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Investigate the relationship between inflation, exchange rate and economic growth with sales of companies in times of economic crisis

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ABSTRACT: One of risk and management dimensions is financial crisis in small and large companies. Management of marketing expenditure is very significant in this case. This study examines impact of marketing costs upon performance of 25 companies in Iran in period of economic stability, during financial crisis, and after financial crisis from 2002 to 2012. The result of this study using dynamic panel data model showed softened impact of marketing expenditure upon net sales in financial crisis period as compared with period of economic stability. Estimates indicate that costs 1 Rials in marketing , leading to increased sales of 58 Rials, and even during the global economic crisis, this figure is equivalent to 26 Rials. The analyses notice the importance of marketing expenditures on sales in Iran. Especially during the crises periods and after, marketing expenditures are found as having significant effects on sales.

Keywords**:** economic stability, financial crisis, exchange rate, economic growth.

INTRODUCTION

Due to the globalization of economies today are associated with each other. In globalization, the global financial crisis, the deal was eventually caught and developing countries have been developed. In particular, the crisis may lead to cessation of growth or even reverse the results will be in developing countries. Political and economic changes, changes in consumer demand market structure, internal and external competition and complications of these changes are more significant. Such changes would have forced companies with flexible strategy and action plan to implement the transition to the economic crisis and to achieve stability.

The purpose of the study

The overall goal in conducting this study, understanding the relationship between marketing costs and macroeconomic indicators of the company's net sales and determine the impact of these variables. It is hoped that the discovery of effective communication and share them win these variables as control variables policy tools, to economic pressures and partly out of the global financial crisis, economic Managers and Investors, the strategy of an action. The detailed objectives of the study are discussed below.
- Assess the costs associated with sales and marketing companies in the business.
- Pushing Marketing managers to spending in this unit and the variable impact of the company's sales performance in the period before and after the global financial crisis.
- Presentation of the impact of macroeconomic indicators Such as economic growth, inflation and the dollar value of the foreign currency corporate and especially the Net sales in the period before and after the economic crisis managers of the economy.

Review of Literature:

Global financial crisis arose from mortgage market in USA and was precipitated to the extent that a large number of financial institutions were thrown into bankruptcy (Tong & Wei, 2009). Due to financial crisis in 2008, returns declined and indices of international share markets became volatile. Europe parliament and European banks asked for expenditure cuts because of negative growth in gross domestic product (GDP) and decrease in sale level (Leopold, 2014). Also, as studies showed, after temporary reduction in advent of financial crisis, oil price soared, which subsequently caused inflation in OPEC countries. Additionally, global crisis exerts impact upon foreign financial outcomes i.e. it is significantly correlated with devaluation of stock exchange (Tong & Wei, 2008). However, influence of such crisis on economy of Iran has opened up serious discussions among professionals and scholars. The first matter of concern is oil price. In other words, in case of such crisis, the oil price slumps and therefore Iran's economy experiences serious difficulties. International financial crisis and expectations of global growth caused prices to go from $150 per barrel in the first months of 2007 to approximately $65 per barrel in 2008. Consequently, OPEC countries experienced great difficulties with exportation and investment in 2009 and 2010.

During international financial crisis, demands on domestic and foreign markets fall. Indeed, corporates' sale and profitability level goes down. As a result, in the first months of the financial crisis, Iran's exchange market reached one of highest-ranked stock exchange in world, unlike industrial countries. But, after 6 months, Tehran's stock exchange indices dropped sharply to the extent that they went from relatively 14000 units in April of 2008 to 8500 units in autumn of 2008. Consequently, investment rate slowed down slump in capital market.

Iran's macroeconomic indices became volatile from the beginning of global financial crisis. These volatilities are as follows:

❖ Economic growth rate extremely became volatile from 2007 to 2008. Even, it reached -5.4 in 2012.

❖ Inflationary pressures, inflationary expectations of citizens, and increased inflations rate caused by oil shocks in OPEC countries showed potential for increase in prices. Prices of domestically-manufactured goods and services increased at a rate of %9.1 in 2011. This rate increased by %30 in 2012.

❖ Dollar-Rial currency price rose from 2010 i.e. price of one dollar went to 19000 Rials in 2011 and increased by 32000 Rials in 2012.

In financial and economic crisis, companies should undergo necessary changes by formulating new strategies in order to have accountability to their shareholders. More specifically, they are required to improve marketing techniques, reduce general costs, and to increase productivity. Also, they should increase budgets of marketing. As studies show, companies with higher level of marketing activities during and after inflation can increase their sales, revenues, and market shares (Candemir & Zalluhoglu, 2011). Marketing aims are higher market shares, sales, and profitability. Therefore, this activity should not be curbed during economic inflation and financial crisis because shareholders do not expect to experience such curb. In the case that tight fiscal policies of firms include reduction in marketing costs, they cannot acquire market share.

MATERIALS AND METHODS

In this paper by static and dynamic the effects of marketing expenditure on comparing performance during financial crises has examined. In accordance with theoretical principles and studies of Joshi and Hanssens (1995 & 2009), Bagwell (2005), Candemir and Zalluhoglu (2011), and Crespo and Storckl (2011), this study takes Equation 1 into consideration for the purpose of evaluating impact of marketing costs upon sales of companies.

$$Ns_{it} = \alpha_1 + \beta_1 Me_{it} + \beta_2 Growth_{it} + \beta_3 Inf_{it} + \beta_4 Usd_{it} + \varepsilon_{it} \qquad (1)$$
$$i=1,\ldots,N \quad t=1,\ldots,T$$

in the above specification Ns, INF, Growth, and Usd are respectively net sales of companies which are subject to marketing costs (Me), Inflation rate, economic growth rate, and currency rate.

In the case that the following dynamic panel is used, dynamics of model is created by inserting intervals of dependent variables as independent variables into the right part of the model. Accordingly, results become more accurate (Baltagi, 2008).

$$y_{it} = \sum_{j=1}^{p} \alpha_j\, y_{i,t-j} + \beta(l) x_{i,t} + \eta_i + \vartheta_{i,t} \qquad (2)$$

Dependent variable interval in the right side of panel disproves non-correlation between independent variables and error terms as one of traditional assumptions. Accordingly, method of ordinary least square (OLS) (in panel model of fixed effects and random effects) produces biased results and inconsistency (Arellano & Bond, 1991; Baltagi, 2008), which are as follows in this study:

In equation (1), η_i is particular unobservable effects in any company with time constant, mean of$E(\eta_i) = \eta_i$, and variance of $Var(\eta_i) = \sigma_\eta^2$. $\vartheta_{i,t}$ is assumed to distribute independently among countries with mean of Zero. $Y_{i,t}$ and x_{it} *are* respectively GDP per capita growth and vector of explanatory variables. Additionally, η_i complies with a random process and a fixed effect.

$$E(Y_{i,t-1}\,\eta_i) \neq 0$$
$$E(x_{i,t}\,\eta_i) \neq 0$$

$\beta(L)$ is a polynomial interval for avoiding biased and inconsistent results in OLS method. By calculating the first-order difference, we can rewrite equation (1) as follows:

$$\Delta y_{it} = \sum_{j=1}^{p-1} \alpha_j^* \,\Delta y_{i,t-j} + \beta^*(l)\Delta x_{i,t} + \Delta\vartheta_{i,t} \qquad (3)$$

Δ is first-order difference. Equation 2 faces difficulties by employing OLS method because of correlation between individual effects and explanatory variables. Additionally, correlation between dependent variable interval and error term $E(\Delta y_{i,t-1}\Delta\vartheta_{i,t}) \neq 0$ imposes linearity. All these parameters produce biased and inconsistent results in Equation 2 due to OLS method (Arellano & Bond; 1991). For removing linearity, dependent variable interval is used as instrumental variable in GMM method. Matrix of optimal instrumental variables (Z matrix) including preset repressors (x), which are correlated with individual effects, is written as follows:

$$z_i = \begin{pmatrix} y_{i1} & x_{i1} & x_{i2} & 0 & 0 & 0 & 0 \ldots\ldots & 0\ldots\ldots & 0 & 0\ldots\ldots & 0 \\ 0 & 0 & 0 & y_{i1} & y_{i2} & x_{i1} & x_{i2} \ldots\ldots & 0\ldots\ldots & 0 & 0\ldots\ldots & 0 \\ & . & . & . & . & . & . & . & . & . & . & . \\ & . & . & . & . & . & . & . & . & . & . & . \\ 0 & 0 & 0 & 0 & 0 & 0 & 0 & y_{i1} & y_{i(T-1)} & x_{i1} & x_{i(T-1)} \end{pmatrix}$$

Rows indicate first-order differential equation for the person I in t=3,4,…..T and moment condition;

$$E[z_i' \quad \Delta\vartheta_i] = 0 \qquad for\ i = 1,2,3 \ldots\ldots N$$

$$\Delta\vartheta_i = (\Delta\vartheta_{i3}, \Delta\vartheta_{i4}, \ldots\ldots, \Delta\vartheta_{iT})'$$

In general, asymptotic and efficient GMM minimizes the following criterion on the basis of these conditions of moment;

$$J_n = \left(\frac{1}{N}\sum_{i=1}^{N} \Delta\vartheta_i' \, Z_i\right) W_N \left(\frac{1}{N}\sum_{i=1}^{N} Z_i' \, \Delta\vartheta_i\right)$$

In order to accomplish this objective, the below weighted matrix is used;

$$W_N = \left[\frac{1}{N}\sum_{i=1}^{N} \left(Z_i' \;\widehat{\Delta\vartheta_\iota}\; \widehat{\Delta\vartheta}_i' \;\; Z_i\right)\right]^{-1}$$

$\Delta\vartheta_i$ is consistent calculation of first-order differential residues which is gained from primarily consistent estimators, and therefore is viewed as two-stage estimator. Given the variance, evenness of components in first-order differential model involves asymptotic estimator of GMM which is gained from the following matrix in a single stage:

$$W_{1N} = \left[\frac{1}{N}\sum_{i=1}^{n} Z_i' \, HZ_i\right]^{-1}$$

H is a square matrix with two sides of main diagonal, one side of first non-diagonal surface, zero point, and other points. Note that W_{1N} is not dependent on any calculated parameters. For use of one-stage or two-stage estimators, Bond (2002) points out that a large number of applied functions of GMM estimators are taken into greater consideration as compared with others.

Accordingly, in the second stage, by using GMM estimators proposed by Arellano and Bond (1994) and the function suggested for impact of marketing costs, economic growth, inflation rate, and value of dollars upon net sales of corporations, we will have:

$$NS_{it} = \varphi + \alpha \sum_{i=1}^{n} NS_{it-1} + \beta_1 ME_{it} + \beta_2 Growth_{it} + \beta_3 INF_{it} + \beta_4 USD + \varepsilon_{it} \qquad (4)$$

Ns_{it}, Me_{it}, Inf_{it}, Usd_{it}, NS_{it-1}, ε_{it}, α and β_1, and φ are respectively volume of net sales, marketing costs, economic inflation rate, price of US Dollars, volume of net sales in case of interval, randomly indefinite effects, regressional coefficient of variables, and constant coefficient.

Need for research

Nowadays, human life is faced with inevitable changes and the interest of human to development increases the pace of change. Were closer to the knowledge-based economy and trade and on her way she will be facing obstacles and challenges. Plato knows the only way to save human knowledge and wisdom of Peter Drucker , the father New Management believes that the biggest change will be in the wisdom of the altered form and content, meaning, sense of responsibility and mission, and finally, in what human experts And is an indication of a poet, then this knowledge is the key. World in the future won't be on the labor force, raw materials and energy but on the science.

Research hypotheses

1. The inflation rate, the company's sales during the economic crisis, there was a significant relationship.
2. Currency, the company's sales during the economic crisis, there was a significant relationship.
3. The rate of economic growth, with sales companies in times of economic crisis, there was a significant relationship

The purpose of the study

The overall goal of this research is to recognize the relationship between marketing costs and macroeconomic indicators of the company's net sales and determine the impact of these variables. . Hence, in this study, more detailed studies are the following objectives:

- Check the use of the company's marketing costs associated with the sale of company
- To push marketing managers to spending in this unit and the variable impact of the company's sales performance in the period before and after the global financial crisis
-Presentation of the impact of macroeconomic indicators such as economic growth, inflation and the dollar value of the foreign currency corporate and in particular the amount of net sales in the period before and after the economic crisis managers.
-Providing information on the optimal amount spent on marketing and advertising during the global financial crisis to researchers in economics and management and investors in the Stock Exchange.

The research method

Method:

The method used in this study, given that the subject is looking at how being descriptive of writing a descriptive - analytical logged in, in order to adapt to the realities of economic theories, relationships between variables the figures, and the implementation of the theories is examined, using inferential statistical and econometric methods, reject or confirm the hypothesis of the test are presented

Model estimation using static panel data

To ensure the results of the estimation of the time series data, estimation is done using combination data (Panel static) method. The combination of data regarding the levels of heterogeneity bias in estimates and multi- Both linear is reduced and performance increases the degree of freedom and variability. The combination method is also more complex models can be investigated and the effects should be detected and measured. The necessity of using combined data, the model has been tested by the F statistic, the results indicate rejection of the null hypothesis and the use of panel data for the model. The choice of method for estimating fixed effects or random effects Housman test statistic to calculate the action, the results indicate that the method of random effects

Check Lymr F test and Housman test

In the third chapter of the proposed combination of data that must be specified whether so-called individual differences in the degree of heterogeneity exists or not? For this estimation, statistical data should be stacked and the usual OLS method (Puling Data) assessment done? F statistic for the null hypothesis based on homogeneous sections (Puling of statistical data) is. If the null hypothesis is rejected, based on the assumption that there is Inconsistency contrast between sections (panel data, statistical data) will be accepted. Lymr F test results in Table 1 are reflected. Results table indicates rejection of the null hypothesis at significance level of 5% and there is a degree of inconsistency and indeed panel indicate the suitability of the data for the three stages of the model.

Table 1. F test results Lymr

	Full time
F Lymr	85/39
Prob	0
The estimate	Panel

Source: findings

Should lead the estimation error, due to changes in levels or that occurred over time. The panel data models with fixed effects and random-effects model features are examined. Housman test is used for this purpose. The Housman test, the null hypothesis of random error estimate is based on the results in Table 2 reflects the modified. The estimation results of Housman test shows that:

Table 2. Results of the Housman test

	Full time
Chi2(x^2)	222/82
Prob	0
The estimate	Fixed

Source: findings

Companies participating in the study, 25 subjects Ceramic tile, rubber, plastic and food, which has at least 11 years on the stock exchange, were selected. Selected data from annual reports and financial company database Tehran Stock Exchange was received.

Table 3. the results of measurement of static and variable coefficients on net sales in the Tehran Stock Exchange

	The estimated coefficients for the entire period (2002-2012)
Me	***125/012
	(8/83)
Growth	-2/59e+ *10
	1/41e+10
Inf	2/71e+9
	(7/17e+9)
Usd	6/77e+7
	(8/26e+7)
_Cons	1/97e+11
	(1/89e+11)

Source: findings

Numbers in parentheses are standard errors.

Index *, **, *** respectively indicate significance at the 1% level, respectively, 5% and 10% respectively.

The survey results and estimates are based on a static model in Table (3) shows that:

- Coefficients of the variables of economic growth, inflation and exchange rates, net sales in the period following the global financial crisis, a significant correlation was not found.
- The impact of certain variables on sales made contrary to economic theory For example, the coefficients of the eleven-year period that includes the periods before and after the economic crisis Economic growth has a negative correlation with the amount of net sales, which is not consistent with economic theory. The results confirmed the static model with respect to the reasons mentioned above is not reliable.

On the other hand, static models able to incorporate the effects of exogenous variables are not interrupted or dynamic panel model has the advantage that the dynamic panel is used.

Table 4. Estimation results of the dynamic relationship marketing expenses to net sales in the Tehran Stock Exchange

	The estimated coefficients for the entire period (2002-2012)
NS_{t-1}	***1/022
	(0/05)
Me	***41/13
	(11/49)
Growth	3/05e+ *10
	(1/69e+10)
Inf	1/18e+ **10
	(2/84e+9)
Usd	1/8e+ *8
	9591768
-Cons	-6/18e+11**
	(2/89e+11)
Wald Test	9528/55***

Source: findings

Numbers in parentheses, the standard error is Robust.

Posing a by *, **, *** indicate significance at the 1% level, respectively, 5% and 10% respectively.

Probability of marketing expenses during the financial crisis is 121/0

Based on the null hypothesis of zero coefficients Lymr F test at the significance level was rejected. The result confirmed the validity of the estimated coefficient.

Meanwhile, "according to the standard deviation of the estimated coefficients are stable or resistant (Robust) is calculated. Standard error to correct the calculation defines error standards or Robust. The method of calculation used to calculate the standard deviation is less than the average public, but they are limited by the assumptions are valid.

The results for the period before the global financial crisis

Based on the above results it can be stated period 2002 to 2008, the cost of marketing had a significant positive effect on sales of these industries. These results are fully consistent with theoretical expectations also considering the obtained coefficients in Table 2, the results are reliable for short periods.

1 -Coefficients obtained for variable marketing costs to the industry's 10/59 show that, for every a penny spent on marketing, an equivalent increase in the amount of sales is 59 dollars.

2. According to the results of estimating the model, variable economic growth with net sales positive correlation Significant and shows that each of the country's economic growth, the test is equivalent to 17.8 billion net sales corporations, has increased.

3. The period of 7 years before the economic crisis is not a significant effect of inflation on net sales.

4 also shows the coefficients obtained for the exchange rate for each of currency rise in stock exchange companies, faced with increased sales of 13.8 million dollars.

Then, the regression model tested for impairment sentences that Table 2 shows the results of this test. Based on these results, the difference between sentences to rank-order regression was therefore an estimation of this model is compatible.

The results for the period following the global financial crisis

The results suggest that the global financial crisis on the industry in Iran during the years 1388 to 1391 has left a profound impact So that the influence of the variable marketing costs reduced net sales Although at this point still remains the most influential variable to other variables And the theoretical expectations compatible.
See also obtained coefficients in Table 2, the following conclusions are deduced.
1. The ratio of 68/26 is obtained for variable marketing costs as indicated in the industry Iran, even in times of economic crisis to pay a penny increase in marketing costs in the amount of 26 dollars will increase the amount of sales .If the amount of economic stability during the 59 dollars to 33 dollars, but despite falling sales Per a penny spent on marketing, there are still significant increase in sales volumes.
2. The effect of economic growth on net sales was not significant at the global financial crisis. But the relationship between the economic stability the financial crisis has been quite significant and positive.
3. The effect of inflation on net sales during the economic crisis, not significant If you factor in the economic stability has been achieved 25.3 billion and shows Rising inflation in a financial crisis may lead to increased rates of sales that the theoretical bases correspond.
4. Effect of exchange rates on net sales during the financial and economic crisis was not significant under circumstances where a significant addition to the pre-crisis period, shows Rail per dollar increase, companies with a sales increase of 146 million riyals samples were met.

CONCLUSION

In tests conducted in this study, the variable costs of advertising, as Behavioral variables significant impact Net sales of the company as changing market performance in 2002 and 2012 has been outstanding. Impact marketing costs during the economic stability of the country, according to research by a penny spent on marketing Leading to increased sales rate amounts to 59 dollars, and the global economic crisis that gripped Of the world's leading macroeconomic indicators are designed to break, resulting in loss of credibility and Significant influence is variable, open at this point, most cost effective marketing variables on net sales Companies are using a penny increase in marketing expenses, an increase of 26 dollars in sales During the eleven-year estimated net we see that the stability and the crisis we are experiencing, with the rise of a rail marketing costs, we see a growth rate of 41 dollars in the sale.

According to a study conducted by increased marketing costs can be considered a way out of the crisis and during the Fiscal tightening economic crisis should not include the cost of marketing and management the Through tools such as the advertising industry can be domestic and international marketing, pursue their interests Profit.
The country's entry into the global market with goods (WTO) is undoubtedly a positive or negative impact directly Receive. The research on the effects of the economic crisis on countries that are now, the direct impact of the global market are received, it seems.

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