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Abstract

The purpose of this paper is to compare prices for a popular quick-service restaurant chain (i.e. McDonalds') across countries throughout the world using the "Big Mac Index" published by "The Economist." The index was originally developed to measure the valuation of international currencies against the U.S. dollar. The analysis in this study examines the relationship between the price of a Big Mac and other variables such as the cost of beef, price elasticity, and income. Finally, these relationships are reviewed to draw inferences concerning the use of demand, costs, and competition in setting prices.

Keywords

David Bojanic, Food and Beverage

Global Pricing Strategy for a Quick-Service Restaurant Chain

By David C. Bojanic

The purpose of this paper is to compare prices for a popular quick-service restaurant chain (i.e., McDonald's) across countries throughout the world using the "Big Mac Index" published by "The Economist." The index was originally developed to measure the valuation of international currencies against the U. S. dollar. The analysis in this study examines the relationship between the price of a Big Mac and other variables such as the cost of beef, price elasticity, and income. Finally, these relationships are reviewed to draw inferences concerning the use of demand, costs, and competition in setting prices.

Introduction

People continue to purchase meals away from home at an increasing rate, including dining in restaurants, ordering delivery or carryout, and using drive-thru services. The Census of Retail Trade published by the U.S. Census Bureau estimates the 2005 sales for food service and drinking places at \$396.6 billion, up from \$203.4 billion in 1992. Quick-service restaurants are a major benefactor of this trend, but "fast casual" restaurants and other full-service concepts are cashing in as well. People around the globe have more discretionary income and less time because of the growing number of demands on them in the form of work, social life, and family activities.

There are many restaurants and other food service firms that have expanded globally in an attempt to take advantage of this trend and to realize increased growth in sales and revenues. One of the prerequisites for competing in the international arena is the ability to adapt the firm's marketing program to fit the local customs and economic conditions. A restaurant's menu must include items that appeal to the local populations and present them in a fashion that adheres to local tastes for ambience and atmosphere in a convenient location. The restaurant chain should also be able to reach its target markets through specific promotion vehicles that limit wasted coverage. Finally, the price point for the menu items should be consistent with the competition in that product class and the standard of living in that geographic location.

The purpose of this study is to examine the global pricing strategy for a fast food restaurant chain (i.e., McDonald's). The "Big Mac Index" published by *The Economist* uses the prices for a popular sandwich as a "basket" of goods and services to measure purchasing power parity (PPP) after converting the prices to U. S. dollars. The relationships between price and various economic variables are examined to determine the degree to which the variables are related. In addition, the influence of the standard of living in the country (e.g., level of development and income) on price and the other economic variables is evaluated. Finally, the results of the analysis are used to make inferences regarding the restaurant chain's use of information on demand, costs, and competition in setting its prices in various countries.

Literature Review

First, it is important to examine the general pricing strategies and tactics used in all industries, and how they are applied on a global basis. Kotler (2007) proposes a decision-making framework for pricing decisions consisting of six stages:

- (1) selecting the pricing objective,
- (2) determining demand,
- (3) estimating costs,
- (4) estimating competitors' costs, prices, and offers,
- (5) selecting a pricing method, and
- (6) selecting the final price.

This approach recognizes that prices should be based on demand, costs, and competition rather than focuses on one's orientation. The decision maker must select among the alternative outcomes and implement the strategy. Implementing a pricing strategy is relatively easy, but pricing is a complex function.

Reviews in the marketing literature on pricing normally cover price promotion decisions, behavioral aspects of pricing, and the role of price in the marketing mix (Rao, 1984). One of the pricing strategies that is particularly relevant for global pricing is geographic pricing (Tellis, 1986). Geographic pricing is used when consumers have special transaction costs and the objective of the firm is to exploit its competitive position. The other characteristics are geographically distinct markets, higher costs in adjacent markets, and economies of scale or unused capacity. The main objective for geographic pricing is to minimize the difference between markets by sharing, or absorbing, the costs between them. This strategy allows firms to adapt their prices to the living standards in various countries where they compete.

Restaurant Pricing Strategies

The three common approaches for setting price are cost-based, demand-based, and competitive-based. Often, firms use a combination of these various approaches because it is possible to overlook important factors that will have a negative impact on revenues and profits. For example, a cost-based strategy could underestimate the potential demand for a product resulting in unrealized consumer surplus. One group of researchers examined this phenomenon using an experimental design at a medium-priced family restaurant (Kiefer, Kelly and Burdett, 1994; Kelly, Kiefer and Burdett, 1994.) Price and quantity demanded were compared for a fried fish haddock dinner over four weekends. There were four levels of price that were varied over the four weekends, and the original price (lowest level) was based on the cost of the ingredients with a desired markup. The demand was found to be inelastic over the price range used in the experiment which indicates that there was more flexibility in price than was originally thought.

Another, more recent study, examined the perceived fairness of the demand-based approach to pricing in restaurants. The authors (Kimes and Wirtz, 2002) conducted a survey of guests at a college hotel to obtain their fairness perceptions for some less common demand-based strategies that could be employed by restaurants. The main premise was that restaurants could use revenue management models that are similar to those used by hotels. There were five scenarios explaining five demand-based strategies: 1) lunch vs. dinner, 2) weekday vs. weekend, 3) time-of-day, 4) coupon (two for the price of one), and 5) table location. There were two versions of the survey; one using a price discount and the other using a price surcharge. The findings of the study indicated that price expressed as a discount was typically viewed as more fair than a surcharge; the two-for-one coupon, the time-of-day, and lunch vs. dinner were the most readily accepted strategies.

The cost-based approach to pricing was also studied using a simulation based on the actual data for 18 restaurants in a fast food chain in the Southeastern United States (Robbins and Haas, 1981). The restaurants were divided into six strata based on the mean sales volume for groups of three and the financial and operational data were used to create a simulation using alternative cost/volume conditions. The results indicated that successful attempts at increasing purchase size provide substantially more revenue. In addition, profits were highly sensitive to fixed costs, as well as variable costs such as labor costs and food costs. Finally, it was concluded that it is particularly important for smaller restaurants to improve efficiencies in these areas in order to survive. Aaronson (2001) investigated the impact of increases in minimum wage on restaurant prices in the United States and Canada using an overall restaurant price index as well as prices for specific menu items at three fast food chains (Aaronson, 2001). The author concluded that restaurant prices tend to rise with increases in the minimum wage and that the restaurants' responses to wage increases tend to take place in the quarter surrounding the date of the wage changes.

Environmental Influences on Restaurant Prices

The demand for restaurant services can be difficult to understand. For example, why do restaurants with excess demand maintain their prices rather than increase prices and realize a higher level of profit? Becker (1991) pondered this question and decided to examine the relationship between demand and supply for restaurants. The analysis was theoretical and focused on the equilibrium price and its instability. The author posited that the demand for a popular restaurant can shift quickly and an "in" restaurant can become "out" in an instant. In fact, it is the author's contention that it is much easier to move from "in" to "out" than from "out" to "in." The main reason for the instability is the social influence on demand (i.e., the restaurant's exclusivity). Therefore, the restaurant owner should determine the degree of social influence when determining their restaurant's pricing strategy.

Other environmental variables such as income and ethnic background in various geographic locations have been researched in relation to pricing by fast food restaurants. Card and Krueger (1994) conducted an analysis of 400 fast food restaurants in New Jersey and Pennsylvania to determine whether prices varied by geographic area. Graddy (1997) investigated the link between income, race, and geographic price differences for fast food menu items. The author used the price data from the Card and Krueger (1994) study and matched it with income and race data from the 1990 census report. The results indicated that there is a relationship between prices and the percentage of blacks living in a zip code area, even when income and cost differences (e.g., wages) are taken into account. Prices increased about 5% for a 50% increase in the proportion of blacks.

This is consistent with the findings in other studies that wages in Atlanta fast food restaurants were negatively correlated with the percentage of white customers, and that prices were higher for groceries in areas with a greater proportion of black residents (Inlanfeldt and Young, 1994; Sexton, 1971). There is also evidence that employee wages at fast food restaurants differ according to ownership (Krueger, 1991). It was determined that low-level managers and crew workers at company-owned units had higher wages than their counterparts at franchised units. This difference was even more pronounced when benefits were considered. One possible explanation is the incentive for franchise owners to closely monitor expenses, including wages, in an effort to maximize the return on their investment. This is meaningful in the international arena because most of the units are franchised to owners, or ownership groups, that are citizens of the country. Therefore, the owners should closely monitor wages and keep them in line with living standards in the country.

Global Pricing Issues

It is clear that there are differences in prices for fast food restaurants in the United States based on location. Further, these differences can be attributed to factors such as income, race, costs of operation, and level of competition. Therefore, prices will vary by country due to the variations in income and cost of living. However, there have been some problems associated with the measurement and comparison of the cost of living across countries (Ruff and Jackson, 1974). Some of the issues include the determination of the patterns of consumption (e.g., the basket of goods and services used for comparison), setting weights and prices for the goods and services in the basket, and monetary and fiscal adjustments for things like taxes and inflation. In addition, Downrick and Quiggin (1994) caution about using GDP per capita or the United Nations International Comparison Project data based on purchasing power parity (PPP) without accounting for the country's level of development.

The purchasing power parity (PPP) proposition suggests that price levels across countries should be equal after converting them to a common currency using exchange rates (Balassa, 1964; Cassel, 1921). In other words, a dollar should buy the same amount of goods and services in all countries. Rogoff (1996) examines the impact of the short-term volatility of exchange rates on PPP and concludes that international markets are more segmented than

domestic markets with large trading frictions across a broad range of goods. These frictions are in the form of changes in monetary and fiscal policy (e.g., taxes and government spending) and changes in the costs of capital and labor. This would suggest that PPP is a good barometer for long-term exchange rates, but not very accurate in the short-run. Fullerton and Coronado (2001) used the prices for identical menu items in restaurant chains operating in Texas and across the border in Mexico to test the "law of one price." Their tests indicated that the Peso value differed from the exchange rate implied by the restaurant price ratios.

The Economist developed a Big Mac Index based on the theory of purchasing power parity. The "basket" is a McDonald's Big Mac, which is produced in about 120 countries with a similar recipe. The Big Mac PPP is the exchange rate that would mean hamburgers cost the same in America as abroad, and comparing actual exchange rates with PPPs indicates whether a currency is under- or overvalued. The issue surrounding the Big Mac Index is whether its "basket" of goods and services (i.e., the Big Mac sandwich) is appropriate for measuring purchasing power. Ong (1997) tested the "tradeability" of the Big Mac (and its components) to determine if it is the "perfect universal commodity." The results indicated that the index is fairly accurate in tracking exchange rates over the long-term, which is consistent with other PPP instruments. However, there were some large variations over the short-term as with other PPP instruments.

The variations could be due to social influences such as the "uniqueness" of fast food restaurants in a country, resulting in lower price elasticity and a higher price than expected. In other words, the concept of purchasing power parity assumes firms use the cost-oriented approach to pricing. It does not account for firms using demand-oriented pricing strategies such as prestige pricing or psychological pricing. Other possible factors that influence the Big Mac price across countries in the short-run are the inclusion of value-added taxes in some countries and/or differing profit margins based on the competitive environment (Miljkovic, 1999). Firms must take their competitive environment into account when determining pricing strategies, in addition to cost differences across countries.

Methodology

The data for this study were obtained from a variety of secondary sources. The Big Mac price, exchange rate, implied PPP, and the valuation versus the U. S. dollar is from the Big Mac index published in the May, 2006 issue of *The Economist* that includes data for 58 countries. Data for common economic variables like GDP per capita, consumer price index (CPI), level of income, and inflation rate were obtained through various government sources. The GDP per capita and inflation rate are from the 2006 World Factbook published by the Central Intelligence Agency (CIA) of the United States of America. The level of income is from the Living Standards Measurement Study of the World Bank. The CPI for each country is from the United States Department of Agriculture's Economic Research Service.

In addition to the common economic variables, some other price-related variables were obtained. The country per diem for meals and incidental expenses is from the U. S. Department of Defense Travel and Transportation Allowance Committee. The figure used in the study is a composite of the per diem rates for the cities on the list for each country, weighted toward the more popular cities where there are definitely McDonald's restaurants. The price of beef is from the International Labour Office's data on retail prices for round of beef. In some cases, a price for round of beef was not available and the price for stewing beef or beef with/without bone was used. Finally, the food expenditures and elasticities are from the United States Department of Agriculture (USDA) Economic Research Service. All of these figures were from the latest sources for 2005 and 2006 depending upon the type of data collection and reporting method.

Results

The first step in the analysis was to examine the intercorrelations among the price for a Big Mac and the economic variables (see Table 1). The highest level of correlations (.60 to .70) represents a strong relationship between price and the federal per diem for food (.602), the GDP per capita (.636), the food price elasticity (.634), and the food income elasticity (-.641). The U.S. federal government's per diem for food by country is closely aligned with the price for the Big Mac in that country. Both the price and per diem have strong correlations with GDP per capita, which would suggest that both could be pegged to the level of development and income in the country. The price elasticity shows that as price increases, the price sensitivity of the consumer increases as well. Conversely, the income elasticity is inversely related to price. The countries with higher prices have larger negative income elasticities, indicating that consumers are less sensitive to food prices as income increases, and both types of elasticity measures are highly correlated with GDP per capita ($r > .90$).

Table 1: Intercorrelations among Big Mac Price and Economic Variables

	Price in US\$	Per Diem	Food %	Beef Price	GDP Per Capita	CPI	Inflation Rate	Food Price Elasticity
Per Diem	.602 (.000)							
Food %	-.386 (.010)	-.510 (.000)						
Beef Price	.469 (.000)	.486 (.000)	-.284 (.072)					
GDP Per Capita	.636 (.000)	.770 (.000)	-.712 (.000)	.520 (.000)				
CPI	-.194 (.198)	-.204 (.067)	.211 (.170)	-.181 (.191)	-.406 (.002)			
Inflation Rate	-.339 (.009)	-.534 (.000)	.383 (.010)	-.386 (.004)	-.568 (.000)	.644 (.000)		
Food price elasticity	.634 (.000)	.767 (.000)	-.656 (.000)	.546 (.000)	.938 (.000)	-.403 (.007)	-.503 (.001)	
Food income elasticity	-.641 (.000)	-.788 (.000)	.645 (.000)	-.564 (.000)	-.968 (.000)	.395 (.008)	.606 (.000)	-.962 (.000)

The only correlation between .40 and .60 is beef price (.469), which is significant and considered somewhat strong. Inflation rate (-.339) and the food percentage of consumers' total expenditures (-.384) are also significantly correlated with price. This suggests that countries for which food expenditures represent a large percentage of total expenditures and with higher levels of inflation tend to have lower prices. However, the correlations are below .40, which is not considered particularly strong. The lowest correlation, and the only one that is not significant at the .05 level, is between the Big Mac price and the consumer price index (-.196). All of these findings are probably related to the level of development and income associated with the country.

Level of Income Analysis

The next step in the analysis included separating countries into income categories based on Living Standards Measurements provided by the World Bank. Middle income and high income were chosen as the groups for the correlation analysis. A separate correlation analysis was performed on each of the two income groups (see Table 2). There are two significant correlations (at the .05 level) with the Big Mac price for the middle income group: beef price (.596) and food income elasticity (-.483). Similarly, there are only two significant correlations with the Big Mac price for the high income group: GDP per capita (.585) and meal per diem

(.557). It is interesting that these four variables were all significant in the first step of the analysis for the entire sample. However, this analysis by level of income demonstrates that there are differences between the countries.

Table 2: Intercorrelations by Country Level of Income

Economic Variable	Middle Income		High Income	
	Pearson coefficient	Significance	Pearson coefficient	Significance
Per Diem	.151	.365	.557	.013
Food %	-.108	.571	.009	.974
Beef Price	.596	.000	.247	.308
GDP Per Capita	.271	.099	.585	.007
CPI	-.028	.867	.188	.441
Inflation Rate	-.297	.070	.024	.919
Food price elasticity	.215	.253	.346	.226
Food income elasticity	-.483	.007	-.341	.233

Analysis of variance (ANOVA) was used to determine the significance of the differences between the means for the economic variables across three income levels (see Table 3). As expected GDP per capita was highest for the high income group (27,470), followed by the upper middle income group (11,572), and lowest for the lower middle income group (5,105). The Duncan mean separation test was used to examine the means and determine where there were significant differences. In this case, the means for all three groups were significantly different than one another. Also, the food income elasticity decreased from the lower middle income group (.670), to the upper middle income group (.583), and was the lowest for the high income group (.335).

Table 3: Price and Economic Variables by Level of Income

	Lower Middle	Upper Middle	High Income	F	Sig.
Price in US\$	2.04a	2.30a	3.32b	9.674	.000
Per Diem	63.05a	72.72a	99.32b	23.202	.000
Food %	35.50b	29.52b	16.22a	16.121	.000
GDP Per Capita	5,105a	15,572b	27,470c	147.119	.000
CPI	145.32b	161.63b	111.65a	6.064	.004
Beef Price	3.42a	5.72a	15.72b	10.972	.000
Inflation Rate	6.53b	5.87b	2.19a	10.487	.000
Food Price Elasticity	-.390a	-.378a	-.248b	95.597	.000
Food Income Elasticity	.670c	.583b	.335a	126.496	.000

The high income group separated from the middle income groups for the rest of the economic variables. The high income group was significantly higher than the middle income groups for Big Mac price, beef price, and per diem. The high income group was significantly lower than the middle income groups for food percentage of total expenditures, CPI, inflation rate, and food price elasticity. Once again, the consumers in the high income level countries have more disposable income (i.e., food is a lower percentage of their expenditures) and are less sensitive to price changes.

Conclusions

Pricing decisions are complex because of the multitude of factors in play in the marketplace. These decisions are particularly difficult in the global arena because there are additional factors such as taxes, the cost of capital, labor issues, and other government policies and regulations. The concept of purchasing power parity suggests that \$1 should buy the same amount of goods and services in all countries. However, the economics literature is clear that purchasing power parity is not achieved in the short-run, and that exchange rate conversions do

not result in “one price” for specific goods or services across countries. The major goal of this paper was to determine whether other economic variables besides the exchange rate could help explain the variation in prices across countries.

The price for Big Macs did vary in accordance with the meal per diem set by the U.S. Department of Defense Travel Allowance Committee. This would suggest that McDonald's sets the price based on the general economic conditions in a country and the overall level of prices based on demand and competition. This is further supported by the significant correlation between the price of a Big Mac and the food price elasticity for the country. Higher prices were found in countries with lower price elasticities, but there was a much weaker correlation between price and food as a percentage of total expenditures. This would suggest that food establishments take advantage of the strong economic environment in developed countries with high incomes by using demand-oriented pricing and charging relatively higher prices for food.

Some of the other economic variables used in the analysis are related to the income level in the various countries. The correlation between price and GDP per capita is significant and relatively strong. The same is true for price and food income elasticity. Countries with higher prices tend to have high food income elasticities as well (i.e., the quantity of food demanded increased with level of income). The analysis by country level of income also showed significant differences between high income countries and middle income countries for the Big Mac prices. Lower income countries seem to use some form of cost-oriented pricing because the price varies with the cost of beef. Also, the relationship between price and food income elasticity is more relevant in the lower income countries. People in lower income countries do not increase their expenditures on food as quickly when income rises. This is probably because food expenditures already represent a relatively large percentage of total expenditures.

It is certainly evident from this study that McDonald's uses a combination of pricing approaches and follows a pricing decision-making framework similar to Kolter's six step approach. The restaurant operators look at demand, cost, and competition in setting final prices. The approach leans more toward cost-oriented pricing in lower income countries and shifts more toward demand-oriented pricing in higher income countries. Consumers in lower income countries spend a larger percentage of their annual incomes on food and they are more sensitive to price. Food purchased away from home cannot cost much more than the food prepared at home. Conversely, consumers in higher income countries are less sensitive to price and look for a unique experience when purchasing food away from home.

Limitations of the Study and Future Work

The data used in this study were obtained from secondary sources mostly compiled by national and international organizations. These organizations are responsible for producing the statistics used in the study, but they are not tailored to meet the exact needs of the study. For example, the food price and food income elasticities are for all forms of food, not just food purchased at restaurants, or any particular type of restaurant. Also, the timing is suspect because the data are mostly annual, but are not collected the same month as the prices and exchange rates. Future studies should incorporate a time series of price data from individual restaurant units and observe the relationships and changes over an extended period of time.

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