Explicit Evidence on an Implicit Contract*

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Abstract

We offer the first direct evidence of an implicit contract in a goods market. The evidence we offer comes from the market for Coca-Cola. We demonstrate that the Coca-Cola Company left a substantial amount of written evidence of its implicit contract with its consumers—a very explicit form of an implicit contract. The contract represented the promise of a five cent (nominal) price and adherence to the “Secret Formula.” In general, the implicit nature of such contracts makes observation difficult. To overcome this difficulty, we adopt a narrative approach. Based on the analysis of a large number of historical documents obtained from the Coca-Cola Archives and other sources, we offer evidence of the Coca-Cola Company both acknowledging and acting on this implicit contract. We also make another unique contribution by exploring quality as a margin of adjustment available to Coca-Cola. The implicit contract included a promise not only of a constant nominal price but also a constant quality (i.e., 6.5 oz. of the Secret Formula). During a period of over 70 years, we find evidence of only a single case of true quality change. By studying the margin of adjustment the Coca-Cola Company chose in response to changes in market conditions, we demonstrate that the perceived costs of breaking the implicit contract were large.
"Sellers . . . can influence the shopping behavior of customers by pledging continuity of an offer . . . Yesterday's offer has a strong influence on today's demand."

Arthur Okun (1981, p. 28)

"Implicit contracts strike many economists . . . as quite plausible. Yet their existence is—almost by definition—not subject to objective verification, at least not from conventional data sources."

Alan Blinder, et al. (1988, p. 149)

"[Narrative approach] allows a vast body of information that cannot be employed in conventional statistical tests, to be brought to bear on [the] . . . question."

Christina Romer and David Romer (1989, p. 167)

1. INTRODUCTION

"Invisible handshakes," or implicit contracts, were popularized by Okun (1981) as a possible source of price rigidity. They have most often been explored in the context of wages set in labor markets (Rosen, 1985, 1994). However, implicit contracts are plausible sources of price rigidity in customer markets as well.\(^1\) To our knowledge, however, no studies offer direct evidence of this in actual customer markets.\(^2\) In this paper, we offer the first direct and, in fact, quite explicit evidence of such an implicit contract. The evidence comes from the market for Coca-Cola.

Starting in 1886, in the bottle or at the fountain, 6.5 ounces of Coca-Cola retailed for 5 cents. With deviations remarkably few and far between, the nominal price of a serving of Coca-Cola did not adjust for over 60 years. The nickel Coke did not entirely disappear from US markets until 1959—over 70 years! Furthermore, during this time there was also remarkable quality rigidity with alterations to the “Secret Formula” occurring less than once a decade (Levy and Young, 2004). We argue that an implicit contract with consumers was associated with both the price and quality rigidity.

The fact that there are no other studies offering direct evidence on the existence of

\(^1\) Okun (1981) introduced the term “customer markets” to refer to those goods markets where long-term relationships can exist between sellers and buyers.

\(^2\) Renner and Tyran (2004) present experimental evidence that long-term relationships based on trust can form to mitigate “lemons” problems when cost shocks are difficult for consumers to discern.
implicit contracts in customer markets should not be surprising. Observing implicit contracts directly is difficult. As Blinder, et al. (1988) note, implicit contracts are "tacit agreements that are not written down, the theory does not predict literal price rigidity, but only that prices are relatively insensitive to fluctuations in demand" (p. 152). Given their implicit nature, conventional data sources are of little use in studying implicit contracts.

To overcome these difficulties, we adopt a narrative approach which has been recently used in other contexts by Romer and Romer (1989, 1994) and Zbaracki, et al. (2004). As Romer and Romer (1989) emphasize, the key benefit of the narrative approach is that it allows one to exploit a large body of soft data containing qualitative information that is difficult to employ in conventional econometric studies.

The Coca-Cola price rigidity is fascinating regardless of the existence of an implicit contract. Today, if we scan the economic literature on price rigidity we find cases of rigid nominal prices in the US for considerable periods of time.\(^3\) Cecchetti (1986) reports that magazine prices normally change only every 3 to 6 years. Using the Stigler and Kindahl (1970) transaction data, Carlton (1986, p. 639) finds that, "It is not unusual in some industries for prices to individual buyers to remain unchanged for several years." Kashyap (1995) studies catalog prices of 12 retail goods over a 35-year period and reports that the average time between price changes is about 15 months. Blinder, et al. (1988) present detailed survey evidence from US firms and conclude that the average lag of price adjustments following supply or demand changes is 3 months.\(^4\)

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\(^4\) See also Hall (2000). Several studies were conducted by the European Central Bank (ECB) and by the central banks of the EU member countries, using a survey methodology similar to Blinder, et al (1988). These studies, which were conducted as part of the ECB's Inflation Persistence Network (Álvarez, et al, 2006 and Dhyne, et al. 2006 summarize these studies), report that the prices in the EU countries tend to be more rigid than in the US, For example, according to Dhyne, et al. (2006), prices in the Euro Area remain
More recently, Levy et al. (2002), Genesove (2003) and Young and Blue (2007) document nominal rigidities in apartment rental rates, orange juice products, and goods sold in Sears catalogs, respectively. These studies report price rigidities ranging on average from about a month (for orange juice) to a few months (for apartment rents) to over two years (for Sears catalog items). Also, recent studies that use micro-level transaction price data report figures of the same order of magnitude. For example, Nakamura and Steinsson (2008) find that the average price duration in the US is between 8 to 11 months. Nakamura and Zerom (2010) study the behavior of the retail and wholesale prices of coffee and find that the duration of manufacturer prices of ground coffee is about 9 months, while retail price spells average about 6.6 months.

Compared to the price spells reported in these studies, the Coca-Cola rigidity is larger by at least an order of magnitude. Also, though it is only a single firm, the Coca-Cola Company is one of the most successful and recognized producers of a consumer good in the world. During the time period we study, the soft drink industry and the Coca-Cola Company itself were a non-negligible part of the US economy. For example, in 1945 the bottled non-alcoholic carbonated beverage industry was 0.26% of US GDP (Riley, 1942, p. 343). The Coca-Cola Company had a roughly 50 percent market share in that industry, making its own contribution an economically significant 0.13% of GDP.

In a previous paper (Levy and Young, 2004) we argue that an explicit contract

unchanged for about 13 months on average. The corresponding figure for the US data studied by Bils and Klenow (2004), is about 6.7 months for the same basket of consumer goods.

5 Some studies document considerably higher frequencies for price changes. Bills and Klenow (2004) examine price changes for 350 categories of goods and services covering about 70 percent of US consumer spending and document that half of the price changes last less than 4.3 months. Dutta, et al. (2002) use data on retail prices of several orange juice products, and document even more frequent price changes.

6 Other studies include Anderson and Simester (2010), Chevalier and Kashyap (2011), Anderson, et al. (2012), and Gagnon, et al. (2012). A related literature that studies pricing to market, reports similar findings. For example, Goldberg and Hellerstein (2012, forthcoming) study beer prices using data from a large US supermarket chain and find that the retail and the wholesale prices of several brands of beers remain unchanged for periods of few weeks to few months. They also find that only about 7 percent of an exchange rate change is transmitted to a beer's retail price. See also Goldberg and Hellerstein (2007) and Gopinath and Itskhoki (2010, 2011).
between the Coca-Cola Company and its bottlers was an important cause of this nominal price rigidity in the early period, until the contract was voided in 1921. The nominal price of Coca-Cola syrup to bottlers was fixed by this contract. Given this, the Coca-Cola Company could increase profits only by increasing the quantity of syrup it sold to bottlers and, therefore, the Company pursued a policy of retail price maintenance. This explicit contract, however, can explain the Coke's price rigidity up to 1921, which leaves over 35 additional years of price rigidity to be explained.

Our previous paper does not address the implicit contract between Coca-Cola and its consumers. We feel that it is an important source of the Coca-Cola price rigidity during the 1921-1959 period, and in this paper we focus on it. However, we stress that the explicit contract documented in Levy and Young (2004) and the implicit contract documented here are not unrelated. Indeed, we believe that the former was a contributing and reinforcing influence on the latter.

In addition to offering direct evidence on an implicit contract concerning price in a customer market, this case study also makes a unique contribution by exploring quality as an additional dimension of the implicit contract. We present evidence that the implicit contract included the promise not only of a constant nominal price but also a constant quality. We document the dedication to the 6.5-ounce serving of the "real thing" and its Secret Formula. Over a 73 year period, only seven confirmed changes in the Secret

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7 Also, subsequent to 1921, two technology-based factors help to explain the continuation of the nickel price. First, an installed base of vending machines with nickel-only capability and limited technology for change-making imposed a constraint on price adjustment. Second, at the 5¢ price, the smallest price increase compatible with consumers using a single coin was a 100 percent increase to 10¢. A monetary transaction technology for smaller price adjustments, keeping consumer "inconvenience costs" low, was not available. Daly (1970) documents widespread consumer inconvenience costs due to a shortage of small change in Brazil around 1970. Also, Selgin (2008) documents how in late 1700s UK private coinage flourished in response to a costly shortage of smaller denomination coins. Knotek (2008) models a firm that incorporates convenience into pricing decisions. His simulation exercises reveal that the model can account for the dynamics of US newspaper cover prices. Knotek (2011) extends the evidence to a cross-section of several convenience store products. Lastly, Eckard (2007) proposes that relatively few "even" price points reduced cashier transaction costs and accounts for pricing in US grocery stores circa 1900.
Formula occurred. Of those, we argue that two are best viewed as changes in the mix of substitutable inputs; another two were adopted to provide identical quality between the bottled and fountain forms of the drink; yet another two changes were mandated by court decisions. Thus we document only a single case of true quality change.

The paper is organized as follows. Section 2 briefly documents both the price and quality rigidities associated with Coca-Cola from 1886 an onward into the 1950s. Changes in economic conditions during this time period are summarized; special attention is given to economically significant changes in the Company’s marginal costs and exogenously-induced shortages in materials. Section 3 then describes implicit contracts and the economic problems that they can solve. We then document that such problems were perceived as important by the Company. Section 4 contains our evidence of an implicit contract in the case of Coca-Cola. This evidence takes the form of (i) internal Company documents and (ii) external observations consistent with the implications of an implicit contract. The relationship between the implicit contract and the explicit contract with bottlers (stressed in Levy and Young (2004)) are addressed in section 5. Alternative explanations for the price rigidity episode are considered in section 6. We conclude in section 7 with some general insights to be gleaned from the specific case of the Coca-Cola implicit contact.

2. THE COCA-COLA EPISODE

Quite possibly the most enduring and binding invisible handshake began with a peddler of patent medicines in Atlanta, Georgia—one John Stith Pemberton. In 1886, Pemberton had an ingenious idea. Why sell 75¢ or $1 bottles of medicine? This was a marketing strategy limited to the sick. Why not sell a single serving for 5¢? Looking back, it is no surprise that the nickel Coke was born. What is surprising is that it was for all intents and
purposes uniform for over 60 years and did not disappear for over 70 years.\(^8\)

Whether in a bottle or at a soda fountain, 6.5 ounces of Coca-Cola retailed for a nickel. Exceptions were remarkably few and far between. Furthermore, such deviations were quite unpopular with consumers. As late as 1951, *Fortune* magazine reported that Louisiana dealers, seeking to pass on cost increases to consumers, had to quickly retreat as consumers threatened to “take *all* their business elsewhere [our emphasis]”: “Everybody knows Coke sells for a nickel – look at the back of this week’s *Life*” (p. 129).

During the over-70 year nominal price rigidity, Coca-Cola exhibited almost equally enduring quality rigidity. Schaeffer and Bateman (1985) document merely six changes in the Secret Formula from 1886 to 1960. We also found evidence of an additional, temporary change in the Secret Formula associated with WWII sugar rationing in 1942. A sugar substitute – most likely saccharine – was used along with rationed sugar.\(^9\) Two of these changes were exogenously imposed on the Coca-Cola Company. All but one of the others are interpreted as attempt to keep quality *unchanged*. Since we argue that constant quality was a part of the implicit contract, we elaborate on each of these Formula changes briefly.

The first documented change was made by Asa Candler who acquired the Coca-Cola Company in 1889. Soda fountain operators were complaining that the syrup turned rancid in storage. Glycerin was added as a preservative to halt the tendency towards fermentation. The Formula was at that time also altered by “adding essential ingredients and by taking others out of the Pemberton Formula” in order to make the Coca-Cola’s ingredients more “compatible” with each other. By all accounts, these Formula changes

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\(^8\) Many general facts mentioned in this section are drawn from Levy and Young (2004). More thorough citations supporting these facts can be found there; more details concerning these facts as well.

\(^9\) Source: Robert Woodruff, the Coca-Cola Company President, in a letter to Arthur Acklin. According to Allen (1994, p. 253n), a substitute for “oil of cassia” was also employed.
were designed to prevent perishing and ensure constant quality at different locations.

In 1899 a second documented change occurred. The Company decided to prepare two different syrups—one for the fountain drink and one for the bottled drink. Specifically, the syrup for bottles contained more sugar, less water, more caramel, more citric acid, less caffeine, and more phosphoric acid (Allen, 1994, p. 9). These differences were designed to adapt the drink to two different settings and guarantee that the two forms of the drink had identical tastes; that is, in order to ensure constant quality across consumption at the fountain and from the bottle.

The third change in the Formula came in response to government’s 1898 collection of a stamp tax on medicine. At that time Coca-Cola was still marketed as a drink with medical value,\(^{10}\) and the Company was taxed $29,502.00. The company later sued the government and the tax payments were returned (Allen, 1994, p. 43). However, at trial in 1901 the issue of cocaine content was addressed and Asa Candler admitted under oath to Coca-Cola having “a very small trace of it.”\(^{11}\) Facing subsequent threats of prosecution, the company relegated the preparation of “Merchandise No. 5” (the ingredient containing the coca leaf and kola nut extracts) to an outside contractor to ensure that the cocaine is completely removed from the drink. This change was made

\(^{10}\) An ad circulated by Yearby’s Drug Store (in late 1890s, no exact date is provided, Coca-Cola Company Archive) states: “Coca-Cola is not simply a nicely flavored syrup, but contains, in a remarkable degree, the tonic properties of the wonderful Erythroxylon Coca Plant of South America, which has a world-wide reputation for sustaining the vital power under conditions of extraordinary fatigue, and affords prompt relief for mental and physical exhaustion, or nervous prostration. It also has the stimulating, enlivening, reviving properties of the extract from the celebrated African Cola Nut. This forms the choicest, most desirable and efficacious remedial combination possible. Coca-Cola renews the vigor of the intellect, rendering the flow of thought more easy and the reasoning power more vigorous; it conduces to mental clearness and activity, freedom from fatigue and power of endurance. It has gained an envious reputation, and has taken position at the very front of the leading and popular soda fountain beverages. For sale at Yearby’s Drug store.” As another example, an ad circulated by Kent’s Drug Stores in Atlanta, 159 Main Street (established in 1846), and 236 Main Street (established in 1858), states: “We have the agency for the celebrated Coca-Cola! A delicious, exhilarating and invigorating drink for Tired Nerves and Brain. Cures Headaches. 5 CENTS GLASS.” Perhaps it is worth noting that other drinks Kent’s Drug Store advertised in the same ad included Orange Phosphate, Wild Cherry Phosphate, Raspberry Water Ice, and Egg Phosphate.

\(^{11}\) Source: Henry A. Rucker (Collector of Internal Revenue) v. The Coca-Cola Company, U.S. Circuit Court, District of Georgia (Trial and Appeal Record, Federal Records Center, East Point, Georgia).
under the threat of it being exogenously imposed on the Company by the government.

The fourth documented change came in 1904. The Coca-Cola Company had been using a powdered form of sugar known as “Confectioner’s A” that can carry moisture. This sugar had a tendency to “sour because this moisture carried impurities with and allowed the sugar to retain them” (Candler, 1950). Asa Candler agreed to switch to granulated sugar after it was pointed out to him that he was paying freight on the moisture. Since we find no evidence of perceived change in the quality of Coca-Cola, the two types of sugar were likely perfect (or very close) substitutes in the production.

A lawsuit brought by the U.S. Department of Agriculture against the Coca-Cola Company under the National Food and Drug Act of 1906 precipitated the fifth documented change in the Formula. According to the 1909 lawsuit, Coca-Cola was “misbranded” because its name promised the presence of kola and coca when it contained little of either; and it was “adulterated” because caffeine was added. On April 20, 1918, nine years after the trial began, the Coca-Cola Company agreed to a settlement which included reducing the caffeine content of Coca-Cola by almost two-thirds. This was a quality change but again, one exogenously imposed upon the Company.

The sixth and final documented change occurred to the Formula when, in response to World War I sugar shortages and rationing, Company president Howard Candler (Asa Candler’s son) began stockpiling sugar at a cost of 28¢ per lb (almost four times its pre-war price). Unfortunately, the price of sugar soon plummeted (Atlanta Georgian, February 15, 1921) and the Company found itself committed to spending over $8 million on sugar at twice the going price (Landers, 1950). To avoid similar future

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12 The company’s sugar refiners had repeatedly urged Asa Candler to use granulated sugar instead but he had refused out of fear that it would indeed change quality of Coca-Cola (Candler, 1950).
blunders the Company developed syrup based on beet rather than cane sugar. Because beets can be grown in more regions than tropical/subtropical cane sugar, the Company hoped to maintain a more continuous supply of Coca-Cola during war times. Expense was taken to try to ensure that the change was not perceived as a quality change. Specifically, the Company hired a German scientist who, along with Company chemists, was tasked with developing a beet sugar that did not compromise the taste.

In addition to the changes documented by Schaeffer and Bateman (1985), we found one additional, temporary change in the Formula in 1942. The WWII sugar shortages led Company President Robert Woodruff to reluctantly agree to use a small amount of saccharine in the place of sugar. In a letter to his accountant, Woodruff acknowledged his hesitation: “Of course you know I am very leery about these things and much prefer not to do anything of the kind, except as a matter of life and death.”14 Additionally, at that time there was a shortage of caffeine. Woodruff approved a temporary cutback in the amount of caffeine in the Formula and authorized a new process for Merchandise No. 5 that required fewer coca leaves (which were also difficult to obtain at that time). While we have no evidence that customers perceived a change in flavor, and although it occurred during the exceptional circumstances of WWII, this must be interpreted as a temporary change in quality.

Even if all seven episodes are interpreted as quality changes, it is worth noting that they occurred over a 70+ year period of nominal price rigidity. This amounts to less than one quality change per decade – still an exceptional extent of quality rigidity.

Neither the nominal price nor quality rigidity would be particularly noteworthy if they occurred over a period without many changes in the relevant market conditions. In

14 Source: Robert W. Woodruff in a letter to Arthur Acklin, October 2, 1942, Robert W. Woodruff Papers, Special Collections Section, Emory University Library.
reality, the 1886 to 1959 time period featured numerous economic shocks which could and should have affected the soft drink market. These included two world wars as well as the earlier Spanish-American War. During the Spanish-American War, a tax was imposed specifically on patent medicines and the IRS declared the Coca-Cola Company liable for $1/8 on every nickel drink (Riley, 1942, p. 26). There were also the demand-side shocks associated with the enactment of nationwide prohibition in 1920 and its subsequent repeal in 1933. The repeal occurred during the Great Depression, certainly another large demand shock. Also notable is the legal persecution associated with the prolonged investigation of the Company following the passing of the Pure Food and Drugs Act in 1906.15

To underscore the importance of the changing economic conditions during this time period for the Coca-Cola Company, we focus on two aspects of material costs: (i) changes in marginal costs associated with materials, and (ii) shortages of materials induced by regulatory interventions (government rationing). Most important amongst the relevant material inputs to Coca-Cola production is sugar. Of course, by volume Coca-Cola is over 10 percent sugar.16 (Excluding carbonated water, sugar is pretty much the entire volume.) However, here we document that sugar specifically (and materials generally) were economically important components of costs from 1886 to 1959.

Table 1 reports, for various years from 1879 to 1955, raw materials costs as a percent of soft drink industry production value. Throughout the entire time period raw materials costs were between 30 and 50 percent of production value. From the evidence we have available, the Coca-Cola Company was fairly typical in this sense. For example,

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15 Chief chemist of the US Department of Agriculture, Dr. Harvey Wiley, apparently had no love for Coca-Cola. He first investigated the Coca-Cola Company for cocaine content. This resulted in Coca-Cola being banned at canteen and post exchanges by the US War Department in 1907. Wiley also seized 40 barrels and 20 kegs of Coca-Cola syrup in 1909. Later Wiley sued the Company for misbranding because Coca-Cola did not have cocaine! (See Young, 1983, p. 12). For a more comprehensive list of changes in market conditions relevant to the Coca-Cola company, see Levy and Young (2004, pp. 771–773).

16 A can of Coca-Cola Classic contains about 40 grams of sugar.
in 1920 the price of sugar per pound was about $0.10 (Allen, 1994, p. 104). We know that around that time the Company was using about 100 million pounds of sugar annually (The Coca-Cola Company, 1925) and 1920 sales were about $32 million (Annual Report, 1921). This puts sugar costs alone at about 31 percent of sales. Compare this to Coca-Cola’s advertising expenditures share of sales (Table 1; column 3). The advertising expenditure share (based on available numbers) ranged between 8 and 17 percent.

The economic importance of materials costs generally, and sugar costs specifically, lends perspective to several shocks weathered by the Coca-Cola Company. For example, in 1917 sugar rationing was instituted due to WWI-related sugar shortage. In May of that year, sugar sold for $0.08 per lb., up from an average of $0.05 that had held over many years (Pendergrast, 1993, p. 129). This represented a 60 percent increase in an input constituting at least one third of costs. (Around the same time, the Company experienced shortages of caffeine and caramel as well.) Things got worse. Late in 1919 the price of sugar reached $0.16 and represented about 67 percent of Coca-Cola revenues (Allen, 1994, p. 104).

Interestingly, there is no evidence of Coca-Cola prices adjusting upward during WWI when its production costs soared. Alternatively, during the postwar inflation there were isolated reports of retailers charging 6¢ or 7¢ for a Coke. (The Coca-Cola Company had no direct/legal control over the price that retailers charged.)

There would have been relief to sugar costs following WWI except for Howard Candler’s ill-advised stockpiling of sugar. (See above.). By 1921, Coca-Cola had warehouses full of contracted sugar while the market price was 3¢ per lb (Fortune, 1951).

Sugar rationing was enacted again during WWII. At the worst point, producers
were rationed 50 percent of their prewar levels (Pendergrast, 1993, p. 201).\textsuperscript{17} Riley (1942, p. 86) describes how, in addition to sugar, soft drink producers experienced "[s]hortages of crowns, sugar, bottles, cases, gasoline, trucks, equipment, manpower, and virtually everything else required for production and business operation were problems of everyday occurrence." At the onset of WWII, sugar was priced at $0.02 per lb. By the end of WWII, when rationing ended, the price was $0.08, up by 300\% (Allen, 1994, p. 276).

WWI shortages resulted in the last of the Secret Formula changes that we can document during the 1886 to 1959 period. The Company decided to use a sugar substitute – most likely saccharine – along with rationed sugar.\textsuperscript{18} Additionally, there was a shortage of caffeine – inventories were down to less than a month’s supply and the price shot up from $1.50 per lb. to more than $7.50 per lb.\textsuperscript{19} Coca leaves were also in short supply. This resulted in the temporary cutback in the amount of caffeine and also in the coca leaves used in production of Merchandise No. 5. (See above.)

Ultimately, it would be postwar inflation rather than any specific input cost that led to the demise of the nickel Coke. By the late 1940s, with nominal production costs soaring, a handful of bottlers began charging 90¢ or $1.00 per case to retailers, rather than the usual 80¢.\textsuperscript{20} In response some affected retailers broke from the nickel. By 1950 \textit{Time} (1950b, p. 12) observed that, "In New York City, bottled Coca-Cola broke loose from its nickel moorings and for the first time went to 6¢." Still, in 1950 only 125 of the 1,100 bottlers had initiated price increases to retailers. In 1951, when about 33 percent of bottling plants had increased their traditional $0.80 per case wholesale price, Coca-Cola

\textsuperscript{17} Allen (1994, p. 251) states that the number was 80 percent of prewar levels.
\textsuperscript{18} Source: Woodruff’s letter to Arthur Acklin.
\textsuperscript{19} Source: Hayes’ letter to Robert W. Woodruff.
\textsuperscript{20} Source: The Coca-Cola Company, \textit{Fact Sheet}.
dropped the placing of "5¢" in its advertising material.\textsuperscript{21} By 1955, \textit{Businessweek} (1955, p. 44) reported that a "bottle of Coke today sells for 6¢, 7¢ or even 10¢ depending on the area." As well, the Coca-Cola Company was introducing, for the first time, various bottle sizes at various prices. By 1959 the last of the 6.5 oz. nickel cokes were gone.

3. **Implicit Contracts**

We use Okun's (1981, pp. 49–50) definition of implicit contracts: "arrangements that are not legally binding but that give both sides incentives to maintain the relationship."\textsuperscript{22} In the specific case of the Coca-Cola Company, we argue below that an implicit contract guaranteed a constant nominal price and quality of Coca-Cola and that this guarantee was valued by its consumers.

3.1 **Economic Rationales for Implicit Contracts**

There are various reasons that sellers and buyers may enter into implicit contracts. Implicit contracts may be established because consumers value the guarantee of a \textit{fair price}.\textsuperscript{23} While fair prices are an admittedly fuzzy concept, there is substantial evidence that they are viewed as important by economic actors. Kahneman, et al. (1986) provide

\textsuperscript{21} Source: “Memorandum to: Mr. Nicholson” (Coca-Cola Company, January, 1951) and “The Price Situation” (Coca-Cola Company, February, 1951). This represented about 29 percent of Coca-Cola’s production. When the nickel price became untenable, Robert Woodruff (then the President of the Coca-Cola Company) got his friend, President Dwight D. Eisenhower, to petition the US Treasury to issue a 7.5¢ coin which would enable the Company to raise its price by 50 percent, while the consumers would still use a single coin. The US treasury apparently had "strong objections" to this (Kahn, 1969, p. 133).

\textsuperscript{22} In the literature such informal agreements are referred to variously as “implicit,” “self-enforcing,” and “relational.” These concepts are interchangeable, at least for our purposes. For example, Telser’s (1980, p. 27) classic paper refers to a “self-enforcing agreement” as one that “remains in force as long as each party believes himself to be better off by continuing the agreement than he would be by ending it.” Also, in the context of firm theory, Baker, et al. (2002, p. 39) refer to “relational contracts: informal agreements and unwritten codes of conduct that powerfully affect the behaviors of individuals within firms.” The differences between these examples and Okun’s definition are largely contexts and the aspects of the contract/relationship being stressed.

\textsuperscript{23} Rotemberg (2011) develops the idea of a fair price in a model where consumers interpret price changes according to their fairness and react accordingly. In Ball and Romer's (2003) model, prices serve as a signal in settings with long-term relationships between consumers and producers. That is why firms allow price variability to occur through infrequent price adjustments. Bils (1989) models a customer market where customers develop an attachment to a product which they have used in past.
survey evidence that the fairness of prices is important for understanding consumer demand. As well, Tyran and Engelmann (2005) find that, in experiments, consumers frequently boycott firms engaged in unfair price increases.24

Implicit contracts may mitigate time consistency problems when habit-forming goods are involved. Sellers may attract consumers today by promising (a continuation of) low prices in the future. As Nakamura and Steinsson (2011) argue, a dynamic time consistency problem arises because, when the future comes, firms have an incentive to raise prices. Consumers realize that if this occurs they will by then be “hooked” and refraining from paying the high prices will be difficult. While explicitly contracting future prices with individual consumers may be prohibitively costly, entering into an implicit contract with all consumers facilitates transactions in the presence of this moral hazard.

Firms may also form implicit contracts with consumers to increase brand loyalty. If there are ostensible close substitutes for a firm’s good then a firm’s brand may convey information about characteristics of the firm’s good (or the “experience” of buying the good from that firm in particular) that differentiate it from similar/substitute goods, but are hard for consumers to observe (Telser, 1980; Klein and Leffler, 1981; and Shapiro, 1983). The difficulty in observing such characteristics creates moral hazard problems. A brand’s reputation can be a signal that a firm is acting in its consumers’ interests (to an extent that suppliers of substitutes without similar brand reputation are not). The firm’s brand then “corresponds to an implicit contract between seller and buyers whereby the

24 This is true even when it is known that costs have increased. See Levy, et al. (2002). There is also ample evidence in experimental economics, where game participants often take retaliatory/punishing actions even if it is against their self-interest. See, for example, Abbink, et al. (2001), Bolton and Zwick (1995), Falk, et al. (2005), Fehr and Gächter (2000), and Gächter and Herrmann (2009).
former supplies high-quality experience goods” Cabral (2000, p. 659).  

A firm’s brand may also insure consumers against input cost fluctuations being passed onto them in the form of retail price fluctuations. Consumers may be hesitant to consume one good exclusively at the cost of available substitutes. If a firm passes on its input cost fluctuations to consumers in the form of retail price fluctuations, consumers may prefer to diversify across goods. (This would be particularly true for habit-forming goods where an initially undiversified consumption bundle will be costly to diversify.) Implicit contracts can insure consumers against such fluctuations. Consumers may be willing to commit to exclusive consumption of a firm’s good if the firm stakes its brand (its goodwill) on not passing on input cost fluctuations. As a commitment mechanism, the firm deliberately makes itself vulnerable to consumer backlash in such contingency, making it more credible.  

The discussion above assumes that the consumers of the drink are fully informed about the price, or that price monitoring can be done at no cost. Given the nature of the product, the assumption is not unreasonable: Coca-Cola is a frequently bought small ticket item. The Coca-Cola Company's insistence to include "5¢" in many of its ads and promotional merchandise it was distributing through the dealers, helped the consumers in being fully aware of its "selling" price, and made it impossible for any retailer to charge a higher price without consumers noticing it. (See section 2.)

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25 Cabral’s quote continues: “... and the latter pay a high price[.]” As we discuss below, in the case of Coca-Cola the nickel price was an important “clause” of the implicit contact. Since Coca-Cola could not, for much of the time period considered, adjust the price that it charged to bottlers (Levy and Young, 2004), a modification of Cabral’s statement is reasonable: and the latter buy a large quantity.
26 As one of the anonymous reviewers noted, there is an interesting difference in the implicit contracts common in labor markets and the implicit contract we document here. In labor markets implicit contracts are usually considered to protect two-sided relationship specific investment. In the case of the product market only the relationship specific investment of the consumer has to be protected.
3.2 Coca-Cola as a Candidate Good for an Implicit Contract

Based on the rationales discussed above we might expect the Coca-Cola Company to have formed an implicit contract with its consumers if Coca-Cola ...

- was potentially habit-forming;
- had ostensible close substitutes available while its distinctive attributes were difficult to observe;
- had relatively volatile input costs.

That Coca-Cola was potentially habit-forming seems plausible. As it does today, Coca-Cola contained caffeine.\(^{27}\) Indeed, up until 1918 Coca-Cola had substantially more of the drug (Schaeffer and Bateman, 1985). Furthermore, up until 1903 Coca-Cola contained small amounts of cocaine. The addictive potency of either ingredient (in the amounts then present) is debatable. However, consumers likely viewed Coca-Cola as habit-forming.\(^{28}\) This is suggested by the intense scrutiny by the US Department of Agriculture following the Pure Food and Drugs Act as well as a resolution opposing the sale of soft drinks with either ingredient passed by the American Bottlers’ Protective Association (a trade association).\(^{29}\)

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\(^{27}\) According to Benjamin, et al. (1991, p. 45), “As early as 1902, Wiley had testified before Congress that caffeine was a poison and habit-forming drug. Although he was not a proponent of coffee or tea, he was willing to tolerate public consumption of those beverages because the caffeine was a natural part of those drinks. However, caffeine was an additive in Coca-Cola which made a beverage adulterated with a harmful ingredient. Moreover, he objected to Coca-Cola because, unlike coffee and tea, it was marketed and sold to children.” For a recent study of habit formation in the context of soft-drinks, see Zhen, et al. (2011).

\(^{28}\) According to Allen’s (1994, p. 41) account, the buyers of Coca-Cola at soda fountains would often order the drink by asking the drugstore employee to “give me a dope” or “a shot in the arm.” This is clearly suggestive of the popular attitudes and perceptions towards the drink’s properties attributes.

\(^{29}\) The long and highly publicized legal-battles that the Coca-Cola Company was involved following the US government’s lawsuits, have led to a spread of the popular perceptions and accusations that the drink is habit forming. The spread of these popular views was further aided by numerous medical experts who believed that Coke had addictive characteristics. For example, according to Allen (1994, p. 45), Dr. J.P. Baird, who was the President of the Medical Association of Georgia, testified as the government witness during the 1901 lawsuit (“Cocaine Lawsuit 1) that “Coca-Cola definitely was habit-forming… Persons who take it freely, seem to become more or less dependent on it.” Chapter 2 titled “Dope” in Allen’s (1994) book, offers a detailed account of how these popular perceptions and beliefs spread over time across the entire US. This despite the (ex-post) assessment (e.g., Benjamin, et al., 1991) that most of the scholarly
In regards to close substitutes there was no shortage of Coca-Cola copycats. According to a Coca-Cola Company insert in the May 17, 1916 issue of the *Drug Trade Journal*, “[a] dozen or more manufacturers of imitations of Coca-Cola were either put out of business or went out of business with the aid of the sheriff.” This refers to Company efforts to defend its trademark against infringement from substitute good producers. These efforts were not entirely successful; new copycats kept springing up.

Meanwhile, a pharmacist named Caleb Bradham was working on a drink called Pepsi-Cola that would become a serious competitor during the Great Depression. Indeed, both Pepsi Cola and Royal Crown Cola would market 12 (rather than 6.5) ounce bottles for a nickel during the Depression (Pendergrast, 1993, p. 193). While these substitute goods were identical to Coca-Cola along several easily observable ways (e.g., brown; carbonated; liquid; sweet), Coca-Cola arguably had several distinct, but difficult to observe, attributes (e.g., some costly and exotic natural ingredients – most famously extracts from coca leaves and kola nuts; more consistent manufacturing and bottling practices), and perhaps not less important, the cult of the Secret Formula.

Finally, while it is difficult to assess the Coca-Cola production cost volatility relative to other consumer goods of the time, we know that the sugar costs were about a third of total costs (section 2 above). Being a fundamental food commodity, sugar was

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30 Reproduced in the Coca-Cola Company’s Advertising Copy Collection, 1916-1919, Vol. 5, 000496 ARS.
32 “Twice as much for a nickel too. Pepsi-Cola is the drink for you.” This line is from a popular 1939 Pepsi jingle that played on radio. Pepsi pioneered the concept of using 30 to 60 second spots for advertising rather than conventional 5-minute blocks (Tedlow, 1990, pp. 90–91).
subject to shortages and rationing during both World Wars, as well as large price fluctuations. Furthermore, just like an undiversified portfolio, the fact that one commodity constituted a full third of costs lends itself to higher potential cost volatility, all else equal.

3.3 The Coca-Cola Company’s Recognition of Consumer Concerns

We argue above that Coca-Cola possessed characteristics associated with implicit contract goods. However, it was the Coca-Cola Company that formed an implicit contract with its consumers. The firm’s perceptions of these characteristics and, more importantly, its perceptions of consumers’ concerns for these characteristics may be most important in this regard.

The Coca-Cola Company recognized that ostensibly close substitutes existed for its product. However, the Company also believed its product was distinctive in important but not immediately observable ways. For example, the Company preached to its employees the drink’s uniqueness in being of a “standardized” quality. In Reviewing a “Proud History:” 1886 to 1925, a series of bulletins distributed to regional and district managers, salesmen and other employees, the Company stated that as early as 1887 “important progress was made in standardizing the drink [with the result that] today every Coca-Cola is like every other Coca-Cola.” Furthermore, the Company perceived this as being important to consumers: “A citizen of Georgia may go to any other state, order a Coca-Cola [and] exclaim, ‘Here’s an old friend!’” Another bulletin crowed that, “[m]ore than 600 trade-marked drinks have appeared on the market during the life of Coca-Cola only to disappear [...] because ‘it repeats’” (emphasis – but not quotes – added).

Also, the two most enduring Company presidents (and dominating personalities) during the 1886 to 1959 period were fervent about what was being standardized – the
Secret Formula – because they believed that the distinctive attributes were important to consumers. In 1899, when rumors were circulating about Coca-Cola leading to cocaine addiction, about twenty salesmen, home office personnel, and branch managers met with Asa Candler (president from 1888 until 1916). One of the attendees made a suggestion: “Couldn’t we just take out the cocaine? Does it really make that much difference?” Candler’s response: “So you want me to change the formula of the country’s favorite beverage[? ...] Never! There is nothing wrong with Coca-Cola. If there was anything the matter with it, do you think we would have such a problem keeping everyone supplied with it?” (Candler, 1950)

Also, during the WWII sugar rationing, Robert Woodruff (president from 1923 until 1939) agreed to use small amount of substitute sugar in place of the rationed sugar, though he preferred not to do so “except as a matter of life and death” (Also see section 2 above.) Woodruff was clearly concerned that deviations from the Secret Formula could be noticed by consumers.

Turning to input costs, the Company knew that these were volatile and comprised a large part of its total costs. However, the relevant question is: did consumers desire insurance against cost fluctuations and did the Company recognize this? Again, the Company perspective can be gleaned from the Reviewing a “Proud History” bulletins: “We are one of the few manufacturers in the [US] who adheres strictly and at all times to a one price policy[. ...] This is a policy of fair dealing – it begets good will if you sell it to the trade so that it is understood.” Also, consider a Coca-Cola Company insert in a 1916 Drug Trade Journal (1916): “Some said: ‘Raise the price to the retailer.’ [...] That is the summary of advice we have received during the past year from people who knew how

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33 Source: Robert Woodruff, letter to Arthur Acklin, October 2, 1942 (Robert W. Woodruff Papers, Special Collections Section, Emory University Library), our emphasis.
greatly our cost of making Coca-Cola has been advanced owing to extravagant rises in costs of all ingredients. [...] We would be mighty poor specimens if we tried to make the druggist carry the load of our increased costs by cutting down your profits on Coca-Cola. The burden is ours—we have gladly assumed it.”

Assuming the Company realized that retailers were profitable to the extent that they satisfied their consumers, this insert can be interpreted as acknowledgement of the fact that consumers valued being insured against cost fluctuations.

It is more difficult to document whether or not the Company perceived Coca-Cola to be addictive. The Company would have been understandably hesitant to state that in writing. However, the Company’s efforts during WWII to provide soldiers overseas with Coca-Cola and the response from soldiers are perhaps telling. By the midst of WWII, American GIs were writing home from European battlefields with near-worshipful descriptions of the soft drink: e.g., “You probably will think that your son has had his head exposed to the sun too long [but] three of us guys walked ten miles to buy a case of Coca-Cola, then carried it back. You will never know how good it tasted” (Pendergrast, 1993, pp. 210-211).

Woodruff made a pledge: Coke would be made available to every member of the armed forces at a nickel a drink, no matter where they might be (Kahn, 1969, p. 84). The Company began overseas operations to deliver Coca-Cola to US soldiers and also served huge training camps across the US.

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35 According to Allen (1994, p. 53), Asa Candler used to encourage subtly spreading the idea that Coca-Cola contained cocaine.
36 For example, it is not implausible that Candler’s resistance to removing cocaine from the drink was in part indicative of his belief that doing so would no longer allow Coca-Cola to “hook” its customers. Furthermore, after winning an extended legal battle (1898 to 1902) to have Coca-Cola not taxed as a proprietary medicine, Company executives would be especially hesitant to create evidence of attributes associated with medicines.
37 Another soldier wrote: “[O]ne real bottle of Coca-Cola, the first one I have seen here. It was pulled out from under the shirt of a pilot. [...] He caressed it, his eyes rolled over it, he smacked his lips at the prospect of tasting it. I offered him one dollar for half of it, then two, then three, and five dollars.”
even sold nickels (at cost) to the soldiers so that they could purchase Coca-Cola in their accustomed manner (Coca-Cola Bottler, 1944, p. 35). Since, in the short-run, this could not have been a profitable operation, this act is consistent with the possibility that the Company believed that its product was habit-forming and insuring its consumers against fluctuations in availability.

3.4 **Observable Implications of Implicit Contracts**

If Coca-Cola is a good candidate product for an implicit contract (and the Coca-Cola Company recognized this) then the observable implications would include the following:

- evidence of the Company having communicated a pledge to consumers;
- since it could not set the retail price directly, evidence that the Company communicated the pledge and its profitability to retailers;
- evidence that the Company perceived itself as vulnerable to costly (in terms of goodwill) backlash by reneging on the pledge;
- evidence of “renegotiations” – Company efforts to mitigate the goodwill costs by explaining the necessity of breaking the contract.

4. **Evidence of an Implicit Contract in the Case of Coca-Cola**

Next, we present evidence that Coca-Cola's fixed nominal price and quality were part of an implicit contract between the Coca-Cola Company and its consumers. This evidence consists of advertisements, trade journal inserts, and internal documents produced by the Company itself. To provide an accurate view of both the Company's and consumers' perspectives, we present most of the material literally; by simply quoting text.
4.1 Extending the Invisible Handshake to Consumers: Communicating the Pledge

A remarkable feature of this implicit contract is that the Company made it *explicit* in the written guarantees and assurances of millions of print ads, displays, promotional giveaway items, etc. Moreover, assurances of quality and price were often included together. The guarantee of a constant price appears to have been a "clause" of the implicit contract from early on; that of constant quality seems to have evolved later on.

An alternative interpretation of such advertising materials is that they simply *included* price information and the price just *happened to be* 5 cents. However, many of these advertising materials were durable items (e.g., metal signs; thermometers; globes with mosaic art glasswork; metal serving trays). Table 2 gives a sense of this by enumerating advertising material distributed by the Company just in 1913. These items could be offered to retailers to entice additional purchases of Coca-Cola. Additionally, the Company would offer to paint retailers' outside walls with large Coca-Cola murals. In 1925 the Company provided 700 such paintings in the US; it provided 820 in 1926 and 835 in 1927.\(^38\) Given the prominence of “5¢” on many of these durable signs, murals and other materials, their value as advertising for the Company appears designed to depreciate (or become negative) in the event of the nickel Coke’s disappearance.

Moving to some examples that span the 1886 to 1959 time period, let us begin with an 1898 ad in the *Atlanta Police Department Bulletin*. At the time Coca-Cola was only local to the Atlanta area and only sold at fountains. But, at whatever fountain one chose, the ad promised Coca-Cola at "5 cents per Glass". Also, besides claiming that it "Relieves Headache Immediately," the ad guaranteed the drink to be "Delicious! [and] Refreshing!" This was certainly not a *constant quality* guarantee, but it began a theme

\(^{38}\) Source: “The Coca-Cola Company: Advertising Expenditures”, internal document, the Coca-Cola Company archives.
that would later evolve into such a guarantee.

In a 1903 Atlanta Journal, Coca-Cola's ad now touted that it was "At Soda Fountains and Carbonated in Bottles." In either case, it was still "5 CENT$". Moreover, again it promised to be "Delicious! [and] Refreshing!" An advertisements with the same promises appeared in a 1909 Atlanta Constitution. So, for over a decade, Atlanta consumers were promised Coca-Cola for 5¢ in either the bottle or at the fountain.

Coca-Cola did not remain local to Atlanta for long. A 1906 full-page Cosmopolitan ad brought the promise of a "5¢" price "AT ALL FOUNTS AND IN BOTTLES" to the nation as a whole. Similar ads were run in American Theater and Country Life in America in 1906. That same year, and ironically given the court battles to follow, the Coca-Cola Company also ran ads stating that it was "GUARANTEED UNDER THE PURE FOOD AND DRUG ACT".39 Despite ensuing problems with Harvey Wiley and the PFDA, the theme of guaranteeing purity along with the 5¢ price would become a recurrent one.

In the early 1900s Coca-Cola was facing competition from a myriad of imitators trying to ride the Coca-Cola coattails, e.g. Coke-Ola, Koca-Nola, Kokola, Toca-Cola, Kaw-Kola, Taka-Cola, and Roco-Cola (Allen, 1994, p. 73). These imitators could easily be – and clearly tried hard to be – perceived as close substitutes by the public. By 1908 the Coca-Cola Company was stressing that consumers should make sure to "GET THE GENUINE" Coca-Cola. The above quotes are from the July 16th, 1908 issue of Life and the ad also guaranteed that Coca-Cola was "5c. Everywhere". Also, 1912 Coca-Cola ads warned "BEWARE!!! of Imitations" and encouraged consumers to "Demand the Genuine – Refuse Substitutes".40 The competition with imitators, along with the guarantee of

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39 Source: The Coca-Cola Company, "Guaranteed."
40 Source: Advertising Copy Collection, 00349 ARS.
purity, would complement each other in an evolving theme of constant quality in Coca-Cola's advertising.

The 1920s continued stressing the "5¢," price, as in a full-page ad in a 1922 issue of *The Ladies Home Journal*. Then the 1930s witnessed the introduction of the famous "pause that refreshes" slogan. The "pause", at this point, had been part of consumers' lives for over 50 years and was "the best friend thirst ever had." We here see the Company stressing a familiarity with the Coca-Cola formula that would also feed into the evolving theme of constant quality.

In 1941 issues of *National Geographic, Boys' Life, Collier's, Life, Time*, and the *Saturday Evening Post*, the "pause that refreshes" was still promised at "5¢," but now there was an additional claim: "You trust its quality." And in a 1942 *Saturday Evening Post* the "5¢" "Delicious and Refreshing" Coca-Cola stated that "Quality carries on." The guarantee of quality was prominent and the "carries on" implied a commitment to constancy that could be depended on over time. By 1945, during WWII sugar shortages and the resulting sugar rationing, the Coca-Cola Company evoked this guarantee to explain Coca-Cola shortages to civilian consumers. "Where's all the Coke gone, anyway?" asked one ad:

[T]he answer is: there's a world-wide sugar shortage, caused by world-wide disorder and confusion that goes along with war. Sugar shortage means Coke shortage because *Coca-Cola never compromises on quality.*

Today, yesterday, tomorrow—Coca-Cola means Coca-Cola, *the same quality as always* [our emphasis].

Another ad featured a neighborhood store clerk telling consumers, "Sorry, but we're short

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41 See, for example, *Nation's Business* (1938).
42 Source: Advertising Copy Collection, 01625 ARS.
43 Source: Advertisement No. S-3.
on Coke today. Consumers are encouraged not to blame the clerk because, again, the sugar is being rationed and "there's one thing you can always be sure of—the Coke you get is the real thing [and] the same quality you have always known [our emphasis]." Both ads, of course, still promised Coca-Cola for "5¢", but now the guarantee of constant quality is explicit.

The above examples are drawn from print ads because they are the most readily available as facsimiles from the Coca-Cola archives. However, during the entire period the Company was issuing similar pledges on the durable promotional items that it provided to retailers. Table 2 represents only a single year’s (1913) provisions. Even in 1887 the Company was distributing 45 tin signs and oil cloth hangers (Allen, 1994, p. 30). By the early 1920s the growing distribution of durable promotional materials included 50,000 metal serving trays and 100,000 streetcar signs (Allen, 1994, pp. 167-168). In 1924 the Company “maintained more than 20,000 painted walls and bulletins throughout the United States” and by the 1930s it also maintained 160,000 billboards across the US (Allen, 1994, p. 206). These materials would hang around, often serving as a reminder that Coca-Cola still sold for a nickel while its “quality carries on.”

4.2 Informing and Convincing Retailers

Ads and promotional materials brought the pledges of the implicit contract to consumers. The Company also made efforts to inform retailers that it had made an implicit contract with consumers; that it was in their common interest not to break its conditions. In many instances, this evidence is even more explicit in detail than the ads

44 Source: Advertisement No. S-2.
46 Indeed, an undated Company document titled “Instructions for Salesmen in Campaign for Promoting 5¢ Price on Coca-Cola” contained a “Guide for Positioning 5¢ Decals on Fountain Advertising Material.”
and materials meant to be seen by consumers.

Recall the 1916 *Drug Trade Journal* insert. (See section 3.3 above.) When WWI had caused syrup ingredient prices to rise, the Coca-Cola Company told its retailers that “Price, quality and advertising will remain the same.” The insert goes on to state: All we ask of our dealers is the natural and human reciprocity of serving only the genuine and serving it properly.” Presumably, in asking for retailers to "serve it properly," the Company referred to 6.5 oz. at 5¢ and using unadulterated syrup.

By 1920s the Coca-Cola Company was using inserts in trade journals encouraging the standard 6.5 oz. size and 5¢ price as something expected by consumers and profitable to retailers. "This Glass increases sales", stated a 1923 insert referring to 6.5 oz. glasses that could be "bought in quantity from your jobber." The insert referred to "The Right Price" of "5¢" which "is the price people expect to pay for Coca-Cola, because it is established by years of custom [our emphasis]." As well, "it gives you [the retailer] a good profit on every sale, but it gives you most profit by giving you more sales [and it's] the price that keeps your cash register ringing, and that's the music that builds business."47

In *Reviewing "A Proud History" 1886 to 1925* (section 3.3 above), each and every page included, in the lower margin, an underlying theme to convey to retailers: "Use the Retailer's figures to show him the profit on Coca-Cola [and] Show him how to push sales to increase the profit on Coca-Cola." Retailers needed to know that "It is not the 5¢ so much as it is the 2,400,000,000 drinks per year. . . . It is this volume which enables us to offer the public, at a nickel, an absolutely pure soft drink" (p. 1900).

By the 1940s the efforts to convince retailers of the profitability of Coca-Cola at 5¢ became even more pronounced. "LOOK AT IT THIS WAY" requested a 1942 insert featuring a magnifying glass focused on a nickel:

47 Source: Trade Paper Insert, reproduced, Coca-Cola Company Archive.
Coca-Cola magnifies the nickel to real importance in your store. When you look at Coca-Cola in terms of what you sell in a year, you see a big profit from a 5¢ sale. On the sale of a case a day your gross profit is $125.00 a year. How's that for magnifying the value of a nickel?

Concerning quality, another 1942 insert declares, "There's a seven-letter word for it":

QUALITY . . . the quality of genuine goodness. That's what your customers recognize in Coca-Cola. . . . 5¢ You trust its quality.48

Yet another 1942 insert states the Coca-Cola Company's guarantee to consumers— "Quality carries on . . . 5¢"—and then makes a guarantee to retailers:

We make this pledge to YOU[.] In national magazines, in newspapers, on posters, and over the radio, we're telling the world that the unmatched quality of Coca-Cola remains the same even though the quantity is limited by Government order.49

Considering the "5¢" in print, this insert and other inserts with a similar 5¢ message targeted to dealers and retailers, may be viewed also as a veiled warning to retailers not to charge more as a type of retail price maintenance.50

As late as 1950 an insert in Food World touted the explicit pledge: "Continuous Quality" and "Continuous Price".51

4.3 Did the Coca-Cola Company Perceive Itself as Vulnerable to Backlash?

In 1948 chairman Robert Woodruff received an editorial in the mail written by Duke Merritt of the Cartersville, Georgia Daily Tribune. Merritt wrote that the editorial

48 Source: Advertising Copy Collection, 01724 ARS.
49 Source: Advertising Copy Collection, "Chain Store Age."
50 The types of promotional items in Table 2 can be considered retail price maintenance of the same type in light of the fact that many of these items had "5¢" imprinted on them. See Munsey (1972) for numerous examples.
51 Source: Advertising Copy Collection, 02815 ARS.
was written "in appreciation of the fact that Coca-Cola is the one unchanged friend of childhood, still the same good taste at the same nickel price". In the editorial, Merritt wrote that:

[W]ay back yonder, a loaf of bread was a nickel, soap was a nickel . . . and coffee and milk were a nickel each [and even] beer, was also five cents a glass then. . . Coca-Cola has changed neither its price nor its quality. . .

Look what has happened to other five-cent items in Coca-Cola's nickel life time. Bread is 15 cents a loaf, in most places, soap is 10 and 15 cents a cake, coffee and milk each cost a dime . . . and beer is 30 cents, we hear.

But our old friend Coca-Cola still remains the same, merely five cents.

Woodruff personally replied to Merritt: "Your comment regarding our product and our Company describes exactly what has been our desire[.]"

. . . In the recent era of rationing and the subsequent period of high—and rising—costs, the maintenance of the 5¢ price has not been devoid of difficulty, but the compensations that arise from doing so, as exemplified by your friendly remarks, are many and not the least of them is the good will embodied in such expressions as these in your editorial [our emphasis].

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52 Source: Robert W. Woodruff Papers, Coll. 10, Box 124.
53 It is noteworthy that the Coca-Cola Company preserved copies of editorials and other articles expressing these sort of sentiments in their archives. For example, in the December 28, 1947 Sunday Booster (Lincoln-Belmont area of Chicago), Leo Lerner wrote: “No doubt you have noticed the new look in the grocery stores? [sic] It's on the price tags. The day my wife sent me shopping . . . I asked the proprietor if there was anything else in the store [besides Coca-Cola] that had not risen in price. . . He shook his head, melancholy as he could be. 'Nope,' said the grocer. 'Coke is the only thing in the whole place that hasn't gone up in price'. . . I stuffed the groceries I bought for $3 into my overcoat pocket and went out. On the way I tipped my hat to the Coca-Cola.” In Indiana, The Lampmaker, published by Local Union No. 663 UAW-CIO, praised Coca-Cola in 1946: “The Coca Cola Company [sic] . . . has notified its salesmen that regardless of the price of sugar it will maintain its price to retailers so that the coke [sic] can be sold by the retailer at five cents per bottle. . . Coca Cola, indeed, is the pause that refreshes in a Big Business world that has gone hog-wild for higher and higher prices. It's still Coca Cola—5¢.” And an editorial from a 1946 Worthington Globe (Worthington, Minnesota) lashed out at individual retailers that deviated from the 5¢
Having communicated the pledge of constant price and quality to consumers and retailers, did the Coca-Cola Company feel that it had structured its goodwill in a way that left it vulnerable to a costly backlash in the event of implicit contract termination? The evidence suggests that it did.

For example, the Coca-Cola Company issued an (undated) set of “Instructions for Salesmen in Campaign for Promoting 5¢ Price on Coca-Cola”. In it the writer(s) ponders: “how would one-third of your fountain customers feel if they were required to pay 100% more [than] they had been accustomed to paying, or that they felt was right for them to pay[?] [our emphasis]” The writer also makes an interesting exception for “outlets such as night-clubs [and] cocktail lounges” where enforcing the nickel price was not thought to be as important “since the customer expects to pay a premium.” The document also claims what may be an implicit acknowledgement that new consumers were concerned with future price fluctuations: holding to the nickel price “attracts youth – your customers today and tomorrow [underlined in original].”

In 1948, vice president Ralph Hayes wrote to president William Hobbs on the importance of maintaining the nickel price: “our bottlers should realize increasingly that they are not only in the process of effectuating a monumental merchandising achievement but that the press and public hold them in high esteem for the vision and the courage so far shown.” Fellow executive and future president H. Burke Nicholson then circulated that letter widely throughout the company stating that nickel price maintenance was “a basic problem of vital interest to our entire organization.”

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standard: “[S]ome local firms have selected for a price upping the very commodity that will discredit all these reassuring words and action – the lowly ‘Coke’. . . [Here] come a bunch of local pirates before the clods are dry on OPA’s grave, who would take Coca-Cola out of the mouths of ordinary common people and make a dime drink of it—nectar for blue bloods to drink. And this without a cent increase in the wholesale price. Fie on them! May their cash registers tarnish in a pause that will refresh their memories of a mutual pledge taken to ’hold the line‘ and combat inflation!”
The clearest evidence of the Coca-Cola Company perceiving itself as vulnerable to goodwill loss is to be found in 1950 documents when inflation increasingly made the nickel Coke untenable and retailers began to defect. A representative of the Coca-Cola Bottling Company wrote to Eugene Kelly, head of international operations, concerning the “price situation”:

[A]ll of the facts and figures that we have [...] tend to point out the pitfalls and the possibility of difficulty on the long term basis, particularly have we pointed out the possible public reaction such as that which you know about in connection with Standard Stations, who changed over some 600 of their machines to 10¢ slots and because of public reaction reduced the price to 5¢ recently.

The Company, fearful of the backlash as retailers abandoned the nickel, also commissioned a firm called Fact Finders to conduct a survey of retail prices in 27 towns and the consumer reaction to price increases. We located the summary results of one such survey (for Alexandria, LA) in the Coca-Cola Archives that described “swift public reaction”: “At first, the public bought up all available Coca-Cola at the old price. As soon as the supply was depleted, [a] boycott was imposed.” The summary also recreated several “typical consumer comments” including [emphases added]:

Buy a Coke? Not me. Haven’t had one since the price went up. I’ll wait until it comes down.

They will be sorry. I haven’t had a Coke all week and I won’t until it sells for a nickel.

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54 Despite his primary role in international operations, the letter refers entirely to US operations and was copied to President H. Burke Nicholson.

The bastards! No one buys Coke now.

Coke will be back to a nickel soon. Just wait and see.

While we cannot say how truly “typical” (or even accurate) these sentiments were, they were the ones recorded for internal Coca-Cola circulation.

Almost all of the Company documents that we located focus on the nickel price. What is not to be found in the internal documentation is also notable. We do not find a single reference to or proposal for an alteration of the Coca-Cola Secret Formula or the serving size. In one sense this is frustrating because we cannot locate any internal discussion about the losses associated with changing quality. However, both of the dominating personalities in Coca-Cola’s history – Asa Candler and Robert Woodruff – established early on during their tenures that changing the Secret Formula was not on the table. Arguably, then, it would make little sense for others within the Company to elaborate upon the costs of doing something that was taboo from the start.

4.4 Renegotiations

Coca-Cola eventually had to accept that the nominal nickel price was not consistent with the realities of the post-WWII inflationary economy. Around the time that this reality was setting in for the Company, we might expect to find evidence of “renegotiations” of the implicit contract’s nominal price clause with consumers. Indeed we do find some evidence that, around 1950, the Coca-Cola Company contemplated actions amounting to such renegotiations.

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56 See section 3.2 above for Candler’s reaction to suggestions about changing the Secret Formula. Kahn (1969, p. 74) notes that Woodruff, upon becoming president of Coca-Cola, “established several guidelines [among which was] he would never tamper with the quality of the product.”

57 In a previous version of this paper, we also argued that the backlash associated with the 1985 introduction of “New Coke” was evidence of the quality clause and its importance to consumers. (Bottler’s incurred a direct loss of $30 million in the form of unsold New Coke inventories according to the Atlanta Journal and Constitution (1995); also Collins (1995)). In that case, the hasty (re)introduction of “Coca-Cola Classic” represented attempts of renegotiations.
For example, a 1950 letter from John Toigo at the Company’s primary advertising firm, D’Arcy, to vice president H. B. Nicholson, notes that “when [wholesale] prices are raised it seems to lead to a mixed price structure.” A suggestion follows:

[W]hen a bottler raises a price complete merchandising and advertising programs might be furnished to him so that a proper price level at which the product should sell at retail could be quickly established, just as against 80¢ we established the nickel price.\(^{58}\)

While we do not have Nicholson’s response, we do know that less than one month later a “Coca-Cola Price Study” based on surveys of 38 towns nationwide was circulated inside the Company.\(^{59}\) Of the six recommendations made regarding “bottler price policy” the first two are basically: *encourage them not to*. However, *if* the prices charged by bottlers (and subsequently retailers) were to rise, then the sixth suggestion is:

At any change in price levels bottler should be prepared to fully advertise and merchandise suggested new price levels. This should be pursued as assiduously as we have the 5¢ and 25¢ [for six packs] prices under the old price structure.

These proposals can be interpreted as plans to renegotiate standard prices for Coca-Cola. We find no evidence that such plans were put into effect. If the Company seriously contemplated renegotiations with consumers, this is itself evidence in favor of an implicit contract’s existence.

5. **Relationship between the Implicit and Explicit Contracts**

As we document in Levy and Young (2004), in 1899 the Coca-Cola Company signed

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over the bottling rights for most of the continental US to two Tennessee lawyers, Benjamin Thomas and Joseph Whitehead. (Mississippi and New England had previously been contracted for by two separate individuals.) According to the contract, Thomas and Whitehead could purchase syrup from the Company at 92 cents per gallon in perpetuity. In Levy and Young (2004, pp. 778-782) we argue that a constant nominal retail price could be optimal if Coca-Cola acted like monopoly in a particular stage of processing where the nominal price of its own output (i.e., the syrup) was fixed. In this paper we are putting forth an alternative source of nominal retail price rigidity. However, we do not believe that the two explanations are exclusive of one another. Indeed, it is likely that the contract with bottlers created incentives for the Coca-Cola Company to develop and/or strengthen the implicit contract with its consumers.

The original bottling company would split, in 1900, into two regional “parent bottlers” (north and south US) that licensed bottling rights to smaller bottling companies. Soon the Company was shipping syrup directly to the bottling plants. According to Allen (p. 109):

The parent companies were left without a clearly defined role. Syrup was [...] to the actual bottlers, so that the parent bottlers were not even acting as genuine middlemen. They simply sat back and took a royalty on every gallon, even though they never handled a drop. The parents paid Coca-Cola 92 cents a gallon for syrup, then turned around and ‘resold’ it to the actual bottlers at a generous markup, usually $1.20 a gallon.

The contract between the Company and the parent bottlers was amended in 1901. The Company agreed to sell syrup to the parent bottlers at $0.90 per gallon plus a $0.10 per
gallon rebate for advertising materials.\textsuperscript{60} In that form, this explicit contract with the parent bottlers would remain in force for two full decades until, in 1921, when a new agreement was reached where the Company sold syrup to the parent bottlers at $1.17 per gallon plus, for every cent that a pound of sugar rose in excess of 7 cents, a 6 cent premium (Pendergrast, 1993, p. 144). This contract would remain unchanged through the demise of the nickel Coke (Johnson, 1987, p. 13). Even then, syrup price changes only occurred in line with a single (albeit very important) ingredient.

By the time the contract was amended to be indexed to sugar prices, syrup sales to bottlers were already 40 percent of Coca-Cola’s sales (Allen, 1994). By 1928 bottle sales surpassed those at the fountain. The Company was essentially a producer of an upstream input used in a production of the final consumer product. While not a monopoly, the Coca-Cola Company had considerable market power. Yet it had handed itself the role of price-taker for a twenty year period. As long as its profit margin was positive, the Company’s basic strategy for increasing profits was by increasing quantity. The retailers and bottlers, alternatively, were in principle able to exploit the Coca-Cola brand and raise the price on the differentiated product. It would then understandably be in the Company’s interests to somehow effectively strip them of their price-setting ability. Forging an implicit contract with consumers – one that included the nickel nominal price – is one way that the Company could have accomplished this.

Of course, explicit evidence that the Coca-Cola Company tried to deprive retailers and bottlers of price setting ability for the sake of their own profits is hard to come by. As Fortune reported in 1951, “Coke has been charged with coercing its bottlers to stay at the 80-cent case price, but the charge has never been even nearly substantiated.” The Company seems to have understood the precarious position that such “coercion” would

\textsuperscript{60} Source: Thomas Ben, letter to W.D. Boyce, November 15, 1901, “Benwood.”
put them in legally. However, it is worth noting that, in the 1950 “Coca-Cola Price Study” (section 4.4. above) a key recommendation to bottlers was that “Coca-Cola should be sold as cheaply as possible consistent with profit.” It is hard not to interpret this as: as long as there’s a positive profit margin for bottlers and retailers, keep the price at 5 cents; the Company will profit via volume.

6. Alternative Explanations for the Episode

In Levy and Young (2004, pp. 789–794) we carefully considered and, ultimately, ruled out the relevance to Coca-Cola of several alternative theories of price rigidity. These included psychological pricing points (Kashyap, 1995) and productivity growth that offset other changes in market conditions. However, while our previous paper focuses on an explicit contract with bottlers and two “technological” factors (i.e., vending machine technologies and single-coin transaction technologies) the present discussion of an implicit contract makes it worthwhile to consider some other alternative explanations for the nickel-price strategy of Coca-Cola.

6.1 Investing in Brand (Stressing Quality) to Charge Premium Price

The existing industrial organization literature on strategic pricing suggests that a firm producing a product that is easy to imitate and that is similar to other firms' products, may use advertising as a means of differentiating its product from the competitors’

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61 For example, in a 1947 legal department memo noted that “in Federal Trade Commission vs. Eastman Kodak [...] the Commission held that since Kodachrome film had only one source, price maintenance could not be protected.” This memo was collected along with correspondence from then Coca-Cola Company vice-president Ralph Hayes concerned with retail deviations from the nickel price. Source Ralph Hayes, letter to W. J. Hobbs, December 9, 1946; attached, legal department memo dated January 9, 1947, “5¢ Price for Coca-Cola”. Also, in a somewhat comical 1950 letter drafted to bottlers (attached to an August 23, 1950 letter from vice president H. B. Nicholson to Pope Brock) after seven full pages presenting arguments why the bottler should hold the 80 cent per case wholesale price, on the eighth and final page it states: “In spite of the fact that our business and yours was built on the 80¢ price, we have no sentimental attachment to it, and let me repeat, we have no desire to influence you to maintain it.” It is unclear whether or not this letter was ever actually sent to bottlers.
products. Clearly, competitors tried to imitate Coca-Cola, believing that they could pass themselves off with very similar names (see footnote 31; e.g., “Coke-Ola”). In such settings, firms will tend to use persuasive advertising (as opposed to informative advertising) designed to persuade consumers by shifting their tastes and preferences, and by establishing and strengthening their brand loyalty and reputation (Carlton and Perloff, 2005; Chioveanu, 2008; Bagwell 2007), thereby increasing their monopoly power (Telser, 1964).

Usually, the goal of product differentiation is to increase profits by increasing demand and decreasing the price elasticity of demand (Waldman and Jensen, 2001, p. 357). That way, a firm with market power, for example a monopolistic competitor selling a differentiated product, can try to increase profits by charging a premium price. This leads to higher profits because intense advertisement deters new entries by increasing their market penetration costs. These costs are increased because new firms must induce consumers to switch from established products to new products (Bagwell, 2007, p. 1715).

This explanation, however, is inconsistent with the Coca-Cola Company's strategy to make the nickel price one of the focal points of its advertising campaign. There is ample empirical evidence that advertising containing price information (and more generally, informative advertising) tends to increase the price elasticity of demand.\(^\text{62}\) It would also be inconsistent with the several documented instances when the Coca-Cola Company resisted pressures towards retail price increases. Many of these were well before the post-WWII inflationary era (e.g., during sugar prices increases during WWI). Resisting price increases is, at least in a straightforward sense, inconsistent with wanting to charge a premium price.

\(^{62}\) See, for example, a meta-study conducted by Kaul and Wittink (1995) who considered 18 studies covering a 20-year period. See Lipczynski, et al. (2009) for a detailed summary.
More generally, by systematically promoting and pushing the 5¢ price of Coke the Company conditioned the public to perceive any price hike as unjustifiable. It created a point of extreme price elasticity, effectively limiting its own market power. Thus, the strategy of heavily promoting and committing to the nickel price appears inconsistent with a goal of increasing profits via product differentiation through a reduction in the price elasticity of demand.

6.2 Market Penetration through Lower Price

Another alternative explanation for the nickel price might be based on a market penetration argument. That is, the Coca-Cola Company at first maintained a fixed low price in order to gain a foothold in the marketplace by capturing market share. An “introductory low price” typically is employed by entrant firms to establish themselves by drawing customers from existing firms (Urban and Houser, 1993). The main goal of the initially low price is to create product awareness and induce trial (Blattberg and Neslin, 1990; Urban and Hauser, 1993).

A nickel price policy lasting for multiple decades appears inconsistent with this type of strategy, although the Coca-Cola Company undoubtedly pursued some forms of market penetration strategies early on. From 1889 through 1893, for example, the Company distributed “tickets” widely throughout the Atlanta area that, when presented at a fountain, entitled to holder to a complementary Coca-Cola. This strategy was perceived as effective and subsequently expanded. From 1894 to 1913, about 8.5 million coupons were redeemed by the Coca-Cola Company. The Company also gave soda fountains enough free syrup to cover the complimentary servings.63 As reflected on in Reviewing a Proud History: “We gave it to hundreds. They learned by doing. Now billions pay for it!

63 Source: www.thecoca-colicompany.com/heritage/pdf/cokelore/Heritage_CokeLore_cocacolasampling.pdf
2,400,000,000 drinks a year!”

The nickel price, however, was not lower than the prices of other similar products at that period. For example, many similar soft drinks during the late 1800s, which at the time were marketed as patent medicine, were selling at 5¢. Other drinks, including beer, coffee, a cup of milk, etc., were also selling for a nickel. Indeed, Joseph Biedenharn, the first entrepreneur to successfully bottle Coca-Cola (in Mississippi in 1894), recollected in a 1959 issue of the Coca-Cola Bottler that “soda water bottlers didn’t want to bother with it; besides, they, said, the price of Coca-Cola was too high” (Tedlow, 1990, p. 41).

So, the initial pricing of the product does not appear to have been designed to undercut the competitors.

More importantly, however, the Company’s decision to stick to the nickel price even after becoming the dominant player in the market is inconsistent with the market penetration pricing strategy. For example, according to Riley (1946, p. 343), in 1945 the Coca-Cola Company had a 50 percent market share of the $579 million bottled non-alcoholic carbonated beverage industry. Having achieved such dominance, one would expect that the Company would move away from the nickel price and raise it. However, the company maintained the nickel price for another 15 years!

7. CONCLUSION: WHAT DO WE LEARN FROM THE COCA-COLA CASE?

We have documented an over 70 year period of exceptional nominal price and quality rigidity for what is arguably the most widely recognized consumer good in the world: Coca-Cola. As widely recognized and successful as Coca-Cola is, it is still only a single good. Does this historical case study have relevance to today’s students of economics? Does it offer us any general insights; teach us any general lessons, ones that are relevant today? We believe that it does.
First, for macroeconomic historians the Coca-Cola case points towards what may have been a fairly widespread phenomenon of “customary prices” in the late 19\(^{th}\) and early-to-middle 20\(^{th}\) century US economy. For example, many food items (e.g., a mug of beer, a cup of coffee, a loaf of bread, a pack of Wrigley’s gum, a bar of Hershey’s chocolate, etc.) also sold for a nickel for many years. More generally, as discussed in Levy and Young (2004), many chain stores operating in the US during the late 1800s and early 1900s (e.g., Woolworth, K-Mart under the label Kresge, Wal-Mart, TG&Y, and Mott’s) were Nickel or Nickel-and-Dime stores, selling all their wares for 5¢ or/and 10¢. Implicit contracts may have played a role in establishing these 5¢ and 10¢ norms as customary prices.

The extent of such nominal price rigidities is only unexceptional relative to the Coca-Cola case highlighted here. For example, Young and Blue (2005) report that for at least 14 years (1938 to 1951) Bayer Aspirin, Gillette Blue Blades, and Tums Tablets had constant prices in Sears, Roebuck catalogs. Other nominal rigidities rival that of the nickel Coke. For example, KC Baking Powder sold for a fixed price of 25 cents for over 50 years.\(^{64}\) Such customary prices may be important for explaining why nominal retail prices were more rigid historically (e.g., Kackmeister, 2007). If so, then understanding such customary prices may involve understanding the implicit contracts existing between the producers of these retail goods and their customers.

Transcending its historical setting, the Coca-Cola implicit contract episode highlights an extraordinarily successful firm that, we have argued, effectively chose to almost entirely forgo nominal price and quality adjustment. While the implications of costly price adjustment have been widely studied, analyses considering price adjustment

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\(^{64}\) Source: Grocer's Want Book, a pamphlet distributed by the Jaques Mfg. Co., Chicago, Illinois, the maker of the K.C. Baking Powder, to the retail grocers for their use in managing and keeping track of the inventories (undated).
versus adjustment on other margins are rarer. Danziger (2001) and Anderson and Toulemonde (2004) are examples; they consider the firm behavior in the presence of both price and quantity adjustment costs.\textsuperscript{65} (To our knowledge there are no analogous analyses that also incorporate quality changes.) The Coca-Cola case studies highlight the need for more general empirical studies of the adjustment costs associated with these dimensions relative to price (e.g., Müller et al., 2007).

Finally, we again note that this is, to our knowledge, the first study to offer direct evidence of an implicit contract in a customer market. How important are such implicit contracts in customer markets generally? Our work may serve as motivation for others to develop relevant hypotheses to test using more conventional data. It may also serve as a guide for those wishing to design surveys as a means towards identification of implicit contracts, a la Blinder et al. (1988). Our course, our work may also provide impetus to further case studies which, in sufficient number, may themselves lead to more general conclusions.

\textsuperscript{65} Ginsburgh, et al. (1991) is an early example of a model of quantity adjustment costs that generated sticky prices similar to a menu cost model.
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<th>Year</th>
<th>Raw Materials Share in Soft Drink Industry</th>
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Sources: Raw materials share is from Riley (1958). Percentages are computed using data on value of production, number of plants, and average raw materials used per plant. Advertising expenditures are from “The Coca-Cola Company Advertising Expenditures,” a Coca-Cola Archives document. Sales are from “Sales of Coca-Cola,” a Coca-Cola Archives document.
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Source: Tedlow (1990, Exhibit 2-1, p. 53)