The Determinants of the Return of Investment: An Empirical Study of Egyptian Listed Corporations

Mahmoud A. Touny[1] and Amir A. Shusha[2]

Abstract

This paper investigated the determinants of the rate of return on investment using78 listed firms in Egyptian Stock Exchange. We used a panel data procedure by applying random effects model using Generalized Method of Moments estimation. The main results showed that the determinants of the return on investment were more effective in service sector than in productive sector. Also, the return on investment in firms with age less than 25 years was more affected by its determinants than firms with age more than 25 years. Add to that, the determinants of the return on investment had more effective role in explaining the changes in the return on investment when operating and financial risks were low. With the absence of role duality, the determinants of the return on investment played a powerful role to clarify the changes in the return on investment. Moreover, the changes in the return on investment well explained by its determinants in firms with large board size. In the light of these results, we provided some recommendations for investors and policy makers of firms.

1 1 Introduction

Before investing in a particular business, investors normally make sure that the business is financially secure and stable and have the ability to produce profits in the long run.

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[1]Associate Professor of Economics, Faculty of Commerce and Business Administration, Department of Economics and foreign Trade, Helwan University, Egypt& College of Applied Studies and Community service, Dammam University, Saudi Arabia.
[2]Assistant Professor of Finance, Faculty of Commerce, Department of Business Administration, Damietta University, Egypt & College of Applied Studies and Community service, Dammam University, Saudi Arabia.

Therefore, when the performance of the firm is not promising, in this case it would not be attractive for any investor. This failure to attract sufficient capital usually leads to negative consequences for the business sector in particular and the economy in general (Al-Matari et al., 2012).The financial performance of successful firms must be the fruit of rational financial policies which is reflected in a positive impact on the market value of the shares through increasing its share of the profits.

Return on Investment (ROI) is a measure which is widely used for measuring the efficiency and effectiveness of financial performance of firms. This measure gives a better picture of how efficiently a company is using the capital that has been invested in it to generate income. This is of course important to any prospective investor who is considering investing in an organization[3].

The main purpose of this study is to investigate the determinants of ROI depending on a balanced panel of 78 Egyptian listed firms belong to service and productive sectors and covers three years (2007-2009). These determinants may vary from one firm to another according to its different demographic attributes. Therefore, the main questions of this study are:

- What are the main determinants of ROI?
- How these determinants defer from one firm to another according to its demographic attributes, risk and board characteristics?

The importance of this study is represented in its attempt to identify the determinants of financial performance of the firms listed in the Egyptian Stock Exchange which help to make recommendations to decision-makers of firms and stakeholders of stock exchange to support their investment decisions.

The paper is structured as follows. Section II discusses the theoretical and empirical literature concerning the determinants of ROI. Section III, displays methodology used in this study and analyzes descriptive analysis of the variables. Using econometric techniques, section IV discusses the study results and finally, section IIV provides a short conclusion and recommendations.

2 2 Literature Review

The ROI represents one of the most important financial indicators of firms. There are a variety of theoretical studies that try to reveal the different determinants of ROI which include many factors such as labor productivity, debit ratio, gross profit to net sales, total investment, investment turnover, and total assists turnover. However, the significance of the impact of these factors on ROI depends on some control variables such as demographic factors, risk, and board characteristics.

The demographic factors include the size and age of firms. The firm size may have a positive or negative impact on firm's performance. Chandler (1962) stated that big firms can operate at low cost due to advantages of economics of scale. Ramsay et al. (2005) showed that larger firms have the ability to raise the barriers of entry to potential competitors and therefore increase their market share. However, in some cases, increase firm's size may hinder large firms to adopt new technologies due to bureaucracy and operational rigidities (Tripsas and Gavetti, 2000). Firm age also affects the performance of firms through learning by doing. Older firms may learn more about production

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[3]http://www.investorguide.com

techniques and enhance productivity (Vassilakis, 2008). On the other hand, young firms may respond more effectively than older firms to environmental changes through applying new strategies, creating new products and markets. These contrast viewpoints about the real effect of age and size of firms on ROI provide another dimension in our study to address this point.

Business risk is the risk that occurs as a result of the change in conditions or performance of the firm or its financial position. These risks appear in firms because of the cost and capital structure of the firm. Operating risk is the possibility of differing the earning profits due to the changes in the net sales as a result of the level of fixed costs in the cost structure. Fixed costs vary from firm to firm and from industry to another, and this are related to the degree of operating risk in different firms and industries. It is expected that the effect of operating leverage on ROI is related to the applied pattern of technology and the nature of sector which the firm belongs to (a productive or service sector). Therefore, firms that are characterized by a high degree of operating risk should not rely heavily on debts to finance their activities as high degree of operating risk is an indicator to the fluctuation of the company's ability to meet its debt.

Another factor that affects the ROI is financial leverage, which refers to the effect of the degree of earning profit on the net profit. Financial leverage results from bearing the firm a fixed financial cost, such as interest, bond coupons and dividends of preferred stocks, and may have a positive or negative impact on the ROI. These effects depend on the firm's ability to use this money effectively, and also on the overall investment climate. However, financial leverage is more flexible compared to the operating leverage as the firm can adjust the financial leverage from time to time due to the circumstances of the firm, which is difficult to be implemented in the case of operating leverage for being related to fixed assets.

The earliest literature on the impact of the board size on firm's performance was by Lipton and Lorsch (1992) and Jensen (1993). Jensen (1993) suggested that smaller board size is favorable as it leads to reduce the managerial teamwork cost. According to Hermalin and Weisbach (2003), smaller boards can be more effective than large boards. This can be explained by the agency problems that may arise when boards consist of too many members. As Lipton and Lorsch (1992) argued, the number of directors on a board should be around seven or eight. They argued that more board size than this level leads to decrease the ability of board directors to control managerial decisions. They also suggested that a large board may increase meaningless discussion and frequently results in a lack of board cohesiveness. Jensen (1993) stated that with large board the problem of coordination exceeds the advantages of having more directors. On the other hand, the performance of very small boards is negatively affected by the shortage of board diversity such as experience, skills, gender and nationality. (Dalton and Dalton, 2005)

In modern corporations, the owners are principals and managers are agents, therefore the board of directors plays a vital role in monitoring management. According to Agency theory, the CEO duality may limit the ability of controlling the performance of management. Fama and Jensen (1983) argued that separation of decision and risk-bearing functions is favorable due to the benefits of specialization of management and risk bearing and also due to controlling the agency problems caused by separation of decision and risk-bearing functions. As a result, separating the role of CEO and board chairmen more likely improves firm's performance. On the other hand, Anderson and Anthony (1986) suggested that CEO duality may enforce the ability of the board of directors to monitor managerial performance through matching between the strategy of formulation

and implementation. This debate about the impact of CEO duality on firm's performance constitutes the main motivation to study this issue in Egyptian environment.

D'Erasmo (2007) studied the linkages between investment rates and firm's age and size in USA through the period (1972-1988). The outcomes indicated that there is a negative relationship among investment rates and both firm's age and size. Smaller firms seem to have a higher marginal rate of return, whereas young firms have higher investment rates. On the other hand, Kipesha (2013) examined the impact of the firm size and age on performance of financial firms using panel data of five years and 30 firms in Tanzania. The results pointed out to a positive impact of firm size measured by total asset on the firm's performance. Add to that, the outcomes showed that the firm age which reflects firm's experience has a positive impact on efficiency, sustainability and financial revenue levels, but has a negative effect on the profitability of these firms.

Nofal et al. (2012) examined the effect of operating and financial leverage on return ratios of Jordan industrial companies listed in Amman exchange through the period 1997-2007. Their results indicated that there is a significant relationship between both operating and financial leverages and profitability ratios. Moreover, they reached to a statically relationship between turnover rates and earning per share. However, Alagha (2005) using data of 15 corporations in Palestine within the period (1999 – 2003) reached that there is no significant relationship between financial leverage and the ROI. Andersson et al. (2013) investigated the determinants of investment returns in the Swedish property fire insurance industry using unbalanced panel data set of 407 firms from 1903 to 1939. Their results showed that investment earnings are inversely related to leverage but positively related to liquidity. This means that firms adopting a more precautionary investment strategy realize higher returns.

Donaldson and Davis (1991) examined the effects of CEO duality on the return on equity using a sample of 337 U.S. corporations. Their analysis depended mainly on two contrasting approaches to the structure of corporate boards: agency theory and stewardship theory. Their findings illustrated that the ROE returns to shareholders are improved by role duality rather than non-duality, which is not consistence with agency theory, and in turn support stewardship theory. However, in the US equity funds, Kempf et al. (2012) demonstrated that duality has a negative impact on investment performance of the fund. This is explained as duality managers tend to use more risky strategies and adopt more extreme investment techniques which reflected in more extreme performance of investment rates. Contrary of these results, Chen et al. (2008) re-examined the relationship between CEO duality and firm performance using data from Standard and Poor's Executive Company database from 1999 to 2003, and they reached to a result that there is no significant relationship between CEO duality and firm's performance or improvement in firm's performance after change in leadership structure.

Guest (2009) examined the impact of the board size on firm's performance for a large sample of 2746 UK listed firms over 1981-2002, and found that the board size has a strong negative impact on profitability and share returns. Also, Al-Matari et al. (2012) studied the relationship between board characteristics and the firm's performance of non-financial listed Kuwaiti firms using a sample of 136 companies for the financial year 2009. The findings of the study support the positive effects of CEO duality on the return on assets (ROA), but a negative effect of board size on ROA. On the other hand, Ghabayen (2012) examined the relationship between board size and firm's performance (ROA) based on the annual reports of listed companies in the year 2011 of a sample of

non-financial firms in the Saudi Market, and the results revealed that board size has no effect on firm's performance.

According to that we can formulate our research hypotheses in the following points:

- The determinants of ROI differ from one firm to another according to sector.
- The determinants of ROI differ from one firm to another according to its age.
- The determinants of ROI differ from one firm to another according to operating and financial leverage.
- The determinants of ROI differ from one firm to another according to role duality and board size.

3 3 Methodology and Data Analysis

Our data set includes a balanced panel of 78 Egyptian listed firms and covers three years (2007-2009) comprising 15 service firms, and 63 productive firms. All financial and economic data of these firms were obtained from Coface, Egypt (2010/2011).

The variables used in our regression models are defined as follows. The dependent variable, Return on Investment (ROI), is defined as the return on assets. The explained variables are divided into two categories; independent variables and control variables. Control variables include sector, firm age, board size, role duality, operating leverage, and financial leverage. Sector variable is classified into Productive (value =1), and service firms (value =0). With regard to firm age variable, it is calculated as the difference between the last year of data (2009) and the established year. The independent variables include some economic and financial indicators involving labor productivity (LP), debit ratio (DR), gross profit to net sales (GPNS), firm size measured by total assets (TI), inventory turnover (ITR), and total asset turnover (TATR). Firms are classified into two groups according to age into new firms which its age less than 25 years, and old firms that its age is 25 year or more.

To investigate the impacts of independent variables on ROI, we use a panel data procedure by applying the random effects model using Generalised Method of Moments (GMM) estimation. The GMM provides a method of formulating models and implied estimators without making strong distributional assumptions, which modifies heteroscedasticity and endogeneity among the explanatory variables, and thus reduces the effects of correlation between the independent variables and the residuals. One advantage of the random effects model is it deals with omitted (unobservable) variables where some of them may be constant over time but vary between cases (company-specific effects), and other variables may be fixed between cases but vary over time(Greene,2003)[4].

The regression model is:

$$ROI_{it} = \beta_0 + \beta_1 LP_{it} + \beta_2 DR_{it} + \beta_3 GPNS_{it} + \beta_4 TI_{it} + \beta_5 ITR_{it} + \beta_6 TATR_{it} + u_{it}$$

where (*i*) points to firm, and (*t*) points to year.

This model is estimated for each control variable to reveal the true effects of the independent variables according to these control variables.

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[4]For more information about the GMM, see: Greene, W. H. (2003). Econometric Analysis, Chapter 18

Table (1) depicts some descriptive analysis and correlation matrix of the model variables. Labor productivity shows a large variation between firms where the standard deviation is about 939, which may return mainly to the diversion of firms included in the sample in both service and productive firms (from small to big firms, state owned to private firms, domestic to foreign ownership firms, and from young to old age firms).The pair-wise correlation matrix indicates to a relatively low correlation between variables. To test for multicollinearity, variation inflation factors (VIF) is estimated for the main explanatory variables of our model. The results of table (2) show that VIFs are less than 10, which is a good indicator for non-existence of a multicollinearity problem in our model.

Table 1: Descriptive statistics and correlation matrix of variables

Variables	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)
1. ROI	6.98	10.26						
2. LP	570	939	0.25^{**}					
3. DR	20.91	29.27	-0.50^{**}	-0.01				
4. GPNS	0.27	0.29	0.40^{**}	0.09	-0.36^{**}			
5. TI	2.70	8.39	0.26^{**}	0.15^{*}	0.07	0.08		
6. ITR	9.13	33.87	0.08	0.06	0.04	0.04	0.06	
7. TATR	0.75	2.05	0.06	0.03	-0.03	-0.05	0.16^{*}	0.01

Note: *significant at 5%,**significant at 1%

Table 2: Results of variance inflation factor (VIF)

Variable	VIF	1/VIF
GPNS	1.19	0.84
DR	1.17	0.85
TI	1.07	0.93
TATR	1.04	0.97
LP	1.03	0.97
ITR	1.01	0.99

4 4 The Empirical Results

Table 3 shows the determinants of ROI according to demographic characteristics of firms which include sector and firm age. It is clear from the results that the effect of DR and GPNS on ROI does not change from service to productive firms, where the effect of DR on ROI is negative and significant at 1% level of significance. Add to that, GPNS seems to have a positive effect on ROI, but more significant in productive sector. On the other hand, TI appears to have a positive and significant impact on ROI only in productive sector. This can be explained as in service sector most of total investment is reflected in fixed assets which are not changed in the short run and may not contributes directly to the ROI, especially the study period covers only three years. With regard to ITR, it has only a significant positive impact on ROI in service sector, which reflects the level of activities in this sector which depends mainly on the inventory turnover. Conversely, TATR appears to have a positive and significant effect on ROI only in productive sector as the activities of the productive sector are reflected mainly in total investment turnover.

The second part of table 3 depicts the determinants of ROI according to the age of firms. Again, DR has a negative and significant effect on ROI in both new and old firms, but more significant in old firms. Also, GPNS has a positive and significant effect on ROI in both new and old firms at 1% level of significance. However, LP seems to have a significant and positive effect on ROI only in new firms and this may be related to the new and modern technologies in these firms which result in increasing the productivity of labor. Total investment on the other hand recoded a positive and significant impact on ROI only in old firms, as old firms are characterized by high level of capital accumulation due to their internal growth rate. As TATR is relatively high in new firms comparing to old firms, this factor seems to have a positive and significant effect only in new firms. In general, Longer-established firms are expected to have developed an effective investment function and thus determinants of ROI tend to be significant in older firms.

Table 3: Determinants of ROI according to demographic characteristics of firms

Variables	Sector		Age	
	Service	Productive	≤ 25	>25
Constant	2.04	-0.84	0.43	4.22*
	(0.73)	(-0.52)	(0.18)	(2.21)
LP	0.01	0.01	0.01**	-0.01
	(1.88)	(0.89)	(2.68)	(-1.29)
DR	- 0.13**	-0.10**	-0.13*	-0.11**
	(-4.00)	(-2.95)	(-2.10)	(-4.15)
GPNS	13.29*	11.70**	10.30**	12.78**
	(2.27)	(5.27)	(3.79)	(3.91)
TI	-0.15	0.85**	0.06	0.76**
	(-1.17)	(9.66)	(0.30)	(8.27)
ITR	0.18*	-0.01	-0.01	0.06
	(2.02)	(-0.41)	(-0.35)	(0.47)
TATR	0.10	7.90**	7.02**	-0.02
	(0.59)	(5.20)	(3.30)	(-0.08)
R^2	0.865	0.333	0.345	0.415
Wald chi^2	104.34**	142.19**	141.43**	129.04**
N. of Obs.	45	189	81	153

Note: The t-ratios are in parentheses
  * significant at 5%, ** significant at 1%

Table (4) summarizes the determinants of ROI according to financial and operating risk measured by leverage. Operating leverage is calculated by the growth rate of operating profit to the growth rate of sales. We choose the value of three as a cutoff point to distinguish between low and high risky firms according to operating risk. Similarly, financial risk is measured by financial leverage, which is calculated by the growth rate of share profit to the growth rate of operating profits. Also, we choose a cutoff point of two to distinguish between low and high risky firms according to financial risk.
According to the results of table 4, DR realizes a negative and significant effect on ROI in both low and high operating risky firms. Furthermore, GPNS captures a positive and

significant effect on both groups of firms, although this effect is more significant and powerful in less operating risky firms. However, the outcomes point out that LP and TATR have only positive and significant impact in less operating risky firms. This conclusion indicates that firms with low operating risk are more capable of utilizing their fixed assets effectively and thus labor productively tends to have more effect on the ROI. Add to that, low operating risky firms are characterized by high level of TATR, which in turn reflects on the earning power of the firm.

Table 4: Determinants of ROI according to operating and financial leverage

Variables	OL		FL	
	< 3	≥ 3	< 2	≥ 2
Constant	0.60	5.23**	4.03**	-1.26
	(0.34)	(3.20)	(2.92)	(-0.64)
LP	0.01**	0.01	0.01**	0.01*
	(3.76)	(1.63)	(3.56)	(2.54)
DR	-0.12**	-0.15**	-0.06	-0.11**
	(-5.46)	(-4.50)	(-1.47)	(-4.64)
GPNS	14.47**	7.14*	7.75**	14.53**
	(5.26)	(2.46)	(4.01)	(4.52)
TI	-0.18	0.65**	0.49**	0.05
	(-1.34)	(7.25)	(5.53)	(0.44)
ITR	-0.01	0.04	-0.01	0.05
	(-0.89)	(0.96)	(-1.19)	(1.53)
TATR	6.10**	-0.01	0.02	6.94**
	(4.07)	(-0.05)	(0.13)	(4.49)
R^2	0.642	0.381	0.28	0.616
Wald chi^2	141.43**	94.94**	66.63	109.83**
N. of Obs.	87	147	121	113

Note: The t-ratios are in parentheses
* significant at 5%, ** significant at 1%

With regard to the determinants of ROI due to financial leverage, both LP and GPNS have positive and significant impact on ROI regardless of the financial risky level of firms, but the effect of GPNS is stronger in high risky firms. Debit ratio has a negative and significant effect just in high financial risky firms. Financial leverage reflects the firm ability to utilize debit funds, and thus high financial leverage indicates that a firm depends largely on debits. This explains why DR has a significant negative effect on ROI in highly financial risky firms. In firms that slightly depend on debits, TI tends to have a significant and positive effect on ROI, while in high financial risky firms, TATR seems to have a significant and positive effect. Firms with high financial risk use funds with constant cost, and therefore they realize a high level of total assets turnover which in turn reflects in high profitability. In general, firms that operate in a risky environment are likely to have a greater need to maximize investment returns than firms that operate in a stable environment.

Table 5 contains the results of the regression model according to board characteristics, which include role duality and board size. Role duality (RD) takes the value (0) when the chairman does not engage the chief executive officer, but if he engages both positions, the RD equals (1). To distinguish between the determinants of ROI according to the board size, we divide the firms to two groups; firms with small board size (BS≤ 7) and firms with large board size (BS>7).

Table 5: Determinants of ROI according to board characteristics

Variables	RD		BS	
	=1	= 0	≤ 7	> 7
Constant	2.48	2.24	2.34	1.53
	(0.95)	(1.50)	(1.45)	(0.63)
LP	-0.01	0.01**	0.01	0.01*
	(-0.49)	(4.46)	(0.02)	(2.12)
DR	-0.12	-0.10**	-0.11**	-0.12**
	(-1.76)	(-4.39)	(-2.74)	(-3.58)
GPNS	6.23*	15.59**	9.94**	14.36**
	(2.08)	(4.90)	(4.53)	(2.80)
TI	0.78**	-0.24	0.33	0.72**
	(7.73)	(-1.60)	(0.87)	(7.41)
ITR	-0.01	0.16	0.37	-0.01
	(-0.04)	(1.86)	(-1.58)	(-0.71)
TATR	3.89	0.18	7.45**	-0.02
	(1.77)	(1.04)	(4.84)	(-0.09)
R^2	0.366	0.558	0.298	0.441
Wald chi^2	69.23**	112.26**	40.55**	108.05**
N. of Obs.	75	159	123	111

Note: The t-ratios are in parentheses
* significant at 5%, ** significant at 1%

The results indicate that GPNS has a significant and positive effect on ROI, whether there is a role duality or not, but this effect is more significant and powerful when there is no rule duality. On the other hand, the existence of role duality makes the impact of TI on ROI to be positive and significant. The chairman seeks to maximize firm size which is correlated with high rewards and welfare to the administrative team. The absence of RD makes LP to have a positive and significant effect on ROI. This points out that the absence of RD supports the ability of CEO to follow his employees' performance which in turn reflected in more labor productivity. On the other hand, DR seems to have a negative and significant effect on ROI only in firms with no role duality.

Contrary to the previous results, the outcomes of table 5indicate that DR seems to have a negative effect and GPNS has a positive and significant effect on ROI regardless of the board size. However, LP and TI have only a significant and positive effect on ROI in firms with large BS. An increase of BS results in an increase of efficiency to follow up employees' performance, which leads to increase their productivity. Add to that, the increase of BS enhances the quality of long run investment decisions which is positively

reflected on ROI. On the other side, TATR recorded positive and significant impact on ROI only in firms with small BS, which indicates that TATR as a determinant of ROI is more effective in firms with small BS. This can be explained by the increase of BS effectiveness and their ability to promote sales and select the most appropriate investment. In general, we can conclude from the previous analysis that GPNS is a main determinant of ROI regardless of the firm characteristics. With regard to DR, it appears as a determinant of ROI in most cases unless in cases where firms characterized by low FL and in the existence of RD. LP is represented as a determinant of ROI in new firms, absence of RD, large BS and low of leverage indicators. On the other hand, the results point out that TI (as an indicator of firm size) is a determinant of ROI in productive firms and in firms characterized by long age, high OL, low FL, existence of RD and large BS. As Andersson et al. (2013) stated, this result indicates that big firms have the ability of avoiding investment returns fluctuations through suitable investment structure, and have sufficient resources to employ specialist financial managers who should have the necessary expertise to maximize investment returns. It is clear from the results that ITR is not a determinant of ROI in most firms except firms belong to service sector. Finally, TATR represents a determinant of ROI in productive firms, and in firms characterized by short age, low OL, high FL, and small BS.

5   5 Conclusion and Recommendations

The main goal of this study is to investigate the determinants of the rate of return on investment (ROI) using balanced panel data of 78 Egyptian listed firms in stock exchange which covers three years (2007-2009).We applied a panel data procedure by applying random effects model using Generalized Method of Moments (GMM) estimation. In general, the return on investment was affected by debit ratio, gross profit to net sales, and inventory turnover in service sector, and affected by debit ratio, gross profit to net sales, total investment and total assets turnover in productive sector.

According to firm age, the main determinants of ROI in older firms were labor productivity, debit ratio, gross profit to net sales, and total assets turnover, while in new firms, debt ratio, gross profit to net sales and total investment were the significant determinants of ROI. With regard to risk indicators, the results indicated that ROI is affected by labor productivity, debit ratio, gross profit to net sales, and total assets turnover in firms with high operating risk, while debit ratio, gross profit to net sales and total investment were the significant determinants of ROI in firms with low operating risk.

On the other hand, labor productivity, gross profit to net sales, and total assets were the determinants of ROI in firms with high financial risk, while ROI was affected by labor productivity, debit ratio, gross profit to net sales and total assets turnover in firms with low financial risk. Furthermore, with the existence of role duality, ROI was affected by gross profit to net sales and total investment, while in case of absence of role duality, factors such as labor productivity, debit ratio, and gross profit to net sales were the main determinants of ROI. From this result, we can conclude that when the chief executive officer (CEO) does not engage the role of chief of the board, the performance of ROI will be affected by new factors such as labor productivity and debit ratio, and the role of gross profit to net sales seems to be more significant.

Moreover, ROI in firms with small board size was determined by debit ratio, gross profit to net sales, and total asset turnover. On the other hand, the effect of total assets turnover disappeared, while new factors such as labor productivity and total investment were effective in firms with large board size. This may return to an increase of the effectiveness of the role of board of directors in these firms.

From the previous results, we can provide some recommendations for decision-makers of firms and stakeholders of stock exchange which are summarized in these points:

Investors should direct their investment to firms with:

- Low debit ratio where debit ratio has a negative impact on ROI in most firms.
- High gross profit to net sales (GPNS) not the net profit as the GPNS reflects the firm's income from its main activity while net profit is affected by income of other activities other than the main activity.
- High labor productivity in new firms and firms with low operating and financial risk.
- High total investment in productive and older firms, and firms with high operating risk but low financial risk.
- High gross profit to net sales and high total investment in case of the existence of role duality, and high labor productivity, high gross profit to net sales, and low debit ratio in case of absence of role duality.
- High gross profit to net sales, high total asset turnover, and low debit ratio in case of small board size, and high labor productivity, high gross profit to net sales, high total investment, and low debt ratio in case of large board size.

On the other hand, decision-makers of firms should give greater attention to the following points:

- Decrease their debit ratio as possible as it has a negative effect on the ROI in most cases.
- Raise their labor productivity especially for new firms and firms with low operating risk and high financial risk.
- Gross profit to net sales as it has a positive and significant impact on ROI in all firms included in this study.
- Total investment appears to be an important indicator of high ROI in older firms and firms with high operating risk and low financial risk.
- Divorce board chief from the chief executive officer as in case of role duality ROI was affected by total investment which maximizes the interests of the executive team at the expense of the interest of shareholders. In turn, the effect of this factor disappeared in case of the absence of role duality in favor to other factors such as labor productivity and debit ratio, and gross profit to net sales which became more significant. Add to that, we can remark that the interpreted force of the regression model increased in case of the absence of role duality as reflected by R^2. This resultis convenient with the corporate governance theory.
- High gross profit to net sales, high total asset turnover, and low debit ratio in case of small board size, and high labor productivity, high gross profit to net sales, high total investment, and low debt ratio in case of large board size.
- Increase the board size as it has a positive effect on ROI which was reflected in an increase of R^2 and explanation variables of the model. However, we shouldn't generalize this results as the theory of board size indicates that the effectiveness of the board size may negatively affected when board size increase over a certain limit.

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