What Happens When Two Economists Go Sleuthing In the Archives of The Coca-Cola Company?

Published: January 10, 2007 in ***Knowledge@Emory***

Everything must change. Take The Coca-Cola Company. In October the world's largest beverage maker introduced Enviga, a sparkling green tea that burns calories, and on December 7 the company tapped its international operations chief, Muhtar Kent, to fill the role of president and COO position. In the world of business, when powerhouse Coca-Cola makes a move, people take note.

Enter Daniel Levy, an adjunct professor with Emory University's Department of Economics, an admirer of the Coca-Cola legacy from both a business and cultural perspective. As an economist, Levy has long been fascinated by the belief that prices respond to changes in market conditions, which has led him to study such products as orange juice to understand price fluctuations. So imagine his surprise upon visiting the World of Coca-Cola in Atlanta, Georgia, in 1993 with his son, when he learned that at one time the price of Coca-Cola had been fixed for more than six decades.

"We heard the tour guide say something like, 'Did you know that the price of a serving of Coca-Cola was five cents from 1886 when it was first sold (inAtlanta, at Jacob's Pharmacy on Peachtree Road), until 1959?' Boy, I was stunned when I heard this," recalls Levy. "This was unbelievable. How can it be that a price (of anything) remains unchanged for over 70 years? It might be that prices are unchanged for a period of perhaps one year, or two years, or even five years, but for a period of 70 years?"

Levy remembered this trivia tidbit, which was hardly trivial to an expert in the Western-style market-based economy and its price system. He then teamed with colleague Andrew T. Young, a visiting assistant professor of economics at Emory, to research The Coca-Cola Company's unusual price behavior. It was an out-of-comfort-zone experience for these economists-turned-historians. "We had to spend many, many hours digging through old files in The Coca-Cola Company archives at the Atlanta headquarters, as well as through many boxes of correspondence and other historical material in the Woodruff Collection at the Special Collections Section of Emory University Library," explains Levy. "This research project has forced us to learn how to read, understand and interpret large volumes of historical data, historical documents and historical studies. In this sense, our study is quite unique."

Adds Young: "As a macroeconomist, mathematical models and empirical studies using government-collected aggregate data are par for the course. This was a chance to play amateur historian, out of the books and into the primary materials, and away from aggregates into the workings of The Coca-Cola Company and other associated individual firms."

The result: "The Real Thing: Nominal Price Rigidity of the Nickel Coke, 1886-1959," which was published in the *Journal of Money, Credit, and Banking* in 2004. A follow-up working paper, "Explicit Evidence on an Implicit Contract" was just submitted to another journal for publication.

The authors' goal in their original paper was to study this unusual episode of price rigidity in detail and to try to explain it. They set out to explore the endurance of the nickel Coke in the context of the times. Levy and Young discovered substantial changes in the soft drink industry over that 70-year period, as well as two World Wars, the Great Depression and numerous regulatory interventions and lawsuits. For instance, notes Levy, sugar, one of the main ingredients in Coke, was rationed during the two world wars. Coca-Cola was also one of the biggest consumers of sugar. During 1925 alone, Coca-Cola consumed more than 100,000,000 pounds of sugar. During World War I, the price of sugar tripled, yet the price of Coca-Cola remained unchanged. The Great Depression and the ensuing drop in demand should have reduced the price of Coke, but didn't. These are only two examples of significant market changes from 1886-1959 under which the 5¢ price of Coke did not waver. "These events, and many other changes that took place in the U.S. and in the soft drink market that were supposed to affect Coke's price, had no impact on the price of Coca-Cola," says Levy. "This is counter to the standard model that we teach in Economics 101. That is what makes this unusually long period of Coca-Cola price rigidity such an interesting puzzle."

In deciphering this puzzle, Levy and Young offer a combination of three different factors as an explanation for Coke's price rigidity. They present them as the following:

We find that this unusual rigidity is best explained by (1) a contract between the company and its parent bottlers that encouraged retail price maintenance, (2) a single-coin vending machine technology, which limited the company's price adjustment options due to limited availability and unreliability of the existing flexible price adjustment technologies, and (3) a single-coin monetary transaction technology, which limited the company's price adjustment options due to the customer "inconvenience cost."

The authors discuss the available vending-machine technology and document statements and actions of the company officers, as well as bottlers, suggesting that the two technology-based constraints, noted in No. 2 and No. 3, played an important role in the decision to maintain the nickel price.

The No. 1 reason, the contract between the company and its bottlers, is explained through economics. The price of the Coca-Cola syrup to bottlers was fixed, until 1921, by a contract. "The Coca-Cola Company could not set the price at which it sold syrup to the bottlers," explains Young. "The company was basically forced to act like a competitive firm where the price it can sell at is a given. As long as at that contracted price, the company's profit margin was positive, the greatest profits were associated with the largest amount of syrup sold to the bottlers. Keeping the retail price low (at a nickel) was a straightforward way to do this. Hence the company pursued a rigorous policy, through advertising and incentives to retailers, of what we would now call retail price maintenance."

In the end, the authors were amused by some of the company's tactics to realize maximum profits while still maintaining the nickel Coca-Cola. For example, the company submitted a plan for a vending machine that still took a nickel but had just enough "blanks" so that the effective price of each Coke that was actually received was greater than five cents. According to this plan, in the vending machine every ninth bottle would be a "bank" or empty bottle. The unfortunate ninth customer, who ended up with the empty bottle, would have to insert another nickle to get his or her Coca-Cola. The previous eight customers got their beverage for a nickel, but the unlucky ninth customer ends up paying 10 cents. In other words, the average price per bottle is 5.625 cents, yet, people are still using only nickels to purchase.

While Levy and Young's research has come under some criticism labeling the tale of nickel Coke as "extreme," the authors argue that they have found other comparable cases. For instance, Wrigley packs of gum were a standard price for half a century; Gillette razor blades had a standard price for at least 20 years; and "five-and-dimes" were a major part of U.S. retail in the first half of the century. "Such long-standing prices may have contributed to an economy that was inflexible relative to today," notes Young. "The research has, through the extreme case, given us insights that are still valid and may not be readily apparent in less extreme forms. For example, we point out the installed base of vending machines as an important contributor to Coca-Cola price rigidity. Granted, it is much easier to adjust prices on vending machines today. Still, two economists named Bills and Klenow have since noted that, even today, prices associated with vending-machine-using industries tend to remain constant for longer periods of time. The details associated with the extreme case will give other economists ideas of what to peer deeply into in less extreme cases."

Levy and Young's Coca-Cola research journey has taken them down many paths since the publication of "The Real Thing": Nominal Price Rigidity of the Nickel Coke, 1886-1959." The authors have recently completed a detailed analysis of the implicit contract—or unwritten understanding—that The Coca-Cola Company established with the American people. The contract promised the Americans a "pure drink for five cents in a bottle or from the fountain." According to Levy, "The company, it turns out, not only made these promises, but also acted upon them. For example, the company resisted zealous suggestions to change its Secret Formula even when the market conditions necessitated it." This new research follows the company's contract withAmerica all the way to the unsuccessful introduction of New Coke in 1984. The authors are also working on another related project that studies the choice of adjusting quantity instead of adjusting price or quality.

Coca-Cola has yielded both an enduring price, as well as enduring research possibilities. Watch Knowledge@Emory for more reports on the Coca-Cola explorations of Levy and Young.

Emory's Department of Economics

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