Exorcising the Ghost of Cigarette Advertising Past: Collusion, Regulation and Fear Advertising

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Cigarette advertising from 1952 through 1954 that made remarkable claims of protection for the smoker's health were in part responsible for unprecedented declines in per capita cigarette consumption in 1953 and 1954. It has long been held that the FTC brought this competitive episode to a sudden halt by circulating a draft set of Cigarette Advertising Guides, and subsequently enforcing those Guidelines. We demonstrate here, using a combination of documentary evidence and an analysis of cigarette advertising content, that it was collusion on the part of the tobacco industry and not the actions of the FTC that brought the fear advertising of the early 1950s to an abrupt end.

> The past eleven years have seen immense changes in the politics of tobacco. However, economic incentives are timeless. Beleaguered manufacturers understand concerns about smoking and in the print media - where they can still place ads - they advertise accordingly. ... The comprehensive cigarette 'settlement' likely will rest on the assumption that cigarette advertising has exactly the opposite of its intended effects. Moreover, policy makers, the public, and the media probably will assume that it was the Federal Trade Commission and the Department of Health and Human Services that pushed for safer cigarettes two or three decades ago, and it was the industry that stopped it - whereas the truth is the opposite. - John E. Calfee

> The pure and simple truth is rarely pure and never simple. - Oscar Wilde

Tobacco companies use advertising to persuade consumers to purchase their brands of cigarette. This is perhaps the only uncontested statement in the debate over cigarette advertising and its regulation. While critics of cigarette advertising see it as inducing people (and particularly children) to take up smoking, and call for further limits on its volume, location, and substance, others conclude that regulation of cigarette advertising has had little effect on smokers' consumption and has had the unintended consequence of increasing tobacco industry profits by reducing competitive advertising expenditures.[1] In a series of articles, John Calfee and his co-authors take the unintended consequences argument a step further. Based on analysis of the content of cigarette ads, Calfee argues that misguided Federal Trade Commission (FTC) regulation has actually limited information about the deleterious health effects of smoking that would otherwise have appeared in cigarette advertising.[2] On this view the FTC, not the tobacco companies, has actually encouraged smoking.

The proposal that unregulated market forces could lead cigarette firms to offer advertisements that contain information on the hazards of smoking, even if this reduced the demand for cigarettes, is based on sound economic theory. So-called "fear advertising," which simultaneously acknowledges the health consequences of smoking and asserts (truthfully or otherwise) that those consequences are minimized by smoking the advertised brand of cigarette, would be individually rational to a firm that saw the gains from consumers switching to its brand outweighing the effects of a reduction in overall demand for cigarettes. This would be particularly true for a firm with a small market share, whose effect on overall demand would be borne disproportionately by other firms. Moreover, if other firms responded to their loss of customers with similar advertising intended to win them back, the situation could become self-reinforcing. No firm would be willing to unilaterally withdraw its ads for fear that customers would conclude that their cigarettes alone were hazardous.

Calfee points to an episode of fear advertising in the cigarette industry in the early 1950s as an example of competitive forces leading the cigarette industry to acknowledge and even publicize the health concerns surrounding smoking at the time, despite the negative effect that such advertising had on the demand for cigarettes. As will be described in greater detail below, many cigarette ads from 1952 through 1954 were remarkable for their claims of protection for the smoker's health and medical reassurances that the smoker had nothing to fear from smoking the advertised brand. It was generally agreed in the contemporary business press that this advertising was at least in part responsible for unprecedented declines in per capita cigarette consumption in 1953 and 1954. Calfee argues that the FTC, by circulating a draft set of Cigarette Advertising Guides in late 1954 and issuing them formally in late 1955, brought this episode to a sudden halt. Had the FTC not stepped in, Calfee contends, market forces would have caused the fear advertising and its consequences to persist.

Economic theory also tells us that when individually rational behavior leads firms to an outcome that does not maximize their joint profits, there is an incentive to collude. Collusion is most likely to be successful in a concentrated oligopolistic industry selling a relatively homogeneous product, where the ability to reach, monitor, and enforce an agreement is greatest. The tobacco industry was in the 1950s, as it is today, a tight oligopoly with a long history of anticompetitive and collusive behavior, and it would hardly be surprising to discover that, in the face of rapidly declining sales, the industry responded conspiratorially. This, in fact, is what happened, and it is the purpose of this paper to demonstrate that it was collusion, and not the actions of the FTC, that brought the fear advertising of the early 1950s to an abrupt end.

CANCER AND FEAR ADVERTISING

While there have been warnings about the connection between smoking and disease since Sir Walter Raleigh promoted its use in the 17th century, the concern was primarily with obvious symptoms such as sore throat and coughing. The situation began its dramatic change in 1950, however, when two medical papers, one British and one American, presented results of epidemiological studies that indicated a statistical relationship between smoking and lung cancer rates.[3] The link between cigarette smoking and cancer was quickly publicized in the press,[4] and while doubters remained among doctors, medical opinion began to swing toward the consensus it holds today. By late 1952, public anxiety about the health consequences of smoking was widespread,[5] and a subsequent study that demonstrated a physical link between tobacco smoke and cancer[6] and further publicity[7] heightened the public's fears.

The tobacco industry's response to what at the time was referred to as the "health scare" was multifaceted. In the marketplace, the biggest change was the introduction and promotion of king size and filter cigarettes. Table 1 shows how the market shares of the different types of cigarette changed from 1950 to 1955.

TABLE 1
CHANGES IN CIGARETTE TYPES, 1950 - 55

	Share of Market (percent)					
Type	1950	1951	1952	1953	1954	1955
Regular	89.9	86.9	80.1	70.8	61.6	54.2
King	9.5	12.2	18.5	26.0	28.5	27.2
Filter	0.6	0.9	1.4	3.2	9.9	18.6

SOURCE: *Business Week*, January 5, 1952, p. 72 and December 31, 1955, p. 47.

Although regular cigarettes (70 mm., unfiltered) comprised a majority of the market throughout the period, the king size cigarette share almost tripled and the filter share grew from less than one percent of the market in 1950 to almost 20 percent in 1955. Moreover, there was a marked proliferation of brands and different versions of existing brands. While the two best selling brands in 1950 (R.J. Reynolds' Camel regulars and American Tobacco's Lucky Strike regulars) still held the top two spots in 1955, Liggett and Myers Chesterfield regulars was pushed from third in 1950 to fourth in 1955 by American Tobacco's Pall Mall kings which ranked fifth in 1950. Philip Morris's self-titled regulars were pushed from the fourth spot in 1950 to seventh in 1955 by Brown and Williamson's Viceroy filters which had the eleventh largest share in 1950 (less than one half of one percent of the market) and R. J. Reynolds' Winston filters, which were only introduced in 1954. Overall concentration of sales by brand in the market, as measured by the Herfindahl-Hirschmann Index, fell from 0.178 in 1950 to 0.106 in 1955.[8]

To promote these new brands and types of cigarettes, their manufacturers played on the health concerns of smokers. From Camel's "more doctors smoke camels" to Pall Mall's "guard against throat scratch" to Philip Morris's "the cigarette that takes the *FEAR* out of smoking (emphasis in the original)," tobacco advertising sought to assure smokers that their brand (but by implication not others) was safe to smoke. This was particularly true of the filter brands, from Viceroy's "double-barreled protection" to Kent's "real health protection with Kent."

At the same time, the consumption of cigarettes fell dramatically. Following 21 straight years of growth, the number of cigarettes consumed fell approximately 2 percent in 1953 and an additional 4 percent in 1954.[9] With the population increasing, this implies even larger declines in per capita consumption. Numerous reasons were proffered for the decline, including the end of the Korean War (fighting men being heavy smokers), changing population demographics (fewer 20-year olds as a result of low Depression-era birth rates), the switch to king sizes (people smoking longer cigarettes but fewer cigarettes), higher cigarette taxes and concerns about cancer.

With regard to the health scare, analysts and commentators observed that the industry's advertising had hardly helped its situation. *Business Week* cited financial analysts' agreement that "the tobacco companies have helped cause sales drop" because they have "scared some smokers out of the cigarette habit by claiming that each brand of cigarette does not contain the 'harmful ingredients' that others do" and "pushed filter mouthpiece cigarettes with advertising that has not only turned many smokers from conventional cigarettes, but, in addition, scared some smokers away from cigarettes entirely."[10] *Tide*, an advertising industry journal, noted the same thing, citing a Valley National Bank of Phoenix report:

> Never has an industry spent so much money trying to talk itself out of business. Every hour on the half-hour, we are reminded ... [of] tars, resins and other bronchial abrasives. Smokers are quite obviously committing slow suicide, but each brand claims that it is somewhat less lethal than other brands.[11]

A subsequent *Business Week* article, noted the persistence of "an avalanche of advertising that features doctors, filters, tars" and "the recent flood of so-called 'men in white' television commercials, wherein announcers wearing white coats and other symbols of the medical profession plug cigarettes" to explain the decline in sales. It went on to question "why has the industry persisted in this 'negative' form of advertising even when, as tobacco growers and others complain, it hurts the trade by making people conscious that cigarettes can be harmful?"[12] The answer, implicit in *Business Week's* analysis, was that the cigarette companies were caught in a classic prisoners' dilemma; running fear ads worked when others didn't run them, and once everyone engaged in the practice, no one would profit by unilaterally withdrawing the ads. "No one will put his guns on the table until the others do so," stated *Business Week*, quoting one tobacco man as saying, "why should we stop unless our competitors do?"[13]

THE FTC BRINGS FEAR ADVERTISING TO AN END - OR DOES IT?

In mid-September, 1954, the FTC announced its intention to issue a set of Cigarette Advertising Guides, and circulated a draft set of those guides for industry comment.[14] Following about a year of conferences with the tobacco industry, the FTC formally announced the Guides on September 22, 1955.[15] The Guides indicated the FTC's intent to seek injunctions against any advertising that:

> 1. made references to "either the presence or absence of any physical effect of smoking,"
> 2. represented that a cigarette brand "contains less nicotine, tars, acids, resins or other substances" than other brands unless the claim and its significance could be supported by reputable scientific proof,
> 3. made references to the effect of smoking on the "(a) nose, throat, larynx, or other parts of the respiratory tract, (b) digestive system, (c) nerves, (d) any other part of the body, or (e) energy," or
> 4. represented "medical approval of cigarette smoking".

By all accounts, the fear advertising had ended by the time the FTC Guidelines were put in place. In the press release accompanying that announcement, the FTC noted that "substantial conformity with the guides took place during the past year while the conferences were in progress" and "expressed hope the industry would continue this voluntary compliance...."[16] Similar observations were made in the business press. For example, *Printer's Ink*, another advertising industry journal, remarked on the changed theme of cigarette advertising in 1955, citing "almost 'Pollyanna' prose" and predicting, "it's doubtful that any major cigarette again will be stampeded into a campaign like, 'Take the fear out of smoking.' Or even, 'Just what the doctor ordered.' "[17] From this, Calfee concludes that, "...FTC regulation reduced the information content of advertising and eliminated an important and socially desirable form of competition among manufacturers."[18]

Curiously, however, some accounts indicated that the fear advertising had ended *before* the preliminary FTC Guidelines were even announced. For example, a July 17, 1954 article in *Tide* predicting a rise in king-size filter cigarettes had the following to say:

> As cigaret-men prepare to win back lost customers with king-size filters, they seem to be drifting back to the quicksands of their contradictory, even disparaging, ad copy war. Already the ad copy battle is being joined by the filters as the regulars settle down to an uneasy armistice.[19]

It also showed two fear ads; a du Maurier ad headlined, "Start today to smoke with greater peace of mind...start to smoke du Maurier the great new cigarette with the world's most efficient filter" and a Parliament ad headlined, "A filter alone is not enough. For maximum protection it should be recessed" with the captions, "From out of the past ... a deadly, old refrain."[20] The clear implication was that fear advertising was a thing of the past (although likely to return, to the author's dismay).

A June 19, 1954 *Business Week* article was even more explicit. Titled, "Admen Soft-Pedal Health," it noted, "cigarette manufacturers have pulled an abrupt about-face in advertising tactics," and continued:

> A couple of years ago, most of them were pulling out all the stops to terrorize their customers into buying their brand. Today, no word of fear, no talk of throat scratch - just comfortable, reassuring phrases about how good a cigarette tastes. Smoking, it seems, is no longer a health cure; it's pure pleasure.[21]

Showing examples of "last year's health" ads and "this year's pleasure" ads, the article goes on to give a brand by brand enumeration of the changes in advertising theme.[22]

These observations, coming three months before the announcement of the FTC's draft Cigarette Advertising Guides, hint that something other than regulation was responsible for the end of this episode. Further investigation reveals that this was, in fact, the case. The cigarette makers, deeply concerned about the cancer scare and finally recognizing the damage that its behavior was doing, had agreed amongst themselves to eliminate fear advertising.

THE CARTEL MEETS

On December 15, 1953 the presidents of all but one of the major tobacco companies met at the Plaza Hotel in New York to plan strategies to deal with the emerging cancer issue. This was an extraordinary gathering in an industry that not twelve years earlier had been convicted of price-fixing and was under such strict antitrust scrutiny that, as one executive put it, "If we bump into the official of another company in a public washroom we have to make sure an impartial third party is present before we say hello."[23] Much of what is known about the proceedings comes from several memos produced by the public relations firm of Hill and Knowlton, which also took part in the meeting.[24] Liggett and Myers opted not to participate, informing the others of its belief that the best course of action was to ignore the entire controversy.[25]

The most publicly visible result of the meeting was the formation of the industry-funded Tobacco Industry Research Committee (later renamed the Council for Tobacco Research).[26] This organization, which had the stated goal of getting to the truth about the link between smoking and cancer, later came under fire for concealing scientific results unfavorable to the industry. But the role that fear advertising played in the cancer crisis and the need to do something about it were also high on the agenda. In response to their own question, "Do the companies consider that their own advertising and competitive practices have been a principal factor in creating a health problem?" Hill and Knowlton concluded:

> The companies voluntarily admitted this to be the case even before the question was asked. They have informally talked over the problem and will try to do something about it. They do, however, point out that this is the one important public relations activity that might very clearly fall under the purview of the anti-trust act.[27]

Similarly, following interviews with the research directors of the four major companies, Hill and Knowlton quoted Grant Clark of R. J. Reynolds:

> Look at the statements on the Viceroy package. Look at the Kent advertising. They've been engaging in that sort of competition for years. You fellows at H and K are in the middle, and so maybe can do something.[28]

That is precisely what was proposed. Among the suggestions compiled by Hill and Knowlton in a list of "Some Things to Do" attached to the "Forwarding Memorandum" was the following:

> Develop some understanding with companies that, on <u>this</u> problem, none is going to seek a competitive advantage by inferring (sic) to its public that <u>its</u> product is less risky than others. (No claims that special filters or toasting, or expert selection of tobacco, or extra length in the butt, or anything else, makes a given brand less likely to cause you-know-what. No 'Play-Safe-with-Luckies' idea - or with Camels or with anything else.)[29]

Thus, fully nine months before the FTC announced its intention to release its Cigarette Advertising Guides, all but one of the major tobacco companies had apparently agreed to cease their fear advertising.

WHAT REALLY ENDED FEAR ADVERTISING?

It is of course possible that the cartel never adopted the Hill and Knowlton recommendation to cease fear advertising, or that they were unable to enforce the agreement amongst themselves, and that despite the cartel's efforts fear advertising continued until the FTC put a halt to it. A close examination of cigarette advertisements of the time, however, reveals this not to be the case. Instead, a somewhat more complex picture emerges, but one that is consistent with the cartel agreement being effective and the FTC having little part to play in the change.

To understand the change in cigarette advertising during the early 1950s, I evaluated the content of cigarette advertisements appearing in magazines in the years 1952, 1953 and 1954. The magazines included in the study are *Colliers*, *Coronet*, *Cosmopolitan*, *Life*, *Look*, *Saturday Evening Post*, *Time* and *U.S. News and World Report*.[30] A total of 1,272 advertisements were examined.

Each advertisement was given a "health score" based on the categories that were condemned in the Cigarette Advertising Guides. Specifically, an advertisement received a point if it (1) made at least one reference to physical effects of smoking, such as cough or irritation; (2) made at least one representation of lower levels of harmful substances, such as tar, nicotine or impurities; (3) made at least one reference to body parts, such as the throat or lungs; or (4) made at least one representation of medical approval, such as a reference to doctors or a medical study. In addition, a point was given if the advertisement made at least one direct reference to health, safety, fear, or protection and another if the headline of the advertisement was health-related. Thus, the maximum score an advertisement could receive was 6 points. Figures 1 through 6 show the average health scores on a monthly basis for each of the major cigarette companies from January 1952 to December 1954. Several patterns of behavior emerge from these data.

One manufacturer was an early participant in the fear advertising episode, but withdrew well before the episode reached its peak. Reynolds (Figure 1), maker of the leading cigarette brand, claimed, "more doctors smoke Camels than any other brand" in an early 1952 ad, while another spoke of noted throat specialists, coast-to-coast tests, and claimed, "not a single case of throat irritation due to smoking Camels." By late 1952, however, Reynolds' ads made no mention of doctors, throats, or irritation, just "cool, mild and rich flavor, pack after pack."

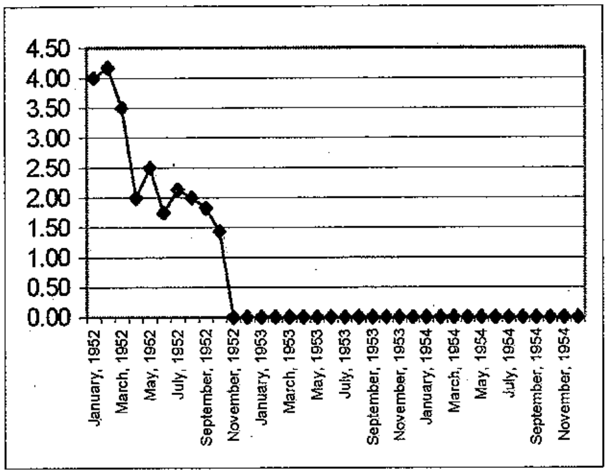

FIGURE 1: REYNOLDS

Clearly, the Cigarette Advertising Guides played no part in this change in advertising, but equally clearly, neither did the cartel agreement. One explanation is Reynolds' late entry into the filter arena, where much of the fear advertising took place. With Camel's market share above 25 percent in 1952, Reynolds' incentive to introduce a filter cigarette and to take part in advertising that reduced overall market sales was weaker, and it was not until 1954 that Reynolds introduced a filter brand, Winston. Reynolds paid a price for its delay, however; through this period, Camel's market share fell steadily.

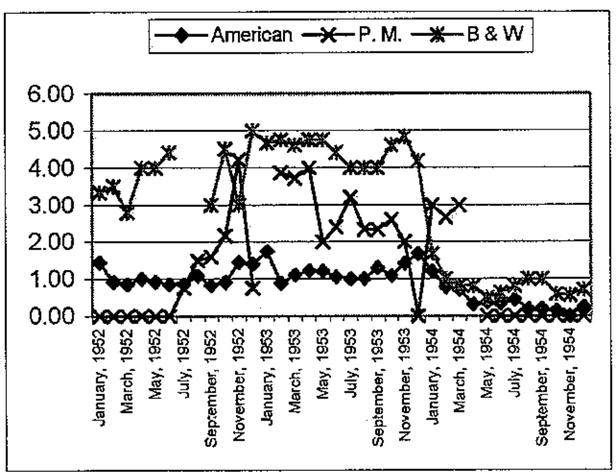

FIGURE 2: BROWN AND WILLIAMSON

Three tobacco companies that were actively engaged in fear advertising through 1952 and 1953 abruptly ceased in early 1954, immediately following the Plaza Hotel meeting and six months or more before the draft Cigarette Advertising Guides were announced (Figure 2). The change is obvious for Brown and Williamson, which in late 1953 was touting Viceroy's "new Health-Guard filter" for "double barreled protection" but by March 1954 was proclaiming "double the filtering action to double your smoking pleasure." Similarly, Philip Morris, which in late 1953 was running the highly controversial, "The cigarette that takes the *FEAR* out of smoking" ad, was by May 1954 emphasizing its "exclusive snap-open pack" and "more vintage tobacco."[31] American Tobacco, whose Lucky Strikes, Herbert Tareytons and Pall Malls made it the leading cigarette company in terms of market share, also reduced its allusions to health in the months immediately following the cartel meeting, although from a relatively low average compared to the other companies. American's lower average reflects differences in the advertising of its brands. While ads for Luckies and Tareytons focused primarily on taste and enjoyment, American promoted its Pall Mall king-size brand by appealing to health. When Pall Mall ads are taken on their own (Figure 3), a pattern similar to those of Brown and Williamson and Philip Morris is revealed. By April 1954, the "Guard Against Throat Scratch" line which had headlined Pall Mall ads in mid-1953 and appeared in ad copy in late 1953 had disappeared.

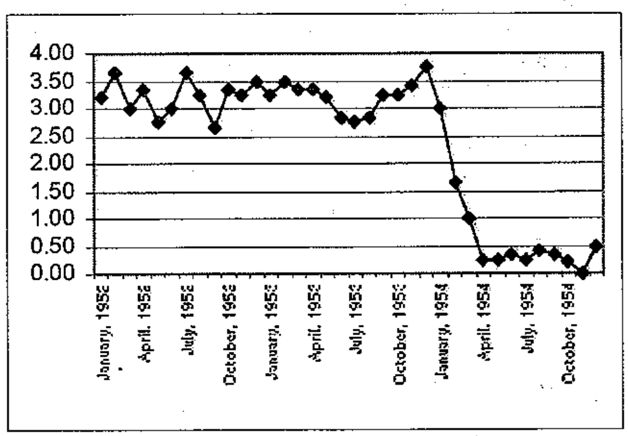

FIGURE 3: PALL MALL

The use of fear advertising by Lorillard (Figure 4) is also complicated by changes in the approaches taken on different brands. Their Old Gold brand was under an earlier brand-specific FTC order not to make comparative claims about tar and nicotine levels (on the grounds that there were no significant differences among leading brands), a fact that Lorillard was using to its advantage in late 1952 by claiming "no other leading cigarette is less irritating, or easier on the throat, or contains less nicotine, than Old Gold. This conclusion was established on evidence by the United States Government."

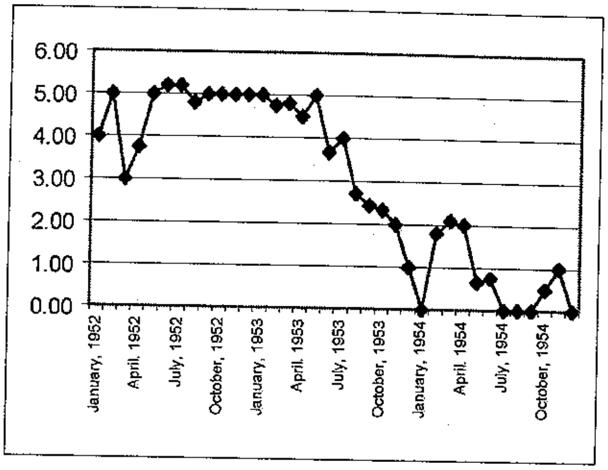

FIGURE 4: LORILLARD

When it introduced its Kent filter brand in April 1953 with fear advertising that even the industry noted for its aggressiveness, Lorillard eliminated the health claims for Old Gold. This can be seen in Figure 5, which shows the scores of the two brands' advertisements separately, and explains the fall in the overall average for Lorillard in mid-1953. Lorillard reduced the health claims in its advertising for Kent too in May and June 1954, and removed them altogether from the magazines under consideration from July through September 1954, but brought back fear advertising briefly in late 1954 with a few ads (two in *Life* and one in the *Saturday Evening Post*) touting the "priceless protection" offered by the Kent Micronite filter.

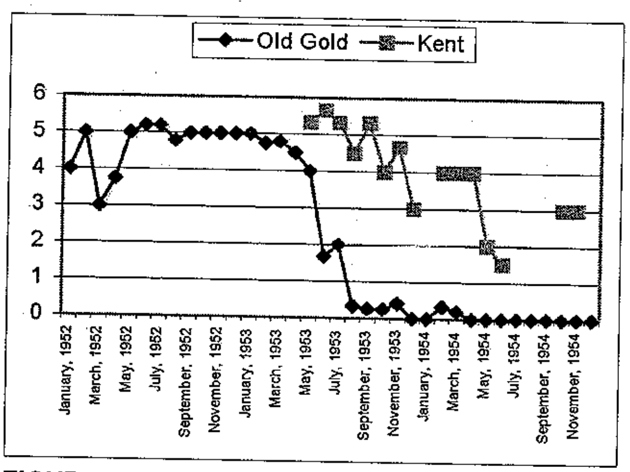

FIGURE 5: OLD GOLD AND KENT

Further confirmation that the change in advertising content was due to the cartel's agreement comes from the behavior of Liggett and Myers (Figure 6), the only major tobacco company to eschew participation. While Liggett reduced the level of its fear advertising gradually over 1954, the abrupt change in the early months of the year that

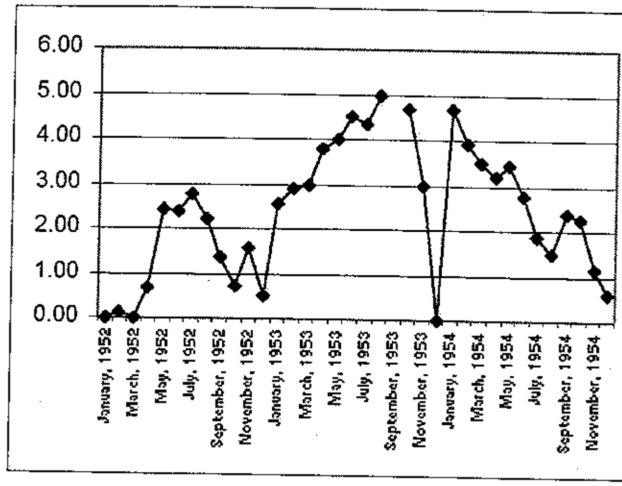

FIGURE 6: LIGGETT & MYERS

characterized the other firms was absent.[32] The contemporary press recognized this fact as well; the June 1954 *Business Week* article that recognized the shift in advertising themes noted, "For reasons best known to itself, Chesterfield has refused to give up the health talk though it, too, finds pleasant things to say in ads."[33] Amongst all the companies, Liggett's advertising was the most health oriented in every month of 1954, and only began to approach that of the rest of the industry in November and December.

TABLE 2: ESTIMATED CHANGE POINTS AND SIGNIFICANCE TESTS

Company or Brand	Est. Date of Change	p-value*
Pall Mall	February 1954	0.000
Phillip Morris	April 1954	0.015
Brown & Williamson	January 1954	0.002
Lorillard	December 1953	0.000
Liggett & Myers	July 1954	0.580

* test of H_0: change at September 1954, against H_1: change between December 1953 and September 1954

Table 2 shows estimates of the points at which each company's fear advertising ended, derived from a simple mean-shift model. These results confirm what is clear from the figures; with the exception of Liggett and Myers, the firms' advertising changed shortly after the December, 1953 cartel meeting. Table 2 also shows a test of the null hypothesis that the firm's fear advertising ended with the FTC announcement in September, 1954 against the alternative hypothesis that the change occurred sometime between the cartel meeting and the FTC announcement. Again, with the exception of Liggett and Myers, the null hypothesis is rejected at the 5 percent level. Details of the statistical procedures are described in the Appendix.

CONCLUSION

The events described here indicate that it was industry collusion, and not FTC regulation, that brought the fear advertising of the 1950s to a halt. While the end of the incident and the announcement of the FTC's draft Guides were nearly contemporaneous, it is clear that the former preceded the latter. Although it is uncommon to have explicit proceedings of a collusive agreement, we have in this case a record that reveals what was agreed to and when. The conspiring firms that were engaged in fear advertising discontinued the practice shortly after the cartel met and well before the draft Guides were announced, while the one firm that was not party to the conspiracy continued its fear advertising, a fact that was noted at the time.

It might be argued that the collusive agreement was largely irrelevant, since the FTC guides would have achieved the same result shortly thereafter. In fact, there was doubt that the FTC would be able to enforce the Cigarette Advertising Guides. As was noted in the contemporary press, the law required the FTC to prove that an advertising claim was false, while the Guides asked the tobacco companies to prove the truth of their assertions.[34] As a result, both the business press and the FTC saw the industry's apparent compliance with the Guides as voluntary, unaware of the agreement that had already been reached.[35]

It might also be argued that the Guides served to enforce the cartel agreement against the normal tendency of collusive agreements to collapse under the incentive to cheat. Although the fear advertising of the 1950s was never repeated, the incentive to draw health comparisons remained. For example, in June 1957, the United States Tobacco Company sent to doctors a letter and report indicating that its King Sano brand of filter cigarettes had "the lowest practical amount of nicotine and tar" among the leading brands.[36] While there is no indication that this was brought to the attention of the FTC, the President of Benson and Hedges did respond with a letter to the Chairman of the Tobacco Industry Research Committee in which he decried "a respected company in the industry [making] denigrating statements about competitive brands," a practice that was "inconsistent with what we have been trying to accomplish in the industry in the past few years," and expressing a desire that the Chairman could, "diplomatically persuade (U.S. Tobacco President) Whitney Peterson that this kind of a letter should not be circulated further or repeated."[37] In any event, the incentive to make health claims was soon eliminated by a fear of litigation. Having adamantly claimed since the 1950s that there was no proof of a causal link between smoking and disease, the industry soon realized that a future health claim might constitute an implicit admission that cigarettes were in fact dangerous, an admission that would make defending product safety suits much more difficult.

Regulation is often blamed for interfering with competitive forces, with unintended consequences detrimental to social goals such as economic efficiency. No doubt this does occur; sometimes, however, closer examination reveals something else at work. It is a mistake to unthinkingly assume that the alternative to regulation is competition, particularly when the industry is as structurally concentrated and has as long a record of noncompetitive conduct as the tobacco industry. When markets aren't competitive, one can hardly expect competitive forces to work, and it is doubtful that unrestrained market forces would lead the tobacco industry to broadcast the dangers of smoking today.

NOTES

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1. See Eckard 1991, Franke 1994, McAuliffe 1988, and Mitchell and Mulherin 1988.
2. See Calfee 1985, 1986, 1997, Ringold and Calfee 1989 and Scheraga and Calfee 1996.
3. See Wynder and Graham 1950 and Doll and Hill 1950.
4. See, e.g., Norr 1952 and *Time*, December 1952.
5. See *Business Week*, Dec. 21, 1952, p. 41.
6. See Wynder, Graham and Croninger 1953.
7. See. e.g., *Consumer Reports*, February, 1953 and Miller and Monahan 1954.
8. This understates the level and overstates the change of concentration of sales by *firm* in the market, since the major tobacco companies each offered several brands and types of cigarette. The HHI was stable, falling from 0.225 in 1950 to 0.221 in 1955.
9. See *Business Week*, January 2, 1954, p. 74 and January 8, 1955, p. 41. See also *Printer's Ink*, December 31, 1954, p. 26.
10. *Business Week*, November 21, 1953, p. 144. See also *Fortune*, December 1953, p. 130.
11. *Tide*, December 5, 1953, p.25.
12. *Business Week*, December 5, 1953, p. 68.
13. Ibid.
14. See *Business Week*, September 18 and September 25, 1954; *Time*, September 27, 1954 and the FTC press release, September 22, 1955 that accompanied the formal adoption of the Guides.

15. See *Business Week*, October 1, 1955 and FTC press release, op. cit.

16. Ibid.

17. *Printer's Ink*, December 30, 1955, p. 15.

18. Calfee 1997, p. 39.

19. *Tide*, July 17, 1954, p. 24.

20. Ibid.

21. *Business Week*, June 19, 1954, p. 58.

22. Ibid.

23. *Business Week*, December 5, 1953, p. 66.

24. See Hill and Knowlton, "Background Material on the Cigarette Industry Client," December 15, 1953 and "Forwarding Memorandum," undated. These are available at www.wa.gov/ago/tobacco/exhibits.htm as exhibits 17 and 5341 respectively. Hill and Knowlton's involvement in the tobacco industry's public relations campaign to deflect concerns about the link between smoking and cancer are documented in Glantz et. al. 1996.

25. See "Background Material," op. cit., p. 1.

26. See *Business Week*, January 9, 1954, p. 31 and *Tide*, January 16, 1954, p. 15.

27. See "Background Material," op. cit., p. 3.

28. See "Forwarding Memorandum," op. cit., p. 4.

29. Ibid., p. 8, emphasis in original.

30. I also examined *Better Homes and Gardens*, *Ebony*, *Ladies Home Journal*, *Liberty*, and *Women's Home Companion*, which were among the popular magazines of the time, but these did not carry cigarette advertising.

31. The sharp declines in health score in December 1952 and 1953 reflect Christmas ads with neutral content such as, "Merry Christmas and all the finest to you."

32. The brief but sharp decline in December 1953 is also the result of a content-neutral Christmas advertisement.

33. *Business Week*, June 19, 1954, op. cit.

34. *Business Week*, September 25, 1954, op. cit.

35. *Business Week*, September 18, 1954 and September 25, 1954, op. cit. and *Printer's Ink*, February 28, 1958, p. 10.

36. See www.wa.gov/ago/tobacco/exhibits.htm exhibit 90A.

37. See www.wa.gov/ago/tobacco/exhibits.htm exhibit 92.

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APPENDIX

Consider a single brand and let Y_t be the value of the health score in period t (t = 1, 2, ..., n). Adopt the simplest mean-shift model:

$$E(Y_t) = \begin{cases} \mu_1 & 1 \le t \le t_c \\ \mu_2 & t_c < t \le n \end{cases}$$

where E denotes expectation, $\mu_2 < \mu_1$, and t_c is the unknown change point. Our interest centers on testing the null hypothesis H_0: $t_c = t_0$ that the change occurred after the FTC announcement in September, 1954 (t_0 = 33) against the alternative hypothesis H_1: $t_1 \le t_c < t_0$ that the change occurred at some time after the industry meeting in December, 1953 (t_1 = 24), but before the FTC announcement at t_0.

A reasonable test statistic is $\Delta = \mathrm{RSS}(t_0) - \mathrm{RSS}(\hat{t}_c)$ where RSS(t) is the residual sum of squares from fitting the mean-shift model (i.e., estimating μ_1 and μ_2) with $t_c = t$ and where $\hat{t}_c$ is the least squares estimate of t_c under H_1. Under the additional assumption of no serial dependence, the significance level of the observed value λ of Δ can be found by randomly permuting the observations $Y_1, Y_2, \ldots, Y_{t0}$; refitting the model and calculating Δ; and repeating the process a large number of times. The significance level or p-value of the observed value of Δ is estimated by the proportion of randomizations for which Δ exceeds λ. Note that $RSS(t_0)$ is unaffected by this randomization scheme, so that the test statistic is effectively $RSS(\hat{t}_1)$.

The significance levels reported in Table 2 were estimated from 1000 randomizations.