Impact of China National Tobacco Company's 'Premiumization' Strategy: longitudinal findings from the ITC China Surveys (2006–2015)

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ABSTRACT

Background In 2009, the China National Tobacco Company (CNTC) began their *Premiumization Strategy*, designed to encourage smokers to trade up to more expensive brands, mainly by promoting the concept that higher class cigarettes are better quality and less harmful. This study is the first evaluation of the strategy's impact on: (1) prevalence of premium brand cigarettes (PBC), mid-priced brand cigarettes (MBC) and discount brand cigarettes (DBC) over 9 years, from 3 years pre-strategy (2006) to 6 years post-strategy (2015); and (2) changes in reasons for choosing PBCs, MBCs and DBCs.

Methods A representative cohort of adult Chinese smokers (n=9047) in seven cities who participated in five waves of the International Tobacco Control (ITC) China Survey: pre-implementation (Wave 1 (2006; n=3452), Wave 2 (2007–2008; n=3586)); mid-implementation (Wave 3 (2009; n=4172)); and post-implementation (Wave 4 (2011–2012; n=4070), Wave 5 (2013–2015; n=2775)). Generalised estimating equations were conducted to examine changes in prevalence of PBCs, MBCs and DBCs, and reasons for brand choice from pre-implementation to post-implementation.

Results From pre-implementation to post-implementation, there was an increase in prevalence of PBCs (5.4% to 23.2%, p<0.001) and MBCs (40.0% to 50.4%, p<0.001), and a decrease in DBCs (54.6% to 26.5%, p<0.001). There was an increase in smokers who chose their current brand because they believed it to be less harmful, both for MBC smokers (+13.0%, p=0.001) and PBC smokers (+9.0%, p=0.06). There was an increase for smokers in all brand classes for choosing their current brand because they were 'higher in quality' and because of affordable price, but the greatest increase was among PBC smokers (+18.6%, p<0.001 and +34.9%, p<0.001, respectively).

Conclusions Our findings demonstrate that the rising trend in Chinese smokers' choice of 'less harmful', 'higher quality' and 'affordable' cigarettes, particularly PBCs, is likely due to CNTC's aggressive marketing strategies. Strong tobacco control policies that prohibit CNTC's marketing activities are critical in order to dispel erroneous beliefs that sustain continued smoking in China, where the global tobacco epidemic is exerting its greatest toll.

INTRODUCTION

The tobacco epidemic in China is a public health challenge of unmatched proportions.[1] More than 300 million people in China smoke (including about half of all men), which represents one–third of the world's smokers, and approximately 1 million tobacco-attributable deaths occur every year.[2] China's cigarette market is vast, with a total of 2.4 trillion cigarettes consumed each year. Chinese smokers consume more cigarettes than smokers in all other low/middle-income countries combined.[3] Without effective measures to reduce tobacco use, the number of annual tobacco-related deaths in China is projected to reach 3 million by 2050.[4]

The China National Tobacco Company (CNTC) is a state-owned enterprise, with a monopoly of the cigarette market, accounting for 98% of domestic sales.[5–7] In 2015, CNTC's gross profit was ¥303 billion (Chinese yuan renminbi, RMB) (about US$48 billion),[8] making it the most profitable company in the country. The tobacco industry contributed ¥840.4 billion (equivalent to about US$122 billion) in tobacco tax revenue in 2015, a 9% increase from their contribution in 2014. In all, CNTC contributes 7%–10% of Chinese central government's total annual revenue through tobacco tax and profit-sharing,[3 7] not including revenues shared to local governments.

Switching between cigarette brands in China in response to price increases

Relative to other countries where the variability of cigarette prices is smaller, Chinese smokers offset price increases by switching to cheaper cigarette brands (and which are often still in the same price class).[9] White *et al*[9] found that although a substantial number (38%) of smokers switched price tiers between waves of the International Tobacco Control (ITC) China Survey, about 1–1.5 years apart, more than half switched brands between waves but stayed within the same price tier. Interestingly, trading up was more common among smokers in mid-priced classes, which likely reflected rising affordability and only a nominal 1.5% price increase between 2006 and 2009. This demonstrates that Chinese smokers are relatively flexible in brand choices and do not generally display strong loyalty to one brand variety.

CNTC's cigarette *Premiumization Strategy*

Historically, the majority of cigarette sales in China have been discount brand cigarettes (DBC) and mid-priced brand cigarettes (MBC). However, as China experienced annual double-digit economic

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growth in the early 2000s,[10] resulting in a surge in disposable household income, Chinese smokers could afford to spend more on cigarettes,[7 11–13] which ultimately would have fuelled an increase in cigarette consumption, and discouraged smoking cessation.[14]

The increasing affordability created a lucrative opportunity for CNTC to increase revenue and profit. Beginning in the mid-2000s, CNTC began to adjust their cigarette brand portfolio, starting first with two important actions. First, CNTC reduced the 1000+ brand and brand variants through elimination and consolidation into a much smaller number of brands to increase production efficiency and to increase product appeal to consumers in both domestic and foreign markets.[7] Second, they changed the price structure of its brand portfolio ('*Juan Yan Jie Gou Ti Sheng*') by decreasing sales of cheaper DBCs and increasing sales of high-end cigarettes by encouraging DBC smokers to trade up to MBCs or premium brand cigarettes (PBC), and encouraging MBC smokers to trade up to PBCs. To achieve their 'trading up' goal, in January 2009, CNTC introduced their 5-year *Premiumization Strategy* (2010–2015).[7 8 15 16] This action plan resulted in a sharp increase in the number of new cigarette brand variants that entered the domestic market (particularly in the post-Premiumization (post-implementation) period, see online supplementary figure 1). Between 2012 and the first half of 2017, a total of 615 new cigarette brand variants entered China's tobacco market, of which 510 (83%) were PBCs, 82 (13%) were MBCs and only 23 (4%) were DBCs[17] (online supplementary figure 2).

While marketing PBCs by emphasising their superiority, quality, luxury and exclusivity, CNTC also linked PBCs to *guanxi*—a Chinese system of social networks and influential relationships to facilitate business and other dealings,[7 18] and positioning PBCs as ideal for gift-giving. Cigarette gifting and sharing are important and common Chinese social networking practices (primarily an exclusive practice among men), and have been shown to have a significant influence on brand preference.[19] These social practices not only drive cigarette consumption among established smokers,[20] but have been linked to increased smoking initiation, failure to quit smoking[20–22] and increased secondhand smoke at home.[23] Gifting and sharing have significantly contributed to the smoking epidemic in China.[19 20]

To our knowledge, this is the first study to evaluate the impact of CNTC's *Premiumization Strategy*. We conducted a longitudinal analysis over a 9-year period (2006–2015), starting from the pre-implementation period through the mid-implementation period, and finally in the post-implementation period. Our longitudinal analyses examined: (1) changes in prevalence of the three cigarette brand categories (PBCs, MBCs, DBCs); (2) the pre-implementation and post-implementation changes in reasons for choosing PBCs, MBCs and DBCs, including those reasons that were specifically targeted in the CNTC strategy (perceptions of quality and of harmfulness) and those that were not specifically targeted (e.g., greater affordability); and (3) predictors of choosing PBCs and MBCs compared with DBCs.

METHODS

The ITC China Survey is a longitudinal prospective cohort study of a representative sample of adult (≥18 years) daily and weekly smokers. Five survey waves were conducted between 2006 and 2015 from six cities in Waves 1 and 2 (Beijing, Changsha, Guangzhou, Shanghai, Shenyang, Yinchuan), seven cities in Waves 3 and 4 (Beijing, Changsha, Guangzhou, Shanghai, Shenyang, Yinchuan, Kunming) and five cities in Wave 5 (Beijing, Guangzhou, Shanghai, Shenyang, Kunming).

At Wave 1, a multistage cluster sampling design was used to randomly identify smokers through household enumeration in each of the respective cities. Informed written consent was obtained, and the survey was conducted by face-to-face interview (approximately 45–60 min). To maintain the sample size over time, cohort members lost to follow-up at each wave were replenished by newly recruited individuals from the same sampling frame as wave 1.[24] Respondents were eligible for this study if they had completed all survey questions regarding their cigarette brand.

For this evaluation study, the five waves were categorised into three periods: *pre-implementation*, consisting of Wave 1 (April to August 2006) and Wave 2 (October 2007 to January 2008); *mid-implementation*, consisting of Wave 3 (May to October 2009); and *post-implementation*, consisting of Wave 4 (September 2011 to November 2012) and Wave 5 (November 2013 to July 2015).

Measures

CNTC's cigarette price classification system

The structure of CNTC's internal classification system of PBCs, MBCs and DBCs arises from a clustering of five cigarette classes (or grades) based on before-tax allocation price: PBCs consist of Class I (>¥10/pack) and Class II (¥7–¥10/pack); MBCs consist of Class III (¥3–¥7/pack); and DBCs consist of Class IV (¥1.65–¥3/pack) and Class V (<¥1.65/pack).

Current regular brand choice

Each respondent's *current regular brand choice* was assessed with this question: '*In the last 30 days, what brand of cigarettes did you smoke more than any other?*' Respondents were asked to show their cigarette package and the bar code was recorded by the interviewer. The bar code was used by the research team to determine the brand and brand variant using CNTC's cigarette catalogue, the official list of all CNTC brands and brand varieties (accounting for 98% of domestic sales).[25] Each brand variety is listed in the catalogue with both a photograph of the package. This information was used to classify smokers' brand explicitly and unambiguously into the five classes (I–V) using the prices for each brand that were gathered from CNTC sources, and then subsequently into the broader categories of PBC, MBC or DBC using CNTC's cigarette price classification system. This matching process was conducted by the first author (SSX) and by a research assistant (both of whom are native Chinese speakers).

Reasons for brand selection

Reasons for brand selection were measured by answering 'yes' or 'no' to four questions: '*In choosing your current regular brand, was part of your decision to smoke this brand based on: they are less harmful to your health, affordable price, high quality, or received as a gift.*'

Demographic and socioeconomic variables

Demographic variables were: sex, age (18–24, 25–39, 40–54, 55+) and monthly household income (<¥1000, ¥1000–¥3000, ¥3000–¥5000, ¥5000–¥7000, ¥7000–¥9000, >¥9000; ¥1=US$0.16).

Cigarette affordability was defined as the ratio of 'cigarettes price per day' to 'household per-capita daily income'. Cigarette price per day was calculated by multiplying the respondent's self-reported cigarette price per stick (converted from the price

they paid for their pack of cigarettes) and the number of cigarettes smoked per day (consumption). Household per-capita daily income was calculated by dividing household monthly income by the average number of days in a month (30.4) and then by the number of adults in the household. For Waves 1–4, where household income was given in categories, the midpoint at each income category was used for the calculation. This index is unitless and is comparable between respondents (and represents the proportion of personal income spent on cigarettes). It is a modified version of the relative income price measure of affordability that was first used by Blecher and van Walbeek,[26] modified in that it was computed at the individual level. A lower ratio is indicative of higher affordability.

Smoking status
Current smokers self-reported having smoked at least 100 cigarettes, and smoked every day (daily smoker) or some days (non-daily smokers).

Time in sample
In longitudinal surveys, individuals' responses may differ depending on how many waves (surveys) they have participated

in. Therefore, it is necessary to control for these time-in-sample (TIS) effects by adding a value for each respondent to all analytic models. Including a TIS variable (which is equal to the total number of waves that the respondent was present (e.g., a respondent who entered the study at Wave 2, and also participated at Waves 3, 4 and 5, would be given a numeric TIS value of 4) is a standard procedure for all longitudinal analyses of ITC survey data.[27]

Statistical analyses
Initial unweighted descriptive statistics were used to describe respondent characteristics at baseline (see table 1).

Weighted prevalence estimates of PBC, MBC and DBC use, and reasons for their current regular brand choice, were calculated at each wave, and also for the pre-implementation and post-implementation periods using logistic regression analyses incorporating generalised estimating equations (GEE).[28] Demographic and socioeconomic explanatory variables and reasons for PBC or MBC brand choice (compared with DBCs) were fitted using GEE models with the multinomial logit link. Pre-implementation and post-implementation differences between PBC, MBC and DBC smokers for the reasons for choosing their

Table 1 Sample characteristics of respondents at recruitment by wave

Characteristics	Wave 1 (2006) (n=3452) n	%	Wave 2 (2007–2008) (n=3586) n	%	Wave 3 (2009) (n=4172) n	%	Wave 4 (2011–2012) (n=4070) n	%	Wave 5(2013–2015) (n=2775) n	%	Total (n=9047) n	%
Age group												
18–24	40	1.2	33	0.9	75	1.8	58	1.4	40	1.4	151	1.7
25–39	604	17.5	588	16.4	807	19.3	730	18.0	462	16.7	1678	18.6
40–54	1708	49.5	1811	50.5	1970	47.2	1837	45.2	1148	41.4	4025	44.5
55+	1100	31.9	1154	32.2	1320	31.6	1442	35.5	1121	40.5	3186	35.2
Sex												
Male	3293	95.4	3411	95.1	3977	95.3	3888	95.5	2627	94.7	8841	95.0
Female	159	4.6	175	4.9	195	4.7	182	4.5	148	5.3	465	5.0
City												
Beijing	521	15.1	608	17.0	586	14.1	531	13.1	517	18.6	1238	13.7
Shenyang	401	11.6	553	15.4	619	14.8	570	14.0	510	18.4	1488	16.5
Shanghai	708	20.5	728	20.3	670	16.1	675	16.6	665	24.0	1370	15.1
Changsha	765	22.2	666	18.6	635	15.2	632	15.5	0	0.0	1260	13.9
Guangzhou	532	15.4	433	12.1	346	8.3	326	8.0	419	15.1	1112	12.3
Kunming	0	0.0	0	0.0	724	17.4	678	16.7	664	23.9	1259	13.9
Yinchuan	525	15.2	598	16.7	592	14.2	658	16.2	0	0.0	1320	14.6
Income												
<¥100	652	18.9	591	16.5	404	9.7	213	5.2	35	1.3	662	7.3
¥1000–¥2999	1548	44.8	1622	45.2	1609	38.6	1164	28.6	299	10.8	2644	29.2
¥3000–¥4999	668	19.4	746	20.8	1188	28.5	1257	30.9	666	24.0	2360	26.1
¥5000–¥6999	234	6.8	269	7.5	465	11.2	678	16.7	730	26.3	1439	15.9
¥7000–¥8999	57	1.7	61	1.7	134	3.2	298	7.3	338	12.2	578	6.4
¥9000 or above	59	1.7	71	2.0	135	3.2	284	7.0	491	17.7	771	8.5
Don't know	234	6.8	226	6.3	237	5.7	176	4.3	216	7.8	593	6.6
Smoking status												
Daily	3250	94.2	3420	95.4	3996	95.8	3863	94.9	2627	94.7	8533	94.3
Weekly	202	5.9	166	4.6	176	4.2	206	5.1	148	5.3	513	5.7
Cohort												
Recruited in Wave 1	3452	100.0	2943	82.1	2302	55.2	1524	37.4	737	26.6	4336	47.9
Recruited in Wave 2	–	–	643	17.9	476	11.4	251	6.2	130	4.7	784	8.7
Recruited in Wave 3	–	–	–	–	1394	33.4	789	19.4	448	16.1	1516	16.8
Recruited in Wave 4	–	–	–	–	–	–	1506	37.0	665	24.0	1616	17.9
Recruited in Wave 5	–	–	–	–	–	–	–	–	795	28.7	795	8.8

current regular brand were also modelled and tested using GEE (with the logit link). All analyses controlled for sex, age, city, cigarette affordability, smoking status and TIS.

To address a potential design effect resulting from the complex longitudinal survey design and within-individual correlations due to repeated measures at each wave, a nested structure that includes the strata (cities), the primary sampling units (neighbourhood or 'Ju Wei Hui') and the respondent IDs (with repeated measures at each wave) was used to construct the models. The rescaled cross-sectional weights at recruitment were applied to each respondent for modelling. The technical details on weight calculation are available in the ITC China Project technical reports:http://www.itcproject.org/technical-report/?country=China.

All the above analyses were conducted using SAS-Callable SUDAAN (V.11).[29] The predicted marginal standardisation method in the SUDAAN GEE model (PREDMARG) was used for estimating prevalence.[30] General linear contrasts of the predicted marginals in the corresponding models were specified to test the significance of between-wave per cent changes. All CIs and statistical significance were tested at the 95% confidence level.

RESULTS
Brand code eligibility
Across the five waves, there were 23 084 smoking respondent records. Of these, 94.6% (21 841 records) provided cigarette package bar codes to the interviewer, leaving 1243 missing records. Among the 21 841 respondent records over the five waves who provided a bar code, 87% (19 011 records) could be assigned to a brand family and variant. Among the 19 011 records with correctly identified brand names and varieties, 95% (18 055 records) could be classified by price; these were categorised into one of CNTC's five price classes. The end result of this process was that 78.2% (18 055/23 084) of the original records were valid for inclusion in this study.

Study sample
The current study included smokers (daily and non-daily) for which information about their current regular cigarette brand could be ascertained at the time of the survey interview (see description above). Of the 10 201 current daily or weekly smokers who participated in any of the five wave surveys, 9047 had complete survey data and their current regular cigarette brand choice was validated, and thus were included in all subsequent analyses.

Table 1 presents the demographic and smoking behaviour characteristics of the sample at recruitment. In brief, the average age of the sample at the time of recruitment was 50.3 years. Nearly all of the respondents were male (95%) and daily smokers (94%).

Prevalence trends of the three cigarette brand choices over the 9-year period
Between 2006 and 2015, there was an increase in PBCs (4.7% to 32.1%) and MBCs (32.3% to 48.1%), and a substantial decrease in DBCs (57.0% to 19.8%) (see table 2). In particular, the largest changes for all three brand classes occurred during the post-implementation period, especially for PBCs where there was a greater influx of new PBCs entering the market.

As shown in figure 1, there was a significant increase for PBCs (5.4% to 23.2%, p<0.001) and MBCs (40.0% to 50.4%, p<0.001), and a significant decrease for DBCs (54.6% to 26.5%, p<0.001) between pre-implementation and post-implementation. The increase for PBCs (+27.4%) was greater than the increase for MBCs (+9.8%, p<0.001) between pre-implementation and post-implementation.

Reasons for current brand choice between pre-implementation and post-implementation
Current brand choice is less harmful to your health
As shown in table 3, there was an increase for smokers in each of the brand classes for choosing their current brand because they were less harmful for their health, although the change was only significant for MBCs (p=0.001), and was marginally significant for PBCs (p=0.06). The difference was not significant between DBCs (+4.4% increase) and PBCs (+9.0% increase) or MBCs (+13.0% increase).

Current brand choice is higher in quality
There was a significant increase for smokers in all three brand classes for choosing their current brand because they were higher in quality. PBC smokers had the greatest increase (+18.6, p=0.0002), followed by MBCs (+16.1%, p<0.0001) and DBCs (+8.4%, p=0.012). PBC and MBC smokers had a greater increase than DBC smokers in choosing their brand because of higher quality (table 3).

Current brand choice is more affordable
There was a significant increase for smokers in all three brand classes for choosing their current brand because of affordable price. But PBC smokers had the largest increase in choosing their current brand because of price (+34.6%, <0.0001), followed by MBC smokers (+26.5%, <0.0001) and DBC smokers (+13.0%, <0.0001). There was a greater increase over time for

Table 2 Prevalence of PBCs, MBCs and DBCs from pre-implementation (2006) to post-implementation (2013–2015) of the *Premiumization Strategy*

Wave (survey year)	Implementation timing	Premium brand cigarettes (PBC)		Mid-priced brand cigarettes (MBC)		Discount brand cigarettes (DBC)	
		%	(95% CI)	%	(95% CI)	%	(95% CI)
Wave 1 (2006)	Pre-implementation	4.7	(3.4 to 6.3)	38.3	(34.0 to 42.9)	57.0	(52.2 to 61.7)
Wave 2 (2007–2008)	Pre-implementation	6.1	(4.5 to 8.2)	41.8	(37.6 to 46.1)	52.1	(47.8 to 56.3)
Wave 3 (2009)	Mid-implementation	8.8	(7.2 to 10.6)	44.0	(40.0 to 48.1)	47.2	(42.6 to 51.9)
Wave 4 (2011–2012)	Post-implementation	19.5	(16.6 to 22.7)	52.4	(47.3 to 57.4)	28.2	(22.5 to 34.6)
Wave 5 (2013–2015)	Post-implementation	32.1	(28.7 to 35.8)	48.1	(43.2 to 53.0)	19.8	(14.7 to 26.1)

The prevalence estimates controlled for sex, age, time in sample, city, affordability and smoking status.
Data are weighted and standardised.
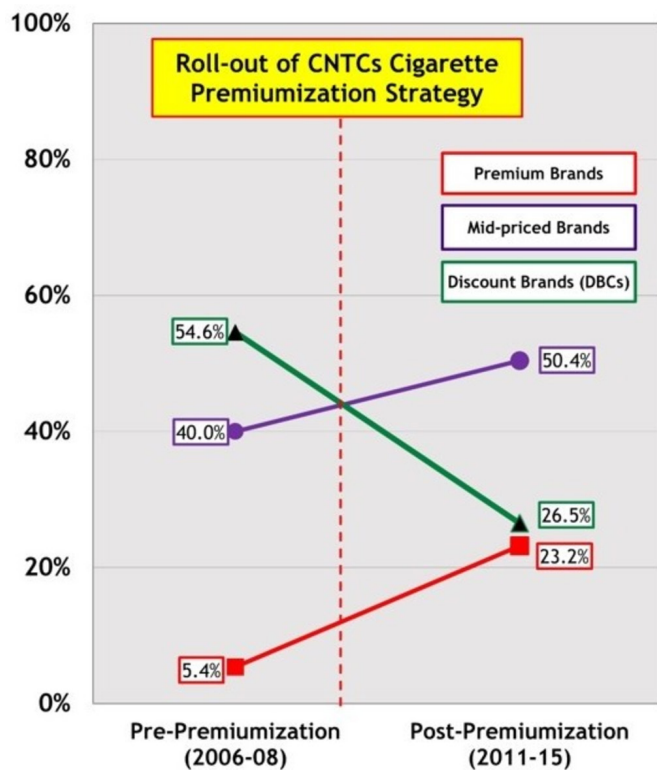
Figure 1 Prevalence of brand choice before and after *Premiumization Strategy* among urban adult smokers in China. CNTC, China National Tobacco Company.

PBC (p=0.0001) and MBC (p<0.0001) smokers to choose their brand because of price compared with DBC smokers (table 3).

Predictors of PBC and MBC use compared with DBCs

Demographic and socioeconomic predictors of current brand choice PBC smokers were more likely to be: younger (with the greatest use among 25–39 year-olds compared with the oldest age group), male, from Shanghai, Kunming, or Yinchuan, a non-daily smoker and have greater cigarette affordability (see table 4A). MBC smokers were also more likely to be younger in age, from all other cities compared with Beijing and less likely to be a daily smoker. And although MBC smokers had significantly greater cigarette affordability compared with DBC smokers, this was more apparent among the PBC group.

Next, when comparing the use of PBCs versus DBCs over time (where Wave 1 was the reference), there was no significant increase in the odds of smokers using PBCs versus DBCs between Wave 1 (pre-implementation) and Wave 2 (pre-implementation; OR=1.50, p=0.1). However, the use of PBCs (vs DBCs) was more likely to have significantly increased by mid-implementation (Wave 3, OR=2.89, p<0.001), and even more so at the post-implementation periods, Wave 4 (OR=16.10, p<0.001) and Wave 5 (OR=51.66, p<0.001). Moreover, after controlling for all personal-level characteristics, affordability and reasons for choosing current brand, PBC use increased exponentially over time, with a much more significant increase at Wave 5 compared with Wave 4.

Finally, when comparing the use of MBCs versus DBCs over time, there was a significant increase in the use of MBCs by Wave 2 (OR=1.39 1.09, p=0.009). And although there were significant increases over time by mid-implementation (OR=1.68, p<0.001) and post-implementation Wave 4 (OR=4.47,

p<0.001) and Wave 5 (OR=7.01, p<0.001), these increments were much less pronounced than the changes in PBC use over time (and there was little difference between Wave 4 and Wave 5 for MBC vs DBC use as compared with PBC vs DBC use), thus pointing to the much greater shift from DBCs to PBCs after the implementation of the *Premiumization Strategy*.

Reasons as predictors of PBC and MBC use compared with DBCs

Compared with DBC smokers, PBC smokers were significantly more likely to choose their brand because they were: less harmful, received as a gift from others and higher in quality. DBC smokers were more likely to choose their brand because of affordable price (see table 4B).

Compared to DBC smokers, PBC smokers were significantly more likely to choose their brand because they were: less harmful, received as a gift from others, and higher in quality. DBC smokers were more likely to choose their brand because of affordable price (see table 4B).

DISCUSSION

The present study demonstrates that CNTC's *Premiumization Strategy*, coupled with increased affordability, has been successful in shifting the market from low-priced brands to the more profitable brands (PBCs and MBCs), with the greatest increase in PBCs, whose market share increased by 17.8 percentage points (a relative increase of 2.3-fold) from pre-implementation to post-implementation.

The reasons for smokers choosing their current brand because of 'lower harm' increased within each of the brand classes between pre-implementation and post-implementation (although this was only significant for MBCs, and marginally significant for PBC smokers). Additionally, there was a significant increase for smokers among all brand classes for choosing their current brand because they were 'higher in quality' and because of price, with the greatest increase among PBC smokers. This strongly suggests that CNTC's *Premiumization Strategy* had an effect for smokers among all brand classes, but to a much greater degree for the PBCs and MBCs compared with the DBCs. This may also be evidence that CNTC took advantage of the increase in cigarette affordability, as this measure had the largest pre-post increases for all three brand classes.

These findings are consistent with those of nationally representative surveys that have shown that Chinese smokers are susceptible to industry marketing messages about the "harmfulness" of cigarette products. For example, the Global Adult Tobacco Survey in China found that only 10% of smokers are aware that that low tar and light cigarettes are equally as harmful as regular cigarettes.[2] Other ITC China studies have shown that the majority of smokers believe that 'light' and 'low tar' cigarettes are less harmful than regular cigarettes[31 32]—the highest level of over 20 ITC countries.[33 34] Gravely *et al* showed that although a substantial proportion of smokers in 10 low/middle-income countries erroneously believed that light, low tar and menthol cigarettes are less harmful, and that filters reduce harm, the findings were particularly disturbing in China, where prevalence of industry-induced misconceptions was the highest for all of these measures.[32] The current study links those findings on the perceptions of harmfulness to CNTC's *Premiumization Strategy*, which included conveying the concept that higher class cigarettes are less harmful: a higher proportion of PBC smokers (55%) at post-implementation chose their brand because they believed them to be less harmful than did MBC smokers (52%) and DBC smokers (39%). PBC smokers were 1.4 times more likely than DBC smokers to choose their brand because they believed them to be less harmful.

Table 3 Reasons for smokers choosing their current cigarette brand: before and after CNTC's *Premiumization Strategy*

	Premium brand cigarettes (PBC)				Mid-priced brand cigarettes (MBC)				Discount brand cigarettes (DBC)			
	n	%	SE	(95% CI)	n	%	SE	(95% CI)	n	%	SE	(95% CI)
Less harmful												
Pre-implementation	146	46.2	3.9	38.6 to 53.9	940	39.3	2.6	34.1 to 44.7	1261	35.1	2.5	30.3 to 40.2
Post-implementation	831	55.2	2.3	50.5 to 59.7	1807	52.3	2.3	47.7 to 57.0	742	39.5	3.0	33.6 to 45.7
Pre-post % difference		+9.0				+13.0				+4.4		
P value of pre-post difference		0.06				0.001				0.26		
P value of pre-post difference of PBCs versus DBCs and MBCs versus DBCs		0.39				0.07				–		
Higher in quality												
Pre-implementation	247	68.3	4.2	59.5 to 76.0	1670	65.2	2.7	59.6 to 70.4	2311	58.8	2.9	52.9 to 64.4
Post-implementation	1387	86.9	1.5	83.5 to 89.7	2829	81.3	1.6	77.8 to 84.4	1070	67.2	2.5	62.1 to 71.9
Pre-post % difference		+18.6				+16.1				+8.4		
P value of pre-post difference		0.0002				<0.0001				0.012		
P value of pre-post difference of PBCs versus DBCs and MBCs versus DBCs		0.036				0.025				–		
Affordable price												
Pre-implementation	162	46.9	5.2	36.9 to 57.2	1660	63.5	2.6	58.1 to 68.6	2979	79.9	1.4	77.1 to 82.5
Post-implementation	1403	81.8	2.5	76.2 to 86.3	3209	90.0	1.2	87.2 to 92.2	1405	92.9	1.6	89.1 to 95.5
Pre-post % difference		+34.9				+26.5				+13.0		
P value of pre-post difference		<0.0001				<0.0001				<0.0001		
P value of pre-post difference of PBCs versus DBCs and MBCs versus DBCs		0.0001				<0.0001				–		

CNTC, China National Tobacco Company.

In addition to marketing higher class cigarettes, particularly the PBCs, as less harmful and higher quality, CNTC took advantage of another vulnerability—the common custom of gifting and sharing of cigarettes. Cigarette smoking is part of the Chinese culture, and gifting and sharing cigarettes are a popular and normal experience, and play an important part in social functions. Gifting of cigarettes, specifically luxury premium brands, cultivates new relationships, expresses gratitude, shows respect and demonstrates financial success of the giver.[19 20 35] It is a social networking phenomenon that is not experienced in any other country in the world. The results from this study demonstrate that smokers' brand preferences were influenced by receiving their brand as a gift, where 3 times more PBC smokers and 1.5 times more MBC smokers reported that they chose their brand because they were received as a gift compared with DBC smokers.

Strengths and limitations

The strengths of this study include the large sample size, rigorous longitudinal study design and the ability to link smokers' current regular cigarette brands with their reasons for choosing their brand. However, there were some limitations. One limitation is that we used the CNTC's (before-tax) allocation price instead of the actual price paid at the last purchase to classify cigarettes as premium, mid-priced or discount brands. CNTC allows retailers to sell cigarettes with an adjustment of 10% above or below the recommended retail price; this may have led to a small number of misclassifications if the adjustment moved a brand from one category to the

adjoining one. It should be noted, however, that this variability led to decreased reliability, not validity/bias, and lower reliability leads to a lower likelihood of statistical significance. In other words, the significant differences obtained were despite the lower reliability, not because of it. Second, the measures used were self-reported, which may be subject to recall bias and social desirability, although it is not clear how this would have changed the pattern of findings. Additionally, among smokers reporting using premium brands at any time over the five waves of data, we do not know whether that was the first time they had ever smoked premium brands. However, what matters is the analyses of switching to vs switching from premium brands, which showed a pattern consistent with CNTC's premiumization strategy objectives. Finally, the composition of the ITC cohorts in China only allowed for analyses of adult smokers; we thus could not examine the effect of the *Premiumization Strategy* on new smokers, including youth.

CONCLUSION

The Chinese tobacco industry is a state-owned enterprise with a monopoly, and its political influence, fuelled by its considerable contributions to the Chinese economy, has led to slow and ineffective governmental action in tobacco control.[33 36–39] The findings from this study are an important manifestation of this influence: the *Premiumization Strategy* over the past decade that has taken advantage of the expanding gap between cigarette prices (kept low in large measure because of the lack of tax increases) and smoker's willingness to pay for 'better quality' and 'lower harm'

Table 4A Demographic and socioeconomic predictors of PBCs and MBCs as a regular brand compared with discount brand cigarettes (DBC)

Explanatory variables	n	% n (raw)	Premium brand cigarette (PBC) smoker		Mid-priced brand cigarette (MBC) smoker	
			OR (95% CI)	P values	OR (95% CI)	P values
Intercept			0.01 (0.00 to 0.02)	<0.001	0.14 (0.07 to 0.26)	<0.001
Survey waves						
Wave 1	3452	19.1	Reference		Reference	
Wave 2	3586	19.9	1.50 (0.87 to 2.58)	0.1	1.39 (1.09 to 1.78)	0.009
Wave 3	4172	23.1	2.89 (1.91 to 4.37)	<0.001	1.68 (1.27 to 2.22)	<0.001
Wave 4	4070	22.5	16.10 (9.85 to 26.32)	<0.001	4.47 (3.10 to 6.44)	<0.001
Wave 5	2775	15.4	51.66 (29.34 to 90.95)	<0.001	7.01 (4.28 to 11.46)	<0.001
Age group						
18–24	246	1.4	5.41 (2.24 to 13.03)	<0.001	3.26 (1.52 to 7.03)	0.003
25–39	3191	17.7	7.94 (5.44 to 11.60)	<0.001	3.56 (2.89 to 4.38)	<0.001
40–54	8474	47.0	2.66 (1.96 to 3.61)	<0.001	1.79 (1.51 to 2.12)	<0.001
55+	6137	34	Reference		Reference	
Sex						
Male	17196	95.24	2.07 (1.03 to 4.17)	0.041	1.34 (0.97 to 1.84)	0.076
Female	859	4.76	Reference		Reference	
City						
Beijing	2763	15.3	Reference		Reference	
Shenyang	2653	14.7	1.19 (0.65 to 2.20)	0.567	1.73 (1.05 to 2.84)	0.032
Shanghai	3446	19.1	20.41 (11.71 to 35.57)	<0.001	17.80 (11.54 to 27.46)	<0.001
Changsha	2698	14.9	0.82 (0.42 to 1.60)	0.564	0.51 (0.30 to 0.86)	0.012
Guangzhou	2056	11.4	0.74 (0.35 to 1.56)	0.429	2.74 (1.49 to 5.05)	0.002
Kunming	2066	11.4	14.65 (6.94 to 30.90)	<0.001	7.89 (4.59 to 13.54)	<0.001
Yinchuan	2373	13.1	2.85 (1.40 to 5.80)	0.004	2.38 (1.54 to 3.67)	<0.001
Time in sample						
1	7802	43.2	1.67 (0.89 to 3.13)	0.111	1.30 (0.69 to 2.43)	0.414
2	4940	27.4	1.35 (0.68 to 2.69)	0.391	1.21 (0.64 to 2.27)	0.558
3	2988	16.6	1.11 (0.66 to 1.85)	0.694	1.19 (0.69 to 2.04)	0.522
4	1631	9.0	1.06 (0.65 to 1.72)	0.821	0.91 (0.60 to 1.39)	0.671
5	694	3.8	Reference		Reference	
Smoking status						
Daily	17156	95.0	0.29 (0.20 to 0.43)	<0.001	0.65 (0.48 to 0.89)	0.007
Weekly	898	5.0	Reference		Reference	
Affordability			6.52 (4.25 to 10.00)	<0.001	1.62 (1.11 to 2.36)	0.012

The variables in the model are presented in table 4b.

Table 4B Reasons that are associated with PBCs and MBCs as a current brand choice compared with discount brand cigarettes (DBC)

Explanatory variables	n	Raw %	Premium brand cigarette (PBC) smoker		Mid-priced brand cigarette (MBC) smoker	
			OR (95% CI)	P values	OR (95% CI)	P values
Intercept			<0.001			
Reason for choosing own brand: less harmful						
Yes	7372	43.2	1.42 (1.18 to 1.70)	<0.001	1.19 (1.02 to 1.40)	0.026
No	9690	56.8	Reference		Reference	
Reason for choosing own brand: affordable price						
Yes	14192	79.3	0.16 (0.12 to 0.21)	<0.001	0.39 (0.32 to 0.47)	<0.001
No	3710	20.7	Reference		Reference	
Reason for choosing own brand: gift from others						
Yes	1628	9.2	2.94 (1.89 to 4.58)	<0.001	1.58 (1.14 to 2.19)	0.007
No	16116	90.8	Reference		Reference	
Reason for choosing own brand: high quality						
Yes	12500	70.6	3.26 (2.70 to 3.95)	<0.001	2.03 (1.81 to 2.27)	<0.001
No	5217	29.5	Reference		Reference	

The other covariates in the model are presented in table 4a.

products. Our findings demonstrate that the rising trend in Chinese smokers' choice of premium brands is likely due to CNTC's aggressive marketing strategies, coupled with greater cigarette affordability. Notably, the strong smoking-social relationship created by the tobacco industry must be broken by deglamorising smoking and cigarette gifting. Strong tobacco control policies that prohibit CNTC's marketing activities are critical in order to dispel erroneous beliefs that sustain continued smoking in China, where the global tobacco epidemic is exerting its greatest toll.

What this paper adds

- ► In early 2009, in the midst of strong economic growth, the China National Tobacco Company (CNTC) started to push forward their *Premiumization Strategy,* which aimed to shift the domestic tobacco market towards more expensive cigarette brands by promoting the concept that higher class cigarettes are better quality and less harmful, particularly premium brand cigarettes (PBCs).
- ► The present study demonstrates that CNTC's cigarette *Premiumization Strategy*, coupled with increased affordability, has been successful in shifting the market from low-priced brands to the more profitable brands (PBCs and MBCs), with the greatest increase in PBCs, whose market share increased by 17.8 percentage points (a relative increase of 2.3-fold) from pre- to post-implementation. DBCs significantly decreased by 28.1% by the post-measure (a relative decrease of 51%).
- ► Reasons for choosing their current brand because it was believed to be 'less harmful' increased at the post-implementation by 13.0% for MBC smokers and by 9.0% for PBC smokers.
- ► From pre-implementation to post-implementation, there was a significant increase for smokers in all brand classes for choosing their current brand because they were 'higher in quality' and because of 'affordable price', with the greatest increase among PBC smokers for both measures (by 18.6% and 34.9% respectively).
- ► These findings demonstrate the need for stronger tobacco control measures in China, particularly implementing large graphic warnings, increasing the price of cigarettes, stronger advertising bans, and public health campaigns that would contribute to the denormalisation of gifting cigarettes and a reduction in erroneous beliefs by smokers that some cigarette brands are less harmful.

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