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RESPONSE

A Response to Commentary on the Article "Restaurant Menu Analysis: Can We Go Further?"

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After a very careful review of the comments regarding this article, the following response is given.

ACCURACY

Indeed, the proposed index method was adopted from a non-English written source. However, in the opinion of the author, the fact that it was published in a foreign language does not make this approach inaccurate or weak in any way. The approach is based on a concept of Paasche and Laspeyres indices that are well known in macro economic analysis all over the world.

The researcher was trying to re-calculate three variables that were originally calculated in Formulas (5), (6), and (7) (pp. 31–32). Unfortunately, the researcher has not accurately used Formulas (5) and (6) for recalculation purposes. The equations in parentheses for Formulas (5) and (6) were supposed to be multiplied by $\sum_{j=1}^{k} q_j^1$ (i.e., 642), as my article suggests, and not by $\sum_{j=1}^{k} q_j^0$ (i.e., 614). It is based on a statistical concept that describes multiplication rules for different type of indices and is a common part of statistics undergraduate curriculum in business schools.

It is agreed that in Table 2 (see Appendix), for menu item 4, $CM^1 * Q^1$ equals \$2,786.70 and not \$2,797.20, which is how it was presented in

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the original article. It affected the total contribution margin, so instead of $9,101.64 (as presented in the article), it will be equal $9,091.14.

Item 3 in Table 2 was calculated correctly. The colleague multiplied 14.73 by 124 instead of 14.79 by 124.

The three equations presented in Formulas (5), (6), and (7) have been recalculated with an Excel spreadsheet proportion of sold items in menu (d) with eight decimal digits. That *excluded* a rounding bias that was mentioned in the article. Example: In Table 1 (see Appendix), for menu item 1, a proportion of a sold menu items was presented as 23.62. While recalculating, it was put as 0.23615635.

Equations (5)–(7) use such variables as CM1D1, CM0D1 and CM0D0. The new results showed that CM1D1 = $14.16065, CM0D1 = $10.90495, and CM0D0=$10.8556. Thus, the result for Eq. (5) is $2,090.16, the result for Eq. (6) is $31.68313, and the result for Eq. (7) is $303.9569. The summary of those three numbers equals $2,425.80. An absolute difference between periods 1 and 2 equals $9,091.14 – $6,665.34 = $2,425.80.

ASSUMPTIONS

The proposed method is dealing with a contribution margin of menu items and not selling price. Upon reading pages 29 and 30, no assumption on the part of the author was found that said "price changes do not play a role in the observed changes in contribution margin." It is obvious that a change in price may change a contribution margin of that particular product.

Page 30 presents some reasons why the contribution margin can change, even if a selling price stays the same. It is agreed that discount promotions, coupons, etc., can indeed affect a contribution margin, which is an additional reason why the contribution margin may change.

The researcher poses a question on how to incorporate price change in this index and believes it is beyond the scope of this commentary. This method can be applied as long as there is a change in the contribution margin for a particular menu item between two periods. Of course, it is possible to assume that in some cases, this change can occur because an actual selling price of the item changes between two periods. In addition, this suggested approach can use a selling price instead of a contribution margin.

It is also possible to apply this method for the same menu item that has the full selling price, a price with a discount A, a price with a discount B, and so on. In this case, a table will have, instead of menu items 1, 2, 3, and 4, the information on the same menu item with different levels of discounts. Restaurant Point of Sales (POSs) systems, in most cases, reflect information on different discounts for menu items.

USEFULNESS

The researcher is concerned that this index is dealing with aggregated menu items, and a menu analysis is supposed to deal with individual items. In reality, this index can easily be calculated for only one menu item, as long as we know a contribution margin for this item, the number of times this item was sold, and the proportion of a sold item in a menu. The same equations are going to be used in this case. The equation $\sum_{j=1}^{k} q_j^1$ allows the use of only one menu item.

APPENDIX

TABLE 1 Information on Four Menu Items (Period 1)

Menu items	CM^0 contribution margin ($)	Q^0 number of items sold	$CM^0 * Q^0$ total contribution margin per item ($)	d^0 proportion of a sold item in a menu (%)	SP^0 selling price ($)	IC^0 item costs ($)	TC^0 total costs ($)	TS^0 total sales ($)	FC^0 food cost (%)	PF^0 profit factor
#1	11.09	145	1608.05	23.62	19.99	8.90	1290.5	2898.55	45%	0.96
#2	10.15	182	1847.30	29.64	17.50	7.35	1337.7	3185	42%	1.11
#3	12.27	112	1374.24	18.24	25.50	13.23	1481.76	2856	52%	0.82
#4	10.49	175	1835.75	28.50	27.60	17.11	2994.25	4830	38%	1.11
Total	44	614	6665.34	100.00			7104.16	13769.55		

^{0}: Indicates variables that relate to base period.

TABLE 2 Information on Four Menu Items (Period 2)

Menu items	CM^1 contribution margin ($)	Q^1 number of items sold	$CM^1 * Q^1$ total contribution margin per item ($)	d^1 proportion of a sold item in a menu (%)	SP^1 selling price ($)	IC^1 item costs ($)	TC^1 total costs ($)	TS^1 total sales ($)	FC^1 food cost (%)	PF^1 profit factor
#1	14.01	160	2241.60	24.92	21.99	7.98	1276.8	3518.4	36%	0.99
#2	15.06	148	2228.88	23.05	23.50	8.44	1249.12	3478	35%	0.98
#3	14.79	124	1833.96	19.32	25.50	10.77	1833.96	3162	42%	0.81
#4	13.27	210	2797.20	32.71	27.60	14.33	3009.3	5796	48%	1.23
Total	57.13	642	9101.64	99.46			7471.46	15954.4		

[1]: Indicates variables that relate to the second period.