

PRODUCTIVITY AND CAPITAL INVESTMENTS: EVIDENCE FROM TEHRAN STOCK EXCHANGE (TSE)

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ABSTRACT

This study investigates the relationship between Productivity and Capital Investments and try to empirically investigate the factors seem to be related to capital investments. For this purpose, a sample consists of 70 firms accepted in TSE thorough 2001 to 2010 were examined.

The results show that, aggregately, there is no substantial relation between Productivity and Capital Investments unless in the second model, which a weak relation exists. The findings show that the leverage characteristics of firms and financing the firm by debts, has a negative and significant effects on capital investments. Also, the variables as firm size, capital intensity and finished goods, have significant and positive relationship with capital investments.

Keywords: Capital Investments, Capital Productivity, Labor Productivity, Cost of Capital, Value Added, Capital Intensity-JEL Classification: M21, G32

1. INTRODUCTION

It is truly clear that production plays an important role in economic growth and blossoming in any country; therefore, all parts of the society reach a consensus on attention and support that focuses on manufacturing sectors to promote economic development and welfare. Capital investment is a critical factor for the prospective success of firms. This is partially due to the extent of such costs that guarantee the situation of their future. Moreover, all decisions related to this kind of investments, provide information about how and where the firm is on its way to meet aspirations and objectives. However, firms` success requires appropriate decisions about capital investment (Moradi and Ahmadi 2010).

On the other hand, it should be noted that many variables (like productivity) affect capital investment and consequently the effective firm`s growth. According to the researchers` findings, productivity is a variable for

total competitiveness at industrial and national levels" (Porter 1990). Production growth will be raised positively due to increasing productivity.

The term "Productivity" is used widely by people regardless of understanding the correct meaning, and this causes them to ignore the productivity itself or even decisions in contrast with it. Chow (1988) stated: "Although the concept of productivity has existed for a long time, a remarkable number of people who decide about improving the performance of industrial units daily, don't know how to answer the simple question about what productivity is". Bijour Keman (1991) states that "decisions relating to productivity improvements are often based on personal beliefs than common point of view (Rahimi and Rezaee-Ghal'e 2008).

In defining productivity, it should be considered as a general and comprehensive concept and as a development, and it is known as an essence or necessity for increasing the level of public welfare, peace and relief in all nations. This concept was applied for the first time in an article published by Queezni, in 1776. Productivity means an action accompanied by success and prosperity (Rahimi and Rezaee-Ghal'e 2008). The term "productivity" is meant "the power and ability to produce" in English dictionaries.

Productivity means both concept and variable for measuring the performance of economic system. Productivity knowledge is not a new phenomenon and its life is as old as human history. It should be pointed out that the notion of productivity is considered as a tool to evaluate the performance of economic activities in many countries and international institutions such as the World Bank and IMF in this century. Higher rates of production growth is one the most important affects of productivity. If productivity grows along with increasing inputs, outputs will increase at the same time. However, it is needed to consider productivity as the main source of economic growth for increasing economic welfare and development. Remarkably, based on objectives determined in the Vision Plan, Iran must be a developed country ranking the first position economically, scientifically and technologically in the region by 1404. Improving productivity can be considered as one of the most useful and important factors for achieving this goal.

Singh et al. (2000) argued that productivity is one of most important variables that affect economic-manufacturing activities. Grossman (2003) made some statements about improving productivity, which is a key result of competitiveness among Economic Enterprises; for example: "Firms should know that earnings achieved by productivity are critical to take quality and price advantages of competition with others" (Rahimi and Rezaee-Ghal'e 2008).

Considering the role of forecasting in economic decisions, in this paper, we will try to determine the factors which explain the differences between productivity and amount of capital investments among TSE firms due to considering assessment as the key element of all economic decisions and investments. It is expected that labor and investment productivity, firm size and capital intensity play important roles in explaining these differences. Therefore, in this research we are trying to detect the relationship between the productivity and capital investment of TSE firms by analyzing productivity information. Hence, we set variables which help us explain relationships between productivity and capital investment by analyzing productivity information related to the manufacturing firms of Tehran Stock Exchange (TSE). Also, we will identify factors influencing the firms that help us reach better knowledge of resolving the problems that cause the lack of success in firms' capital growth. Thus, it allows us to detect some means to solve them.

2. LITERATURE REVIEW

Since production is an essential and critical factor for providing higher growth, we can consider manufacturing firms as the main engine of growth and wealth creating in all developed societies; therefore, manufacturing contribution in National Gross Product is essential in all countries. However, manufacturing rates will increase by rising sales and particularly investment growth rates. Capital investment is considered as an important and valuable issue for the prospective success of firms. This is because the rate and extent of this style of investments and decisions related to them will reflect the firms' future situation and status. Therefore, appropriate decisions about capital investment will lead to success (Moradi and Ahmadi 2010).

There are many variables in the field of investment growth, particularly productivity leading to growth. The researchers state that productivity is generally a variable applied to industrial and national competitiveness (Porter 1990). Many developed countries obtain their significant part of manufacturing growth by means of productivity. All in all, the ratio of productivity growth is about 50 percent in these countries. Therefore, the higher the productivity, the higher the production rates will be. Productivity is a concept and variable for evaluating the performance of the economic system. Productivity knowledge is not a new phenomenon, and its life is as old as human history. The concept of productivity is considered as a tool to evaluate the performance of economic activities by many countries and the global financial institutes such as the World Bank and International Monetary Fund (IMF). Increasing the rates of manufacturing growth is one of the most important results of productivity improvement. If

productivity grows along with applying inputs, the growth of manufacturing will be higher. To increase the economic welfare and growth in the society, it's necessary to look deeply into productivity as the main source of economic growth. Notably, based on objectives determined in Iran's Vision Plan, the country must be a developed nation ranked in the first position economically, scientifically and technologically in the region by 1404. Therefore, quick and continuous economic growth is needed for achieving this goal. Moreover, promoting productivity may be considered as one the useful and affective factors for meeting this objective.

Singh et al. (2000) argued that productivity is one of the most important variables which affect economic-manufacturing activities and Grossman (2003), discussed improving productivity which as a key factor is resulting from competitiveness among economic enterprises: "Firms should know that earnings achieved by productivity are critical for achieving the quality and price advantages of competition with others" (Rahimi and Rezaee-Ghal'e 2008).

Bernolak (2009) terminologically explained productivity in a way that is related to manufacturing:

Productivity means 'the amount of the resource we have used in order to have a good production'. We increase productivity whether we have produced a certain amount of goods by applying fixed or smaller resources. "Resources mean all human and physical sources including all people offering services or producing stuffs or the assets that allow employees to produce goods or provide additional services. Those resources which are applied may include land, buildings, moveable and non-movable equipments or machineries, tools, raw materials, properties and other available assets".

This definition includes two features:

1. Productivity relates very closely to the use and availability of resources. In short, productivity of a firm will decrease if resources are not used properly or if they seem to have shortages.
2. There is a meaningful relationship between productivity and value creation. Thus, higher productivity is obtained exactly when activities and resources applied in manufacturing process result in increasing the value of the produced goods. Therefore, it can be said that wastes must be eliminated in order to improve productivity (wastes versus productivity).

However, in this paper, we try to extract some variables to determine factors that affect the amount of corporate investments by following up analyzing manufacturing firms' information of Tehran Stock Exchange (TSE). By defining some variables, this paper focuses on the relationship between productivity and capital investment in order to provide some new information for stakeholders. Previous studies have focused on determinants

of capital investments and the role of productivity, but in this paper we utilize some accounting variables as substitution for productivity and we will define and use different definitions of productivity from accounting view. Some of the studies done in this field presented following.

Capital investment is the costs that maintain, consist or increase the production capacity and services and also help firms provide future profitability. Capital investment is mainly spent on the purchase, construction, improvement and maintenance of fixed assets (Mojtahed-zadeh and Ahmadi 2010). Firms grow slowly in a large number of developed industries that produce standard goods. However, those experiencing recent technical improvements endure higher capital investments. Investigations suggest that in concentrated industries, budgeting of capital investments is more easily done than other firms since the anticipation of the future conditions is easier. Capital investment is an essential factor for the future success of firms. This is likely because relevant decisions reflect the condition of firms. Therefore, appropriate decisions about capital investments will lead to the future success of firms (Mashayekhi et al. 2006).

The costs suffered by firms for acquiring fixed assets such as: Lands, Buildings, Machineries, Vehicles and Equipments are the elements of capital investments. These costs are depreciated and subtracted from earnings. Capital investments are created when a new fixed asset is purchased or values are added to existing assets for increasing their economic life. Capital investment includes purchasing an asset, transportation costs, insurance, legal costs and all costs undertaken for acquiring an asset and preparing it in order to be applied by firms. Managers carefully focus on capital investment decisions. That's why they are irreversible and costly.

Astiri (2002) investigated the information content of capital investment in active firms of Tehran Stock Exchange (TSE) for the period of 1996 to 2000. Study results show the information content of capital investment in relation to variables such as future earnings and sales.

Jahan-khani and Kan'aani-Amiri (2007) provided a model that determines capital investment levels in firms accepted in Tehran Stock Exchange (TSE), by considering accounting information. They declared that managers should run projects which are profitable to maximize the value of firms. Capital investment is an essential part of financing firm projects. Firms' funding strategy is one of the most important issues in financial sciences. Selecting types of funding that include floating shares or bonds or taking out a loan affects the stock exchange. The main goal of this paper is to provide a comparative study among the firms using capital investment, or leveraged firms. Moreover, relationships between capital investments and Tobin's Q variable and future stock returns and relationships between the type of financing and Tobin's Q variable and future stock returns happens in

these two groups of firms. The population of this research includes the firms listed in Tehran Stock Exchange for the period 1991 to 2004. Results show that capital firms are more sensitive to non-fundamental elements of the stock prices in the stock markets in comparison with leveraged firms. Investment firms are positively less sensitive to future stock returns in this market as well. Research results indicate that stock markets (stock prices) are in relationship with investment firms and also corporate investment and stock markets are continuously interdependent and cross-referenced from a chronological point of view.

Moradi and Ahmadi (2010) in a research titled “determining the factors that affect the behavior of corporate investment in incomplete markets” studied the factors which influence the capital investment. At the next step, they assessed changes in capital investment by using data obtained from 81 firms of TSE from 2002 to 2008 and applied the regression model. This research results show that there is only a meaningful relationship between operating cash flow variable and capital investment variation.

Mojtahed-Zadeh and Ahmadi (2010) studied the fields of earnings quality, accounting information and capital investment. The purpose of this study was detecting the effect of increasing earning quality on the sensitivity of capital investment to the current financial year earnings and its accruals. Earning quality was calculated based on the quality of working capital accruals. Test hypothesis used in this study indicates that the sensitivity of future capital investment to current financial year earnings will increase due to increase in the quality of earnings. Moreover, it was found that the sensitivity of the future capital investment to the accruals of earnings will be higher than cash flows.

Biddle and Hilary (2009) investigated the effect of increasing the quality of accounting information on the sensitivity of capital investment to operating cash flows by selecting samples from 34 countries. Their research results showed that due to the quality growth of accounting information, the sensitivity of capital investment to operating cash flows increase.

By selecting 6193 American firms, Chen (2005) examined the effect of increasing earning quality on the sensitivity of the next financial year's capital investment to the current year's accounting. In his study, it was assumed that the capital investment of the next financial year is sensitive to current year's earnings. Therefore, he studied the effect of earnings quality on this sensitivity. Measuring the quality of earning quality in his study based on the quality of working capital accruals of Dechow (2002), in which the less applying measurement errors and estimates for working capital, the higher the quality of accruals and earning quality will become. Results indicate that there is a positive association between earning quality and capital investment; in other words, the sensitivity of the next financial year's

capital investment to the current accounting earnings will grow due to increasing earning quality.

Mashyekhi et al. (2011) examined accrual's anomaly (the effect of accruals on stock returns), capital investment anomaly (the effect of capital investment on stock returns) and also improving stock performance by simultaneously using both anomalies in Iran's capital market. Samples were selected from among 480 active firms of Tehran Stock Exchange (TSE) during the period 2002-2008. They found that there are distinct accruals and capital investment anomalies in Iran's Capital Market. Findings show that after controlling "Fama and French three-factor risk model", investors who apply two instead of only one anomaly earn higher returns.

Zhang (2000) remarked that firms are self-sufficient in development of their activities, and current profitability is playing a role as a predictor for Capital Projects (capital investment) decisions. Normally, directors apply this option (developed or less-developed) as soon as they receive the sign of profitability, whether it's high or low. In other words, accounting information steers all decisions about capital projects.

Khaksar (2002) in his research studied measuring productivity in domain of Iran's Aluminum Co. during the period 1351-1372. He applied two methods of Index and function for his research. He found that fluctuations in the metal industry share better situation in comparison with others firms.

Zera`a-Nezhad and Ansari (2008) examined the major industrial investment productivity of Khuzestan Province during the period 1972-2005. They concluded that the growth of capital productivity has been approximately constant in this region in 2007.

Rahimi-Far (2009) expressed: "empirical studies show that economic growth results from production factors- particularly labor productivity- in some countries", by analyzing productivity and economic growth. "Increasing and improving working conditions and promoting labor productivity are important factors for achieving goals and objectives", she added.

Tayyebi et al. (2009) concluded that human investment affects the total factor productivity of production and economic growth positively and meaningfully. They also detected that industrial exports and human investment have a combined positive and significant effect on economic growth and production factors of countries in which studies have been conducted.

Herzer (2005) and Miller and Ypadhyay (2000) in their study titled "the effect of economy openness, trade orientation, and human investment on the total productivity of production factor" found that human investment

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affects total productivity in both groups of developing and developed countries. But human investment and open economy have an opposite relationship in achieving a positive effect on the total factor productivity of production in less developed countries.

Medda and Piga (2003) examined the relationship between research and development (R&D) costs to productivity. They also divided R&D costs into domestic and foreign factors relating to universities, research centers and other businesses. Hence, they studied the effect of each of these factors on total productivity. The research results show that there is a positive and meaningful relationship between various kinds of costs and the total factor productivity of production.

Herzer et al. (2005) analyzed the effect of industrial products, raw materials exports and investment merchandise imports on the economic growth in China. Results showed that the industrial exports and investment imports promote knowledge dissemination, sciences, state of the art technology, the level of production factor, and productivity that result in a positive and meaningful relationship with economic development.

Chaudhuri et al. (2010) evaluated the Indian firms' productivity and capital investment. They investigated three industries and recognized that capital productivity in automotive and chemical industries and also capital intensity in chemical and electronic industries are significant. Moreover, labor productivity is meaningful only in electronic industry. Their paper's findings show that companies need to be managed for improving productivity from the growth point of view, but not only to improve performance.

In the next section, the theoretical framework to develop hypotheses has been discussed.

3. HYPOTHESES DEVELOPMENT AND VARIABLES

Maybe, it seem to be no obvious relationship between productivity and companies' capital investments, but the firms will be able to develop a strong strategy by insisting on labor productivity and adopting decreasing costs viewpoint. For example, Judson (2007) states that "works are done in any organization anyway; the important thing is that how the work is done". Baldwin and Clark (1992) suggest that firms need capital in order to achieve high quality innovative flexible performance quickly. Thus, capital productivity (optimal use of capital) is considered as one of the most important indicators of firms' growth. So, the paper hypothesis is as follows:

H1: There is a significant and positive relationship between productivity and capital investments.

- *H1 a: The higher the capital productivity, the greater the capital investments.*
- *H1 b: The higher the labor productivity, the greater the capital investments.*

On the other hand, according to previous studies, some variables may affect the amount of capital investments. The size of firms reflects corporate financial resources for conducting operation. It also enables firms to apply capital market resources in order to raise their cash flows (love 2001; Dhawan 2001). Therefore, it is expected that the larger the size of a firm, the greater the capital investments. It should be noted that firms suffer different costs for financing activities in capital markets and the increase of financing due to investments, will lead to increasing the cost of capital. Therefore, we expect the higher the cost of capital, the lower the capital investment growth. The firms possessing more finished goods, distribution costs, and advertising and marketing costs will encompass lower resources to grow investments, because they have to focus on these costs and apply resources to produce products and store them in warehouses (Chaudhuri et al. 2010: 69). So, the model used to examine the research hypotheses is as follows:

$$\begin{aligned}
 INVG_t = & b_0 + b_1VAG_t + b_2DEL_t + b_3NVLAB_t + b_4NVLAB_t + b_5NVLAB_t + b_6VADEP_t + b_7VADEP_t \\
 & + b_8VADEP_t + b_9DEPSA_t + b_{10}RDS_t + b_{11}MKTGS_t + b_{12}FGS_t + b_{13}INTL_t + b_{14}DER_t \\
 & + b_{15}AGE_t + b_{16}LnSAL_t + u_t
 \end{aligned}$$

Table 1, presents Calculations of variables. Capital investment is calculated by 2 ways as shown in the table. Capital productivity is calculated by using value added in three ways (VADEP1, VADEP2 and VADEP3) and these three variables are scaled by dividing them to total assets. Also, three alternative variables (NVALAB1, NVALAB2 and NVALAB3) are applied to compute labor productivity. We respectively use production value added, owners` value added and total value added to the wage and salary costs to compute these three variables. K_e represents common stocks' cost of capital and K_d represents cost of debts. By definition, WACC shows Weighted Average Cost of Capital.

4. METHODOLOGY

The population of this study is the firms listed in Tehran Stock Exchange (TSE) during the years 2001 to 2010 (1378-1388). Samples were selected by applying available sampling considering following conditions:

- 1) Corporate financial period in Persian date is Esfand, 29 and it should not be violated fiscally.
- 2) In order to homogenize samples, firms` activities should not be investment and financial activities.

3) Firms` information should be available.

Regarding the aforementioned restrictions, 70 firms were selected and investigated.

Table 1- Variables and calculation methods

Type of Variable	Variable Name	Calculation
Dependant	Capital investments (INVG1)	Common stocks + reserves + interest bearing long-term debts
Dependant	Capital investments (INVG2)	logarithm of property, plant and equipments
Independent	production value added (VADEP1)	(sales – cost of goods sold)
Independent	owners' value added (VADEP2)	[net income-(common shareholders' equity* K_e)]
Independent	total value added (VADEP3)	(earnings before interest and taxes-taxes)- [(interest bearing debts + shareholders' equities)*WACC]
Independent	growth of value added (VAG)	Changes in the value added of the firm i during the preceding year
Independent	Labor productivity (NVALAB)	ratio of net value added to wage costs
Independent	Capital productivity (VADEP)	ratio of net value added to depreciation costs
Control	Labor costs change (DELL)	changes in labor costs of the firm i during the preceding year
Control	Capital intensity (DEPSAL)	ratio of wage costs to depreciation costs
Control	Research and Development costs (RDS)	research and development costs to sales
Control	Advertising and ... costs (MKTGS)	advertising, marketing and distribution costs to sales
Control	Finished goods (FGS)	finished goods inventories to sales
Control	Interests of long-term debts (INTL)	long-term debt interests to long-term loans
Control	Financial leverage (DER)	debt to equity ratio
Control	Firm age (AGE)	number of years have passed after the listing of the firm in TSE
Control	firm size (LNSALE)	logarithm of sales
other	Effective tax rates	corporate earnings tax to income before tax
other	Wd	book value of interest-bearing debts to total equity
other	We	Weight of common stock and retained earnings to total equity
		$WACC=K_d.W_d + K_e.W_e$
		$K_e=R_f + \beta (R_m-R_f)$

5. DATA ANALYSIS

Descriptive statistics of variables are presented in table 2 and the Pearson correlations of variables are presented in table 3. Capital investment 1 and 2 are considered as dependent variables with averages of 4.902 and 4.861.

Table 2- Descriptive statistics				
Variables	Mean	Maximum	Minimum	Standard deviation
INVG1	4.902645	6.384806	2.571592	0.499348
INVG2	4.861103	6.708526	2.373372	0.58811
VAG	0.242872	73.82022	-16.689	2.938009
DELL	0.2674	35.22205	-0.96193	1.513102
NVALAB1	8.211266	114.6321	-1.2511	12.41427
NVALAB2	4.222806	160.4279	-19.7556	11.32204
NVALAB3	4.443649	99.11936	-16.4854	9.477632
VADEP1	65.83221	10200	-3.06883	528.4059
VADEP2	102.6703	56400	-1290	2150
VADEP3	67.65476	27800	-199.258	1070
DEPSA	0.794027	24.75563	0.000061	1.728085
RDS	0.0008	0.13	0	0.00701
MKTGS	0.066608	0.961495	-0.0023	0.06174
FGS	0.363786	2.122506	0.021173	0.2037
INTL	0.925496	12.16908	0	1.3312
DER	2.756057	46.315	-58.6316	4.620396
AGE	33.3286	57	9	10.83327
LNSALE	5.363769	6.880357	4.038898	0.468905
Valid N (listwise)	700			

As shown in table 3, there is a high correlation between two capital investment substitutions (INVG1 and INVG2) and the highest correlation is for firm size.

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Dependent Variable	variables					
	NVALA B2	NVALA B1	DELL	VAG	INVG2	INVG1
INVG1	.155**0	.260**0	-0.023	-0.016	0.878**	1
INVG2	.163**0	.264**0	-0.014	0.004	1	0.878**
Dependent Variable	variables					
	RDS	DEPSAL	VADEP3	VADEP2	VADEP1	NVALA B3
INVG1	-0.052	.339**0	0.043	0.038	0.061	.192**0
INVG2	0.009	.389**0	-0.01	-0.012	-0.011	.205**0
Dependent Variable	variables					
	LNSALE	AGE	DER	INTL	FGS	MKTGS
INVG1	.796**0	.081*0	-0.112**	-0.205**	0.015	0.003
INVG2	.754**0	0.048	-0.099**	-0.129**	-0.085*	-0.083*

Findings from regression analysis of variables are offered in Table 4 and 5 by using the first dependant variable (INVG1). According to the results, we can conclude that there is not a significant relationship between dependant (INVG1) and independent variables (VADEP and NVLAB). As it's seen, the determination coefficient of this model is 0.757.

Table 4-Model summary (INVG1)

sig.	Durbin-Watson	adj. R ²	R ²	Correlation coefficient
0.000	1.783	0.754	0.757	0.870

Table 5-Coefficients (INVG1)

model	non-standardized coefficients		standardized coefficients	t-static	significance level	Collinearity Statistics	
	Variable coefficient	Standard deviation	(Beta)			Tolerance	VIF
(Constant)	-0.228	0.126		-1.818	0.07		
LNSALE	0.902	0.022	0.847	40.28	0.000	0.795	1.258
FGS	0.558	0.05	0.227	11.145	0.000	0.843	1.186
INTL	-0.061	0.007	-0.162	-8.6	0.000	0.985	1.015
MKTGS	1.029	0.163	0.127	6.309	0.000	0.865	1.156
DER	-0.01	0.002	-0.092	-4.847	0.000	0.985	1.015
DEPSA	0.027	0.006	0.092	4.504	0.000	0.834	1.2
AGE	0.003	0.001	0.055	2.804	0.005	0.926	1.08

a. Dependent Variable: INVG1

So, the final model is as follows:

$$INVG1 = -0.228 + 0.902LNSALE + 0.588FGS - 0.061INTL + 1.029MKTGS - 0.01DER + 0.027DEPSAL + 0.003AGE$$

Findings from regression analysis of variables using the second dependant variable (INV2) are offered in Table 6 and 7. According to the results, there is a negative and significant relationship between dependant (INV1) and independent variables (VADEP and NVLAB). As it's seen, the coefficient of determination in this model is 0.635 and the model is significant at 5%.

Table 6-Model summary (INV2)

sig.	Durbin-Watson	adj. R ²	R ²	Correlation coefficient
0.000	1.477	0.631	0.635	.797

Table 7-Coefficients (INV2)

Model	non-standardized coefficients		standardized coefficients	t-static	significance level	Collinearity Statistics	
	Variable coefficient	Standard deviation	(Beta)			Tolerance	VIF
(Constant)	-0.429	0.182		-2.358	0.019		
LNSALE	0.963	0.033	0.768	29.552	0.000	0.782	1.278
DEPSA	0.061	0.009	0.18	6.533	0.000	0.692	1.445
FGS	0.482	0.078	0.167	6.206	0.000	0.728	1.373
DER	-0.012	0.003	-0.092	-3.956	0.000	0.982	1.019
INTL	-0.037	0.01	-0.084	-3.611	0.000	0.984	1.016
NVALAB1	-0.004	0.001	-0.08	-2.837	0.005	0.667	1.499
VADEP1	-7.89E-05	0	-0.071	-2.77	0.006	0.808	1.238
RDS	4.577	1.931	0.055	2.37	0.018	0.995	1.005

a. Dependent Variable: INV2

So, the final model is as follows:

$$INV2 = -0.429 + 0.963LNSALE + 0.061DEPSAL + 0.482FGS - 0.012DER - 0.037INTL - 0.004NVALAB1 - 0.0000789VADEP1 + 4.577RDS$$

Variable coefficient and significance level (lower than 0.05%) are used to examine research hypothesis H1. As can be seen in the above table, significance levels are respectively 0.131, 0.112, 0.230, 0.182, 0.072 and

0.069 about relationship between capital investments 1 and labor productivity 1, 2 and 3, and capital productivity 1, 2 and 3. This indicates that all significance levels are higher than 0.05; therefore the hypothesis is rejected. Also, the examination of capital investment 2, labor productivity 1 and capital productivity (0.005 and 0.006) indicates significance level lower than 0.05. Therefore, among all indicators of capital and labor productivity, only two variables are accepted. Additionally, firm size has a significant relationship with the two dependent variables (INV1 and INV2). Capital intensity (DEPSAL) and finished goods (FGS) show a positive and significant relationship with dependent variables in the two models. Also, financial leverage (DER) and interest (INTL) show a negative relation with capital investments.

5. CONCLUSIONS AND SUGGESTIONS

In this paper we examined the relationship between capital and labor productivity and capital investment. Findings show that there is no significant relationship between labor productivity or capital productivity and capital investments (Unless in the second Model for NVLAB1 and VADEP1 which a weak relationship observed). Thus, the main hypothesis of this research is rejected. That is against many preceding researches such as Rahimi-Far (2009), Tayyebi et al. (2009), Miller and Ypadhyay (2000), Herzer (2005) and Chaudhuri et al. (2010). It may be due to the lack of proportionality between employees' expertise and skills needed for jobs, conventional and non-competitive economic structures, lack of strong interests in attracting skilled labor force, non-renovation of labor training, training quality levels and managers' knowledge, lack of attention to the increasing number of researchers and inventors related to production activities and also making indigenous absorbed knowledge from the foreign countries and many other cases like these may have been involved in rejecting most hypotheses of this paper.

Findings suggest a positive and significant relationship between Firm size and capital investments as Chaudhuri et al. (2010) suggest in their work. Since the size of firm plays an important role in relation to capital investments, it can be said that the larger the size of the firm, the more capable it is to have easy and convenient access to cash and resources. They can also keep on their improvements and growth hopefully.

Results show a positive and meaningful relationship between capital intensity and capital investment. Thus, the third hypothesis is accepted; that is similar to the research of Chaudhuri et al. (2010) as well. The importance of capital intensity suggests that companies should consider the right combination of labor and capital so that the firms' resources are not spent causelessly.

Finally, the advertising, marketing and distribution costs and finished goods inventory have a significant and positive relationship with capital investments, similar to Chaudhuri et al. (2010). Therefore, we can conclude that the higher the finished goods inventories and advertising, marketing and distribution costs, the less the investment of firms. Of course, these reductions should take place at certain levels. Because excessive reduction may also lead to a plummet in sales and resources, which may subsequently end in investment growth reduction.

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