of this trend, cigarette manufacturers have invested in price discounting of some popular premium brands, and in some cases have repositioned older premium brands as discounted brands. For example, in 2007, Reynolds American repositioned Pall Mall cigarettes as a discount brand. Our data, consistent with data from other sources, shows that Pall Mall has realised substantial growth in market share since 2007.[18 19]

Consistent with previous studies, premium brands such as Marlboro, Newport and Camel continue to dominate the market due to their greater popularity with younger smokers who are less likely to switch to discount cigarette brands.[20] However, even though smokers in our sample between the ages of 18 and 24 years were more likely to report smoking a premium brand cigarette compared with older smokers, loyalty to a given brand was not that strong since we observed frequent switching between different premium brands. It is likely that the traditional pricing tiers of a decade ago (ie, premium, discount and deep discount), may no longer apply, as cigarette manufacturers have increasingly used price promotions to keep popular premium brands, such as Marlboro, priced to be competitive with the discount brands.[21]

This study undoubtedly underestimates the true level of brand switching that is happening for two reasons. First, we only counted a brand switch if the person reported smoking a different cigarette brand at the time of the next survey wave. This method fails to take into account brand switching that undoubtedly occurs between survey waves (eg, switching from one brand to another, but then switching back by the time of the next survey wave). Second, and more importantly, we only counted switching between different brand families rather than switching brand varieties within the same brand family (eg, Marlboro Red to Marlboro Gold). Another limitation of our data is that our estimates of the use of different brands (eg, Marlboro, Pall Mall, etc.) and brand categories (ie, premium and discount) likely overrepresent brands that are popular among older adult smokers (ie, discount brands) and under-represent brands (ie, Marlboro, Newport, and Camel) that are popular with younger (ie, under

Table 3 Factors associated with switching between premium and discount brands*

Variables	Discount to discount (n=3152)		Premium to premium (n=3152)		Premium to discount (n=3152)		Discount to premium (n=3152)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Sex								
Females vs males	1.09	(0.83 to 1.44)	1.08	(0.78 to 1.49)	1.21	(0.92 to 1.59)	1.07	(0.71 to 1.60)
Age (yrs)								
25–39 vs 18–24	1.89	(0.72 to 5.01)	**0.29**	(0.17 to 0.51)	1.20	(0.72 to 2.00)	1.42	(0.57 to 3.57)
40–54 vs 18–24	**2.74**	(1.09 to 6.87)	**0.23**	(0.14 to 0.38)	0.67	(0.41 to 1.11)	0.96	(0.39 to 2.33)
55–max vs 18–24	**3.86**	(1.55 to 9.64)	**0.21**	(0.12 to 0.36)	0.92	(0.56 to 1.51)	1.04	(0.43 to 2.54)
Race								
Other vs White	0.81	(0.47 to 1.40)	1.32	(0.74 to 2.35)	1.30	(0.81 to 2.08)	0.44	(0.17 to 1.14)
Black vs White	0.50	(0.25 to 1.02)	1.25	(0.69 to 2.26)	0.85	(0.46 to 1.57)	1.07	(0.49 to 2.34)
Income†								
Low vs high	**2.81**	(1.81 to 4.36)	0.67	(0.42 to 1.07)	**1.47**	(1.01 to 2.13)	**2.20**	(1.25 to 3.87)
Middle vs high	**1.71**	(1.12 to 2.63)	0.80	(0.53 to 1.19)	0.90	(0.62 to 1.31)	1.21	(0.67 to 2.17)
No answer vs high	**2.32**	(1.19 to 4.52)	0.75	(0.35 to 1.62)	0.82	(0.43 to 1.55)	0.66	(0.25 to 1.77)
Nicotine dependence‡								
≥4 vs <4	**1.27**	(0.98 to 1.65)	**0.59**	(0.40 to 0.86)	1.21	(0.90 to 1.63)	1.20	(0.80 to 1.80)
Smoking								
Daily vs non-daily	1.13	(0.62 to 2.08)	0.82	(0.43 to 1.54)	1.15	(0.61 to 2.15)	1.23	(0.47 to 3.23)
Region								
Midwest vs west	1.06	(0.70 to 1.61)	0.77	(0.50 to 1.20)	1.15	(0.77 to 1.74)	0.68	(0.37 to 1.28)
Northeast vs west	1.09	(0.69 to 1.73)	0.92	(0.58 to 1.47)	1.05	(0.68 to 1.62)	0.74	(0.42 to 1.31)
South vs west	**1.49**	(1.02 to 2.19)	**0.58**	(0.37 to 0.90)	0.95	(0.63 to 1.41)	0.64	(0.37 to 1.09)
Education§								
Moderate vs low	0.77	(0.57 to 1.05)	0.82	(0.56 to 1.21)	1.15	(0.87 to 1.51)	**1.74**	(1.13 to 2.68)
High vs low	**0.59**	(0.37 to 0.92)	1.43	(0.92 to 2.23)	**0.58**	(0.36 to 0.94)	1.40	(0.73 to 2.66)
Wave								
Wave 3 vs 2	**1.61**	(1.17 to 2.22)	1.45	(0.89 to 2.37)	0.93	(0.57 to 1.52)	1.11	(0.54 to 2.29)
Wave 4 vs 2	**1.66**	(1.16 to 2.38)	1.32	(0.78 to 2.25)	0.99	(0.64 to 1.55)	1.52	(0.78 to 2.97)
Wave 5 vs 2	1.08	(0.68 to 1.72)	0.93	(0.52 to 1.66)	0.93	(0.54 to 1.61)	0.97	(0.45 to 2.09)
Wave 6 vs 2	1.27	(0.81 to 2.01)	1.00	(0.57 to 1.75)	1.16	(0.68 to 1.95)	1.55	(0.76 to 3.16)
Wave 7 vs 2	**1.73**	(1.09 to 2.73)	1.09	(0.61 to 1.94)	1.26	(0.78 to 2.04)	1.00	(0.45 to 2.21)
Wave 8 vs 2	**3.08**	(1.84 to 5.16)	1.41	(0.67 to 3.01)	**2.16**	(1.22 to 3.83)	1.00	(0.40 to 2.47)

Bold items are statistically significant (p<0.05).
Note that the April 2009 federal excise tax increase occurred between survey waves 7 and 8.
*Adjusted for time-in-sample.
†Income defined as low=≤US$29 999; medium=US$30 000–US$59 999, or high≥US$60 000.
‡Nicotine dependence measured by heaviness of smoking index (scored 0–6) and categorised as either low=<4, or high≥4.
§Education defined as low: ≤high school; moderate=some college/tech/trade school; high=college degree or higher.

age 18 years) smokers who were not part of our sample. Additionally, we were unable to measure factors related to the weakening US economy during this period. That is, rising prices and stagnated or reduced disposable income could more fully explain switches to discount brands rather than total income alone. As well, some participants in wave 7 were surveyed after the April 2013 FET increase, indicating that our measure of differences from wave 7 to 8 may be an underestimation. Finally, our study also suffers from biases that result from attrition of our sample over time, which tends to be higher among those who are younger and non-Caucasian. To compensate for attribution of our longitudinal sample, we replenished participants lost to follow-up at each subsequent survey, and have attempted to adjust for time-in-sample variations across the different survey waves.[14]

In summary, with fewer people taking up smoking today, price marketing within and between the premium and discount brand categories is likely to play an increasingly important role in defining which cigarette brands remain popular in the future. Despite the continued popularity of well-known brands, such as Marlboro, Newport and Camel, the popularity of premium brands, such as Winston, Virginia Slims, and Benson and Hedges appears to be on the decline. The traditional pricing tiers of a decade ago (ie, premium, discount and deep discount), also seem no longer to apply, as manufacturers have increasingly used price promotions to keep popular premium brands, such as Marlboro, priced to be competitive with the pricing of many discount brands.[18 19 21 22]

Previous studies have shown that the presence of discount brands can undermine efforts to discourage tobacco use.[4 5] This study shows that those who can least afford to keep smoking because of their economic standing (ie, low-income individuals) and health risks (ie, older smokers and those who smoke more heavily), were also the group of smokers most prone to use and switch to discount brand cigarettes. From a tobacco control perspective, the findings from this study suggest that governments should consider enacting stronger minimum pricing laws in order to keep the base price of cigarettes high, since it seems clear that aggressive price marketing will continue to be used by manufacturers to compete for the shrinking pool of smokers in the population.

What this paper adds

- The results from this study reveal that adult smoker cigarette brand preferences in the USA have shifted over the past decade with an increase in the use of discount cigarette brands, especially after the 2009 increase of US$0.61 in the federal excise tax on cigarettes.
- Our data also suggest that demographic and smoking trends favour the continued growth of low-priced cigarette brands, although the traditional pricing tiers of a decade ago (ie, premium, discount and deep discount), may no longer apply as cigarette manufacturers have used price promotions to keep popular premium brands, such as Marlboro, priced to be competitive with discount brands. From a tobacco control perspective, the findings from this study suggest that governments should consider enacting stronger minimum pricing laws in order to keep the base price of cigarettes high, since aggressive price marketing will likely continue to be used by manufacturers to compete for the shrinking pool of remaining smokers in the population.

Contributors GTF, KMC, AH: conception and survey design. MC, PD, KMC: data analysis. MC, PD, GTF, FJC, AH, MBT, MJC, KMC: drafting the manuscript and revising it critically for important intellectual content. All authors read and approved the final manuscript.

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Competing interests None.

Ethics approval All the data collection methods were reviewed and approved by the following review panels: Roswell Park Cancer Institute Institutional Review Board, the University of Waterloo Human Research Ethics Committee, and the Medical University of South Carolina Institutional Review Board.

Provenance and peer review Not commissioned; externally peer reviewed.

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Appendix 1. Categorization of Cigarette Brands as either Premium or Discount

Category	Name of Cigarette Brand
Premium	Accord, American Spirit, Barclay, Belair, Benson & Hedges, Camel, Capri, Carlton, Chesterfield, Davidoff, Du Maurier, Dunhill, Dunhill International, Eve, Kent, Kool, L&M, Lark, Lucky Strike, Marlboro, Max, Merit, Mild Seven, More, Nat Sherman, Newport, Now, Parliament, Players, Quest, Rothman's, Salem, Sampoerna, Saratoga, Tareyton, True, Vantage, Virginia Slims, Winston, Raleigh, Business Club Full Flavor, Ronhill, Dreams
Discount	24/7, 305, 1839, A1, Ace, Allstar, Allway Save, Alpine, American, American Diamond, American Hero, American Liberty, Arrow, Austin, Axis, Baileys, Bargain Buy, Baron, Basic, Beacon, Berkeley, Best Value, Black Hawk, Bonus Value, Boston, Bracar, Brand X, Brave, Brentwood, Bridgeport, Bronco, Bronson, Bucks, Buffalo, BV, Calon, Cambridge, Campton, Cannon, Cardinal, Carnival, Cavalier, Champion, Charter, Checkers, Cherokee, Cheyenne, Cimarron, Circle Z, Class A, Classic, Cobra, Complete, Corona, Courier, CT, Decade, Desert Gold, Desert Sun, Discount, Doral, Double Diamond, DTC, Durant, Eagle, Echo, Edgefield, Epic, Esquire, Euro, Exact, Exeter, First Choice, First Class, Focus, Fortuna, Galaxy Pro, Gauloises, Generals, Generic/Private Label, Geronimo, Gold Coast, Gold Crest, Golden Bay, Golden, Golden Beach, Golden Palace, GP, GPC, Grand, Grand Prix, G Smoke, GT Ones, Hava Club, HB, Heron, Highway, Hi-Val, Jacks, Jade, Kentucky Best, King Mountain, Kingsley, Kingston, Kingsport, Knife, Knights, Lakes, Larson, Legend, Lewiston, Liberty, Liggett, Lobo, Main Street, Malibu, Marathon, Marker, Market, Maverick, Maxim, Maxxon, Medallion, Meridian, Miss Diamond, Misty, Monaco, Monarch, Money, Montclair, Montego, Move, Mustang, Native, Natural Blend, Natural Harvest, Niagara, Nobel, No Frills, Nova, Old Gold, Omaha, Ol' Kentucky, Omega, Opal, Optiva, Pace, Palermo, Pall Mall, Patriot, Pilot, Planet, Poker, Private Stock, Pyramid, Quality Smokes, Rave, Revenge, Rich, Rio, Rivermont, Riverside, Riviera, Roger, Romy, Royals/Rothman's Royals, Sabre, Sandia, Scenic 101, Score, Sebring, Seneca, Shield, Signature, Silva Thins, Silver, Silver Eagle, Sincerely Yours, Signal, Single Stick, Sixty, Sky Dancer, Smoker Friendly, Smokin Joe, Sonic, Sonoma, Sport, Stockton, Sundance, Supreme, Tahoe, Ten Twenty, Top Choice, Tourney, Tucson, Tuscany, Ultra Buy, Unify, Union, USA, USA Gold, Value Time, VB, Viceroy, Vortex, Wave, Way, Western, Westport, Wild Horse, Winner, Worth, Yours, Yukon

高端和低价卷烟品牌的消费变化趋势：来自国际烟草控制政策评估项目（ITC）美国调查的发现（2002-2011）

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▶ 更多资料仅于网上公布，若需参考请浏览在线杂志。
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摘要

目的 本文目的是研究高端卷烟品牌和低价卷烟品牌的消费变化趋势，以及所使用的卷烟品牌与品牌转换之间的相关性。

方法 本文分析了ITC项目美国调查取得的成人吸烟者的组群数据。总的研究样本包括从2002年到2011年8轮调查招募和随访的6669名成年吸烟者。平均每轮调查包括1700名吸烟者样本以及补充失访者的样本。

结果 在这8轮调查中，吸烟者报告了总共260种不同的卷烟品牌，其中17%为高端品牌，83%为低价品牌。在我们八轮调查的样本中，吸烟者报告的最受欢迎的高端品牌是Marlboro、Newport和Camel。在2002年至2011年间，使用低价品牌卷烟吸烟者的比例逐渐上升，并且在2009年之后，随着联邦卷烟消费税提高了0.61美元，越来越多吸烟者由购买高端品牌卷烟转为购买低价品牌卷烟。卷烟的品牌偏好随着年龄和收入的不同而不同。年轻的或者高收入的吸烟者偏好高端品牌卷烟，而年长的、中低收入的和重度吸烟的吸烟者则更喜欢低价品牌卷烟。

结论 我们的数据表明，人口结构的变化和吸烟的趋势导致了低价卷烟品牌的持续增长。从烟草控制的角度而言，本研究发现表明，由于卷烟的生产者可能会继续采用竞争性的价格营销策略以争取逐渐减少的吸烟者群体，政府应该考虑制定更强有力的最低价格法案，以保证卷烟的基准价格维持在一个较高水平。

前言

经济学理论以及日常生活中的经验已经证实了价格和可支配收入在购买决策中的作用。正如适用于其他消费品一样，这一原则也适用于卷烟销售。大量研究已经证实，卷烟价格提高10%通常会导致卷烟消费量减少2.5—5%[1-3]。吸烟者卷烟支付能力的降低能够影响吸烟行为，从而鼓励戒烟，同时也促使吸烟者减少日均吸烟量。另外，吸烟者卷烟支付能力也可能促使他们寻找更廉价的途径购买卷烟，例如从免税的渠道购买卷烟或者转而购买更廉价的品牌[4,5]。

二十世纪80年代，依靠品牌形象的卷烟营销策略把高端卷烟品牌与某种被众多消费者所渴望的生活方式联系起来[6,7]。然而，高端卷烟通常价格较高。因此卷烟生产商开始通过价格和品牌形象来区分产品，低价卷烟在美国随之流行[8]。1980到1993年间，由于年长、中低收入和重度吸烟者通常对品牌形象并不太在意，通过吸引这些吸烟者，低价卷烟逐渐占领了超过三分之一的美国卷烟市场[9,10]。

二十世纪90年代，高端卷烟的生产商通过降低高端品牌的价格来应对不断增长的低价品牌市场，从而缩小了高端品牌和低价品牌的价格差异[11]。尽管这种价格变动减少了低价卷烟的市场份额，但在接下来的十年，低价品牌的市场份额仍能维持大约四分之一[12]。

本文展示了2002到2011年间进行的ITC项目美国成人吸烟者组群调查的数据，旨在研究使用高端品牌卷烟和低价品牌卷烟的变化趋势，卷烟品牌类型的相关性，以及品牌转换。由于组群调查的时间设置，我们还可以通过ITC调查数据研究2009年联邦卷烟消费税（FET）的提高对高端品牌和低价品牌的影响。

方法

研究设计和抽样

本文数据来源于由6669名成年吸烟者组成的具有全国代表性的样本。这些样本是在2002至2011年间作为ITC美国成人吸烟者组群的一部分被招募和调查的。每年，ITC会对他们进行标准化的电话访谈。在最初的登记中，受访者包括至今已吸超过100支卷烟并且在过去的30天中至少已吸过一支卷烟的成年吸烟者（18岁及以上）。通过随机数字拨号，本研究使用概率抽样的方法来招募样本人群。如果被访家庭里有多个成年吸烟者，我们将从访问时间起最早过生日者作为调查对象。在随后多轮调查中，我们应用与首次招募相同的方法来选择受访者，以补充没有参加后续调查的失访者，由此每轮调查维持了大约1700个调查对象的样本规模。在本文中，我们有8轮的调查数据可供分

析，提供了总计七个连续的“研究对子”。具体地说，样本包含两部分，一部分是参与跟踪调查的成年吸烟者，另一部分是为了补充每轮调查中的失访者而招募的吸烟者。通过这一流程，每轮调查都保持1500-2000个调查对象的样本规模。每轮调查平均失访率是35%。关于调查方法的更多细节可参见其它文献[13,14]。

研究指标卷烟品牌使用

在每轮调查中，吸烟者被询问他们是否吸机制卷烟。如果他们回答“是”，调查员会询问他们是否有经常购买的卷烟品牌，同时请他们给出卷烟品牌的名称。调查员从预先确定的卷烟品牌清单上选择该品牌。如果该品牌不在清单上，调查员则需将受访者提供的品牌名称记录下来。没有出现在预先确定的清单上的品牌将被通过网络资源来确认是否真实存在。在每轮调查中，卷烟品牌清单会被更新。

品牌分类

我们将受访者所报告的卷烟品牌分为两类：高端和低价。依照定义，人们所理解的高端品牌产品比低价品牌产品具有更高的价值[15]。然而，仅仅依靠价格来对品牌进行分类可能产生误导性的结果，因为我们发现一些高端品牌，如Marlboro，定价比很多低价品牌的平均价格还要低。由于卷烟在制造上具有基本一致性，与产品的实际价格相比，消费者所感知的品牌价值更多地与生产商对其赋予的广告形象相关。因此，在对调查对象报告的卷烟品牌是高端还是低价进行分类时，我们以制造商在网站或贸易出版物上发表的产品介绍为准。在线补充附录1说明了本研究中不同的品牌如何被分为高端和低价。

品牌转换

品牌转换被定义为吸烟者在各轮调查之间所使用的卷烟品牌发生了转换的现象。

数据分析

描述性统计被用于描述各轮调查中高端品牌和低价品牌的趋势以及品牌转换。在以下情况中，我们运用广义估计方程（GEE）来分析重复测量指标：（1）估计经调整后的每轮调查中品牌价值类别的流行率，（2）检验品牌转换及高端品牌和低价品牌使用的变化趋势，以及（3）建立模型研究吸烟者的特征与品牌转换的关系以及特定的品牌转换模式（低价到低价，高端到高端，高端到低价）之间的关系，其中吸烟者的特征包括性别，年龄，家庭收入（低收入≤29999美元，中等收入=30000-59999美元，高收入≥60000美元），对尼古丁的依赖性（以吸烟指数（得分在0 – 6之间）来计量，并分为低度依赖（≤4）和高度依赖（>4））和地理位置（东北部，南部，中西部，西部）。所有的模型使用logit连接的二项分布。非结构化相关矩阵被用于解释个体内相关。之所以使用非结构化相关矩阵是因为我们认为不同时间点之间的相关度是不同的（可交换相关结构也假定不同时间点之间的相关度不同），而且个体内相关不依赖于测量之间的时间选择（如自回归相关结构假定同一个体的不同观测值之间的内相关依赖测量之间的时间选择）。同样，假设受访者之间不存在相关性似乎也不合理（独立相关结构假定受访者之间不存在相关性）。在一些情况下，采用非结构化相关结构会导致模型不收敛，此时，由于GEE对模型误定具有稳健性，我们采用可交换相关结构来建立模型。

由于通货膨胀的存在，我们对吸烟者自报的卷烟价格按照2011年的货币价值做了调整[16]，并采用SAS V.9.3进行统计分析[17]。

表1 ITC 项目美国调查样本的人口学特征(n=6669)

人口学特征	n 均值(范围)	百分比
性别		
男性	3032	(46.5)
女性	3637	(54.5)
年龄		
18-24	749	(11.2)
25-44	1710	(25.6)
40-54	2436	(36.5)
55+	1774	(26.6)
种族		
黑种人	668	(10.1)
其他	813	(12.2)
白种人	5163	(77.7)
收入*		
低	2454	(37.0)
中	2182	(32.9)
高	1542	(23.3)
无应答	454	(6.9)
教育†		
低	3037	(45.6)
中	5584	(38.2)
高	6657	(16.1)
无应答	12	(0.2)
各轮受访者人数		
第1轮	2140	(32.1)
第2轮	684	(10.3)
第3轮	889	(13.3)
第4轮	742	(11.1)
第5轮	745	(11.1)
第6轮	711	(10.7)
第7轮	382	(5.7)
第8轮	376	(5.6)
受访者完成的调查数		
1	2969	44.5
2	1519	22.8
3	876	13.1
4	498	7.5
5	319	4.8
6	212	3.2
7	124	1.9
8	152	2.3

*收入：低收入≤29 999美元；中等收入=30 000–59 999美元；高收入≥60 000美元。
†受教育程度：低≤高中；中=一些学院/技术学校/职业学校；高=大学研究生学位或者更高。
ITC，国际烟草控制政策评估项目

结果

调查对象的人口学特征

表1显示了样本中吸烟者的人口学特征。除女性样本被略微过度代表之外，ITC项目调查对象的人口学特征反映了美国成年吸烟者的相应特征。大部分调查对象是在第一轮调查时招募的，少部分是在随后的调查中补充到样本中的。

高端品牌和低价品牌

2002至2011年间，我们识别了260种不同的卷烟品牌，其中17%为高端品牌，其余为低价品牌。图1展示了经样本出现次数、年龄、性别和所报告日均吸烟量调整后的每轮调查高端和低价品牌的流行率和平均价格。使用低价品牌的吸烟者比例从2002年的25%增加到2011年的31%，其中最大的变化发生于第7轮到第8轮之间（从27.1%到31.0%；p=0.0053）。

表2总结了吸低价品牌卷烟人群的人口学特征。通过和吸高端品牌卷烟的人比较，低价品牌卷烟的使用者更多的是女性、年长者、低收入和低受教育程度人群，并且尼古丁依赖性更高（尼古丁依赖性通过吸烟指数来衡量）。南部和中西部地区的受访者多报告低价品牌，而东北部和西部地区的受访者则通常报告高端品牌。

品牌转换

图2显示了调整样本出现次数、年龄、性别和所报告日均吸烟量后，各轮调查之间的品牌转换率。品牌转换率在2002年至2004年间增加，之后逐渐稳定，到了2009年再次增加。年轻、低收入和吸低价品牌卷烟的吸烟者通常与较高的品牌转换相关联。第8轮调查的品牌转换率比第2到第7轮调查的品牌转换率高了76%（p<0.01）。此外，品牌转换率在第7轮和第8轮之间增长最快（14.6和23.2；p<0.01），第8轮的转换率比第7轮增加了91%（p<0.01）。这正好与联邦消费税的提高相一致。调整后高端到低价品牌的转换，在第2轮到第5轮调查间的变化相对平缓，但第5轮到第8轮之间从3.5%增加到7.5%。尽管研究期间的整体增长在统计上不显著（p=0.10），但第7轮和第8轮之间的转换率差别是最大的，而且在统计上显著（4.6%和7.5%；p=0.05）。

大约23%参与多轮随访的受访者报告了至少一次品牌转换。在参与多轮随访的受访者中可能存在多种品牌转换模式。我们观察到的转换模式包括低价品牌到低价品牌的转换（348/838；41.5%），高端品牌到低价品牌的转换（269/838；32.1%），高端品牌到高端品牌的转换（269/838；26.0%）以及低价品牌到高端品牌的转换（131/838；15.6%）。

表3显示了基于GEE模型来预测出现品牌转换的吸烟者特征的结果。我们考虑的品牌转换模式包括低价品牌到低价品牌的转换，高端品牌到低价品牌的转换，高端品牌到高端品牌的转换，以及低价品牌到高端品牌的转换。从一个低价品牌转换到另一个低价品牌的吸烟者倾向于具有年长，中低等的家庭收入以及居住在南部地区的特征。从一个高端品牌转换到另一个高端品牌的吸烟者一般比较年轻（18-24岁），有更高的家庭收入，可能居住在西部。从一个高端品牌转换到一个低价品牌的吸烟者倾向于有更低的家庭收入。从一个低价品牌转换到一个高端品牌的吸烟者多有较低的收入和中等的受教育程度。与其他品牌相比，Marlboro、Newport和Camel卷烟的吸烟者品牌转换较少。

讨论

本研究结果显示成年吸烟者的卷烟品牌偏好在过去十年间发生了转变，其中，低价卷烟品牌逐渐流行，尤其是在2009年联邦卷烟消费税提高0.61美元后。这个发现和Tauras等人十年前的研究发现是一致的[6]。然而，2009年联邦卷烟消费税提高后低价品牌的增长出乎我们的意料之外，因为相对定价较高的高端品牌而言，低价品牌的相对价格更容易受到影响，我们原本预期低价品牌的卷烟销量会下降。这一意外可能是因为高端品牌积极的价格营销以及更加严格的市场限制降低了一些高端品牌的感知价值。从这个角度而言，当消费者面临支付由卷烟税增加带来的更高卷烟价格时，他们更愿意选择（仅依靠价格来营销的）低价品牌。

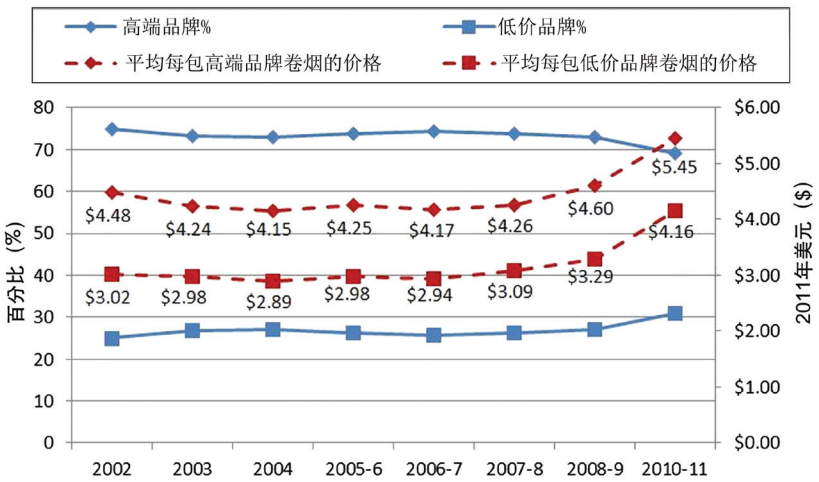

图1 每轮调查每包卷烟平均价格以及吸高端品牌和低价品牌卷烟的百分比*

***每包卷烟的平均价格在按整条和按单包购买之间，并且以2011年的美元价值为准做了调整。**

表2 报告吸高端品牌卷烟的吸烟者的特征*

变量	OR	95% CI
性别		
女性vs男性	1.15	(1.01 - 1.30)
年龄		
25-39vs18-24	2.34	(1.71 - 3.22)
40-54vs18-24	5.56	(4.13 - 7.50)
55及以上vs18-24	9.47	(6.99 - 12.84)
种族		
其他vs白种人	0.74	(0.59 - 0.91)
黑种人vs白种人	0.37	(0.29 - 0.48)
收入†		
低vs高	3.10	(2.57 - 3.73)
中vs高	1.77	(1.46 - 2.13)
无应答vs高	2.34	(1.74 - 3.15)
尼古丁依赖‡		
>=4 vs <4	1.14	(1.02 - 1.27)
吸烟		
每日vs非每日	1.18	(0.92 - 1.53)
区域		
中西部vs西部	1.33	(1.10 - 1.61)
东北部vs西部	1.03	(0.84 - 1.27)
南部vs西部	1.58	(1.31 - 1.90)
教育§		
中vs低	0.97	(0.84 - 1.12)
高vs低	0.66	(0.54 - 0.80)
调查轮次		
第2轮vs第1轮	1.13	(1.02 - 1.25)
第3轮vs第1轮	1.16	(1.03 - 1.30)
第4轮vs第1轮	1.14	(0.99 - 1.31)
第5轮vs第1轮	1.13	(0.97 - 1.33)
第6轮vs第1轮	1.16	(0.98 - 1.36)
第7轮vs第1轮	1.22	(1.01 - 1.49)
第8轮vs第1轮	1.59	(1.25 - 2.02)

注意:2009年4月联邦消费税（FET）在第7轮调查和第8轮调查之间增加了。
*调整了样本出现次数。
†收入定义为：低≤29 999美元；中=30 000–59 999美元；高≥60 000美元。
‡尼古丁依赖性的测量：依据吸烟指数的大小（得分 0–6）；分类：低≤4，高≥4。
§教育定义为：低≤高中；中=一些学院/技术/职业学校；高=大学研究生学位或者更高。

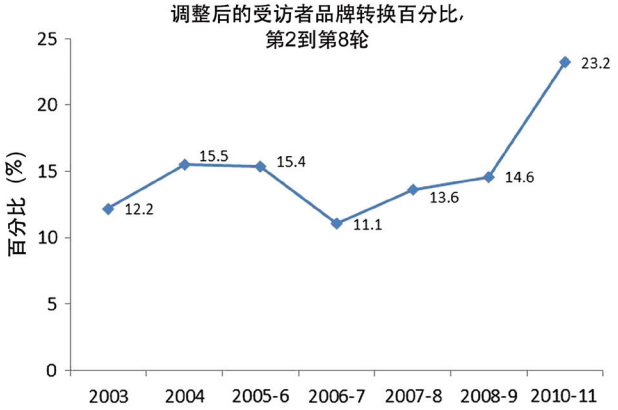

图2 各轮调查之间的品牌转换率*
*经样本出现次数、年龄、性别和报告的日均吸烟量调整后的转换率

我们的数据表明，人口结构和吸烟行为的变化趋势支持了低价卷烟品牌的持续增长，因为和前几代相比，抽烟的年轻人越来越少，因此形成了吸烟者越来越多地由年长、中低收入个体组成的局面，而这部分人群受品牌形象影响较少而更倾向于转向低价品牌。我们的数据表明，一旦吸烟者转而购买低价品牌，尽管他们可能在不同的低价品牌中来回转换，但他们通常会持续购买低价卷烟。可能是意识到了这个趋势，卷烟生产商投入资金对一些流行的高端品牌进行价格折扣，并且在某些情况下把前高端品牌重新定位为低价品牌。例如，在2007年，美国雷诺公司把“Pall Mall”作为一个低价品牌重新定位。和其他来源的数据一致，我们的数据显示“Pall Mall”自2007年开始已经实现了市场份额的大量增长[18,19]。

和以前的研究一致，由于高端品牌，如Marlboro，Newport和Camel，在年轻的吸烟者中非常流行，它们将继续主导着市场。这些年轻的吸烟者不太可能会转向低价卷烟品牌[20]。然而，尽管样本中18岁到24岁间的吸烟者相比年长的吸烟者更多地报告吸高端品牌的卷烟，但对于特定品牌的忠诚度并不强：我们观察到了不同高端品牌间的频繁转换。这可能是因为卷烟生产商越来越多的采用价格促销来维持高端品牌的流行度，如定价足以和低价品牌竞争的Marlboro，因此十年前传统的价格等级（高端，低价，廉价）可能不再适用[21]。

毫无疑问，本研究低估了品牌转换的真实水平，这可以从以下两方面进行解释。第一，如果一个人在接下来的一轮调查中报告了与前一轮不同的卷烟品牌，我们把这种情况仅仅当作一次品牌转换计算。这无疑没能考虑发生于各轮调查的间隔时间中发生的品牌转换（如，从一个品牌转换为另一个品牌，然后在下次调查中又转换回来）。第二，也是更重要的一点是，我们仅仅计算了不同品牌系列之间的转换，而没考虑在同一品牌系列内的品种间的转换（如，Marlboro Red 到 Marlboro Gold）。我们数据的另一个局限性是所研究的品牌（如Marlboro，Pall Mall等）以及品牌分类（高端和低价）可能过度代表了流行于年长吸烟者中的品牌（即低价品牌），而对流行于青少年（小于18岁）吸烟者中的品牌（如Marlboro，Newport和Camel）代表性不足。而这部分青少年吸烟者（也就是小于18岁）不是我们样本的一部分。此外，我们无法测量这段时期美国经济增长减缓的因素。也就是说，物价上涨和可支配收入（而不是总收入）的停滞甚至负增长，可能能够更加充分地解释向低价品牌的转换。同样地，第7轮调查中的一些受访者在2013年4月联邦消费税提高后才接受了调查，这可能导致我们低估了第7轮和第8轮调查的差异。最后，我们的研究也存在偏差，这些偏差来源于样本随时间逐渐流失，而这种流失更容易发生在年轻人和非白种人中。为了补偿纵向样本的流失，我们在每轮后续调查时补充了新的受访者以代替失访者，同时尝试调整各轮调查中样本的出现次数[14]。

表3 高端和低价品牌之间品牌转换的相关因素*

变量	低价到低价(n=3152)		高端到高端(n=3152)		高端到低价(n=3152)		低价到高端(n=3152)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
性别								
女性vs男性	1.09	(0.83-1.44)	1.08	(0.78-1.49)	1.21	(0.92-1.59)	1.07	(0.71-1.60)
年龄								
25-39vs18-24	1.89	(0.72-5.01)	**0.29**	(0.17-0.51)	1.20	(0.72-2.00)	1.42	(0.57-3.57)
40-54vs18-24	**2.74**	(1.09-6.87)	**0.23**	(0.14-0.38)	0.67	(0.41-1.11)	0.96	(0.39-2.33)
55及以上vs18-24	**3.86**	(1.55-9.64)	**0.21**	(0.12-0.36)	0.92	(0.56-1.51)	1.04	(0.43-2.54)
种族								
其他vs白种人	0.81	(0.47-1.40)	1.32	(0.74-2.35)	1.30	(0.81-2.08)	0.44	(0.17-1.14)
黑种人vs白种人	0.50	(0.25-1.02)	1.25	(0.69-2.26)	0.85	(0.46-1.57)	1.07	(0.49-2.34)
收入†								
低vs高	**2.81**	(1.81-4.36)	0.67	(0.42-1.07)	**1.47**	(1.01-2.13)	**2.20**	(1.25-3.87)
中vs高	**1.71**	(1.12-2.63)	0.80	(0.53-1.19)	0.90	(0.62-1.31)	1.21	(0.67-2.17)
无应答vs高	**2.32**	(1.19-4.52)	0.75	(0.35-1.62)	0.82	(0.43-1.55)	0.66	(0.25-1.77)
尼古丁依赖‡								
>=4 vs <4	**1.27**	(0.98-1.65)	**0.59**	(0.40-0.86)	1.21	(0.90-1.63)	1.20	(0.80-1.80)
吸烟								
每日vs非每日	1.13	(0.62-2.08)	0.82	(0.43-1.54)	1.15	(0.61-2.15)	1.23	(0.47-3.23)
区域								
中西部vs西部	1.06	(0.70-1.61)	0.77	(0.50-1.20)	1.15	(0.77-1.74)	0.68	(0.37-1.28)
东北部vs西部	1.09	(0.69-1.73)	0.92	(0.58-1.47)	1.05	(0.68-1.62)	0.74	(0.42-1.31)
南部vs西部	**1.49**	(1.02-2.19)	**0.58**	(0.37-0.90)	0.95	(0.63-1.41)	0.64	(0.37-1.09)
教育§								
中vs低	0.77	(0.57-1.05)	0.82	(0.56-1.21)	1.15	(0.87-1.51)	**1.74**	(1.13-2.68)
高vs低	**0.59**	(0.37-0.92)	1.43	(0.92-2.23)	**0.58**	(0.36-0.94)	1.40	(0.73-2.66)
调查轮次								
第3轮vs第2轮	**1.61**	(1.17-2.22)	1.45	(0.89-2.37)	0.93	(0.57-1.52)	1.11	(0.54-2.29)
第4轮vs第2轮	**1.66**	(1.16-2.38)	1.32	(0.78-2.25)	0.99	(0.64-1.55)	1.52	(0.78-2.97)
第5轮vs第2轮	1.08	(0.68-1.72)	0.93	(0.52-1.66)	0.93	(0.54-1.61)	0.97	(0.45-2.09)
第6轮vs第2轮	1.27	(0.81-2.01)	1.00	(0.57-1.75)	1.16	(0.68-1.95)	1.55	(0.76-3.16)
第7轮vs第2轮	**1.73**	(1.09-2.73)	1.09	(0.61-1.94)	1.26	(0.78-2.04)	1.00	(0.45-2.21)
第8轮vs第2轮	**3.08**	(1.84-5.16)	1.41	(0.67-3.01)	**2.16**	(1.22-3.83)	1.00	(0.40-2.47)

黑体条目表示具有统计显著性（p<0.05）。注意:2009年4月联邦消费税（FET）在第7轮调查和第8轮调查之间增加了。
*调整了样本出现次数。
†收入定义为：低≤29 999美元；中=30 000–59 999美元,；高≥60 000美元。
‡尼古丁依赖的测量：依据吸烟指数的大小得分（0–6）；分类：低≤4，高≥4。
§教育定义为：低≤高中；中=一些学院/技术/职业学校；高=大学研究生学位或者更高。

总之，随着现今吸烟人群越来越少，高端和低价品牌之内和之间的价格营销可能在决定未来卷烟品牌的流行趋势方面扮演一个越来越重要的角色。尽管知名品牌，如Marlboro，Newport和Camel，得以保持其流行度，高端品牌的流行性，如 Winston，Virginia Slims和Benson and Hedges，已经开始下降。十年前传统的价格等级（即，高端、低价和廉价）似乎也不再适用。这是因为生产商越来越多的利用价格促销手段来保证高端品牌的流行性，如Marlboro 的定价几乎与低价品牌旗鼓相当[18,19,21,22]。

已有的研究表明，低价品牌的出现会破坏人们为了减少烟草使用所做的努力[4,5]。本研究表明，那些因为经济条件（低收入人群）和健康风险（年长的和重度吸烟的人群）而最不能承受长期吸烟所带来负担的吸烟者，却也是最容易使用或者转而使用低价品牌卷烟的群体。从烟草控制的角度而言，本研究的发现表明，由于卷烟的生产者们可能会继续实行竞争性的价格营销策略以争取逐渐减少的吸烟者群体，政府应该考虑制定更强有力的最低价格法案，以保证卷烟的基准价格处在一个较高水平。

本文贡献

- ▶ 本研究结果表明美国成年吸烟者的卷烟品牌偏好在过去十年已经改变了。其中，低价卷烟品牌的使用增加了，尤其在2009年联邦卷烟消费税增加0.61美元后。
- ▶ 虽然当厂家越来越多的利用价格促销手段来保证高端品牌的流行度，如定价足以与低价品牌竞争的Marlboro，十年前传统的价格等级（即高端，低价和廉价）可能不再适用。我们的数据显示人口结构变化和吸烟趋势带来了低价卷烟品牌的持续增长。从烟草控制的角度而言，本研究的发现表明，由于卷烟的生产者们可能会继续实行竞争性的价格营销策略以争取逐渐减少的吸烟者群体，政府应该考虑制定更强有力的最低价格法案，以保证卷烟的基准价格处在一个较高水平。

贡献

GTF、KMC、AH：设想和调查设计。MC、PD、KMC：数据分析。MC、PD、GTF、FJC、AH、MBT、MJC、KMC：起草手稿并对其中重要的知识内容做了严格修订。所有的作者阅读并同意了终稿。

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出处和同行审查 未开展；外部同行已评审。

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