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Regression Analysis of the Impact Factors of Steel Enterprise Net Profit Based on Ordinary Least Squares

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Abstract: In this study, in order to study the influence about the phenomenon of loss in steel enterprises, factors affecting net income are analyzed which can better control the net profit of steel enterprises and make the enterprise in a favorable position in the future competition. This study uses net profit to measure the operating results of an enterprise and the econometrical analysis is carried on influencing factors of the net profit. By selecting the influence of net profit indexes, this study uses an empirical analysis of econometric software-EViews 6.0, a non-linear model is constructed by ordinary least squares method among fixed assets (X1), total profit (X5), income tax (X6), the rate of return on net assets (X7), the capital gains rate (X9) and the net profit, at the same time, the correlated inspections are being done. We can get some conclusions so that making the steel enterprises get a much better development.

Key words: Steel enterprises; net profit; regression analysis

INTRODUCTION

There has been the phenomenon of the loss in the steel enterprises during recent years, in order to analyze the loss causes of steel enterprises, Anshan steel company is selected as the research object. The regression analysis selects some quantifiable index and net profit. According to the regression results, steel enterprises select suitable investment decisions so that enterprises can make a profit.

In 1960s, foreign scholars began to study the problems of enterprise profit management, the main researches were Ball and Brown (1968) were the United States of accounting scientist and they found that the change of stock price and earnings were significantly correlated. Beaver (1968) proved that there was a positive relationship between the stock price and the financial report on the other hand. Then, this study began to form, until the 80's the theory gradually moved towards mature. Lev (1989) pointed out the main factors which affect the net profit and forming the basic structure of quality. Easton and Zmijewski (1989) found that there was a positive relationship between persistent profit and earnings coefficient at the same year. In the 80's, the scholars also studied on the enterprise profit (Porter, 2004) (Trueman and Titman, 1988). Finger (1994) used historical profit data and historical cash flow data to predict the future cash flow, he discovered that historical

cash flow data predicted more accurately. Lorek and Willinger (1996) studied the cash forecast model among profits, the history of cash and short-term accruals. Graham and Knight (2000) conducted the empirical analysis with the actual data in a certain extent; he concluded that the obtained cash flow affected the profit quality. Ali *et al.* (2011) made a further analysis on the profit quality of enterprise.

China began to study corporate profits in the early 1990s, Wu (1991) proposed a target profit management in the public transportation industry applications after which they began to study the management method of corporate profits. Until the 21st century, the research of corporate profits has been relatively mature.

Wang (2013) pointed out in her article that there was the inventory problem in FAW Xiali Co. Ltd and there was a certain role to increase profit by putting forward some suggestions for management. Fang (2012) pointed out that investors and stakeholders increasingly concerned about the company's financial information, there was also more and more fraud of financial information in enterprises at the same time, so we need discriminate the companies' profit and financial information, this would help managers make better investment decisions. Guo (2011) pointed out in the article how to achieve scientifically and realistically the enterprise's financial objectives and value. Wang *et al.* (2010) studied that in the financial crisis environment, it was necessary to analyze power grid

enterprise's cost system and characteristics, we should control the cost in a reasonable range and manage the whole process of the power grid enterprise, so that, we could realize the profit of the enterprise. Lan (2009) pointed out in his article in order to achieve stability profit, enterprise's management work should introduce reasonable economic management system. Qi (2007) mentioned in the article that the new accounting standards began to implement in January 1, 2007, the new accounting policy would affect the enterprise profit and earnings per share and other financial indicators, if we wanted to manage corporate profits and we must thoroughly understand the new accounting standards. Jiang *et al.* (2006) pointed out that due to the particularity of Chinese market economy, through the empirical research found that the diversification had a positive effect on enterprise value. Chen (2005) discussed the main reasons of the automobile industry monopoly, in order to increase the profit of enterprise, we must continue to promote inter enterprise competition. Zhou (2004) who put the meager profit enterprises as the research object, he selected the indexes related to earnings management, it studied on the proportion of enterprises on the earnings management and means. Lu *et al.* (2003) researched on the basis of the inside and outside scholars, they found that the key factor of the enterprise profit growth was the brand loyalty of the conclusion.

Through the study of inside and outside enterprises net profit, it can be found that researchers studied on the influence of net profit enterprises in the domestic while researchers studied the cash flow of enterprise's net profit abroad. This study studies the related problems of corporate profits, it chooses steel industry as an example and then we select indicators from the following three aspects. Impact profit formula, financial statements and the rate of exchange published data. The method of regression analyses the factors influencing the net profit, it concludes about the net profit model. From the model, we can provide useful advice for managers, causing the enterprise to be in the more advantageous competition position.

ANALYSIS OF FACTORS INFLUENCING THE NET PROFIT

According to the basic formula of net profit: Net profit = total profit-the income tax expenses, the total profit and the income tax expenses can be chosen as its two main factors affecting net profit, there is a positive relationship between total profit and net profit.

From the balance sheet, profit statement and cash flow statements, factors affecting net profit not only come

from the income statement, but also come from the balance sheet and cash flow statement. We choose the fixed assets, liabilities, owner's equity and ending cash and cash equivalents as the factors influencing the net profit.

According to Anshan Steel Company Securities Network releases data, indicators are selected include the rate of return on net assets, rate of return on total assets, the capital gains rate, operating profit ratio and cost profit rate.

CONSTRUCTION AND SOLUTION OF THE MODEL

Choice of the sample and indicators: Because the steel industry suffered serious losses in recent years and Anshan Steel Company has been Special Treatment (ST), it based on this background, this study studies the influence of Anshan Steel Company Limited by Share Ltd on net profit factors. This study selects time series data of Shenzhen stock exchange from 1997 to 2011 and its data comes from hexun.com-Angang Steel Company-stock-market center.

According to the above-mentioned reasons for selecting indicators, the study selected the following indicators: Fixed assets (X1), total liabilities (X2), the owner's equity (X3), the final cash and cash equivalents (X4), total profit (X5), income tax (X6), the rate of return on net assets (X7), return on total assets rate (X8), the capital gains rate (X9), operating profit ratio (X10) and cost profit rate (X11). Through statistical testing, we preliminarily analyse the distribution of the total sample, as shown in Table 1.

Construction and solution of the model: By solving the model, we select a fixed assets (X1), total profit (X5), income tax (X6), the rate of return on net assets (X7), the capital gains rate (X9) as explaining variables of the model, Finally it is concluded that the output model as shown in Fig. 1.

By ordinary least squares estimation method and the output results of the above can obtain the net profit function of Anshan Steel Company.

$$1/Y = -1.93967383533e-10 - 4.09421945657e-21 \times (1/X1 + X1) + 0.689121843221 \times 1/X5 - 0.00733089957343 \times 1/X6 - 1.5714794645e-11 \times 1/X7 + 2.65688519298e-10 \times (X9 + 1/X9)$$

$$(-3.94) (-3.60) (6.79) (-5.95) (-5.95) (-7.31) (7.37)$$

$$R^2 = 0.999 \text{ S.E.} = 5.58E-11 \text{ F} = 3901.903$$

Dependent Variable: 1/Y Method: Least Squares Date: 06/28/13 Time: 17:18 Sample: 1997 2011 Included observations: 15				
	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.94E-10	4.92E-11	-3.944477	0.0034
1/X1+X1	-4.09E-21	1.14E-21	-3.599762	0.0058
1/X5	0.689122	0.101562	6.785217	0.0001
1/X6	-0.007331	0.001232	-5.951786	0.0002
1/X7	-1.57E-11	2.15E-12	-7.306326	0.0000
X9+1/X9	2.66E-10	3.61E-11	7.368636	0.0000
R-squared	0.999539	Mean dependent var	1.57E-09	
Adjusted R-squared	0.999283	S.D. dependent var	2.08E-09	
S.E. of regression	5.58E-11	Akaike info criterion	-44.09175	
Sum squared resid	2.80E-20	Schwarz criterion	-43.80853	
Log likelihood	336.6882	Hannan-Quinn criter.	-44.09477	
F-statistic	3901.903	Durbin-Watson stat	2.670434	

Fig. 1: Output model

Heteroskedasticity Test: Glejser			
F-statistic	0.601750	Prob. F(5,9)	0.7009
Obs*R-squared	3.758197	Prob. Chi-Square(5)	0.5847
Scaled explained SS	1.910721	Prob. Chi-Square(5)	0.8614

Fig. 2: Heteroscedasticity test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.762869	Prob. F(1,8)	0.2209
Obs*R-squared	2.708531	Prob. Chi-Square(1)	0.0998

Fig. 3: Autocorrelation test

Table 1: Statistical test

	MAX	MIN	AVERAGE	SD
X1	57267000000	225352000	20821094933	21972385206
X2	50683000000	1212061000	18438016400	20167108282
X3	55345000000	5092173000	24429658400	22272771650
X4	7733000000	562339000	2339754400	1727681002
X5	10373000000	-3281000000	2290221133	3454076727
X6	2848000000	-9490000	463157400	1317180914
X7	0.23	-0.04	0.089333333	0.074590948
X8	0.15	-0.02	0.06	0.047958315
X9	1.15	-0.3	0.356	0.38501948
X10	0.16	-0.04	0.053333333	0.065428987

The figures in brackets are the corresponding T-statistic values, S.E. is the standard error of regression function, R^2 is the determination coefficient. $R^2 = 0.999$, it means that the type of fitting is good, 99% of variable Y was explained by X1, X5, X6, X7, X9. The probability is less than 0.05, the equation's F-statistic value is 3901.903 and the equation is significant as a whole. Because of $t_{0.005/2}(9) = 2.26$, the test results reject the null

hypothesis there is nonlinear regression relationships among fixed assets, total profit, income tax, the rate of return on net assets, the capital gains rate and net profit.) Variables pass under the 5% level of significance test, so you can think that the model can well reflect the research problem of quantitative relationship.

MODEL TEST

Heteroscedasticity testing: The Glejser testing method is used to test heteroscedasticity, it can be seen $T = 5$ and $R^2 = 0.25$, we check the Chi-square distribution table ($\alpha = 0.05$, the degrees of freedom is 20), so, $TR^2 = 3.75 = \chi^2_{0.05}(20) = 31.410$, the model shows no heteroscedasticity. Also a view from the probability distribution, all of the probability values are bigger than 0.05, it shows that the model does not have heteroscedasticity, as shown in Fig. 2.

Autocorrelation testing: The LM testing method is used to test autocorrelation, it can be seen $T = 15$ and $R^2 = 0.18$, we check the Chi-square distribution table ($\alpha = 0.05$, the degrees of freedom is 1), so $TR^2 = 3.75 = \chi^2_{0.05}(1) = 3.841$, the model shows no autocorrelation.

Also a view from the probability distribution, all of the probability values are bigger than 0.05 that the model does not have autocorrelation, as shown in Fig. 3.

In summary, the described model in this study has no heteroscedasticity and autocorrelation, the model has better stationarity.

CONCLUSION

According to the current market environment, in order to adapt to the pace of development of economy, it

is more important to invest in enterprise, to carry out a reasonable investment, we manage the net profit efficiently and it analyses business-related investments impact on net profit, it has become an important factor for faster and better development of enterprise. Due to Chinese national conditions and the traditional concept, enterprise in the field of Chinese industry has become relatively stable, but the steel enterprises in recent years has been a loss, this study analyses several important factors that affect the net profit of enterprises, so enterprises in the investment process defined the various factors that impact on net profit, we can better control net profit of such enterprises, it can make the enterprise in a favorable position in the future competition.

In this study, we use the relevant knowledge of econometrics, there is the regression analysis between the net profit and the related factors affecting the net profit and then we get a nonlinear regression equation about the net profit. But there are also some insufficiencies in this study when we select the explain variables, we oversight a lot of qualitative variables, such as the ability of employees, the quality of leadership, enterprise culture, so the explain variables cannot fully explained the net profit.

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REFERENCES

- Ball, R. and P. Brown, 1968. An empirical evaluation of accounting income numbers. *J. Accounting Res.*, 6: 159-178.
- Lev, B., 1989. On the usefulness of earnings and earnings research: Lessons and directions from two decades of empirical research. *J. Account. Res.*, 27: 153-192.
- Chen, Z.G., 2005. Margins and market structure: Based on the empirical analysis of Chinese automobile industry. *Ind. Econ. Res*
- Easton, P.D. and M.E. Zmijewski, 1989. Cross-sectional variation in the stock market response to accounting earnings announcements. *J. Account. Econ.*, 11: 117-141.
- Ali, E., R.M. Mohsen, H.M. Adel, T. Madjid and A. Nazila, 2011. An overall profit Malquist productivity index with fuzzy and internal data. *Math. Comput. Modell.*, Vol., 54.
- Fang, H.Y., 2012. Discussion on how to use accounting analysis found that the phenomenon of corporate profit manipulation. *J. Manuf*
- Finger, C.A., 1994. The ability of warnings to predict future earnings and cash flow. *J. Account. Res*
- Graham, C.M. and J.R. Knight, 2000. Cash flows vs. earnings in the valuation of equity REITs. *J. Real Estate Portfolio Manage.*, 6: 17-25.
- Guo, Y.N., 2011. Reflections on the relationship between financial management objectives and enterprise value realization. *J. Jiaxing Univ.*, Vol., 29
- Jiang, F.X., Z.B. Liu and Z.F. Lu, 2006. Research on enterprise value and earnings volatility, taking the empirical study of Chinese listed companies as an example. *J. Finan. Econ*
- Lan, H., 2009. Research on enterprise economic management system. *J. Mod. Bus.*, Vol., 26
- Lorek, K.S. and G.L. Willinger, 1996. A multivariate time-series prediction model for cash-flow data. *J. Account. Rev.*, 71: 81-102.
- Lu, J., D.H. Zhang and M.J. Cui, 2003. Evaluation and western brand loyalty research and application revelation. *J. Bus. Econ. Manage*
- Porter, M.E., 2004. *Competitive Advantage*. Free Press, Simon and Schuster Ltd., New York, USA.
- Qi, M., 2007. New accounting standards on the impact of corporate profits maneuver. *J. Econ. Shandong*, Vol., 23
- Trueman, B. and S. Titman, 1988. An explanation for accounting income smoothing. *J. Account. Res.*, 26: 127-139.
- Wang, S., 2013. Problems and countermeasures of inventory management in enterprise. *J. Foreign Invest. China*
- Wang, X.L., Z.Y. Hao and L.L. Zhang, 2010. Deepening the research on cost management of grid enterprises. *J. Energy Technol. Econ.*, Vol., 22
- Beaver, W.H., 1968. The information content of annual earnings announcements. *J. Account. Res.*, 6: 67-97.
- Zhou, X.S., 2004. Based on association rules analysis of profit corporate profits quality evaluation. *J. Account. Res*
- Wu, S.G., 1991. Talk about quantity, cost, profit analysis the management of the target profit in the bus industry. *China Civil Engineering Society Urban Public Transport Society of the Fourth Annual Conference*, 1991.