

Examining the Impact of Research and Development Department Performance on the Profitability of Golkaran Agro-Industrial Company

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Abstract

The overall objective of this study was to evaluate impact of research and development department performance on the profitability of Golkaran Agro-Industrial Company and in this regard, taking into consideration the planning system, implement and monitor the research and development unit to the above issue will be discussed. The aim of the present study and applied research in the field is based on the nature and methods of descriptive - analytical. The population is research and development department of Golkaran Agro-Industry Company that has been chosen. The observations were used to analyze the data in a range of 6years services from 2007 to 2012. In collecting the data, library studies and statistical and financial reports were used. The methods of descriptive and inferential statistics (Pearson correlation coefficient, simple regression and stepwise regression) and Student's t test (T-Test), (F-Test), the test were used to analyze the data. Software statistical software used in this study (Excel) and software (SPSS), and software (Minitab). Therefore, the results of testing show that there is a significant impact between the performance of research and development: (Subsystem performance planning, implementation (production), control and revision, research and development), on profitably of Golkaran Agro-Industrial Company.

Keywords: performance, research and development, profitability, Golkaran agro-industrial Company

1. Introduction

Today's competitive advantage in the knowledge leads to the development of effective knowledge and technology. Along with the rapid technological changes and technical knowledge in various industries,

there is a new attitude in research and development. In addition to factors, such as global move towards a knowledge-based companies and consequently, foundations flourishing creativity and innovation in the history of these centers have an important role in this movement were formed and different generations (Mosaei, 2008, p. 13).

Process research and development is to identify needs or talents, the appearance of ideas, creation, design, production, introduction and distribution of a product and process technology system. Indeed, the link between research and development activities in science and knowledge of the product or processes produced product (Hosseini, 2004, p. 61). According to the material presented and the importance of research and development performance in increasing the profitability of businesses, and considering the following three scheduling system, implement and monitor, the study also addressed this issue and the issue of examining the impact research and development department performance on the profitability of Golkaran Agro-Industrial Company will be studied.

2. Review of literature

With the arrival of the third millennium and era of incremental change new technologies, most engineering work by software available to everyone is done. However, it still provides added value engineering for Android, their ability to identify new fields of business and creative and innovative solutions to solve problems and difficulties ahead and power improvements in their work in addition, their long-term survival of the organization today and gain competitive advantage depends on innovation in manufacturing and supply of goods and services. On this basis, and given the complexities involved in research activities and knowledge as the requirements of the third millennium, it is necessary that managers pay attention to today's organizations develop their ability and staff in innovative and creative ways to solve problems before them (Jafari and Zarghami, 2011, p. 16).

Research and Development

Research and development, to the sum of the innovative, creative, innovative, systematic and planned with the aim of expanding the frontiers of scientific knowledge which generally and the treasure of human knowledge and human society and applied this knowledge in various fields to improve human life. In short, to innovate and create products, processes, equipment, tools, systems, services and new ways done, or the other. The main factor stimulating research and development of industrial and economic development of all known firms and an important factor in strengthening the technological capacity is the country's economic growth. Methods and mechanisms for technology development through research and development, such as research and internal development, joint research and development, contract research and development and outsourcing research and development (Azar et al., 2010, p. 6)

Research, development, and business profitability

Net income profits of a business and an approximate measure of the success or failure of any business enterprise. According to economists, profits as a stimulus for economic activity according to Schumpeter research and development effect on profits. In his view, firms with monopoly power higher by increased research and development, access to risk reduction through innovation find, so that by maintaining monopoly power, profitability will be affected and increased research and development. Of course, it

should be noted that the benefits of research and development not only the benefits of research and development not only because of monopoly power; but also increased profitability of most firms create new products. Research and development costs due to increased efficiency in the long run less risk than are other costs such as machinery and equipment. Simultaneously profitability, research, and development are also influenced by other factors.

Background research

In the field of research and development and its impact on profitability inside and outside the country, there are few studies but in similar and related issues can be found further research. In this section, we briefly mentioned some of these studies.

A) Internal background

Molaei and Dehghani (2011), in a study to assess the impact of spending on research and development in the industrial sector's market share (non-linear approach LSTAR) began. The results of this study non-linear correlation between the cost of research and development and market share in the industrial sector of Iran confirmed. Encourage and support research and development of state of the industry, to enhance the market share of firms, this study is the most important policy recommendation (Molaei and Dehghani, 2011, p. 55).

In a study on the role of research and development costs in the value added of the industry's high-tech. Based on the results, this type of expenditure is added at a crucial role in increasing the value of this industry. In other words, you need to enter global markets and the development of advanced industries in each country, focusing on scientific research (Vaez et al., 2007, p. 53).

B). Foreign backgrounds

Nord (2011), a study of the relationship between investment in research and development with profitability (Assessment of Agricultural Industry) conducted. Previous studies showed that the theoretical literature on the relationship between two variables based on the theoretical foundations for economic reasons were explained the link between research and development costs and profitability. According to the literature and research hypotheses raised through empirical model was used to investigate it.

Regression was used for statistical analysis, the results indicated the existence of the relationship between investment in research, and development in the agricultural industry is the profitability (Nord, 2011, p. 2). Szilagyi (2010) in a study of research and development examined accounting issues.

Research and development expenses in the financial statements are shown in different ways. Different charm and different aspects of the company (such as size and ownership) on accounting methods are effective priority. In this study, an analysis of accounting research and development based on nationality (Hungarian, German and Estonia) and international standards will be discussed. According to strive to be different accounting methods for various reasons a certain way depending on the interests and characteristics of the company paid. As a result, a better image of the check costs Innovation (research and development) achieved in the financial statements of companies (Zylagy, 2010, p. 140).

3. Research Methodology

The aim of the present study in the field of applied research, as researchers sought to examine the impact of research and development department performance on the profitability of Golkaran Agro-Industrial Company. Company officials can use the results as well as those interested in the subject studied. Due to the fact no study to collect data and determine the variables used library resources and measure the variables of data through forms and reports and accounting system will be used for research and development unit and this study is based on the nature and methods of descriptive - analytical. The population is research and development department performance on the profitability of Golkaran Agro-Industrial Company. Moreover, according to the same organization, the same as the sample is selected. The observations were used to analyze the data in a 6-year range from 2007 to 2012. In addition, in the study, the data collection library (Internet, books, articles, theses and research reports) and statistical and financial reports have been used. To study various aspects of theoretical research, literature and the literature on the subject, library research methods were used.

In addition, the collected information verifies or rejects hypotheses, research and development of statistical reports and financial statements of Golkaran Agro-Industrial Company was applied.

Collection data tool

To measure the research variables and statistical reporting tool in financial statements of Golkaran Agro-Industrial Company have been used. Research and development performance measurement systems for performance of Golkaran Agro-Industrial Company reports published by the research and development for the years 2007 to 2012 were used and to measure the profitability of Golkaran Agro-Industrial Company and loss account of the company and the profit (loss), net of interest to be taken during the period studied. The following performance reporting systems research and development department of Golkaran Agro-Industrial Company as well as the profit (loss) net profit and loss account based on the years 2007 to 2012 in the form of Table 1 and Table 2.

Table 1 Performance of sub-systems research and development of Golkaran Agro-Industrial Company from 2007 to 2012 years

2012	2011	2010	2009	2008	2007	Measures	Subsystem
31	20	26	15	12	12	The number of ideas presented	Planning
52	27	17	11	1	1	The number of cases submitted to the ministry	
15	14	28	13	1	1	The number of cases submitted to the ministry	
18	15	15	11	6	3	Number of Permits Obtained	
46	41	33	15	6	2	The number of products	Production

9	7	2	0	0	0	Products with deformation	Control and revision
4	2	1	1	0	0	Products by changing the formulation	
6	4	0	0	0	0	Products by changing the shape of the packaging	

Table 2-profit (loss), net agricultural Golkaran during the period 2007 to 2012

2012	2011	2010	2009	2008	2007	Profit (loss)
957/216/595/ 4	437/082/314/ 3	329/338/936/ 2	258/762/766/ 1	633/858/759/ 1	136/641/024/ 1	Profit Net

Methods, statistical analysis, and conceptual model

In this study, the methods of descriptive statistics (frequency distribution, mean, standard deviation, variance and percent) and inferential statistics (normality of the dependent variables, Pearson correlation coefficient, linear regression and stepwise regression); to summarize and analyze the data is used. SPSS statistical software was used in this study. Conceptual model is presented in Figure 1. According to low information in research and development department of Golkaran Agro-Industrial Company and as in Model 1 is shown indicators of the ideas presented, the number of projects running. The number of cases submitted to the ministry and the number of licenses obtained under the planning system to measure performance. The number of products produced under the system for measuring the implementation and transformation of products medicinal products by changing the formulation by changing the shape of the packaging and product number and revision control system is used to measure below.

Figure 1 The conceptual model

4.1 Analysis of data

In this part of the research, data will be analyzed. So that to study the variation of models using T-test (T-Test), is used. In addition, to ensure reliable results from tests default regression model was used. In order to analyze the data from the application (Excel) and to test hypotheses and completed testing to ensure that the model SPSS software (SPSS) software (Minitab) was used. So bivariate and multivariate regression test the hypotheses used.

Statistical descriptions

To use the default regression should first be considered by the underwriters at any multiple linear regression model that assumes its accuracy, regression results are valid and otherwise replaced with another model. These are (supposed) include:

1-normality, 2-constant variances, 3-independence, 4- both linear.

Through trial model residuals of the regression, assumptions are dealt at the end of the season. So, first check the suitability (normal data) data described above. For this purpose, all variables into the model and accordingly we create a variable detection. These variables include: 1-variable predicted based on all variables, 2-variable predicted by the standard 3-variable residuals. 4-variable standardized residuals. Created variables to evaluate and test the model assumptions are required.

So, in this section, the statistical properties of the variables presented. These features include the mean frequency and the number of observations for each variable is used in this study.

Table 3. Table mean performance and profit logarithm six years to 2012

Year	An average of three subsystems (performance score)	Logarithm of Profit
2007	33/6	9.011
2008	66/8	9.245
2009	22	9.247
2010	6/40	9.468
2011	3/43	9.520
2012	33/60	9.662

Kolmogorov - Smirnov: The test for normal distribution of data from statistical questionnaires assuming the Kolmogorov - Smirnov is done.

Table 4. Kolmogorov - Smirnov Normality data - dependent variable

One-Sample Kolmogorov-Smirnov Test		
		y ₁
N		96
Normal Parameters ^{a,b}	3.3899	30.0255
	.28752	6.87375
Most Extreme Differences	.205	.132
	.116	.050
	-.205	-.132
Kolmogorov-Smirnov Z		2.010
Asymp. Sig. (2-tailed)		.104
a. Test distribution is Normal.		
b. Calculated from data.		

Source: research findings

Table 5. Kolmogorov-Smirnov test-independent variables

One-Sample Kolmogorov-Smirnov Test					
		x1	x2	x3	x4
N		96	96	96	96
Normal Parameters ^{a,b}	2.9265	3.0099	2.9782	2.9265	20.1922
	.18317	.15921	.20805	.18317	1.96165

Most Extreme	.318	.184	.219	.318	.072
Differences	.262	.184	.214	.262	.072
	-.318	-.123	-.219	-.318	-.056
Kolmogorov-Smirnov Z		3.118	1.801	2.142	3.118
Asymp. Sig. (2-tailed)		.143	.325	.481	.435
a. Test distribution is Normal.					
b. Calculated from data.					

Source: research findings

To test the hypothesis of Kolmogorov - Smirnov was used. The results showed that, given the amount of test statistics (Sig), between all variables as in Table 4 and Table 5, is shown and also due to the comparison with the critical error level (5%), it is observed that test statistics in the region of rejection (H0), is located. As a result, it can be argued that the data are normally distributed.

Data analysis and hypothesis test

Any researcher to collect data and information to assess and correct scientific method and is also analyzed so that they can answer the research question results and the study evaluated the hypothesis or hypotheses researcher after the analysis based on the result, commenting on his hypothesis and according to the results they will be approved or rejected. In this section, according to data from research samples and using statistical tests to test the hypothesis will be discussed.

Hypothesis: research and development department of Golkaran Agro-Industrial Company affect the profitability of the company.

Table 6. Results of regression tests

Variables Entered/Removed ^b			
Model	Variables Entered	Variables Removed	Method
1	x3, x1, x2 ^a	.	Enter
a. All requested variables entered.			
b. Dependent Variable: Yit			

Source: research findings

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.560 ^a	.314	.292	.24197
a. Predictors: (Constant), x3, x1, x2				

Source: research findings

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.182	.684		.266	.000
x1	.674	.136	.429	4.954	.000
x2	.018	.162	.010	.114	.000
x3	.555	.124	.402	4.468	.000
a. Dependent Variable: Yit					

Source: research findings

$$\text{Log(Inox}_{it}) = -1.552 + 1.231 \cdot \text{Log}(X_{1it}) - .317 \cdot \text{Log}(X_{2it}) + .400 \cdot \text{Log}(X_{3it}) + .205 \cdot \text{Log}(X_{4it}) - .076 \cdot \text{Log}(X_{5it}) + U_{it}$$

Table (6), indicate the results obtained from the regression of the main hypothesis. It states that there is a significant relationship between the performance of research and development (Subsystem performance planning, implementation (production), control and revision, research and development), and profitably research and development department of Golkaran Agro-Industrial Company. The determination coefficient of the regression test set out in Table (6), shows that research and development performance variables (subsystem performance planning, implementation (production), control and revision, research and development), (Independent variable), (00.56) percent of research and development department of Golkaran Agro-Industrial Company.

Table 7 - test results (ANOVA^b), the coefficient comparison of the mean model coefficients

ANOVA ^b					
Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	2.762	3	.921	16.640	.000 ^a
Residual	5.091	92	.055		
Total	7.853	95			
a. Predictors: (Constant), x3, x1, x2					
b. Dependent Variable: Yit					

Source: research findings

Table (7), indicate the results of the test (ANOVA^b), in the case of the hypothesis is that the results of regression tests at 95% (percent), and the level of 5% (percent) and comparison the significance level (= 0.000 sig) is significant.

Therefore, the table (6) to the table (7) indicates statistical hypothesis is described. According to the table above it can be concluded that the amount of test at a significance level (Sig), independent variables less than or test error is 5%. Therefore, given that the level of 5% is considered for this study, so this variable

was significant and the main research hypothesis is confirmed. Moreover, the independent variables on the dependent variable had a significant impact. In other words: there is a significant relationship between the performance of research and development (subsystem performance planning, execution (manufacturing), monitor, research and development), and profitability of research and development department of Golkaran Agro-Industrial Company.

The second column in the table shows above correlation coefficient (.560 a). The results of the test with 95% (percent), the total population of the study, Golkaran Agro-Industrial Company generalized.

- Interpretation of the coefficients influence the final regression model for research: general interpretation of the coefficients for the effectiveness of research and development performance (performance sub-systems planning, execution (manufacturing), monitor, research and development), on the profitability of agricultural enterprise planting, can be expressed as follows:
- Research and development performance equation (subsystem performance planning, execution (manufacturing), monitor, research and development), as the independent variables on the profitability of agricultural enterprise planting, as the dependent variable: Data analysis in this research, correlation and regression analysis were (R). The variables studied by using available resources during 2007 to 2012 has been extracted, the amplitude of up to 6 years and then depending on the type of data using statistical software (SPSS19), vector regression (R) (determined by estimation method) analysis is carried out which model is as follows:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + U_{it}$$

$$\text{Log}(Y_{it}) = \beta_0 + \beta_1 \text{Log}(X_{1it}) + \beta_2 \text{Log}(X_{2it}) + \beta_3 \text{Log}(X_{3it}) + \beta_4 \text{Log}(X_{4it}) + U_{it}$$

$$\text{Log}(Y_{it}) = .182 + .674 \cdot \text{Log}(X_{1it}) + .018 \cdot \text{Log}(X_{2it}) + .555 \cdot \text{Log}(X_{3it}) + U_{it}$$

Thus, according to the results of the test or the results of regression models estimated model for R & D performance equation (subsystem performance planning, implementation (production), control and revision, research and development), the company's profitability in agricultural planting, as the dependent variable, Table (4-17) observed that the level of statistical significance F (prob (F-statistic)), indicating that the regression is significant. The 0.0000 indicate that the model is significant at the level of 95%. The coefficient of determination (R²) adjusted was 0.314 times and indicates that approximately 31.40% of the variation in the dependent variable explained by the independent variables model.

Table 8. The test results (Coefficientsa), model coefficients

Coefficients ^a						
Model	Unstandardized Coefficients			Standardized Coefficients	T	Sig.
	B	Std. Error		Beta		
1 (Constant)	.182	.684			.266	.000
x1	.674	.136		.429	4.954	.000
x2	.018	.162		.010	.114	.000

x3	.555	.124	.402	4.468	.000
a. Dependent Variable: Yit					

1. As the Table (8), implies, variable ratio (X1t) or the coefficient of the independent variable (performance under the planning system research and development unit), equal to (+0.674). Thus, according to statistics (t), as well as the significance of this variable (= 0.000 Sig), the results indicate the significance of this factor in the final research model at the level of 5 percent. In addition, these findings show that the coefficient of samples (X1t), or the independent variable factor (Subsystem performance planning research and development), becomes larger, the coefficient profitability of agro-industrial company Golkaran (Yit), are also higher. Alternatively, slope coefficient is positive because it is significant in the equation. As a result of the assumption (H1), the hypothesis is confirmed. This relationship is a significant estimate in the linear equation.

2-As the Table (8), implies, variable ratio (X1t) or the coefficient of the independent variable (performance subsystem run (production), research and development), equal to (0.018), respectively. Thus, according to the statistics (t), and the significance of this variable (= 0.000 Sig), the results indicate the significance of this factor in the final research model at the level of 5 percent. In addition, these findings show that the coefficient of samples (X1t), or the coefficient of the independent variable (performance subsystem run (production), research and development), will be harder, profitability index of Golkaran Agro-industry (Yit), also will increase. The factor or the slope of the equation is significantly positive.

As a result the assumption (H1), the hypothesis is confirmed. This relationship is a significant estimate in the linear equation.

3. As the Table (8), implies, variable ratio (X1t) or the coefficient of the independent variable (performance control systems and review the research and development unit), equal to (+0.555). Thus, according to statistics (t), and the significance of this variable (= 0.000 Sig), the results indicate the significance of this factor in the final research model at the level of 5 percent. In addition, these findings show that the coefficient of samples (X1t), or the coefficient of the independent variable (the system performance monitor research and development), becomes larger, the coefficient profitability of Golkaran agro-industrial company (Yit), are also higher. On the other hand, slope coefficient is positive because it is significant in the equation. As a result of the assumption (H1), the hypothesis is confirmed. This relationship is a significant estimate in the linear equation.

5. Conclusion

As mentioned in the analyzing of data is one of the primary objectives of this study, examining the impact of research and development performance on the profitability of agricultural enterprise planting. It can be said research and development department of Golkaran Agro-Industrial Company affect the performance of corporate profitability, coefficients significant test statistic is derived from estimating the models. According to the results, it can be stated that the impact on the profitability of research and development department of Golkaran Agro-Industrial Company, as samples are examined, the results verifiable. Of course, to achieve this objective, statistical tests and regression vector is used. To achieve the study goals, we tested the models presented; the data were collected using a questionnaire. Based on this comprehensive research overview raised in the first chapter, in the second chapter the literature,

theoretical discussions on the issue and also discussed the literature and research methodology and research methods used in this study were reported in the third quarter. Finally, findings and data obtained from this study are presented and analyzed in the fourth quarter. The aim of this chapter is to summarize the preceding discussion dealt with the results of the current study closely and correctly extracted. In this chapter generally paid conclusion and the application of research proposals, research limitations and suggestions for future research are presented.

Summary of results and discussion of basic hypotheses

Main hypothesis testing: performance of the research and development unit Golkaran agro-industrial affects the profitability of the company.

Table (4-15) to Table (4-17), which in the fourth quarter this study will be presented, suggests that correlation between research and development performance (performance sub-systems planning, execution (manufacturing), monitor, research and development D), and profitability agricultural planting, there is a significant relationship. Also on the table correlation coefficient (.560 a), shows that the correlation coefficient is the square or the coefficient of determination (the amount of variation in the dependent variable can be explained by regression). In addition, standard error estimates of the distribution points around the regression line are measured in two-dimensional space.

The value of this index is greater the greater the dispersion of points around the regression line. The results of the test with 95% (percent), the total study population, the agro-industrial companies planting, generalized.

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