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THE DISCLOSURE BEHAVIOR AND PERFORMANCE OF RUSSIAN FIRMS: PUBLIC DISCLOSURE INDEX AND DEA APPLICATION

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ABSTRACT

This paper aims, to measure the levels of public disclosure of 92 manufacturing firms listed on Russian Stock Exchange and empirically investigates the link between the level of disclosure and firm performance proxies as of December 2009. To carry out this study, annual financial reports of the firms were accepted as a proxy for the level of disclosure released on firms' web-sites and the reports used to construct a disclosure index as a yardstick to measure the level of a firm's disclosure. A disclosure index was constructed as a yardstick to measure the level of firm's disclosure by using the firms' annual reports. CCR - DEA model and BCC – DEA model used to obtain efficiency scores. PDI and TA used as inputs, MV, MV/BV and Tobin's q used as outputs. Average score of PDI is 0,69. The highest PDI was 0.81 and the lowest one was 0.45. Only 7 firms have scale efficiency and the technical efficiency at the same time. Other 84 firms don't have total efficiency, technical efficiency or scale efficiency.

Keywords: Public Disclosure Index, firm performance, corporate governance , annual reports, voluntary disclosure.
JEL Classification: G30, L25, M10

1. INTRODUCTION

The concept of corporate governance in recent years has become the key phenomenon for the development of the transparency of countries, markets and companies. Corporate governance is not a new concept but its popularity has increased in the last few decades due to various crises such as the East Asian crisis of the late 1990s and a number of fraudulent activities in the corporate world. Now every country recognizes that the good corporate governance is essential for the efficiency and growth of their economy. Several reasons lie at the root of this.

First of all, economic growth requires new investments. New investments can be financed both from internal and external sources. While internal finance is often insufficient for economic growth, external investment is required for diversification of the economy and the development of all sectors. However, external investment, in turn, can come only in a good investment environment. Thus, improving the quality of corporate governance is essential for global investors. As was mentioned in the Global Investor Opinion Survey (McKinsey and Company, 2002), corporate governance is a significant investment criterion.

Secondly, one of the most important reasons behind the crises in international financial markets in recent years has been the lack of corporate governance policies of countries and companies. Globalization has increased the volume as well as the complexity of business trade adding to the difficulties associated with external control and making the concept of corporate governance more popular and useful.

Technological advances and globalization have increased the diversity of financial instruments available to emerging markets, which are themselves restructuring and widening their international access as a result of increasing competition. This new structure has exposed developing markets and companies that operate in

them to scrutiny from, international fund managers who gauge their investment decisions, in part, on financial performance and quality of corporate governance.

One of the principles of corporate governance is "public disclosure and transparency". In accordance with this principle, companies inform all interested parties about their financial situation, performance, ownership structure and other conditions in a timely and accurate manner.

In terms of the effective functioning of the capital market, in which providers of funds make decisions on the distribution of funds, "information" has a special significance. The problem of asymmetric information also raised issues such as moral hazard and adverse selection. Herein, the principle of "disclosure and transparency" acquires a special importance for capital markets. However, the disclosure of only operating results is not enough for shareholders and other interested parties to manage their control and decision making processes.

The present perspective approaches transparency as a dynamic process and this new concept of transparency requires more active behavior and imposes new responsibilities on companies. The OECD Principles describe corporate governance in terms of the relationship between management of a company, its shareholders, its board and other stakeholders. It is a system which is used for the purpose of controlling and directing the companies. That is why the OECD Principles of Corporate Governance (OECD, 2004) demand accurate and timely disclosures not only of operational and financial results, but also of a company`s mission, ownership structure, board members and top executives, the financial rights provided to them, related party transactions, and the management and internal control structure. To provide the desired level of transparency, disclosure about related parties and corporate social purposes are among the elements that are needed. The regulatory authorities of countries in this process impose the rules related to transparency as the number one priority of corporate governance reforms.

The main questions of this paper are: 1. How can we measure the level of voluntary disclosure? 2. If it was used as an input, Public Disclosure Index (PDI), what would be performance efficiency of firms? Some previous papers have linked firm performance to a number of corporate governance aspects, such as board of directors and ownership structure and some other disclosure indexes. Nevertheless, in this study, we are associating PDI to firm performance by deploying DEA.

The paper is organized as follows. Following the introduction, in section 2, we explain the theoretical framework and disclosure index. In section 3, we examine PDI, Tobin's q and firms size's impact on the firm value. We deploy a disclosure rating form (DRF) to obtain a PDI that measures the level of a firm's disclosure using the annual reports of 92 manufacturing firms listed on the Russian Stock Exchange. We use Tobin's q, market value and market value/book value ratio as a performance proxies. Then the efficiency scores are obtained by data envelopment analysis (DEA). In section 4, we discuss findings. Section 5 concludes the paper.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Disclosure and Firm Value

According to signaling theory (Spence, 1973), the primary objective of corporate disclosure is to inform analysts and investors about the firm's quality and value. This suggests that voluntary disclosure decisions lead to the reporting of relevant information about firm performance. Based on these theoretical suggestions, prior studies have attempted to empirically examine the relevance of voluntary corporate disclosure. The first research about public disclosures and its applications began with studies demonstrating market failures between 1930 and 1970. Berle and Means (1932), Jensen and Meckling (1976), and Akerlof (1970) are examples of these studies.

Academic works on this theme examined the public disclosure and transparency practices of enterprises, and their relations with the capital markets. Sengupta (1998), Botosan (1997) and Ashbaugh et al. (2004) tested the relationship between the public disclosure and the cost of debt and capital based on the idea that, detailed, timely and correct disclosure of information would reduce the risk of the company, so the cost of debt and capital will be lower.

Botosan (1997) examined the association between disclosure level and the cost of equity capital by regressing firm-specific estimates of cost of equity capital on market beta, firm size and a self-constructed measure of disclosure level. Her measure of disclosure level is based on the amount of voluntary disclosure provided in the 1990 annual reports of 122 manufacturing firms. She found a positive relationship between high levels of disclosure and the low cost of capital.

Sengupta (1998) tried to prove that disclosure reduces the cost of debt in his study. He used the data of total disclosure score for 311 different companies obtained from 1987-1991 annual volumes of FAF reports. According to his results, firms that disclosure timely, detailed and clear information are rewarded with a lower cost of borrowing.

Silva and Alves (2004) tested relationships between firm value and public disclosure level of 150 Brazilian, Argentinean and Mexican firms in their study. The firm value measured by the Tobin's q. As a result, they found that the size and industry brunch of firms had the most impact on Tobin's q. They found positive relationship between disclosure level and firm value.

Fan et al., (2003) tested the relationship between disclosure level and the competitive and strategic characteristics of 144 Chinese companies. As a dependent value, they used disclosure of information about competitive characteristics of a company. They found that variables related to industry competitiveness have a significant effect on the level of voluntary disclosure. Corporate governance factors and company earnings have no effect on the level of voluntary disclosure.

The work by Liu and Eddie (2007) showed that Chinese companies are more willing to adopt the public disclosure if they have foreign investment. Their study also confirmed the hypothesis that bigger companies disclose more information. They also found negative relationship between company revenue and disclosure level.

Firth (1979) in his study found that bigger companies have more willingness to disclose more information. Chow and Wong-Boren, (1987) tested the relationship between their level of voluntary disclosure and size in 52 Mexican companies. As a result, they found a positive relationship.

Huafang and Jianguo (2007) examined 559 Chinese companies' disclosure level in their study. They found a positive relationship between the number of independent managers and disclosure level, and a negative relationship between CEO duality and disclosure level.

Bollen et al. (2006) examined the websites of 270 companies in Austria, Belgium, France, the Netherlands, South Africa and the United Kingdom. They found a positive relationship between company size, the level of multi-nationality, the percentage of shares open to individual investors, environmental factors and the disclosure information on the Internet. They found that multinational companies are using the Internet more than other companies as a tool to inform their investors. Also they found a positive relationship between environmental factors and the disclosure level.

Cormier et al. (2009) examined the websites of 189 companies in Canada for information on productivity, as well as social and financial activities. They found a positive relationship between disclosureabout social and financial activities on the web site and firm value.

Gandia (2008) examined the websites of 92 Spanish listed companies. He found that disclosure levels depend on the degree to which firms are followed by analysts, their listing age, their "visibility" and whether they belong to the communications and information services industry. He did not find any relationship between the level of disclosure and the company auditing or variables related to corporate management. Also, he found a positive relationship between the number of analysts following the firm and the disclosure level.

Black (2002) examined 21 Russian companies and tested the hypothesis that good corporate governance impacts the company's market value. According to his estimations, it is possible to increase the market value of a company to 700 – fold with good corporate governance.

Black et al. (2006) used the data of Russian companies from 1999 to 2006 and tested the relationship between corporate governance and firm values. They found a strong correlation.

Judge et al. (2003) examined the management of Russian companies and the impact of management on firm value. They found that CEO - duality impact firm value negatively. Overall, their findings suggest that effective corporate governance may be essential to firm performance in Russia.

2.2. Disclosure Index

The main difficulty when analyzing the corporate governance disclosure of a company is to determine an objective measure to quantify the non-numeric data. In terms of measuring the effect of transparency on firm value, one of the important points is how to measure the degree of transparency. To quantify the non-numeric data, researchers have usually developed the disclosure index by studying and analyzing the content and scope of the company's annual reports. The main assumption is that the annual report is the most relevant means of diffusing information regarding the status of the business. It is also assumed that the more information the annual report contains the higher the degree of company's transparency (Meek et al., 1995; Botosan, 1997).

Lui and Eddie (2007) examined Chinese companies on the basis 147 criteria for a disclosure index. If there is information in annual reports matching each criterion they gave one point, if not 0. They collected all these scores to form the the total disclosure score of the company. The score was then divided by the possible maximum score. The result was the disclosure index for the company.

Huafang and Jianguo (2007) examined the relationship between ownership structure, board of directors and voluntary disclosure in Chinese companies. They divided the index into four parts. They used 30 criteria. The four parts are: introductory information, information about productivity, financial information and non – financial information. They used a similar system to Lui and Eddie (2007) for calculating the disclosure index, but they used a total score, instead of an index.

Cormier et al. (2009) used 111 criteria in their research. They divided these criteria in nine parts. These are: robustness of Internet page, financial results, management information systems, corporate governance, the value of the consumer, human resources and intellectual capital, production efficiency, growth and development, and social responsibility. All indicators are calculated on a scale of 1 to 3.

Bollen et al. (2006) reviewed the quality of companies' Internet pages to look for how web sites are used to develop relations with investors. Their index is determined by six criteria: disclosure of annual and quarterly reports on the websites, press releases and other information, easy access to information on websites, opportunity to communicate directly via e-mail or subscription, video and audio record and opportunity to participate in meetings online.

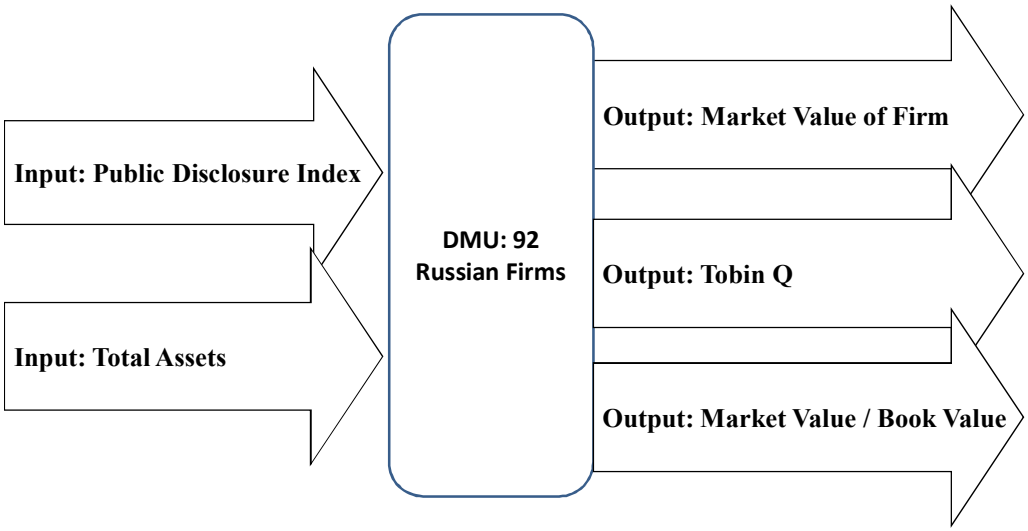
Gandia (2008) examined the disclosure of Spanish companies about corporate governance through the information on their websites. The author used 32 criteria, divided into 4 parts: disclosure of information about board of directors, annual general assembly of shareholders, ownership structure and other information related to the management.

3. DATA AND METHODOLOGY

DEA is an operations research technique to measure relative efficiency of firms (also called decision making units — DMUs) that use multiple inputs to produce multiple outputs. DEA identifies DMUs that produce the largest amount of output by consuming the least amount of input. These DMUs are classified as efficient (Cooper et al., 2006). Thus, in order to evaluate 92 companies registered on the Russian Stock Exchange (MICEX), financial data were collected from the companies' balance sheet and income statements whereas the PDI were calculated for each firm through examination of annual reports. Assumption here is if the companies' annual reports have transparent enough and give meaningful information to investors next year financial performance will be better. Thus, PDI scores obtained from 2008 annual reports and financial data got from December 2009 balance sheet and income statements. Based on the DEA, the current study develops tools and provides means for characterizing and improving the performance of Russian Stock Exchange companies. The calculated PDI and the Total Assets (TA) of the firm were used as inputs, whereas market value (Ulucan, 2000 and 2002; Perçin and Ustasüleyman, 2007; Zhu, 2000; Kahveci, 2011; Kahveci et al. 2013) and market value/book value ratio and Tobin's q were used as outputs. The aim is to evaluate the disclosure capability of

firm to turn into its performance. Efficiency score results show us which company is best in terms of its performance to produce annual report as a means of disclosure tool and transparency measure. If some companies are not efficient by transforming PDIs into its performance (market value, market value/book value and Tobin's q), that means that they are not able to produce good annual reports that affects positively their performance. The model is shown below in Figure 1.

Figure 1: DEA Analysis Model for DEA



3.1. Public Disclosure Index

In many studies, to calculate information from annual reports,researchers generate information by using rating forms. The number of items used in rating forms vary in different studies. In this study, the disclosure rating form (DRF), in parallel with previous studies (Lui and Eddie (2007), Huafang and Jianguo (2007), Cormier et al. (2009) Bollen et al. (2006) and Gandia (2008)) is based on the information that firms provide in their annual reports. We generate a DRF composed of 109 items for the purpose of this study. Botosan (1997),and Standard &Poor's (2007) used a similar DRF in their studies.

To calculate PDI we generate a DRF for converting information from annual reports to quantitative values. In this context, the DRF consists of six chapters under three main parts. For disclosed information, each company earns a score of 1, and for undisclosed information it takes 0. The chapters and the main parts of the DRF are given below.

- Ownership Structure and Investor Rights
  - Ownership Structure
  - Investor Rights
- Financial and Non – Financial Information
  - Financial Information
  - Non – Financial Information
- The Board of Directors, Management
  - Information About The Board of Directors and Management
  - Compensation of the Board of Directors and Management

Formula used for calculating PDI is below:

PDI = Total Score / Maximum Score(109)

Based on the explanation above, PDI scores are obtained by using annual reports in 2008. Average score of PDI for 92 Russian companies in 2008 year is 0,69. The score of company with the highest PDI was 0.81 and the lowest one was 0.45.

3.2. Tobin's Q Ratio

Tobin's q was developed by James Tobin (Tobin, 1969) as the ratio between the market value of a company and replacement value of its physical assets.

Tobin's q = (Equity Market Value + Liabilities Market Value) / (Equity Book Value + Liabilities Book Value)

If the market value of firms reflected solely the recorded assets of a company, Tobin's q would be 1.0. If Tobin's q is greater than 1.0, then the market value of the company's recorded assets. This suggests that the market value reflects some unmeasured or unrecorded assets of the company. High Tobin's q values encourage companies to invest more in capital because they are "worth" more than the price paid. On the other hand, if Tobin's q is less than 1, the market value is less than the recorded value of the assets of the company. This suggests that the market might be undervaluing the company. In many studies, researchers used Tobin's q as an indicator of the firm value. Griffith (1999), Kuznetsov and Muravyev (2004) studied the relationship between firm performance and ownership structure of firm, independent managers and CEO – duality. They found a positive relationship between these variables. Also, Klapper and Love (2004) and Black et al., (2002), examined corporate governance quality and firm performance. They also find a positive relationship between corporate governance and firms' Tobin's q.

It is very hard to calculate the replacement value of the physical assets for use in this ratio. In this study we use a simple approximation formula of a q value which was developed by Chung and Pruitt (1994) as defined below:

Approximate q = (MVE+PS+DEBT)/TA

MVE – The Product of a firm's share price and the number of common stock shares outstanding.

PS – The liquidation value of the firm's outstanding preferred stock.

DEBT – The value of the firm's short –term liabilities net of its short – term assets, plus the book value of the firm's long – term debt.

TA – The book value of the total assets of the firm.

It has been calculated all companies' Tobin's q. Average Tobin's q is 1,35 which means the Russian companies average market value is greater than the recorded value of their assets. It can be seen by looking at the average MV/BV ratio, it is 2,41 which means the market value is greater than the book value.

3.3. Size of the Firm

The other most common indicator for disclosure is the size of the firms. There some reasons for big companies to disclose more information than medium or small size companies:

- They are more recognized and monitored by public and investors.
- It will be easier to find funds at a lower cost if you disclose more information.
- There are more opportunities and more infrastructure tools in big companies for more disclosure.

In some studies, authors found a positive relationship between the size of companies and their disclosure (Meek et al., 1995, Wallace et al., 1994). In this study as measurement for size we used total assets.

4. FINDINGS AND DISCUSSIONS

It should also be noted that the traditional DEA models can be analyzed in two ways, an input orientation or an output orientation. The objective of an input oriented model is to minimize inputs while producing at least the given output levels, on the other hand, the objective of an output oriented model is to maximize outputs while using no more than the observed amount of any input. (Cooper et al., 2000). In terms of this study, we believe

that it is appropriate to adopt an output maximization assumption since it is widely accepted in strategy research that the main aim of the firm is to maximize market value. Thus, the firm using given inputs should be able to maximize market value and so market price.

While CCR models are used to measure total efficiency, BCC models, on the other hand, are used for technical efficiency. If a technically efficient Decision Making Unit (DMU) has an inefficiency coming from a scale inefficiency, it cannot be totally efficient. The relationship between total efficiency and technical efficiency is shown by the equation below (Cooper et al, 2006: p.141; Ulucan, 2002; Kahveci, 2011).

Total efficiency score = Technical efficiency score X Scale efficiency

This equation can be used to decide if firms have scale inefficiency. First, using a CCR - DEA model, total efficiency scores are obtained. Then, using a BCC – DEA model, technical efficiency scores are obtained. Finally, scale efficiency scores are calculated.

According to the results, 7 firms have scale efficiency and technical efficiency at the same time. Thus only 7 firms can be said to have total efficiency. The remaining 84 firms don't have total efficiency, technical efficiency or scale efficiency. It means that 84 firms could be more efficient by increasing or decreasing their scale. They could not reach desired performance levels by current PDIs and TAs.

Table 1: Efficient Firms DEA Scores, Inputs and Outputs

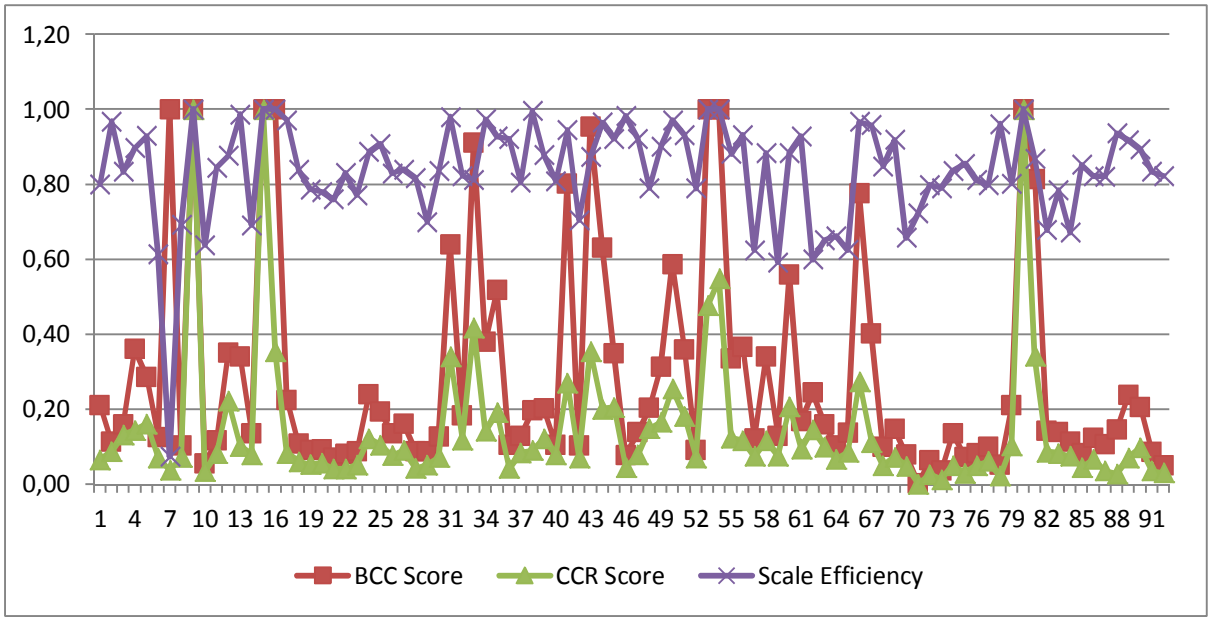
Firms	TA	PDI (2008)	MV/BV	Tobin's Q	MV (billion)	BCC Score	CCR Score	Scale Efficiency	Times as a benchmark for another DMU (CCR)	Times as a benchmark for another DMU (BCC)
7	8,83	0,62	0,76	0,50	5,56	1,00	0,07	0,07	0	0
38	207,10	0,67	0,78	0,90	131,24	0,20	0,20	1,00	0	0
9	21,90	0,45	32,42	9,54	187,51	1,00	1,00	1,00	79	83
15	6950,74	0,72	0,80	0,66	4332,96	1,00	1,00	1,00	0	2
16	193,17	0,74	4,95	3,16	775,01	1,00	1,00	1,00	61	63
53	2,95	0,72	1,07	7,29	5,84	1,00	1,00	1,00	12	9
54	2696,72	0,81	1,64	1,33	2418,65	1,00	1,00	1,00	25	36
80	1,42	0,72	53,88	0,24	73,42	1,00	1,00	1,00	6	4
Average	1260,35	0,68	12,04	2,95	991,27	0,90	0,78	0,88	-	-

Table 1 shows the efficient firms inputs, outputs and DEA scores. Firm 7 has total efficiency and firm 38 has scale efficiency but neither of them have technical efficiency. The other 6 firms have total and scale efficiency at the same time.

Technical efficiency requires a firm to produce the maximum output given the level of inputs employed. Scale efficiency means the firm has the right scale in accordance with its output. As shown in Figure 2, only 6 firms are efficient in term of technical and scale efficiency and then total efficiency. Although firm 9 has the lowest PDI score, the biggest Tobin's q, and the second big MV/BV ratio it is one of the most efficient firms in both efficiency score. On the other hand, although firm 15 and firm 80 rank a little above the average PDI score, the former has the biggest MV and the latter has the biggest Tobin's q and both of them are efficient in terms of technical and scale efficiency. Thus, this shows that it does not necessarily to have the highest PDI score to be efficient.

Relatively efficient firms appear in the reference set of relatively inefficient firms. In this regard, in terms of CCR scores, firm 9 has been observed on the reference set 79 times, firm 16, 61 times, firm 53 12 times, firm 54 25 times and firm 80 only 6 times. On the other hand, in terms of BCC scores, firm 9 has been observed on the reference set 83 times, firm 16, 63 times, firm 53 9 times, firm 54 36 times and firm 80 only 4 times. Only firm 38 has scale efficiency without having have technical or total efficiency. It can be said that, it has the right scale.

Figure 2: DEA Efficiency Scores



5. CONCLUSION

The purpose of this study was first to calculate PDI scores of 92 Russian companies that listed on MICEX by using 109 items defined under 6 main parts on the basis of annual reports. Then by using these PDI scores as an input with total assets, to estimate the characteristics of technical and scale efficiency of those companies in terms of their performance.

The results of this study can be summarized as follows:

- The average PDI score for the 92 Russian companies, in 2008 was 0.69. The company with the highest PDI scored 0.81 and the lowest 0.45.
- Only 7 firms have technical and scale efficiency, accordingly total efficiency score. The rest of the firms do not have efficiency at all. Average total efficiency is 0.25 showing the necessity to increase performance for almost all companies.
- The average scale efficiency is 0.84 which is relatively very good compared to total efficiency. Most of the companies have close to the right scale.

The study also aimed to measure the levels of public disclosure of the 92 firms listed on the Russian Stock Exchange. Annual financial reports of the firms were accepted as a proxy for the level of disclosure released on firms' web-sites and the reports used to construct a disclosure index as a yardstick to measure the level of a firm's disclosure.

Economic growth requires new investment. New investments can be financed both from internal and external resources. In Russia, as a developing country, internal finance is not enough for the economy. External investment is required for diversification of the economy and development of all sectors. Foreign investment, in turn, can come only in a good investment environment. And this is not possible without improving the quality of corporate governance. By informing all interested parties about their financial situation, performance, ownership structure and other conditions in a timely and accurate manner, companies can attract more investors.

According to results, companies listed on MICEX has average 0,69 PDI scores and average MV/BV ratio of 2,41 and average Tobin's q of 1,35. Bigger than 1 MV/BV and Tobin's q ratio shows there is much interest for those companies, in other words, investors are choosing those companies for their investments and they are willing

to pay more than the firms' actual value. Overall, it can be said that, firms that has been analyzed have good PDI scores, which means they disclose necessary information to investors in their annual reports and they have also relatively good scale efficiency scores compared to the total efficiency scores which means they are relatively efficient by scale. This study showed that the level of public disclosure level is good in Russia. For new investments Russian companies might improve the disclosure level and by doing so they can attract new investors and they can get the funds they need easily. It is necessary to arrange disclosure level to the scale and to the market value of the company. By increasing and decreasing the disclosure level (PDI scores) companies can affect their performance, in this study it means market value, Tobin's q and MV/BV ratio.

For further researches;

- Similar studies can be conducted to see how PDI scores change over the years.
- Various PDI scores obtained from different set of variables might be compared to see the effectiveness of those PDI scores.
- Various companies' PDI scores from various sectors can be compared to see how the disclosure behavior of companies changes from one sector to another.
- Comparison of PDI scores among different countries can be done to see the differences among countries and the effects on the firm performances.

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