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Board Structure and Corporate Performance

Özgür Arslan
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This paper attempts to analyze the impact of board structure attributes on their accounting and stock market performance. Our analyses are built on an emerging market, Turkey for the period between 1995 and 2006. We conduct our analyses through binary logistic methodology. Our findings show that, while board ownership does not have any impact on the accounting performance, it has a fairly positive influence on the stock market performance of firms during the crisis period. Similarly, the situation when the CEO of a firm is also the chairman of the board is not found to have any impact on the corporate performance of firms, although its negative impact is present during the crisis period. Moreover, board independence is found to not to have an effect on accounting performance, yet the stock market perceives board independence positively, both in general and in the crisis periods. Finally, board size has a positive impact , both on the accounting and on the stock market performance of firms, yet the impact on the corporate performance reverts to adverse during the crisis period.

Key Words: board size, board independence, ROA, Tobin's *Q*
JEL *Classification:* G14, G20

Introduction

The main purpose of this study is to examine the impact of board attributes on corporate performance in an emerging market, Turkey. Therefore we examine whether a significant difference exists between board size, board independence, board ownership and their accounting and stock market valuation performance measures, specifically return on assets (ROA), and Tobin's *Q*.

This study contributes to the limited existing body of literature regarding the emerging markets from various aspects. First, it provides additional evidence for determination of the direction of the relationship

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between board structure and firm performance in an emerging market context. Due to the limited number of studies in this field and the contradictory results obtained, there is still not a consensus on whether board structure improves firm performance in emerging markets. Moreover, most empirical research studying the relationship between board structure and corporate performance uses data from the US or other developed economies and provides mixed results.[1] However, the ability to generalize these results regarding the board structure-performance relationship may not extend across national boundaries. While the assumption of a utility maximizing agent is universal, each country's regulatory and economic environment, the strength of capital markets, and current governance practices are different. As a result, the importance and value of various governance structures should be separately examined in each country. Furthermore, this study presents evidence from an emerging market and a civil law country which possesses relatively different characteristics to those of the common law and developed countries that have been extensively studied by the majority of the existing studies in the corporate governance literature.

There have only been a few studies addressing Turkey related with this topic. As compared with the contents of previous studies, this study is the most detailed one that is directed towards examing the performance effects of board structure in Turkey. Moreover, having elaborated an emerging market, one must also take into consideration the fluctuations in the market. Therefore we also study the role of the board attributes during the economic constriction periods in Turkey.

We study the period between 1995 and 2006 on a total of 999 firm level observations and we conduct our analyses through logistic regressions. Despite the finding of Selekler-Goksen and Karatas (2008) that board structure does not have a significant impact on performance, our in–depth analyses goes beyond this finding. Firstly, our findings indicate that while board ownership does not have any impact on the accounting performance, it has a fairly positive influence on the stock market performance of firms during the crisis period. Similarly, the situation when the CEO of a firm is also the chairman of the board is not found to have any influence on corporate performance of firms, however its negative impact is observed only during the crisis period. Moreover, board independence is found not to have an affect on accounting performance, yet the stock market perceives board independence positively, not only in general but also during the crisis periods. Finally, our most interesting

results are related to the board size. Generally, board size has a positive impact on both the accounting and the stock market performance of firms. Nevertheless, the impact of board size on the corporate performance reverts to adverse during the crisis period.

The remainder of the paper proceeds as follows. Section two reviews the related literature and builds hypotheses. Section three explains briefly the data and methodology, and section four reports the results of the analyses of performance measures for the each of the attributes of the board structure. Finally, section five concludes the paper.

Literature Review and Hypothesis Development

The finance literature covers a vast array of research concerning the relationship between board structure and firm performance. In other words, the main two tasks of the board are advising and monitoring the activities of management. The better these activities are accomplished the more improvement in corporate performance will be achieved. Therefore this section summarizes the literature and builds the hypotheses.

This paper centers on the departure from a basic model of the owner-manager firm and approach to the separation of ownership from control. In this paper we concentrate on the concept which leads to the agency problem (Jensen and Meckling, 1976). The information advantage of controller over owners creates potential for opportunistic behavior. Therefore, we hypothesize that, as the ownership level of board members increases, the corporate performance of firms rises in turn, owing to diminished agency problem. At first, Morck, Shleifer, and Vishny (1988) find no robust link between the amount of equity owned by members of the board and firm value. However, through using accounting data, Bhagat, Carey and Elson (1999) show a significant correlation between stock owned by outside directors and company performance. Moreover, Bagnani et al (1994) report a positive relationship between bond returns and the ownership level, whereas Guest, Gosh, Hughes (2006) find in UK firms that board ownership has a strong positive impact on long run share returns and a weak positive impact on operating performance. Finally Coles, Lemmon and Wang (2008) concludes that ownership does not have any explanatory power on the firm performance measured by Tobin's *Q*.

Chairs are special board members who have the job of overseeing the entire board's activity. However when a manager of a firm is also chairman of the board in the same firm, then the board is not assumed to

be independent in monitoring and advising activities, because the objectivity in judgment of the performance of the company is likely to be impaired. When the board is independent it can serve as a balance to tip the scales in favor of better corporate performance. Rosenstein and Wyatt (1997) find that independent directors cause stock market investors to give a positive response and increase the market value of the firm. Westphal (1999) emphasizes that CEO's intervention on the board, or even taking up the chairman position, may end up in diminished involvement and effectiveness of board members by reducing their tendency to control management decision making. Finally, Millstein and Macavoy (1998) find a significant correlation between board independence and superior economic profit.

As for Turkey, Küçükçolak and Özer (2007) show that 10.4 percent of all the ISE members have separated the responsibilities of CEO and chairman. Furthermore, Kula (2005) studies mostly small and non-listed companies in Turkey and finds that separation of chairman and general manager positions has a significant positive effect on firm performance. Nevertheless, through studying both accounting and stock market data, Bhagat and Black (1999) do not obtain evidence that greater independence results from higher performance. In accord with this, Nickell (1995) states that non-executive directors may not have adequate incentives to remove managers when the stock market performance of the firm declines.

Board size is the most elaborated board structure in the corporate finance literature, and in general the relationship between board size and corporate performance is found to be inversely related. Using both Tobin's *Q* and ROA as the performance measures, Yermack (1996) confirms a negative association between board size and firm value because benefits of monitoring from enlarging boards are outweighed by problems associated with the increased asymmetric information and deteriorated communication issues. This result is rooted in the finding of Jensen (1993), which suggests that there is a likelihood that the gap between ownership and control expands as the boards gets bigger. As the size of boards increases the percentage of independent directors, who have no or very low ownership in firm, is expected to increase as well.[2] A recent study by Cheng (2008) also concludes that board size has a negative impact on both the accounting and the stock market performance of the board size. Finally, Coles, Daniels and Navrees (2008) find that there is a U-shaped relationship between the firm size and corporate performance.[3]

Data and Methodology

This study is built on non-financial firms listed on Istanbul Stock Exchange (ISE). We have a balanced panel including 999 observations. Our study period is between the years 1995 and 2006. Therefore we are able to study the role of the crisis period on the board structure–corporate performance relationship as well. We collect financial data directly from the ISE website (www.imkb.gov.tr), whereas the ownership data are gathered from the *Yearbook of Firms,* which is issued annually by the ISE.

Our aim is also to investigate how the relationship between board structure and corporate performance is affected during the crisis years. Therefore we interact every board attribute with a crisis dummy in the regressions. Turkey was adversely affected by the Russian debt default in the year 1998 due to the contagion effect. Moreover Turkey was severely hit by a domestic financial crisis, which reflected its influence during the years 2001 and 2002. Therefore the crisis dummy takes the value of unity if the observation years coincide with the years 1998, 2001 and 2002, and zero otherwise.[4]

We use logistic regression methodology for conducting our analyses. Our estimation technique allows for a binary dependent variable, which rules out the usual regression analysis, including the linear probability model. The probabilities in our model are bounded by zero and unity, hence linear functions are inappropriate for our models given that they are inherently unbounded. In specific, our logit model contains a two state dependent variable, namely: State 1 = High Corporate Performance and State 0 = Low Corporate Performance. Put differently, we assume that the dependent variable is a dummy variable which takes the value of unity if a firm is reported to have a high corporate performance, and zero otherwise. A firm is accepted to have a high (low) corporate performance if the value of its Tobin's *Q* (ROA) is ranked at the top (bottom) 25 percent of the sample. We exclude all the observations falling between the top and bottom quartiles of the sample in order to eliminate the shadow variables. Finally the total number of observations falling into the top (bottom) quartile is 500 (499).

A common representation of the logit model used in our estimation is as follows;

$$P_t^i = f(X_{t-1}^i, E_{t-1}), \tag{1}$$

where P_t^i takes the value of 1, if i is found to have a high Tobin's *Q* (ROA)

in year t and takes the value of zero if otherwise. Vector X^i_{t-1} represents board characteristics of the firm. Vector E_{t-1} represents other attributes of the firm such as the financial attributes. More explicitly, the probability of having a high corporate performance is a random event and unknown, but can be estimated. The probability of having a high corporate performance is:

$$P[Y^i = 1] = p_0. \tag{2}$$

Furthermore, the probability of having a low corporate performance is:

$$P[Y^i = 0] = 1 - p_0. \tag{3}$$

The probabilities are determined by some firm specific variables and X_i are assumed to come from a logistic distribution function. Then, we can write the probability of having a high corporate performance as a function of X as follows:

$$P[Y^i = 1|X] = \frac{1}{1 + \exp\left(\sum_j X^i_j \beta_1\right)}. \tag{4}$$

Finally, the probability of having low corporate performance would be:

$$P[Y^i = 0|X] = \frac{\exp\left(\sum_j X^i_j \beta_1\right)}{1 + \exp\left(\sum_j X^i_j \beta_1\right)}. \tag{5}$$

We concentrate on the odds ratios while interpreting the regression results. The coefficients of the model are estimated by the maximum likelihood method. Furthermore, we include the following control variables into the model; age , size, debt maturity structure, leverage and cash holding behavior of the firm.

Results

As seen from table 1, our first results provide the descriptive statistics on the variables. The average board ownership is found to be only 9.6 percent. Moreover, the average of persons on the board is 5.7. *Chairman* is a dummy variable taking the value of 1 if the manager of the firm is also the chairman of the board, and zero otherwise. Our results show that in most firms managers do not simultaneously work as a chairman on the board. *Board Independ.* represents board independency and is a dummy

TABLE 1 Descriptive statistics

Variables	Mean	Median	Std. Dev.	Minimum	Maximum
Board Own.	9.601	0.120	17.494	0.000	83.320
Board Size	5.708	6	28.810	2	45
Chairman	0.085	0	0.279	0	1
Board Independ.	0.400	0	0.490	0	1
Age	26.692	29	13.087	1	95
Size	17.556	17.575	1.904	0	22.885
Debt Maturity	0.746	0.788	0.183	0	1
Leverage	0.478	0.479	0.211	0	0.984
Cash	0.070	0.029	0.097	0.000	0.850
MV/BV	2.292	1.657	2.116	0.000	14.585
ROA	0.057	0.051	0.120	–1.253	0.854

NOTES This table presents descriptive statistics for the whole sample. *Board Own.* represents total ownership percentages of the board members in the firm. *Board Size* is the total number of members on the board. *Chairman* is a dummy variable taking the value of 1 if the manger of the firm is also the chairman of the board, and zero otherwise. *Board Independ.* represents board independence and is a dummy variable taking the value of 1 if the manager is also a board member, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Maturity* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets. MV/BV is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/*Book Value of Assets*. Finally, *Return on Assets* (ROA) is estimated as net profits scaled by total assets.

variable taking the value of 1 if the manager is also a board member, and zero otherwise. On average, managers are not found to be a member on boards, since the average value of the dummy variable is 0.4. Generally, firms in our sample are found to be young yet large in size. Firms on average hold short maturity of debt and have a fair leverage yet low cash holdings. Finally, firms in the sample have on average high growth opportunities and a positive return on assets.

Table 2 presents the Pearson Correlation matrix across the variables. We are assured that we have no threat of multicollinearity since the correlation coeffcient does not exceed 0.50 for any of our variables.

BOARD OWNERSHIP

We firstly look at the association between ownership levels of board members and the stock market performance of firms. Table 3 demon-

TABLE 2 Pearson correlation matrix

Variables	*Board Own.*	*Board Size*	*Chairman*	*Board Ind.*	*Age*	*Size*	*Debt Mat.*	*Leverage*	*Cash*
Board Own.	1								
Board Size	−0.203*	1							
Chairman	0.209*	−0.137*	1						
Board Ind.	−0.010	0.036	0.098	1					
Age	−0.165*	−0.208*	−0.021	0.062	1				
Size	−0.143*	0.169*	−0.048	0.039	0.151*	1			
Debt Mat.	0.060	−0.053	−0.002	0.081	−0.095	−0.171*	1		
Leverage	−0.007	−0.201*	0.069	0.017	−0.067	−0.043	−0.029	1	
Cash	−0.016	0.134*	0.050	0.056	0.020	0.161*	0.037	−0.186*	1

NOTES This table presents Pearson's Correlation matrix for the main variables used in our analysis. *Board Own.* represents total ownership percentages of the board members in the firm. *Board Size* is the total number of members on the board. *Chairman* is a dummy variable taking the value of 1 if the manger of the firm is also the chairman of the board, and zero otherwise. *Board Ind.* Represents board independency and is a dummy variable taking the value of 1 if the manager is also a board member, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets. MV/BV is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/*Book Value of Assets.* Finally, *Return on Assets* (ROA) is estimated as net profits scaled by total assets. * Indicates that correlation is significant at the 5% level (two-tailed).

TABLE 3 Board Ownership and the Stock Market Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	3.205	0.868	13.653	0.000	
Board Own.	0.006	0.005	1.429	0.232	0.994
*Board Own.*Crisis*	0.022	0.009	6.481	0.011	0.979
Age	0.022	0.006	15.514	0.000	1.023
Size	–0.355	0.045	62.652	0.000	0.701
Cash	5.139	0.868	35.072	0.000	170.579
Maturity	0.322	0.398	0.655	0.418	1.380
Leverage	4.021	0.366	120.886	0.000	55.783

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.204	n/a
Nagelkerke – R^2	0.273	n/a
–2log likelihood	1156.46	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is MV/BV, which is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/*Book Value of Assets.* The independent variable is a binary one which takes the value of 1 if the MV/BV of that company is situated at the top 25 percent of the sample and zero if it is situated at the bottom 25 percent of the sample. *Board Own.* represnts total ownership percentages of the board members in the firm. *Board Own.*Crisis* is an interaction between *Board Own.* and the crisis years.*Crisis* is a dummy variable taking the value of 1if the observation is at the years 1998, 2001 and 2002 and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

strates the regression results, where our dependent variable is the dummy variable which takes the value of unity (zero) if the value of Tobin's *Q* of the firm is situated at the top (bottom) quartile of the sample.

In general, board ownership is not found to have any influence on the stock market performance of firms. However, we see that board ownership has a positive influence during the crisis period. Specifically, a 1 percent increase in the ownership level of board members is likely to have a 21 percent increase in the stock market performance of that firm. We conclude that investors opt for the firms having owner members on boards during the economic constriction periods.

When the control variables in the regression are examined, it is firstly

TABLE 4 Board Ownership and the Accounting Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	3.977	0.856	21.607	0.000	
Board Own.	0.007	0.005	2.153	0.142	0.993
*Board Own.*Crisis*	0.005	0.009	0.304	0.995	0.978
Age	0.005	0.005	0.684	0.408	1.005
Size	–0.216	0.042	26.602	0.000	0.806
Cash	8.004	1.062	56.797	0.000	2993.418
Maturity	1.300	0.424	9.400	0.002	3.668
Leverage	–3.871	0.373	107.923	0.000	0.000
Goodness of fit tests	Value	*p*-value			
Cox and Snell – R^2	0.271	n/a			
Nagelkerke – R^2	0.362	n/a			
–2log likelihood	1069.857	0.000			
No. of observations	999				

NOTES This table presents the results of the logistic regression, while the independent variable is ROA, which is defined as the return on assets and estimated as net profits scaled by total assets. The independent variable is a binary, one which takes the value of 1 if the ROA of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Board Own.* represents total ownership percentages of the board members in the firm. *Board Own.*Crisis* is an interaction between *Board Own.* and the crisis years. *Crisis* is a dummy variable taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

seen that, firm age is found to be positively related to Tobin's *Q*, whereas firm size is associated with a low stock market performance. As confirmed by the finding of Arslan, Florackis, and Ozkan (2006) firms with high growth opportunities are found here to hoard a high level of cash. However, despite the highlighted reasoning of a negative association between long term debt and growth opportunities by Myers (1977), we do not find any significant relationship between the variables in this regression.

Our next set of results as presented in table 4 reveals the relationship between the board ownership and the accounting performance of a firm. Here dependent variable is the dummy variable which takes the value of unity (zero) if the value of the ROA of the firm is situated at the top

(bottom) quartile of the sample. Interestingly, we find no relationship between board ownership and the ROA of firms. Even the interaction with the crisis period yields an insignificant relationship. Therefore we conclude that ownership of board members does not play a significant role in reducing agency costs and asymmetric information problems in firms.

Regarding the results on the control variables, firm age is not found to have a significant impact on the accounting performance of firms. Firm size has a negative impact on the accounting performance since a one percent increase in firm size reduces the ROA by almost 20 percent. Profitable firms are likely to have a higher level of cash flow, and the positive and significant coefficient of the cash–holding variable confirms our reasoning. Profitable firms are found to hold a higher level of short term debt relative to the long term debt. Finally leverage and profitability are found to be negatively related. This finding confirms the pecking order theory of Myers and Majluf (1984) in the sense that profitable firms firstly resort to their internal funds for financing.

MANAGER AS A CHAIRMAN OF THE BOARD

Here we investigate the situation when a CEO of a firm also acts as chairman of the board. Table 5 provides the results on the relationship of the separation between the manger and chairman positions in a firm and its stock market performance.

The separation is not found to have any impact on the stock market performance of firms. However the interaction with the crisis dummy shows us that the market perceives the situation when such a separation is not fulfilled in a firm as being a bad signal during the crisis period. Therefore, a one percent increase in the occurrence of an event of non-separation of a managerial and a chairman position in a firm is likely to decrease its stock market performance by 66 percent. The results on the relationship between the control variables and the stock market performance go hand in hand with those reported in table 3.

When we move to the impact of the degree of separation between the manager and chairman roles on the accounting performance of firms, we regard the results reported in table 6.

Interestingly we can not find a statistically significant relationship between the *Chairman* dummy and the accounting performance, neither in general nor specifically in the crisis period. Therefore we conclude that the non-separation between the CEO and chairman positions in a firm is

TABLE 5 Manager as the Chairman of the Board and the stock market performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	2.698	0.883	9.323	0.002	
Chairman	0.112	0.286	0.152	0.697	1.118
*Chairman*Crisis*	–1.070	0.532	4.039	0.044	0.343
Age	0.024	0.006	18.663	0.000	1.025
Size	–0.339	0.044	58.884	0.000	0.713
Cash	5.242	0.872	36.173	0.000	188.965
Maturity	0.307	0.396	0.598	0.439	1.359
Leverage	3.991	0.363	120.711	0.000	54.128
Goodness of fit tests	Value	*p*-value			
Cox and Snell – R^2	0.199	n/a			
Nagelkerke – R^2	0.265	n/a			
–2log likelihood	1163.62	0.000			
No. of observations	999				

NOTES This table presents the results of the logistic regression, while the independent variable is MV/BV, which is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/*Book Value of Assets.* The independent variable is a binary one, which takes the value of 1 if the MV/BV of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Chairman* is a dummy variable taking the value of 1 if manager of the firm is also the chairman of the board, and zero otherwise. *Chairman*Crisis* is an interaction between *Chairman* and the crisis years. *Crisis* is a dummy variable taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

not found to be as hazardous as expected for the accounting performance of firms. In other words, managers, who also hold chairman position in a firm, are not likely to transfer wealth to their benefit at the expense of the shareholders. The results on the control variables align with those reported in table 4.

BOARD INDEPENDENCE

Table 7 presents the results of the estimation for a possible relationship between board independence and the stock market performance. Here, we are only interested in the situation in which a manager is only a member of the board, not a chairman. Therefore the results in this section are different in interpretation to those reported in the previous section.

TABLE 6 Manager as the Chairman of the Board and the accounting performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	3.871	0.852	20.633	0.000	
Chairman	–0.082	0.305	0.073	0.787	0.921
*Chairman*Crisis*	–0.329	0.578	0.325	0.569	0.720
Age	0.006	0.005	1.414	0.234	1.006
Size	–0.217	0.042	26.966	0.000	0.805
Cash	7.989	1.064	56.392	0.000	2948.91
Maturity	1.307	0.424	9.492	0.002	3.695
Leverage	–3.865	0.372	107.832	0.000	0.000

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.269	n/a
Nagelkerke – R^2	0.359	n/a
–2log likelihood	1073.015	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is ROA, which is defined as the return on assets and estimated as net profits scaled by total assets. The independent variable is a binary one, which takes the value of 1 if the ROA of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Chairman* is a dummy variable, taking the value of 1 if manager of the firm is also the chairman of the board and zero otherwise. *Chairman*Crisis* is an interaction between *Chairman* and the crisis years. *Crisis* is a dummy variable, taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

Our results show that board independence is negatively related with Tobin's *Q* of a firm. A 1 percent increase in the board independence is expected to decrease the stock market performance by almost 74 percent. Similarly, board independence is also perceived as a bad signal during the crisis period. Observing a 1 percent increase in the board independence is likely to decrease the stock market performance by almost 63 percent. The results concerning the control variables are in accord with those previously reported.

Our next results are reported in table 7 and they demonstate the direction of the association between board independency and the accounting performance. We find no statistically significant role of board indepen-

TABLE 7 Board Independence and the Stock Market Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	2.800	0.882	10.021	0.002	
Board Independ.	–1.334	0.468	8.145	0.004	0.263
*Board Independ.*Crisis*	–0.976	0.268	13.260	0.000	0.377
Age	0.024	0.006	18.210	0.000	1.025
Size	–0.342	0.045	57.878	0.000	0.710
Cash	5.625	0.873	41.504	0.000	277.298
Maturity	0.268	0.401	0.508	0.476	1.331
Leverage	4.281	0.377	129.151	0.000	72.322

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.212	n/a
Nagelkerke – R^2	0.283	n/a
–2log likelihood	1146.68	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is MV/BV, which is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/Book Value of Assets. The independent variable is a binary one, which takes the value of 1 if the MV/BV of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Board Independ.* represents board independence and is a dummy variable taking the value of 1 if the manager is also a board member, and zero otherwise. *Board Independ.*Crisis* is an interaction between *Board Independ.* and the crisis years. *Crisis* is a dummy variable, taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

dence in the accounting performance of firms, not only in general but also within its interaction with the crisis period. Furthermore, the control variables are identical in sign and significance with the previous findings.

We conclude that board independence has an adverse impact on corporate performance in general. It is likely that independent board members in Turkish firms do not have sufficient incentives to monitor management, due to the following reasons. First of all, the executive and non-executive split may be non-artificial for Turkish firms. In other words, the benefits of board members may be informally parallel to those of the managers in expense at the shareholders. Furthermore, there may be an

TABLE 8 Board Independence and the Accounting Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	3.979	0.860	21.386	0.000	
Chairman	–0.156	0.166	0.887	0.346	0.856
*Chairman*Crisis*	–0.098	0.272	0.130	0.718	0.907
Age	0.007	0.005	1.509	0.219	1.007
Size	–0.220	0.042	27.518	0.000	0.802
Cash	7.929	1.062	55.754	0.000	2777.879
Maturity	1.314	0.424	9.594	0.002	3.720
Leverage	–3.880	0.374	107.845	0.000	0.000

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.270	n/a
Nagelkerke – R^2	0.359	n/a
–2log likelihood	1072.218	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is ROA, which is defined as the return on assets and estimated as net profits scaled by total assets. The independent variable is a binary one, which takes the value of 1 if the ROA of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Board Independ.* represents board independence and is a dummy variable taking the value of 1 if the manager is also a board member, and zero otherwise. *Board Independ.*Crisis* is an interaction between *Board Independ* and the crisis years. *Crisis* is a dummy variable taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

asymmetry of information between non-executive and executive members on a board. Therefore, the quality of financial or strategic information divulged to non-executive members by the executive ones may be poor.

BOARD SIZE

Table 9 presents results on the relationship between board size and firm performance. In contrast to to the general findings in the literature, board size is found to have a positive impact on the stock market performance of firms. Specifically, a 1 percent increase in the size of a board is likely to increase the stock market performance of firms by 1.3 times. However board size is found to be negatively affecting the stock market

TABLE 9 Board Size and the Stock Market Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	2.270	0.889	6.524	0.011	
Board Size	0.295	0.046	40.327	0.000	1.343
*Board Size*Crisis*	–0.159	0.027	34.646	0.000	0.853
Age	0.017	0.006	8.458	0.004	1.017
Size	–0.413	0.048	73.179	0.000	0.661
Cash	5.622	0.887	40.174	0.000	276.503
Maturity	0.330	0.406	0.674	0.412	1.395
Leverage	4.749	0.397	143.313	0.000	115.493

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.246	n/a
Nagelkerke – R^2	0.328	n/a
–2log likelihood	1102.61	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is MV/BV, which is calculated as [(*Book Value of Assets – Book Value of Equity + Market Value of Equity*)]/*Book Value of Assets.* The independent variable is a binary one, which takes the value of 1 if the MV/BV of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Board Size* is the total number of members on the board. *Board Size*Crisis* is an interaction between *Board Size* and the crisis years. *Crisis* is a dummy variable, taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

performance during the crisis period. A 1 percent increase in the board independence is likely to decrease the stock market performance by almost 15 percent. Control variables have similar sign and significance levels to those of the previous findings.

Results in table 10 show the relationship between board independence and the accounting performance. Similar to the previous findings, board size increases the accounting performance of firms. A 1 percent increase in the size of the board increases the accounting performance by almost 1.08 percent. In a similar fashion, board size has a negative influence on the ROA of firms. A 1 unit increase in the board size decreases the accounting performance of firms by almost 5 units. The significance and signs of the control variables align with those of the previous findings.

We derive from these results that board size has a generally positive

TABLE 10 Board Size and the Accounting Performance

Variables	Coefficient	Std. Error	Wald	*p*-value	Odds
Intercept	3.536	0.881	16.103	0.000	
Board Size	0.080	0.044	3.308	0.069	1.084
*Board Size*Crisis*	–0.049	0.027	3.302	0.069	0.952
Age	0.003	0.006	0.356	0.551	1.003
Size	–0.220	0.042	27.335	0.000	0.803
Cash	8.033	1.070	56.378	0.000	3081.806
Maturity	1.276	0.425	9.024	0.003	1.558
Leverage	–3.801	0.373	103.736	0.000	0.000

Goodness of fit tests	Value	*p*-value
Cox and Snell – R^2	0.273	n/a
Nagelkerke – R^2	0.364	n/a
–2log likelihood	1067.856	0.000
No. of observations	999	

NOTES This table presents the results of the logistic regression, while the independent variable is ROA, which is defined as the return on assets and estimated as net profits scaled by total assets. The independent variable is a binary one, which takes the value of 1 if the ROA of that company is situated at the top 25 percent of the sample, and zero if it is situated at the bottom 25 percent of the sample. *Board Size* is the total number of members on the board. *Board Size*Crisis* is an interaction between *Board Size* and the crisis years. *Crisis* is a dummy variable, taking the value of 1 if the observation is at the years 1998, 2001 and 2002, and zero otherwise. *Age* is the number of years a firm has been operating. *Size* is the natural logarithm of total assets. *Debt Mat.* is the ratio of short term debt to total debt. *Leverage* is the ratio of total debt to total assets. *Cash* is the ratio of cash and marketable securities to total assets.

effect on the corporate performance through increasing effectiveness in advising the decision-making in a firm through the diversified experience and know-how of the various members. Similarly, the marginal costs of monitoring the managerial activity are observed to be decreasing as the board size increases. However the situation reverts during the crisis period, and board size becomes disadvantageous for the corporate performance of firms. It is likely that communication problems arise during the economic downturn times, hence the costs of the board size then outweigh its benefits.

Conclusion

The impact of the attributes of the board structure is not elaborated in detail in the corporate finance literature from an emerging market per-

spective. Therefore, this study shows the relationship between the corporate performance, namely the accounting and the stock market performance, and the board independence, separation of the tasks of management and chairman, board ownership and the board size. We build our analyses on the a total of 999 observations of Turkish non-financial listed firms for the period between 1995 and 2006. We conduct our analyses through logistic methodology by eliminating the shadow variables. We also study how the relationship is affected during the crisis periods.

Our findings indicate that, while board ownership does not have any impact on the accounting performance, it has a fairly positive influence on the stock market performance of firms during the crisis period. Similarly, the situation when the CEO of a firm is also the chairman of the board is not found to have any impact on the corporate performance of firms, although its negative impact is observed during the crisis period. Moreover, board independence is found not to have affect on accounting performance, yet the stock market perceives board independence positively both in general and in the crisis periods. Finally, our most interesting results are related to the board size. Generally, board size has a positive impact on both the accounting and the stock market performance of firms. Nevertheless, the impact of board size on the corporate performance reverts to adverse during the crisis period.

Notes

1 See among others Hermalin and Weisbach 1991; Agrawal and Knoeber 1996; Brickley, Coles, and Terry 1994.

2 In accord with this, Bhagat and Black (1996) find that the median ownership percentage of independent directors is 1 percent.

3 Following this finding we have checked the Turkish data, however our results do not confirm a noneconomic U-shape relationship between board size and both ROA and Tobin's *Q*. Therefore, in our analyses, we assume that the association is linear.

4 We also take the 1997 Asian crises into account, however the contagion effect of this incidence was midly felt in Turkey. Besides, our results do not change when we include the years 1997 as a unity dummy in our analyses.

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Valuation of Slovene Publicly Traded Companies with a Valuation Model Based on Expected Earnings and Growth Opportunities

Igor Stubelj

The article sheds light on valuating Slovene publicly traded companies. The research aim is to solve the problems about company valuation in an emerging market, such as the Slovene market certainly is. The critical point is how to evaluate the variables to put in the valuation model. The chosen methodology deals with these problems, and minimizes the analyst's subjective judgment and the bias the analyst puts into the valuation. Twenty Slovene publicly traded companies are valuated with a valuation model based on expected earnings and growth opportunities. The research provides the assessment and the usefulness of valuation with the model and the conclusions from the valuation results.

Key Words: company valuation, earnings, investments, capital, cost of equity capital
JEL *Classification:* G30, G34

Introduction

Investors and managers very often have to ask themselves how much the worth is of their business, their company, the competitive company or maybe the company in which they intend to invest their capital. The managers' primary objective should be to increase the value of the investors' equity capital. To do so, they must know the factors that influence the value of the company and their impact on the share price. Without this knowledge they will not be able to know the consequences of their decisions, and the influence on the share price of the company (Glen 2005). Because of the market imperfection and the investors' perceived expectations there is a difference between the market and the internal price of a company. From Bertoncel's perspective (2006), the internal value of the company is based on the profound analyses and the judgment of the company. The internal value is often expressed as a present value of expected cash flows from operations, discounted at

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the present value with a proper discount rate. We can call the internal value the 'right' or 'real' value of the company.

From the perspective of many experts, valuating a company on the basis of present and past data is nonsense. Moreover, Jerman and Manzin (2008) argue that financial accounts often do not provide evidence for all the capabilities for future growth and future earnings, as many intangibles do not meet the criterion for their recognition. Damodaran (2006) comments that with financial data and appropriate methodology it is possible to forecast the value for most assets, albeit with error, and that the forecast value is not very different from the market value in the long term. He also comments that the difficulty of valuation is the bias the experts put into the models. They often have an idea of the value of the company before putting the numbers in the models. In this case, the result of the valuation is the product of their expectations. In the process of valuation we must pay attention to the possible bias introduced by the valuers, the unpredictable future, and the complexity that modern technology and simple access to information insert into the analysis.

The paper is organized as follows. After the introduction the aims of the research are presented, followed by the theoretical background of dynamic equity valuation. Further we explain the methodology used , the market properties and present the data. Last are the results and conclusions. In addition we make suggestions for further research.

Aims of the Research

The valuation models are more or less 'simple' in theory, but the estimation of the variables to be inserted into the models is not simple in practice. The evaluation of the variables is very important and critical for the results of the valuation. The value of variables is often a subjective choice of the analysts. We propose the method used, e. g. kernel estimator, based on historical data to forecast the expected variables. We also propose the method to evaluate the cost of equity capital for Slovene companies, which is problematic due to the short history of data and the characteristics of a new and developing Slovene capital market. We have tried to reduce the subjectivity with the methodology used in our valuation.

The aim of the research was to evaluate Slovene publicly traded companies' valuation with a model, based on expected earnings and growth opportunities. We have chosen a 'simple' model which uses financial data

from the balance sheet and income statement. The data used for the valuation are public and accessible.

With the help of statistical methods, on the sample of twenty Slovene publicly traded companies, we have evaluated the usefulness and the possibility of valuating Slovene publicly traded companies with the model based on expected earnings and growth opportunities and the chosen methodology.

The objective was to find the difference between the calculated internal value and the market value of the company and the variance of the market value that the model can explain. However, we have expected a low explained variance and small usefulness of the model on the developing and fast changing Slovene equity market.

Dynamic Equity Valuation: Theoretical Background

Company's valuation is a utilitarian activity. Because of the value of a good valuation, the experts have developed several models based on different presumptions and determinants of value.

For the investor the value of an investment in financial terms is the present value of expected cash flows the investment (asset) will generate in the life time. Different valuation models have different presumptions about which are the relevant cash flows to discount at a present value. In the literature we can find at least four more or less distinct approaches to the valuation of shares (Miller and Modigliani 1961): (1) the discounted cash flow approach; (2) the current earnings plus future investment opportunities approach; (3) the stream of dividends approach; (4) the stream of earnings approach. Miller and Modigliani (1961) have demonstrated that these approaches are, in fact, equivalent.

One of the first and simplest valuation tools is the Gordon model (1962). The Gordon model is based on the presumption that the future cash flows an investor receives from a stock are cash dividends growing at a constant growth rate. However, the Gordon model cannot be used if we do not expect dividends (frequent in start-ups firms) in the near term or when the growth rate is bigger than the cost of equity (frequent in fast growing firms) but we expect that competition influence will diminish it in the future. The model is not a perfect descriptor of reality; however, it helps to reduce the range of uncertainty around key value drivers (Harris, Eades, and Chaplinsky 1998). The model was used by Fama and French (2002) and Harris and Marston (1992; 2001) to estimate the equities and market risk premiums. Foerster and Sapp (2005)

in their research found out than over the entire sample period (more than 120 years) dividend-based models perform well at explaining actual prices; they perform better than commonly used earnings-based models. The major drawback of the dividend models is that they require estimation of the expected dividends (see Sorensen and Williamson 1985; Rozeff 1990). Estimation became increasingly difficult for companies with varying growth rates or irregular dividend payouts. In such cases, earnings based valuation approaches may be more useful (French, Subramaniam, and Trapani 1998).

The discounted Free Cash Flow Models (FCFM or DCF) are not very different to the dividend discount models. The FCFM consider potential dividends an investor can gain from the investment. There are simple FCFM models in which dividends grow at a stable sustainable growth rate to infinity, the costs of capital are constant and two or multi-stage models based on different presumptions of growth in different time intervals. In these latter models also the cost of capital can differ at different stages. Copeland, Koller and Murrin (2000) argue that managers who use the discounted cash flow approach for valuation focusing on increasing long-term free cash flow will ultimately be rewarded by higher share prices. They also argue that the evidence from the market is conclusive. Naïve attention to accounting earnings will often lead to value-destroying decisions. The greater risk in the use of DCF models is reliance on subjective analyst input of the many critical variables required (Rawley and Schostag 2006).

A very prominent valuation method is residual income valuation (RIV). It is theoretically equivalent to the discounted 'free-cash-flows-to-equity' model as well as the original dividend discount model from which both are derived. The model expresses total common equity value as the sum of the book value of stock-holders' equity and the present value of residual income (RI). RI is defined as the difference between reported net income and the product of book value of equity and the firm's cost of equity capital (Halsey 2001). The problems with the use of RIV were analyzed by Ohlson (2000). The reason for a widespread acceptance of the RIV model is the importance the model gives to accounting data in equity valuation. On the contrary, traditional equity valuation models, which are based on future cash flows, suggest a general irrelevance of future earnings and other accounting data (Ohlson 2005). The residual income is in principle the same on the level of equity capital as Economic Value Added or Economic Profit (EVA) on the level of total

capital. A variant of the RIV model with the fade rate assumption or with the perpetuity assumption is explained in Bradshaw (2004).

In the last years several research studies have been done with the purpose of comparing the RIV an FCFM based valuations, see Bernard (1995), Francis et al. (2000), Frankel and Lee (1998). On the balance, the RIV is more accurate in forecasting the share value than the FCF based valuation (Halsey 2001). Lundholm (1995) and Lundholm and O'Keefe (2001) proved that with both models we get satisfying results and that the proven superiority of the RI model and the difference between the results is due to the use of incorrect presumptions.

Beside all the models discussed above, analysts have developed other less known variants of equity valuation models based on different presumptions and determinants of value.

Methodology and Data

THE VALUATION MODEL

In a previous research we have used three models with equal methodology for the valuation of companies on the Slovenian equity market (see Stubelj 2008). We used the models on 20 Slovenian publicly traded firms. The first was the Residual Income Valuation model (RIV), the second was the expected stream of earnings approach in valuation (Miller and Modigliani 1961), and the third was the Thomas J. O'Brien model (2003). With the first model we obtained results for 14 (of 20) companies. In the case of 6 companies the growth rate of the residual income exceeds the cost of capital. In this case the result did not make have any sense. With the second model we got the results for just 9 companies. The problems with this model arise when the growth rate of net income exceeds the cost of capital, which was the case of these 11 companies. The results in such case did not make sense. The problem with the first two models is that companies in emerging markets and also in transition economies have a great volatility of data in the financial reports due to the transition process (see also Kavčič and Tavčar 2008) and also to possible fast growth. The reason for instable financial data lies not just in companies' operations but rather in the necessity to adapt to changing conditions and frequent law changes, which is the case for the Slovene market. With the O'Brian model we have obtained the results for all 20 companies. We conclude that the model could be used in emerging markets. However we have not used all the possible dynamic valuation models in the research,

but O'Brien's results provided the rationale to use the his model in this research and test the explanation power on an emerging equity market (see Stubelj 2008). The O'Brien (2003) formula may lend itself to application to many real-world cases of supernormal, but declining earnings growth and with no current dividend payments, and may avoid the need to resort to complex spreadsheet or real options models. We did not find any research that has tested this model for the valuation of companies in emerging equity markets. Therefore we believe the proposed method is being used for the first time in one of the emerging economies.

The model is based on the Miller and Modigliani (1961) formulation of an asset's value as the sum of two present values. The first is the present value of the current operations. The second is the present value of growth opportunities.

The O'Brien formula emphasizes that the fundamental drivers of a firm's expected future earnings stream are:

- the expected investment outlay in the next period,
- the expected growth rate of future investment outlays,
- the expected rate of convergence of the new investments' return on equity (ROE) to the firm's cost of equity, if competition is expected to gradually erode the excess ROE.

The formula is simple, because it assumes that the expected growth rate of future investment outlays and the expected convergence of their ROE's to the firm's cost of equity capital are constant (O'Brien 2003).

The formula may be applicable for some reasonable earnings and free cash flow patterns not possible with the Gordon model. For example, by not requiring a firm's new investment to be a constant plowback percentage of earnings, the model may be applied to a firm that requires external funds in excess of earnings in the near term, while forecasted to pay net dividends in the future. The formula may also be applied to firms with declining earnings growth patterns and even to firms with negative near-term earnings (O'Brien 2003).

O'Brian states that the value of the firm may be expressed as:

$$V = \frac{E_1}{k} = \frac{I_i}{k}\left(\frac{R_1 - K}{k + d}\right), \tag{1}$$

$$d = f - g_{I1}, \tag{2}$$

where: E_1 – annual earnings expected from the assets currently in place, k – firm's cost of equity capital, I_1 – incremental equity capital investment

outlay expected a year from now, R_1 – ROE expected on I_1, the expected incremental income level (from investing I_1) divided by I_1, $R_1 = \Delta E_2/I_1$, d – expected annual decay rate in the net present values of the firm's future growth opportunities, $d = f - g_1$, f – annual fade rate at which the ROE's for new investments are expected to converge toward the firm's cost of equity capital, and g_{I1} – expected annual growth rate of incremental investment outlays; $IN = I_1(1 + g_1)N$, $N = 2, 3, \ldots$

The estimation of f and g_1, as well as the estimation of the expected earnings, expected investment outlays, expected growth rates and other variables present the most difficult part in using the formula. The source of errors lies in the imprecision of their estimation.

In the research, Fama and French (2000) have proved that in a competitive environment the profitability is mean reverting. This is in line with standard economic arguments which say that in a competitive environment competitive forces produce mean reversion in profitability. In a simple partial adjustment model they have discovered that the rate of mean reversion is about 38% year. But the mean reversion is highly nonlinear. Mean reversion is faster when profitability is below its mean and when it is far from its mean in either direction.

In the O'Brien formula it is considered that competition would diminish the excess ROE and plowback opportunities in the future. The erosion of the growth opportunities is gradual and perpetual. The erosion is defined by the decay rate in the formula.

THE COST OF CAPITAL

The cost of equity capital represents the minimum return investors request on their invested capital. For this reason we use it as a discount factor for the future earnings and cash flows from the new investment opportunities. A small change in the cost of capital is reflected in bigger change of value. The profitability on the level of the capital cost is not an added value, it is a cost of the invested capital. It is a profitability that investors demand for the risk they bear.

The equity capital is not 'working' for free, for its use we must pay a certain price to its owners. It is a scarce good. In aggregate it is limited to the amount that people in the whole world are willing to save (invest). The task of earning a capital cost is not a question of company financing or – worse defined – subordinated to other company goals, as many managers think. To earn a cost of capital is the market mandate (Stewart 1999).

In the oft-cited publication Stocks, Bonds, Bills, and Inflation, Ibbotson and Sinquefeld wrote: 'Estimating the cost of capital is one of the most important and difficult tasks performed by financial analysts. There is no clear consensus on the best way to approach this problem. Because of the impact that the cost of capital can have on valuation and financial decision making, the analyst should typically use at least two methods to derive the cost of equity.' (Borgman and Strong 2006.)

Many models and techniques have been developed to estimate the cost of equity capital, such as: the Capital Asset Pricing Model (CAPM) (Black 1972; Lintner 1965; Ross 1976; Sharpe 1964), the Fama and French Three Factor Model (Koller, Goedhart and Wessels 2005; Estrada 2005), the Arbitrage Pricing Theory and others. Mishra and O'Brien have studied (2004) the empirical perspective on the issue of a global investor's cost of capital for an emerging market investment.

The primary conclusion of the CAPM (3) is that the relevant risk of an individual stock is its contribution to the risk of a well diversified portfolio. The CAPM is calculated as follows:

$$r_i = r_f + \beta_i(r_m - r_f), \tag{3}$$

where: r_i – required rate of return, r_f – risk free rate, β_i – beta coefficient, r_m – market rate of return, and $(r_m - r_f)$ – market risk premium.

Several shortcomings arise from the following assumptions on which CAPM is based: (a) asset returns are linearly related to their covariance with the market's return, (b) assets with higher systematic risk have a higher return than do assets with lower systematic risk, and assets with the same systematic risk should give the same return, (c) there is no relationship between firm-specific risk and returns, because specific risk can be eliminated through diversification (Gunnlaugsson 2006), (d) the total risk of a stock is a combination of systematic (market) and non-systematic (specific) risk (Antunović 1999). McNulty at al. (2002) found three central shortcomings of CAPM: (a) the validity of beta, (b) the reliance of historical data, (c) the indifference of holding period (Zellweger 2007). Surveys have found that the CAPM approach is by far the most widely used method (Brigham and Ehrhardt 2005). The CAPM is, almost certainly, the most widely used model in finance for a very simple reason: it yields an essential magnitude, the return investors should require from an asset given the asset's risk (Estrada 2005). Interesting are the results of the study that Gunnlaugsson (2006) made on the validity of the CAPM on the small Icelandic stock market. They indicate that the CAPM

has worked well on the small Icelandic stock market and that it, or the beta coefficient, does explain returns better than on larger foreign stock markets. A strong relationship between the beta and stock returns was found in the research. Further, the stock returns with high betas were higher than one would expect, according to the CAPM. Nagel, Peterson and Prati (2007) have conducted empirical tests on the different cost of equity estimation methods based on historical returns. In the direct comparisons of these methods, they have found that the best ex ante estimation method available to financial managers is essentially the CAPM with beta restricted to one; that is, a naïve model where the cost of equity capital equals the risk-premium added to the risk-free rate. For the above stated facts we decided to use the CAPM for the estimation of the cost of equity capital.

DATA AND METHODOLOGY

For the estimation of the cost of equity capital we have used stock prices for the last five years, applying the data from 1st April 2002 to 1st April 2007. For the measurement of movement of the Slovene capital market we have used the index SBI 20. The returns of stock prices and the index SBI 20 have been calculated for every five market working days.

With the regression analysis we have evaluated a coefficient of systematic risk β which was needed for calculating of the cost of capital. Different financial institutions, like Thomson Financial, Bloomberg and Yahoo, calculate betas in different ways and their betas are different for the same companies. Most analysts use four to five years of monthly returns, some use 52 weeks of weekly returns (Brigham and Ehrhardt 2005). We have used the market risk premium from the estimated risk premiums on the Aswath Damodaran web site (http://pages.stern.nyu.edu/~adamodar/). We have calculated the risk free rate as the sum of the Yield to Maturity the of 30-year inflation indexed Treasury Bond, which we found on the Bloomberg web site, and the Slovene inflation, which we obtained from the Statistical Office of Republic of Slovenia web site (Statistični urad Republike Slovenije 2007).

From the historical data we have estimated the expected earnings of the valuated companies, the expected investment outlay of equity capital, the expected investments growth rate and the expected return of new investments outlays of equity capital. For the estimation of the annual fade rate, at which the ROE's for new investments are expected to converge toward the firm's cost of equity, we have used the aggregate data of

valuated companies. The aggregate data are less volatile. The big volatility of the data used has made impossible the estimation for the individual companies in our case. This procedure has added a certain level of error in our results. Because of the drawbacks of trend methodology that arise from its anticipated linearity and the least squares methodology as such, we have used a kernel estimator for the estimation of the expected value of the parameters mentioned in this paragraph.

In order to estimate the empirical density, we made use of kernel density estimators. The goal of the density estimation is to approximate the probability density function $f(x)$ of the random variable X (Schoutens 2003). The outcome of this operation is a smoother empirical probability density function (Meucci 2005). Assume, that we have n independent observations $x_1, x_2, \ldots, x_n$ from the random variable X. The kernel density estimator for the estimation of the density $f(x)$ at point x is defined as (4) (Schoutens 2003):

$$\hat{f}_h = \frac{1}{nh} \sum_{i=1}^{n} K\left(\frac{x_i - x}{H}\right), \tag{4}$$

where: $K((x_i - x)/h)$ – kernel function, x – random variable, n – number of observations, and h – bandwidth.

We typically use the so-called Gaussian kernel (5):

$$K(x) = \frac{e^{-\frac{(x_i - x)^2}{2h^2}}}{\sqrt{2\pi}}. \tag{5}$$

In the above formula we also have to select the bandwidth h. We use Silverman's (1986) rule of thumb value (6):

$$h = 1.06\sigma n^{-\frac{1}{5}}, \tag{6}$$

where: σ – the standard error of the random variable. Due to the transition of the Slovene companies to the International Financial Reporting Standards (IFRS 2008), the reported book value of the equity capital in the 2006 is smaller due to different accounting rules. For certain companies are even smaller in comparison to 2005, although the companies have positive earnings and have retained a certain amount of them. This would also have an influence on the valuation, like a smaller expected investment outlay; therefore we have modified these data for the year 2006. Most companies have reported, together with the balance sheet for 2006, also the balance sheet for the year 2005 in accordance with the new

standards for the purpose of comparison. We have calculated the index of change of the book value of equity capital. With this index we have multiplied the reported book value for the year 2005 in accordance with the old standards, and have obtained the estimated book value of the equity capital for the year 2006, which the firms would have reported if the standards had not changed. With this method we have preserved the continuity of the course of the book value of equity capital in the time series of data, and have also improved the estimation of the expected growth of the equity capital investment outlays.

The valuation results were compared with the market value of the valuated companies. By the use of linear regression we have calculated how much variance of the ratio of the market value and the book value of the equity capital of the companies can be explained by the ratio of the estimate value and the book value of the equity capital.

In the research we have presumed that the companies preserve an optimal capital structure and use a target capital structure also in new investments. This is significative, because it means that the cost of capital is a constant and it will not change in the future.

Market Properties and Valuated Companies

Valuation in emerging markets is difficult. This is because of risk and obstacles to business, including great economic uncertainty, illiquid capital markets, controls of flow of capital into and out of the country, less rigorous accounting standards and disclosure levels, and high levels of political risk (Koller, Goedhardt and Wessels 2005). The problems with the valuation of companies on the Slovene market arise from the smallness of the market and from the small number of public traded companies. Many changes in the Slovene financial area that occurred in the period of transition indicate a short history of usable data for the analysis. The data used from the balance sheets and income statements are very volatile and are not a result of long-term growth and companies' tax policy. For these reasons the valuation is aggravated.

The reason for instable financial data lies not just in companies' operations but rather in the need to adapt to changing conditions and in the frequent law changes on the Slovene market. In Slovenia an intensive process of accepting new concepts of economic actions in the direction from a semi command toward a market economy took part in the period of transition (Novak 2003).

Some important properties of the Slovene equity capital market are:

- The Slovene equity capital market is small compared to developed capital markets. The market capitalization of the three biggest companies represents 50% of the entire market capitalization of shares which trade on the Ljubljana stock exchange. Measured on 5th April 2007.
- It is relatively inefficient as are other segments of financial markets in Slovenia (Dolenc 2007) and has been mostly driven (at least in its beginning) by privatization transactions (Dolenc 2006).
- Liquidity has risen in Slovenia in recent years, but is still low in comparison with developed financial markets, if we compare the turn of the market capitalization for more liquid stocks.
- Only a small number of financial instruments are present on the market.

VALUATED COMPANIES

We have valuated twenty Slovene publicly traded companies, the biggest publicly traded companies in Slovenia whit shares quoted on the Ljubljana Stock Exchange (2007), measured by market capitalization (the market value of stocks on 5th April 2007). The shares of the selected companies represent 85.5% of market capitalization of all quoted shares on the Ljubljana Stock Exchange, measured by the market value of stocks on 5th April 2007.

Results

THE COST OF EQUITY CAPITAL

For a developed (mature) equity market we can calculate the risk premium from the historical data (historical risk premium). We can compute the premium from the difference between average returns on stocks and average returns on risk-free securities. In this case we need data over an extended period of history to get a reasonable standard error of risk premium estimates. Damodaran (2006) suggests long periods, 50 years or more.

In most emerging markets, we have not had a long history of available data. This is also the case for Slovenia (we have data for just about 15 years and these data are under question because of big changes in the market during the period of transition and a low liquidity of the market), so we decided to calculate the risk premium using the method and data we have found on the Damodaran web site (http://pages.stern.nyu.edu/~adamodar/) as follows:

TABLE 1 The valuated companies

Company	(1)	(2)	(3)	(4)	(5)	(6)
ACH, d. d.	2,886,877	93,114	56.01	161,694	20,123	1.74
Aerodrom Ljubljana, d. d.*	1,936,229	87,564	75.82	146,805	30,501	3.29
Delo, d. d.	667,464	26,200	134.00	89,440	16,974	3.41
Gorenje, d. d.	12,200,000	270,168	35.37	431,514	751,744	1.60
Helios, d. d.	219,861	67,411	1392.91	306,247	18,703	4.54
Intereuropa, d. d.	7,902,413	156,894	36.36	287,332	131,500	1.83
Iskra avtoelektrika, d. d.	1,608,313	49,032	57.05	91,754	169,943	1.87
Istrabenz, d. d.	5,180,000	178,472	67.06	347,371	23,530	1.95
Krka, d. d.	3,542,612	622,683	882.91	3,127,808	601,308	5.02
Lesnina, d. d.	76,495	75,847	1850.00	141,516	84,429	1.87
Luka Koper, d. d.**	7,140,000	286,367	77.05	550,137	105,034	3.77
Mercator, d. d.	3,765,361	571,551	260.70	981,630	106,328	1.72
Merkur, d. d.	1,312,585	203,613	259.48	340,590	814,080	1.67
Petrol, d. d.	2,086,301	398,456	578.83	1,207,614	1,892,644	3.03
Pivovarna Laško, d. d.	8,578,391	233,072	51.97	445,819	87,048	1.91
Salus, d. d.	134,980	43,807	837.18	113,003	189,234	2.58
Sava, d. d.	2,006,987	350,162	291.32	584,675	44,167	1.67
Telekom Slovenije, d. d.	6,535,478	1,071,888	383.11	2,503,807	455,971	2.34
Terme Čatež, d. d.	597,916	83,893	220.50	131,840	27,507	1.57
Žito, d. d.	355,792	59,300	215.43	76,648	87,917	1.29

NOTES Column headings are as follows: (1) number of shares of the company quoted on Ljubljana stock exchange dated 31/12/2007, (2) book value of equity capital of the company dated 31/12/2006 in 1000 EUR, (3) market value of a share dated 5/4/2007 in EUR, (4) market capitalization of a company dated 5/4/2007 in 1000 EUR, (5) overall sales of a company in year 2006 in 1000 EUR, (6) market-to-book value ratio of equity capital of a company. * 1,860,298 preference shares (unquoted), ** 6,860,000 preference shares (unquoted).

$$\mathrm{RP}_s = \mathrm{PT}_{tn}\left(\frac{\sigma_{gd}}{\sigma_{go}}\right) = 0.5\% \cdot 1.5\% = 0.75\%, \tag{7}$$

where: RP_s – additional risk premium for Slovene market on the risk premium for a mature market – US market, PT_{tn} – additional default risk premium, σ_{gd} – standard deviation of stock returns for the global market, σ_{go} – standard deviation of bond returns for the global market.

We have added the above calculated additional risk premium for the

TABLE 2 The betas and the calculated cost of equity capital

Company	Calculated betas											Cost of equity capital
	5 years of data			4 years of data			3 years of data					
	5 days	10 days	20 days	5 days	10 days	20 days	5 days	10 days	20 days	ave. β	σ	
Aerodrom Ljubljana, d. d.	0.76	0.71	0.82	1.07	1.14	1.27	1.11	1.21	1.35	1.05	0.23	10.77%
Delo, d. d.	0.63	0.58	0.69	0.69	0.71	0.81	0.72	0.65	0.59	0.67	0.07	8.65%
Gorenje, d. d.	1.10	1.20	1.21	1.08	1.23	1.22	1.04	1.25	1.23	1.17	0.08	11.48%
Helios, d. d.	0.77	0.81	0.84	0.79	0.83	1.01	0.82	0.84	0.93	0.85	0.07	9.63%
Intereuropa, d. d.	1.00	1.00	0.70	1.14	1.22	0.78	1.28	1.52	0.94	1.06	0.25	10.85%
Istrabenz, d. d.	1.14	1.23	1.15	1.27	1.41	1.33	1.14	1.26	1.13	1.23	0.10	11.78%
Krka, d. d.	1.19	1.08	1.19	1.04	0.85	0.99	1.04	0.84	1.05	1.03	0.13	10.66%
Luka Koper, d. d.	1.05	1.27	1.12	1.30	1.70	1.62	1.35	1.72	1.60	1.41	0.25	12.83%
Mercator, d. d.	1.09	1.09	1.20	1.07	1.06	1.16	1.03	1.06	1.16	1.10	0.06	11.06%
Merkur d. d.	0.71	0.76	0.82	0.69	0.75	0.83	0.65	0.71	0.88	0.76	0.08	9.10%
Petrol, d. d.	1.14	1.03	1.00	1.25	1.09	1.06	1.27	1.06	1.01	1.10	0.10	11.07%
Pivovarna Laško, d. d.	0.76	0.71	0.74	0.76	0.87	0.85	0.68	0.86	0.83	0.78	0.07	9.27%
Salus, d. d.	0.53	0.76	0.76	0.49	0.73	0.77	0.44	0.63	0.69	0.64	0.13	8.48%
Sava, d. d.	0.73	0.79	0.78	0.76	0.84	0.74	0.79	0.89	0.70	0.78	0.06	9.24%
Terme Čatež, d. d.	0.63	0.63	0.51	0.71	0.77	0.69	0.82	0.82	0.83	0.71	0.11	8.86%
Žito, d. d.	0.58	0.60	0.66	0.47	0.54	0.63	0.49	0.51	0.67	0.57	0.07	8.07%
Betas for industry for Europe from Damodaran online (2007)												
ACH, d. d.	Retail-Automobile									0,81		9,41%

Telekom Slovenije, d. d.	Telecom services	1,03	10,66%
Lesnina, d. d.	Retail-Home Furnishings	0,90	9,92%
Iskra Avtoelektrika, d. d.	Electric Products	0,71	8,85%
Cost of capital of the aggregate*			10,57%

NOTES * We have calculated the cost of capital of the aggregate with the weights multiplied by the cost of capital for the single company. The weights are the ratio of the book value of a single company and the overall book value of the valuated companies.

TABLE 3 Kernel estimation of the expected fade rate

		x_1	x_2	x_3	x_4	x_5	x_6	x_7	x_8	
Calculated historical fade rates f	x_i	1.1971	−0.1986	−1.9222	−0.1140	0.4568	4.7058	−0.9552	−19,9160	
$P_j = e^{-(x_1-x)^2/2h^2}/\sqrt{2\pi}$	P_j									$\sum P_j/nh$
	P_1		0.3850	0.3338	0.3867	0.3951	0.3184	0.3665	0,0001	0,0523
	P_2	0.3850		0.3779	0.3990	0.3959	0.2567	0.3949	0,0003	0,0529
	P_3	0.3338	0.3779		0.3758	0.3597	0.1782	0.3923	0,0010	0,0483
	P_4	0.3867	0.3990	0.3758		0.3967	0.2606	0.3939	0,0003	0,0530
	P_5	0.3951	0.3959	0.3597	0.3967		0.2865	0.3847	0,0002	0,0531
	P_6	0.3184	0.2567	0.1782	0.2606	0.2865		0.2216	0,0000	0,0364
	P_7	0.3665	0.3949	0.3923	0.3939	0.3847	0.2216		0,0005	0,0516
	P_8	0.0001	0.0003	0.0010	0.0003	0.0002	0.0000	0.0005		0,0001
$\sum\sum P_j/nh$										0,3478
Expected fade rate for the agregate data of the valuated companies f_1										0,2831

Slovene market to the risk premium for the US market to get the risk premium for the Slovene market.

$$\text{RP} = (r_m - r_f) = \text{RP}_{zt} + \text{RP}_s = 4.91\% + 0.75\% = 5.66\%, \tag{8}$$

where: $\text{RP} = (r_m - r_f)$ – market risk premium, RP_{zt} – market risk premium for the US market, RP_s – additional risk premium for the Slovene market on the risk premium for a mature market – the US market.

We have calculated the risk free rate as the sum of the Yield to Maturity of the 30-year inflation indexed Treasury Bond, which we found on the Bloomberg web site, and the Slovene inflation, which we found on the Statistical Office of Republic of Slovenia web site (Statistični urad Republike Slovenije 2007) as follows:

$$r_f = \text{YTM}_a + i_s = 2.43\% + 2.4\% = 4.83\%, \tag{9}$$

where: r_f – risk free rate, YTM_a – Yield to Maturity of the 30-year inflation indexed US Treasury bond, i_s – inflation in Slovenia in April 2007, measured as an average annual index.

We could use a Slovenian treasury bond for the risk free rate but we prefer to calculate it with the above method. The reason is that we add a country risk premium in the calculation of a risk premium, and if we used a Slovenian treasury bond we considered the country risk premium twice.

With the statistical method of regression analysis we have evaluated a coefficient of systematic risk β which we needed to calculate the cost of capital. To reduce the subjectivity we have calculated the average β out of the nine estimated betas with a different choice of data. We have used past data for 3, 4 and 5 years and returns for 5, 10 and 20 days. For the companies with a too short history data of stock returns we have used the betas for Europe industry which we found on the Damodaran web site (http://pages.stern.nyu.edu/~adamodar/). The results are presented in table 3.

In developed markets, like the US market, we can also calculate betas with the above method, or simply we just look for the betas for the companies or for industry areas on the web pages of Bloomberg, NYSE, Damodaran online or other financial web sites.

ESTIMATION OF THE FADE RATE

For estimation of the annual fade rate, at which the ROE's for new investments are expected to converge toward the firm's cost of equity we

have used the aggregate data of valuated companies. The aggregate data are less volatile. The relatively high volatility of the data used has made impossible the estimation for the individual companies in our case. The high volatility of reported data of the companies is due to the nature of a fast changing emerging equity market, such as the Slovenian one, and presumably is also true for most emerging markets. We have calculated the fade rate from the aggregate historical data for the last 11 years for the valuated companies with the following formula:

$$f = -\left(\left(\frac{R_{t+1} - k_a}{R_t - k_a}\right) - 1\right), \tag{10}$$

where: f – annual fade rate at which the ROE's for new investments are expected to converge toward the firm's cost of equity capital, R_{t+1} – ROE on new investments of the aggregate of the valuated companies in a year $t + 1$, R_t – ROE on new investments of the aggregate of the valuated companies in a year t, and k_a – cost of capital of the aggregate.

With the kernel estimator we have evaluated the expected fade rate from the calculated historical fade rates.

$$f = \frac{1}{\sum K} \sum_{i,j=1}^{n} (p_j x_i) = 28.31\%. \tag{11}$$

The expected fade rate is very high. This means that every investment outlay of the valuated companies will in the future earn a smaller added value in every next period.

INVESTMENT OUTLAY OF THE EQUITY CAPITAL

$$I_t = \text{KVKL}_t - \text{KVKL}_{t-1}, \tag{12}$$

where: I_t – investment outlay of the company equity capital in the year t, KVLK_t – book value of the company equity capital in year t, and KVLK_{t-1} – book value of the company equity capital in year $t - 1$.

ROES OF THE NEW INVESTMENT OUTLAYS OF EQUITY CAPITAL

$$R_t = \frac{E_{t+1} - E_t}{I_t}, \tag{13}$$

where: R_t – ROE of new investment outlays of equity capital in year t, E_t – earnings of the company in year t, E_{t+1} – earnings of the company in year $t + 1$, and I_t – investment outlay of equity capital in year t.

EARNINGS GROWTH RATE

$$g_d = \frac{E_t}{E_{t-1}} - 1, \tag{14}$$

where: g_d – earnings growth rate, E_t – company earnings in year t, and E_{t-1} – company earnings in year $t - 1$.

INVESTMENT OUTLAYS OF EQUITY CAPITAL GROWTH RATE

$$g_i = \frac{I_t}{I_{t-1}} - 1, \tag{15}$$

where: g_i – growth rate of investment outlays in year t, I_t – investment outlay of equity capital in year t, and I_{t-1} – investment outlay of equity capital in year $t - 1$.

We have estimated with the kernel estimator the expected values from the calculated historical values for the next variables: ROE of the investment outlays, the earnings growth rates, and the investment outlays of equity capital growth rates. With the expected variables and the data from the last year we have calculated the expected earnings and the expected investment in the next period.

EXPECTED EARNINGS

$$E_1 = E_0(1 + g_{d1}), \tag{16}$$

where: E_1 – expected earnings in the year 2007, g_{d1} – estimated expected earnings growth rate, and E_0 – earnings of the company in the year 2006.

EXPECTED INVESTMENT OUTLAYS

$$I_1 = I_0(1 + g_{i1}), \tag{17}$$

where: g_i – estimated expected growth rate of investment outlays, I_0 – investment outlay of equity capital in year 2006, and I_1 – expected investment outlay of equity capital in the year 2007.

EXPECTED DECAY RATE OF NPV'S OF THE FIRM'S FUTURE GROWTH OPPORTUNITIES

$$d = f - g_{i1}, \tag{18}$$

where: g_i – estimated expected growth rate of investment outlays, f – annual fade rate at which the ROE's for new investments are expected to converge toward the firm's cost of equity capital.

TABLE 4 Calculated and estimated variables for the valuated companies

Company	(1)	(2)	(3)	(4)	(5)	(6)
ACH, d. d.	8,799.21	15,089.54	0.1153	0.1991	0.1223	0.1678
Aerodrom Ljubljana, d. d.	9,713.99	5,844.22	0.0935	0.1829	0.1036	0.1896
Delo, d. d.	2,083.69	1,112.69	−0.1270	−0.1444	0.0443	0.4101
Gorenje, d. d.	13,142.47	−1,884.84	0.0103	0.0985	0.0850	0.2728
Helios, d. d.	9,667.89	12,404.32	0.1451	0.1706	0.2441	0.1380
Intereuropa, d. d.	4,583.46	3,811.98	0.2391	0.1914	−0.0162	0.0440
Iskra avtoelektrika, d. d.	2,693.32	1,053.79	−0.1854	0.1052	0.1180	0.4685
Istrabenz, d. d.	2,302.40	11,701.01	−0.0239	−0.1488	0.0020	0.3070
Krka, d. d.	139,750.36	129,373.38	0.2843	0.2386	0.2364	−0.0012
Lesnina, d. d.	9,605.25	11,224.23	0.0749	0.1423	0.1412	0.2082
Luka Koper, d. d.	22,030.82	22,245.07	−0.0294	0.1454	0.1041	0.3125
Mercator, d. d.	26,612.18	127,614.00	0.3802	0.0106	0.1047	−0.0971
Merkur, d. d.	15,024.53	26,841.92	−0.0121	0.0618	0.1778	0.2952
Petrol, d. d.	47,074.08	48,389.99	0.3359	0.2039	0.1858	−0.0528
Pivovarna Laško, d. d.	6,196.92	22,512.59	0.1698	0.0443	0.0170	0.1133
Salus, d. d.	6,743.86	3,333.43	0.0524	0.0944	0.0572	0.2307
Sava, d. d.	28,720.98	23,287.61	−0.2684	0.1215	0.2061	0.5515
Telekom Slovenije, d. d.	115,993.13	84,469.42	−0.0829	0.0053	0.2017	0.3660
Terme Čatež, d. d.	3,506.49	1,509.21	−0.4198	−0.2473	−0.0789	0.7029
Žito, d. d.	5,806.31	1,791.88	0.2389	−0.9117	0.5677	0.0442

NOTES Calculated variables: (1) E_1 – expected earnings for the next period (1000 €), (2) I_1 – expected investment outlays of equity capital (1000 €). Estimated variables: (3) g_{I1} – expected investment outlays of equity capital growth rate, (4) R_1 – expected ROE of new investment outlays of equity capital, (5) g_{D1} – expected growth rate of earnings, (6) $d = f - g_{I1}$.

We can see from table 4 that the expected decay rates for most companies are high (Luka Koper, d. d., for example have a decay rate of 31.25%). We can conclude that the value of expected new investments (the second part of the O'Brien formula) will have a small impact on the estimated value of these companies.

The estimated values range from –842% of the market value for Mercator, d. d., to 98% of the market value for ACH, d. d. Such deviation for the company Mercator, d. d., is due to a negative decay rate which is close to the estimated cost of equity. We have removed Mercator, d. d.

TABLE 5 Results of the valuation, estimated value of equity capital of the valuated companies

Company	(1)	(2)	(3)	(4)	(5)	(6)
ACH, d. d.	93,113.69	161,693.98	1.74	157,663.48	0.98	1.69
Aerodrom Ljubljana, d. d.	87,564.20	287,852.68	3.29	103,929.70	0.36	1.19
Delo, d. d.	26,199.90	89,440.18	3.41	18,118.96	0.20	0.69
Gorenje, d. d.	270,167.68	431,514.00	1.60	114,514.06	0.27	0.42
Helios, d. d.	67,411.00	306,246.59	4.54	141,322.07	0.46	2.10
Intereuropa, d. d.	156,893.91	287,331.74	1.83	61,303.07	0.21	0.39
Iskra avtoelektrika, d. d.	49,031.94	91,754.26	1.87	30,794.61	0.34	0.63
Istrabenz, d. d.	178,471.71	347,370.80	1.95	−42,801.91	−0.12	−0.24
Krka, d. d.	622,682.81	3,127,807.56	5.02	2,831,419.23	0.91	4.55
Lesnina, d. d.	75,846.59	141,515.75	1.87	112,609.06	0.80	1.48
Luka Koper, d. d.	286,367.32	1,078,700.00	3.77	178,499.28	0.17	0.62
Merkur, d. d.	203,613.44	340,589.56	1.67	142,741.35	0.42	0.70
Petrol, d. d.	398,456.34	1,207,613.61	3.03	1,129,359.44	0.94	2.83
Pivovarna Laško, d. d.	233,071.99	454,615.47	1.95	9,796.47	0.02	0.04
Salus, d. d.	43,807.00	113,002.56	2.58	80,774.33	0.71	1.84
Sava, d. d.	350,161.95	584,675.45	1.67	322,047.43	0.55	0.92
Telekom Slovenije, d. d.	1,071,888.16	2,503,806.98	2.34	918,326.79	0.37	0.86
Terme Čatež, d. d.	83,892.92	131,840.48	1.57	32,347.17	0.25	0.39
Žito, d. d.	59,299.70	76,648.27	1.29	−104,523.41	−1.36	−1.76
Standard error (Mercator, d. d., excluded)					0.5159	1.2967

NOTES Column headings are as follows: (1) book value of equity capital of a company dated 31/12/2006 in 1000 EUR, (2) market value of a share dated 5/4/2007 in EUR, (3) market-to-book value ratio of equity capital of a company, (4) Estimated value of equity capital of a company with the O'Brian model, (5) estimated value to market value ratio of equity capital of a company, (6) estimated value to book value ratio of equity capital of a company.

from the further analysis. All the companies have been valuated lower than the market value. The mean (Mercator, d. d., excluded) of the estimated value to market value ratio was 33.9%. Above the mean of the estimated value to market value ratio were the companies: Petrol, d. d., ACH, d. d., Aerodrom Ljubljana, d. d., Helios, d. d., Iskra Autoelektrika, d. d., Krka d. d., Lesnina, d. d., Merkur, d. d., Salus, d. d., Sava, d. d., Telekom Slovenije, d. d., and the standard error of the estimated value to market value is 51.59%. For the companies Žito, d. d. and Istrabenz, d. d. the

estimated values are negative. The reason is that the estimated expected return on new investment outlays is lower than the estimated cost of capital, which is decreasing the value of the equity capital of the companies.

We have been interested in how much variance of the market value of the valuated companies we can explain with the estimated value. We have done a linear regression of the market-to-book value ratio, i. e. the dependent variable and the estimated value to book value ratio of the companies, i. e. the independent variable.

The resulting adjusted R^2 was 0.451. This means that we can explain 45.1% of variance of the market-to-book value of the equity capital ratio with the estimated value to book value of the equity capital ratio.

Conclusions

The aim of the research was to evaluate Slovene publicly traded companies' valuation with an O'Brian (2003) model, based on expected earnings and growth opportunities. We have chosen a 'simple' model which uses financial data from the balance sheet and income statement. The data used for the valuation are public and accessible. We have expected a low explained variance and small usefulness of the model on the developing and fast changing Slovene equity market. The estimated values for the companies were very low; the estimated value of all the companies is below the market value. The model has explained 45.1% of variance of the market-to-book value ratio of the equity capital with the estimated value to book value ratio of equity capital. We can say that the model has some-altough small-explanation power in our case.

The model is based on the expected earnings and growth opportunities and we have concluded that the estimated Slovene companies' earnings and growth opportunities are too small. That is why the estimated value is in general much lower than the market value. It is possible that in the observed years the companies have exploited to the maximum the possibility of income tax relief and have lowered the earnings. In order to exploit income tax relief the companies have invested in less interesting projects with low returns. A possible solution to the problem of lowering the earnings for the tax reasons lies in the use of a model of free cash flows to equity for the valuation.

The lower earnings in the observed years have been due to the agent relations. The undefined property of the companies is causing the intentional lowering of the reported earnings, and in consequence the value of the company, with the purpose of obtaining a smaller purchase value.

The earnings have been presumably lowered due to the high agency costs on the level of owners-managers, also due to the undefined property. Till this day in many valuated companies that we have dealt with in this research the state has a large share of ownership.

The data for the model are drawn from the balance sheets and income statements of the companies. The data are subject to accountant creativity. For this reason the valuation with such a model is under question. To diminish this problem we have used the data for a longer period, because the exaggerated accountant creativity is difficult to sustain. But the data can be corrupted in certain years, thus destroying the continuity.

Taking into account the facts, we can conclude as follows. The estimation of the internal value of the equity capital of the chosen companies is not reliable. Beside this, the fact is that earnings and growth opportunities of the estimated Slovene companies are too low to confirm the market value. The market value of the companies can be higher due to the insider information which certain investors have, and this information points to the higher potential of the companies than is shown by the data from the balance sheets and income statements. The market value can be higher due to the expected takeover at a higher price. The value of the company as an independent economic subject is, with regard to its potential, much smaller. The market values can be boosted by purchasing in the market for speculative reasons of investors, or thinking to sell in a short term at prices higher than the buying prices. The high market price of the chosen companies might be higher due to the few investment opportunities for investors on the Slovene capital market.

Suggestions for Further Research

The cash flows from the investments are usually irregularly distributed through time – for this reason it would be interesting to repeat the research every year.

It would be also useful to estimate 'comparable' foreign companies and compare the results with those of the Slovene companies.

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The Impact of Firm Size on Dividend Behaviour: A Study With Reference to Corporate Firms across Industries in India

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The objective of this paper is to examine the association between the Corporate Leverage (CL) and the Dividend Policy (DP) of firms across industries in India in respect of Size of Corporate Firms. The investigation is conducted on a panel sample of 73 firms across industries [Cement, Chemical and Fertilizer, IT, Oil and Gas, Pharmaceutical, Shipping, and Textiles], which listed their shares in National Stock Exchange (NSE) in India for the period 1996–2007. The impacts of Capital Structure (CS) variables (leverage) on DP measures – dividend payout (Net dividend paid/net income) in the presence of some basic fundamental variables are considered to be the determinants of DP, using the Multiple Regression Technique (OLS method). The results of the cross-sectional OLS Model for the selected sample firms under various sectors show that there is a significant effect of selected independent variables, $\text{DPO}\alpha + \beta_1\text{DPO}_{t-1} + \beta_2\text{PAT} + \beta_3\text{TDE} + \beta_4\text{CF} + \beta_5\text{SIZE} + \beta_6\text{INV} + \beta_1\text{LTD} + \beta_8\text{STD} + e$. Therefore, this study proves that the DP of Small Size, Medium Size, Large Size, and Overall Corporate Firms across industries in India is dependent on the level of debt in CS.

Key Words: capital structure, dividend policy, corporate leverage, long term debt, short term debt, total debt
JEL *Classification:* G30, G32, G35

Introduction

From the practitioners' viewpoint, dividend policy (DP) of a firm has implications for stakeholders. For investors, dividends – whether declared or accumulated and paid at a later date – are not only a means of regular income, but also an important input in valuation of a firm. This implies

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that dividends may have negative consequences too for investors. Similarly, the cost of raising funds is not insignificant and may well lead to lower payout, particularly when positive net present value projects are available. Apart from flotation costs, information asymmetry between managers and outside investors may also have implications for DP. Further, in the presence of information asymmetry and flotation costs, investment decisions made by managers are subject to the pecking order of financing choices available.

One of the mechanisms of reducing expropriation of outside shareholders by agents is high payout, which will result in reduction of free cash flow available to managers. The presence of information asymmetry may also mean that managers need to signal their ability to generate higher earnings in future with the help of high dividend payouts (Bhattacharya (1979), Kose and Williams (1985), and Miller and Rock (1985)). Rozeff (1982) model payout ratios are presented as a function of three factors: flotation costs of external funding, agency cost of outside ownership, and financing constraints as a result of higher operating and financial leverage.

Statement of the Problems and Significance

The study mainly focuses on the effect of CS on DP of corporate firms across industries in India, and seeks to answer whether the size of the firm would appear to be one of the important factors in determining the dividend behavior of corporate firms in India.

Review of the Literature

Since strategies are aimed at acquiring competitive strength, this requires considerable funding, firms need to adopt appropriate financial policies to mobilize risk capital. The CS and DP is a complex set of analysis, as the investment decision and financing decision are important decisions a firm should take in the course of its operation. Gordon (1959) examined the three possible hypotheses with respect to what an investor pays for when he acquires a share or common stock that he is buying: (1) both the dividend and the earnings, (2) the dividends, and (3) the earning. It may be argued that most commonly he is buying for the price at some future date, but if the future price will be related to the expected dividends. Wilson (1967) argued that it should not be possible to increase the expected utility of one member without decreasing the expected utility of some other member. Hagen (1973) discussed the problem of determining

an optimal DP for a firm having a set of shareholders with specified preferences. An optimal DP will consequently mean a dividend payout rule, which maximizes some utility criterion as defined by the shareholders' preferences. Michel (1979) examined the extent to which industry dividend figures affect determination of a particular firm's DP.

Woolridge (1983) analyzed the effect of unexpected dividend changes of common stock, preferred stock, and bonds. Two potential effects are identified: a wealth transfer effect, and a signaling effect. Kane, Young, and Marcus (1984) found that there is a statistically significant interaction effect, i. e. that the abnormal return corresponding to any earnings or dividend announcement depends upon the value of the other announcement. Miller, and Rock (1985) examined the standard finance model of the firm's dividend decisions. The extension endogamies which the dividend announcement affects are amply documented in recent research. Ghosh and Woolridge (1989) examined the focuses on shareholders' reaction to growth-motivated cuts and omissions and stated that, although growth announcements mitigate the capital loss induced by dividend decreases, the stock-market response to growth-oriented dividend cuts is still strongly negative. Lim (1989) observed that dividend depends in part on the firm's current earnings and in part on the dividend of the previous year.

Lambert, Lanen, and Larcker (1989) found the association between the initial adoption of stock options for senior-level executives and subsequent changes in corporate DP, and suggested that dividends be reduced relative to expected dividends. Brennan and Thakor (1990) examined the preferential tax treatment of capital gains for individual investors; it is shown that a majority of a firm's shareholders may support a dividend payment for small distribution. For larger distribution open market stocks repurchase is likely to be preferred by a majority of shareholders, and for the largest distribution, tender offer repurchases dominate. Deangelo and Deangelo (1990) analyzed the DP adjustments of firms to protracted financial distress as evidenced by multiple losses during 1980–1985, and found that almost all sample firms reduced dividends, and more than half apparently faced binding debt covenants in the years they did so. Hodder and Senbet (1990) have developed a theory of CS in an international setting with corporate and personal taxes and highlighted the key role that corporate tax arbitrage plays in generating international CS equilibrium.

Allen (1991) examined the financial managers' perceptions of the

broad determinants of listed Australian company CS decisions. The results are consistent with Donaldson's previously reported American findings, in that firms appear to follow a pecking order with respect to funding sources and they also report policies of maintaining spare debt capacity. Yener (1991) analyzed the Korean securities market's reliance on debt financing and emphasis on debt financing as one of the major issues related to corporate financial policy in Korea. Factors such as persistently high international interest rates, foreign exchange rate fluctuations, inflation, international competition and indications of a slowdown in the world trade have led to increased pressure on the liquidity of many growth-oriented Korean firms, especially in the Manufacturing Sector. Chunchi and Kao (1992) found a significant relationship between dividend changes and subsequent earnings. Changes in DP are interesting because dividends are the focus of agency conflicts between owners and managers of firms (Rozeff 1982).

Akhigbe, Borde, and Madura (1993) used an event study methodology and found that the share price response for insurers is significant and positive. The magnitude of the response for life insurers is smaller than that of the other types of insurers or industrial firms, but is greater than that of the banks. Papaioannou and Savarese (1994) examined, in particular, the new tax law which lowered the top personal marginal tax rate for dividends. Johnson (1995) used recent theoretical models and suggested that debt and dividends can serve as substitute free cash flow control or signaling devices.

Collins, Saxena, and Wansley (1996) have recognized the potential differences in DP between regulated and unregulated firms, and focused on agency-cost and monitoring explanations for the relevance of dividends, revealing that there are fundamental differences in the relationship between insider holdings and DP for unregulated firms and utilities, but suggesting that the regulatory environment enhances rather than mitigates the importance of the insiders' role for utilities. Elston (1996) analyzed the importance of DP and liquidity constraints in the context of the firm's investment behavior, suggesting that after controlling for the firm's dividend payment, liquidity constraints remain an important determinant of the firm's investment behavior. Gulati and Zantout (1997) found that immunizing the firm's real growth potential against the effects of inflation and interest rate fluctuations generally requires frequent changes in its CS.

Koch and Shenoy (1999) considered a broader distinction among three

types of firms' value – maximizing firms (Tobin's q close to 1), over investing firms ($q < 1$), and under investing firms ($q > 1$). Using this interpretation of the free-cash-flow hypothesis, dividend and CS changes should reflect a larger change in agency costs (and thus a larger information effect) for both low and high q firms than that for firms with q values close to 1. Feed Back Measures (GFMS) found a distinct U-shaped relation between Tobin's q and the amount of predictive information contained in a firm's dividend and CS policies, with a minimum at a q value near one. Mohanty (1999) examined whether the firms offering bonus issue have been able to generate greater returns for their shareholders than those which have not offered any bonus issue but have maintained a steadily increasing dividend rate, and found that a few firms increased the dividend rate after a bonus issue, while the bonus issuing firms fielded greater returns to their shareholders than those which did not make any bonus issue but maintained a steadily increasing dividend rate.

Romano, Tanewski, and Smyrnios (2000) examined the factors that influence small-medium enterprises (SME) owner-managers' financing decisions and found that these processes are influenced by firm owners' attitudes toward the utility of debt as a form of funding as moderated by external environmental conditions, in addition to a number of other factors: e. g., culture; entrepreneurial characteristics; entrepreneurs' prior experiences in CS; business goals; business life-cycle issues; preferred ownership structures; views regarding control, debt equity ratios, and short- vs. long-term debt; age and size of the firm; sources of funding for growth; and attitudes. La Porta et al. (2000) examined the 'outcome model' and found that dividends are paid because minority shareholders pressure corporate insiders to disgorge cash; the 'substitute model' reveals that insiders are interested in issuing equity in the future pay dividends to establish a reputation for decent treatment of minority shareholders.

Ooi (2001) analyzed by employing panel data methodology; the DP of property firms quoted on the London Stock Exchange (LSE) shows that the dividend payout ratio of the average real estate corporation is dictated, to a large extent, by the firm's total asset holding and leverage ratio. Property investment firms pay significantly higher dividends when compared to property trading firms. Booth et al. (2001) examined whether CS theory is portable across countries with different institutional structures, and provided evidence that these decisions are affected by the same vari-

ables as exist in developed countries. Kumar and Lee (2001) examined how to develop an empirically dynamic model of discrete DP based on an inter-temporal signaling framework, in which dividend adjustments signal only substantial variations in the permanent earnings of the firm, and showed that dividend smoothing is positively associated with factors such as, earnings variance, low liquidity, and high probability of bankruptcy, as well as the expected return on capital investment by the firm.

Goldstein, Ju, and Leland (2001) found that most CS models assume that the decision on how much debt to issue is a static choice; however firms adjust outstanding debt levels in response to changes in the firm's value. Ahmed et al. (2002) examined this using both a market-based and an accrual-based measure of conservatism, and found that the firms facing more severe conflicts over DP tend to use more conservative accounting; they document that accounting conservatism is associated with a lower cost of debt after controlling for other determinants of the firm's debt costs. John Graham and Harvey (2002) examined finance theory, as well as aspects that are hard to reconcile and found systematic relationships between corporate financial choices and managerial factors, such as the extent of top management's stock ownership, and the age, tenure, and education of the chief executive officer (CEO). Baker and Wurgler (2002) found that firms are more likely to issue equity when their market values are high, relative to book and past market values, and to repurchase equity when their market values are low. As a consequence, current CS is strongly related to historical market values. The results suggest the theory that CS is the cumulative outcome of past attempts to time the equity market.

Stenbacka and Tombak (2002) analyzed the simultaneous investment and financing decisions made by incumbent owners in the presence of capital market imperfections, representing a theory for how the optimal combination of debt and equity financing depends on the firm's internal funds, and identity complementarities between the two financial instruments. Mao (2003) presented a unified analysis that accounts for both risk shifting and under-investment debt agency problems. For firms with positive marginal volatility of investment, equity holders' risk-shifting incentive will mitigate the under-investment problem, which implies that contrary to conventional views, the total agency cost of debt does not uniformly increase with leverage, and predicts that for high growth firms in which the under-investment problem is severe, the optimal

debt ratio is positively related to the marginal volatility of investment.

Gugler (2003) analyzed the relationship between dividends and the ownership and control structure of the firm for a panel of Austrian firms over the 1991–1999 period, and found that state-controlled firms engage in dividend smoothing, while family-controlled firms do not. Campello (2003) examined firm- and industry-level evidence of the effects of CS on product market outcomes for a large cross-section of industries over a number of years, and found that debt financing has a negative impact on firm's (relative- to-industry) sales growth in industries in which rivals are relatively un-levered during recessions, but not during booms. Graham, Lang, and Shackelford (2004) found that employee stock option deductions lead to large aggregate tax savings for Nasdaq. For S&P firms, in contrast, option deductions do not affect marginal tax rates to a large degree.

Anand (2004) analyzed most valuable public sector undertakings (PSUS) in India to find out the determinants of the DP decisions of the corporate firms in India, and revealed that the findings are in agreement with Lintner's study on DP. The DP is used as a signaling mechanism to convey information on the present and future prospects of the firm, and thus affects its market value. Mihir et al. (2004) examined the CS of foreign affiliates and internal capital markets of multi-national corporations (MNCS) and found that the MNCS appear to employ internal capital markets opportunistically to overcome imperfections in external capital markets. Nishioka and Baba (2004), who investigated the dynamics of CS of Japanese firms, found that the trade-off theory provides an appropriate framework to assess this issue after controlling for various variables as proxies for other hypotheses, including governance structure, the pecking order theory, and market-timing hypothesis. Among such variables, profitability as a proxy for the pecking order theory has significant explanatory power.

Sharma (2006), who examined the focuses on the dividend trends of selected Indian firms, found a strong confirmation for the signaling theories of Bhattacharya (1979), and Miller and Rock (1985), which gives inconclusive results about the tax-effect theory. Graham and Tuckerb (2006) investigated the magnitude of tax shelter activity to analyze whether participating in a shelter is related to corporate debt policy, and found that the average annual deduction produced by the shelters in their sample is very large, equalling approximately nine per cent of asset value. Faulkender, Milbourn, and Thakor (2006) presented an in-

tegrated theory of CS and DP, in which both financial policy choices are driven by the same underlying factors and jointly determined as implicit governance mechanisms to allocate control over real decisions between managers and investors. Singhania (2006) examined the dividend trends of manufacturing, non-government, non-financial, and non-banking companies listed on Bombay Stock Exchange (BSE) and found that the tax preferences theory does appear to hold true in the Indian context in the Indian case of both the categories of firms, i. e., regular payer and non-regular payer, and also found that there is a significant difference in average dividend payout ratio in the two different tax regimes, and also that there are wide industry-wise variations in empirical findings. Sharma (2007) offers mixed and inconclusive results about the tax-effect theory, which is not applicable to the selected Indian firms, thus indicating that the change in the tax structure does not have a substantial effect on the dividend behavior of firms. Kalea and Shahrurb (2007) found that the firm's leverage is negatively related to the R&D intensities of its suppliers and customers. Anil and Kapoor (2008) found that profitability has always been considered as a primary indicator of dividend payout ratio, while there are numerous factors other than profitability that also affect the dividend decisions of an organization e. g., cash flows, corporate tax, sales growth, market to book value ratio, and size. Dividend payout ratio is positively related to profits, cash flows, and size and, it has an inverse relationship with corporate taxes, sales growth and market to book value ratio.

Though an ample number of research studies has been undertaken in the field of CS and DP, very few of them have associated the effect of CS on DP based on size of the firms. Therefore, to fill this gap in the literature and to shed light, the present paper attempts to analyze the effect of CS on DP, considering the size of the firms across industries in India.

Scope of the Study

The paper is an attempt to provide an empirical support to the hypothesized relationship between CS and DP in respect of the size of corporate firms across industries. Hence, the study proposes to seek answers to the following stated questions:

- How far does the corporate firms' mix of CS policies dynamically interact overtime to influence firms' performance with respect to DP?

- Is there a significant impact of CS on DP based on size?
- How far are the CS and DP inter-related?

Objectives of the Study

- To analyze the impact of CS on DP in respect of the size of corporate firms across industries in India.
- To suggest appropriate measures with respect to the inter-dependence of CS and DP in respect of the size of corporate firms across industries.

H_0^1 *There is no significant relationship between the level of debt in* CS *and level of equity dividend in Cement Industry, Chemical and Fertilizer Industry, Information Technology Industry, Oil and Gas Industry, Pharmaceutical Industry, Shipping Industry, and Textile Industry.*

H_0^2 *There is no significant relationship between the level of debt in* CS *and level of equity dividend in small size firms, medium size firms, large size firms, and all selected firms across all selected sectors.*

H_0^3 *There is no significant effect of selected independent variables on* DPO *of Cement Industry, Chemical and Fertilizer Industry, Information Technology Industry, Oil and Gas Industry, Pharmaceutical Industry, Shipping Industry, and Textile Industry.*

H_0^4 *There is no significant effect of selected independent variables on* DPO *of small size firms, medium size firms, large size firms, and all firms under selected sectors.*

Methodology

SOURCES OF DATA

The study used only secondary data, which are collected from CMIE [Center for Monitoring Indian Economy Private Limited] Prowess Package. The data collected from this source have been compiled and used as per the objectives of the study.

SAMPLING DESIGN

The study has been made on a sample of 73 corporate firms across seven industries in India. These industries have been chosen based on a stratification process in respect of dividend high yielding sectors. The stratification process for the choice of corporate firms across industries has been adopted based on the asset value of firms, i. e., corporate firms whose total assets value has been significantly increasing over the period have

TABLE 1 Number of corporate firms chosen for the study

Industry	Number of corporate firms
Cement	12
Chemical and Fertilizer	10
IT	8
Oil and Gas	10
Pharmaceutical	15
Shipping	10
Textile	8
Total corporate firms	73

been included in the sample of corporate firms, in this way of stratification the sample of 73 corporate firms has been arrived at, after giving due consideration to the parameters, i. e., proper and regular dividend payment to shareholders, and availability of required data for the study period.

Further, the sample corporate firms are classified into three groups based on assets value viz., small size firms – firms whose total assets value is up to Rs. 100 crore (ten million); medium size firms – firms whose total assets value is between Rs. 100 crore (ten million) and Rs. 500 crore (50 million); large size firms – firms whose total assets value is larger than Rs. 500 crore (50 million).

Tools Used for Analysis

RATIOS

$$\text{STD\_TA} = \frac{\textit{Short Term Debt}}{\textit{Total Assets}} \cdot 100 \tag{1}$$

$$\text{LTD\_TA} = \frac{\textit{Long Term Debt}}{\textit{Total Assets}} \cdot 100 \tag{2}$$

$$\text{TD\_TA} = \frac{\textit{Total Debt}}{\textit{Total Assets}} \cdot 100 \tag{3}$$

CORRELATION COEFFICIENT (KARL PEARSON'S COEFFICIENT OF CORRELATION)

$$\textit{The significance of the correlation coefficient} = \frac{r}{(1-r)^2(n-2)} \tag{4}$$

$$\textit{Degrees of freedom} = (n-2) \tag{5}$$

Correlation analysis is carried out to find out the existence of multi-co

linearity among independent variables, in order to decide what variables can be used in the OLS regression model, or how the regression model with all independent variables can be used.

OLS REGRESSIONS

Here, the impacts of CS variables (leverage) on dividend policy measures – dividend payout (net dividend paid/net income) in the presence of some basic fundamental variables–are considered to be the determinants of dividend policy using the multiple regression technique (OLS method). Before using the OLS method, the degrees of relationship among independent variables as well as between independent and dependent variables were analysed with Pearson-product moment correlation. It is appropriate to use the regression technique with the step-wise procedure, if there is any collinearity among some independent variables. The specification of the regression model is given below:

$$\begin{aligned} \text{DPO} = {} & \alpha + \beta_1 \text{DPO}_{t-1} + \beta_2 \text{PAT} + \beta_3 \text{TDE} + \beta_4 \text{CF} + \beta_5 \text{SIZE} \\ & + \beta_6 \text{INV} + \beta_7 \text{LTD} + \beta_8 \text{STD} + e, \end{aligned} \tag{6}$$

where DPO = Dividend Payout Ratio, DPO_{t-1} = Lagged DPO, PAT = Profit After Tax (Net Income), TDE = Total Distributable Earnings, CF = Cash Flow, SIZE = Firm Size (natural logarithm of Total Assets), INV = Capital Expenditure, LTDTA = Long-Term Debt to Total Assets, STDTA = Short-Term Debt to Total Assets, β = estimated coefficients, α = intercept term, e = error.

CHOW TEST

The Chow Test formula is:

$$F(k, \text{N}_1 + \text{N}_2 - 2k) = \frac{[\text{SSE}_p - (\text{SSE}_1 + \text{SSE}_2)] : k}{(\text{SSE}_1 + \text{SSE}_2) : (\text{N}_1 + \text{N}_2 - 2k)}, \tag{7}$$

where SSE_p = sum of squared error term for pooled model, SSE_1 = sum of squared error term for group 1, SSE_2 = sum of squared error term for group 2, k = number of estimated parameters (including constant), N_1 + N_2 = N's for each of group 1 and group 2, respectively.

Period of the Study

The data used for the study relate to the selected corporate firms across industries in India for the period of ten years, on a yearly basis ranging from 1996–1997 to 2006–2007.

Limitations of the Study and Scope for Further Study

- The study is limited to only 7 industries. Therefore, this comprises the trend of only a few numbers of industries, which would not be sufficient, totally, to generalize the inferences to the whole of a country, India.
- The data used for the study are secondary in nature. Therefore, the accuracy of the results of analysis is dependent, too, upon the reliability and accuracy of the compiled secondary data.

Further studies could be undertaken by future researchers in the following aspects and areas:

- by undertaking studies in other industries, new and interesting inferences could be found;
- by categorizing the firms into various classes based on other bases, proportion of capital elements, e. g., debt and equity studies, could also be conducted.

Major Findings on Across-Industry Analysis

Tables 2 to 9 present the results of regression analysis for sample firms under seven sectors.

It is evident (see table 2) that lagged dividend payout has a significant positive effect on DPO ($\beta = 0.2605$, $t = 2.77$, $p < 0.01$) and INV has a significant negative impact on the dependent variable ($\beta = -0.0697$, $t = -2.03$, $p < 0.05$). This shows that the dividend payout in the previous year plays a vital role in determining the current year dividend payout of sample firms under Cement Sector. However, the increase in capital expenditure decreases the level of dividend payout significantly. In the full model with addition of CS variables, only the said variable is found to have a significant coefficient with DPO.

None of the debt variables has a significant impact on DPO, as their coefficients are insignificant. However, coefficient of determination is found to have increased by two per cent. So, [Chow-test] F is calculated to find whether there is a collective impact of those two CS variables on DPO. The F is found to be insignificant, providing strong evidence that CS does not have any effect on DP in terms of distribution of dividend payout relative to net income of the sample firms under Cement Sector. Therefore, H_0^1 in respect of Cement Sector is rejected, as DPO_{t-1} has a positive impact at 1% level (0.2605), and INV has a negative impact at

TABLE 2 Results of Cross-Sectional OLS Model for sample firms under Cement Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	9.3640**	2.11	25.7511**	2.04
DPO_{t-1}	0.2605***	2.77	0.2342**	2.46
PAT	0.0170	1.50	0.0107	0.88
TDE	0.0298	1.63	0.0329	1.79
CF	—	—	—	—
Size	—	—	—	—
INV	–0.0697**	–2.03	–0.0697**	–2.03
LTD_TA	—	—	–0.2628	–1.56
STD_TA	—	—	–0.0577	–0.19
R^2	0.1462		0.1680	
Adjusted R^2	0.1131		0.1185	
F-value	4.41***		3.340***	
	4.103		6.101	
Chow Test *F*-value			1.32	
			2.101	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

5% level (–0.0697) in the reduced model; with respect to the full model DPO_{t-1} (0.2342), and INV (–0.0697) at 5% level.

The regression analysis (see table 3) shows that both, the reduced model and the full model, are fitted significantly (*F*-value = 3.70, $p < 0.01$ and $F = 2.70$, $p < 0.05$). The reduced model fitted with only lagged DPO, PAT, TDE and CF, and together explaining 14.84 per cent of the variation in DPO ($R^2 = 0.1484$). The coefficients of PAT with positive sign and of TDE with negative sign are significant. That is, net profit increases the DPO, and any increase in TDE decreases it. The negative relationship between TDE and DPO indicates that the sample firms under this industry have reduced dividend payout when a portion of net income is held for future investments (Reserve and Surplus). With the best-fitted (reduced) model, leverage variables are added and the full model is run. R^2 value has increased but the significance of PAT and TDE has disappeared. Further, none of the coefficients of the debt variable is found to be significant, revealing that they do not have a unique impact on DPO after

TABLE 3 Results of Cross-Sectional OLS Model for Sample Firms under Chemical and Fertilizer Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	26.2192***	4.81	35.0989***	3.14
DPO_{t-1}	0.1954	1.65	0.2300*	1.82
PAT	0.0676*	1.92	0.0452	1.12
TDE	–0.0188**	–2.23	–0.0150	–1.61
CF	0.0132	1.57	0.0150	1.76
INV	—	—	—	—
LTD_TA	—	—	–0.1525	–0.75
STD_TA	—	—	–0.4550	–1.08
R^2	0.1484		0.1632	
Adjusted R^2	0.1084		0.1028	
F-value	3.70***		2.70**	
	4.85		6.83	
Chow Test *F*-value			0.73NS	
			2.83	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

partialling out the effect of some characteristics of firms. But the negative sign of the coefficient has shown that increase in debt financing in CS is likely to reduce the DPO. *F* (Chow) for both LTD and STD reveals that there has been an increase in R^2 value of the full model. But, *F* (Chow) is found to be insignificant, providing evidence that CS does not play a vital role in determining the dividend payout relative to net income of sample firms under the Chemical and Fertilizer Sector. Hence, H_0^1 is rejected in respect of PAT at 10% level (0.0676), and TDE negatively at 5% level (–0.0188) in reduced model; with respect to the full model DPO_{t-1} (0.2300) at 10% level for Chemical and Fertilizer Sector in respect of PAT and TDE.

The analysis shows (see table 4) that the reduced model, even after step-wise procedure, is not fitted significantly. But coefficients of explanatory variables in the model are significant at a level of 10 per cent. This may be due to the existence of high collinearity between PAT and TDE. The significant negative coefficient of lagged DPO indicates that payout of dividend from net income is reduced if dividend payout in

TABLE 4 Results of Cross-Sectional OLS Model for Sample Firms under Information Technology Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	70.8656	2.76	80.2616	3.00
DPO_{t-1}	−0.0737*	−1.81	−0.0603	−1.41
PAT	0.0237**	2.12	0.0196*	1.66
TDE	−8.7622*	−1.85	−9.3753**	−1.96
CF	—	—	—	—
Size	—	—	—	—
INV	—	—	—	—
LTD_TA	—	—	−0.2897	−1.20
STD_TA	—	—	−0.0894	−0.18
R^2	0.0736		0.0983	
Adjusted R^2	0.0327		0.03	
F-value	1.80NS		1.44***	
	3.68		5.66	
Chow Test *F*-value			0.90	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

the previous year is high. The full model with leverage variables is also not fitted significantly, and explanatory power of the model (R^2 values) is higher when compared to that of the reduced model. But the significance of lagged DPO has disappeared in the presence of leverage. The negative sign of leverage variables reveals that there are chances of reduction in DPO with increase in debt fund. On the whole, it is found that sample firms belonging to Information Technology Sector have kept giving dividends, irrespective of their performance. Hence, H_0^1 is rejected in respect of DPO_{t-1} negatively at 10% level (−0.0737) and PAT at 5% level (0.0237), and TDE negatively at 10% level (−8.7622) in reduced model for Information Technology Sector; with respect to the full model PAT (0.0196) at 10% level, and TDE negatively at 5% level (−9.3753).

The analysis (see table 5) shows that both the reduced (*F*-value = 10.40, $p < 0.01$) and full models (*F*-value = 7.21, $p < 0.01$) for Oil and Gas Sector are fitted significantly at 1 per cent level.

The explanatory variable in the reduced model explains 26.63 per cent of the variable in DPO. Also, the coefficients of lagged DPO ($\beta = 0.4485$, p

TABLE 5 Results of Cross-Sectional OLS Model for sample firms under Oil And Gas Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	14.0944***	4.72	20.8602***	3.69
DPO_{t-1}	0.4485***	4.53	0.3920***	3.86
PAT	0.0032*	1.69	0.0030	1.56
TDE	–0.0005	–1.39	–0.0005	–1.49
CF	—	—	—	—
Size	—	—	—	—
INV	—	—	—	—
LTD_TA	—	—	–0.1809*	–1.87
STD_TA	—	—	–0.0710	–0.57
R^2	0.2663		0.3002	
Adjusted R^2	0.2407		0.2585	
F-value	10.40***		7.21***	
	3.86		5.84	
Chow Test *F*-value			2.03	
			2.84	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

< 0.01) and PAT ($\beta = 0.0032$, $p < 0.10$) are significant with a positive sign. From the significant positive co-efficient of these variables, it is inferred that the increase in net profit kept increasing the dividend payout every year among the sample firms under Oil and Gas Sector. The explanatory power of the full model with addition of leverage variables is found to have increased by 3.39 per cent ($R^2 = 0.3002$ when compared to $R^2 = 0.2663$ for the reduced model). Also the coefficient of leverage variable, LTD_TA is significant positively ($\beta = -0.1809$, $p < 0.10$), indicating that the dividend payout has come down to a significant level when there has been a considerable increase in debt financing in CS from long-term sources.

However, both the leverage measures together failed to explain variation in DPO, as *F* (Chow) ($F = 2.03$, $p > 0.10$) is insignificant, i. e., the sample firms under Oil and Gas Sector have not considered the status of debt financing in CS before distributing a part of their net income as dividend. Hence, H_0^1 is rejected in respect of DPO_{t-1} positively at 1% level

TABLE 6 Results of Cross-Sectional OLS Model for Sample Firms under Pharmaceutical Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	30.5227**	2.35	27.3356**	2.10
DPO_{t-1}	0.4011***	4.86	0.3999***	4.90
PAT	–0.0396	–1.28	–0.0276	–0.88
TDE	0.0180**	2.38	0.0190**	2.44
CF	–0.0044	–0.94	–0.0099*	–1.87
SIZE	–3.4379	–1.41	–3.6663	–1.48
INV	—	—	—	—
LTD_TA	—	—	0.0018	0.02
STD_TA	—	—	0.4469**	2.15
R^2	0.2001		0.2285	
Adjusted R^2	0.1691		0.186	
F-value	6.45***		5.37***	
	5.129		7.127	
Chow Test *F*-value			2.34*	
			2.127	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

(0.4485) and PAT at 10% level (0.0032) in the reduced model; with respect to the full model DPO_{t-1} positively (0.3920) at 1% level, and LTD_TA negatively at 10% level (–0.1809) in respect of DPO_{t-1}, PAT and LTD_TA for Oil and Gas Sector.

The full model with inclusion of leverage variables of sample firms under Pharmaceutical Sector is fitted significantly with the coefficient of determination to the extent of 22.85 per cent ($R^2 = 0.2285$, $F = 5.37$, $p < 0.01$). Further, in the full model the effect of CF becomes significant with a negative sign ($\beta = -0.0099$, $p < 0.01$). Between leverage variables, the coefficient of STD_TA is significant positively at 5 per cent level ($\beta = 0.4469$, $p < 0.01$). Therefore, the sample firms kept the dividend payout on the positive side when they have sizeable fund in reserves and surpluses through borrowing from short-term sources even if there has been a marginal decline in PAT as well as a notable decline in CF. The *F* result (Chow) ($F = 2.34$, $p < 0.01$) [significant] reveals that CS with a sizeable level of short term fund and meagre level of long-term fund have

TABLE 7 Results of Cross-Sectional OLS Model for Sample Firms under Shipping Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	7.2854**	2.31	1.2477	0.26
DPO_{t-1}	0.4928***	5.54	0.4392***	4.70
PAT	–0.0382	–1.38	–0.0327	–1.17
TDE	0.0066	1.04	0.0057	0.90
CF	—	—	—	—
Size	—	—	—	—
INV	0.0203	1.48	0.0161	1.16
LTD_TA	—	—	0.2320*	1.77
STD_TA	—	—	0.0205	0.04
R^2	0.3033		0.3292	
Adjusted R^2	0.2705		0.2807	
F-value	9.25***		6.79***	
	4.85		6.83	
Chow Test *F*-value			1.60	
			2.83	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

significant explanatory power on the DPO of sample firms under Pharmaceutical Sector. Hence, H_0^1 is rejected in respect of DPO_{t-1} [positively at 1% level (0.4011)] and TDE at 5% level (0.0180) in the reduced model; with respect to the full model DPO_{t-1} [positively (0.3999)] at 1% level, and TDE at 5% level (0.0190), CF negatively at 10% level (–0.0099), and STD_TA positively at 5% level (0.4469) in respect of DPO_{t-1}, TDE, CF, and STD_TA of Pharmaceutical Sector.

The firms under Shipping Sector are significantly positively related to lagged DPO ($r = 0.5243$, $p < 0.01$) and LTD_TA ($r = 0.3546$, $p < 0.01$). Only PAT and TDE ($r = 0.9196$, $p < 0.01$) and TDE and INV ($r = 0.8412$, $p < 0.01$) are collinear with each other. In order to know which is superior over the other in explaining DPO when otherwise held constant, PAT, TDE and INV are included in the reduced model, and step-wise procedure is carried to get the model of best fit. The results (see table 7) show that the degree of collinearity between PAT and TDE has come down to marginal level in the presence of lagged DPO and INV (capital expendi-

ture), because these two variables are found in the reduced model even after the step-wise process. All the four explanatory variables in the reduced model could explain to the extent of 30.33 per cent of variation significantly in DPO (F-value = 9.25, $p < 0.01$).

As far as the estimated co-efficient of the explanatory variables, in the reduced model, are concerned, only the co-efficient of lagged DPO (β = 0.4928, $p < 0.01$) is significant positively, which reveals that the sample firms under Shipping Sector have kept increasing the dividend payouts over the period when all others are held constant. The full model with CS proxies, LTD_TA and STD_TA is also fitted significantly with a co-efficient of determination at 32.92 per cent in DPO (R^2 = 0.3292, F-value = 6.79, $p < 0.01$). Also, the co-efficient of LTD_TA is significant positively at 10 per cent level (β = 0.2320, t = 1.77, $p < 0.01$). This reveals that the sample firms under Shipping Sector have kept paying dividend irrespective of the level of increase in debt fund in CS through long-term financing. The difference in explained variance (R^2) between the two models is not significant (Chow F = 1.63 is insignificant), indicating that the influence of long-term debt financing on DPO has disappeared with a marginal increase in short-term fund in CS. Hence, there is no impact of CS on DP of the sample firms under Shipping Sector, and therefore H_0^1 is rejected in respect of DPO_{t-1} positively at 1% level (0.4928) in the reduced model; with respect to the full model DPO_{t-1} positively (0.4392) at 1% level, and LTD_TA positively at 10% level (0.2320) of Shipping Sector.

In respect of sample firms under Textile Sector, no multi-collinearity among the independent variables is found, and the DPO is not correlated with all the variables, providing evidence that distribution of part of the net income as dividend is independent of earnings, cash flow, and debt fund in CS. However, the analysis shows that the reduced model with coefficient of determination to an extent of 7.75 per cent (see table 8) is fitted significantly (R^2 = 0775, F-value = 2.90, $p < 0.10$), whereas the full model is not, though there has been a marginal increase in the explained variation with inclusion of CS variables (R^2 = 0.0810, F = 1.47, $p > 0.10$ – insignificant). But the significant co-efficient of PAT (β = 1.9594, t = 2.11, $p < 0.05$) with a positive sign and that of TDE (β = –0.3547, t = –2.13, $p <$ 0.05) with a negative sign in both the models indicates that DPO is more than that of the net profit, and dividend paid from the total distributable earnings without considering the debt financing in CS for Textile Sector.

Hence, H_0^1 is rejected in respect of PAT positively at 5% level (1.9594), and TDE negatively at 5% level (–0.3547) in the reduced model; with re-

TABLE 8 Results of Cross-Sectional OLS Model for Sample Firms under Textile Sector (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	20.3188***	2.98	21.4650	0.80
DPO_{t-1}	—	—	—	—
PAT	1.9594**	2.11	1.9488**	2.01
TDE	–0.3547**	–2.13	–0.3929*	–1.97
CF	—	—	—	—
Size	—	—	—	—
INV	—	—	—	—
LTD_TA	—	—	0.0265	0.07
STD_TA	—	—	–0.1521	–0.31
R^2	0.0775		0.0810	
Adjusted R^2	0.0508		0.0261	
F-value	2.90*		1.47NS	
	2.69		4.67	
Chow Test *F*-value			0.13	
			2.67	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

spect to the full model, PAT positively (1.9488) at 5% level, and TDE negatively at 10% level (–0.3929). Hence, H_0^1 is rejected in respect of the effect of PAT and TDE on DPO of Textile Sector.

Firm Size-Wise Analysis

The relationship between DP measured as DPO (dividend payout paid/net income) and CS for sample firms with small, medium and large size total assets is analyzed and the results are shown in tables 9–12. DPO is positively related with lagged DPO ($r = 0.1953$, $p < 0.05$), PAT ($r = 0.1950$, $p < 0.05$), TDE ($r = 0.1680$, $p < 0.10$), and negatively associated with CF ($r = –0.1793$, $p < 0.10$) and INV ($r = –0.3634$, $p < 0.01$). From significant correlation coefficients, it is found that the current year DPO has impacted on the previous year DPO, increase in PAT and decrease in capital expenditure (INV) among small size sample firms.

With regard to the unique impact of control and debt variables, the results of regression analysis using reduced and full model for small size

TABLE 9 Results of Cross-Sectional OLS Model for small size firms under all selected sectors (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	23.6180***	5.61	18.5859***	2.73
DPO_{t-1}	0.2350**	2.04	0.2323**	2.00
PAT	0.4259	1.64	0.4732*	1.77
TDE	—	—	—	—
CF	—	—	—	—
Size	—	—	—	—
INV	–1.1126***	–3.78	–1.1996***	–3.81
LTD_TA	—	—	0.1216	0.89
STD_TA	—	—	0.1182	0.47
R^2	0.1927		0.2003	
Adjusted R^2	0.1675		0.1578	
F-value	7.64***		4.71***	
	3.96		5.94	
Chow Test *F*-value			0.45	
			2.94	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

sample firms across the selected sectors reveal (see table 9) that both the reduced model ($R^2 = 0.1927$, $F = 7.64$, $p < 0.01$) and full model ($R^2 = 0.2003$, $F = 4.71$, $p < 0.01$) are fitted significantly, explaining to an extent of 19.27 per cent and 20.03 per cent of the variation respectively for the reduced model and full model in respect of DPO. The co-efficient of PAT is significant at the level of 10 per cent, which shows that the lagged DPO and PAT have a positive effect on DPO when there has been a decline in capital expenditure (INV).

Whereas, the co-efficient of LTD_TA and STD_TA is not significant, revealing the fact that the DPO is independent of the debt level in CS of small size sample firms, which supports the significance of both the leverage variables in explaining the DPO (*F* of Chow test is insignificant). Hence, H_0^2 is rejected in respect of DPO_{t-1} positively at 5% level (0.2350), and INV negatively at 1% level (–1.1126) in the reduced model; with respect to the full model DPO_{t-1} positively (0.2323) at 5% level, PAT at 10% level (0.4732), and INV negatively at 1% level (–1.1996) for Small size firms

TABLE 10 Results of Cross-Sectional OLS Model for medium size sample firms under all selected sectors (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	36.8846	1.64	34.5672	1.46
DPO_{t-1}	0.1634**	2.55	0.1592**	2.47
PAT	−0.1142*	−1.78	−0.1196*	−1.67
TDE	0.0582**	2.13	0.0479	1.22
CF	0.0418**	2.04	0.0442**	2.14
Size	−5.2592	−1.20	−4.2581	−0.82
INV	−0.0660	−1.26	−0.0688	−1.31
LTD_TA	—	—	−0.0664	−0.66
STD_TA	—	—	0.1230	0.73
R^2	0.0577		0.0628	
Adjusted R^2	0.0354		0.0329	
F-value	2.58**		2.10**	
	6.253		8.251	
Chow Test *F*-value			0.68	
			2.251	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

under all selected sectors. Therefore, the DP of small size sample firms across all selected sectors is independent of the level of debt in CS.

The regression model for medium size firms is fitted significantly (see table 10) with all the control variables, but together they explain to an extent of 5.77 per cent of the variation in DPO ($R^2 = 0.0577$, $F = 2.58$, $p < 0.05$). The co-efficient of lagged DPO ($\beta = 0.1634$, $t = 2.55$, $p < 0.05$), TDE ($\beta = 0.0582$, $t = 2.13$, $p < 0.05$) and CF ($\beta = 0.0418$, $t = 2.04$, $p < 0.05$) is significant positively, and that of PAT ($\beta = -0.1142$, $t = -1.78$, $p < 0.10$) is significant negatively in the reduced model.

In the presence of leverage variables (full model), the statistical significance of TDE has disappeared. Therefore, there has been a continuous increase in DPO when there has been an increase in TDE and CF, even if there is a decline in PAT when the status of debt is not taken into consideration. However, with marginal decrease in LTD and considerable increase in STD, the medium size firms have not considered TDE before distributing dividend payout to shareholders. Hence, CS and DP are un-

TABLE 11 Results of Cross-Sectional OLS Model for large size firms under all selected sectors (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	14.8011***	7.37	18.9381***	5.58
DPO_{t-1}	0.4380***	7.89	0.4390***	7.90
PAT	—	—	—	—
TDE	—	—	—	—
CF	—	—	—	—
Size	—	—	—	—
INV	—	—	—	—
LTD_TA	—	—	–0.1238*	–1.78
STD_TA	—	—	–0.0455	–0.37
R^2	0.1741		0.1830	
Adjusted R^2	0.1713		0.1747	
F-value	62.21***		21.88***	
	1.295		3.293	
Chow Test *F*-value			1.60	
			2.293	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

related with each other in the case of medium size sample firms of all selected sectors. (*F* of Chow test is insignificant), and therefore rejecting H_0^3 in respect of DPO_{t-1} positively at 5% level (0.1634), PAT negatively at 10% level (–0.1142), TDE positively at 5% level (0.0582), and CF positively at 5% level (0.0418) in the reduced model; with respect to the full model DPO_{t-1} positively (0.1592) at 5% level, PAT negatively at 10% level (–0.1196), and CF positively at 5% level (0.0442). Hence, there is a significant effect of DPO_{t-1}, PAT, TDE, and CF on DPO in medium size sample firms under all selected sectors.

The full model regression analysis with step-wise approach for large size sample firms, in which leverage variables as proxy for CS are included, is fitted significantly (see table 11) explaining to the extent of 18.30 per cent of the variation in DPO ($R^2 = 0.1830$, $F = 21.88$, $p < 0.01$).

Besides, LTD_TA has a unique significant negative impact on DPO ($\beta = -0.1238$, $t = -1.75$, $p < 0.10$). However, there is a lack of collective impact of both leverage variables on DPO (*F* of Chow test is significant). Hence,

TABLE 12 Results of Cross-Sectional OLS Model for all sample firms under all selected sectors (mean values in %)

Independent variable	Reduced Model		Full Model	
	Coeff.	*t*-value	Coeff.	*t*-value
Intercept	15.3441***	11.17	19.6463***	8.00
DPO_{t-1}	0.3094***	7.79	0.3010***	7.56
PAT	0.0013	1.36	0.0006	0.61
TDE	—	—	—	—
CF	—	—	—	—
Size	—	—	—	—
INV	—	—	—	—
LTD_TA	—	—	–0.1117***	–2.43
STD_TA	—	—	–0.0070	–0.08
R^2	0.0889		0.0972	
Adjusted R^2	0.0861		0.0917	
F-value	31.91***		17.55***	
	2.654		4.652	
Chow Test *F*-value			3.00**	
			2.652	

NOTES *** Significant at 1% level, ** Significant at 5% level, * Significant at 10% level.

H_0^4 is rejected in respect of DPO_{t-1} positively at 1% level (0.4380) in the reduced model; with respect to the full model DPO_{t-1} positively (0.4390) at 1% level, LTD_TA negatively at 10% level (–0.1238) for large size firms under all selected sectors. The distribution of dividend payout is independent of the CS between debt and equity of the large size sample firms across all selected sectors.

It is evident from the result of regression analysis for all sample firms pooled together (see table 12) that both, the reduced model as well as the full model are fitted significantly, explaining to the extent of 8.89 per cent ($R^2 = 0.0889$, $F = 31.91$, $p < 0.01$) and 9.72 ($R^2 = 0.0972$, $F = 17.55$, $p < 0.01$) variation in DPO respectively. In the reduced model, only lagged DPO and PAT are retained by step-wise procedure. Between the estimated co-efficient, it is significant positively only for lagged DPO ($\beta = 0.3094$, $t = 7.79$, $p < 0.01$). The co-efficient, though positive, is not significant for PAT, indicating that the PAT has a unique negligible effect on DPO in the presence of the previous year's DPO status. However, in the presence of

leverage variables, though present with insignificant co-efficient, the degree of unique relationship of PAT with DPO has decreased heavily. At the same time, the co-efficient of lagged DPO is significant at 1 per cent level ($\beta = 0.3010$, $t = 7.56$, $p < 0.01$). Besides, between LTD_TA and STD_TA, the coefficient of LTD_TA is significant negatively ($\beta = -0.1117$, $t = -2.43$, $p < 0.05$) at 5 per cent level. The difference in explained variance between the full model and the reduced model (difference in R^2) is also significant at 5 per cent level (Chow $F = 3.00$, $p < 0.05$). Hence, it is found that all the sample firms across all selected sectors keep distributing dividend if it is done so in the previous years, and increase/decrease in DPO is based on the level of debt fund in CS. Hence, H_0^5 is rejected in respect of DPO_{t-1} positively at 1% level (0.3094) in the reduced model; with respect to the full model DPO_{t-1} positively (0.3010) at 1% level, LTD_TA negatively at 1% level (–0.1117) as there is significant impact of DPO_{t-1}, LTD_TA on DPO in all sample firms under all selected sectors, therefore DP in terms of dividend payout is significantly influenced by the CS of firms in India.

Concluding Remarks

This study examines the impact of firm size on the dividend behaviour of corporate firms in India, and has been carried out on 73 firms by empirically analysing the determinants of DP over a wider testing period from 1996/1997 to 2006/2007. Dividend behaviour was tested using the full-Britain model and its variants on the pooled cross sectional/time series data for the sample of observations from 1996/1997 to 2006/2007. The models are estimated using the Ordinary Least Square (OLS) method.

Dividend stocks are expected to provide a combination of dividend cash flows and capital gains from the investors' view. The preference of shareholders for one or the other should have a powerful influence on decisions regarding dividend payment, which leads one to examine the extent to which dividend payments and dividend yields vary significantly across firms, industries and time. Firms come in various sizes and shapes, and they could be single-owner enterprises or large MNCs with many shareholders cutting across geographical boundaries. The management of each firm normally makes DP, but the nature of the ownership can play an important role in DP decision.

While investors concentrate their attention on dividend yield, management pays more attention to the impact of dividend payouts on the firm's capital needs. A high dividend pay out reduces firm's access to re-

tained earnings, which is often viewed as the lowest cost source of capital. For that reason, management may prefer lower dividend payout ratios, but must recognize the realities imposed by shareholders' preference for at least some payment of dividends. According to the traditional view of CS, when a firm's leverage exceeds the optimum CS, its cost of capital increases. Shareholders will want more dividends and more money will be needed to meet interest obligations to debt holders, the weighted average cost of capital will be high and the firm's liquidity position may be affected and growth retarded.

The purpose of this study was to empirically analyse the extent to which the perceived theory about the conventional determinants of dividend behaviour of corporate firms explains the dividend behaviour of quoted firms across industries in India with respect to size. The effects of firm size, growth prospect and the level of gearing on dividend behaviour of firms have been analysed. The dividend behaviour of corporate firms in India's emerging market seems to be significantly influenced by a number of factors, which substantially differ from what is common in developed countries.

Irrespective of the sector, the relationship between the CS and DP remains same, i. e in most of the cases the impact of CS measures, viz., LTD_TA, STD_TA, and TD_TA on DP is unique. The hypothesis which formulated that 'there is no significant relationship between the level of debt in capital structure and level of equity dividend' has been rejected in almost all the sectors. The inter-correlation matrix among variables in the regression models for various sectors also supports the conclusion that there is impact among the independent variables chosen for the study. The results of the cross-sectional OLS Model regression for the selected sample firms under various sectors also show that there is a significant effect of selected independent variables [$\text{DPO} = \alpha + \beta_1 \text{DPO}_{t-1} + \beta_2 \text{PAT} + \beta_3 \text{TDE} + \beta_4 \text{CF} + \beta_5 \text{SIZE} + \beta_6 \text{INV} + \beta_7 \text{LTD} + \beta_8 \text{STD} + e$] on the dividend pay out.

The study proves that the equity dividend percentage and the debt financing in CS are inversely related to each other in most of the sectors. Besides, the CS of sample firms significantly influences dividend payout across all selected sectors when pooled together, but sector-wise and size-wise, there is an insignificant relationship between DP and CS. Therefore, it is concluded that the DP of small size, medium size, large size, and overall corporate firms across industries in India is independent of the level of debt in CS.

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Change Management in Adult Educational Organizations: A Slovenian Case Study

Romana Martinčič

Successful implementing and managing of change is urgently necessary for each adult educational organization. During the process, leading of the staff is becoming a key condition and the most significant factor. Beside certain personal traits of the leader, change management demands also certain leadership knowledges, skills, versatilities and behaviour which may even border on changing the organizational culture. The paper finds the significance of certain values and of organizational climate and above all the significance of leadership style which a leader will adjust to the staff and to the circumstances. The author presents a multiple qualitative case study of managing change in three adult educational organizations. The paper finds that factors of successful leading of change exist which represent an adequate approach to leading the staff during the introduction of changes in educational organizations. Its originality/value is in providing information on the important relationship between culture, leadership styles and leader's behaviour as preconditions for successful implementing and managing of strategic change.

Key Words: change management, educational organization, leadership, process of changes, qualitative research
JEL *Classification:* I10, M10

Introduction

The only constant of the time we live in are the changes in all areas of our life and work. They are incited by a number of factors: technological advancement, changed expectations and needs of the clients, changed market conditions, changing of legislation, changed social values etc. (Paton and McCalman 2000); no organization – large or small, local or global – is immune to change (Kotter 1998b). Educational organization must follow the opportunities and avoid the threats which occur in the contemporary turbulent environment. The changing of legislation and regulation of education entails change implementation in a special manner 'from the top downwards.' An educational organization has little or no

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influence on such change. Its task is more or less to respond to change, as it has no choice but to operate in accordance with the rules. Much more interesting for the long term efficiency of an organization is the change that originates from the organization itself as a premeditated, planned activity caused by various reasons: fewer pupils and students, young or adults, the need to improve the quality in education or to introduce new formal or informal forms of education etc.

Several authors (Fullan 2001; Bukovec 2005; Coleman 1994; Drucker 1999; Kotter and Cohen 2003; Tracy 1999) claim that successful implementing and managing of change depends on the leadership style. The changes in organizations represent a major challenge to leaders, as the quality of leadership is proved in the course of implementing change. The central topic of this research was to study implementing change from the point of view of leadership in three adult educational organizations. As leadership is a highly complex phenomenon its exploring has been approached holistically and the leadership styles were put into the context of a situation and of the prevailing organizational culture. The radical/strategic change, which represents fundamental transformation of the steady manners of operation in an adult educational organization, was placed into the focus of interest.

Leading change in educational organizations is not really a frequent topic in the literature and, when it is, it deals more with the permanent improvement of work in schools (Leithwood, Jantzi and Steinbach 1999; Davies 2002) and less with leading radical change, such as implementing completely new educational programmes or new activities. This aspect is very important for many Slovene adult educational organizations.

Management vs. Leadership

For further reference in this paper, the leadership and management will be considered as two different processes, as differentiated by Hersey and Blanchard (1993). According to these authors a narrower and a broader meaning are attributed to leadership. They maintain that 'management is thought of as a special kind of leadership in which the achievement of organizational goals is paramaount [. . .] Leadership occurs any time one attempts to influence the behaviour of individuals or group regardless of the reason.' Leadership is defined as one of the functions of management whereby a manager will apply all available resources including the human resources. The essence of leadership is in influencing them and in inter-action between a leader and staff. Several authors (Dubrin 2004;

Dessler 2001; Tavčar 2000b; Yukl 1998; Možina et al. 1996) define management as a process of planning, organizing, leading and supervising of the members of organization. Leading represents just one of the functions or tasks of a manager (Tavčar 2000a).

But all these numerous definitions have a common basis: leadership is *influencing the staff.* No matter how efficient the leader is he/she can not achieve results without people. The activities and tasks in organizations are getting more and more sophisticated and that is why people are of crucial importance. 'The leadership is not a person or a position, [. . .] it is a complex, paradoxical and moral relationship between people [. . .] which can cause harm between some groups, accompanied by benefits to others [. . .] and is based on trust, obligation, commitment and vision – nobody can be a leader without willing followers' is the definition of leadership by Rosenbach and Taylor (1998, 2–4, quote acc. to Storr 2004, 416).

One of the most difficult tasks is implementing and managing change, which requires the leaders to have certain personal traits of: being a risk taker and politically astute, having charisma and confidence, offering inspiration, and taking ownership of the initiative (Chrusciel 2008). Leaders are expected to: have versatility and skills, adjust of leadership style to the situation and the staff, and demonstrate efficient behavioural patterns.

CHALLENGES OF LEADING CHANGE

When distinguishing between management and leadership in accordance with the above definitions, a conclusion can be drawn that leadership as a 'softer' principle of management is a crucial factor in implementing change. Bukovec (2005) maintains that management suffices to control the gradual changes, and leadership is necessary when an organization seeks to implement radical/strategic change. Kotter (1998a) suggests eight critical stages to take into account when implementing radical change:

- Establish a sense of urgency: If people are not made aware of the importance of change, they will simply not cooperate in the process of changing.
- Form a powerful guiding coalition: This means, to assemble a group of dedicated individuals who will pledge their influence and knowledge to introduce change.

- Create a vision that will help direct the change effort.
- Communicate the vision and instilling enthusiasm into people to make them comprehend the significance and purpose of the change.
- Empower employees to undertake important tasks.
- Plan for and achieve short-term wins to reinforce momentum.
- Consolidate improvements and produce still more change.
- Institutionalize new approaches and ways of work – to make sure that the desired changes become part of the organizational culture.

Because of the complexity of the contemporary situations the leaders have to focus on five basic ingredients of efficient leadership (Fullan 2001):

- *Moral purpose:* a leader is to be directed by a moral purpose which is manifested in caring for and in endeavouring to improve the life of the staff, of clients and of society as a whole.
- *Understand the change process:* not understanding of the process of change only leads to failures; the good ideas only will not be sufficient. The leader must uderstand how to implement good ideas. Doing so, to control the troubles that may occur at the beginning of introducing changes, the leader must if necessary change the organizational culture.
- *Relationship building* is of crucial importance for successful introduction of changes. Without good relationships, things will deteriorate. Aiming to solve problems, an efficient leader will endeavour to cooperate with his/her staff.
- *Knowledge creation and sharing;* a leader shall stimulate the staff to engage in permanent learning and acquiring new knowledge. The employees are not supposed to keep their knowledge to themselves. They must share it for the benefit of a succesful solution of problems.
- *Coherence making:* is leaders' permanent task, since in the culture of changes which is accompanied by inequilibrium and instability, leading of staff is a most demanding job.

Leadership in an educational organization has its peculiarities. Teachers, advisors and organizers are comparatively well educated and expect a certain amount of autonomy in their work. The concept of distributed leadership has been much debated and heavily promoted within the school sector (Harris 2007). The core of school leadership practice

is direction setting (Jacobson et al. 2005). Scheerens (1998) emphasizes some forms of leadership in education and defines the main fields of activity of a leader in educational organization. A leader has to support all innovative efforts in an organization and to reward efficient work. A leader has: to understand the process of changing (Andrews, Cameron and Harris 2008), to determine the reasons for possible failure in implementing change and to be in control of strategies to cope with the resistances (Cook 2009). A leader (manager/headmaster) of an educational organization who endeavours to achieve the progress of all participants in education, promotes the professional development of teachers and other staff and is himself/herself willing to learn, becomes a catalyst of change.

Starting-Point of Qualitative Research

A qualitative and quantitative paradigm which emerged from two philosophical bases, phenomenology and positivism, is being discussed in the literature. Essentially, a positivist believes that the reality which is observed exists independently of the researcher (Easterby-Smith, Thorpe and Lowe 2003). As opposed to positivism, there engaged the phenomenological approach, which is called social constructionism by the same authors. Here the researcher is not supposed only to collect facts and to find out the frequency of phenomena, but also to discover how people perceive the reality and what significance they attribute to it. Alvesson and Deetz (2000) maintain that it is easier to comprehend micropractices from daily life through qualitative – also called interpretative – research methods.

The primary goal of this type of research is an empirical description and deep understanding of a limited part of the existing social reality with the added ambition of stimulating moderate (modest) social changes. Leading is by its natural role a process – oriented permanent activity which is, for this very reason, easier to research with qualitative methods (Merriam 1998; Cassel and Symon 2005). The classical positivist approach, which deals with the social world as a world independent of individual perception of the researcher (Toš and Hafner-Fink 1998), is almost inadequate for research of leadership.

The process aspect of leadership requires predominantly open questions, where the answers are sought above all in personal discussions with people who know a great deal about the subject of the research. In qualitative research, the research material is compiled in the form of verbal

descriptions and also processed and analysed verbally without using the measuring procedures.

METHODOLOGY

The research was conceived as a multiple qualitative case study (Merriam 1998; Yin 1994). In the literature, the synonym collective case study has also been found (Silverman 2005; Stake 1995). In a multiple case study each individual case is contemplated as a single case and finally as a whole, and remains inside the same methodological framework (Yin 1994). General recognitions which fit to all cases are sought. A case study or a study of a small number of cases will be inevitable when the aim is an in-depth understanding of the situation. It is an intense, complete description and analysis of an individual unit, of a case, or of the whole, e. g. of: individual, event, group, or community (Merriam 1998). Basically it is an enquiry in a real life context, as opposed to the contrived context of experiment (Yin 1994).

The validity of qualitative research is designated by the term credibility which comprises the substantiation of the selection of procedure (Tratnik 2002), and by its trustworthiness. The validity of the present research is enhanced with the following: (1) triangulation; three educational organizations and inside them three different information sources (managers/headmasters, deputies and staff), (2) exact tapescripts of interviews, (3) accurate organizing of the material to obtain the records (documentation) of an individual case.

The research aims to determine an efficient approach towards managing change. What leadership approach is prevailing in the selected organizations and how does it affect the implementing and control of change? Which are the crucial factors of efficient leadership? The selected educational organizations differred in characteristics significant for the purpose of the research. A public and a private adult educational organization and an educational centre, or its unit for adult education, were included. The research comprised headmasters (managers), their deputies in all three educational institutions and seven professionals, three from each educational institution and one from an educational centre. Among the professionals, there were organizers of education and teachers in the educational programmes for adults. The selection of samples in phenomenological research is somewhat different from the selection in the positivist approach. Merriam (1998) maintains that selection of a non-probability intentional sample is based on the assumption that the in-

vestigator wants to discover, understand and gain insight into the phenomenon. That is why a sample needs to be selected so that it provides the most information. Because in those organizations which were willing to cooperate the selected sample was practical, and due to relevance of the included individuals, it was intentional. The data in the research were collected by semi-structured interview.

The basic questions for interviews were:

- Can you enumerate a few major/strategic changes that you have implemented in the past five years?
- Can you describe how the changes were implemented?
- How was the leading of staff conducted during the time of implementing change?
- How would you define the organizational culture in your organization?

Where appropriate, these questions were supplemented with additional questions during the interview to direct it, above all to the following: reasons and initiatives for changes, visions regarding the change, possible resistance and conflicts, communication and adoption of changes, organizational culture, values, relationships, climate and leadership styles. Additional topics or fields that were of interest, were noted in the form of a memorandum which induced me to ensure that the interviews in all three organizations were conducted in approximately the same way. This is what Yin (1994, 45) stands for and calls 'strategy of repetiton.' The analysis of the data was carried out according to the method suggested by Miles and Huberman (1994) in the framework of general analytical procedure. The analysis using a multiple case study has a few peculiarities. Merriam (1998) speaks of two stages: the first is analysis of each individual case, i. e. within-case analysis, and the other is cross-case analysis. The latter 'strives to establish a general explanation that fits each of the individual cases even though they may differ in details' (Yin 1994, 112). The advantage of cross-case analysis lies in greater generalization and in-depth understanding and explanation.

There have been few researches in this field. The present study is the first in the country and should serve as a basis for further research. The study has some limitations. Each educational organization is a case of its own and that is why the generalization may present one of the limitations. When working with a sample of only three educational organiza-

tions, it is difficult to reach conclusions that can be readily generalized to other settings.

Results of the Research

The data were categorized in the following thematic sets or categories: (1) reasons for changing, (2) characteristics of the process of implementing change, (3) culture of educational organizations, and (4) factors of successful managing of change. A completed thought, word or sentence of the interviewed was a unit to be evaluated.

REASONS FOR CHANGES

All organizations involved had introduced changes at their own initiative. They were not forced by legislation or regulations adopted by schools authorities, but instead by their own concern to maintain competitivness. According to what they said, they managed to do so with new and up to date programmes (curricula) and better quality of teaching. One of the managers said:

> The technological changes with the clients were the reason why the programmes had to be changed. People who were educated on the basis of old curricula simply could not get employment as they lacked new knowledges and did not command the modern communication technology.

Another manager said:

> [...] we were forced into changes by the development of education of adults in Slovenia and by social, economical and political changes. Among other reasons were also the concern for the quality and reputation of the organization and [...] due to a decrease in the number of the students in their organization they had to look for a market niche to replace the 'drying programmes.'

Table 1 presents concisely the reasons for changes.

The major reasons for implementing changes in the public adult educational organization EO (1) were connected with quality and development and consequently with an increase in enrollment of students. The private adult educational organization EO (2) was seeking for reputation and image. The most important reasons for change in educational center EO (3) have been caused by the need to adjust to new educational programmes.

TABLE 1 Reasons for changes

EO (1)	• General social, economical and political changes • Decrease in the enrollment and thereby decrease in the scope of work of the staff • Searching the market niches • Concern about the quality and the desire to improve and to develop
EO (2)	• Acquiring reputation/maintaining the image in the environment • Searching for market niches in connection with the economic situation
EO (3)	• Technological changes with clients who enter the educational programmes • Adjusting of education to the needs of work (adequately educated people will be more employable)

CHARACTERISTICS OF THE PROCESS OF IMPLEMENTING CHANGE

The replies showed that the original initiative for implementing change originated from the managers, who then presented them to their close team. Two of the managers and three of the staff specifically pointed to the manager's efforts and his stimulating others to contribute their views and initiatives. The final success of implementing change depends largely on these initial steps, which include a thorough consideration of the necessity of implementing change and of the need to select the 'right' people above all people who possess expertise in the field touched by the change and to whom a change represents a certain challenge. As one of the directors said, he selects people 'in whose line a certain topic is,' and eventual the possible lethargy of individuals at the beginning he overcomes with 'somewhat more authoritative leadership.' Another manager coped with the initial aversion to change by involving the staff in systematic training to acquire the knowledge neccessary for implementing changes. To the question as to who on the staff had been included in the project team for change, he replied that 'above all those who have certain professional knowledge.' An additional criterion in selecting them was also their propensity for changes, i. e. 'they have a desire to make things better,' he said. But he did not entirely exclude those who were in opposition, as they too need 'to be convinced of necessity of changes' if these were to be successful.

The research showed that resistance is an inevitable evil which may lead to serious conflicts which probably each leader implementing change will have to face. It is interesting that in the two smaller organizations (public and private organizations), there were no serious aversions to-

wards change. The staff was aware of the seriousness of the situation and of the need for new programmes of higher quality which would be interesting for the prospective clients. As one of the managers said, 'his colleagues were highly understanding in accepting different and additional tasks,' among others also for fear of losing the job in case of a decreased number of students enrolled. A few more troubles turned up in the third organization. The reason for them was described by the manager in a few sentences:

> One of the most difficult things is to change a teacher. To move his centuries long-concentration on one subject was a major problem that needed to be tackled. Other hindrances were of technological nature such as introducing computers at work, improving and updating programmes for administrative and technical operating of the school, and finally organization of management itself.

The deputy said that inside the adult education department no resistances had been perceived as they were 'a small group which had been operating as such for over a decade.' Further he said that 'there were more difficulties with negotiating between the adult education department and the comparatively large group of employees engaged in regular education or in the education of young people.'

The organizer of adult education was even more specific in her replies. She said: 'Communication between the adult education department and the educational centre as a whole has always been difficult [...] things stuck already when the changes were in the stage of presentation to the whole staff.' Further she said that she 'literally had to work separately with each teacher' as they 'contemplated adult education as if it did not belong in the educational system,' she continued. Their manager also said that they tried to motivate people for the planned change at conferences and by means of workshops, which was not convincing enough – not even for sceptics, let alone the opponents. He had to use 'his authority' and had 'to address each individual by means of personal contact,' he added.

The responses indicated that there is no simple recipe for coping with resistances. The respondents had often underlined the significance of communication. The change needs to be presented to all employees, they need an explanation of what it means and what it will bring to them, the necessity of change needs to be pointed out and substantiated with

various arguments. One of the managers even claimed that 'the initial comprehensive information' is crucial.

CULTURE OF EDUCATIONAL ORGANIZATIONS AND THEIR VALUES

The responses showed that changes in educational organizations are strongly related to the prevailing culture, which is comprised of organizational structure, common values, leadership style and organizational climate. These 'soft approaches' seem particularly important for the teaching staff. One of the managers said: 'With an authoritative approach in the project or in the school no change can succeed.' An authority always suffocates the creativity, and without creativity there can be no introducing novelties and improvements. In spite of the fact that the employees in the educational organizations are directed by different values, and that these organizations are differentiated also by organizational structure, a common core, on which implementing change can be built, could be observed in the three organizations which were the subject of the research. This common core consists of democratic relationships, mutual respect and trust which serve for more efficient and successful implementing of change.

All respondents agreed that the organizational structure has a considerable, if not outright the largest impact on implementing change in their respective organizations. Further they agreed that a prevailing culture can impede or assist the endeavours for changing. One of the deputies defined the culture as 'knowledge, habits and values which the employees with longer work experience pass down to the younger colleagues.' She pointed out the importance of a respectful relationship, which seems to be significant for the welfare of all employees and thereby 'affects their creativity and good performance.' In her opinion, 'people always have to express loyalty to the organization' for which they work. Further she emphasized that expressing loyalty to the organization is demonstrated not only by carrying out the tasks, but also in other ways by showing pride in being employed in the organization and with enthusiasm for achieving the common goals.

The culture was rated as democratic and cooperative in all involved organizations. All professionals replied that they 'can express opinions' and that they are given due consideration.' Beside cooperation, the trust of the teachers and organizers in the management and vice versa is likewise important. Trust is a glue that amalgamates the staff and makes pos-

sible that success of cooperation. As one of the professionals said: 'You cannot do anything on your own. You must work jointly with a team of colleagues. Trust and the feeling that you can rely on them is very important here.'

Kindness, helpfulness and flexibility were a few of the values on which the participants laid stress. They said that they placed the participants of the education and taking care of them as the first of the daily tasks in the focus of the teaching process. One deputy of the headmaster said that they 'are not treated as mere numbers', but that in fact the staff really takes an interest in them. She also stressed: 'The important values that direct their work are expertise, accuracy, responsibility, respectful mutual relations and a positive climate. The latter is also a reason for the employees' loyalty to the organization for which they work.'

FACTORS OF SUCCESSFUL LEADING OF CHANGE

In the interviews, all the professionals in staff also reported that their 'directors adjust the leadership style to the situation and to the people.' Most of the time, they practice the participative and democratic but sometimes also the authoritative style. The research found that at the start of implementing change the managers had to apply a more authoritarian style to overcome staff resistance.

During the preparation for change, it is of supreme importance that a vision, i. e. a clear picture of future is created and presented in detail to the staff. One of the managers said: 'And when I finally have the whole picture in my mind I present it to my subordinates with much enthusiasm and energy.' During the discussion, the three organizers of education maintained that 'an early involvement of the persons to carry out the introduction of change is important for successful implementing of change and for achieving commitment of the staff to change.' Also the selection of the team is very important. One of the managers stressed: 'People with inadequate knowledge and those who are strongly opposed to the change may jeopardize the whole project or programme.'

During the implementation constant motivation and control of achieving the interim objectives are necessary. The motivation for work, also in cases when major obstacles or problems turn up which may demotivate the staff, can according to all three managers be achieved 'with their own enthusiasm and by setting a good example.' They said that they all 'involved the organizers of education and teachers and the coordinate team in individual activities.' One of the managers said:

TABLE 2 Factors for Successful Leadership

EO (1)	• Including people in the early stage of preparation and not only in the stage of implementation • 'Maintaining' motivation for change • Open communication • Participation of the organizers of education and teachers in decision making • Coordinating team and individual activities
EO (2)	• Presentation of a clear picture for the future • Open communication • Coordinating team and individual activities • 'Maintaining' motivation for change • participation of the organizers of education and teachers in decision making
EO (3)	• Including suitable people in a team • Open communication • Coordinating team and individual activities • 'Maintaining' motivation for change • Participation of the organizers of education and teachers in decision making • Consolidation of the introduced change • Motivating for creative solving of problems

> With some members of the team, I had to deal authoritatively and with others I had to check their exaggerated enthusiasm ... I personally communicated with the colleagues and kept repeating to them how significant small steps are and the successes connected with them [...] but when the new programme was introduced this was not the end, for the change needed to become a routine.

Table 2 presents factors for successful leadership in a particular educational organization. As we can see, the most important factors according to respondents are: (1) open communication, (2) motivation for change in all steps of implementation, (3) participation of employees in decision making, and (4) coordinating of team and individual activities.

Managers and staff in the researched organization had different opinions about how to introduce changes more efficiently. One of them thought that everybody has to act in the direction of change or, as he expressed it: 'We must all breathe with the idea because otherwise it will fail.' Another one added: 'It is necessary to support creative people who have ideas.' In the opinion of one professional, 'in schools more attention should be paid to development and creative problem solving.' The respondents emphasized the 'importance of motivation and the necessary enthusiasm for changes that it requires.' According to them, the 'changes

are easier introduced by creative people who like to do something new.' Also a climate which is in favour of development and novelties accelerates introducing changes.

Achieving the final result is a long-term and demanding task for all people involved. The comparative distance of the goal may have a demotivating effect and that is why it is important to maintain the motivation by pointing out 'small' victories.

The managers saw the key to successfully introducing the changes in the mode of leadership which is sometimes more people oriented. This was illustrated by the following statements:

> In my opinion it is necessary to get acquainted with the team with whom you work, listen to their opinions and only then take up the tasks regarding the changes.
>
> In change management/leadership some values will help – the first is respect for the colleagues, the second is loyalty to the collective. In my opinion, respect is the most far reaching, and honesty, fairness and kindness too.
>
> Efficient change management is affected by the openness and accessibility of the manager.

Conclusions and Recommendations for Practice

A manager/headmaster exercises a considerable influence on implementing change. With his/her personal characteristics – trait, actions and manner of leading of the staff – he/she may accelerate or decelerate the pace of introducing the changes. With faithfulness to the vision and values of the educational organization, with openness to learning, with strategic ponderation and by promoting cooperation among the staff, he/she may efficiently introduce change. The leadership performance requires adjustment of style to the staff and situation (Leithwood, Jantzi and Steinbach 1999). We cannot expect the manager to be omnipotent, yet it is clear, however, that his/her leadership is an important condition in implementing change.

The research showed that managers of the organizations involved are aware of the importance of the market in education and of adjusting educational programmes to the ever more demanding requirements of enterprises and individuals. Moreover, these managers are well aware of their active role in the development of their own educational institution. In working with people, or in merely being in contact with them, they

do not swear by 'hard' methods, e. g. dictating, enforcement, rivalry, and punishment. Instead they are in favour of the soft method of leading, i. e. stimulating, showing the challenges, motivating, rewarding, healthy competition and cooperation. Their two trump cards are openness, and to a certain extent the charisma which induce the staff to do the best for the common good. Strategic thinking is manifested in their initiative for changes.

According to some authors (Kotter 1998a; Kotter and Cohen 2003), the important thing is that the managers know how to instil enthusiasm into their colleagues who are sufficiently trained, competent, show interest and are in favour of changes. They cope with the resistances in different ways: by involving the professional staff at the very beginning, when the vision of change is being prepared, by substantiating and persuading about the necessity, even the inevitability of change, and by emphasizing the first successes the moment the change produces them. In this way the fainthearted will be convinced about what can be changed and what can not.

The adult educational organizations which were the subject of the research are marked with a specific organizational culture and structure by which the organizations are essentially differentiated. Cooperation, open and relaxed communication, mutual trust, expertise and placing the person, – the subject of education –, in the centre of the process of teaching, from the nucleus of common characteristics of organizational culture. This has led to successful implementation of the planned changes in the organizations which were researched.

The findings can be summed up as follows:

- Implementing changes in the researched educational organization is closely linked to the organizational cultures and prevailing values.
- Leading changes is connected with the leading of staff, where the headmaster/manager plays a decisive role.
- The headmaster/manager has to be familiar with the process of changing and with its stages.
- In implementing changes, the headmaster/manager has to consider the important factors of successful leading of changes.

The research findings confirm that implementing changes in educational organizations requires managers who, in addition to having management talents, also have a well developed leadership trait which in critical moments moves things from a standstill. This is possible by making

their staff enthusiastic, by stimulating them, by connecting with one another, by offering support and by giving them the necessary feeling that success is guaranteed in spite of interim difficulties.

Communication was considered very important. In the opinion of participants in the present study, it was practically always inadequate. In the individual steps of implementing change, work should be inspected and the stages discussed in detail. The professionals in the staff could have more influence in deciding on the change to be implemented. This would ensure that a change would be accepted as if it were their own idea and its implementation would be much easier.

A thorough consideration about the necessity of change would often prevent tension among the employees, and the sensibleness of simultaneous involvement in various projects which are demanding in terms of funding, personnel and equipment, would be determined at the beginning.

The leadership styles did not prove less appropriate at the time of implementing change. Adequate adjustment of various leadership styles: democratic, participative and authoritative and adjustment of leading to the groups and individuals proved to be an efficient leadership mode in uncertain times entailed by change. A generic leadership approach is not desirable, because it denies the impact of context (Werkman 2009). An authoritarian style of leading was suitable at the beginning of implementing change. With a somewhat more formal approach it was possible to overcome or to control the initial passiveness or minor resistances of the employees. The employees must accept the novelties and changes and consider them as their own. This will only happen if the staff participates in decision making which refers to changes. The staff needs to be involved as early as possible in the preparation of visions regarding the change. Only in this way will they stick to the initial inclination to changes and endeavour to implement them throughout the process of changing.

The four themes serve as a powerful framework to help headmasters/managers develop a leadership philosophy that enables a successful implementation of change in an adult educational organization. Although there is no single answer as to how to lead change in an educational organization, these guiding principles, developed from practices of successful adult educations, can serve as a framework for individuals who want to institute change management practices within their organizations.

The findings for these cases have important implications for the practice and preparation of change leaders/agents in educational organizations.

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Understanding ISO*'s 9001 Benefits and Research through an Operations Strategy Framework*

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Despite the success that the ISO 9001 standard has achieved it has been extensively criticized and empirical studies have shown controversial results about its impact on performance. Our conceptual study was motivated by the mentioned dilemma about ISO 9001 effectiveness, and the controversy that this dilemma raises in literature on the one hand and on the other by almost exponential growth of certifications among companies world-wide. It is our opinion that in order to understand results related to ISO 9001 implementation we need to take a step back from empirical research and instead try to analyze ISO conceptually by taking into account also the results of empirical studies implemented in the past. The purpose of the paper is to clarify the purpose of implementation of ISO 9001 and, in relation to this purpose, to analyze different possible benefits resulting from its implementation. In order to achieve this purpose our goal is to analyze the criticism of the old ISO 9001:1994 by using a specific framework of the operations strategy theory. The paper emphasises that in accordance with its conformance purpose, ISO 9001 is successful in building conformance capability and that by using ISO 9001 practices companies can also benefit in relation to production economics through improved process efficiency and to other competitive capabilities. It also emphasises that empirical results expected from ISO 9001 implementation are strategy contingent and therefore this should be taken into account in designing empirical studies about ISO's benefits.

Key Words: ISO 9001, quality assurance, conformity, standards
JEL *Classification:* L15, M10

Introduction

Since its introduction in 1987, the ISO 9001 standard for quality management systems has made a huge intprint on global economy: there are one million firms certified by the standard, the standard has been adopted

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globally as well as in most industry sectors. The number of firms adopting the standard has been growing constantly and many firms still encourage their supply chain partners to seek certification. Therefore implementation of the ISO 9000 series probably represents one of the most widely used systems for achievement of transition towards improved organizational managerial systems. On its journey the standard has been revised three times – in 1994, 2000, 2008. Especially the 2000 revision was significant.

The literature review shows that the empirical research of implementation issues and results of ISO 9001:1994 has been extensive (for reviews of ISO 9001:1994 empirical research see for example Curkovic and Pagell, 1999; Santos and Escanciano 2002; Quazi et al. 2002; Angel R. Martínez-Lorente and Micaela Martínez-Costa 2004; van der Wiele et al. 2005). Despite the overwhelming popularity of ISO 9001:1994, there has been considerable confusion and frustration surrounding the role and business value of ISO 9000 certification (Terziovski, Samson, and Dow 1997). Additionally the ISO 9000:1994 model has received harsh criticism from the perspective imposed by the total quality management concept, and the literature identified several critical areas, requirements of a quality management system which were not included in the ISO 9000 requirements (Curkovic and Pagell 1999; Martinez-Lorente and Martinez-Costa 2004; Sroufe and Curkovic 2008). Empirical studies also researched the benefits and implementation problems of the new version of ISO 9001:2000 (Magd and Curry 2003; Biazzo and Bernardi 2003; Casadesus and Karapetrovic 2005; van der Wiele et al. 2005; Magd 2008; Feng and Terziovski, and Samson 2008), however the empirical research related to results of ISO 9001:2000 did not show a very optimistic picture either.

Singh (2008) claims that 'whilst popular, ISO 9000 is not beyond reproach. There is no clear-cut evidence of its effectiveness.' 'In general, studies investigating the effects of ISO 9000 on performance have shown mixed results' (Martinez-Costa, Martinez-Lorente, and Choi 2008), but more importantly ISO 9000 appears to selectively affect certain types of performance (Singh 2008). Especially empirical observation on the financial and business performance impact of ISO 9000 certification have yielded inconsistent results (Singh 2008; McGuire and Dilts 2008). This implies that there is a need for better understanding of the benefits that can be achieved through implementation of ISO 9000.

Our conceptual study was motivated by the above mentioned dilemma about ISO 9000 effectiveness, and the controversy that this dilemma

raises in literature on the one hand, and on the other hand with the almost exponential growth of certifications among companies world-wide. It is our opinion that, in order to understand results related to ISO 9001 implementation, we need to take a step back from empirical research and instead try to analyze the ISO conceptually by taking into account also the results of empirical studies implemented in the past. The purpose of the paper is to clarify the purpose of implementation of ISO 9001 and in relation to this purpose to analyze different possible benefits resulting from its implementation. In order to achieve this purpose our goal is to analyze the criticism of the old ISO 9001:1994 by using a specific framework of the operations strategy theory. This framework has been well defined and accepted within operations management research and therefore it has been used as a comparison basis within analysis of ISO 9001. Identification of problematic situations within analysis requires identification of an appropriate comparison basis. Justification for using operations strategy as a reference framework is presented in the analysis part of the paper.

The analysis draws upon a conceptual theoretical and empirical research base, developed within operations strategy research on the one hand, and on the other hand the paper also builds on an extensive empirical research basis related to implementation issues and benefits of ISO 9001:1994 and 2000.

The Journey from the 1994 Revision to 2000 Revision

The ISO 9000 quality assurance standards were first issued in 1987 and revised in 1994 by the International Organization for Standardization (ISO). Historically, ISO 9000 stemmed from the need to rationalize quality issues in contractual, business-to-business (or business-to-administration) relations (Conti 1999). Larson and Häversjö (2001) have pointed out that the standard with its origin in defence purchase had a clear focus on assuring that the company supplying the defence order was able to deliver. The supplier should study the order submitted ('contract review') and make sure that they understood and delivered as described. No more, no less. The initial aim behind the ISO 9000 series was to build confidence between suppliers and manufacturers in business-to-business transactions and in international trade (van der Wiele et al. 2005). Therefore, as Tummala and Tang (1996) clearly stated, there is one and only one core value for ISO 9001:1994, namely, conformance to specified requirements.

But besides this external benefit there has also been an important potential internal benefit for organizations that have implemented the standard. In its origin, ISO 9001 standard was also concerned with efficiency in an indirect way, by assuring deliveries as promised. By its emphasis on up-stream and in-process checks and by prevention it would help to reduce negative quality costs and in this partial way contributes to efficiency (Larson and Häversjö 2001).

But despite that, the ISO 9000:1994 version has been extensively criticized. First stream of criticism has been conceptual. Within this stream researchers identified deficiencies of ISO 9001:1994, mostly on the basis of its comparison with either the most important TQM elements or directly with quality awards models such as the Malcolm Baldrige Award Model and European Quality Award Model (Tummala and Tang 1996). Researchers that analyzed ISO 9000:1994 based on comparison with TQM mostly shared the view that ISO 9000:1994 certification's requirements represent the minimum common factor for any quality system (Santos and Escanciano 2002; Magd 2008), and as already explained it was considered as insufficient in relation to several critical areas:

- *Product quality:* Certification does not ensure that the product is of high quality, or attractive to the consumer (Curkovic and Pagell 1999; Santos and Escanciano 2002; Magd and Curry 2003).
- *Customer focus and competitive advantage:* the ISO series does not include a strong customer satisfaction and market focus (Curkovic and Pagell 1999; Santos and Escanciano 2002; Gotzamani, Theodorakioglou, and Tsiotras 2006; Sroufe and Curkovic 2008).
- *Continuous improvement:* ISO 9000 has limited focus on and does not explicitly support continuous improvement (Curkovic and Pagell 1999; Biazzo and Bernardi 2003; Martinez-Lorente and Martinez-Costa 2004; Sun et al. 2004; Gotzamani, Theodorakioglou, and Tsiotras 2006).

The second stream of criticism of ISO 9000:1994 has been related to empirical research showing that there is no clear empirical confirmation that ISO is improving company performance (Terziovski, Samson, and Dow 1997; Sun 2000; Singels, Ruel, and van de Water 2001; Santos and Escanciano 2002; Martinez-Costa and Martinez-Lorente 2007). Also this type of criticism has been related to lack of ISO implementation results based on the perspective of expected results from the implementation of a TQM system.

This criticism, based on the comparison of ISO and broader TQM approaches, seemed to have an important effect on the content of reformation of ISO standards, although some of the researchers emphasized that quality awards models (as representatives of broader TQM approaches) and ISO 9000 standards differ fundamentally in focus, purpose, and content and that companies should choose one or the other (Kartha 2004). Mostly, however, researchers were quite harmonious in evaluating revisions in the ISO 9000:2000 as a positive step in the right direction for solving/improving deficiencies discovered/embedded in the ISO 9000:1994 series. The prevalent opinion has been that the changes proposed were in areas that in particular would assist organizations to bridge the gap with TQM and to introduce more modern management practices (Biazzo and Bernardi 2003; Sun et al. 2004) so that quality assurance requirements and quality management aspirations can be aligned holistically (Boulter and Bendell 2002). TheISO 9000:2000 series are also formally based on a set of quality management principles, that are very much in line with the principles of TQM and the principles of the most popular quality and business excellence awards (Gotzamani 2005).

Most important changes, introduced in the ISO 9000:2000 versions, in adopting the TQM philosophy placed stronger emphasis on customer satisfaction and an effective process-oriented approach focusing on continual performance improvement (Franceschini, Galetto, and Cecconi 2006). Researchers claimed that in order to survive in the highest competitive business environment, the past approach of 'conformity to requirements,' which aimed at achieving customer satisfaction by preventing nonconformity, is not enough. Instead, a more proactive system, which is driven by 'customer satisfaction assurance,' should be introduced (Tsim, Yeung, and Leung 2002; Magd and Curry 2003; Gotzamani 2005; Franceschini, Galetto, and Cecconi 2006).

Operations Strategy Framework

It has been recognized that manufacturing activities could contribute a lot to business performance and this has been put to a posture of strategy – the operations strategy (Sun, Hong, 2002). Skinner (1969) is the pioneer in defining operations strategy. In his seminal articles Skinner (1969; 1974) emphasised the need to 'link' manufacturing decisions with overall corporate/business strategy and he developed the concept of internal and external consistency (Sun and Hong 2002; Boyer, Swink, and Rosenzweig 2005). Business strategy specifies the scope of each business

(the range of products and markets in which the company or business unit will compete) and defines the basis on which a business unit can achieve and maintain a competitive advantage within its industry (Rusjan 2005). Porter (1985) developed the idea that all competitive strategies are variants of generic strategies involving a choice between differentiation and delivered cost (price), with degree of focus, i. e., serving niche or broad markets, providing a second competitive dimension (Ward and Duray 2002).

Business strategy has to be supported by appropriate performance of all business functions. Operations strategy therefore studies what is the role of operations in achievement of competitive advantage. This is achieved through aligning capabilities of manufacturing with competitive requirements of the marketplace (Voss, 1995; Dangayach and Deshmukh 2001). Various authors in operations strategy literature have used different terms to describe such manufacturing capabilities, although they have most often been referred to as competitive priorities in case researchers meant intended capabilities, and as competitive capabilities in case researchers meant realized capabilities (Ward, Bickford, and Leong 1996). Despite differences in terminology, general agreement exists in the manufacturing literature about the dimensions of competitive capabilities or priorities that are generic in manufacturing, which normally include cost, flexibility (product mix and volume), quality (design and conformance), delivery (dependability and speed), and innovativeness (Flynn, Schroeder, and Sakakibara 1995; Dangayach and Deshmukh 2001; Swamidass, Darlow, and Baines 2001). There is an apparent relationship between Porter's types of competitive advantage and manufacturing competitive priorities.

Manufacturing attempts to achieve its competitive priorities (objectives) by formulating and implementing manufacturing strategy. In accordance with this, Maruckeck, Pannesi, and Anderson define operations strategy as a 'collective pattern of coordinated decisions that act upon the formulation, reformulation and deployment of manufacturing resources and provide a competitive advantage in support of the overall strategic initiative of the firm' (Marucheck, Pannesi, and Anderson 1992). Most of the researchers give similar definitions (Dangayach and Deshmukh 2001). There is a general agreement about the strategic manufacturing decision areas in which capability-building program choices are made. Researchers agree about the set of strategic choices in manufacturing, which were placed into two groups, structural and infrastructural by

Hayes and Wheelwright (1984) (Dangayach and Deshmukh 2001; Boyer and Lewis 2002).

While the general framework for operations strategy is fairly well defined and accepted, debate continues over the relationship between competitive priorities. An important question associated with the alignment of operations capabilities with the business mode of competing, and the alignment of strategic decisions with operations priorities, is the question of the existence of trade-offs among capabilities, which implies that there is the need to trade-off between the various dimensions of manufacturing performance in order to best support the choice between cost leadership or differentiation (Porter 1985) formulated at business unit level (Dostaler 2001). This has been a major area of debate between the supporters of the proposition that trade-offs are necessary, versus supporters of a cumulative capabilities model specifying that capabilities can be complementary and built simultaneously over time (Boyer, Swink, and Rosenzweig 2005).

The important result of research related to competing views has been that the idea of the possible multiple positive impact of a given practice has become generally acceptable. Distinction between the trade-off and cumulative approach, after all, has not been as large as it might have seemed. It has been more a matter of the degree of extremity in the definitions. Therefore the actual question is not whether a trade-off or a cumulative approach is the right one, but with what activities and to what degree different capabilities can be cumulated (Flynn and Flyn 2004).

Analysis of Criticism of ISO 9000:1994 from operations Strategy Theory Perspective

We use the operations strategy framework as a basis for comparative analysis of ISO because of similarities between the two and because of their relationships. The purpose of ISO 9001:1994 has been clearly recognized as conformance, which represents one of the competitive priorities/capabilities emphasized within the operations strategy. From this perspective the old series of standards was congruent with the operations strategy framework. In fact, ISO actually nicely describes the logic of operations strategy. If the conformance is defined as strategic priority (either an order winner or a qualifier) within business strategy development, different activities have to be implemented in order to develop a certain level of this capability within different business functions of the company. The ISO quality system represents an example of a set of ac-

tivities that have to be implemented in order to achieve conformance capability. Therefore both the ISO and the operations strategy framework represent a rational, prescriptive, top down approach of decision making, with its emphasis on the formulation of plans for subsequent implementation.

The role of operations strategy is to support the implementation of business strategy through determining policies, and necessary activities within operations strategic decision areas. The role of ISO 9001:1994 has been similar, and consistent with this framework, however we can identify two differences between the two: the first difference was that ISO was narrower, as it had to provide practices needed only for the implementation of one of the competitive priorities, and the second that it was broader as – still in accordance with the logic of the operations strategy framework – it included not only activities within operations, but also other business functions. Therefore ISO developed activities that needed to be implemented within operations (and considering the analogy also within other business functions) in case business strategy identified conformance as an important competitive priority. So ISO 9001:9004 was taking care of the implementation part for one of the competitive priorities. Empirical research confirms that ISO has developed appropriate levers to build conformance capability (Sun 2000; Gotzamani and Tsiotras 2002). So the question is: why has ISO 9001:1994 received so much criticism?

Discussion Related to Conceptual Criticism of ISO 9001:1994

From the operations strategy framework it seems that most of the conceptual criticism of ISO 9000:1994 can be related to the definitional problems of quality brought up by Garvin (1984), Reeves and Bednar (1994) and associated multidimensionality of the quality concept (Garvin 1984). Garvin (1984) and Reeves and Bednar (1994) identified five approaches to defining quality, among which three were most commonly used by quality researchers and are also important for our research:

- The manufacturing-based approach defines quality as conformance to specifications. In the manufacturing-based approach, improving quality leads to lower costs, as preventing defects is viewed as less expensive than repairing or reworking them.
- In the user-based approach quality is defined as the extent to which a product satisfies the individual customer's wants, needs, and ex-

pectations. Firms can include numerous attributes and weights when trying to judge expectations.

- Value-based definitions emphasize that both price and quality have to be considered in a competitive market as consumption decisions which are based on both price and quality.

To overcome the conflicting definitions of quality, Garvin (1984) suggested an eight-dimensional framework for thinking about the basic elements of product quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. Researchers emphasized that continued inquiry and research into quality and quality-related issues must be built upon a thorough understanding of differing definitions of the construct (Reeves and Bednar 1994). This is important because provision of different quality dimensions poses different demands on different organizational functions (e. g. marketing, design, manufacturing, purchasing) and may require different organizational practices depending on the quality dimension in question (Flynn, Schroeder, and Sakakibara 1995). Why is this important for analyzing the conceptual criticism of ISO?

If we look into conceptual criticism of ISO 9001:1994 from the operations strategy theory framework, we see that ISO has mostly been criticized for doing exactly what it was supposed to do, i. e. providing appropriate levers for building conformance capability. Conceptual criticism that ISO 9001:1994 did not provide high quality of the product or assure that the product would be attractive to the consumer (Curkovic and Pagell 1999; Tummala and Tang 1996; Magd and Curry 2003) is related to the misinterpretations of the ISO's purpose and role. Criticism that ISO did not provide product quality is based on neglect of the multidimensionality of quality concept. Researchers did not use an appropriate definition of quality, and they based their criticism on interchanging two dimensions of quality, conformance to specifications and product performance (design quality).

We emphasized that the original purpose of ISO 9000 standard procedures has been to guarantee, that products meet agreed customers requirements. Therefore the ISO 9000:1994 standard represented a specific decision making process which had a specific and clear purpose to ensure a supplier's conformance to specified requirements. It is important to notice that the standard's goal has not been the determination of the appropriate level of product and service technical requirements.

The level of technical sophistication had to be determined beforehand in some other decision making process, and technical specification represented an input into the ISO 9001:1994 quality system. In accordance with its purpose, the standard appropriately completed its goal to determine and describe different levers that have to be developed, established, instituted, and emphasized within the company in order to achieve the conformance purpose. Researchers and ISO itself emphasised that quality system requirements specified in the ISO standards were considered complementary to technical product and service requirements (Tummala and Tang 1996; Kartha 2004; Van der Wiele et al. 2005). What this actually meant was that the level of the product quality was external to ISO.

What should product characteristics be, or what level of product quality do we want to achieve, or which customers are the right ones to negotiate requirements with, as they belong to the company's target customer group, is something that has to be determined within business strategy based on market segmentation and on targeting the appropriate customer group. Regardless of what desired level of product quality has been determined within business strategy, ISO has to achieve conformance to specifications. This is valid even though the company does not compete on the high quality of its products. Therefore researchers were right that compliance to the standards did not necessarily prevent an organization from producing 'poor-quality' products (Kartha 2004). But the reason for this has been that the level of product quality was external to ISO as it has been determined within business strategy. The goal of ISO has not been to determine the desired level of product quality and to provide levers needed to improve product quality. As mentioned above, the achievement of capability related to this quality dimension would usually require different activities.

In relation to ISO's focus on conformance to specification, researchers often inappropriately concluded that a certification's requirements represent the minimum common factor for any quality system focusing on process rather than product/service quality (Gavin, Gallimore, and Brown 2002; Van der Wiele et al. 2005; Magd 2008). We said inappropriately, because ISO does not represent a minimum, we could even say it represents a maximum for assurance of conformance capability. The ISO system is a quality system, which is well designed in accordance with its conformance purpose, however it is not a system for the improvement of product quality, and has never meant to be. But describing ISO as a

minimum characteristics quality system shows that researchers viewed ISO as being too narrow, although it was fulfilling its purpose.

Researchers emphasised the need for a broader view of ISO when they were referring to customer focus and customer satisfaction. In fact they explicitly criticised ISO for being too narrow, and not have been customer focused. As Reeves and Bednar (1994) pointed out, the major advocates (Crosby, Deming, Feigenbaum, and Juran) of a conformance-to-specifications definition of quality stressed that customers' wants must be the driving force of specifications that are established. So the standard was customer focused. They also claimed that if customers' needs are governed by specific requirements or standards, as they would be for many industrial customers, conformance to specifications is the most objective, appropriate, and easily measured definition of quality. However this definition might be problematic for services, since 'when specifications cannot be established or conformance to them actually detracts from the quality of the service, defining quality as conformance to specifications results in lower, not higher, quality' (Reeves and Bednar 1994). Another problem is that many if not most consumer goods are not evaluated in terms of conformance to specifications. As ISO has been expanding also into consumer goods industries and services, the conformance quality definition began to seen narrow, and the focus on customer need started.

By looking into the emphasis on satisfying customer needs from the point of view of approaches to quality definitions mentioned above, we can see that criticism of the lack of customer focus really represented a change in approach to quality definition. Researchers made a shift from the manufacturing-based towards the user-based definition. But what does this change in the definition of quality mean if we look into it from the perspective of the operations strategy framework? It means that the focus is broadened, including not only conformance priorities but also other operations strategic priorities (Curkovic and Pagell 1999). Sun, for example, points out that in Japan and other countries, 'quality circle' is still termed 'quality circle' although it may deal with cost, delivery and service problems, and that this does not imply that quality is 'dead,' but that all other performance factors such as productivity, flexibility, delivery and innovation are alive (Sun et al. 2004).

From this perspective of change in the definition of quality also other types of conceptual criticism of ISO 9001:1994 become clear, and can be similarly dismissed as they are based on the change of quality definition,

and therefore deny ISO's original purpose. We can see that the fact that ISO 9001:1994 limited itself to serving as a base for continuous improvement, understood as a continuous reduction of non-conformities was in accordance with its purpose. As mentioned, ISO represented a consistent decision making cycle with its specific purpose, and therefore this decision cycle could not primarily provide continuous improvement related to other purposes.

It is commonly accepted among quality researchers that quality must be defined by the customer, and therefore all product or service attributes that contribute value to the customer and lead to customer satisfaction need to be addressed. Consequentially the simple and internally oriented requirements of the ISO 9001 standard received serious doubts and criticism as to the extent to which they could guarantee quality through customer satisfaction. Our analysis showed that ISO 9001 can contribute to customer satisfaction through achievement and continuous improvement of product conformance (and associated benefits discussed in the next section) in accordance with the manufacturing-based definition of quality, however it can't contribute to customer satisfaction through achievement and improvement of product performance (design quality) in accordance with the user-based definition of quality.

Discussion Related to Empirical Research Criticism of ISO 9001:1994 Results

Regarding the criticism in empirical research, it seems that it is mostly based on neglecting the theoretical base of possible impacts of activities implemented within the ISO system. The problem was that design of the research often has not been based on the theoretical basis that could be drawn from the operations strategy literature. If we take into account the operations strategy framework, empirical studies should search for the direct impact of ISO practices on different capabilities. Although ISO's basic purpose was identified as conformance, this does not mean that activities implemented within the ISO system could not improve also other capabilities. In fact they do, and there is a conceptual theoretical explanation for that, as well as empirical confirmation. Based on the cumulative capabilities approach it is generally accepted within operations strategy that specific practices can have positive effects on different capabilities. Also most of the cumulative capabilities models have emphasized that quality activities represent the basis for the build up of other capabilities (Flynn and Flynn 2004). Garvin (1984) developed a theoretical base

from which it can be implied that ISO practices could affect not only conformance, but also efficiency and productivity, and that conformance capability is also usually positively related to some other dimensions of quality.

Most of the empirical research that studied ISO benefits has identified a positive impact on what researchers usually called internal efficiency, which include: clearer definition of their processes and responsibilities that have resulted in reduction in product defects, rejections and claims; reduction in rework and warranty cost (Sun 2000; Santos and Estanciano 2002; Gotzamani and Tsiotras 2002). On the other hand we found only one empirical study which tried to identify the impact of ISO on different dimensions of quality. Based on case analysis of 11 European companies, Withers and Ebrahinpour (2000) found out that ISO often had a positive impact not only on conformance, but also on perceived quality, serviceability, and reliability as well, in case these presented order winners for companies. On the other hand, the results showed moderate or null impact on performance, features, and aesthetics dimensions. These results confirm our discussion related to the impact of ISO 9001 on product performance (product design) in the previous section.

Therefore there is a theoretical foundation, as well as empirical confirmation, that implementation of ISO 9001 practices has a simultaneous positive impact on different competitive capabilities in accordance with the cumulative capabilities framework. This was probably one of the important reasons why ISO has gained such popularity and has been so widely introduced globally. But on the other hand, research identified also some trade-off characteristics of implemented ISO activities. Researchers mostly identified trade-off impacts associated with ISO implementation on flexibility capability. Implementation of the standards may result in the development of a static quality system that increases bureaucracy and reduces flexibility and innovation (Fuentes et al. 2000; Martinez-Lorente and Martinez-Costa 2004; Gotzamani, Theodorakioglou, and Tsiotras 2006). Loss of flexibility and the rigid documentation may tend to hamper the ability of a company to change quickly (Tsim et al. 2002).

More problematic from the point of view of considering the theoretical base of possible impacts of activities implemented within the ISO system, were studies that were analyzing effects of ISO on competitive advantage, customer satisfaction, increased sales, company's financial performance, and similar. These studies often found that ISO did

not have an important impact, but mostly showed controversial results (Martinez-Costa and Martinez-Lorente 2007). The studies mostly tried to identify the direct impact of ISO introduction on the mentioned performance measures. Rarely have studies used moderating variables, for example Terziovski, Samson, and Dow (1997) used 'strong' and 'weak' TQM environment as a moderating variable. Based on the operations strategy framework studies should have taken into account strategy as a moderating, control variable or mediating variable, when trying to identify such impacts. From the operations strategy perspective it is clear that conformance capability which is the purpose of ISO, represents only one element of a company's competitiveness. And regarding the company's competitiveness, conformance could either have the role of order winner, and in this case represent an element of competitive advantage, or else it could have the role of a qualifier (Hill 1994). However as mentioned above, ISO practices affect different competitive capabilities, and through them they also can have an impact on competitive advantage, customer satisfaction, sales, and profitability. But what this impact would be depends on the competitive strategy of the company, i. e. whether conformance and other capabilities on which ISO implementation had an effect represent order winners or qualifiers within the company. Each of the possible situations would lead to different consequences regarding ISO's impact.

Within operations strategy research different authors have studied the impact of quality practices on company performance, however they took the operations strategy framework into account (Flynn, Schroeder, and Sakakibara 1995; Fynes and Voss 2001). Research by Flynn et al. shows that competitive advantage is a multifaceted construct, and that besides quality there are other factors that contribute to competitive advantage. This suggests that focusing solely on quality improvement may not be a sufficient means for a plant to attain and sustain a competitive position. A study done by Fynes and Voss showed that there is no evidence to support the proposition that improved quality performance is positively related to improved overall business performance, which was contrary to the results of PIMS (Profit Impact of Market Strategies) studies that provided support for the relationship between product quality and firm performance. They explained this with an argument that in many marketplaces, the role of quality performance has changed from that of order-winner to order-qualifier, and as such is a necessary but not sufficient contributor to overall business performance, and there-

fore the contribution of quality performance to business performance may have changed. We claim that research studies of ISO benefits should follow approaches similar to those used by authors in operations strategy research to identify the results of ISO implementation. They should take into account that the basic purpose of ISO 9001 is conformance, and that conformance represents just one element of the quality dimensions and just one among many possible differentiators that a company could choose from in the attempt to achieve a competitive advantage.

The view that competitive strategy should be used as a moderating variable is also indirectly supported by the results of empirical research studying ISO benefits. Empirical research has shown that so called external benefits of ISO implementation changed in time. Santos and Estanciano (2002) noted in their study that other benefits of a clearly commercial nature, such as 'sales increase,' 'market share increase' and 'export increase,' which was considered to be the most important in the oldest studies, received the lowest benefits score. This can be related to other studies which claimed that conformance in the early eighties represented an order winner, but later rather became a qualifier (Garvin 1984; Flynn, Schroeder, and Sakakibara 1995; Fynes and Voss 2001; Sroufa and Curkovic 2008).

That ISO 9001 has generally been accepted as a qualifier in the modern business setting (Terziovski, Samson, and Dow 1997; Fuentes et al. 2000; Douglas, Coleman, and Oddy 2003; Sroufa and Curkovic 2008), is, besides the cumulative capabilities characteristics of activities implemented within ISO, that we already mentioned, probably the second reason for such a wide implementation of ISO globally. Garvin (1984) argued that conformance is a more objective measure of quality, because virtually all users regard it as desirable. If we consider that conformance represents a qualifier it also becomes understandable that its impact on competitiveness, customer satisfaction and company performance will not be of high importance. Therefore the strategic contingency in ISO implementation might explain the controversies in empirical results about ISO benefits.

In fact empirical research of ISO benefits implicitly acknowledged strategy contingency. However they did this indirectly, as empirical research identified motivation for ISO implementation as an important factor determining ISO implementation benefits. Motivation for ISO implementation can be interpreted as strategy contingency based. We explained that in accordance with the operations strategy framework

companies will introduce ISO either because conformance is an order winner, or because it is a qualifier. Regarding the motivation of the introduction of ISO 9001, the literature recognizes two groups of imperatives: external or market driven imperatives and internally- or improvement driven reasons (Martínez-Costa and Martínez-Lorente 2007). It can be implied that in case companies are externally pressured to introduce of ISO, conformance represents a qualifier, and when companies wanted to improve processes and internal efficiency, conformance represents an order winner. Empirical research shows that companies with internal motivation for the implementation of ISO achieved better performance results, while companies that introduced ISO based on external pressure, on the other hand, achieved lower performance results (Huarng, Horng, and Chen 1999; Singels, Ruel, and van de Water 2001; Heras, Dick, and Casadesus 2002; Llopis and Tari 2003; Terziovski, Samson, and Dow 1997; Arauz and Suzuki 2004).

We can conclude that, although unwillingly, as instead they were searching for results that could not be (or at least only by taking contingencies into account) conceptually contributed to ISO 9001 implementation, researchers were actually confirming that the ISO based quality system has been appropriately functioning for achieving the purpose for which ISO standard has been designed. Although the results lead to researchers' criticism of ISO, they in fact confirmed that the levers included into ISO requirements were the right ones as they improved conformance and contributed to associated gains in efficiency.

Conclusion

The paper has analysed the ISO 9001 system using the operations strategy framework for a basis comparison. Similarities between the two enabled us to clearly define the purpose of the ISO 9001 system and the scope of its possible results. This is important both, for practitioners, as well as for researchers.

Empirical research confirms that, in accordance with its conformance purpose, ISO 9001 is successful in building conformance capability and that by using ISO 9001 practices companies can also benefit in relation to production economics through improved process efficiency, and also to other competitive capabilities. On the other hand practitioners cannot expect ISO to improve the level of product quality, and consecutively provide associated customer satisfaction and continuous improvement. Improving the level of product quality is not within the scope of ISO

9001; instead it has to be determined within the process of developing business strategy.

Therefore all requirements of ISO 9001 have to be interpreted in relation to product conformance. For example, in monitoring performance through measuring customer satisfaction within ISO requirements we should only measure whether we achieved product conformance (for example by collecting data about customer complaints) or satisfaction of the customer by our meeting product specifications. If conformance to specifications was achieved to a certain degree, the ISO system worked well. Therefore the customer satisfaction measurement within ISO 9001 cannot measure customer satisfaction in general, because the general goal of achieving customer satisfaction is based on the achievement of different capabilities – which are part of another (and broader) business strategy decision making process.

By looking into ISO 9001 from the point of view of the operations strategy framework, we could also better understand the expected scope of empirical results. We emphasised that empirical results expected from ISO 9001 implementation are strategy contingent and therefore this should be taken into account in designing empirical studies about ISO's benefits. The impact of ISO 9001 on competitive advantage, sales and profitability depends on the role of conformance and other capabilities affected by ISO implementation within a company's strategy. An important impact can be expected in case conformance and other capabilities affected by ISO implementation represent order winners of the company.

The old ISO 9001 has been mostly criticized regarding its lack of customer focus, however the paper showed that this criticism has in fact been based on a user-based definition of quality, where ISO 9001 has actually been correctly implemented following the manufacturing-based definition. Taking this into account, it became clear that is not true that relation with customers did not exist in the previous version of ISO 9001, in fact originally in ISO the specifications were given by the customer. They were based on a contract between the company and the specific customer. With the new emphasis on customer satisfaction the purpose of ISO 9001 could switch from conformity to competitiveness. So the question then arises, whether ISO should become the standard of strategy implementation instead of the standard for assurance of meeting product specifications.

We showed that such expectations of ISO were based on interchanging two definitions of quality. Changing from a conformance-based ap-

proach to a user-base approach can be understood from the point of view of needs of service and consumer goods industries. However such a change in the purpose of ISO 9001 would mean that its focus is broadened, and therefore ISO would also have to introduce new levers needed for achievement of other capabilities. Changing the purpose of ISO to resolve problems related to these industries therefore is not an appropriate solution. Instead of broadening the purpose of the standard, we should search for new approaches as to how ISO 9001 requirements for conformance could be improved in the case of the consumer products and services. In consumer markets the customer might not be able to express his/her needs directly, therefore the question of whether customer needs have been properly included into product specifications becomes important. Maybe ISO could include requirements that would confirm that target customer groups have been appropriately determined and that their requirements have been appropriately translated to product specifications (for example through use of the QFD method). Determination of specifications in the service setting is also difficult because of their characteristics. Application of existing and new research for the purpose of standardization and certification is needed, both for consumer markets and for services in order to help determine approaches for product/services characteristics, and conformance policies.

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