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Menu Analysis for Coffee Shop Operation: Using Activity-Based Costing

Hyun-Oh Kang
Texas Tech University, ho.kang@ttu.edu

Sang-Mook Lee
Texas Tech University, mookvndn@hotmail.com

Young Hoon Kim
The University of Mississippi, younghoon.kim@unt.edu

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Hyun-Oh Kang
Texas Tech University
Lubbock, Texas, U.S.A.

Sang-Mook Lee
Texas Tech University
Lubbock, Texas, U.S.A.

and

Young Hoon Kim
The University of Mississippi
Oxford, Mississippi, U.S.A.

ABSTRACT

In the highly competitive coffee shop business a more accurate menu-pricing method is needed to maximize profit. By applying Activity-Based Costing (ABC) theory to original menu-engineering methods, managers of a business can be informed about the actual cost and contribution margin of each menu item. This study demonstrates the feasibility of a modified menu-engineering method using ABC theory applied to the operation of a coffee shop. The results show that ABC can be an efficient method for maximizing overall profit of a coffee shop business.

Key Words

Activity-Based Costing, coffee shop, menu engineering

INTRODUCTION

The foodservice industry in the United States is a very challenging and competitive business, characterized by small profit margins and relatively high failure rates. (Ebbin, 2000). This condition is also true on a global basis and, particularly, in a competitive market like South Korea. Foodservice managers find it difficult to satisfy their sophisticated and demanding customers without compromising menu prices that allow them to earn reasonable profits. The importance of price, and methods for using pricing strategically, have a long history in economic theory. There have been numerous studies conducted to find accurate pricing models for the foodservice industry including menu engineering analysis (Kasavana & Smith, 1982).

In the foodservice business, undistributed operating expenses, such as labor and fixed costs, represent a large percentage of total cost structure (Defranco & Noriega, 2000). However, these expenses are largely ignored when menu prices are established. Typically, menu prices are calculated by applying a mark-up percentage to the cost of goods sold, which ignores many major operating costs, such as labor, utilities, direct operating expenses, or fixed costs (Schmidgall, 1997). In highly competitive markets, foodservice managers may no longer be able to price their menus by simply marking up their variable product costs. They may need to use more sophisticated approaches to survive and generate desired profits.

For the purpose of menu pricing in a restaurant, several methods have been introduced. Kasavana and Smith (1982) offered an approach to menu pricing that analyzed every item on a menu from the perspective of contribution margin and sales volume. Kasavana and Smith (1982) created four quadrants (Star, Plowhouse, Puzzle, Dog) which they use to define their research. Pavesic (1985) suggested that food-cost percentage, contribution margin, and sales volume should be used together in order to determine which items were profitable. In their research Hayes and Huffman (1985) also found that some menu items could be migrated quite easily among these different quadrants.

These menu analyses suggested that foodservice managers can find profitable menu items that lead to operation success. Nonetheless, labor cost is considered an important factor in foodservice business, and, in these analyses “fixed cost” was not considered. Most of the labor cost is considered to be a fixed cost, generated while preparing, cooking, and serving customers. Therefore, Activity-Based Costing (ABC) methods could have been used to put labor cost into menu-engineering analysis.

The first time Activity-Based Costing theory was introduced, the theory added the “overhead cost” of manufacturing into each product (Cooper, 1989; Cooper & Kaplan, 1992). ABC has major advantages over other costing methods because of its ability to trace overhead cost, which allows for more accurate unit costing. In the foodservice industry, ABC makes it possible to track overhead cost, such as labor cost, for each menu item. The foodservice manager must have accurate information about menu items to find the optimum menu mix. Therefore, using ABC theory will help them obtain exact menu costs including labor cost.

This study attempts to conduct menu-engineering analysis using ABC theory and shows that “menu evaluation” differs from the original method which was developed by Kasavana & Smith for a coffee shop located in South Korea.

LITERATURE REVIEW

Kasavana and Smith (1982) offered an approach that analyzed every menu item from the perspective of contribution margin and sales volume for menu pricing. “Contribution margin” was defined as the difference between selling price and direct cost, related to a particular menu item. The items with high contribution margin and

sales volume were called “Stars,” items with low contribution margin and low popularity were called “Dogs.” The other categories of menu items were “Plowhorses” and “Puzzles.”

Pavesic (1985) suggested that food-cost percentage, contribution margin, and sales volume should be considered together in order to determine which items were profitable. According to Pavesic, the best items for a menu are those which have high-weighted contribution margins and low food-cost percentages.

Hayes and Huffman (1985) argued in previously indicated approaches, that some menu items could be moved quite easily between quadrants. They introduced “Goal Value Menu Analysis” which was presented as an algebraic formula that assessed each menu item’s food-cost percentage, popularity, contribution margin, selling price, and variable-cost percentage. Each item was assigned a certain goal value number that helped researchers perform a comparison among different menu items and a goal value.

In the first stage of ABC, resource costs are assigned to various activity centers by the resource drivers (Cooper & Kaplan, 1992). An activity center is composed of related activities, usually clustered by function or process. Resource drivers are the factors chosen to approximate the consumption of resources by the activity centers. Each type of resource traced to an activity center becomes a cost element of an activity cost pool. In the second stage, the activity drivers are used to measure the consumption by the activities of products or services and assign cost to the products or services. Generally, ABC recognizes different types of activities, i.e., unit-level activity, batch-level activity, and product-level activity (Tsai, 1996).

For a foodservice operation, it was appropriate to create two activity centers: The Front-of-the House (FOH) and the Back-of-the House (BOH). Cleaning, preparation, cooking and administration were the main activities of BOH, and communication, cleaning, set-up, serving customers and administration were the main activities of FOH (Raab, Shoemaker, & Mayer, 2007). Sseveral studies have been done using activity-based costing for a restaurant providing dining service (Raab, Shoemaker, & Mayer, 2007) and a quick service restaurant (Annaraud, Raab, & Schrock, 2008). For a coffee shop, however, the process from ordering through service to customers is a simple process, and sometimes the whole process can be done by one person. Therefore, there is only one important activity center in a coffee shop. However, even with only one activity center, it is necessary to find which activity drivers to use for ABC in menu-engineering analysis. In a coffee shop operation, “time” can be defined as an “activity driver.” There are many part-time workers in coffee shops. We can show that “time” is an “activity driver” by considering the labor costs incurred while preparing each menu item.

This study examines whether it is feasible and preferable to apply ABC theory to a coffee shop operation. Comparing original menu-engineering methods to a modified menu-engineering method using ABC, the study discusses why the original methods often do not maximize profits of the operation. In addition, the study examines the opportunities to maximize profits in the coffee shop business by applying ABC theory.

METHODOLOGY

The research was conducted at a coffee shop on a college campus in South Korea. The coffee shop was managed by graduate students of the Seoul National University, and the name of the café was FANCO. The prices of the FANCO’s menu items were based solely on food cost, excluding overhead costs, such as labor costs. As mentioned before, in this study direct labor cost was added to the basic unit cost for a menu item using “time” as an activity driver. In operating procedures for a coffee shop, the administrative procedure through service to the customers, there were numerous “activities” which were shared activities or that were distinguished as activities for each menu item. For this study, the key point was to add the labor cost, which also considered preparation time of each menu item.

The study assumed that every employee in a coffee shop was paid KRW 3,700 per hour (about $3.36 per hour) in order to calculate direct-labor costs. To employ time as an activity driver, preparation times for each menu item were measured using a stop-watch. Since how long a customer took to order is more related to that customers' characteristic or the number of items ordered, this amount of time was not considered. Preparation time for each menu item was the main focus of this study. This time was measured from the point that customer orders were taken to the point that food was served to the customer.

This measuring procedure was conducted during a two-week period. The study tried to measure as many different employees as possible to minimize variance. Mean value of the observed time spent was used as an activity driver. The hourly wage of KRW 3,700 equaled KWR 61.67 per minute. Direct labor costs for each menu item calculated the preparation time (minutes) multiplied by 61.67; this was the labor cost per minute. The sales volume of the coffee shop for one month was calculated and applied to the menu-engineering method developed by Kasavana & Smith in 1982. Analysis to distinguish the differences between the results of a original menu-engineering method (Kasavana & Smith) and a modified menu-engineering method using activity-based costing is shown in figure 1. We used MS office Excel 2007 for analysis.

RESULT

During the measuring procedure period, there was no change in sales volume. We used identical sales volume data in the modified menu-engineering method. Also, there was only change in the contribution margin. Therefore, the contribution margin for the menus is highlighted.

As shown in Table 1, there was a variance of more than twenty percent to cost of goods sold (COGS) per sales changes in two sandwich menus; these are marked as bold. The COGS/Sales ratio of Banana Toast changed 29.19% as compared to the basic cost, and that of FANCO Sandwich changed 25.94%. In these categories there were considerable variances from less than 1 percent (Cake piece) to 29 percent (Banana Toast).

There was one change to the menu category during the time we were applying the modified menu-engineering method using ABC. As mentioned above, the COGS/sales change of Banana Toast was most significant; therefore its category—determined by contribution margin—was changed from high to low. This is an important finding of our study. If we do not consider the labor cost, some menus, which consume more resources, i.e., preparation time, were categorized as "Star" items in the basic menu-engineering analysis method. However, as shown in Table 2, there was the possibility of change in menu category in the menu-engineering analysis method using ABC that allocated direct labor cost to each menu item.

Table 1. *Cost of Goods Sold per Sales Ratio Change Related to Activity-Based Costing (Sandwiches)*

	Basic Costs	Direct Labor Cost	COGS/Sales	Change (%)
Banana Toast	433.06	126.42	0.373	***29.19***
BLT Sandwich	1,169.65	205.90	0.550	17.60
Bagel Cream Cheese	815.83	28.27	0.563	3.47
Plain Bagel	412.50	22.61	0.435	5.48
Grilled-bagel-Tomato	585.57	94.04	0.453	16.06
Grilled-bagel-Pineapple	756.50	94.04	0.567	12.43
Bagel Sandwich	955.22	178.04	0.453	18.64
FANCO Sandwich	410.10	106.38	0.516	***25.94***
Cake piece	1,870.00	18.50	0.755	0.99

Table 2. *Modified Menu-Engineering Using Activity-Based Costing (Sandwiches)*

Menu	Contribution Margin	CM Criteria	Modified CM	Modified CM Criteria
Banana Toast	1,066.94	***H***	940.52	***L****
BLT Sandwich	1,330.35	H	1,124.45	H
Bagel Cream Cheese	684.17	L	655.90	L
Plain Bagel	587.50	L	564.89	L
Grilled-bagel-Tomato	914.43	L	820.39	L
Grilled-bagel-Pineapple	743.50	L	649.46	L
Bagel Sandwich	1,544.78	H	1,366.74	H
FANCO Sandwich	589.90	L	483.52	L
Cake piece	630.00	L	611.50	L

There were COGS/sales ratio changes in beverage menus as with the sandwich menus as shown in Table 3. The COGS/sales ratio of the Smoothie changed more than 35% when using activity-based costing. When direct labor cost was added to basic food cost, there was change to the average contribution margin. Before applying ABC theory, the average contribution margin was KRW 1,026.33, according to the modified menu-engineering method the average contribution margin changed to KRW 964.54. Therefore, there was a change in contribution criteria for the menu from Low to High as shown in Table 4. FANCO Coffee Grande was categorized as “low” by contribution margin criteria before applying ABC. Because the “time spent” portion of the menu was short and the menu consumed fewer resources than other menus. Unlike Banana Toast (Table 2), which changed to “less profitable” status, the category of FANCO Coffee Grande changed to “more profitable status” with regard to contribution margin.

Table 3. *Cost of Goods Sold per Sales Ratio Change Related to Activity-Based Costing (Beverages)*

	Basic Costs	Direct Labor Cost	COGS/Sales	Change (%)
FANCO Coffee Grande	485.93	46.25	0.355	9.52
FANCO Coffee Tall	347.33	33.51	0.381	9.65
Espresso	373.73	33.23	0.407	8.89
Americano	528.83	37.34	0.377	7.06
Cappuccino	646.53	79.14	0.363	12.24
Café Latte	603.33	59.61	0.331	9.88
Caramel Latte	1209.13	137.73	0.539	11.39
Café Mocha	1325.03	114.43	0.576	8.64
Iced Americano	539.11	70.92	0.305	13.16
Iced Café Latte	769.51	68.35	0.335	8.88
Iced Café Mocha	1702.16	140.81	0.614	8.27
FANCOccino	1328.80	207.62	0.439	15.62
Green tea	578.55	49.33	0.419	8.53
Black tea	473.40	49.33	0.348	10.42
Chamomile tea	753.80	49.33	0.321	6.54
Peppermint tea	936.00	49.33	0.394	5.27
Hot Chocolate	547.72	72.39	0.310	13.22
Coke	483.25	20.56	0.504	4.25
Sprite	483.25	20.56	0.504	4.25
Milk	355.75	50.50	0.406	14.20
Iced tea	368.31	43.17	0.274	11.72
Smoothie	436.90	155.20	0.197	***35.52***
Frozen Yogurt	1041.00	23.64	0.532	2.27
Orange Juice	768.25	20.56	0.526	2.68

Table 4. *Modified Menu-Engineering Using Activity-Based Costing (Beverages)*

Menu	Contribution Margin	CM Criteria	Modified CM	Modified CM Criteria
FANCO Coffee Grande	1,014.07	***L***	967.82	***H****
FANCO Coffee Tall	652.67	L	619.16	L
Espresso	626.27	L	593.04	L
Americano	971.17	L	933.83	L
Cappuccino	1,353.47	H	1,274.33	H
Café Latte	1,396.67	H	1,337.06	H
Caramel Latte	1,290.87	H	1,153.14	H
Café Mocha	1,174.97	H	1,060.54	H
Iced Americano	1,460.89	H	1,389.97	H
Iced Café Latte	1,730.49	H	1,662.14	H
Iced Café Mocha	1,297.84	H	1,157.03	H
FANCOccino	2,171.20	H	1,963.58	H
Green tea	921.45	L	872.12	L
Black tea	1,026.60	H	977.27	H
Chamomile tea	1,746.20	H	1,696.87	H
Peppermint tea	1,564.00	H	1,514.67	H
Hot Chocolate	1,452.28	H	1,379.89	H
Coke	516.75	L	496.19	L
Sprite	516.75	L	496.19	L
Milk	644.25	L	593.75	L
Iced tea	1,131.69	H	1,088.52	H
Smoothie	2,563.10	H	2,407.90	H
Frozen Yogurt	959.00	L	935.36	L
Orange Juice	731.75	L	711.19	L

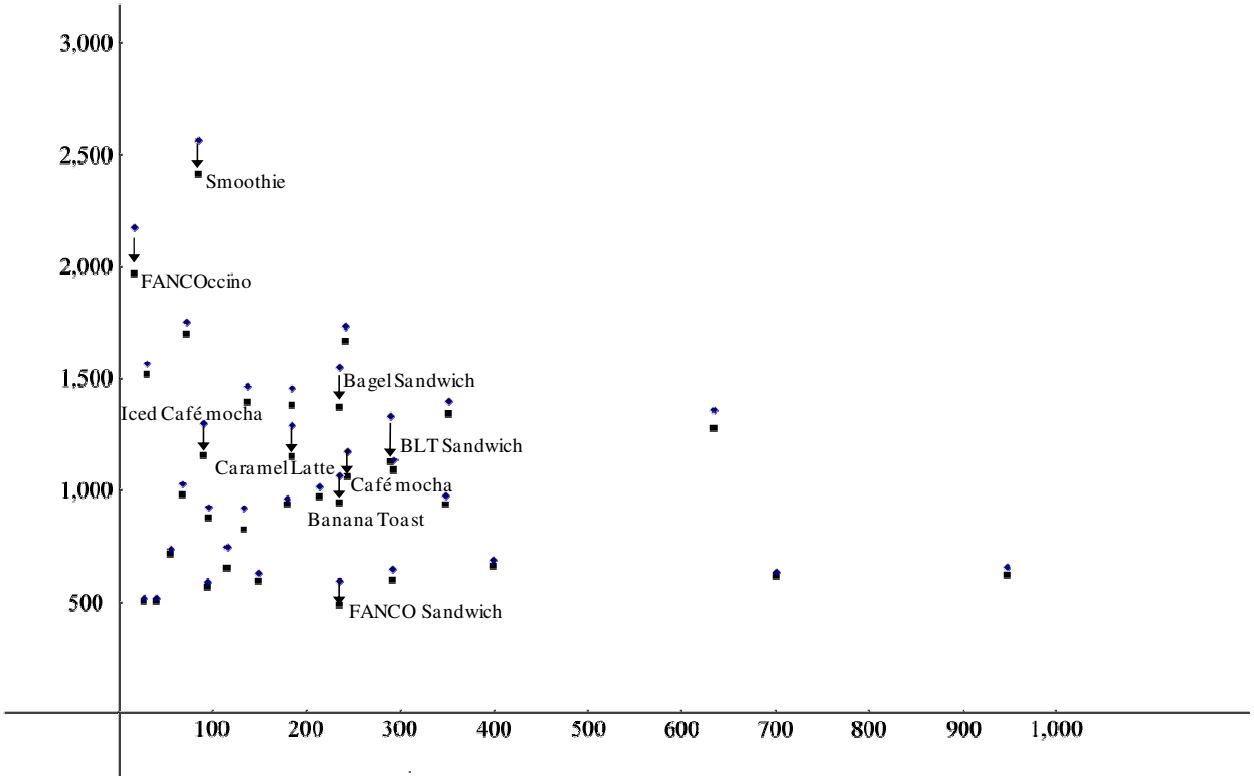

Figure1. Contribution Margin Change in Menu-Engineering Analysis Using Activity-Based Costing

DISCCUSSION & CONCLUSION

This research was conducted at a coffee shop that provided a limited menu with limited service. There are many coffee shops now, including take-out coffee shops, and they have become a part of our lives. As a result, there are highly competitive circumstances among these numerous coffee shops.

This study provided basic data for a modified menu-analysis method using activity-based costing, and applied the scientific menu-analysis techniques to a coffee shop operation. The results of this study suggest that adopting a modified-menu engineering analysis approach using activity-based costing may have significant benefits for a coffee shop's management. In particular, it may be especially useful for the coffee shop businesses that are suffering from the huge competition in the market. This study suggests that menu management should be done based on the result of modified menu analysis that considered activity-based costing theory.

However, there are some limitations to this study. The study was an exploratory attempt and used a convenience sample of only one coffee shop operation located on a collage campus in South Korea. Therefore, this research has limited generalizability. Further research is needed to examine the modified menu-engineering analysis using activity-based costing for the other coffee shops in South Korea as well as other countries. The short period of observation along with the assumption that labor costs generated from KRW 3,700 flat rate in order to calculate ABC menu engineering results could be one of limitations of this study. In spite of these limitations, this current study demonstrated that modified menu-engineering analysis can be a thoughtful and useful tool for analyzing a

coffee shop's contribution margin on individual menu items or entire menus. In addition, for ultimate success in the competitive coffee shop business, managers should make profitable menus available but set reasonable prices based on continuous menu monitoring.

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