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Investigating the operating budget of foreign oil companies (Case study: National Iranian Oil Company)

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Abstract

The present research is aimed at verifying the operational budget of foreign oil companies (case study: National Iranian Oil Company). The statistical population of the present study is the National Iran Oil Company, and subject to lack of samples the population of the study is conducted with all national Iranian oil company's subsidiaries that operate abroad are studied. To collect the necessary information and statistics, a questionnaire method was used for hard data, as well as a sample of the conducted studies, also competent authorities references were used for soft data. To carry out this research, at first, the significance of the variables was checked using the generalized Dickey-Fuller test, and after determining the degree of significance of the variables, the ARFIMA method was used to determine the model of operational budgeting. To estimate the research model, Eviews 10 software was used. The results of the research analysis showed that political risk and inflation have a negative and significant impact on the operating budget of the company and reduce the efficiency of resources. Also, the increase in environmental and organizational variables causes budgeting based on the intrinsic price of crude oil. Finally, the results of the research showed that variables such as the behaviour of competing companies and financial support as variables of structural failure in the operational budgeting model have a significant impact.

Keywords: operating budget, foreign oil companies, budget, national Iranian oil Company
2020 MSC: 94C60, 91G15

1 Introduction

Budgets have traditionally been considered essential Armstrong et al. [3], Ekholm and Wallin [11], Hansen et al. [20], Onsi [36]. It is the cornerstone of the management control process in almost all organizations, but despite its widespread use it appears to be incomplete Hope and R Fraser [23], Hansen [21]. Recently, the subject has received considerable criticism from Ekholm and Wallin [11], Hansen, et al. [21], Libby and Lindsay [26], and Neely et. al. [34]. From a theoretical perspective, budgeting practices have been criticized for inducing budget games or inefficient behaviours, as well as being a time-consuming annual ritual that encourages rigid planning and incremental thinking Hansen et al. [21], Lukka [27], Merchant [30], Onsi [36]. Criticism of "traditional budgeting" was usually made by academics and was often an exaggeration of the "worst current practice" that could be improved and thereby avoid problems. However, a large number of studies examining budgeting issues show that budgets are still widely used and

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add value in most organizations (e.g., Bourmistrov and Kaarbøe [7], Hansen and Otley [20], Hansen et. al. [21], Libby and Lindsay [26], McCarthy and Lane [29], Marginson and Ogden [28]). The findings of these studies show that while improvements can be made to the budgeting process, many companies simply adapt rather than abandon it entirely.

Barbosa Filho and Parisi [14] and Frezatti [15] discussed the beyond-budget approach as an innovation compared to traditional budget models.

Merchant took a different approach and studied the influence of budget models and behavioural influences on management behaviour and performance [31]. Among the studies in the budgeting literature, few have dealt with the forecasting of operating costs and their effective calculation methods. However, most articles refer to asymmetric information on budget slack, capital budgeting process, incentives, budget as a managerial performance tool, budget participation and organizational effectiveness, and the role of budget information.

Gomes et al. [18] and Silva and Lavarda [40] focus on a budget from the perspective of many authors in the organizational environment, such as the works of Brüggen and Luft [9] Hartmann et al. [22] and Marginson and Ogden [28]. Therefore, according to Silva and Lavarda, the researches that deal with the issue of budgets at the international level is long and is carried out in several fields of knowledge such as economics, psychology, sociology, management and accounting, but they are not econometrics [40].

According to the mentioned cases, it can be said that cost control is inevitable considering the various stages in the production of petroleum products, from sending crude oil to the refinery and carrying out refining operations on it until the final production of the product and its transfer to the consumer. Undoubtedly, one of the problems that has been observed in high-cost industries, including the National Iranian Oil Company, is the issue of non-compliance with the defined budget and project costs. In fact, one of the serious needs of the National Iranian Oil Company, apart from the discussion of technology and the method of manufacturing petroleum products, is the discussion of determining the budget and controlling costs according to the determined budget. The comprehensive budgeting approach of the National Iranian Oil Company as a tool to determine the required budget and monitor the sustainable costs compared to the expected costs with detailed reviews of the operating stages and alternative implementation solutions in the field of financial structure, in the first place, costing and review of implementation alternatives And finally, it deals with the decision and implementation of more economical options according to the determined budget. Nevertheless, further investigations of this subject against empirical evidence can improve and expand our understanding of the subject. In response to this call and the problems expressed in this industry, the present research deals with the issue of localization of the operating budget of oil companies in the National Iranian Oil Company. By examining the models and mathematical equations in the mentioned research, none of these researches have provided a unified model. In this research, while examining all the theoretical research in the field, we integrated the family of GARCH models, the Wech model, Back model to solve the problem and answer the research questions.

In this method, the experiences of other companies are examined and their planning model is extracted. Then the extracted model is evaluated and developed based on the capacities of the studied sector. In this regard, many issues arise in the current research:

1. How is the efficiency of the estimated model determined?
2. What is the basis of the current budgeting plan?
3. How does operational budgeting solve the problems?

2 Research background

In the field of operating budget and its relationship with various fields of oil and gas field-based production, several works have been written in recent years, some of which are mentioned below. In research, Ghasemi and colleagues investigated the areas and solutions to reduce the dependence of the government budget on oil. Taking into account the country's previous experiences in establishing financial rules and assuming the will to restructure the relationship between the government and the people and design scientific and practical programs for the regeneration of the government, the proposed financial rule to reduce the dependence of the government's budget on oil resources, aiming to reduce the deficit The budget will be without oil [16]. In research, Nouri Chenaristan Sefali investigated the evaluation and ranking of the role of executive components of operational budgeting in improving comprehensive quality management in Gachsaran Oil and Gas Exploitation Company. The findings indicate that the amount of authority in operational budgeting has contributed the most to the improvement of comprehensive quality management [35]. Azizi and Bazargan Karig investigated the project budgeting based on a performance progress case study: oil

and gas and petrochemical EPC project. It is worth mentioning that the tenders for the development phase of the Chalinger-Grenkan oil field have just been held and are starting with the identification of the contractor company and the consulting and engineering company [5]. In research, Haj Amini Najafabadi investigated the impact of the budget deficit structure on liquidity in Iran's economy: the central bank's response function approach. The obtained results show that the changes in total budget deficit and liquidity are not necessarily in the same direction. The government's decision to increase the operating budget deficit, which reflects the current operations of the government, increases the total budget deficit and liquidity. However, capital balance surplus shocks, which mainly reflect the oil developments of Iran's economy, do not affect liquidity, despite the decrease or increase in the total budget deficit [19]. In research, Hossein Al-Saadi and Talebnia investigated the obstacles to implementing operational budgeting in Bandar Abbas Oil Refining Company. The results of this research show that according to the prioritization, the following factors hinder the implementation of operational budgeting in this company, and the environmental factors are therefore suggested to reduce and eliminate the effects of the identified obstacles in the implementation of operational budgeting in Bandar Abbas Oil Refining Company [24]. In research, Sabzevari et al. investigated the feasibility of implementing an operational budget for Gachsaran Oil and Gas Exploitation Company. Based on the results obtained from the test of the fourth main hypothesis and according to the confirmation of this hypothesis, it has been concluded that the implementation of the operating budget in this company brings economic savings [39].

Aljabri et al in a study on oil price and fiscal policy in an oil exporting country: empirical evidence from Oman. This paper examines the impact of oil price shocks on fiscal policy and real GDP in Oman using new unknown data. Decomposing government revenue and GDP into oil and non-oil components, we find that oil price shocks explain about 26 percent of the variation in oil revenue and 90 percent of oil GDP [2]. In research, Brodunov et al. investigated the budget law: reducing dependence on oil. This article examines a way to reduce the dependence of the national currency on oil prices. The retrospective analysis of the data showed that there is a close relationship between the ruble, the US dollar, and the price of oil in the international market. This study shows that the budget law can be one of the possible measures to reduce the dependence of the national currency on oil prices. Analyzing the main differences between the new budget law and its previous version, the authors note that in the previous budget law, the final price was calculated as the average price per barrel of Brent crude oil in the past few years [8]. Adedokun investigated the effects of oil shocks on government expenditure and government revenue linkages in Nigeria (with exogenous constraints). The SVAR results show that oil price shocks cannot predict government expenditure changes in the short term, while the predictive power of oil revenue shocks is very strong in both the short and long term. VAR and VECM also corroborate the results of SVAR and provide further insight that the hypothesis of short-run fiscal synchronization between oil revenues and total government expenditure is proven [1]. In research, daSilva et al. investigated operational cost budgeting methods: quantitative methods for process improvement. This study aims to compare operating cost forecasting models to identify models that are relatively easy to implement and show less deviation. The results show that the models have a potential application and multivariate models fit better and show a better way to predict costs than univariate models [10].

2.1 Theoretical framework and conceptual model presentation

To carry out this research, it is necessary to define a specific framework from among the different definitions and dimensions proposed for the research topic so that it is possible to move based on the specified framework and achieve acceptable results. The lack of definition of the framework and the openness of its scope will confuse the researcher and dispersion and incoherence in summarizing the results. As stated in the statement of the philosophy of using the conceptual model of research, the beginning of the present research will be the statement of questions related to the use of this conceptual model. The conceptual model is the foundation on which the research is based. In this regard, one of the ways to solve problems related to operational budget planning is the detailed study of operational budget planning models in oil companies abroad. Based on that, the experiences of other companies will be examined and the components of its localized model will be extracted as described in the table below, and then the extracted components will be evaluated and developed based on the capacities of the studied sector.

In short, it can be stated this, as the above summary shows, each of the previous researchers has studied the above topic in a macro and general way, but the researcher in the present research discussed the topic more comprehensively and examined the contract and more variables. Analysis has been put. That is, each of the above researches is in some way inside this research. The researcher will not only measure the direct one-to-one relationships of the variables according to the method suggested below, but will also estimate the indirect relationships of each of the macro variables as well as the subgroup variables.

Table 1: Research variables

Components	researchers	Reference
Inflation	Aljabri et al, Brodunov et al	[2, 8]
operational budgeting	Adedokun, DaSilva et al, Muleri	[1, 10, 33]
GDP	Aljabri et al, Otley	[2, 37]
Oil prices	Aljabri et al, Adedokun	[2, 1]
Prices in parallel markets	Brodunov et al	[8]
Political risk	Aljabri et al	[2]
Environmental conditions in the organization	Artz, Arnold	[4]
Total costs	Adedokun	[1]
Export of petroleum products	Moura et al, Aljabri et al	[32, 2]
Financial transparency	Gomes et al, Brodunov et al	[18, 8]
Company assets	Vanzella and Lunkes, Bornia and Lunkes, Silva and Lavarda	[41, 6, 40]
Debts of the company	Marginson and Ogden, Qwader	[28, 38]
The value of the company's shares	Moura et al, Brodunov et al	[32, 8]
Non-financial personnel costs	Adedokun, DaSilva et al	[1, 10]

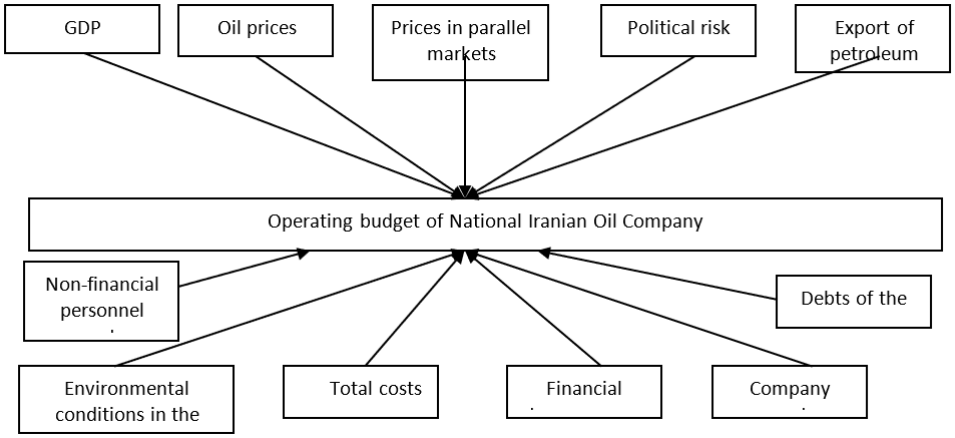

Figure 1: Research conceptual model (source: researcher's findings)

2.2 Research methodology

The current research is cross-sectional in terms of the time of conducting the research; in terms of research results, practical; In terms of the research implementation process, it is combined; In terms of the purpose of the research, it is descriptive-analytical (and of the case study type) and in terms of the logic of the research implementation, it is inductive. The statistical population of the current research is Iran Oil Company, and due to the smallness of the statistical population under study, all oil companies that operate in this field abroad are studied. To collect the necessary information and statistics, the questionnaire method was used, as well as the sampling of the conducted studies. This research is descriptive research of the correlation type, which deals with knowing the cause-and-effect relationships of the phenomenon in question. In the current research, the models in the operating budget of foreign oil companies are carefully examined and then based on the internal capacities, the desired model is prepared and so-called localized. Finally, the designed model is tested and evaluated. To analyze the data obtained from the distribution of the questionnaire, Smith PLS and Eviews statistical software are used, in two levels of descriptive and inferential analysis:

a) Descriptive analysis: In this stage, the data is displayed in the form of distribution of mean, median, deviations, etc. in the form of tables, graphs and statistical forms.

b) Inferential analysis: In this step, the research hypotheses are explained and checked according to the data related to each variable.

c) The analysis method in Eviews software will be in the form of a model with Arch-Garch uncertainty conditions.

2.3 ARCH

2.3.1 Model specification

To model a time series using an ARCH process, let and denote the error terms (return residuals, with respect to a mean process), i.e. the series terms. These ϵ_t are split into a stochastic piece z_t and a time-dependent standard deviation σ_t characterizing the typical size of the terms so that

$$\epsilon_t = \sigma_t z_t.$$

The random variable z_t is a strong white noise process. The series σ_t^2 of is modeled by

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \cdots + \alpha_q \epsilon_{t-q}^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \epsilon_{t-i}^2$$

where $\alpha_0 > 0$ and $\alpha_i \geq 0$, $i > 0$. An ARCH(q) model can be estimated using ordinary least squares. A method for testing whether the residuals and exhibit time-varying heteroskedasticity using the Lagrange multiplier test was proposed by Engle [12]. This procedure is as follows:

1. Estimate the best fitting autoregressive model AR(q) $yt = \alpha_0 + \alpha_1 y_{t-1} + \cdots + \alpha_q y_{t-q} + \epsilon_t = \alpha_0 + \sum_{i=1}^{q} \alpha_i y_{t-i} + \epsilon_t$.
2. Obtain the squares of the error 2 and regress them on a constant and q lagged values:

$$\hat{\epsilon}_t^2 = \alpha_0 + \sum_{i=1}^{q} \alpha_i \hat{\epsilon}_{t-i}^2$$

   where q is the length of ARCH lags.

3. The null hypothesis is that, in the absence of ARCH components, we have $\alpha_i = 0$ for all $i = 1, \cdots, q$. The alternative hypothesis is that, in the presence of ARCH components, at least one of the estimated a coefficients must be significant. In a sample of 7 residuals under the null hypothesis of no ARCH errors, the test statistic $T'R2$ follows χ_2 distribution with q degrees of freedom, where T' is the number of equations in the model that fits the residuals vs the lags (i.e. $T' = T - g$). If $T'R2$ is greater than the Chi-square table value, we reject the null hypothesis and conclude there is an ARCH effect in the ARMA model. If $T'R2$ is smaller than the Chi-square table value, we do not reject the null hypothesis.

2.4 GARCH

If an autoregressive moving average (ARMA) model is assumed for the error variance, the model is a generalized autoregressive conditional heteroskedasticity (GARCH) model. In that case, the GARCH (p, q) model (where p is the order of the GARCH terms σ^2 and q is the order of the ARCH terms ϵ^2), following the notation of the original paper, is given by

$$\begin{aligned}
&y_t = x_t' b + \epsilon_t \\
&\epsilon_t | \psi_{t-1} \sim N(0, \sigma_t^2) \\
&\sigma_t^2 = \omega + a_1 \epsilon_{t-1}^2 + \cdots + a_q \epsilon_{t-q}^2 + \beta_1 \sigma_{t-1}^2 + \cdots + \beta_p \sigma_{t-p}^2 = \omega + \sum_{i=1}^{q} \alpha_i \epsilon_{t-i}^2 + \sum_{i=1}^{p} \beta_i \sigma_{t-i}^2.
\end{aligned}$$

Generally, when testing for heteroskedasticity in econometric models, the best test is the White test. However, when dealing with time series data, this means to test for ARCH and GARCH errors. Exponentially weighted moving average (EWMA) is an alternative model in a separate class of exponential smoothing models. As an alternative to GARCH modelling it has some attractive properties such as a greater weight upon more recent observations, but also drawbacks such as an arbitrary decay factor that introduces subjectivity into the estimation.

2.5 GARCH(p, q) model specification

The lag length p of a GARCH(p, q) process is established in three steps:

1. Estimate the best fitting $AR(q)$ model

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \cdots + \alpha_q y_{t-q} + \epsilon_t = \alpha_0 + \sum_{i=1}^{q} \alpha_i y_{t-i} + \epsilon_t.$$

2. Compute and plot the autocorrelations of ϵ^2 by

$$\rho = \frac{\sum_{t=i+1}^{T} (\hat{\epsilon}_t^2 - \hat{\sigma}_t^2)(\hat{\epsilon}_{t-1}^2 - \hat{\sigma}_{t-1}^2)}{\sum_{t=1}^{T} (\hat{\epsilon}_t^2 - \hat{\sigma}_t^2)^2}$$

3. The asymptotic, that is for large samples, the standard deviation of $\rho(i)$ is $1/\sqrt{T}$. Individual values that are larger than this indicate GARCH errors. To estimate the total number of lags, use the Ljung-Box test until the value of these is less than, say, 10% significant. The Ljung-Box Q-statistic follows χ^2 distribution with n degrees of freedom if the squared residuals ϵ_t^2 are uncorrelated. It is recommended to consider up to $T/4$ values of n. The null hypothesis states that there are no ARCH or GARCH errors. Rejecting the null thus means that such errors exist in the conditional variance.

3 Data analysis

To carry out this research, at first, the significance of the variables was checked using the generalized Dickey-Fuller test, and after determining the degree of significance of the variables, the ARFIMA method was used to determine the operational budgeting model. To estimate the research model, Eviews 10 software was used. In this section, the test of sequence (randomness of data), skewness, and kurtosis and the test of late dependence are used to examine the components affecting

4 Findings

Table 2: Parent test results

Chi-square	F	t	β	time series
16.679	13.679	-8.771	-0.2375	Yields from six months of budgeting

Considering the value of the calculated test statistics and the significance level of the model at the 99% confidence level, the null hypothesis that $\beta = 1$ will be rejected for operational budgeting data.

Table 3: Skewness and elongation test results

Skewness	Kurtosis	Number of data	time series
0.3102	0.051	3157	Budgeting of the previous year

In this test, the critical values of the skewness coefficient of the normal distribution are equal to zero and its elongation coefficient is equal to three. As seen in Table 3, in the previous year's budgeting data, the skewness is close to zero, but not negative, and the skewness is less than three; Therefore, based on this test, it is not possible to comment on the existence of inconsistency in the budgeting process. The Shapiro-Wilk normality test was performed for the six-monthly budgeting process of the index, and the probability level of 0.001 indicates the rejection of the null hypothesis based on the normality of the six-monthly distribution of the operational budgeting process.

The existence of long-term memory in financial assets is a very important issue from the theoretical as well as the empirical point of view. If the market has long-term memory, there will be significant autocorrelation between observations taken over a very long period of time. Since the series are not independent of each other over time, understanding the distant past helps predict the future. The existence of long-term memory in corporate processes

Table 4: Research model by ARFIMA method

Variable	amount	standard deviation	t	Prob.
BgA	0.192804	0.033519	5.752034	0.0000
BgA(-1)	0.102830	0.024748	4.155075	0.0000
PN	83.57625	3.073751	27.19031	0.0000
DUM	676.4823	258.4132	2.617831	0.0089
@TREND	-1.235457	0.423791	-2.915250	0.0036
MA(1)	0.077133	0.023228	3.320633	0.0009
MA(2)	0.678672	0.018930	35.85203	0.0000
SMA(1)	0.633077	0.028303	22.36820	0.0000
SMA(2)	-0.061194	0.022485	-2.721578	0.0065
SMA(3)	0.235682	0.022867	10.30648	0.0000
SMA(4)	0.647048	0.021585	29.97679	0.0000
SMA(5)	0.337773	0.025597	13.19601	0.0000

has violated the weak form of the efficiency hypothesis, and also questioned the linear models of pricing the company's assets, indicating that non-linear models should be used in the pricing of capital assets. New developments in trading methods and increasing market information have caused companies to get closer to effective planning processes than in the past. Therefore, if it is determined that the time series has the characteristic of long-term amplitude dependence, then its changes are not random and predictable.

Table 5: Model estimation by ML-ARCH method

Variable	Coefficient	Std. Error	z-Statistic	Prob.
BgA	0.257338	0.034561	7.445855	0.0000
BgA(-1)	0.105782	0.024507	4.316302	0.0000
PN	83.39925	2.330186	35.79082	0.0000
DUM	793.6996	257.8100	3.078623	0.0021
@TREND	-2.098424	0.415543	-5.049835	0.0000
MA(1)	0.089149	0.016525	5.394758	0.0000
MA(2)	0.677637	0.013279	51.03222	0.0000
SMA(1)	0.640024	0.018741	34.15164	0.0000
SMA(2)	-0.048110	0.017445	-2.757854	0.0058
SMA(3)	0.254780	0.016067	15.85708	0.0000
SMA(4)	0.645302	0.017683	36.49218	0.0000
SMA(5)	0.328889	0.019100	17.21923	0.0000
Variance Equation				
C	3830509.	65581.63	58.40826	0.0000
RESID(-1)∧2	0.000975	0.000343	2.847306	0.0044
GARCH(-1)	-0.997321	0.000419	-2382.095	0.0000

Table 6: M-GARCH model

Variable	Coefficient	Std. Error	z-Statistic	Prob.
GARCH	-572.3698	65.35972	-8.757226	0.0000
C	7566.480	977.8847	7.737599	0.0000
@TREND	0.468876	0.153820	3.048214	0.0023
AR(1)	0.912397	0.012877	70.85687	0.0000
MA(1)	-0.610778	0.036525	-16.72221	0.0000
MA(2)	0.534589	0.021413	24.96536	0.0000
SMA(1)	-0.406978	0.041366	-9.838380	0.0000
SMA(2)	-0.722756	0.024051	-30.05099	0.0000
SMA(3)	-0.064994	0.048028	-1.353263	0.1760
SMA(4)	0.273999	0.024333	11.26034	0.0000
SMA(5)	0.249872	0.031051	8.047063	0.0000
	Variance Equation			
C	1150189.	37836.28	30.39909	0.0000
RESID(-1)∧2	0.413760	0.042875	9.650439	0.0000
GARCH(-1)	0.097932	0.018400	5.322355	0.0000

By comparing different values of ARCH, the value of ARCH(3,3) is accepted for designing the model. Adding each parameter to the model produces two effects in opposite directions. These two effects consist of increasing the explanatory power of the model against the loss of the degree of freedom. There are many criteria that try to choose

the optimal model by considering these two effects. But the two criteria of Akaike and Schwartz are the most widely used of these criteria. Below is the formula related to these two criteria in univariate mode.

$$AIC = -2\ln(L)/T + 2n/T$$

$$SBC = -2\ln(L)/T + n\ \ln(T)/T.$$

where n is equal to the number of estimated parameters, T is the number of usable observations and L is the maximum value of the logarithm of the probability function. The use of these criteria is such that in the comparison between models with different intervals, one should choose the model that has the lowest values of these two criteria among the rest of the models. In that case, we choose that model as the optimal model. The point that should be considered is that in small samples, using the AIC criterion is preferable to the SBC criterion, and in large samples, the use of the SBC criterion is preferable to the AIC criterion.

Table 7: GARCH model design

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	10012.56	103.1655	97.05338	0.0000
	Variance Equation			
C	9041425.	695160.9	13.00623	0.0000
RESID(-1)∧2	0.294345	0.163904	1.795836	0.0725
RESID(-2)∧2	0.071792	0.151411	0.474153	0.6354
RESID(-3)∧2	0.049544	0.133029	0.372430	0.7096
RESID(-4)∧2	0.076345	0.127767	0.597538	0.5501
RESID(-5)∧2	-0.029166	0.112854	-0.258442	0.7961
RESID(-6)∧2	-0.011760	0.101600	-0.115748	0.9079
R-squared	-0.020527	Mean dependent var		9530.74
Adjusted R-squared	-0.020527	S.D. dependent var		3363.62
S.E. of regression	3397.976	Akaike info criterion		18.8921
Sum squared resid	2.71E+10	Schwarz criterion		18.9117
Log likelihood	-22180.82	Hannan-Quinn criter.		18.8992
Durbin-Watson stat	0.142513			

In this section, considering the operating budget efficiency in the ARFIMA model, the design of the GARCH model is discussed. By estimating the model, the value of Akaike and Schwarz coefficients, the model with the lowest coefficient value is selected. Therefore, we write different ARMA values and compare Akaike and Schwarz values. The residual values will have different answers considering different AR and ma. Based on the assumptions of the model, the prob values represent the significant value of each of these AR, ma.

Table 8: ARCH test

Heteroskedasticity Test: ARCH			
F-statistic	0.0410621	Prob. F(4,2340)	0.008011
Obs*R-squared	0.91644838	Prob. Chi-Square(4)	0.008007

An important limitation in GARCH and ARCH methods is their symmetry; This means that they consider the absolute value of changes in predicting the fluctuations of various variables in the planning process and ignore their sign, and therefore the effects of negative shock and positive shock with the same magnitude are considered to be the same on the series fluctuation. While series fluctuations do not show the same reaction to qualitative and quantitative variables such as good and bad news (favorable and unfavorable shocks); For example, in the case of stock prices, unexpected bad news greatly changes the volatility, while good news; They change volatility slowly and the opposite is shown in the case of inflation. Considering that these factors are highly effective in the operational budgeting process; A newer model that solves these problems should be considered. Thus, to solve this problem and to analyze the behavior of fluctuations, it is necessary to use an Asymmetric Model [25].

One of the asymmetric models of conditional variance heterogeneity; GARCH is Threshold ARCH (TGARGH) proposed by Glosten, et al. [17]. In this model, good and bad news are separated by a virtual variable. The conditional variance equation of TGARGH is expressed as follows [19]:

$$h_t = \beta_0 + \int_{i=1}^{q} \beta_i \varepsilon_{t-i}^2 + \int_{j=1}^{p} \theta_i h_{t-i}^2 + \int_{k=1}^{r} \varphi_k \varepsilon_{t-k}^2 D_{t-k} + v_t$$

$D_(t-k)$ is the virtual variable that separates news is called Threshold Term. In this part, the EGARCH conditional variance heterogeneity model is used to model and extract the fluctuations (turbulence) of operational budgeting efficiency; Because the time series fluctuation of operational budgeting index may not show the same reaction to positive and negative shocks, and to analyze the behavior of fluctuations, it is necessary to use an asymmetric model. The EGARCH model has advantages over other conditional heterogeneity variance models, which include:

1- The dependent variable is logarithmic, so the coefficients of the variables on the right side can be positive or negative, and the conditional variance will be positive anyway.

2- In this model, the effect of asymmetric shocks is also considered.

3- The estimates obtained from the exponential model will not be sensitive to the presence of outlier observations.

4- This model does not have any restrictions on the parameters and is sufficient for the EGARCH process. ε_t in the equation of the conditional mean has a normal distribution and In the equation, the conditional variance is less than unity

The positive value of γ in the estimation of the EGARCH model indicates that the effect of positive price shocks leads to more uncertainty index (volatility), while negative shocks reduce volatility and price uncertainty in the stock market.

5 Conclusion

1- Political risk and inflation have a negative and significant effect on the operating budget of the company and reduce the efficiency of resources. The analysis of the research data showed that the existence of political risk as well as inflation reduces the operational budgeting power and makes it difficult to continue the designed program. These researchers investigated a research entitled the feasibility of implementing an operating budget in Gachsaran Oil and Gas Exploitation Company. The results of this research show that the ability to implement is not significant at the 95% confidence level and this hypothesis has not been confirmed, but it has been confirmed from the two dimensions of authority and acceptance of the main hypotheses, also based on the results obtained from the fourth main hypothesis test. Also, according to the confirmation of this hypothesis, it has been concluded that the implementation of the operational budget in this company will be economical.

2- The increase in environmental and organizational variables causes budgeting based on the intrinsic price of crude oil. According to the results of the research, the price increase in the oil markets increases the performance of the operating budget of the companies, but the increase in the prices in the parallel financial markets has a negative effect on operational budgeting. In the face of these scarce resources, continuous attention to planning and allocation of resources and then budgeting is an undeniable necessity. The importance of the budget is much greater in universities that receive their credits from the government, i.e. public universities, because of the very important role they play in the scientific and cultural orientation of the young generation in society. An increase in variables related to corporate factors reduces the efficiency of operational budgeting in the organization. The results of the analysis of the research data showed that improving the status of corporate variables increases the efficiency of operational budgeting. The results of this part of the research are in line with the findings of Fazli et al. [13], this research examines the problems of implementing operational budgeting and considers the budget of a government organization on a case-by-case basis and tries to identify the most important indicators that are related to the problems of implementing operational budgeting. examine and also provide solutions in this regard.

3- The model has sufficient validity based on statistical and measurement tests.

4- Variables such as the behavior of competing companies and financial support as variables of structural failure in operational budgeting model have a significant effect. The results of the research data analysis showed that the behavior of competing companies and financial support are the most important factors in creating structural failure in the operational budgeting process. The results of this research show that there is a significant relationship between the implementation of operational budgeting and management factors, and the problems of implementation of operational budgeting are related to management factors in the order of indicators 1) technical and process factors 2) human factors 3) environmental factors are therefore suggested. In the implementation of the implementation of the operational budget, identify these obstacles and take action to remove them.

6 Research and executive proposals

For future studies, in order to solve the problems and problems of current research and their development, the following suggestions are presented:

Using dynamic systems methods to simulate the future trends of operational budgeting and applying scenarios and observing the results of these scenarios on other economic variables

Using quality indicators such as quality of service delivery, rational and adaptive expectations, portfolio portfolios, and amendments to investment laws on operational budgeting efficiency.

Investigating the effects of good governance indicators in Iran and its effect on the flow of investment in companies on the efficiency of operational budgeting

Providing supervisory and operational solutions to control the negative consequences of stock market transactions, such as extreme fluctuations and inconsistencies in the process of operating price budgeting in the operational budgeting of companies that are members of the Securities and Exchange Organization.

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