
3rd Central & Eastern European LUMEN International Conference
New Approaches in Social and Humanistic Sciences | NASHS 2017 |
Chisinau, Republic of Moldova | June 8-10, 2017

New Approaches in Social and Humanistic Sciences

Tobit Regression Model to Determine the Dividend Yield in Iraq

Meshal Harbi ODAH*, BAHR KADHIM Mohammed, Ali SADIG
MOHOMMED BAGER

<https://doi.org/10.18662/lumproc.nashs2017.30>

How to cite: Odah, M. H., Bahr Kadhim, M. & Sadig Mohommed Bager, A. (2018). Tobit Regression Model to Determine the Dividend Yield in Iraq. In V. Manolachi, C.M. Rus, S. Rusnac (eds.), *New Approaches in Social and Humanistic Sciences* (pp. 340-347). Iasi, Romania: LUMEN Proceedings.
<https://doi.org/10.18662/lumproc.nashs2017.30>



3rd Central & Eastern European LUMEN International Conference
New Approaches in Social and Humanistic Sciences |
NASHS 2017 | Chisinau, Republic of Moldova | June 8-10, 2017

Tobit Regression Model to Determine the Dividend Yield in Iraq

Meshal Harbi ODAH^{1*}, Bahr KADHIM MOHAMMED²,
Ali SADIG MOHOMMED BAGER³

Abstract

In the model of linear regression, the values of variables are known. The sample is limited by censoring limited restriction point where the approved variable is (Threshold point). Censoring occurs at the observation of the independent variables for the entire sample and the censored regression model is considered adequate when the data has to be censored from left at censored point equal to zero. After this, the Tobit regression model can be applied. In this paper we will identify the determinants of the Distribution of Profits between some competing companies on the Iraq Stock Exchange. The profit distribution in the shareholding companies determines the profits which are distributed to the shareholders and the part that is held. The retained profits are a major source of investment in the companies. Although expansion is desirable, profit distribution is as well. The study examines the determinants of the dividend yield, by using the Tobit regression model. The study will use a data set for some companies that traded on the Iraqi Stock Exchange between 2005 and 2015. The results of the analysis of tables use data on Market capitalization, Earnings per share, Market price to book value ratio and debt-equity ratio affect the distribution of profits paid, in some companies traded by Iraq Stock Exchange.

Keywords: *Tobit regression model, dividend yield, Iraq Stock Exchange.*

¹ The Bucharest University of Economic Studies, Department of Statistics and Econometrics, Muthanna University, Iraq, m.algelidh@gmail.com.

² The Bucharest University of Economic Studies, Department of Statistics and Econometrics, University of AL-Qadisiyah, Iraq, baherm@yahoo.com.

³ The Bucharest University of Economic Studies, Department of Statistics and Econometrics, Muthanna University, Iraq, nader.ali62@yahoo.com.

<https://doi.org/10.18662/lumproc.nashs2017.30>

Corresponding Author: Meshal HARBI ODAH

Selection and peer-review under responsibility of the Organizing Committee of the conference



This is an Open Access article distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 Unported License, permitting all non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited

1. Introduction

The topic of dividend yield is a recurrent concern in modern corporate finance. Dividends are commonly defined as the distribution of earnings among the shareholders of the company in proportion to their ownership (Frankfurter and Wood, 2003) which led to the emergence of a number of competing theoretical explanations for dividend yield. Extensive empirical studies have been published recently, but these are usually concentrated in developed nations due to lack of reliable data with respect to developing countries. The aim of this study is to find the validity of different views regarding determinants of dividend yield in Iraq, from the country's perspective, and empirically prove their significance using censored regression modelling, respectively Tobit regression. Dividend yield is one of the most important financing policies in companies since the nature of their relationship with shareholders is direct, having a clear impact on the share price in the market where it relates to the decision to divide the company's net profits between dividends distributed to shareholders and retained earnings. The stock market and stock price are affected by the profits adopted by the company's distribution policy. The Iraqi Stock Exchange began operations in June 2004, since then operating under Iraq Securities Commission, and starting from the year 2005, it has been Iraq's only stock exchange. Having a start-up of 15 companies, has now reached more than 100. Turnover of shares in 2005 was approximately \$5 million USD per trading session and a range of firm and market characteristics have been proposed as potentially important in determining dividend yield. Empirical literature has attempted to test these competing models and refine them and has generally been focused on developed stock markets such as the UK and USA.

The examination of dividend yield in emerging stock markets has, until recently, been much more limited. This study aims to determine the dividend yield (DYLD) in Iraq, an emerging market that has been particularly poorly analysed to date. Generally, emerging stock markets have several similar characteristics so, to some extent, corporate dividend behaviour in Iraq may share some important similarities with other emerging equity markets.

The article is structured in 6 sections, beginning with an introduction in the first section, followed by the Problem Statement in the second one. In the third section the Aims of the research are presented and in the fourth the Methodology of Tobit regression model and random effects, sample study and test multicollinearity problem are described. The fifth section contains analysis and findings, the sixth sections discussions and the seventh section is dedicated to conclusions.

2. Problem Statement

The dividends can be described as rewards given to investors for their investment in a firm having either the form of cash (cash dividends) or stock (stock dividends). The payment of dividends yield depends on company policy and on its financial position. There are no specific rules in Iraq that make dividend payments mandatory. Gill, Biger, Mand, and Shah (2012) [5] compared the determinants of dividend yield in the USA manufacturing and in the services sector. Their results show that pay-outs in the services industry depend on profit margins, sales growth, and debt-equity ratios. For the manufacturing firms, pay-outs are a function of profit margins, market-to-book ratios, and tax implications. Denis and Osobov (2008) [3] have analysed in their research the dividend yield in different countries (1989-2002). In the US, Canada, UK, Germany, France, and Japan, larger and more profitable firms are more likely to pay higher dividends, whereas outside the US, there is little evidence of a positive relationship between dividend paying and non-paying firms. Renneboog and Szilagyi (2008) [8] have written literature in which they compared the European firms paying lower dividends with the market-oriented American firms, their results showing that the pay-outs of Dutch firms were lower because they tended to use their power against shareholder provisions. Lee and Ryan (2002) [10] have analysed the dividend signalling hypothesis and the issue of direction of causality between earnings and dividends - whether earnings cause dividends or vice versa. Their results showed that dividend payment is influenced by recent performance of earnings and free cash flows. Also, Pandey (2003) [7] proved in his research that dividend behaviour of Malaysian companies is very sensitive to changes in earnings. Despite the fact that prior research has been limited in the area of finding determinants of dividend yield as far as Iraqi companies are concerned, there is a research gap in terms of finding dividend yield determinants by using advanced regression models such as the Tobit regression model. The aim of the present study is to identify the concerns emerging from significant determinants of corporate dividend policies as they influence corporate decision-making.

3. Research Questions/Aims of the research

Since the significant determinants of dividend yield are an important input for dividend decision-making process, the main objective has been set to identify the concerns emerging from significant determinants of corporate

dividend policies as they influence corporate decision-making. The study also aims to find what the significant determinants of dividend decision for some companies traded in the Iraqi Stock Exchange between 2005 and 2015 are and empirically prove their significance, through the use of censored regression modelling, namely Tobit regression model.

4. Research Methods

The Tobit regression model is very adequate to estimate the random effects models, since there are no extra problems with dynamic models, with the except of how to deal with initial conditions. Since all parameters are estimable in the Tobit regression model, very few applications of the random effects Tobit model apply with panel data, but it makes it the most suitable statistical model to solve a problem in which a dependent variable of the data is binary. Since the work of James Tobin (1958) [9], Tobit regression has been the subject of great theoretical interest and various practical applications have been developed using it in fields such as econometrics, biological sciences, finance, and medicine. Tobit regression (TR) can be viewed as a linear regression model where only the data on the response variable is incompletely observed. In Tobit model, the response variable is censored at zero. The firms have only two options regarding their dividends, either to pay or to not pay them. In Iraq, many companies do not pay dividends at all, and even those who pay dividends do not pay them continuously, giving the dependent variable (dividends) a special feature with two outcomes: either equal to zero or positive. Dividends can never be negative so OLS is not an appropriate method to analyse the payment of dividends, due to the nature of the dependent variable. The most adequate approach is to use and apply the Tobit regression model. The evaluation of the determinants is realised with the help of the censored data estimation, namely the Tobit regression model. Indeed, the observed dependent variable, the amount of dividend paid by each firm, may either be zero or positive. The data are then censored in the lower tail of the distribution.

We consider the static Tobit regression model, given by:

$$y_{it}^* = \beta^T x_{it} + \alpha_i + e_{it} \quad i = 1, 2, \dots, n \quad \dots \dots (1)$$

$$y_{it} = y_{it}^* \text{ if } y_{it}^* \leq 0$$

$$y_{it} = y_{it}^* \text{ if } y_{it}^* > 0$$

Where the random effects α_i and the term error e_{it} are assumed to be $\alpha_i \sim IN(0, \sigma_\alpha^2)$ and $u_{it} \sim IN(0, \sigma_u^2)$, respectively, and independent of

$x_{i1}, x_{i2}, \dots, x_{iT}$. For β estimate the maximum likelihood estimation (MLE) we used R packages for analyzing the data (Arne, (2013) [2]).

The study has been conducted based on the time-frame 2005-2015, in the case of 47 companies⁴. The companies traded on the Iraqi Stock Exchange (ISX, 2005-2015) [6] and covered six sectors: industrial, service, insurance, agriculture, tourism and hotels, as well as banks during the studied period. The pooled cross section and time series data was used, as well as dependent variable dividend yield (DYLD) and the independent variables.

The explanatory variables (independent) are the following:

X1: Market capitalization (MCAP)

X2: Size of the company (SIZE)

X3: Earnings per share (EPS)

X4: Debt-equity ratio (DER)

X5: Market price to book value ratio (MBR)

X6: Years that company has been into existence (AGE)

The independent variables used for the study should not have high correlation among them. They should be unique to the extent that each one of the independent variables should be counted as separate and so we checked for correlations among the variables. For the test results Farrah-Galaber, we note that the calculated value $\chi_c=8.123$ is less than the value table=11.07 of the table. This indicates that the model has not multicollinearity problem.

5. Findings

Table 1. Descriptive Statistics for the Dependent and Independent Variables

Variable	Mean	Min	Max	Std. Dev.
MCAP	30.91	0.07	297	37.19
SIZE	0.635	11.3	122	7.27
EPS	33.28	0	201	30.86
DER	0.746	0	9.3	1.047
MBR	3.37	0.27	29.41	3.512
AGE	41.3	2	107	23.76
DYLD	12.57	0	683	51.74

⁴. The list of companies used in the analysis is available upon request.

Table 2.Results of the Analysis of Tobit Regression Model

Variable	Coefficient	t – Value	P– Value
MCAP	-14.86566	-0.799924	0.000
SIZE	0.735818	1.126048	0.3803
EPS	-0.105298	-0.600501	0.00002
DER	-78.18398	-0.483300	0.0051
MBR	-0.177351	-0.596288	0.00073
AGE	0.154211	12.785130	0.7155
Newton-Raphsonmaximization, 6 iterations			
The pseudo-R square = 0.85314			

Notes: significant at 5% level.

6. Discussions

Summary Descriptive Statistics: In Table (1) the data provides summary statistics of variables used in the study. Descriptive statistics give an overview of the data we are working with and as can be seen, there are some outliers present in the data set and variation is high in some variables. The range of values is also high for most of the variables.

Results of analysis of Tobit Regression Model: Table (2) shows the final results with all the significant variables for the phenomenon studied, the results of parameter estimation and t value analysis, the significant factors affecting dividend yield. Pseudo-R square = 0.85314 means that from the independent variables (Market capitalization, Size of the company, Earnings per share, Debt-equity ratio, Market price to book value ratio, Years that company has been into existence) explain 85.3% from the variation (dividend yield), proving the strength of the Tobit model in representation of the studied phenomenon data. We know the value (β) of the relationship between response variable and covariates. If $(+\beta)$, indicates a positive relationship, then $(-\beta)$ indicates a negative relationship).

Through the results shown in Table (2), we see the relationship between dividend yield and X1: Market capitalization as negative. So, if there is an increase in X1: Market capitalization by one unit, the dividend yield will decrease (-14.8657) and this variable (X1: Market capitalization) has significant effect on dividend yield.

Also, we see that the variables (X2: Size of the Company and x6: Years that company has been into existence) do not have significant effect on dividend yield meaning that the variable (X2: SIZE & X6: AGE) have weak impact on dividend yield.

The relationship between dividend yield and (X3: Earnings per share) is negative, meaning that if the Earnings per share increases by one unit, the dividend yield will decrease (-0.1053) and this variable (Earnings per share) has significant effect on dividend yield.

We see that the relationship between dividend yield and (X4: Debt-equity ratio) is negative, meaning that if the Debt-equity ratio increases by one unit, then the dividend yield will decrease (-78.1839) and this variable (Debt-equity ratio) has significant effect on dividend yield.

The relationship between dividend yield and (X5: Market price to book value ratio) is negative, meaning that if the Market price to book value ratio increases by one unit, then the dividend yield will decrease (-0.1774) and this variable (Market price to book value ratio) has significant effect on dividend yield.

7. Conclusions

In the study of the determinants of dividend yield for some companies that traded on the Iraqi Stock Exchange were examined between 2005 and 2015. The tested procedures were followed to arrive at the most suitable model by using the censored regression model, Tobit regression model, and maximizing the log likelihood function. We showed that only four of the determinants (Market capitalization, Earnings per share, Market price to book value ratio and Debt-equity ratio) are found to be significant for dividend yield determination for the sample companies while other determinants, namely, Size of the Company and (AGE) Years that company has been into existence were found to be insignificant.

The study demonstrated that much of the existing theoretical literature on dividend yield can be applied to an emerging capital market such as Iraq. Many of the factors that were found to be significant in the determination of dividend yield are the same as those found in developed capital markets. The results of the study can be used by shareholders to take informed decision while deciding on distribution of profits based on dividend yield, and significant determinants can be used to predict dividend yields in future.

References

- [1] Amemiya T. Tobit models: A survey. *Journal of econometrics*, 1984. 24(1-2). pp. 3-61

- [2] Arne H. Estimating Censored Regression Models in R using the censReg Package. R package version 5.05. University of Copenhagen. 2013
- [3] Denis D. J., & Osobov, I. Why do firms pay dividends? International evidence on the determinants of dividend policy. *Journal of Financial Economics*, 2008. 89(1). pp. 62–82
- [4] Greene W. *Econometric analysis*. Book. New York University. Seventh Edition. 2007
- [5] Gill A., Bigger N., Mand, H. S., & Shah, C. Corporate governance and capital structure of small business service firms in India. *International Journal of Economics and Finance*, 2012. 4(8). pp. 83–92
- [6] ***. Iraqi Stock Exchange the Directorate General of Statistics and Research, Annual Bulletin. 2005-2015
- [7] <http://www.isx-iq.net/isxportal/portal/homePage.html?currLanguage=en>
- [8] Pandey I. M.. Corporate dividend policy and behaviour: The Malaysian evidence. *Asian Academy of Management Journal*. 2013. 8(1), pp. 17–32
- [9] Renneboog L., & Szilagyi, P. G. Corporate restructuring and bondholder wealth. *European Financial Management*. 2008. 14(4). pp. 792–819
- [10] Tobin J. "Estimation of Relationships for limited dependent Variables ", in *Econometrica*. 1958 January 26. pp. 24-36
- [11] Lee H. W., & Ryan P. A. Dividends and earnings revisited: Cause or effect? *American Business Review*, 2002. 20(1). pp. 117–122