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Evaluation of advertising effectiveness and advertising expenditures in banking: A time series analysis

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The purpose of this study is to investigate horthe advertising effectiveness of private banks of Pakistan by examining the effects of advertising expenses on interest income, operating income and return on assets. In this respect, Koyck distributed lag model is employed on the annual data of 19 private banks of Pakistan over the time period 2007 to 2018. Results indicated significant positive effect of advertising expenses on interest income and significant negative effects of advertising expenses on operating income and return on assets respectively. Overall results point towards the detrimental effects of advertising expenses on financial performance, which unveils the advertising ineffectiveness of private banks of Pakistan. This study is exclusive as it questioned the advertising effectiveness of banks in the context of Pakistan. This study focused on only private banks, so this facet can be investigated for other types of financial and non-financial institutions in future.

Keywords: advertising, effectiveness, financial performance, banks

INTRODUCTION

The relationship between advertising expenditures and financial performance has been questioned by numerous studies in last two decades (Eng, & Keh, 2007; Panigyrakis, Kapareliotis, & Ventoura, 2009; Mullineaux, & Pyles, 2010; Bayazidi et al., 2016; Acar, & Temiz, 2017; Meyer, & Ujah, 2017; Mulchandani, Mulchandani, & Attri, 2019). It is inevitable for firms to detect the effects of their advertising spending on financial performance. Detrimental effects of advertising expenditures in the shape of poor financial performance can threaten the survival of firms. Moreover, poor financial performance has some other implications. It often challenges the effectiveness of existing marketing strategy and pushes firms towards confined capital spending strategy (Tucci, & Tucker, 1995).

Some studies reported advertising inefficiency as the reason of poor financial performance. For generating higher sales, firms often overspend on advertising that causes performance decline (Halim, 2010, Brown, & Cheong, 2013; Rubio, 2018). Moreover, it is also documented that there is no pattern in advertising spending of firms. Even these expenditures do not depend upon the financial position of firms. Institutions having either stable or delicate position spend uneven amounts on advertising (Valentyn & Pavlov, 2017). This anomaly raises questions about the efficiency and subsequent effectiveness of firms' advertising spending.

Advertising is one of the major discretionary expenditures of firm that influences its value creation process. The principal objective of firm requires it to add maximum value for its owners. Due to this objective, managers are now more anxious about the financial outcome of advertising expenditures and are curious to know the effects of advertising on firm value (Sahay & Pillai, 2009). Yet, managers can create value for their owners by spending advertising money efficiently (Brown, & Cheong, 2013).

Advertising is generally considered as an effective tool for raising product and service awareness (Panigyrakis, Kapareliotis & Ventoura, 2009). It also plays a vital role in creation of brand value (Chu & Keh, 2006). Advertising expenditures reinforces the consumer perception of brand, which results in positive attitudes of investors (Joshi & Hanssens, 2010). Because of these reasons, firms spend considerable amounts on advertising their products and services. Intense competition has also forced firms to spend more on advertising to remain ahead of their competitors. Like other institutions, commercial banks also incur large advertising expenditures each year for publicizing their market offerings to actual and prospective customers. Advertising expenditures has both short term and long-term effects (Berkowitz, Allaway, & D'Souza, 2001). Efficacious advertising positively influences the financial performance indicators of firm in current period and leaves a positive carry-over effect for years to come. However, unsuccessful advertising adversely effects firm in current period and leaves an adverse carry-over effect for future years (Meyer, & Ujah, 2017). Therefore, it is essential for firms to assess the effectiveness of advertising expenditures in order to ensure better prospects.

Banking sector of Pakistan experienced phenomenal growth for five years period of year 2013 to 2017. The amount of assets was 10.69 trillion rupees in year 2013 and became 18.53 trillion rupees in year 2017, which indicates a growth of 73.3 percent. However, economic growth of Pakistan has now slowed down due to emanation of economic uncertainty since year 2018. The dependence of banking sector's growth on country's economic progress has created uncertainty among bank managers regarding the growth and performance prospects of their institutions. Moreover, the influence of economic conditions on advertising decisions of firms cannot be neglected (Park, & Jang, 2015). This critical situation necessitates assessment of advertising effectiveness of banks with the aim of identifying the specific effects of advertising spending on financial performance

and recommending the optimal level of advertising expenditures to managers.

This paper is a meaningful contribution to literature. It extends the existing literature of marketing-finance interface by evaluating the overlooked facet of advertising effectiveness of banks in the context of Pakistan. Remaining paper is designed as follows: Section II entails review of literature. Section III entails data collection and methodology. Section IV entails results of study and section V entails the conclusion.

LITERATURE REVIEW

Literature shows that researchers devoted ample attention to advertising expenditures for decades. The implications of advertising expenditures lead researchers to question its utility. The first considerable implication of advertising expenditures is the subsequent firm value. Various studies documented positive relationship between advertising expenditures and firm value (Graham, & Frankenberger, 2000; Sahay, & Pillai, 2009; Wang, & Vaughan, 2014; Liao, Sung & Yu, 2016). This positive association indicates that managers can increase their firm's value by spending large amount on advertising. Further, Guenther and Guenther (2018) identified that all components of advertising expenses are not value enhancing. Only those advertising expenses that generate short term revenues are value boosters.

Instead of examining direct effects of advertising expenses on firm value, many researchers examined the effects of advertising expenses on the factors that fall between them. These factors include sales and profitability. Theoretically, large advertising expenses may result in more sales and these sales may yield high profits. These profits may further cause increase in firm value. Past studies reported positive association between advertising expenses and sales, supporting the notion that sales increases as a result of increase in advertising expenses (Eng & Keh, 2007; Peng et al., 2014; Sridhar et al., 2016). Moreover, advertising expenses of current period positively affects the sales of current as well as subsequent periods (Baidya, Maity & Ghose, 2012). However, this effect is large in current period and reduces in subsequent periods.

The nature of advertising effect on sales depends upon publicity volume and firm's reputation. For firms with high positive publicity volume and weak reputation, large advertising expenditures result in higher sales. But for firms with high negative publicity volume and strong reputation, large advertising expenditures result in lower sales (Spotts, Weinberger & Weinberger, 2014). Moreover, the intensity of advertising effect on sales also depends upon state of economy. The effect of advertising expenditure on sales is more intense in contraction period as compared to expansion period. Reducing advertising budget during contraction period results in decrease in sales, whereas increasing advertising budget results in increase in sales (Park & Jang, 2015).

The effect of advertising expenditures on firm's profitability is ambiguous according to literature. Bayazidi et al., (2016) observed insignificant relationship between these variables and highlighted that firm's advertising has no effect on its financial performance. On the other hand, some studies observed positive influence of advertising expenditures on profitability and documented that firms can increase their financial performance by incurring large advertising expenditures (Eng & Keh, 2007; Panigyrakis, Kapareliotis & Ventoura, 2009; Mullineaux & Pyles, 2010). Contrary to this, Meyer and Ujah (2017) identified negative influence of advertising expenditures on profitability and established the notion that large advertising expenses results in poor financial performance.

Few other studies examined the effects of advertising expenses on financial performance indicators of banks. These indicators include interest income, operating income and return on assets. Acar and Temiz (2017) found significant positive relationships of advertising expenses with each of these financial indicators and reported that increase in advertising expenses causes sequential increase in interest income, operating income and return on assets. Mulchandani, Mulchandani and Attri (2019) endorsed the significant positive relationships of advertising expenses with interest income and return on assets but reported insignificant relationship of advertising expenses with operating income. Hypothesis developed based on discussed literature are as follows:

H1: There is a significant relationship between advertising expenses and interest income.

H2: There is a significant relationship between advertising expenses and operating income.

H3: There is a significant relationship between advertising expenses and return on asset.

DATA COLLECTION AND METHODOLOGY

Data collection

As of year, 2018, Pakistani banking sector is comprised of 33 banks. Among these, 5 are public sector banks, 20 are private sector banks, 4 are specialized banks and 4 are foreign banks. This study is centered on private sector banks. Based on data availability, this study utilized data of 19 private sector banks over 12 years from year 2007 to 2018. Data is extracted from annual reports of Pakistani banks.

Methodology

Three accounting measures are used in this study for assessing the advertising effectiveness of banks. These measures include interest income, operating income and return on assets (ROA). Banks usually aim to enhance their profitability through large advertising expenses. Such expenses are expected to cause increase in interest revenues, income and return. Therefore, advertising is referred as effective if it causes consequent increase in profitability. These measures were also used by researchers in past for assessing advertising effectiveness (Acar & Temiz, 2017; Mulchandani, Mulchandani & Attri, 2019). Distributed lag model is used to examine the relationships of advertising expenses with interest income, operating income and ROA respectively. This model is usually used when dependent variable is expected to respond to current and lagged values of explanatory variable. There are two versions of this model namely finite and infinite. The mathematical expressions of these models are as follow:

Finite $Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} \ldots + \beta_k X_{t-k} + v_t$ **(1)**

Infinite $Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} \ldots + v_t$ **(2)**

Parameters in above expression can be estimated through ordinary least square method (OLS). But estimation in such form has two issues. First, there is uncertainty with respect to lag length selection. Second, probable multicollinearity between explanatory variables can produce biased results. Koyck (1954) described a method to estimate distributed lag model by addressing these issues at the same time. This method assumes that the effect of lags of explanatory variable on dependent variable reduces geometrically. This function is as follows:

$$\beta_k = \beta_0 \lambda^k,\ k = 0,1,2, \ldots. \quad \textbf{(3)}$$

In above expression, λ indicates rate of reduction in distributed lag and its value range is 0 to 1. Due to this function, each β coefficient value turns out to be bigger than prior β coefficient. β_k in above expression indicates value of lag coefficient and depends upon value of λ. The reduction rate in β_k is fast when the value of λ is close to 0 and vice versa. Moreover, mean lag is determined using following mathematical expression:

$$Mean\ lag = \lambda/(1-\lambda) \quad \textbf{(4)}$$

In above expression, 1-λ indicates the speed of adjustment. Mean lag is the weighted average value of all lags and measures the speed of response of dependent variable to the explanatory variable. Considering λ, infinite model can be expressed as follows:

$$Y_t = \alpha + \beta_0 X_t + \beta_0 \lambda X_{t-1} + \beta_0 \lambda^2 X_{t-2} + \beta_0 \lambda^3 X_{t-3} + \cdots + v_t \quad \textbf{(5)}$$

There are two issues with above mathematical expression. First, it requires estimation of numerous parameters. Second, it is not possible to apply linear regression analysis to this model form. To resolve these issues, Koyck (1954) added lag by one period that resulted in following expression:

$$Y_{t-1} = \alpha + \beta_0 X_{t-1} + \beta_0 \lambda X_{t-2} + \beta_0 \lambda^2 X_{t-3} + \beta_0 \lambda^3 X_{t-4} + \cdots + v_{t-1} \quad \textbf{(6)}$$

By multiplying above expression with λ results in following mathematical form:

$$\lambda Y_{t-1} = \lambda\alpha + \lambda\beta_0 X_{t-1} + \beta_0 \lambda^2 X_{t-2} + \beta_0 \lambda^3 X_{t-3} + \beta_0 \lambda^4 X_{t-4} + \cdots + \lambda v_{t-1} \quad \textbf{(7)}$$

Subtracting equation (5) from equation (7) results in following mathematical expression:

$$Y_t - \lambda Y_{t-1} = \alpha(1-\lambda) + \lambda\beta_0 X_t + (v_{t-\lambda} v_{t-1}) \quad \textbf{(8)}$$

By rearranging, above expression can be written as follows:

$$Y_t = \alpha(1-\lambda) + \lambda\beta_0 X_t + \lambda Y_{t-1} + v_t \quad \textbf{(9)}$$

In above expression, v_t is equal to $v_{t-\lambda}v_{t-1}$ and also to moving average of vt, vt_{-1}. The entire procedure discussed above is Koyck transformation and the resulting equation (9) is recognized as Koyck model. This model is also used by other researchers according to literature (Bezawada & Pauwels, 2013; Acar & Temiz, 2017; Mulchandani, Mulchandani & Attri, 2019). Moreover, following distributed lag models are used to identify the effect of advertising expenses on each accounting measure:

$$II_t = \alpha + \beta_0 Adv_t + \beta_1 Adv_{t-1} + \beta_2 Adv_{t-2} + \beta_3 Adv_{t-3} + \cdots + \beta_k Adv_{t-k} + v_t \quad \textbf{(10)}$$

$$OI_t = \alpha + \beta_0 Adv_t + \beta_1 Adv_{t-1} + \beta_2 Adv_{t-2} + \beta_3 Adv_{t-3} + \cdots + \beta_k Adv_{t-k} + v_t \quad \textbf{(11)}$$

$$ROA_t = \alpha + \beta_0 Adv_t + \beta_1 Adv_{t-1} + \beta_2 Adv_{t-2} + \beta_3 Adv_{t-3} + \cdots + \beta_k Adv_{t-k} + v_t \quad \textbf{(12)}$$

II_t means interest income; OI_t means operating income; ROA_t means return on assets and Adv_t means advertising expenses. Interest income, operating income and advertising expenses are scaled by total assets at the beginning of period. ROA is determined by dividing net income with total assets.

For estimation, lag length is selected at first because of Schwarz information criteria (SIC). After selecting appropriate lag length, equation (10), (11) and (12) are estimated using OLS. Finally Koyck model is applied to address the issues of OLS.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics of all variables used in this study are reported in table I as follows:

Table 1: Descriptive statistics

Statistics	Interest Income	Operating Income	ROA	Advertising Expense
Mean	0.091	0.010	0.006	0.001
Median	0.091	0.015	0.009	0.001
Maximum	0.191	0.066	0.037	0.013
Minimum	0.049	-0.168	-0.064	0.000
Std. Dev.	0.021	0.026	0.014	0.001

Correlation Analysis

The correlation coefficients are reported in table II as follows:

Table 2: Correlation Analysis

Variable	Interest Income	Operating Income	ROA
Advertising expense	0.399***	-0.379***	-0.293***

Note: ***Significant at 1 percent level

Lag length selection

Lag lengths are selected on the basis of SIC values reported in table III. Lag length of 3 is selected for equation (10) in which interest income is dependent variable. This lag length indicates that effect of advertising on interest income vanishes after 3 years. Moreover, lag length of 1 is selected for equation (11) in which operating income is dependent variable. It indicates that effect of advertising on operating income vanishes after 1 year. Similarly, lag length of 1 is selected for equation (12) in which ROA is dependent variable. It shows that effect of advertising on ROA remain for 1 year.

Table 3: Lag length selection based on SIC

Lag	SIC (Interest Income)	SIC (Operating Income)	SIC (ROA)
k=0	-6.053	-5.958	-7.042
k=1	-6.769	-7.224*	-8.100*
k=2	-6.846	-7.180	-8.087
k=3	-7.128*	-7.123	-8.049
k=4	-7.099	-7.066	-8.000
k=5	-7.053	-7.080	-7.990
k=6	-7.001	-7.023	-7.965

Results of OLS regression

After including the selected lags, appropriate regression technique is applied on equation (10), (11) and (12) respectively. Results of regression are reported in table IV as follows:

Table 4: Results of OLS regression

		Explanatory variables			
Dependent Variable	**α**	**$\beta_0 Adv_t$**	**$\beta_1 Adv_{t-1}$**	**$\beta_2 Adv_{t-2}$**	**$\beta_3 Adv_{t-3}$**
Interest Income					
Coefficients	0.08	13.78	-5.43	0.01	4.2
p-value	(0.00)***	(0.00)***	(0.06)*	(0.99)	(0.00)***
Adjusted R^2: 0.134					
p-value (F-stat):(0.00)***					
Operating Income					
Coefficients	0.02	-4.40	-2.79	NA	NA
p-value	(0.00)***	(0.02)**	(0.00)***		
Adjusted R^2: 0.586					
p-value (F-stat):(0.00)***					
ROA					
Coefficients	0.01	-2.22	-0.97	NA	NA
p-value	(0.00)***	(0.03)**	(0.10)*		
Adjusted R^2: 0.564					
p-value (F-stat):(0.00)***					

Note: *,**,***Significant at 10, 5 and 1 percent level

Results reported in table IV indicate that all models are statistically significant.

Koyck model

In order to resolve the issues of OLS regression, models are estimated using Koyck model. Results of these estimations are presented in table V as follows:

Table 5: Results of Koyck model estimations

Model	α	$\beta_0 Adv_t$	λII_{t-1}	λOI_{t-1}	λROA_{t-1}	Adj. R^2
$II_t = \alpha + \beta_0 Adv_t + \lambda II_{t-1} + \nu_t$	0.03 (0.00)***	2.38 (0.07)*	0.67 (0.00)***	NA	NA	0.483 (0.00)***
$OI_t = \alpha + \beta_0 Adv_t + \lambda OI_{t-1} + \nu_t$	0.01 (0.00)***	-6.05 (0.00)***	NA	0.30 (0.00)***	NA	0.645 (0.00)***
$ROA_t = \alpha + \beta_0 Adv_t + \lambda ROA_{t-1} + \nu_t$	0.01 (0.00)***	-2.29 (0.00)***	NA	NA	0.51 (0.00)***	0.733 (0.00)***

Note: Coefficients with p-value in parenthesis; *,**,***Significant at 10, 5 and 1 percent level

Results reported in table V shows significant positive relationship between advertising expenses and interest income, which indicates that interest income increases (decreases) with increase (decrease) in advertising expenses. H1 is accepted on the basis of this result. Moreover, this result confirms the earlier findings of Acar and Temiz (2017); Mulchandani, Mulchandani and Attri (2019). Further results show significant negative relationship between advertising expenses and operating income, which indicates that operating income increases (decreases) with decrease (increase) in advertising expenses. H2 is accepted on the basis of this result. However, this result contradicts with the earlier findings of Acar and Temiz (2017); Mulchandani, Mulchandani and Attri (2019). Moreover, results show significant negative relationship between advertising expenses and ROA, which indicates that ROA increases (decreases) with decrease (increase) in advertising expenses. H3 is accepted on the basis of this result. This finding is inconsistent with the earlier findings of Acar and Temiz (2017); Mulchandani, Mulchandani and Attri (2019). Overall results suggest that increase in advertising expenses results in increase in interest income on end but decrease in ROA on another end. This indicates that the proportionate increase in advertising expenses is more than proportionate increase in interest income, which results in performance decline instead of improvement.

Further, mean lag is calculated to determine the effect duration of change in advertising expenses on interest income, operating income and ROA respectively. Results are reported in table as follows:

Table 6: Results of mean lag calculations

	Model	Model	Model
Dependent Variable	**Interest Income**	**Operating Income**	**ROA**
Mean Lag= $\lambda/(1-\lambda)$	2.04	0.43	1.06

Results reported in table VI indicate that advertising takes 2.04 years to effect interest income, 0.43 years to effect operating income and 1.06 years to effect ROA. Based on function $\beta_k = \beta_0\lambda^k$, regressions equations are rearranged by using the values of β_0 and λ obtained from Koyck model. These equations are presented in table as follows:

Table 7: Results of regression equation derived from Koyck model

$Y_t = \alpha + \beta_0 X_t + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \ldots + \upsilon_t$ and $\beta k = \beta_0 \lambda^k$, k=0,1,…	
Equation 10	$II_t = 0.08 + 2.38\ Adv_t + 1.60\ Adv_{t-1} + 1.07\ Adv_{t-2} + 0.72\ Adv_{t-3} + \nu_t$
Equation 11	$OI_t = 0.02 - 6.05\ Adv_t - 1.81\ Adv_{t-1} + \nu_t$
Equation 12	$ROA_t = 0.01 - 2.29\ Adv_t - 1.18\ Adv_{t-1} + \nu_t$

Coefficients of equation (10) presented in table VII are calculated as follows:

$$\beta_0 = \lambda^0\beta_0 = (0.6709)^0 x\ (2.3809) = 2.3809$$
$$\beta_1 = \lambda^1\beta_0 = (0.6709)^1 x\ (2.3809) = 1.5973$$
$$\beta_2 = \lambda^2\beta_0 = (0.6709)^2 x\ (2.3809) = 1.0716$$
$$\beta_3 = \lambda^3\beta_0 = (0.6709)^3 x\ (2.3809) = 0.7189$$

Coefficients of equation (11) presented in table VII are calculated as follows:

$$\beta_0 = \lambda^0\beta_0 = (0.2994)^0 x\ (-6.0475) = -6.0475$$
$$\beta_1 = \lambda^1\beta_0 = (0.2994)^1 x\ (-6.0475) = -1.8106$$

Coefficients of equation (12) presented in table VII are calculated as follows:

$$\beta_0 = \lambda^0\beta_0 = (0.5138)^0 x\ (-2.2874) = -2.2874$$
$$\beta_1 = \lambda^1\beta_0 = (0.5138)^1 x\ (-2.2874) = -1.1753$$

CONCLUSION

This paper employed Koyck model to examine effect of advertising expenses on interest income, operating income and return on asset. The rationale for employing Koyck distributed lag model is to recognize the duration of effect of advertising on financial performance. SIC values indicated that advertising effects interest income for 3 years, operating income for 1 year and ROA for 1 year. Moreover, mean lag values indicated that changes in advertising expenses take 2.04 years to have noticeable effect on interest income, 0.43 years on operating income and 1.06 years on ROA.

Koyck model estimation indicated significant positive effect of advertising expenses on interest income for 3 years. However, this effect continuously reduces with time. On the other hand, Koyck model estimation indicated significant negative effect of advertising expenses on operating income for 1 year. Similarly, significant negative effect of advertising expenses on ROA is observed for 1 year. These results indicate that increase in advertising expenses causes increase in interest income but decrease in operating income and ROA. As ROA is the final outcome for stakeholders, therefore, it can be concluded that there is negative relationship between advertising expenses and financial performance. More precisely, advertising expenses have detrimental effect on financial performance of private banks in Pakistan. This finding unveils the advertising ineffectiveness of banks that can be the result of inefficient advertising spending of banks.

This study unearthed the effects of advertising expenses on financial performance of private banks. The findings of this study are useful for both bank managers and owners. This study pointed towards the ineffectiveness of advertising expenditures, which requires immediate attention of bank managers. This ineffectiveness can be the outcome of worst advertising decisions that results in less benefits and more cost. Managers can improve the financial performance of their institutions through optimal advertising decisions. Moreover, owners can demand managers to initiate measures that are necessary for elimination of advertising ineffectiveness.

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