

A COMPREHENSIVE ANALYSIS OF THE MARKETING MIX COMPONENTS IMPACT ON THE QUALITY OF HEALTHCARE ACTIVITY

Ana Maria Bobeica¹

ABSTRACT

The paper is based on a quantitative Analysis made on Romania's healthcare market in order to quantify the impact of some key elements of the marketing mix like the Price Component, Placement, Human Resource, Product and Placement/Location and the Healthcare Quality of Services and to establish the connection between the components from the Healthcare Managers point of view.

The study was made during April and May 2013 and explains the answers of more than 100 Healthcare Managers around Romania.

The results show a direct connection between the key elements analyzed and are the base of a future case study in the healthcare marketing field.

Key words: marketing healthcare, quality healthcare marketing, marketing mix

1. INTRODUCTION

I. The present degree of knowledge

Despite long-term interests on problems and sustainability programs, research in this field so far not led to a set of questions, operational definitions and procedures or paradigms that converge in one direction; therefore the subject still remains open. Also when it comes to sustainability of healthcare we refer also to factors that affect the sustainability including financing. In this case we mean public healthcare expenditure related to GDP. The latest research in the literature of healthcare [1] concluded that "there is only one statistical and accurate factor that influence the cost of health and this is the correlation to the Gross Domestic Product (GDP) ".[2]

But when we speak about the Marketing Mix in Healthcare we also have to mention the following factors: [3]: the price, promotion, distribution, product and other factors like: the human resource (HR). [4]

The Quality of Healthcare Services is determined by multiple factors like: satisfaction, retention, loyalty, promotion, the quality context and output of quality. [5].

In this paper we shall analyze the marketing mix component of pricing and the impact on demand of healthcare and also the impact of satisfaction as a key component of quality on

¹ PhD Student Doctoral School of Marketing, Academy of Economic Studies, Bucharest,
a_bobeica@yahoo.com

the level of patient's retention. We are also analyzing the perspective of social Healthcare Activity because the Marketing of Healthcare has a strong social component. [6]

II. The hypothesis, methodology and results

We are analyzing the Quality of healthcare services from the point of view of Price component, Product, Promotion, Location/Placement and Human Resources and the Demand level of healthcare service. [7]

H1: Price, as a Marketing Mix component has a major and direct impact on the Quality of Healthcare Services.

H2: Human Resource as a Marketing Mix component has a major and direct impact on the Quality of Healthcare Services.

H3: Placement, as a Marketing Mix component doesn't have such a major impact on the Quality of Healthcare Services.

H4: Price is influenced directly by the placement component in the Healthcare Services Sector

H5: Price is influenced directly by the human resource component in the Healthcare Services Sector

H6: Price is influenced directly by the promotion component in the Healthcare Services Sector

H7: Price is influenced directly by the product/service component in the Healthcare Services Sector

The methodology uses a questionnaire [8] about the quality of healthcare activities and was sent to all the participants to the National Conference of Healthcare Management, in Predeal, April 19-21, 2013. Also responses have been collected online in a form of an Online Questionnaire and also by postal replies. We have a total of 100 respondents from what 93 were valid responders, and 76 of them have responded to the Question regarding the Marketing Mix Components and the Quality of Services. The participants were questioned about the level of importance they would give to the price/product/promotion/placement/hr factor on a Scale from 1 to 5 (5 -*Most important*, 4- *Important*, 3- *Relative important*, 2- *Less important* 1-*Very less important*) in order to quantify the impact of the price on the quality of the healthcare activity. [9]

$$y_i = a + b \bullet x_i, i=1..76 \quad \text{Equation (1)}$$

Where: y_i represents the quality of service in healthcare; x_i represents the level of price/product/promotion/placement/HR paid for the healthcare services.

The model analysis was analyzed in EViews statistical program.

2. PRICE COMPONENT

I. Histograms and stats

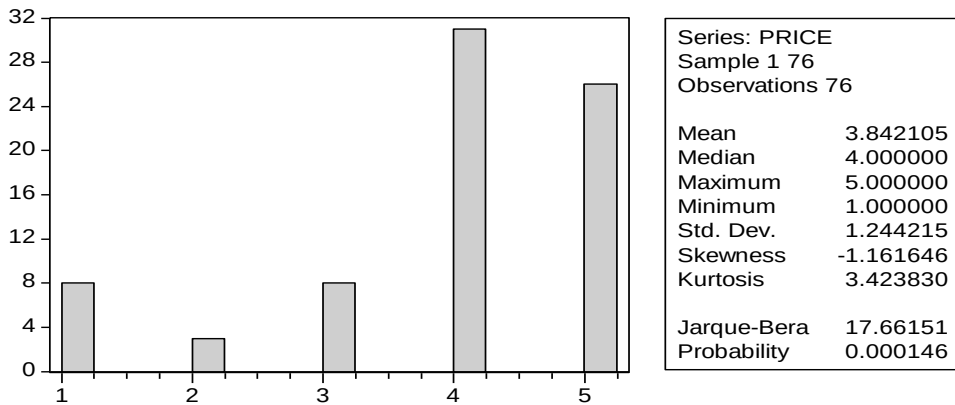


Figure 1 – Histograms and stats

The mean is situated around the value of 3.84 (Figure 1), respectively between the level of *Relative Important (3)* and *Important (4)* on the analyzed scale which reflects the direct and important connection between the Price and the Quality of the Healthcare services/activities. (H1)

The Jarque Bera indicator is high which indicates the presence of deviations. The probability is small. The variables are ordered in Figure 2 in the form of a Linear Graphic.

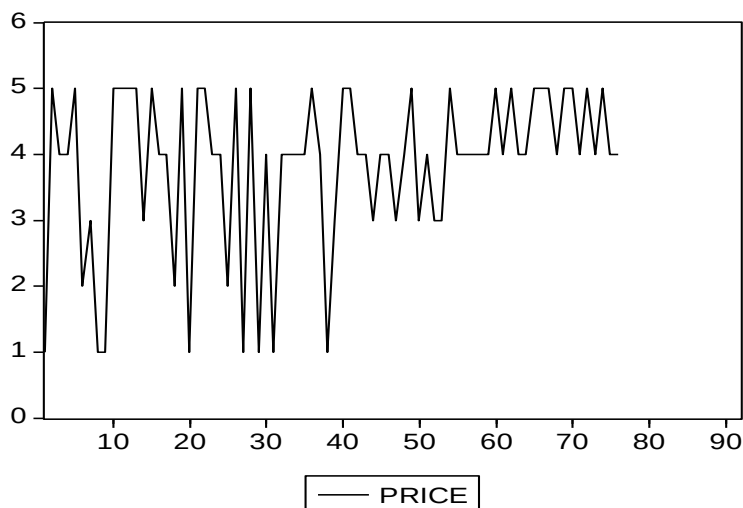


Figure 2 – Linear Graphic

3. PLACEMENT COMPONENT

I. Histograms and stats

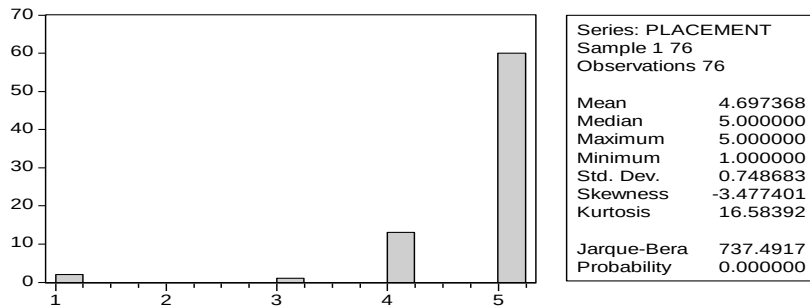


Figure 3 – Histograms and stats

The mean is situated around the value of 4.69 (Figure 3), respectively between the level of *Important (4)* and *Most Important (5)* on the analyzed scale which reflects the direct and important connection between the Placement and the Quality of the Healthcare services/activities. (H2)

The Jarque Bera indicator is high which indicates the presence of deviations. The probability is small. The variables are ordered in Figure 4 and Figure 5 in the form of a Linear and Bar Graphic.

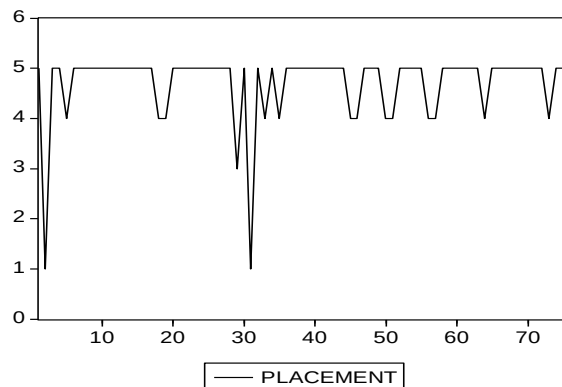


Figure 4 – Linear Graphic

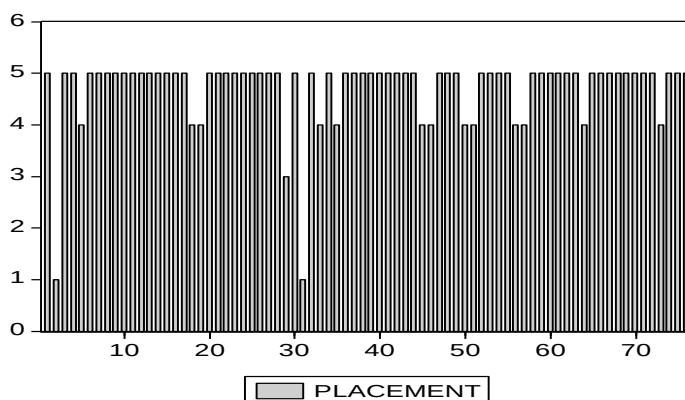


Figure 5 – Bar Graphic

4. HUMAN RESOURCE (HR) COMPONENT

I. Histograms and stats

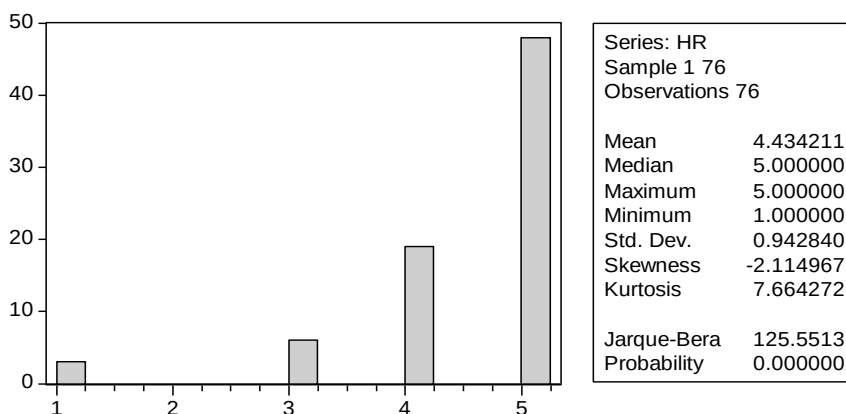


Figure 6 – Histograms and stats

The mean is situated around the value of 4.43 (Figure 6), respectively between the level of *Important (4) and Most Important (5)* on the analyzed scale which reflects the direct and important connection between the Human Resource (HR) component and the Quality of the Healthcare services/activities. (H3)

The Jarque Bera indicator is relatively high which indicates the presence of deviations. The probability is small. The variables are ordered in Figure 7 in the form of a Linear Graphic. Also the Kernel Density is presented in Figure 8.

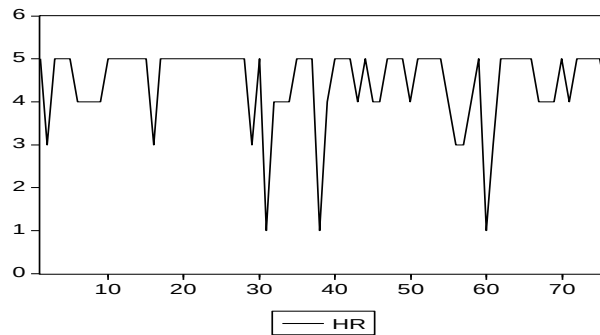


Figure 7 – Linear Graphic

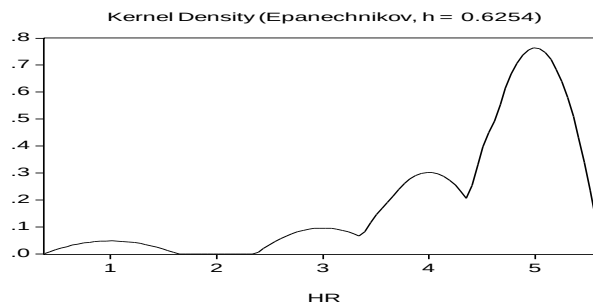


Figure 8 – Kernel Density

Equation Analysis between Components
Price and Placement Equation (H4)

Estimation Equation of the Linear Model of Regression:

=====

PRICE = C(1)*PLACEMENT + C(2) Equation (2)

Substituted Coefficients:

=====

PRICE = 0.2704225352*PLACEMENT + 2.571830986

Dependent Variable: PRICE				
Method: Least Squares				
Date: 05/19/13 Time: 02:24				
Sample: 1 76				
Included observations: 76				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PLACEMENT	0.270423	0.190614	1.418694	0.1602
C	2.571831	0.906537	2.836985	0.0059
R-squared	0.026478	Mean dependent var	3.842105	
Adjusted R-squared	0.013323	S.D. dependent var	1.244215	
S.E. of regression	1.235899	Akaike info criterion	3.287437	
Sum squared resid	113.0310	Schwarz criterion	3.348772	
Log likelihood	-122.9226	F-statistic	2.012692	
Durbin-Watson stat	2.100918	Prob(F-statistic)	0.160186	

Figure 9 – Estimation of the parameters of the Linear Model of Regression

The coefficient of variable “C” doesn’t have significance from the economic point of view. From geometrical point of view it represents the point where the regression line intersects Oy axes.

The +0.27 coefficient of Placement variable is also named the regression coefficient. Trough the sign it indicates the sense of the influence of Placement on Price component („+” means a direct influence). By level (number) shows the quantum of the influence (at every rise with a number of the cause the effect variable modifies in the same way with 0.27 units) (see Figure 9)

$R^2=0.013$ shows that 1.33% of the total variation of the price it is explained by the influence of Placement component, so the Placement Component is not a determinant factor to be considered in the model.

Price and Human Resource Equation (H5)

Estimation Equation:

$$\text{PRICE} = C(1) * \text{HR} + C(2)$$

Equation (3)

Substituted Coefficients:

$$\text{PRICE} = 0.3931320308 * \text{HR} + 2.098875074$$

Dependent Variable: PRICE				
Method: Least Squares				
Date: 05/19/13 Time: 12:33				
Sample: 1 76				
Included observations: 76				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
HR	0.393132	0.146440	2.684590	0.0090
C	2.098875	0.663675	3.162507	0.0023
R-squared	0.088749	Mean dependent var	3.842105	
Adjusted R-squared	0.076435	S.D. dependent var	1.244215	
S.E. of regression	1.195719	Akaike info criterion	3.221336	
Sum squared resid	105.8011	Schwarz criterion	3.282671	
Log likelihood	-120.4108	F-statistic	7.207022	
Durbin-Watson stat	2.035997	Prob(F-statistic)	0.008957	

Figure 10 – Estimation of the parameters of the Linear Model of Regression

The coefficient of variable “C” doesn’t have significance from the economic point of view. From geometrical point of view it represents the point where the regression line intersects Oy axes.

The +0.39 coefficient of HR variable is also named the regression coefficient. Trough the sign it indicates the sense of the influence of HR on Price component („+” means a direct influence). By level (number) shows the quantum of the influence (at every rise with a number of the cause the effect variable modifies in the same way with 0.39 units) (see Figure 10)

$R^2=0.076$ shows that 7.64% of the total variation of the price it is explained by the influence of HR component, so the HR Component is not a determinant factor to be considered in the model.

Price and Promotion Equation (H6)

Estimation Equation:

=====

$$PRICE = C(1)*PROMOTION + C(2)$$

Equation (4)

Substituted Coefficients:

=====

$$PRICE = 0.4847980008 * PROMOTION + 1.985839234$$

Dependent Variable: PRICE				
Method: Least Squares				
Date: 05/19/13 Time: 02:28				
Sample: 1 76				
Included observations: 76				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PROMOTION	0.484798	0.115666	4.191366	0.0001
C	1.985839	0.461330	4.304597	0.0001
R-squared	0.191853	Mean dependent var	3.842105	
Adjusted R-squared	0.180933	S.D. dependent var	1.244215	
S.E. of regression	1.126043	Akaike info criterion	3.101261	
Sum squared resid	93.83007	Schwarz criterion	3.162596	
Log likelihood	-115.8479	F-statistic	17.56755	
Durbin-Watson stat	2.087116	Prob(F-statistic)	0.000076	

Figure 11 – Estimation of the parameters of the Linear Model of Regression

The coefficient of variable “C” doesn’t have significance from the economic point of view. From geometrical point of view it represents the point where the regression line intersects Oy axes.

The +0.48 coefficient of Promotion variable is also named the regression coefficient. Trough the sign it indicates the sense of the influence of Promotion on Price component („+” means a direct influence). By level (number) shows the quantum of the influence (at every rise with a number of the cause the effect variable modifies in the same way with 0.48 units) (see Figure 11)

$R^2=0.180$ shows that 18.09% of the total variation of the price it is explained by the influence of Promotion component, so the Promotion Component may be a determinant factor to be considered in the model.

From the analysis we found that the parameters are significantly different from zero (prob<5%).

The **Akaike** criterion applied to the diverse autoregressive models is minimal for this model: 3.10. The determination degree is a relatively small one, 19%. The errors are normally distributed and the DW (Durbin-Watson) statistic is relatively close to value 2.

Price and Product Equation (H7)

Estimation Equation:

=====

$$\text{PRICE} = \text{C}(1) * \text{PRODUCT} + \text{C}(2)$$

(5)

Equation

Substituted Coefficients:

=====

$$\text{PRICE} = 0.3931320308 * \text{PRODUCT} + 2.098875074$$

Dependent Variable: PRICE				
Method: Least Squares				
Date: 05/19/13 Time: 12:41				
Sample: 1 76				
Included observations: 76				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PRODUCT	0.393132	0.146440	2.684590	0.0090
C	2.098875	0.663675	3.162507	0.0023
R-squared	0.088749	Mean dependent var	3.842105	
Adjusted R-squared	0.076435	S.D. dependent var	1.244215	
S.E. of regression	1.195719	Akaike info criterion	3.221336	
Sum squared resid	105.8011	Schwarz criterion	3.282671	
Log likelihood	-120.4108	F-statistic	7.207022	
Durbin-Watson stat	2.035997	Prob(F-statistic)	0.008957	

Figure 12 – Estimation of the parameters of the Linear Model of Regression

The coefficient of variable “C” doesn’t have significance from the economic point of view. From geometrical point of view it represents the point where the regression line intersects Oy axes.

The +0.39 coefficient of Product variable is also named the regression coefficient. Trough the sign it indicates the sense of the influence of Product on Price component („+” means a direct influence). By level (number) shows the quantum of the influence (at every rise with a number of the cause the effect variable modifies in the same way with 0.39 units) (see Figure 12)

$R^2 = 0.0764$ shows that 7.64% of the total variation of the price it is explained by the influence of Product component, so the Product Component is not a determinant factor to be considered in the model.

5. CONCLUSIONS

Interpretation of Equation 1:

The medium level for the 5 marketing mix components is the following:

	Price	Product	Promotion	Placement	HR
Level	3.84	4.43	3.82	3.53	4.69

Comments:

The same level of appreciation have the two analyzed components Price and Promotion, respectively between the level of *Relative Important (3) and Important (4)* on the analyzed scale.

An interesting fact is that our research confirms the higher importance and impact of Human Resource Component and Product Component (the Medical act by itself) on the Quality of the Healthcare service that is presented also in theory and in some American Studies, and determined in our study on a scale between *Important (4) and Most Important (5)*.

Hypothesis analysis:

H1: Price, as a Marketing Mix component has a major and direct impact on the Quality of Healthcare Services.

*True: direct impact, not true: major impact. We can say that it has an important impact but not a major one! **H1 – doesn't verify itself completely. FALSE***

H2: Human Resource as a Marketing Mix component has a major and direct impact on the Quality of Healthcare Services.

*True: direct impact, true: major impact. **H12– does verify itself completely. TRUE***

H3: Placement, as a Marketing Mix component doesn't have such a major impact on the Quality of Healthcare Services.

*True: doesn't have a major impact. We can say that it has an important impact but not a major one! **H13 – does verify itself completely. TRUE***

Interpretation of Equation 2:

H4: Price is influenced directly by the placement component in the Healthcare Services Sector

*Yes, it verifies because it shows a direct connection between the variables, but it also shows that Placement Component doesn't have an important impact on Price Level. **TRUE***

Interpretation of Equation 3:

H5: Price is influenced directly by the human resource component in the Healthcare Services Sector

*Yes, it verifies because it shows a direct connection between the variables, but it also shows that HR Component doesn't have an important impact on Price Level. **TRUE***

Interpretation of Equation 4:

H6: Price is influenced directly by the promotion component in the Healthcare Services Sector.

Yes, it verifies because it shows a direct connection between the variables, and it also shows that **Promotion Component may have an important impact on Price Level. TRUE**

Interpretation of Equation 5:

H7: Price is influenced directly by the product/service component in the Healthcare Services Sector

Yes, it verifies because it shows a direct connection between the variables, but it also shows that the Product Component doesn't have an important impact on Price Level. **TRUE**

The results of this paper testify the importance of the price as an important factor that explicit determines the quality of the healthcare activity but most important being the Human Resource and the Medical act/Product by itself.

The Promotion component only has been determined to have both a direct an important impact on Price Level.

The present analysis is to be taken as a first step in a future statistical correlation between the most important factors that determines the quality of services on the Romanian Market and their connection with marketing mix components and also with Retention Practices and the level of Patient Satisfaction.

6. REFERENCES

- [1] **P.M. Graham, C. Graeme, R Finn, R McDonald**, The medium term sustainability of organizational innovations in the National Health Service, Implementation Science Journal 2011
- [2] **A.M. Bobeica, O. Neacsu**, Financing public healthcare "a sustainable and development system factor, Proceedings of the 20th International Economic Conference - IECS 2013, Sibiu, Romania, 17-18 May, 2013.
- [3] **P. Kotler, J Shalowitz, R Stevens**, *Strategic Marketing for Health Care Organization: Building a Customer Driven Health Care System*, Jossey-Bass, 2008.
- [4] **A.M. Bobeica**, *Creating the foundation of a Healthcare Research Project*, Chinese Business Review Journal, Volume 12, Number 2, February 2013
- [5] **C. R. Gowen III, L Mcfadden, J M Hoobler**, Exploring the efficacy of healthcare quality practices, employee commitment and employee control, Journal of Operation Management 24 (2006)
- [6] **R. Zaharia**, Marketing Social-Politic, Curs, Editura ASE, Bucuresti, 2000
- [7] **I. Cetina, R Violeta, Gh Orzan**, Planificarea activitatii de marketing in serviciile de sanatate, Revista de Economie teoretica si aplicata v 15, nr 6, p 57-66, 2008
- [8] **A.M. Bobeica**, The quality of healthcare services and the marketing mix components, Revista Metalurgia, No MI2013SPISSUENO8, May/June 2013
- [9] **I. Catoiu, D Vranceanu** – Cercetari de marketing, Tratat, Editura Uranus, Bucuresti 2009