

Levy, Daniel C.; Young, Andrew T.

Working Paper

Promise, trust and betrayal: Costs of breaching an implicit contract

Working Paper, No. 2020-07

Provided in Cooperation with:

Department of Economics, Bar-Ilan University

Suggested Citation: Levy, Daniel C.; Young, Andrew T. (2020) : Promise, trust and betrayal: Costs of breaching an implicit contract, Working Paper, No. 2020-07, Bar-Ilan University, Department of Economics, Ramat-Gan

This Version is available at:

<https://hdl.handle.net/10419/249197>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Promise, Trust and Betrayal: Costs of Breaching an Implicit Contract*

Daniel Levy

Department of Economics, Bar-Ilan University
Ramat-Gan 52900, ISRAEL,
Department of Economics, Emory University
Atlanta GA, 30322, USA, and
Rimini Center for Economic Analysis, ITALY
Daniel.Levy@biu.ac.il

Andrew T. Young**

College of Business Administration
Texas Tech University
Lubbock, TX 79409, USA
A.T.Young@ttu.edu

Last Revision: November 20, 2020

Abstract: We study the cost of breaching an implicit contract in a goods market. Young and Levy (2014) document an implicit contract between the Coca-Cola Company and its consumers. This implicit contract included a promise of constant quality. We offer two types of evidence of the costs of breach. First, we document a case in 1930 when the Coca-Cola Company chose to avoid quality adjustment by incurring a permanently higher marginal cost of production, instead of a one-time increase in the fixed cost. Second, we explore the consequences of the company's 1985 introduction of "New Coke" to replace the original beverage. Using the Hirschman's (1970) model of Exit, Voice, and Loyalty, we argue that the public outcry that followed New Coke's introduction was a response to the implicit contract breach.

JEL Codes: E31, K10, L11, L16, L66, M20, M30, N80, N82

Keywords: Invisible Handshake, Implicit Contract, Customer Market, Long-Term Relationship, Cost of Breaching a Contract, Cost of Breaking a Contract, Coca-Cola, New Coke, Exit, Voice, Loyalty, Nickel Coke, Sticky/Rigid Prices, Cost of Price Adjustment, Cost of Quality Adjustment

* We are grateful to two anonymous reviewers for constructive comments and suggestions which improved the paper significantly. We thank the seminar participants at the 2017 Italian Law and Economics Association annual conference at the Libera Università Maria Ss. Assunta in Rome, at the 2018 Economic History Association of Israel annual conference at Tel Aviv University in Ramat-Aviv, at the 2015 Israeli History and Law Association annual conference at the Ben-Zvi Institute in Jerusalem, and at Bar-Ilan University in Ramat-Gan, for comments and suggestions. In particular, we thank Joel Mokyr, Alexander Stremitzer, Ansgar Wohlschlegel, Dror Goldberg, Igor Livshits, David Klein, Avichai Snir, Itamar Caspi, and Osnat Peled, for helpful comments and suggestions. We are grateful to Dan Schwarzfuchs and David Geffen for bringing to our attention a 1935 change in the Secret Formula, which we were unaware of. We rotate co-authorship. All errors are ours.

** Corresponding author: A.T.Young@ttu.edu

1. INTRODUCTION

Implicit contracts have been hypothesized to play potentially important roles in labor market wage setting (Bailey 1974; Azariadis 1975; Rosen 1985, 1994) and also in price setting for consumer goods (Okun 1980, 1981). However, implicit contracts may also matter in regard to non-price dimensions of market exchanges. In this paper, we offer evidence of the existence of an implicit contract between a firm and its consumers. We argue that this implicit contract included separate “clauses” regarding both price and *quality*. The firm in question is one of the world’s most recognized and successful producers of a consumer good: the Coca-Cola Company.

In general, implicit contracts are difficult to identify empirically. Being implicit, hard data on them are hard to come by.¹ For price-setting decisions in goods markets, the most direct evidence available is based on interviews of decision-makers in businesses (e.g., Blinder 1991, 1994; Blinder et al. 1998).

Most relevant to the present study, Young and Levy (2014) provide a detailed case study of the Coca-Cola Company, arguing that it had an implicit contract with its consumers that included a constant (nominal) price and also quality. That study focuses on the period (1886 into the 1950s) up through when the constant price was abandoned. In this paper, we explore the more enduring quality clause and the dramatically disastrous breach of it with the introduction of New Coke. On April 23, 1985, New Coke was introduced to the public with much fanfare. Coca-Cola’s market share had been persistently declining, but New Coke was decidedly beating Pepsi in blind taste tests. However, less than three months – and more than 40,000 letters and 400,000 phone calls from angry consumers – later, Coca-Cola Classic (the original “Secret Formula”) was brought back, while New Coke was gradually pulled off the market.

We offer two types of empirical evidence of the nature and magnitude of the costs of breach. We build on Young and Levy (2014) who document an implicit contract between the Coca-Cola Company and its consumers. First, we have a good deal of information on how and why the Company arrived at the decision to abandon its fabled Secret Formula in favor of New Coke. We document the costs of research and development and testing involved with New Coke; also the direct losses incurred by Coca-Cola bottlers subsequent to New Coke’s introduction. We use

¹ In the context of labor markets, empirical studies have been motivated by a testable restriction across labor-supply and consumption equations (e.g., Beaudry and DiNardo 1995; Ham and Reilly 2002; Kilponen and Santavirta 2010).

Hirschman's (1970) model of exit, voice, and loyalty, as a framework for analyzing the behavior of US consumers in the days that followed New Coke's introduction. We also document a wealth of "soft" data on costs of breaching implicit contract in terms of goodwill lost.

Second, we consider an earlier period when the Coca-Cola Company incurred significant costs to *avoid* breaching the quality clause. In 1930, the Company faced a government-imposed regulation on the processing of coca leaf extract (the notorious "Merchandise No. 5"). To continue using coca leaves and maintain the Secret Formula, the Company chose to incur a permanently higher marginal cost of production instead of a one-time fixed cost increase. This cost incurred can be viewed as a lower bound of the perceived cost of breaching.

The Coca-Cola implicit contract makes for a fascinating case study. It is obviously an extreme case and, as such, will not necessarily generalize to other cases. However, we have access to an exceptional amount of detail regarding how the quality clause was forged, that it was acknowledged in the statements of management, and that management recognized risks involved in breaching it – all of this culminating with decision to introduce New Coke and the rather spectacular aftermath. Understanding this episode can provide important insights into the sort of conditions under which the costs of breaching an implicit contract may be quite large.

The paper is organized as follows. In section 2, we discuss the implicit contract theory as it applies to goods markets. A brief summary of the Young and Levy's (2014) account of the Coca-Cola implicit contract is provided in section 3. In section 4, we document evidence of the permanently higher marginal cost that the company chose to incur in 1930 to avoid a quality change. Then in section 5, we discuss the 1985 episode when the company *did* choose to breach the quality clause by introducing New Coke. This introduction was costly. There were *ex ante* costs of R&D and the *ex post* losses incurred by bottlers. However, New Coke was also accompanied by explicit and often vehement protests by consumers. In section 6, we present a version of Hirschman's (1970) model of exit, voice, and loyalty as a framework within which to assess and interpret consumer reactions to New Coke. Then in section 7, we document and describe the costs and market responses associated with New Coke, including the explicit consumer reactions. In section 8, we discuss possible reasons for the company's miscalculation in light of its remarkable customer loyalty. We also consider the New Coke episode in relation to subsequent Coca-Cola product introductions. We conclude in section 9.

2. “INVISIBLE HANDSHAKES”

An implicit contract is an unwritten, legally non-binding understanding that all parties have incentives to preserve. It will be self-enforcing as long as all parties to it adhere to its terms, continuing to behave as mutually expected.

In a seminal studies, Okun (1980, 1981) elaborates on an “invisible handshake” by which sellers and buyers arrive at an understanding of a price that is mutually perceived to be acceptable (or fair) since the marginal costs of search to find a better price exceed the benefits. The stable price discourages buyers from searching because of the implicit commitment of sellers not to raise the price when markets are tight. In return, sellers do not cut the prices when there is insufficient demand. The implicit contract, therefore, helps sellers establish a long-term relationship with buyers, winning their loyalty through stable prices. Another advantage of stable prices is that they make future sales more predictable.²

In the context of goods markets, much of the implicit contract literature is rooted in Okun’s (1981) analysis and emphasizes a stable price as the key component of an implicit contract.³ However, the quality of a good might also be a component of an implicit contract. Implicit understandings of stable quality are consistent with recent episodes of consumers expressing anger and disappointment over quality-adjustments. For example, *BBC* in 2017 reported on Ferrero SpA changing the ingredients of its popular Nutella spread. One consumer tweeted: “I mean ... should I even get out of bed today? #BoycottNutella”. Likewise, *The Guardian* reported in 2015 on how consumers “of Cadbury’s Fruit & Nut chocolate bars have reacted with fury after the company changed the recipe for the first time in 90 years to include sultanas.”⁴

Suffice to say, the consumer reactions mentioned above pale in comparison to those that followed the introduction of New Coke in 1985.

² Implicit contracts can offer additional benefits to sellers and buyers. First, studies have shown that consumers value the guarantee of a fair price (Kahneman, et al. 1986, Ball and Romer 2003, Rotemberg 2005, 2011). Implicit contracts may also lessen time inconsistency problems in case of habit-forming goods (Nakamura and Steinsson 2011, Bils 1989). This may have been historically relevant for Coca-Cola, a good with both caffeine and (originally) limited amounts of cocaine (Young and Levy, 2014, pp. 812–813).

³ For recent examples see Greenslade and Parker (2008), Anderson and Simester (2010), Levy and Smets (2010), and Paciello et al. (2019).

⁴ Source: “Nutella’s apparently changed its ingredients and Twitter is furious,” *BBC*, November 10, 2017, <http://www.bbc.co.uk/bbcthree/item/e06d5d6a-bc97-4d22-9045-06183f12089f> (accessed August 9, 2020); Rebecca Smithers, “Choc horror over Cadbury’s Fruit and Nut recipe change,” *The Guardian*, November 4, <https://www.theguardian.com/lifeandstyle/2015/nov/04/cadbury-fruit-and-nut-recipe-change-sultanas-raisins> (accessed August 9, 2020).

3. THE COCA-COLA IMPLICIT CONTRACT

Young and Levy (2014) argue that Coca-Cola was a good candidate for an implicit contract because it (a) was potentially habit-forming, (b) had volatile input costs, and (c) had numerous, close substitutes and difficult-to-observe distinctive characteristics. In cases of (a) and (b), an implicit contract can mitigate time-consistency problems. A seller may attract consumers by promising a continuation of certain quality, price, etc.; but have an incentive to renege when the future arrives (Nakamura and Steinsson, 2011). When input prices are volatile, this time-inconsistency is exacerbated. Furthermore, when a good is habit-forming, consumers may be particularly wary of becoming “hooked” and incurring costs when that inconsistency manifests.

A contract is a straightforward device to mitigate this time-inconsistency. However, explicitly contracting on future prices with millions of individual consumers is prohibitively costly. By fostering an implicit contract, individual consumer-specific transaction costs can be avoided. Furthermore, even if explicit contracting is not prohibitively costly, consumers may be hesitant to contract exclusively for a single good when there are close substitutes (i.e., good exit options). An implicit contract can elicit consumers’ *de facto* commitments without them explicitly locking themselves in.

Young and Levy (2014) argue that the Coca Cola Company developed business strategies that acknowledged the sort of consumer concerns described above. The company aggressively marketed the 5¢ price, held the price of its syrup to bottlers and fountains constant, and provided negative and positive incentives to retailers to maintain the nickel Coke (Levy and Young, 2004). All of these measures insured consumers against future price volatility. On the quality side, the company standardized the drink and cultivated the idea of the Secret Formula. These efforts were aimed at convincing consumers that there were not close substitutes for Coca-Cola; that consumers should insist upon the “real thing”.⁵ Long-time company president, Robert Woodruff (1923-1954), was so convinced of the Secret Formula’s importance to consumers that he would not consider deviating from it “except as a matter of life and death.”⁶

These understandings led to a gradual formation of an implicit contract between the Coca-

⁵ The famous “It’s the Real Thing” tagline did not begin to appear in advertising materials until the 1940s and was not adopted for a major, widespread promotional campaign until 1969.

⁶ Source: Robert W. Woodruff in a letter to Arthur Acklin, October 2, 1942, Robert W. Woodruff Papers, Special Collections Section, Emory University Library, Atlanta, GA. The statement was in response to a suggestion to use sugar substitute during WWII rationing.

Cola Company and its customers. To demonstrate the establishment of the implicit contract, Young and Levy (2014) focus on observable implications of implicit contracts. For example, they demonstrate that the Company communicated its pledge not to increase the nickel price nor to change the Secret Formula. They also document the company's efforts to communicate this pledge to retailers and convince them that it was profitable to abide by it. In its efforts, the company demonstrated that it perceived itself to be vulnerable to losing goodwill if it reneged. This aspect of the implicit contract was critical for ensuring its self-enforcement.

Unlike the nickel price which lasted until 1959, the Coca-Cola Company's efforts to hold to the Secret Formula persisted right up to the introduction of New Coke in 1985. Young and Levy (2014, pp. 807–809) report only seven instances of ingredient changes. Six of these were either legally mandated or best interpreted as attempts to *maintain* quality. Then there was a temporary change in 1942 when a small amount of saccharine was added and the amount of caffeine and coca leaves decreased. While this was not mandated, it was motivated by the extraordinary environment of WWII shortages and rationing. In addition to the seven instances reported in Young and Levy (2014), in 1935 a rabbi by the name of Tobias Geffen convinced the company to replace the non-kosher glycerin (produced from beef tallow) with a vegetable-based glycerin.⁷

Ultimately, the company was impressively faithful to the Secret Formula over just shy of a century. Of the few changes, none were publicized and we can find no evidence of consumers perceiving a quality change. In light of this, the well-publicized introduction of New Coke in 1985 represented a singular and dramatic quality change.

To summarize, Young and Levy (2014) demonstrate that Coca Cola was a good candidate for an implicit contract. They report evidence of the Coca-Cola Company fostering, acknowledging and seeking to maintain an implicit contract with its consumers. Notably, they demonstrate that the company perceived itself as vulnerable to consumer backlash if it reneged, implying that the *perceived costs* of breaching the implicit contract were large. Young and Levy (2014), however, offer no evidence to quantify the perceived or actual costs of breaching. In this paper, we set out to do exactly that.

⁷ We learned about this change through a private correspondence from Dan Schwarzfuchs and David Geffen after Young and Levy (2014) was published. Two additional formula changes are also implemented for a two-week period each year, during the Passover holiday, in markets with significant observant Jewish communities. (The bottles are easy to spot thanks to yellow caps.) See Samuel Freedman, "A Passover Toast to a Rabbi Known for Social Activism, and for Kosher Coca-Cola," *The New York Times* (New York edition), April 23, 2011, p. A15 (http://www.nytimes.com/2011/04/23/us/23religion.html?_r=0) (accessed August 9, 2020).

4. COST OF AVERTING A BREACH OF THE IMPLICIT CONTRACT

The first evidence we offer is indirect. It is based on the way the Coca-Cola Company handled a shortage of coca leaves in 1929. To avert a change in the drink's quality by changing the Secret Formula, which would have constituted a breach in the implicit contract and a one-time fixed cost, the company instead chose to pay a higher marginal cost *indefinitely*.

The shortage of coca leaves was related to government-imposed restrictions on their importation. As discussed in Levy and Young (2004), extract from coca leaves was one component of the Secret formula's "Merchandise No. 5". US narcotics laws prohibited any importation of coca leaves except by two companies, Merck & Company and Maywood Chemical Works, that manufactured cocaine for medical and scientific purposes. The Coca-Cola Company was buying coca extract from these companies after they had filtered the cocaine out.

Given the continuous increase in the demand for Coca-Cola, by the end of the 1920s, the two companies were unable to manufacture enough coca extract to meet the Coca-Cola Company's needs. The company began lobbying in Washington, leading to an amendment to the proposed 1930 Porter Bill, designed to further toughen US narcotics laws. The amendment "was plainly aimed at rescuing the Coca-Cola Company" (Allen, 1994, p. 195) and initially encountered resistance:

"But giving up would mean changing the Secret Formula, and that was unacceptable. [...] Coca-Cola without the coca was unthinkable, even if the coca in question was a tiny dollop that was powdered, percolated, steamed, double-distilled, pasteurized, and otherwise exhausted until not one consumer in a million would have noticed its absence. The point was Coca Cola's mystique, the cult of the formula. If word got out that the coca was gone, people *might think* they tasted a difference, and that could be ruinous" [emphasis in original] (Allen, 1994, p. 196).

In the end, Congress signed off on the amendment, provided that the Coca-Cola Company would destroy any cocaine and other byproduct alkaloids under the supervision of the newly established Bureau of Narcotics. This led to the resumption of a steady supply of coca leaves for the company.

Coca-Cola's vice president of sales, Harrison Jones, in consultation with the VP of quality control and the company's associate general counsel, made an assessment of the expected effect

of the new taxes and processing costs involved in manufacturing Merchandise No. 5. These included the cost of coca leaves (20¢/Lb in Peru), 10¢/Lb duty, 16¢/Lb narcotic tax, 50¢/oz for coca leave processing, cost of destroying cocaine (“unknown”), and the cost of freight (coca leaves from Peru to New York; also “unknown”). According to Jones’ calculations, these additional taxes and processing costs would increase the cost of manufacturing Merchandise No. 5 from \$1.11/Lb to \$1.51/Lb, a 36 percent increase.⁸

Thus, the Coca-Cola Company avoided adjusting quality by committing to a higher marginal cost of production. (Furthermore, its lobbying efforts to secure continued supply of coca leaves were no doubt costly.) The company was willing to incur the higher marginal cost per pound of Merchandise No. 5 indefinitely into the future. Given that willingness, these costs can be interpreted as a lower bound on the true perceived cost of making a quality adjustment and breaching the implicit contract.

To assess the magnitude of these costs, we computed the annual additional cost of producing Merchandise No. 5 that the Coca-Cola Company incurred. The resulting figures are reported in **Table 1**. In 2018 prices, the added annual cost the company incurred amounted to \$1.4 million–\$3.1 million, between the years 1931–1939. As a proportion of the Company’s gross sales, net profits, and expenses, the added cost amounted to about 0.20%, 0.60%, and 0.90%, respectively. We emphasize that these costs should be interpreted as the lower bound of the true perceived cost of breaching the implicit contract.

It is worth noting that the choice to incur these costs rather than change the formula was made right at the outset of the Great Depression. With falling incomes and increasing uncertainty, this may have been perceived as an exceptionally risky time to make a quality change. Also, if the Coca-Cola Company wished to promote a new formula, executives might have feared that the resources necessary to do so would have been tight. However, we doubt that the company would have wanted to publicize such a change.⁹ This can perhaps be contrasted to the case of New Coke, which was developed in response of declining market share for Coca-Cola. (See section 5 below.) Whereas the coca extract change may have been contemplated as high risk-low reward, it is possible that New Coke was thought to be a low risk-high reward gambit.

⁸ Source: Memorandum from Harrison Jones to R.W. Woodruff, “In RE: #5,” July 28, 1930, R.W. Woodruff Papers, 1819–1996. Emory University, Stuart A. Rose Manuscript Archives and Rare Book Library, Atlanta GA 30322.

⁹ In 1918, when the company made a temporary switch from cane sugar – which was rationed during WWI – to beet sugar, it did not inform consumers (Schaeffer and Bateman 1985).

5. A BRIEF HISTORY OF NEW COKE

Having presented evidence that reflects a lower bound on the *perceived* costs of breaching the implicit contract's quality clause, we now turn our attention to evidence on the *realized* costs when the Coca-Cola Company *actually breached* the implicit contract by introducing New Coke in 1985. We begin with a brief overview of its development and introduction.

In the late 1970s and early 1980s, Coca-Cola's market share was falling while Pepsi's was on the rise. These trends were contemporaneous to PepsiCo's "Pepsi Challenge" national marketing campaign of public blind taste tests. Coca-Cola's market share had stood at 60% after WWII. By 1984 it was down to only 22%; this was a virtual parity with Pepsi's market share of 18% (Blanding, 2010, pp. 59–60). Even worse, the Coca-Cola Company conducted its own blind taste tests and found that, indeed, consumers preferred Pepsi by margins as high as 10–15 points.

With management's blessing, Coca-Cola Company chemists began considering a reformulation of the Secret Formula. The research project was code-named "Project Kansas" and was a secretive and elaborate endeavor. The company undertook what became a two-year effort in search of an improved formula that would beat Pepsi in blind tests. In the end, the Company chemists arrived at a new formula that differed in several ways from the original. The new formula contained less phosphoric acid to give the drink less bite and a smoother taste. In addition, to replace the acidity lost by reducing the phosphoric acid, more citric acid was added; this provided more of a lemon aroma. The new formula also had more fructose and was therefore sweeter. The amounts of caramel and caffeine were adjusted and the amount of vanilla was reduced. The secret blend of flavoring oils ("Merchandise No. 7x") was also adjusted. Finally, and importantly, Merchandise No. 5 was removed completely. Coca-Cola would henceforth contain neither of its namesakes: coca leaves and kola nuts.

The efforts appeared to have paid off: after an exhaustive battery of 190,000 blind taste tests, the new formula was beating Pepsi by a margin of 6–8 points. (It was also beating the original Coca-Cola in these taste tests.) New Coke was introduced with a huge fanfare in New York City on April 23, 1985. It was made clear to consumers that the drink had undergone a substantial quality change.

6. VOICE AND EXIT UNDER LOYALTY

To say that New Coke was not a success is an understatement. The Coca-Cola Company sunk

millions of dollars into researching and developing the new formula and, ultimately, sales were dismal. But consumers were not content to simply not buy New Coke; they also explicitly protested the quality change, often vehemently. (This is all detailed in section 7 below.) A useful framework for understanding consumer reactions to New Coke and, also, the Coca-Cola Company's subsequent re-introduction of the original product (as "Coca-Cola Classic") is provided by Hirschman's (1970) classic work on voice, exit and loyalty. Hirschman explores the general case where:

The performance of a firm or an organization is assumed to be subject to deterioration for unspecified, random causes which are neither so compelling nor so durable as to prevent a return to previous performance levels, provided managers direct their attention and energy to that task (pp. 3–4).

The above provides an apt characterization of the Coca-Cola Company's breach of the implicit contract with the introduction of New Coke. The violation of the quality clause was what Hirschman refers to as a (at least potentially) "repairable lapse" (p. 1) by the company.

The management of a firm can be alerted to a repairable lapse via two types of consumer reactions. First, consumers can stop buying from the firm and seek out a competitor to buy from instead. This is the *exit option* and it is an economist's default assumption. The availability of exit is the hallmark of a monopolistically competitive market where each firm is to some extent a *price- and quality-maker*; yet also faces competition from producers of substitutes.

While exit is an economist's default assumption, there is another reaction by which consumers can discipline a firm: *voice*. Voice can serve either as a substitute for or complement to exit. Consumers can voice their disappointment with a firm's performance, communicating their feelings individually or collectively to its management. Alternatively, they may communicate their frustration to the public – to "anyone who cares to listen" (p. 4) – to mobilize others to discipline the firm through their own exit or voice.

Hirschman (1970) emphasizes that exit is a *market act*: it is impersonal, usually taking place anonymously. Exit is also a binary decision: one either exits or does not. Alternatively, voice is a *political act* and it can range from a "faint grumbling to violent protest" (p. 16). The use of voice is typically personal, involving an expression of critical opinion to firm management. Furthermore, increasing the frequency or intensity of that expression may make voice more effective (at least up to a point).

All else equal, voice will be exercised more often, or more intensely, when the exit option is less appealing or simply unavailable to consumers. For example, when the available substitutes are poor, consumers will tend to exercise their voice. In the extreme, voice is consumers' only option for disciplining a monopoly. Alternatively, if a perfectly competitive firm experiences a deterioration in quality, its consumers will simply purchase the (previously identical; now superior) good from any one of the competitors. Between monopoly and perfect competition, a mix of exit and voice reactions is likely to be observed.¹⁰

The case of Coca-Cola is clearly one of these intermediate cases, but one where the Coca-Cola Company had considerable market power. As we argue in section 3 above, Coca-Cola was potentially habit forming and, furthermore, the company made efforts to convince consumers what were ostensibly close substitutes were actually not so. This created substantial *loyalty* amongst Coca-Cola consumers. Loyalty describes a situation where consumers “suffer in silence, confident that things will soon get better” (Hirschman 1970, p. 38); it creates high switching costs for consumers and “holds exit at bay and activates voice” (p. 78). A loyal consumer will try to affect a reversal of the quality-deterioration and “will often search for ways to make himself influential” (p. 77).

Hirschman (1970, p. 80) observes that voice's “effectiveness depends on the *discovery* of *new* ways of exerting influence and pressure towards recovery.” One way to interpret consumers' reactions to New Coke – their references to “the American dream,” “the US Constitution,” and even “God” – is that they aimed to portray their displeasure as larger than themselves: to make their protests be perceived as universal by the Coca-Cola Company.

According to Hirschman (1970), voice will be particularly effective in settings where there are few buyers or in settings where few buyers account for a substantial proportion of total sales. It will also be effective in the case of an expensive durable good, where consumers are often repeat-buyers. In the context of low cost non-durable goods, in contrast, most consumers will simply exit and switch to a substitute good. Based on this, then, one might not expect extensive use of the voice option in the case of Coca-Cola. It is a non-durable, inexpensive consumer good. In addition, the market offers numerous substitutes (both historically and today; e.g., Pepsi, Dr. Pepper, RC Cola, etc.). Furthermore, the drink has millions of consumers in the US alone.

¹⁰ The predictions of the theoretical models of Beard et al. (2015) and Gans, et al. (2020) are consistent with Hirschman's (1970) observations.

However, customer loyalty played a critical role in the case of Coca-Cola (Fisher, 1985). Loyal customers have high switching costs because of their attachment to the product; they are more likely to be amongst non-exiting, vocal protesters. As discussed above, many Coca-Cola consumers had a strong attachment to the drink; though substitutes were numerous, they were not perceived to be *good* substitutes.

The various acts of protest undertaken by a large number of *loyal* customers made the act of voice particularly effective. Furthermore, the voice option was combined with the temporary exercise of exit: consumers boycotted the Coca-Cola Company. Hirschman (1970) defines boycott as a hybrid of exit and voice. In this case, consumers were voicing a credible threat of exit: New Coke sales never rose. Recovery of sales would have to wait until consumers collectively lifted the boycott with the (re)introduction of Coca-Cola Classic.

6.1 A Formal Model of Exit, Voice, and Loyalty

Our arguments can be formalized by adapting Beard et al.'s (2015) model of Hirschman's ideas to the events around the New Coke's introduction. In our adaptation, we depart from Beard et al. in three aspects to better fit the model to the New Coke episode, and to answer the questions we pose. First, we assume that consumers know about Coke's quality change *ex ante*. This assumption is reasonable given that the Coca-Cola Company publicly announced the introduction of New Coke. Second, consistent with the actual events around the New Coke introduction, we assume that the number of people who try the reformulated product (the New Coke) and find that they like it, is zero. Third, unlike Beard et al. who focus on the effect of market competition on the extent of voice, we focus on the choice of voice vs exit for consumers with a strong attachment to the original product. The model allows for consumers to try the New Coke, and then assess, *ex post*, the quality change as either an increase (i.e., an improvement) or a decrease (i.e., a worsening).

Consider a market with N price-taking consumers, each with income y . Following the New Coke announcement, each consumer takes the opportunity to taste it by buying one unit at price p and trying it. Depending on their possible reactions to the reformulated drink, the consumers are divided into five groups/types: first (1) non-buyers who do not like New Coke and so continue not buying (*NB*); then there are buyers who (2) like New Coke and are happy with it (*H*), (3) do not like New Coke but remain loyal buyers (*L*), (4) do not like New Coke and voice

unhappiness (V), or (5) do not like New Coke and choose to exit (E).¹¹ Regarding options (4) and (5), exercising either the voice or the exit option can only be done at a cost.

We assume that consumers know their type, $T \in \{NB, H, L, V, E\}$, which is a random variable defined on the interval $[\underline{T}, \bar{T}]$ with cumulative and marginal distribution functions $F(T)$ and $f(T)$, respectively. A consumer's utility depends on his/her type. Assuming a linear utility function, we assume that the five possible consumer reactions are associated with corresponding utilities, which are function of T :

$$U_{NB} = U(y) \quad (NB) \quad (1)$$

$$U_H = T + U(y - p) \quad (H) \quad (2)$$

$$U_L = \lambda T + U(y - p) \quad (L) \quad (3)$$

$$U_V = \nu T + U(y - p) - C_V \quad (V) \quad (4)$$

$$U_E = \varepsilon T + U(y - p) - C_E \quad (E) \quad (5)$$

where $U' > 0$, C_V is the cost of voice, and C_E is the cost of exist with $C_E > C_V > 0$. We assume that the parameters ε , ν , and λ satisfy

$$1 > \varepsilon > \nu > \lambda > 0. \quad (6)$$

The ordering in (6) reflects the relative utility effects of the quality change announcement on different consumer types.

Under this formulation, loyalty is the least costly reaction while exit is most costly. In making this assumption, Beard et al. (2015) follow Farrell and Klemperer (2007) in emphasizing significant costs involved in switching to a different good. Given consumer attachment to the Coca-Cola brand and perceived poor substitution possibilities, this emphasis seems reasonable here.¹²

A consumer that buys the New Coke does not like it, has three options moving forward:

¹¹ Our type- H consumers are equivalent to Beard et al.'s consumers who buy the product/service and discover ex-post that it works. In the case of New Coke, type- H consumers seem to have been few in number.

¹² Consumers that do not like the quality change (New Coke) are always worse off after the change. That is, $T + U(y - p) > zT + U(y - p)$, $T \in \{L, V, E\}$, $z \in \{\lambda, \nu, \varepsilon\}$. However, the amount of the utility-loss experienced by the consumers varies by their type, as indicated by (6). Also note that a consumer will buy the good only if $U(y) < U(y - p) + \max\{T, \lambda T, \nu T - C_V, \varepsilon T - C_E\}$, implying that the utility from buying is greater than the utility from not buying: $U(y) < T + U(y - p)$.

remain loyal and keep buying (L), opt to voice displeasure (V), or exit (E). The option chosen will depend on the consumer's type (T) and the parameter values $\varepsilon, \nu, \lambda, C_V$, and C_E . We assume that there exist values T_0, T_1 , and T_2 , satisfying $\underline{T} < T_0 < T_1 < T_2 < \bar{T}$, such that consumers whose type falls in the range $\underline{T} < T < T_0$ are not buying, those in the range $T_0 < T < T_1$ are loyal, those in the range $T_1 < T < T_2$ opt for voice, and those in the range $T_2 < T < \bar{T}$ choose to exit.

Consumers exercising voice is particularly relevant to the New Coke episode. In the model, that case manifests when,

$$\left(\frac{\varepsilon - \nu}{\nu - \lambda} \right) < \left(\frac{C_E}{C_V} \right). \quad (7)$$

The left-hand side of (7) is the relative utility gain from exiting (rather than voicing displeasure or remaining loyal). For voice to be the optimal action, that ratio must be smaller than the (right-hand side) ratio of exit costs versus the voice cost. If such is the case for many consumers, then the consumer reactions to New Coke (documented above) become intelligible.

Figure 1 shows how the consumers separate into different types. The lines on the figure represent the utilities obtained by different consumer types depending on their actions. Because the utility functions are linear, the upper envelope they form is convex. The thresholds T_0, T_1 , and T_2 , are obtained by finding the intersection points of the utility functions.¹³ Thus T_0 is obtained by setting $U_{NB} = U_L$, which yields ,

$$T_0 = \frac{U(y) - U(y - p)}{\lambda} > 0. \quad (8)$$

Similarly, setting $U_L = U_V$, we obtain,

$$T_1 = \frac{C_V}{\nu - \lambda} > 0, \quad (9)$$

and setting $U_V = U_E$, we obtain,

$$T_2 = \frac{C_E - C_V}{\varepsilon - \nu} > 0. \quad (10)$$

Based on the model's assumptions, we can compute the number of consumers that choose

¹³ Given the ordering we assumed in (6), the linear utility functions (1)–(5) preserve the single crossing property.

actions L , V , and E , respectively:

$$n_L = N[F(T_1) - F(T_0)]; \quad (11)$$

$$n_V = N[F(T_2) - F(T_1)]; \quad (12)$$

$$n_E = N[1 - F(T_2)]. \quad (13)$$

We are particularly interested in how the relative costs of voice (C_V) versus exit (C_E) help to determine (12) relative to (13). The partial derivatives can be calculated as follows:

$$\frac{\partial n_V}{\partial C_V} = -N \left[\frac{f(T_2)}{\varepsilon - \nu} + \frac{f(T_1)}{\nu - \lambda} \right] < 0; \quad (14)$$

$$\frac{\partial n_E}{\partial C_E} = -N \left[\frac{f(T_2)}{\varepsilon - \nu} \right] < 0; \quad (15)$$

$$\frac{\partial n_V}{\partial C_E} = \frac{\partial n_E}{\partial C_V} = N \left[\frac{f(T_2)}{\varepsilon - \nu} \right] > 0. \quad (16)$$

Given (6), the quantities in the brackets are all positive. These partial derivatives are intuitive. For example, if C_V is high, then, all else equal, n_V will be low while n_E will be high. Similarly, if C_E is high, then n_V will be high while n_E will be low.

The evidence that we document below suggests that many Coca-Cola consumers perceived available substitutes to be poor (or perhaps difficult to discover). Hence C_E was high for them. As such, we observe many consumers exercising their voice, expressing their displeasure with the Coca-Cola Company. However, there were also many consumers that (perhaps also) exercised the exit option. (See the \$69.3 million of unsold inventory documented below.)

As we argue in section 7 below, the cost in terms of lost goodwill almost certainly dwarfed the costs of R&D and unsold inventories. This implies that voice and exit were complementary. Consumers' loyalty led them to exercise both: they refused to buy New Coke and complained about it vociferously and bitterly, to anyone who cared to listen. However, voice appears to have been more important in causing the return of the original product

7. COSTS OF BREACHING THE IMPLICIT CONTRACT

Now we consider the costs associated with the Coca-Cola Company breaching the quality clause

of its implicit contract with consumers. First, we note that the Company sunk \$4 million (\$7.7 million in 2005\$) into research and development and taste-testing the New Coke formula. Second, the Company's bottlers incurred a direct loss of \$30 million (about \$57.6 million in 2005\$) in the form of unsold New Coke inventories (Collins 1995).

However, we argue that the R&D and lost inventory costs were significantly smaller than the loss that the Coca-Cola Company incurred in terms of goodwill lost. Hard evidence of lost goodwill is, of course, difficult to provide. In **Figure 1** we plot (adjusted into 2005 \$; logged) net operating revenues and shareholders' equity for the Coca-Cola Company, from 1974 to 2004. (Trend lines are estimated in each case by OLS.) Both series actually exhibit an increase from 1985 to 1986; however they both dip below trend in the following years. In particular, shareholders' equity does not return to trend for over a decade (until 1997). However, any inference directly made based on **Figure 1** is clearly more casual than causal.

Alternatively, Simon and Sullivan (1993) develop a method to estimate "brand equity" based on Tobin's Q (1969, 1978). They define brand equity as "the incremental cash flows which accrue to branded products over and above [those] which would result from the sale of unbranded products" (p. 29). This definition encompasses what we have in mind by the goodwill associated with the implicit contract. Simon and Sullivan use the Coca-Cola Company to illustrate their method; based on this, they report an event study, estimating the impact of New Coke's introduction on the Company's brand equity. They estimate Coca-Cola brand equity to be about 55% of its market value, which in 1985 would have been about \$1.6 billion (about \$3.1 billion in 2005 \$). They then find that New Coke's introduction decreased the Coca-Cola Company brand equity by about 15% (about \$465 million in 2005\$). This is almost an order of magnitude larger than the sum of R&D and lost inventory costs.

A large goodwill loss is reflected in the (more informal) evidence of consumers voicing their displeasure with New Coke. Within a week of its introduction, over 1,000 phone calls were being received daily at the Coca-Cola Company headquarters in Atlanta from consumers expressing shock, anger and outrage. By the middle of March, that number had increased to 5,000 daily; by the beginning of June, 8,000 daily. By the time the original formula was reintroduced (on July 11; as "Coca-Cola Classic), the Company had received 400,000 calls. During this time, the Company also received 40,000 letters of protest (Pendergrast 1993, p. 355). The phone calls and letters expressed sentiments that, at least in hindsight, appear wildly out of

proportion to the issue of a soft drink. A consulting psychiatrist, retained by the Company, recalled that “the emotions he heard were similar to those of grief-stricken parents mourning the death of favorite child” (Pendergrast 1993, p. 355).

The main theme of the letters was betrayal. Consider just a few examples.

“Changing Coke is just like breaking the American dream, like not selling hot dogs at a ball game.”

“For years, I have been what every company strives for: a brand-loyal consumer. [...] My ‘reward’ for this loyalty is having the rug pulled out from under me. New coke is absolutely AWFUL. ... Don’t send me any coupons or other inducements. You guys really blew it.”

“Millions of dollars’ worth of advertising cannot overcome years of conditioning, or in my case, generations. The old Coke is in the blood. Until you bring the old Coke back, I am going to drink R.C.”

“Would it be right to rewrite the Constitution? The Bible? To me, changing the Coke formula is of such a serious nature.”

“There are only two things in my life: God and Coca-Cola. Now you have taken one of those things away from me.”

“Changing Coke is like God making the grass purple or putting toes on our ears or teeth on our knees.”

“My dearest Coke: You have betrayed me.”

Undoubtedly, not every letter and phone call were quite as over-the-top as these. Still, the overall impression left on Company executives by the consumer responses was bewilderment and exasperation. After monitoring the consumer hotline and hearing the complaints, company president Roberto Goizueta muttered: “They talk as if Coca-Cola had just killed God”

(Pendergrast 1993, p. 364).

We argue that the contrast between consumer reactions during blind taste tests and when New Coke was publicly introduced reflect the importance of the implicit contract. “Blindfolded, people were consumers who wanted a new taste. Eyes open, they were Americans who felt betrayed by New Coke” (Allen 1994, p. 17). Note that one way to interpret this is that consumers did not so much have a problem with New Coke’s introduction as they did with the old Coca-Cola being taken away from them. This interpretation is consistent with the tone of the letters quoted above (notwithstanding the fact that one consumer *does* outright state that New Coke is “AWFUL”). It is also consistent with the idea that negative consumer reaction was not based on a rejection of New Coke’s taste but, rather, the Coca-Cola Company’s breach of the implicit contract. The original Coke and along with its Secret Formula was something that had been committed to and delivered on for nearly a century; goodwill toward the Coca-Cola Company was tied up with adherence to that commitment.

Consumer voice and exit were ultimately effective. On July 11, 1985 – without fanfare – the company announced the return of the original Coke under the name, “Coca-Cola Classic.” Don Keough, Vice President for Operations, summarized the lesson the company learned from the century’s biggest blunder: “The simple fact is that all the time and money and skill poured into consumer research on the New Coca-Cola could not measure or reveal the deep and abiding emotional attachment to original Coca-Cola felt by so many people” (Allen, 1994, p. 416).

8. BREACHING THE IMPLICIT CONTRACT: WHAT WENT WRONG?

One of the important issues in the context of implicit contracts is a vulnerability of the Coca-Cola Company to consumer backlash in the case of breach. This vulnerability makes the contract incentive compatible and therefore credible. Young and Levy (2014) demonstrate that the company’s management recognized that it was indeed vulnerable to consumer backlash. They believed that three attributes of the product – price, quantity (per serving), and quality – should remain unaltered, as promised by an implicit contract.

Beginning in 1920s, for example, the Coca-Cola Company was stressing in its ads both the 6.5 oz. quantity and 5¢ price as something that consumers expected and could count on. Similarly, upon becoming president of Coca-Cola, Robert Woodruff “established several guidelines [among which was that] *he would never tamper with the quality of the product*” [our

emphasis], (Kahn, 1969, p. 74). The 1969 campaign depicting Coca-Cola as the “Real Thing” reflected the Company’s continued effort to communicate that commitment to the general public.¹⁴

Similarly, the Coca-Cola Company early on recognized the importance of protecting and preserving its consumer goodwill. For example, the company’s 1924 annual report stated: “All of our equipment might be replaced more easily than could our goodwill, which has been cultivated through 38 years of consistent effort.”¹⁵ Company leadership viewed the maintenance of the implicit contract as a key to the accumulation and maintenance of consumer goodwill.

In light of the above, it is remarkable that the Coca-Cola Company abandoned the original Coke. Goizueta’s decision to reformulate the 99-year-old drink was made based on blind taste-tests, with the hope of beating Pepsi in their fight for the market share. What the Coca-Cola Company management did not take into account was consumers’ emotional attachment to what “Coca-Cola” stood for: continuation, stability, childhood memories. It was not the drink inside the bottle that mattered. It was the bottle, the label on it, the name “Coca-Cola,” and what it signified to America (Fischer, 1985).

As Blanding (2010) explains, they should have known better. When Coca-Cola was developing Diet Coke, the Company’s marketing people discovered that the word “Coke” was enough to drive sales. For example, “When they tested Tab against Pepsi, it lost by a 4 percent margin; when they poured the same drink into a Diet Coke can, however, it caused customer preference to jump 12 points” (p. 61). But that was attaching the term “Coke” to a different product *alongside* the original and still-available Coca-Cola. Replacing the old Coke with something different and labeling it “Coke”? Well, that was something entirely different.

Studies have confirmed this effect. For example Pierce (1987) and Pierce and Belke (1988) show that brand names and trademarks can exert greater influence over consumers’ opinions of the actual taste of products. Based on their experiments, they report that the product labels (rather than taste) influenced subjects’ ratings of Coke and New Coke, depending on the subjects’ reported prior attitudes. The regular users of Coke ranked products that were labeled

¹⁴ Even though the consumer ad campaign was not introduced until 1969, consider an ad that the company placed in a number of retail trade publications, reproduced in Coca-Cola Company’s *Advertising Copy Collection, 1942*, 01724 ARS (Coca-Cola Company Archive): “There’s a seven-letter word for it: QUALITY... the quality of genuine goodness. That’s what your customers recognize in Coca-Cola... [I]t’s the real thing. 5¢. You trust its quality.”

¹⁵ Source: Annual Report of the Coca-Cola Company, February 26, 1924, p. 4.

“Coke” higher than the products that were labeled “New Coke.” In contrast, subjects who did not drink Coke regularly showed a greater preference for the product labeled “New Coke.”

Furthermore, Lee et al. (1996) report that since Coca-Cola has been around for such a long time, consumers have developed a strong emotional attachment to the brand, and thus they do not like to see it changed.

The Coca-Cola Company’s misadventure with New Coke might in part be due to its limited product portfolio at that time. The company had purchased or introduced a limited number of other soft drink brands over the years – Fanta (1946), Sprite (1961), Tab (1963), and Fresca (1966); it had also made a foray into the juice market by purchasing the Minute Maid Corporation in 1960. However, none of these offerings were attached to the Coca-Cola brand. As mentioned above, that changed in 1982 with the introduction of “Diet Coke”, which was subsequently followed by “Caffeine Free Coca-Cola” in 1983 and “Caffeine Free Diet Coke” in 1984. New Coke, therefore, represented only the third time that the Coca-Cola Company had introduced a new product under the “Coca-Cola” brand or its “Coke” variant.

Since that time, the Coca-Cola Company has introduced a large number of products into the “Coca-Cola”/“Coke” portfolio. (As examples, today you can purchase “Coca-Cola Energy”, “Coca-Cola Life”, “Coca-Cola Vanilla”, “Coca-Cola Cherry”, and “Coca-Cola with Coffee”.) Broad product portfolios are now commonplace and scholars have identified at least two broad reasons why this is the case. First, broad portfolios allow firms to cater to heterogeneous consumer bases more effectively (Lancaster 1979; Connor 1981). Second, broad portfolios provide better deterrence against entry by new competitors (Schmalensee 1978; Brander and Easton 1984; Bananno 1987).

However, New Coke was different than the company’s other experiments with extending the brand in that it was planned as a complete *replacement* of an existing product – and, for that matter, the flagship product with just shy of 100 years of history! Given that Coca-Cola market share was declining relative to Pepsi, such a substitution appeared to be a reasonable response to changes in market conditions. However, the Coca-Cola Company underestimated the extent to which its brand equity was tied to the Secret Formula rather than the name “Coke”, per se. While New Coke was preferred to both the older formula and Pepsi in blind taste tests, once it was introduced to the public it was “compared with a Coke brand that came with 100 years of positive brand equity attached” (Elliott and Percy 2007, p. 184). The Coca-Cola Company

assumed that its brand equity would transfer to New Coke; instead, the replacement of the original Coca-Cola was harmful to that equity. We argue that this was true because that brand equity was based, in large part, on an implicit promise of constant quality; and after nearly a century, that promise was reneged on.

Did the Coca-Cola Company learn from the New Coke episode moving forward? While we have little direct evidence that speaks to this question, one can infer that this is true based on the company's subsequent approach to introducing its "Coke Zero" brand in 2005 in relation to its existing "Diet Coke" sugar-free soda. Ringold (1988) and Jones et al. (2016) both emphasize that the Coca-Cola Company left itself particularly open to backlash because it had positioned New Coke as a replacement product rather than an additional choice. In the immediate aftermath, this was something that the company's director of marketing research and its director of marketing acknowledged "was a mistake"; "maybe we goofed" (Oliver 1986, p. 113).

By positioning New Coke as a replacement of a pre-existing option, Ringold (1988) argues that the Coca-Cola Company was vulnerable to "psychological reactance" on the part of its consumers (Brehm 1966, 1972). According to this theory, consumers perceived themselves to have a set of freedoms, one of which was being able to consume Coca-Cola. When New Coke was introduced, consumers discounted the availability of a new (perhaps better) beverage; instead, they emphasized that their freedom to drink the original Coca-Cola was being taken away. This psychological reactance would not have been anticipated based on blind taste tests with participants who did not know if their input would be informing a product change, replacement, or addition (Jones et al. 2016).

Jones et al. (2016, p. 3) observe that the Coca-Cola company's "recent past positive experience of the diet Coke [sic] introduction may have made decision makers believe that if they applied the same processes [e.g. focus groups; taste tests], they would also experience success with New Coke." It is notable, then, that when the company decided to introduce Coke Zero in 2005 (later rebranded "Coca-Cola Zero Sugar" in 2017), it was not a replacement for Diet Coke. Indeed, the company has never discontinued Diet Coke despite the fact that it has been continuously losing market share to Coke Zero and some company executives have

complained about the latter's cannibalization of Diet Coke sales.¹⁶

9. CONCLUSION

We offer empirical evidence on the costs associated with the Coca-Cola Company breaching an implicit contract with its consumers. We offer two types of evidence. The first is based on the argument that if the Coca-Cola Company chose to pay a permanently higher marginal cost of production rather than adjust quality, then we can interpret that increase as a lower bound of the cost of breach. The second type is based on analysis of the market reaction following the decision to abandon the century-old Secret Formula and introduce New Coke in 1985.

We believe that it is an important case study because the Coca-Cola is one of the most successful and recognized products in the world, with one of the most valuable brands. Based on our case study, we can speculate that similar implicit contracts likely exist in the context of other consumer products characterized by loyal customers with strong attachments. In such cases, the cost of breaching the implicit contract might also be substantial.

Furthermore, this case study points to the importance that "voice" can play relative to "exit" in disciplining firm behavior. Beard et al. (2015, p. 718) note: "The salubrious story of competitive markets thus rests largely on the ability and willingness of informed consumers to take actions that discipline ill-behaving firms." The default "action" to which economists turn is exit. However, the Coca-Cola case study suggests that voice may not only part of the story, but one that can be more important than previously recognized - indeed, in some cases more important than exit.

Our work will hopefully motivate future studies to identify and analyze cases where implicit contracts and/or the voice option are important factors. Our work highlights economists' neglect of both those factors in goods markets. This is important especially in light of how the Internet and social media have dramatically reduced the cost of, on the supply side, communicating commitments and, on the demand side, exercising voice. The increased availability of the social media data (e.g., tweets data used by Gans, et al 2020) will offer new avenues and opportunities for future research on implicit contracts, and on voice, exit, and loyalty.

¹⁶ See "Coca-Cola Cannibalism: Diet Coke's Sister Brand is Pushing it Closer to the Brink of Destruction", *Business Insider* (October 25, 2017): <https://www.businessinsider.com/coke-zero-sugar-trumps-diet-coke-2017-10> (last accessed August 9, 2020). The "executives" references in the article are not named.

REFERENCES

- Allen, F. (1994) *Secret Formula: How Brilliant Marketing and Relentless Salesmanship Made Coca-Cola the Best-Known Product in the World*. New York: Harper Business.
- Anderson, E. T. and Simester, D. I. (2010) Price stickiness and customer antagonism. *Quarterly Journal of Economics*, 125, 729–765.
- Azariadis, C. (1975) Implicit contracts and underemployment equilibria. *Journal of Political Economy*, 88, 1183–1202.
- Bailey, Martin (1974), “Wages and Employment under Uncertain Demand,” *Review of Economic Studies* 41, 37–50.
- Ball, L. and Romer, D. (2003) Inflation and the informativeness of prices. *Journal of Money, Credit, and Banking*, 35, 177–196.
- Bananno, G. (1987) Location choice, product proliferation, and entry deterrence. *Review of Economic Studies*, 54, 47–64.
- Beard, R., Macher, J. and Mayo, J. (2015) Can you hear me now? exit, voice and loyalty under increasing competition. *Journal of Law and Economics*, 58, 717–745.
- Beaudry, P., and DiNardo, J. (1991) The effect of implicit contracts on the movements of wages over the business cycle: evidence from micro data. *Journal of Political Economy*, 99, 665–688.
- Bils, M. (1989) Pricing in a customer market. *Quarterly Journal of Economics*, 104, 699–718.
- Blanding, M. (2010) *The Coke Machine: The Dirty Truth behind the World’s Favorite Soft Drink*. New York: Avery-Penguin Group.
- Blinder, A.S. (1991) Why are prices sticky? preliminary results from an interview study. *American Economic Review*, 81, 89–100.
- Blinder, A.S. (1994) On sticky prices: academic theories meet the real world. In (N.G. Mankiw, Ed.) *Monetary Policy*. Chicago: NBER and the University of Chicago Press.
- Blinder, A. S., Canetti, E. D., Lebow, D. E. and Rudd, J. B. (1998) *Asking about Prices: A New Approach to Understanding Price Stickiness*. New York: Russell Sage Foundation.
- Brander, J., and Eaton, J. (1984) Product line rivalry. *American Economic Review*, 74, 323–334.
- Brehm, J. W. (1966) *A Theory of Psychological Reactance*. New York: Academic Press.
- Brehm, J. W. (1972) *Responses to Loss of Freedom: A Theory of Psychological Reactance*. Morristown: General Learning Press.
- Collins, G. (1995) Ten years later, Coca-Cola laughs at ‘New Coke’. *New York Times*, April 11, 1995, Business Day Section, p. C4.
- Connor, J. (1981) Food product proliferation: a market structure analysis. *American Journal of Agricultural Economics*, 21, 606–617.
- Elliott, R. and Percy, L. (2007) *Strategic Brand Management*. Oxford: Oxford University Press.
- Farrell, J., and Klemperer, P. (2007) Coordination and lock-in: competition with switching costs and network effects. In (M. Armstrong and R. H. Porter, Eds.) Vol. 3 of *Handbook of Industrial Organization*. Amsterdam: Elsevier.
- Fisher, A. B. (1985) Coke’s brand loyalty lesson. *Fortune*, August 1985, 44–46.
- Friedman, M. (1962) *Capitalism and Freedom*. Chicago: University of Chicago Press.
- Gans, J. S., Goldfarb, A. and Lederman, M. (2020) Exit, tweets, and loyalty. *American Economic Journal – Microeconomics*, (forthcoming).
- Gelb, B. and Gelb, G. (1986) New Coke’s fizzle – lessons for the rest of us. *Sloan Management Review*, 28, 71–76.

- Greenslade, J. and Parker, M. (2008) Price-setting behavior in the United Kingdom. *Bank of England Quarterly Bulletin*, 4, 404–415.
- Ham, J.C. and Reilly, K. T. (2002) Testing intertemporal substitution, implicit contracts, and hours restriction models of the labor market using micro data. *American Economic Review*, 92, 905–927.
- Hirschman, A. (1970) *Exit, Voice, and Loyalty: Responses to Decline in Firms, Organizations, and States*. Cambridge: Harvard University Press.
- Jones, K., Ondracek, J., Saeed, M., and Bertsch, A. (2016) Don't mess with Coca-Cola: introducing New Coke reveals flaws in decision-making within the Coca-Cola Company. *GE-International Journal of Management Research*, 4, 1–6.
- Kahn, E.J., Jr. (1969) *Robert Winship Woodruff*. Atlanta: The Coca-Cola Company.
- Kahneman, D., Knetsch, J. and Thaler, R. (1986) Fairness as a constraint on profit seeking: entitlements in the market. *American Economic Review*, 76, 728–741.
- Kilponen, J. and Santavirta, T. (2010) New evidence on implicit contracts from linked employer-employee data. *Scandinavian Journal of Economics*, 112, 864–883.
- Lancaster, K. (1979) *Variety, Equity, and Efficiency*. New York: Columbia University Press.
- Lee, M., Lee, J. and Kamakura, W. (1996) Consumer evaluations of line extensions: a conjoint analysis. *Advances in Consumer Research*, 23, 289–295.
- Levy, D. and Smets, F. (2010) Price setting and price adjustment in some European Union countries: introduction to the special issue. *Managerial and Decision Economics*, 31, 63–66.
- Levy, D. and Young, A. T. (2004) “The Real Thing”: nominal price rigidity of the nickel coke, 1886–1959. *Journal of Money Credit and Banking*, 36, 765–799.
- Nakamura, E. and Steinsson, J. (2011) Price setting in forward-looking customer markets. *Journal of Monetary Economics*, 58, 220–233.
- Okun, A. (1980) The invisible handshake and the inflationary process. *Challenge*, 22, 5–12.
- Okun, A. (1981) *Prices and Quantities: A Macroeconomic Analysis*. Washington, DC: The Brookings Institution.
- Oliver, T. (1986) *The Real Coke, The Real Story*. New York: Random House.
- Paciello, L., Pozzi, P. and Trachter, T. (2019) Price dynamics with customer markets. *International Economic Review*, 60(1), 1–34.
- Pendergrast, M. (1993) *For God, Country and Coca-Cola: The Unauthorized Biography of the Great American Soft Drink and the Company that Makes It*. New York: Simon and Schuster..
- Pierce, W. D. (1987) Which Coke is it? social influence in the marketplace. *Psychological Reports*, 60, 279–286.
- Pierce, W. D. and Belke, T. W. (1988) Stimulus control of consumer opinion by brand names: a social conditioning analysis. *Psychological Record*, 38, 227–236.
- Ringold, D. J. (1988) Consumer response to product withdrawal: the reformulation of Coca-Cola. *Psychology and Marketing*, 5(3), 189–210.
- Romer, D. (1993) The new Keynesian synthesis. *Journal of Economic Perspectives*, 7, 5–22.
- Rosen, S. (1985) Implicit contracts: a survey. *Journal of Economic Literature*, 23, 1144–1175.
- Rosen, S. (Ed.) (1994) *Implicit Contract Theory*. Brookfield: E. Edgar.
- Rotemberg, J. (1987) The new Keynesian microfoundations. *NBER Macroeconomics Annual*, 1, 69–104.
- Rotemberg, J. (2005) Customer anger at price increases, changes in the frequency of price adjustment and monetary policy. *Journal of Monetary Economics*, 52, 829–852.
- Rotemberg, J. (2011) Fair pricing. *Journal of the European Economic Association*, 9, 952–981.

- Schaeffer, R., and Bateman, W. (1985) The formula for Coca-Cola: the old ... the new. *The Cola Call* 4–6 (Coca-Cola Company Archives).
- Schmalensee, R. (1978) Entry deterrence in the ready-to-eat breakfast cereal industry. *Bell Journal of Economics*, 9, 305–327.
- Simon, C. J., Sullivan, M. W. (1993) The measurement and determinants of brand equity: a financial approach. *Marketing Science* 12, 28–52.
- Tobin, J. (1969) A general equilibrium approach to monetary theory. *Journal of Money, Credit, and Banking*, 1, 15–29.
- Tobin, J. (1978) Monetary policies and the economy: the transmission mechanism. *Southern Economic Journal*, 44, 421–431.
- Young, A. T. and Levy, D. (2014) Explicit evidence of an implicit contract. *Journal of Law, Economics, & Organization*, 30, 804–832.

TABLE 1 Increase in the marginal cost of producing "Merchandise No. 5" as a result of the 1930 Porter Bill.

	Syrup Sold (gals.)	Merchandise No. 5 Used (lbs.)	Current \$s	2018 \$s	Share of Gross Sales	Share of Net Profits	Share of Expenses
1931	26,679,998	205,230	\$82,092	\$1,356,181	0.20	0.59	0.91
1932	22,022,817	169,406	\$67,762	\$1,242,019	0.20	0.63	0.73
1933	20,891,971	160,707	\$64,282	\$1,241,683	0.20	0.59	0.74
1934	25,909,268	199,302	\$79,720	\$1,493,912	0.20	0.56	0.82
1935	29,670,098	228,231	\$91,292	\$1,673,302	0.20	0.58	0.85
1936	37,478,577	288,296	\$115,318	\$2,083,255	0.20	0.57	0.90
1937	44,293,110	340,716	\$136,286	\$2,376,563	0.19	0.59	0.90
1938	48,508,414	373,141	\$149,256	\$2,658,111	0.19	0.58	0.85
1939	56,248,702	432,682	\$173,072	\$3,126,597	0.19	0.60	0.87

Source: Coca-Cola Company Annual Reports for the corresponding years and authors' calculations.

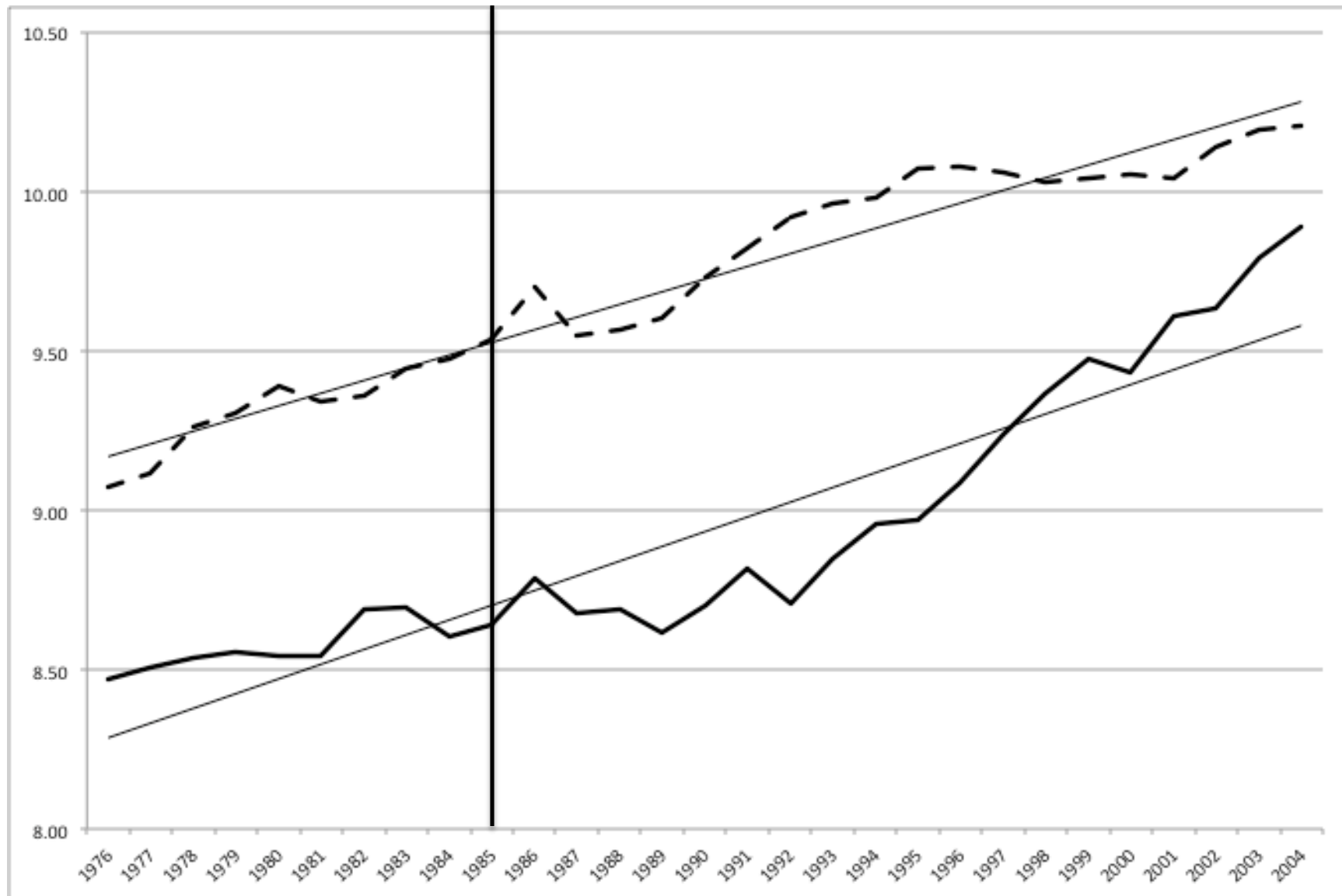


FIGURE 1 Coca-Cola Company (log; inflation adjusted) net operating revenue (dashed) and shareholders' equity (solid), 1974-2004.

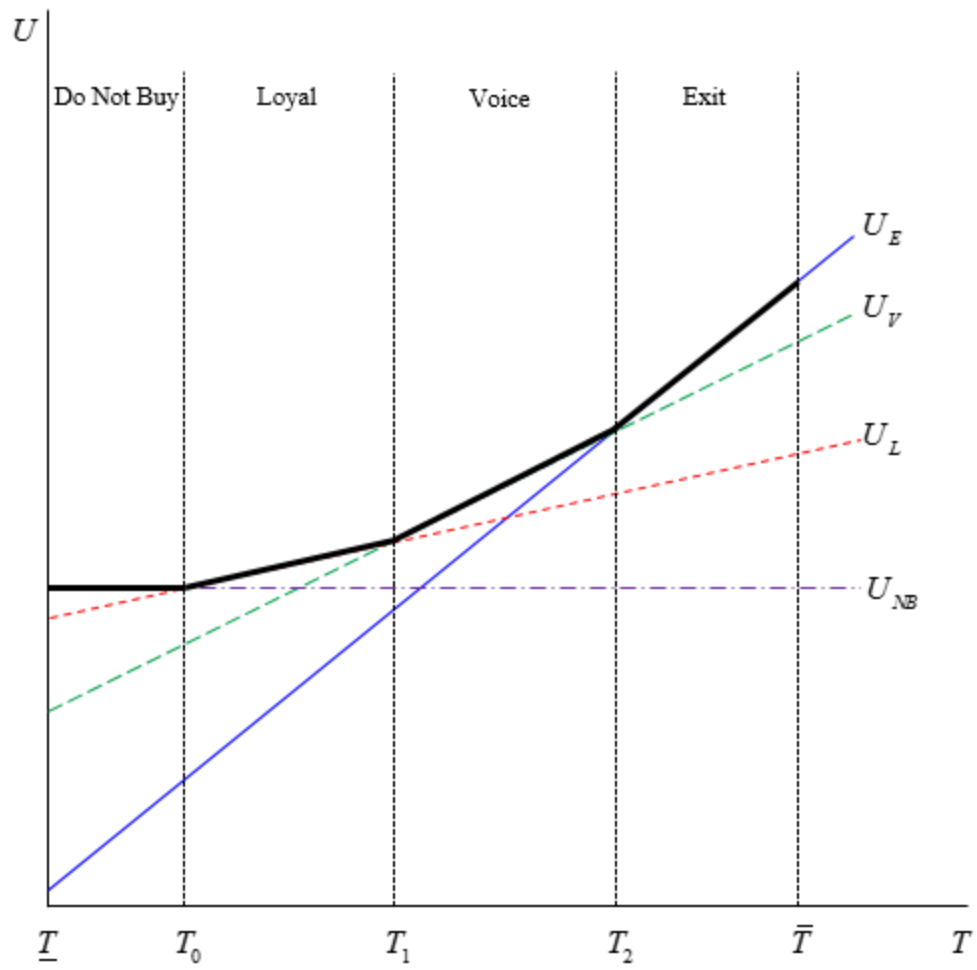


FIGURE 2 Exit, voice, and loyalty: thresholds separating different consumer types.

Source: Beard et al. (2015)