Journal of Applied Sciences

ISSN 1812-5654

science alert

ANSInet
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http://ansinet.com

Journal of Applied Sciences 13 (19): 3952-3960, 2013
ISSN 1812-5654 / DOI: 10.3923/jas.2013.3952.3960

Empirical Research of the Relationship Between Corporate Social Responsibility and Add Value: Based on China's Listed Company Panel Data of 2005-2011

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Abstract: The relevance between corporate social responsibility and financial performance has become a heated debate at home and abroad over the past 20 years. Most scholars study the relationship between them from the perspective of shareholders and by setting the profit index or market return index. This study explores the relationship between them from the perspective of stakeholders,value added is just a very important tool to evaluate corporate financial performance. The purpose of the study is to uncover whether enterprise undertaking corporate social responsibility has an impact on improving value added. Some studies result confirmed that the index of value added had an ability to explain the market risks which is more powerful than the indexes of profit and market. Taking the data of China's listed companies in 2005-2011, the author verifies the relationship between corporate social responsibility and value added by using the balanced panel data regression model of fixed effect. The results show that not only in short-run but also in long-run, enterprises' fulfilling their social responsibility is positive to added value.

Key words: Value added, corporate social responsibility, stakeholder

INTRODUCTION

The relevance between Corporate Social Responsibility (CSR) and financial performance has become a heated debate in the academic circle of business management research at home and abroad over the past 20 years. Carroll (2000) believed that the relationship between CSR and corporate financial performance was very complicated from the theoretical or methodological point of view. The clarification of the relationship between them is invaluable for the business managers, shareholders, stakeholders, because it is not only of importance for the study of the dynamics mechanisms of CSR, but of important practical significance for various stakeholders of enterprises and meanwhile, it enables business managers to make more proactive fulfillment of CSR.

Most scholars from home and abroad study the relationship between them from the perspective of shareholders and by setting the profit index (Preston and O'Bannon, 1997; Makni *et al*., 2009; Li and Xiao, 2011) or market return index (Schnietz and Epstein, 2005) as the explained variable. Despite the continuous improvement, deepening and innovation of the study on the correlation between them, there have been many differences in defining the financial performance index in the academic circle and no final conclusion has been reached so far. Studies show that maybe the explanation strength of the performance measurement index is inadequate or the viewing angle is narrow and the researchers should pay more attention to the interests of the stakeholders other than shareholders when the researchers evaluate enterprise financial performance. So far, there are very few scholars who verify the relationship between them by measuring financial performance from the perspective of stakeholders. The added value (VA) is a financial index which can reflect enterprise's capacity of value creation and an important tool to measure corporate performance. Added-value has recognized the interests of not only shareholders but also other stakeholders who have made contribution to value creation (Niranjan and Suvarun, 2008). It can not only increase shareholders' value but also encourage the enthusiasm and creativity of other stakeholders (in particular, the employees) to measure the corporate financial performance by value added. It is of great significance for enterprise and even the society because it has a perspective which is broader than the index of profit and can encourage more stakeholders to actively cooperate (Pong and Mitchell, 2005; Liu and Kong, 2006) found that profit index has more explanation strength than mar ket index. And Karpik and Belkaoni (1990) confirmed that the index of value added has an ability to explain the market risks which is more powerful than the indexes of profit and cash

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flow. Furthermore, the ultimate goal of enterprise should be the maximization of stakeholders' integral interests (Chen and Teng, 2009).

In view of the above, from perspective of stakeholders, this study attempts to set corporate financial performance index taking value added, which is a financial index with a greater capacity to explain the market risks, as the explanatory variable and take the related CSR measure indexes as the explanatory variables. Taking the data of 298 China's listed companies in 2005-2011, the author verifies the relationship between CSR and VA by using the balanced panel data regression model of fixed effect. The results show that in the long term, enterprises' fulfilling their social responsibility is positive to the added value. Moreover, even in the current period, enterprises' fulfilling their social responsibility is positive to the added value. This shows that it is of great importance to the improvement of corporate value added from the current period or in the long term to pay attention to the interests of stakeholders and to take appropriate social responsibility for stakeholders. The study on the relationship between them can not only enrich the theory of CSR and promote value-added application, but also serve as theoretical reference for the business management in decision making.

MATERIALS AND METHODS

Theoretical analysis and the research hypothesis: Since the Berle-Dodd debate in the 1930s, the academics have stated extensive researches on stakeholders.The involvement of stakeholders influences the normal operation of enterprises. Enterprises cannot continue the sustainable development if they fail to meet stakeholders' reasonable requirements (Ahlstedt and Jahnukainen, 1971). It can not only increase company's reputation but impact positively on its performance (Johnson 2003) and improve its value to meet key stakeholders' requirements (Freeman and Liedtka, 1991; Johnson, 2003). Being out of social responsibility activities may result in the increases in hidden costs, so that the competitive advantage will be restricted, causing an adverse effect on the financial performance (Johnson, 2003) and thus affecting company's market value (Rao and Hamilton, 1996). As stakeholder theory has gradually been perfected, it is considered a theory which is most close to the researches on CSR (Wood and Jones, 1995) and social responsibility has played an important role in helping enterprise to gain social capital and maintain its competitive advantages (Zhou, 2011) Add value not only can scientifically and reasonablly measure function of various stakeholders about wealth creation in the enterprise, but also can strengthen the cohesion among the various stakeholders (Bougen, 1983). At the same time, it can emphasis on main part of the employees in the aspect of create wealth, making the staff produce a more positive attitude to the enterprise (Morley, 1981). In addition, enterprise Can draw up incentive mechanism to increase productivity according to add value and can correct the traditional evaluation index system of enterprise economic performance (Morley, 1979; Aupperle *et al*., 1985). Many businesses in the United States use racah coefficient (i.e., salary should account for 39.395% of Add value) to judge if the worker's wage level is reasonable, which can alleviate part of labor conflicts. More important is that measuring by adding value can promote the optimal allocation of resources,and improve the economic benefit (Lou, 1996; Chen, 1998; Zhao, 2002). In addition, Riahi-Belkaoui (1992) confirmed that it had the ability to explain the market risk to measure corporate performance by using the financial index of value added which is stronger and more powerful than using the index of market return. Thus, it is hypothesized that:

- **H:** There is a positive correlation between CSR and value added

Selection of explanatory variables: There is no established uniform evaluation index system for CSR in China. Combining with the practice and taking the quantifiability of variables and the availability of data into account, this study believes that Clarkson's theory, which divides stakeholders into major and minor ones, is more realistic and more conducive to study. The major stakeholders are investors, employees, customers, suppliers, government and community, which are sequenced by the impact on enterprises (Song and Sheng, 2009). At present it has become a mainstream method to measure CSR from the perspective of stakeholder. The stakeholder theory has been incorporated into the framework of corporate social performance by Wood (1991), Carroll (1991), Clarkson (1995) and peters and Mullen (2009). Through the China scholars of literature,this article aims to construct CSR evaluation index system from the perspective of enterprise's major stakeholders:

- **Responsibility for investors:** The investors mentioned in this study refer to those in the broad sense, including not only shareholders but creditors. Enterprise's responsibility for creditors is primarily the good debt-paying ability, which can be reflected by the index of quick ratio (Li, 2012). The

responsibility for shareholders is primarily their investment profitability, which is assessed by profit rate of net asset as a substitute index (Gong, 2012)

- **Responsibility for employees:** Enterprise's responsibility for employees is embodied in, on one hand, the wages and benefits paid to employees which can be quantified; on the other hand, company should also pay attention to their long-term development in the company, enhance efforts in staffs training and care their psychological requirements, all of which are difficult to quantify and therefore this study sets employee wage growth rate as a substitute variable (Shen, 2005; Shi, 2012)
- **Responsibility for customers:** Responsibility for customers is embodied in the economic interests and product safety.With the absence of suitable index to measure the latter in the financial statements, the researchers primarily take the former into account in the responsibility for customers. The substitute variables adopted in this paper are cost rate of prime business (Li, 2012; Shi, 2012) and growth rate of prime business (Zhu, 2012)
- **Responsibility for providers:** Responsibility for providers is reflected in the compliance with business credit, payment of amount due for raw materials and services to suppliers as well as the guarantee extent of its cash holdings for its debt. So, this paper sets the indexes of velocity of accounts payable (Gao, 2009; Wang, 2012) and cash accounts payable rate (Li, 2012) as substitute variables
- **Responsibility for government:** The main responsibility for government is reflected in taxation and therefore this paper sets the index of taxes on asset as a substitute variable (Song and Li, 2010; Zhang *et al*., 2011)
- **Responsibility for community:** The responsibility for community primarily includes enthusiasm in public welfare, compliance with law, societal conceptions of morality, as well as creating more employment opportunities. Therefore this study sets the indexes of public donation expenditure rate (Wen and Fang, 2008;Wang, 2012) and employment growth rate (Qiao and Tan, 2009) as substitute variables

Selection of explained variables: Add value is that the sales of enterprise deduct the purchased materials and services in a certain period and it is new value that the enterprise creates. This study uses the present optimization distribution method to calculate add value, the calculation formula is: VA = Employees' salary+Interests+Tax+Dividend+Retained earnings. As an absolute figure, when an enterprise's VA grows larger, the contributions that the enterprise makes to shareholders and other stakeholders become greater. However, also because VA is an absolute figure, the scales of enterprises are not taken into consideration and VA of enterprises of different scales is not comparable. To remove the influence of the assets scale, this article takes the asset value-added rate as the dependent variable, making enterprises of different scales comparable. The formula to calculate asset value-added rate is: AVAR = VA/Average total assets, in which Average total assets = (Beginning total assets+Ending total assets)/2.

Selection of control variables: However, an enterprise's fulfillment of its responsibilities for its stakeholders is only one of the factors that influence value added. By reading previous literature, the author finds that Value added is also affected by other factors. To better examine the relationship between these factors, the influence of these factors on value added should be controlled to make the model more reasonable and complete. Therefore, the following variables are introduced in this article as control variables.

State-owned share-holding rate: Chen and Jiang (2000) found that there is a negative correlation between state-owned share-holding rate and company value in the business that is highly competitive. Li (2006) discovered that there is a positive correlation between state-owned share-holding rate and company value. Wang (2007) and Song and Li (2010) discovered that that corporate performance is affected by the state-owned share-holding rate.

Ownership concentration: Bai and Liu (2005) found that the majority-shareholder share-holding rate has a U-type negative effect on corporate performance. Li (2006) discovered that corporate performance is positively affected by the majority-shareholder share-holding rate. Song and Li (2010) holds that corporate performance is affected by the ownership concentration.

Capital structure: Wang (2003) has affirmed the functionof debt financing in financial performance; Su (2004), however, found that corporate debt financing causes decline of corporate performance when he studied the private listed companies. Li (2006) found that debt rate structure positively acts on enterprise value. Mitchell *et al*. (1997), Shen (2007), Yang and Yin (2009) and Shen *et al*. (2012) discovered that financial performance is affected by capital structure.

Table 1: Names of the variables and calculation equation of the variables

Variable properties	Variable names	Calculation equation
Explanatory variables		
Explained variables	Asset value-added rate (AVAR)[a]	(Payment of employee+interests+taxes+dividends+retained earnings)/average total assets
Responsibility for investors	Quick ratio(QR)	(Current assets-inventory)/current liabilities
	Profit rate of net asset (PRNA)	Net profit/{(beginning owners' equity+ending owners' equity)÷2}
Responsibility for employees	Employee wage growth rate (EWGR)	(Total wages in current period-total wages in previous period)/total wages in previous period
Responsibility for customers	Growth rate of prime business (GRPB)	(Prime business revenue in current period-prime business revenue in previous period)/prime business revenue in previous period
	Cost rate of prime business (CRPB)	Prime business cost/prime business revenue
Responsibility for providers	Velocity of accounts payable (VAP)	Prime business cost+ending inventory-beginning inventory/average balance of accounts payable
	Cash accounts payable rate (CAPR)	Net cash flow from operating/accounts payable
Responsibility for government	Taxes on asset (TOA)	Total corporate tax/average total assets
Responsibility for community	Employment growth rate (EGR)	(No. of employees in current period-No. of employees in previous period)/No. of employees in previous period
	Public donation expenditure rate (PDER)	Donation expenditure/current sales
	State-owned share-holding rate (SSR)	State-owned shares/total shares
	Ownership concentration (OC)	Majority-shareholder share-holding rate
	Capital structure (CS)	Long-term liabilities/total assets

Model construction: The author constructs the panel data model according to the corresponding research needs on the basis of previous study methods, relationship between CSR and value-added and according to the study hypothesis and collected data. The panel data model is as follows:

$$Y_{it} = a_t + b_i X_{it} + \varepsilon_{it} \ (i = 1,2,3, \ldots, N; t = 1, 2, 3, \ldots, T) \quad (1)$$

In Eq. 1, Y_i is the explained variable. X_{it} is the explanatory variable. a_t is the constant term in the model. b_i is the coefficient vector which is corresponds to the independent variable vector X_{it} in the dimension of k×1. K is the quantity of independent variables. ε_{it} is random error items that are independent of one another, with the average value being zero and the random error items being equally variant. N is the quantity of cross section members. T is the whole time of each cross section member.

Results sample selection and the basic statistics: This article selects some A-share listed companies as samples and the study period is from 2005-2011. The samples are selected according to the following principles: (1) Remove samples whose operations are not normal from the samples, (2) Remove samples without consecutive and comprehensive data, (3) Remove outliers from the samples, Finally, the author of this article chooses 298 companies which include 2086 samples that fulfill the preceding requirements. The basic statistics of the main variables in this study is listed Table 1. Financial data of the sample listed companies in the empirical study come from GTA's CSMAR database, the Genius Finance database and the China listed companies' information website (http://www.cnlist.com/).

In addiion,the result demonstrates that there is a significant relationship between explained variables and explanatory variables when the level is at 0.05, which shows clearly that all variables are highly representative and there is not a colinearity relationship among the explanatory variables.

Empirical approach: The Hausman test is adopted in this article to determine the type of model to be adopted. The results of the Hausman test for the model demonstrate that the fixed-effect regression model should be adopted in conducting panel data analysis. *, **and ***represent the significant correlation when the value is 10, 5 and 1%, respectively in the following table. The detailed equation is as follows:

$$AVAR_{it} = a_i + b_1 QR_{it} + b_2 PRNA_{it} + b_3 EWGR_{it} + b_4 GRPB_{it} + b_5 CRPB_{it} + b_6 VAP_{it} + b_7 CAPR_{it} + b_8 TOA_{it} + b_9 EGR_{it} + b_{10} PDER_{it} + b_{11} SSR_{it} + b_{12} OC_{it} + b_{13} CS_{it} + \varepsilon_{it}$$

In the above equation, "i" is an integer from 1-298, which represents the Ith cross section member. "t" is an integer from 1 to 7, which represents seven years from 2005-2011. This article adopts some software to conduct estimation through the fixed-effect regression model. Since, the sample points for the fixed-effect regression model are comparatively large and following industry differences may cause heteroscedasticity in the panel data model, the White heteroscedasticity correction method is adopted in the following regression to handle this problem.

Estimation result: First the Multiple Linear Regression (MLR) is conducted for cross-section data in each year from 2005-2011. The result shows that most variables'

Table 2: Descriptive statistics of each variable and regression results of the model of the overall sample panel data

Explanatory variable	Maximum	Median	Mean	Minimum	Standard	Regression coefficient
QR	1.000	0.700	0.670	0.020	0.190	0.019* (1.553)
PRNA	13.521	3.270	3.470	-1.256	1.019	0.022** (2.025)
EWGR	18.049	5.040	5.340	-1.428	2.995	0.001*** (3.356)
GRPB	20.611	7.846	7.446	-0.999	3.486	0.468*** (4.321)
CRPB	1.070	0.381	0.360	0.010	0.150	-0.006** (-2.048)
VAP	21.542	8.290	8.762	0.111	5.291	0.003 (0.563)
CAPR	22.595	10.169	10.235	1.651	3.654	-0.520** (-2.159)
TOA	3.473	0.896	0.956	-0.497	0.327	0.321** (2.163)
EGR	18.562	10.025	9.712	-1.000	2.725	0.028** (1.998)
PDER	0.050	0.001	0.001	0.000	0.001	5.631** (2.198)
SSR	0.613	0.164	0.169	0.005	0.123	-0.750** (-2.008)
OC	0.851	0.331	0.361	0.041	0.161	0.380** (2.115)
CS	0.791	0.081	0.082	0.000	0.111	-0.486** (-2.108)
Intercept term						1.326** (1.981)
Observed value						2086
Adj-R^2						0.183
f-value						19.5
p-value						0.000

*, ** and ***Represent the significant correlation, when the value is 10, 5 and 1%, respectively, Table 2 shows the results after heteroscedastic amendment

symbols are as expected and have significant influence, which proves that an enterprise' fulfillment of CSR for its stakeholders is positively correlated with value added (The corresponding table is omitted due to space limitation). The author uses the panel data model further to analyze data from 2005-2011. Generally speaking as shown in Table 2, the model overall fitting is significant (F in the model becomes significant when the value is 1%). In the overall sample regression, the overall explanation rate of independent variables can explain 18.3% of the influence on asset value-added rate. In general, the explanation relationship between explanatory variables and explained variables is consistent with the expected relationship. Although, a variable does not have significant influence, the variables can reflect the direction of influence on asset value-added rate. The colinearity among explanatory variables is weak (the tolerance value of all explanatory variables is over 0.1 and the Variance Inflation Factor (VIF) is below 2) and residuals of the regression model are independent from one another (the D-W value is close to 2). From the statistics perspective, the adjustment R^2 by overall samples is only 18.3%, which proves that the explanatory variables have limited influence over explained variables. Except the influence factors described in this article, there may be other factors that affect corporate value-added to be explored, yet they are not focused in this article.

In addition, the regression results show that, there is a significant negative correlation between the control variables of state-owned share-holding rate and asset value-added rate when the value is 0.05, which means that the lack of substantive supervision over the management, which is caused by the absence of state-owned "owner", makes opportunity for exploiting their own advantage and thereby affects enterprise's value creation. There is a significant positive correlation between the control variables of ownership concentration and asset value-added rate when the value is 0.05, which means that the majority shareholders, rather than exploiting their own advantage via the collusion with the management, exercise effective control over the management to reduce the agent cost and encourage them to produce wealth for shareholders and other corporate stakeholders through efficient operation. There is a significant negative correlation between the control variables of capital structure and asset value-added rate when the value is 0.01, which means that the higher enterprise's long-term liability rate, the greater its financial risk and credit pressure will be and the more the constraints it will be subject to and thus the value creation will be negatively affected.

Robustness test: In-depth studies of CSR and value added have been conducted in the preceding paragraphs and the author has reached some important conclusions. To verify the conclusion correctness, it is necessary to conduct robustness analysis. This article will probe into CSR and value-added from the aspects of the public undertaking, commerce, real estate, industry and integrated industry, to verify whether the conclusion is robust. By comparing Table 3 with Table 2, it is found that in the CSR and value-added model, the symbols of regression coefficients in all formats are identical, while only the degree of significance and values of the coefficients are different. Although, in the model, a few coefficients have different symbols, coefficients that have high degree of significance have identical symbols in all models and coefficients of which the symbols are different in different models do not have high degree of significance and do not have high values. This

Table 3: Regression results of the five industries panel data model and corresponding statistical test results

Variables	Public undertaking	Commerce	Real estate	Industry	Integrated industry
QR	-0.640* (-1.75)	-0.180** (-2.21)	-0.740** (-2.11)	-0.015** (-2.01)	-0.029** (-2.16)
PRNA	0.033** (2.02)	0.021** (2.01)	0.056** (2.29)	0.025** (2.11)	0.035** (2.15)
EWGR	0.450** (2.01)	0.004**(2.32)	0.254*** (4.76)	0.006*** (4.06)	0.006** (2.07)
GRPB	0.038*** (6.03)	0.001*** (4.31)	0.027*** (4.56)	0.668*** (5.71)	0.598** (2.09)
CRPB	-0.160** (-2.13)	-1.29** (-1.99)	-0.254** (-2.46)	-0.005** (-2.17)	-0.005** (2.04)
VAP	0.086 (0.52)	0.017 (0.36)	0.074 (0.15)	0.002 (0.37)	0.002 (0.25)
CAPR	-0.170** (-1.98)	-0.003** (-2.16)	-0.263**(-2.25)	-0.753** (-2.15)	-0.671** (2.11)
TOA	0.225** (2.31)	0.460** (2.31)	0.124** (2.12)	0.174** (2.16)	0.258** (1.99)
EGR	0.021** (2.11)	0.002** (2.29)	0.035** (2.41)	0.004** (2.09)	0.003** (2.15)
PDER	71.250*** (6.76)	35.132*** (6.15)	58.250*** (8.76)	8.431*** (9.76)	6.921*** (4.16)
SSR	-0.094** (-1.92)	-0.261** (-2.13)	-0.094** (-2.23)	-0.662** (-1.97)	-0.543** (2.13)
OC	0.907** (2.12)	0.054** (2.19)	0.907** (1.96)	0.393** (2.01)	0.281** (2.26)
CS	-0.059** (-1.95)	-0.641** (-2.21)	-0.326** (-2.35)	-0.583** (-2.35)	-0.685** (-2.21)
Intercept term	1.230* (1.69)	1.386** (1.96)	1.281** (2.101)	0.961*** (5.32)	0.822** (2.36)
observed value	140	273	140	1134	399
f-value	45.726	25.848	34.521	18.682	16.856
p-value	0.000	0.000	0.000	0.000	0.000
Adj-R^2	0.584	0.282	0.434	0.168	0.123

*, ** and ***Represent the significant correlation when the value is 10, 5 and 1%, respectively. Table 3 shows the results after heteroscedastic amendment

demonstrates that the panel data regression in different industries does not affect corresponding conclusions in this article. Therefore, the empirical result about the influence of CSR on value-added is reliable. As is shown in Table 3 for specific results.

CONCLUSION

Based on the theory of value added, CSR and stakeholder, this study has carried out an annual regression analysis and panel data regression analysis for the asset value added rate by setting the variable of CSR according to the stakeholders involved in enterprise. The results indicate:

- Most social responsibility variables currently have a positive impact on added value. The author believes that the probable cause is that value added is based on more stakeholders and their interest requirements have never been ignored, it will inevitably get support from them. An effective strategy in a short term is to increase the revenue by bulk-cheap. And commonly used profit indexes reflecting the financial performance previously published studies are more based on shareholders. Some researchers got negative correlation with their conclusion. The theory of "shareholder supreme" may be challenged to some extent, but after all, each stakeholder has made contribution to enterprise and without their support the performance may go way down. As a result, for the extensive stakeholders, it is advantageous to increase value added to fulfill CSR for stakeholders even in the short term
- In the long term, most social responsibility variables are of positive impact on value added. This shows that enterprise's fulfilling CSR for stakeholders can increase its value added. The social impact hypothesis, that is, the better the enterprise fulfills CSR, the better its financial performance will be, has been verified by this conclusion and it has been supported by the theory of stakeholders, which is represented by Freeman. It is worthy of special mention is that both the results of the population regression and robust regression of the samples show a positive correlation between the assets value added rate and the rate of employment growth, public donation expenditure, prime business revenue growth, net asset profit as well as pay increase in varying degrees. Furthermore, it is significant in all the industries, that is to say, no matter in what industry, enterprise's fulfilling the relevant CSR for the community, consumers, investors or employees will increase its value added, that is to say:

- Enterprise's engagement in social welfare may generate media attention and there will be a lot of positive reporting, so the enterprise can bolster its image and thereby increase the value added
- Providing quality products and services for consumers as much as possible to increase the revenue year by year and thereby increasing value added
- Enterprise's ability to pay the interest on schedule will reduce the default risk and creditors may lower loan interest and reduce restrictive clauses and enterprise thereby increasing value added
- Enterprise tries its best to meet the reasonable requirements of employees and the employees will perform their tasks with an attitude consonant with their status as masters of the enterprise and enterprise thereby increases the value added

- The regression results also show a notable negative correlation between the assets value added rate and the prime business cost rate when the value is 5%. The author believes that the probable cause is that the strategy of cost reduction alone cannot meet the requirements of consumers and it should comes with quality guarantee and favorable after-sales service in order to meet their needs and gain support from them. The unnoteworthy value-added rate and turnover rate of account payable indicate that the occupancy of the payment to suppliers for goods has little impact on the creation of value added. There is a significantly negative correlation between the value-added rate and accounts payable cash deposit when the value is 5%, which shows that a great deal of deposit funds for the payment to suppliers for good will lead to quite high monetary capital costs, which is not propitious for the value creation. That is to say, the less the payment of the accounts payable deposit, the more funds for operation the enterprises will have, which is propitious for the value creation

Note (AVAR)[a]: "AVAR" is the abbreviation of the first letter of each word of "asset value-added rate". At the back of the acronym are similar to those of the front.

ACKNOWLEDGMENT

This study was supported by the Specialized Research Fund for the Doctoral Program of Higher Education (20100111110015).

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