



The Inter – Relationship Between Profitability and Growth in Iranian Market

Seyed Babak Ebrahimi*, Hooman Abdollahi, Ali Farmani

Seyed Babak Ebrahimi, Department of Industrial Engineering, K. N. Toosi University of Technology

Hooman Abdollahi, Department of Industrial Engineering, Karaj Branch, Islamic Azad University

Ali Farmani, Department of MBA, Iran University of Science and Technology

KEYWORDS

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ABSTRACT

Owing to the attractiveness of developing economies, which seems engaging for investors, studying cardinal features of financial market of these economies seems important and necessary. The present study examines the relationship between firm's profitability and growth in Iranian manufacturing industry consisting of Tehran Stock Market listed between manufacturing firms. For the purpose of the study, firms' annual data during 2005-2014 period constituted the sample of the paper. In order to understand the direction of causality between firm growth and profitability, system GMM (Generalized Method of Moments) is employed to estimate growth and profit regressions. The results obtained indicate that there is a positive bilateral relationship between profitability and growth in the case of Iranian manufacturing firms. Also, the empirical analysis finds that the positive impact of current profit (growth) on current growth (profit) is stronger than the impact of the prior's year..

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1. Introduction

The high competitiveness of today's economical environment, added to effects of globalization, means that industries must find ways to satisfy their customers [1]. In so doing, the extent to which a firm achieves profit and growth is an indicative factor according to traditional theories. Organizational theorists believe that profit and growth are firms' two competing targets. Although pursuing both objectives

simultaneously is difficult, managers opt for either profit or growth, but not both. Thus, an interaction occurs between growth and profitability. The relationship between growth and profitability has been a striking and controversial issue in finance due to inconsistent results reported in empirical findings [2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13]. While previous studies have provided evidence from advanced and developed countries, this paper investigates data from a developing's. In so doing, the researchers investigate the data of Iranian listed manufacturing firms to fathom whether the relationship between profit and growth is

* Corresponding author: Seyed Babak Ebrahimi

Email: b_ebrahimi@kntu.ac.ir

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contingent upon economic development. Developing economies are acquiring engaging positions since the complexities of the present financial markets have caused international companies and investors having a tendency towards developing financial markets to earn more profitability and growth. The attractiveness of the developing markets is in the profit and growth levels that developed markets do not offer to investors [14].

The proposition that growth and profit affect each other is suggested by some related theories, but it still seems equivocal. In developing economies whose financial markets are not well-developed enough, both profit and retained earnings are considered as two important sources of finance for expansion as the firms must permanently control the situation to make appropriate investment decisions [15]. In order for profitable growth to be achieved, firms either focus on profit or growth since it is difficult to achieve these very two objectives concurrently [12]. Furthermore, developing growth has been a key benchmark of firms' success, and sales growth has become one of the most common objectives for business managers [11]. Therefore, there is an interplay between profit and growth that empirical analysis determines its direction.

In this context, the researchers try to shed light on the relationship between growth and profitability; in other words, the aim of this study is to seek answers for these very questions: Is profitability a corollary of growth? Or firms grow due to profitability and reinvesting the profits? Therefore, this paper uses a panel data on 72 Iranian listed manufacturing firms over the span 2005-2014. Profit and growth rates are observed annually for this period, and several control variables, such as firm's size, debt ratio, and financial leverage, are considered. We estimate growth and profit regressions by using system-GMM [16]. This paper provides contribution to the literature because this is the first study that investigates the profit-growth relationship amongst Iranian firms while uses controlling variables as well.

The paper proceeds as follows. Section 2 reviews the literature germane to our study. In section 3, the regression model and estimation method are presented. This is followed in section 4 by empirical results. Section 5 concludes the paper.

2. Literature Review

Theories, such as First Mover Advantages (FMAs) [17], network externalities [18], experience effects [19], and scale economies

[20], suggest that profitability arises from growth or establishing a stronger market position either via lowering costs.

Several, but not many, studies have been conducted in empirical realm specifically in advanced countries. For instance, Robson and Bennett [21] observed a positive profitability-growth and profitability-number of employee's relationships in small and medium-sized British firms although only the growth case is considered statistically significant. Cox et al. [22] indicated the presence of a positive relation between sales growth rate and profit growth rate. In conformity with antecedent studies Cowling [23] indicates that profit-growth relationship is dynamic in British firms. Coad [7] reported that the growth impact on consequent financial performance is larger in French firms, whilst profitability is of a positive and statistically significant effect on growth. Investigating a sample of Italian manufacturing firms, Bottazzi et al. [24] observed that the correlation between profitability ratio and firm growth is positive, but scarcely significant; however, Coad et al. [25] showed that growth has a positive impact on profitability, but reciprocal relationship is not approved. Perényi and Yukhanaev [26] reported a positive relationship between past profitability and firm current growth rate. On the other hand, some studies have demonstrated that growth does not lead towards profitability [27, 28] and firm's profit generation slows down because of swift growth [29]. Besides, a study by Davidsson et al. [10] contended that profit-focused firms are in better situation to reach profitable growth in comparison with growth-focused-firms.

However, a consistent positive growth-profit relationship is not found in empirical studies. Some studies report no relation between the growth and profitability [27]; for instance, Gschwandtner [30] argued that there is not a statistically significant relationship between firm growth and profitability in American companies. Likewise, Bottazzi et al. [24] proved that there is not a remarkable relationship between growth trend and profitability. Furthermore, by using a dynamic panel model, Shehzad et al. [31] found that growth and profitability are independent.

On the other hand, some studies have demonstrated that growth does not lead towards profitability [27, 28, 32] and firm's profit generation slows down because of rapid growth [29]. A study by Davidsson et al. [10] suggested that profit-focused firms are in better condition to reach profitable growth in the future that in comparison with growth-focused-firms.

Markman and Gartner [27] studied profit-growth relationship via sales as well as employment growth as indicators of firm growth and found a negative interplay between firm growth and profitability.

Also, Jang and Park [12] provided evidence on the dynamic relationship between profit and firm growth. They found that the prior year's profit influences the growth rate of the current year positively. Although, the current and prior year's growth rates have a negative effect on the current year's profit, their findings evince that in the restaurant industry, profit begets growth, but growth has a detrimental impact on profit. Delmar et al. [33] recognized positively bilateral relationships between growth and profit. Lee [34] used dynamic panel data regressions by applying fixed effects and GMM methods to evaluate the relationship between growth and profitability in Korea, and found that profit affects growth negatively, but growth affects profit positively. Federico and Capelleras [35] examined Spanish manufacturing firms during the period 1996–2010, and declared that the effect of profit on growth is not significant. Yu et al. [36] showed the profit-growth relationship is mediated via investment. Firm's contemporaneous and lagged profits display positive and significant effect on investment spike and investment activity leading to higher growth. Based on the system generalized method of moments Model, Yoo and Kim [37] found that a profitability-driven management strategy limits firm's growth.

Insert Table 1

Table 1 presents the results and denouement of the most seminal empirical studies, showing that the empirical results consist of a motely group of findings. As seen above, both theoretical and empirical approaches are paradoxical in finding the direction of profit-growth relationship in firms of different financial markets. To be in line with the literature, this paper explores this objective in Iranian manufacturing firms.

3. Research Methodology and Model

Many researchers have compared different time series models together in order to determine the more efficiency in financial markets [38]. For the purpose of this study, trying to figure out the relationship between growth and profitability, a two-step system GMM [16] is employed. In this section, research methodology, model, data, and variables are presented.

3-1. Research Methodology

Dynamic panel data estimation becomes more suitable where unobservable factors affect both

the dependent and the explanatory variables, and also some explanatory variables are strongly related to the past values of the dependent variable [39]. This is the matter in regressions of growth on profit, and vice versa. Blundell and Bond [16] suggested the dynamic panel data model employed in the equations of present study; by the way, the developed version of GMM estimator was also recognized as system-GMM (sys-GMM) derived from a system's estimation of two simultaneous equations: in first differences (with lagged levels as instruments) and in levels (with lagged first differences as instruments). The two-step sys-GMM uses a consistent appraisal of the weighting matrix taking the residuals from the one-step estimate when heteroscedasticity and serial correlation exist [40]. However, the two-step GMM runs estimations of the standard errors that tend to be downward biased.

A weakness of GMM estimations may be too many instrument problems, although there are diverse methods to lessen instrument variable number. Using only certain lags, rather than all available lags for instruments (limited lags), is the first method. The second, collapsing, is to compound instruments by adding them to smaller sets. A dynamic way is to benefit from the two techniques together [41]. There are several reasons to justify the preference of dynamic sys-GMM panel model. Firstly, static panel estimation ignores dynamics and leads to estimation bias [42, 43]. The meaning of omitted dynamics implies that such models are misspecified as passing over the impacts of lagged dependent variable on dependent variable [43]. Secondly, the correlation of independent variable with the error term occurring in regression model can be solved easier by dint of dynamic panel data models in comparison with the static models.

3-2. Model

To depict the specification of the dynamic panel growth and profit models, the following equations are specified:

$$\begin{aligned}
 GR_{i,t} &= \alpha_1 + \beta\alpha_2 GR_{i,t-1} + \alpha_3 PR_{i,t} + \eta_{1i} + v_{1i}; \quad i \\
 &= 1, 2, \dots, n, t \\
 &= 1, 2, \dots, T.
 \end{aligned} \tag{1}$$

$$\begin{aligned}
 GR_{i,t} &= \alpha_1 + \beta\alpha_2 GR_{i,t-1} + \alpha_3 PR_{i,t} + \alpha_4 PR_{i,t-1} + \eta_{1i} \\
 &+ v_{1i}; \quad i = 1, 2, \dots, n, t \\
 &= 1, 2, \dots, T.
 \end{aligned} \tag{2}$$

$$\begin{aligned}
 & PR_{i,t} \\
 & = \beta_1 + \beta_2 PR_{i,t-1} + \beta_3 GR_{i,t} + \eta_{2i} + v_{2i}; \quad i \\
 & = 1, 2, \dots, n. t \\
 & = 1, 2, \dots, T.
 \end{aligned} \quad (3)$$

$$\begin{aligned}
 & PR_{i,t} \\
 & = \beta_1 + \beta_2 PR_{i,t-1} + \beta_3 GR_{i,t} + \beta_4 GR_{t-1} + \eta_{2i} \\
 & + v_{2i}; \quad i = 1, 2, \dots, n. t \\
 & = 1, 2, \dots, T.
 \end{aligned} \quad (4)$$

Where i represents the firms ($i = 1, \dots, 72$) and t indicates the time span ($t = 2004, \dots, 2010$). η_{1i} and η_{2i} indicate firm-specific effects; v_{1i} and v_{2i} are random error terms. To constitute additional related control variables, size, debt ratio, and financial leverage are considered, but the coefficients of these control variables are not estimated in the regressions, only used as exogenous instrumental variables.

3-3. Data and Variables

The data are extracted from balance sheets and annual financial statements of 72 manufacturing firms listed in Tehran Stock Market over the period 2004-2010. In this paper, sales growth, believed to be closely related to the profitability, is used as a measure of firm growth. Net sales growth is an obvious prospect for a variable that would designate a firm's profitability due to giving a more accurate image of the real sales engendered by the firm. Model's variables and their computational methods are presented in table 2.

Insert Table 2

Descriptive statistics of the main and control variables are presented in table 3. Accordingly, the results show that growth rate is greater than profit rate for manufacturing firms listed in Tehran Stock Market. It means these firms have a high growth rate, but profit rate is slower. The average size indicates that these firms are relatively large.

Insert Table 3

4. Empirical Results

Before model estimation and as a preliminary step, we use scatter plots to provide a visual representation of the underlying relationships between growth rate and prior year's profit rate or between profit rate and prior year's growth rate. In table 4, these relationships, as scatter plots, are displayed.

Insert Table 4

The first row of Table 4 displays $GR_{(t)}$, $GR_{(t-1)}$, and prior year's profit rate. The second row of Table 2 represents $PR_{(t)}$, $PR_{(t-1)}$, and prior year's growth rates. It is obvious, based on the plots, for profit rate in times t and $t-1$, the current and prior

year's profit rates have positive correlation. All other plots have a cloud shape and implicate no relationship but $GR_{(t)}$ and $GR_{(t-1)}$ that almost have a little positive correlation. Clearly, these scatter plots show that whether or not there is a relationship between variables but no information about directions of effects will be given by them.

To find the directions of causalities, Eq (1), Eq (2), Eq (3), and (4) are estimated by using sys-GMM estimators, and the results are presented in tables 5 and table 6.

Insert Table 5

According to results presented in Table 5, there is a statistically significant relationship between growth and profit. Likewise, a positive relationship exists between the present growth and the growth of prior year. The regression of Eq (1) denotes that growth persists and the current profit bolsters the current growth. The impact of the current profit on current growth (1.2) is more apparent than that of prior year's growth (0.5); however, both are statistically significant. It means high profitability gives rise to high level of growth for firms. In dynamic regression equations, the lagged dependent variable is included into the model in order to control the endogeneity problem or better still the correlation of independent variable with the error term. Using the lagged profit added to the model and regressing Eq (2), it is revealed that the current profit and prior year's profits have a positive effect on firms' growth, but prior year's profit impact is not significant (t-value, 0.57), meaning that Iranian market is intensely volatile as well as making an allusion to pickaxe society of Katouzian [44]. On the other hand, prior year's growth does have a fairly strong positive impact on the current growth (0.54) and statistically significant (t-value, 16.39) for the manufactory firms of Tehran Stock Market. The results convey that high profits of a particular year tend to have higher growth rates next year. Moreover, the Sargan test and the test for second-order autocorrelation of the residuals, AR (2), were performed to assess model specification and instruments validity, and approve the robustness of findings.

The results of the profit regression, Eq (3) and Eq (4), are presented in Table 6. According to the result of Eq (3), prior year's profit is of a positive and significant (t-value, 3.53) impact on current profit. Besides, the current growth influences the current profit positively and significantly. All regressions engender statistically significant and positive coefficient estimates of the prior year's profit and growth terms. That is to say, high

growth leads to high profits. Although the result of Eq (4) conveys that prior year's growth has a very little and insignificant impact on the current profit, the impact of the current growth is more obvious than the prior's.

Comparing the regression result of profit with that of growth, for manufactory firms of Tehran Stock Market, the authors fathom that the impact of the current profit on the current growth, and vice versa, is much stronger than prior year's effect. It may happen due to the volatility of a developing economy affected by environmental factors. Furthermore, the results demonstrate that lagged growth affects the current year's profit positively, but it is not statistically significant; furthermore, there is a relatively strong positive relationship between lagged profit and the current growth.

Insert Table 6

5. Conclusion

This study investigates the relationships between firm's profitability and growth in Iranian manufacturing industry consisting of Tehran Stock Market listed manufacturing firms covering 2005-2014. In order to fathom the direction of the causality between firm's growth and profitability, Dynamic Panel Data estimation methods are employed to estimate profit and growth regressions.

The empirical analysis corroborates the direct relationship between the current growth and current profit; what is more, findings indicate a positive relationship between prior year's profit with current growth rate and also a positive inter-relationship between prior year's growth and the current profit exists. The findings from the profit regressions show that firm growth affects the profit positively. The positive effect of growth on profit is consistent with the findings recently reported by other researchers from different financial market and contradicts the theories in Industrial Organization suggesting a negative relationship.

The present study finds a bilateral positive relationship between growth and profitability. Be that as it may, limitations of this context may lie in the dataset used in this analysis which is not sufficient enough to generalize these results over the all Iranian manufacturing sector. Moreover, using LAD regression could be useful to check the robustness of the results. Also, the findings in this study indicate a need for further research to explore the moderating role of different variables on the relationship between profit and growth.

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Tab. 1. Recent seminal studies of growth and profit

	Regional Scope	Period	Method	Growth on profit	Profit on growth
Cowling [23]	UK	91–93	OLS 2SLS	Positive	Positive
Goddard et al. [6]	EU	92–98	OLS GMM	Neutral	Positive
Coad [7]	France	96–04	OLS GMM	Positive	Neutral
Coad [8]	France	96–04	LAD(VAR)	Positive	Neutral
Coad et al. [25]	Italy	89–97	LAD(VAR)	Positive	Neutral
Jang and Park [12]	US	78–07	GMM	Negative	Positive
Lee [34]	South Korea	97-12	Fixed effects GMM LAD(VAR)	Positive	Negative
Coban [39]	Turkey	99-08	GMM	Positive	Positive

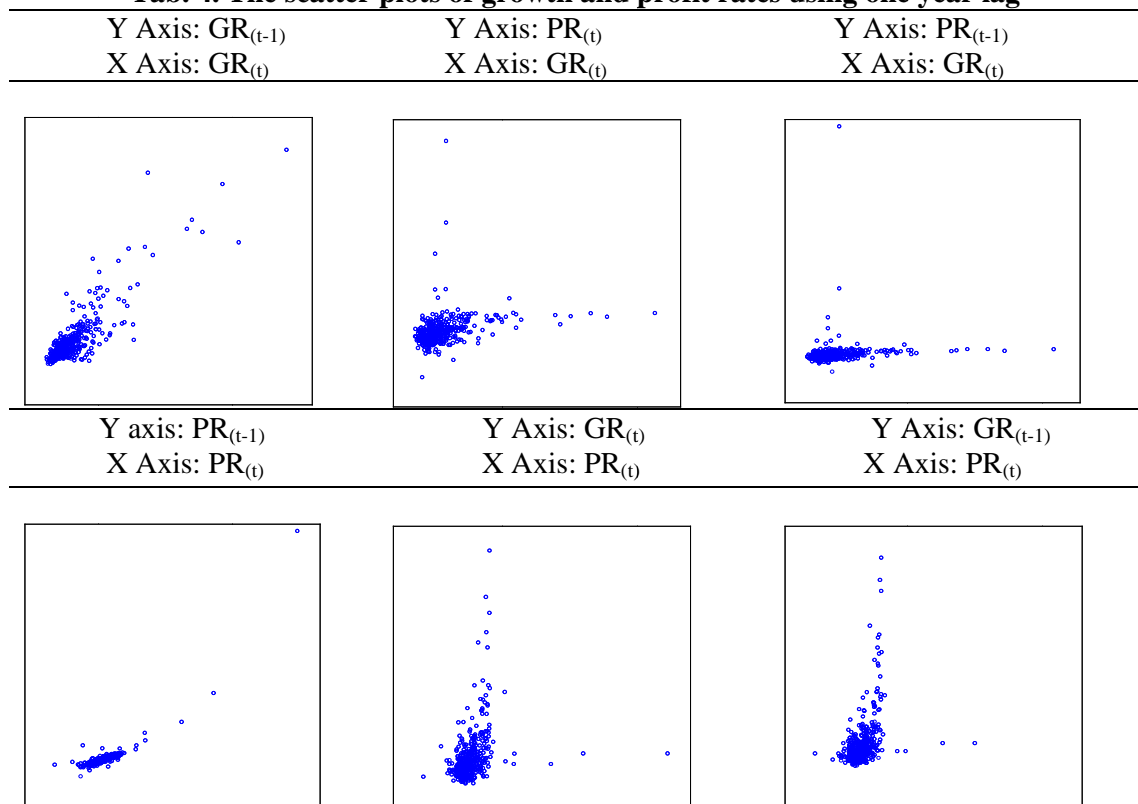
Tab. 2. The variables and their computational methods of the sys-GMM Model

Main variables	Computational method of the variables
Growth Rate	Book to market value-Shareholders' equity+(Stock price _(t) *Stock quantity _(t)) / Book-to-market value
Profit Rate	Gross operating profit _(t) / Sales _(t)
Control variables	Computational method of the variables
Leverage	(Short term debt + Long term debt) / Equity
Debt Ratio	Total liabilities / Total assets
Size	Stock price _(t) *Stock quantity _(t)

Tab. 3. The descriptive statistics of main and control variables

Variables	GR	PR	Leverage	Size	Debt
Mean	0.5863	0.3166	2.3819	0.6045	62.8035
Std. Dev.	1.0024	0.5664	3.6065	0.2345	18.4569
Obs.	496	504	496	497	504

Tab. 4. The scatter plots of growth and profit rates using one year lag



Tab. 5. Two-step sys-GMM estimation results of growth regressions

Dependent variable: GR	Eq (1)		Eq (2)	
	Coefficient	t-statistic	Coefficient	t-statistic
GR _(t-1)	0.5745	21.4027	0.5457***	16.3913
PR _(t)	1.2064***	2.6353	1.0261**	1.9391

PR _(t-1)	—	—	0.3608	0.5750
AR(1)	0.0004		0.0004	
AR(2)	0.5822		0.7414	
Sargan	0.097		0.058	
Instruments	15		15	
Observation	573		573	

NOTE: Year dummies are included for all regressions, but not reported here in order to save space. GMM type variables are GR(t-1) and PRt and their lags range is set from two to five in all models.

*Significance levels at 5% level.

**Significance levels at 1% level.

*** Significance levels at 0.1% level.

Tab. 6. Two-step sys-GMM estimation results of profit regressions

Dependent variable: PR	Eq (3)		Eq (4)	
	Coefficient	t-statistic	Coefficient	t-statistic
PR _(t-1)	0.2409***	3.5324	0.1516	2.1351
GR _(t)	0.1196**	2.7733	0.0917**	1.9580
GR _(t-1)	—	—	0.0266*	0.6031
AR(1)	0.0052		0.0045	
AR(2)	0.3079		0.3530	
Sargan	0.256		0.222	
Instruments	15		15	
Observation	573		573	

NOTE: Year dummies are included for all regressions, but not reported here in order to save space. GMM type variables are GR(t-1) and PRt and their lags range is set from two to five in all models.

*Significance levels at 5% level.

**Significance levels at 1% level.

*** Significance levels at 0.1% level.

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