CAPITAL MARKETS DEVELOPMENT AND THEIR INFLUENCE ON THE CAPITAL STRUCTURE OF TRADED CROATIAN COMPANIES

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Abstract

The paper looks at the results of the 2002 Securities Market Act in Croatia on the capital structure of listed and traded Croatian joint stock companies. The act required that all qualifying joint stock companies list their stocks on the new joint stock companies quotation regardless whether they were or wished to be listed. In addition, the act demanded companies listed on the newly formed joint stock companies quotation to submit their quarterly financial and business results which was not the case before. It would be expected that with the increased transparency of the equity markets and greater market capitalization companies would resort to equity financing following the act. However, the paper finds that companies did not increase their shareholder's equity. Moreover, companies seemed to follow behavior predicted by the pecking order theory using internal financing when available, and debt financing when external financing was needed. Their reluctance to use the equity markets indicates that costs of equity remain high for Croatian companies possibly due to high informational asymmetry.

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1. Introduction

In Croatia, the Securities Market Act of 2002 has forced all qualifying companies with more than 100 shareholders and a shareholder's equity of more than 30 million HRK or with publicly traded shares to list their stocks on the joint stock companies quotation as of 2003. The Act required companies to also adhere to now stricter reporting requirements and publish their business and financial reports quarterly. As a result, listing of new companies increased market capitalization whereas disclosure of financial reports increased equity markets transparency. The question arises whether increased transparency reduced the cost of equity and promoted its use as an external source of finance leading to lower leverage levels. In other words, did the companies adjust their capital structure, and what was the effect of firm specific characteristics in the process?

Two major theories in the field of capital structure are the trade off theory and the pecking order theory with sometimes contradicting predictions as to the effects of firm specific characteristics on the capital structure of the company. The paper attempts to answer the following questions within the frame of these theories. First, did the stricter disclosure requirements and forced listing of qualifying companies lead to decreased leverage levels. This could be expected both within the framework of the pecking order and the trade off theory. That is, if increased transparency of equity markets reduced the cost of equity capital, according to the pecking order theory, equity though last on the list of financing sources due to its high costs, should become more affordable. On the other hand, according to the trade off theory , companies balance between the costs and benefits of leverage versus equity and as costs of equity decrease companies should be more inclined to turn to equity markets. The findings of this paper however show, that although the most profitable companies did decrease their leverage levels significantly, the least profitable companies in fact increased it. Moreover, the decrease in leverage levels of the most profitable companies was not due to

higher shareholder's equity but retained earnings, indicating that companies did not turn to equity markets for external financing, possibly due to high informational asymmetries.

Second, I attempt to answer whether the behavior of listed and traded Croatian companies in the 2002 to 2006 period can more easily be interpreted in the light of the pecking order or the trade off theory. It is shown that these companies adhered to the pecking order theory predictions, mainly that when internal financing was available companies decreased their leverage levels and when internal financing, due to lower profitability, was not available companeis resorted to debt financing first rather than issuing equity.

The organization of the paper is the following. Literature review relating to capital structure and the effects of transparency will be presented first followed by the review of capital markets in Croatia. Research hypothesis as well as the data and methodology will be presented next followed by the analysis of the results, comparison with previous research and the conclusion.

2. Literature Review

The pecking order theory relies on informational asymmetries between managers and outside investors on the true value of the firm and potential returns on future investments. The informational asymmetry raises the costs of acquiring external financing and therefore managers will always prefer to use internal financing for the investments if these are sufficient. If external financing is needed, the firm will resort to bank loans first, bond markets second and only as a last resort to equity financing. The reason being the increasing levels of informational asymmetry and therefore costs of financing from the external sources listed. Therefore, according to the pecking order theory the optimal capital structure target does not exist in a strict form (Myers, 2001).

The trade off theory. Although cost of debt is lower than the cost of equity, the substitution between the two does not result in a change in the weighted average cost of capital. In fact the cost of equity and therefore the return to equityholders rises with higher debt due to higher risk thus leaving the cost of capital unchainged. Once taxes are introduced, debt financing becomes more attractive due to its tax shield effects and financial leverage actually increases the value of the firm. However, firms will not increase their debt levels to one hundred percent since debt increases the costs of financial distress by requiring interest and principal payments and in an extreme case may lead to bankruptcy. The main proposition of the trade-off theory is that companies will choose to balance the tax benefits of debt and the costs of financial distress by optimizing their capital structure (Myers, 2001). The trade off theory also takes into account the agency costs of the conflict between creditors and equityholders. According to Jensen and Meckling (quoted in Harris and Raviv, 1991) the choice between debt and equity will be influenced by the agency costs arising due to conflicts between owners and managers, as well as conflicts between creditors and equityholders.

Conflict between owners and managers is often described in corporate governance literature. The "principal" or the outside investor attempts to protect her rights after submitting the management of her company to an "agent" or manager (Tirole, 2001). Shleifer and Vishny (1997) argue that complete contracts between the manager and the investor can not be specified for various reasons and therefore the manager is left with ample control of the company. Since the manager may choose to pursue personal rather than shareholders' interests, expropriation of owner's funds may arise. Jensen and Meckling (quoted in Harris and Raviv, 1991) claim that debt can partially offset the described agency conflict by restricting free cash flow the managers can expropriate.

Conflict between creditors and equityholders arises since the debt contract asymmetrically distributes the potential gains and losses from investments between the agents. The equityholders prefer the riskier investment if its higher gains offset the greater probability of a loss. This is not the case for debtors as their gains are limited and the value of debt decreases with riskier investments. Hence, incurring debt reduces one type of agency cost while creating a new type of agency cost. Naturally, it is optimal for firms to balance between the two (Jensen and Meckling quoted in Harris and Raviv, 1991).

Capital structure, cost of capital and transparency.

The reliance of the pecking order on informational asymmetry implies that informational asymmetry reduction in terms of greater transparency of the firm value may decrease equity and/or debt cost of capital depending on which type of informational asymmetry it reduces.

Gilson (2000) argues that there is a clear link between corporate governance, transparency and the development of capital markets, that is, equity investors require credible financial disclosure in order to evaluate the company. Lack of financial disclosures may possibly lead to underdeveloped equity markets. Bushee and Leuz (2004) look at the results of the 1999 SEC disclosure regulation requiring companies trading in the Over the Counter Bulletin Board (OTCBB) to accept filing with the SEC and show that for the companies which remained listed by complying with the new regulation both liquidity and market value increased. In turn Lipson and Mortal (2007) in their working paper link liquidity to capital structure decisions and show that greater liquidity is associated with a higher issuance of equity possibly due to reduced informational asymmetry. Hence, it could be argued that increased disclosure regulation leads to increased use of equity financing.

In the same way, certain types of transparency reduce the agency conflict between managers and debtholders making debt a less costly source of financing. The latter was confirmed by Yu (2005) as he shows that accounting transparency does reduce credit spreads and by Sengupta (quoted in Aggarwal and Aung Kyaw, 2009) confirming the negative relation between cost of debt and transparency.

3. Capital Markets in Croatia

The economic environment in Croatia during the period of the study has been relatively stable. From chart 1, one may observe that the GDP growth was steady, averaging 4.7% from 2002 to 2006, following a period of negative and low GDP growth. The unemployment rate (Chart 2) after reaching its high in 2000 has been declining from 14.8% in 2002 to 11.2% in 2006. At the same time, yearly inflation was relatively low (Croatian National Bank, 2009). The period from 2002 to 2006 was a credit expansion period, with the entrance of foreign banks in Croatia in the late 1990's, the percentage of foreign owned bank assets increased to approximately 90 percent in the period from 2002 to 2006 compared to 6.7 percent in 1998. The average Euro denominated interest rate declined steeply from 16.47 percent in 1998 to 8.35 percent in 2002 and averaged 7.2% in the 2002 to 2006 period. Bank gross loans to public and limited companies on the other hand have grown from approximately 42 billion HRK in 2002 to 65 billion HRK in 2006 while at the same time the external debt as a percentage of GDP increased from 53.9% in 2002 to 74.9% in 2006 (Croatian National Bank, 2009).

Finance industry in the 2002 to 2006 period was one of the fastest growing sectors of the Croatian Economy. In the period, financial markets have experienced an expansion visible in the growth of market capitalization (Table 1) Factors which have influenced this propulsion include the development of financial institutions and legislation, as well as, relatively stable macroeconomic environment. However, despite the set up of new institutions and legislations regulating capital markets, bank loans remained the main source of finance in this period and companies showed reluctance to tap the stock and bond markets for external financing (Žigman, 2006). Reasons for the underutilization of equity and bond financing may be considered similar and are in line with the pecking order theory where higher informational disadvantage of equity and bond markets directs companies toward firstly internal finance and

secondly bank loans. In their survey of the CFO's of the largest Croatian companies with over 100 stockholders and equity above 30 million HRK Miloš Sprcic and Wilson (2007) find that the respondents are still unwilling to tap the bond market and rely on bank financing instead. Major factors influencing their decision are the flexibility of bank loans and business privacy. Moreover, approximately half of the respondents believe that a good standing with their banks serves as a signal of the firm's positive market value (Miloš Sprcic and Wilson, 2007). Reluctance to use the stock markets resulted in a relatively limited offer in the stock markets which coupled with the credit expansion and hence increased demand for stock resulted in an upward pressure on stock prices (Žigman, 2006).

Croatian securities exchange is relatively small and young dating from 1991. From the table 1 it may be seen that, in terms of market capitalization Croatian stock exchanges experienced rapid growth in the 2002 to 2006 period. This growth was evident also in the relation of market capitalization to GDP indicating that the stock exchange has become more important for the Croatian Economy in general (Zagreb Stock Exchange, 2009). When looking at the 2006 market capitalization of stock exchange as a percentage of GDP in table 2, due to rapid increase in the 2002 to 2006 period, Croatia falls between Germany and France and seems to be outdoing the Central European Stock Exchanges. However, regular stock market turnover as a percentage of market capitalization is very low only 6 percent, for comparison, Poland with 45 percent has the next lowest figure. Therefore, the degree of regular trading activity on the stock exchange is very low. Market capitalization of bond markets as a percentage of GDP is increasing but is well behind the bond markets both in Central Eastern and Western Europe (Zagreb Stock Exchange, 2009, World Bank, 2009).

JSC quotation. In July 2002 the Securities Market Act was passed requiring companies qualifying as "public joint-stock companies" to list their shares into the public joint stock companies (JSC) quotation. Any company with more than 100 shareholders and a

shareholder's equity of more than 30 million HRK or with publicly traded shares was mandated by the act to list its stocks on the exchange. The new quotation required JSC companies to publish quarterly business and financial reports. The mandated date for listing on the JSC quotation was set as July 25th, 2003. The new securities act literally forced the qualifying companies to list their stocks and publish their financial and business reports quarterly (Narodne Novine, 2002). The securities market act was announced and enacted in order to advance the development of the Croatian capital and more specifically equity market. Table 3 shows the number o listed and traded JSC quotations both on the Varazdin Stock Exchange and Zagreb Stock Exchange during the period 2003 to 2007. The two stock exchanges were joined in 2007. Charts 3 and 4 visually present the number of listed and traded companies. From table 1, one might observe the increase in the market capitalization in 2003 and 2004 (Zagreb Stock Exchange, 2009).

4. Data and Empirical Methodology

The sample includes companies which were first listed on the JSC quotation in 2003 or 2004 and traded at least in one of the years between 2003 and 2006. After excluding financial companies and utilities due to the potential effects of regulation on their capital strucure, 164 companies and their major financial indicators are followed for the period 2002 to 2006. The data was collected from the Croatian Financial Agency (FINA) for a fee. FINA is a governement financial agency that collects yearly financial reports from Croatian companies and manages the registry of yearly financial reports.

4.1. Hypothesis

The following questions are addressed in this paper. First, did the increased transparency and forced listing of the companies on the stock exchange decrease the leverage levels of the Croatian companies? Second question relates to the behavior of the joint stock companies when setting their capital structure in this environment. Mainly, does their behavior fit with the pecking order or the trade off theory and what does it imply about the Croatian companies.

4.1.1. The effect of greater transparency on leverage levels

In accordance with the literature, due to stricter disclosure requirements of the Zagreb Stock Exchange for the JSC quotation, investors are expected to show greater trust towards the equity markets thus lowering the cost of equity financing for companies. In turn, the companies are expected to turn to the capital markets as a source of external financing showing decreased levels of leverage. Such behavior might be expected not only from previously listed companies whose cost of equity decreased due to greater transparency but also from newly listed companies. For newly listed companies, the cost of listing on the stock exchange and adhering to the reporting requirements became legally mandated sunk costs.

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Once this hurdle cost has been absorbed, the companies should find it easier to obtain funds through equity financing. This is a prediction that fits well into both theories of capital structure. According to the trade of theory companies are expected to balance between the costs and benefits of financial leverage. As costs of equity financing decrease the benefits of leverage the companies are more inclined to turn to equity markets. The pecking order predicts that companies turn to equity markets last due to high informational asymmetry and therefore high costs of equity financing. However, once these costs are reduced due to stricter disclosure regulations, the companies are expected to increase the use of equity financing. Although decreased leverage and increased usage of equity financing due to the 2002 Act would fit into both of the capital structure theories, it should be noted that even if these results were lacking this would not be a contradiction to either of the theories; it would only signal that the costs of equity despite potentially increased transparency remain too high.

4.1.2. Pecking Order vs. Trade Off Theory behaviour

Pecking order and trade off theory predict sometimes contradictory effects of firm specific characteristics on leverage levels. The effect of the following firm specific characteristics on leverage is tested in order to understand the behavior of Croatian public joint stock companies in the frame of the capital structure theories.

Profitability, according to the pecking order theory, will be negatively correlated with leverage. This is due to the fact that companies will resort to external financing for investment when the retained earnings are insufficient. For this reason, lower profitability and hence lower internal sources of financing will lead to higher levels of leverage. However, the trade off theory predicts that lower profitability increases the bankruptcy costs for the company which then leads to a decrease in the optimal leverage for the company. Hence, profitability and leverage are expected to be positively correlated, due to lower bankruptcy costs, more profitable companies will increase their target leverage level (Fama and French, 2002).

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Investment opportunities are predicted to increase leverage levels according to the simple pecking order theory. That is, given the profitability level, firms with more investment opportunities will have a greater need for external financing once internal funds are exhausted. The trade off theory predictions are contrary, companies with more investment opportunities will have no need to discipline managers by incurring debt since cash flows will be directed to investments. Hence, leverage tends to be lower for companies with higher investment levels (Fama and French, 2002).

Volatility of earnings and cash flows will tend to be negatively correlated with the leverage level according to the pecking order theory. Companies with volatile cash flows are more likely to sustain from issuing debt in order to prevent lack of funds if investment opportunities arise when cash flows are low. This is also a prediction of the trade off theory of capital structure (Fama and French, 2002).

Tangibility or the collateral value of assets could impact the availability of external financing for companies. Tangible assets used as collateral allow companies to overcome the informational disadvantage and obtain external financing since the default on the loan becomes less expensive for the lender. Collateral, therefore, lowers the cost of debt for companies and according to both the pecking order and the trade off theory; tangibility should be positively correlated with leverage (Almeida and Campello, 2007).

4.2. Empirical Methodology

In order to analyze the change in debt levels and test the main predictions of the two capital structure theories the panel data is used and the following equation is estimated by fixed effects model. Random effects are not presented as the Hausman test, where under the null hypothesis fixed effects and random effects estimators are both consistent and do not differ significantly, was rejected at 0.34 percent significance level.

$$\begin{split} Leverage_{i,t} &= \beta_0 + \beta_1 Profitability_{i,t-1} + \beta_2 Investment_{i,t-1} + \beta_3 Volatility_{i,t} + \beta_4 Tangibility_{i,t-1} + \beta_6 Y2004 + \beta_7 Y2005 + \beta_8 Y2006 + u_{i,t} \end{split}$$

i=1,...,N

t=1,...,T

where N represents cross section units and T represents time.

4.3. Variable measurements

Leverage is measured by the ratio of total debt to total assets, ratio of long term debt to total assets and ratio of short term debt to total assets. Total debt includes both short term and long term debt. Total assets include both current assets and non-current assets.

Profitability of assets is measured by the ratio of earnings before tax to total assets.

Volatility is measured by the natural logarithm of the total assets of a company. The variable serves as a proxy since more mature, larger companies are expected to have lower earnings volatility.

Investment opportunities are measured by the growth in assets $dA_t/A_t=(A_t-A_{t-1})/A_t$ or current investment.

Tangibility is measured by the ratio of property, plant and equipment to total assets. Property, plant and equipment include natural resources and material assets that may be pledged as collateral.

Due to potential endogeneity of explanatory variables, profitability in particular, as standard in the capital structure literature, lagged variables for profitability, tangibility and volatility are used. It should be noted that if in fact profitability is endogenous to leverage, lagging it one period may not be sufficient. However, due to the short time span of the panel data, only 5 years; 2002 to 2006, using first differencing with one period lagged variables or explanatory variables lagged for more than one period would only allow for comparison of leverage levels from 2004 to 2006. These results would not be meaningful since we would like to see the changes from 2003 when the Securities Market Act was enacted. For the same reason, measurement for investment level, change in assets to assets ratio is not lagged.

Profitability could be endogenous to leverage levels for several reasons. First, higher leverage levels may increase expenses as external financing becomes more expensive and suppliers reduce the availability of trade credit. Second, company may be forfeiting favorable investments due to restricted sources of financing. This would in fact make investment variable endogenous as well. Third, if customers perceive that the company is in financial distress they may choose alternative suppliers thus reducing revenue further.

Profitability and investment are more likely to be influenced by leverage levels if the company is in financial distress and sources of external financing are limited thus prohibiting optimal investment. However, the particular period in question was in fact an economically stable period and more importantly a credit expansion period thus indicating that external financing in the form of credit loans was not limited. In fact, interest rates continued to decline in the period and bank gross loans to public and limited companies grew from approximately 42 billion HRK in 2002 to 65 billion HRK in 2006 (Croatian National Bank, 2009).

Furthermore, the sample of companies was divided into the most profitable and least profitable companies. If in fact companies under financial distress, or the least profitable companies, were unable to invest profitably due to restricted financing we would expect their leverage levels to remain same or decline. However, this was not the case. In fact, it was the least profitable companies that increased leverage levels as it will be shown in the analysis of results. This would imply that the companies in the sample were able to obtain external

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financing for their investments and that both investment and profitability are not likely to be influenced by leverage through this mechanism.

4.4. Descriptive statistics

From table 4, where mean and standard deviation of total debt to total assets ratio are presented, it is visible that companies in the sample increased their leverage levels from 0.39 to 0.435 percent from 2002 to 2006. Considering the fact that this was a credit expansion period in Croatia this result is not particularly surprising. However, this results seems to contradict the first hypothesis where companies should in fact be decreasing their leverage levels due to greater transparency of equity markets.

In table 5 mean and standard deviation of earnings before tax to total assets ratio is presented. From the table one might conclude that profitability first experienced a decline and after reaching a trough in 2004 profitability began to rise once again.

Change in assets or investment was positive and increasing as presented by the increase in the mean level in table 6 from 2002 to 2006. This growth is also reflected in the growth of the mean of total assets from 2002 to 2006 (Table 7). This would imply that the companies were incurring greater debt in order to finance growth.

However, the investment does not seem to be geared towards property, plant and equipment. In fact the mean of the ratio of property plant and equipment to assets has experienced a decline when comparing 2002 and 2006 (Table 8). Therefore, it is possible that increased leverage was geared towards maintaining working capital during this growth period.

5. Analysis of results

5.1. Leverage regressions

Total debt. Table 9, column 1, reports the estimation results for the whole sample with total debt to total assets ratio as a dependent variable. From the table it is evident that only profitability and investment are marginally significant. Whereas profitability coefficient is negative, investment coefficient is positive confirming the pecking order theory. The companies in the sample will tend to resort to leverage when internal funds are not sufficient to support the investment. However, there is no evidence that the companies decreased their levels of debt due to the listing on the stock exchange. Moreover, the coefficient on tangibility is statistically insignificant, meaning that the debt incurred in any case was not related to investments in plant, property and equipment.

Profitability effect. In order to further substantiate the results the sample was split into the most profitable versus the least profitable companies. Companies have been ranked according to their average yearly profitability in the 2002 to 2006 period.

When looking at the results for the most profitable companies, one notices again that the behavior of the companies might be better explained by the pecking order theory. Whereas investment is statistically very significant and positive, profitability is negative and marginally significant. That is, holding all else constant, less profitable companies are more likely to incur debt whereas if holding all else constant, more investment is generally accompanied by higher leverage levels. As both pecking order and trade off theory predict, the coefficient on volatility proxy or the natural logarithm of total assets coefficient is positive and statistically very significant indicating that larger companies do in fact have higher leverage levels due to their possible lower earnings and cash flow volatility. Again tangibility is not statistically significant for this sub sample of companies. The year effects, however, are

statistically very significant and negative. That is, the most profitable companies following the JSC Act in 2003 have in fact decreased their leverage levels measured by the total debt to total assets ratio.

For the least profitable companies, the firm specific variables, besides the volatility or the natural logarithm of total assets, are not statistically significant; therefore there is no evidence that this sub sample of companies behaviorally follows the predictions of either the pecking order or the trade off theory. The only very significant variables are volatility and the year dummies. Surprisingly, the volatility coefficient is negative, which does not fit well into the pecking order or the trade off theory. However, the least profitable companies seem to have incurred higher levels of leverage when compared to their 2003 leverage levels. The fact that the least profitable companies are incurring ever greater levels of debt whereas more profitable companies are reducing their levels of total debt indicates that both groups conform to the pecking order theory where new investment is financed by higher debt levels when earnings are not sufficient.

Long term debt. Table 10 shows the estimation results when taking long term debt to total assets ratio as the dependent variable. Column 1 shows the results for the full sample. Profitability and investment are statistically very significant and conform to the predictions of the pecking order theory, that is profitability coefficient is negative whereas investment coefficient is positive. Volatility is marginally significant and again confirms that larger companies with presumably less volatile cash flows tend to incur higher debt levels. Tangibility is again insignificant. Surprisingly, the year dummy for year 2006 for the entire sample is statistically very significant and negative, that is companies have reduced their levels of long term debt in 2006 compared to 2003.

Profitability effect. When looking at the most profitable companies' profitability looses its statistical significance, however, the coefficient on investment remains statistically very

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significant and positive confirming the pecking order theory. The year dummies are all negative and statistically very significant, that is, the most profitable companies have been reducing their leverage levels in 2004, 2005 and 2006 compared to 2003. However, none of the variables' coefficients for the least profitable companies is statistically significant; therefore, the behavior of these companies may not be explained by the standard firm specific characteristics of either the pecking order or trade off theory.

Short term debt. Table 11 finally shows the estimation results for the short term debt to total assets ratio as the dependent variable. Results for this specification are less clear cut. First, profitability though negative is statistically insignificant. Investment is statistically insignificant as well. Volatility is only marginally significant and surprisingly negative, contradicting both the pecking order and trade off theory. It seems that larger companies with stable earnings and cash flows rely less on short term financing. Year dummies are all statistically very significant and positive, indicating that companies have increased their short term debt steadily since 2003.

Profitability effect. However, when looking at the most profitable companies sub sample, again, results again confirm to the pecking order theory. Larger, stable companies with higher investment levels tend to increase their short term debt. Moreover, the year dummies coefficients are negative again though only the year dummy for 2005 is marginally statistically significant. Therefore, there is some evidence that the most profitable companies decreased both their short term and long term debt steadily after 2003. The least profitable companies' results are again not as straightforward. Investment is statistically very significant but the coefficient is negative confirming the trade off theory where companies with higher investment levels have less need to incur debt to restrict the management from squandering the free cash flows. However, the coefficient on volatility is negative and statistically very significant which does not fit into either the pecking order or the trade of theory. Moreover,

tangibility coefficient is statistically very significant yet negative which counters the predictions of both the pecking order and the trade off theory. That is within the least profitable sample, smaller companies with lower levels of fixed assets are more likely to incur short term debt.

In all of the regressions for the least profitable companies it appears that the firm specific characteristics are unable to explain the leverage levels, however, this sub sample of companies has been increasing their leverage levels measured by total debt to total assets ratio and short term debt to total assets ratio. The fact that the least profitable companies are increasing their debt levels is a confirmation of the pecking order theory.

5.2. Shareholder's equity regression and the effect of being listed prior to the JSC Act

Although there is evidence that the most profitable companies following the new legislation in 2003 decreased their leverage levels steadily in the 2004 to 2006 period seemingly confirming that the act had positive effects on equity levels of listed companies two questions naturally come to mind. Where the companies increasing their shareholder's equity or are the higher equity levels result of higher retained earnings? Second, is there a difference between companies for which the new act resulted in only higher reporting standards and companies which where forcefully listed? Do firm characteristics of these two groups of companies differ?

Shareholder equity. Table 12 reports the results with shareholder equity as the dependent variable. Column 1 shows the results for the whole sample, and in fact, shareholder equity has decreased in 2004, 2005, and 2006 compared to 2003, though only marginally significantly.

Profitability effect. After dividing the sample into most profitable and least profitable companies it is visible that the most profitable companies though they decreased their leverage level have not in fact increased their shareholder's equity as the coefficients for the year dummies are statistically insignificant and either slightly negative or practically zero. Moreover, least profitable companies in fact decreased their shareholder equity statistically very significantly. These results shed light on leverage regressions. Whereas the most profitable companies decreased their leverage levels and hence increased equity levels, it appears that this decrease has mainly been the result of the increase in retained earnings and greater profitability, not the fact that the companies began to use the stock markets as the source of external finance. This result confirms to the pecking order theory where companies will in fact resort to issuing equity last since the perceived costs of equity seem to be the highest for the company. Although the forced listing has increased the market capitalization of the Croatian stock exchanges, companies still seem reluctant to use equity financing and greater transparency has not lead to lower costs of equity financing or companies perceived these costs as still too high.

As previously mentioned, companies in the sample may be divided into those listed prior to the act and those forcefully listed. Results for the leverage regressions with total debt to total assets as the dependent variable are presented in table 13. Column 2 shows the results for companies listed prior to the act. The behavior of companies listed prior to the act conforms to the pecking order theory. Whereas profitability is statistically very significant and the coefficient is negative, investment is statistically significant with a positive coefficient. There is some evidence that companies listed prior to the act have decreased their leverage levels compared to 2003 though only marginally statistically significantly in years 2004 and 2005.

However, for companies not listed prior to the act there is no evidence that

behaviorally they follow either the pecking order or the trade off theory. Moreover their leverage levels have increased statistically significantly in 2004, 2005, 2006 when comparing to 2003. Such behavior hints that the two groups might differ when looking at firm specific variables.

Table 14 shows the mean values and standard deviation of firm characteristics for companies listed prior to the Act in 2003 and those that were listed forcefully; leverage, profitability, investment, size and tangibility. When looking at the mean values it is evident that at first sight companies listed due to the Act were less profitable, more leveraged and smaller, however, these companies were also more tangible and invested more.

In order to conclude whether there is any statistically significant difference between these two sets of companies it is necessary to conduct multivariate analysis of variance and univariate analysis of variance. From one way multivariate analysis of variance, results of which are reported in Table 15, it may be concluded that the two groups statistically significantly differ when looking at the firm characteristics jointly; leverage, profitability, investment, natural logarithm of size and tangibility.

Univariate analysis of variance reported in table 16 shows that the companies differ statistically significantly in the following firm characteristics; leverage, profitability and size. The null hypothesis of no difference between the two groups in terms of investment and tangibility can not be rejected. From these results one may concur that the companies which were forced to list after the act are smaller, less profitable and more leveraged than the companies listed prior the act.

6. Comparison with previous research

The results regarding profitability have been confirmed in other studies as well where profitability is generally found to be negatively correlated with leverage levels. In their 1988 paper on the determinants of capital structure choice, Titman and Wessels look at 469 U.S.A. manufacturing firms for the 1974 to 1982 period. The authors use factor analysis techniques where the observable firm specific characteristics from the financial statements are used as indicators of latent factors or the unobservable construct. Leverage ratios; short term, long term, and convertible debt scaled by either the market or book value, are then presented as functions of these factors. The authors find that past profitability measured as operating income over sales and operating income over total assets is negatively related to all leverage measurements though statistically significant only when leverage is scaled by market value not book value. Contrary to the findings in this paper, size is negatively correlated to long term and short term debt when scaled by book value. Size indicators used are natural logarithm of total assets and quit rates.

Fama and French (2002) look at approximately 3000 U.S.A companies for a time period from 1965 to 1999 excluding financial and utility companies. In their study of both leverage and dividend payout ratios instead of using cross section or panel regressions the authors use the average coefficients from year to year cross section regressions. Determinants of leverage measured as total debt to total assets ratio include among others the annual earnings before interest and taxes to total assets ratio (profitability), growth in assets (current investment) and natural logarithm of assets (proxy). Profitability is found to be statistically significantly negatively related to leverage ratios while natural logarithm of assets is found to be statistically significantly positively related to leverage ratios. Investment on the other hand measured as the growth in assets is also significantly positively related to leverage ratios. Similar results have been found in this paper.

Joever (2006) and Nivorozhkin (2003) look at the capital structure determinants in the transition economies from Central Eastern Europe. Joever (2006) looks at unbalanced panel firm level data from 9 countries (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, and Slovakia) for the 1995 to 2002 period. Joever (2006) focuses on country determinants of capital structure but includes firm specific characteristics including tangibility (tangible assets to total assets), profitability (profit to total assets ratio proxy), and log assets, while controlling for country and time specific effects. For listed firms the profitability variable is not statistically significant, possibly due to imprecise measurement, whereas both tangibility and natural logarithm of assets are. Size is found to be positively correlated with leverage levels and tangibility negatively. On the other hand, in Nivorozhkin (2003) study of Bulgarian and Czech companies in the 1993 to 1997 period profitability is again found to be negatively correlated with leverage. The same holds for tangibility while size variable is positively correlated.

Brav (2009) researches the behavior of both public and private firms. His data includes firms from United Kingdom and 1993 to 2003 period. By looking at the leverage levels of both sets of firms he finds that private companies tend to have higher leverage levels. In addition, he finds that profitability measured as return on assets is again negatively correlated with leverage levels. However, this correlation is more economically and statistically significant for private firms. In addition, Brav (2009) concludes that public equity is cheaper than private equity and this could result with debt being a much more important source of external financing for private companies. Although the sample in this paper looks at traded and listed Croatian companies, their behavior seems to resemble more to the private firms' behavior in the United Kingdom in terms of reluctance to tap the equity markets. This is not surprising since Joever (2006) claims that in transition economies informational asymmetries are higher. Therefore public equity could be perceived very costly in Croatia where laws and

regulations governing the equity markets are still being developed. As a support, Fan et al (2008) find that leverage ratios are higher for firms functioning in economies with less stringent laws and higher corruption. Therefore when resorting to external financing; companies do not choose equity probably due to informational asymmetries and associated costs.

7. Conclusion

The Securities Market Act from 2002, by forcefully listing qualifying companies has increased the market capitalization of Croatian stock exchanges and by requiring that listed companies submit their quarterly business and financial reports increased transparency as well. As mentioned previously, Bushee and Leuz (2004) link higher transparency of equity markets with increased liquidity, on the other hand Lipson and Mortal (2007) find that companies with more liquid stocks are more likely to issue equity. Hence, it could be expected that Croatian companies both newly listed and listed prior to the act should increase their shareholder equity levels as the source of equity financing became less expensive. However, it is evident from the data that the forced listing of Croatian companies and higher reporting standards did not have such an effect. The potential explanations for this are several.

First, companies in Croatia seem to follow the pecking order theory without attempts to balance the benefits and costs of debt as the trade off theory would predict. That is, if the internal funds are sufficient for investment, these companies avoid incurring external sources of financing, be it debt or equity. Furthermore, research by Miloš Sprcic and Wilson, 2007 has shown that financial officers of top Croatian companies will consider bank loans before any other source of external finance.

Second, since the 2002 to 2006 period was also a credit expansion period in Croatia it is not surprising that less profitable companies have increased their leverage levels in the absence of internal financing.

Third, there is a statistical difference between companies listed before the act and those newly listed after 2003. It seems that larger, more profitable companies have already self selected themselves to be listed on the stock markets. This implies that forceful listing of companies on a stock exchange that was envisioned to promote the development of stock markets only somewhat artificially increased market capitalization while at the same time

brought stocks of lesser quality on the market. Though higher financial reporting standards required by the act are commendable it appears that the development of the equity market is a long term process especially in a transition economy potentially plagued with high informational asymmetries.

In fact, high informational asymmetries could be the reason why Croatian companies seem to adhere to pecking order theory rather than optimizing their capital structure levels as the trade off theory would predict. As mentioned previously, although profitability is generally found to be negatively correlated with leverage levels, Brav (2009) finds that this negative correlation is more significant for private firms in United Kingdom than for public firms and that private firms are less likely to tap the capital markets due to informational asymmetries. Reluctance of traded Croatian companies to use capital markets could be interpreted as a result of high informational asymmetries still persistent in the Croatian economy. This suggests that further education of capital market participants on potential benefits of equity and bond financing, as well as, greater regulation and transparency of capital markets is needed in Croatia. As this is a long term process, more changes are to be expected before the equity market becomes an important source of external financing in Croatia.

Appendix – Tables and Figures

	Stock Markets				Bond Markets			
	Market		Regular Market		Market		Regular Market	
	Capitalization		Turnover		Capitalization		Turnover	
				% of				% of
		% of	Mil	Marke		% of	Mil	Market
	Mil HRK	GDP	HRK	t Cap	Mil HRK	GDP	HRK	Cap
2002	43.929	0,21	2.535	0,06	10.131	0,05	899	0,09
2003	60.494	0,27	2.199	0,04	13.419	0,06	613	0,05
2004	103.475	0,42	3.976	0,04	24.560	0,10	668	0,03
2005	144.006	0,54	6.971	0,05	34.399	0,13	516	0,02
2006	234.520	0,82	14.186	0,06	40.011	0,14	513	0,01

 Table 1 Major Characteristics of Croatian Stock and Bond Markets 2002-2006

(Zagreb Stock Exchange, 2009)

	Stock Market		Bond Market	
		Market		
	Market	Turnover	Market	
	Capitalization (%	(% of Market	Capitalization (%	
	of GDP)	Cap)	of GDP)	
Croatia	0,82	0,06	0,14	
Czech Republic	0,31	0,75	0,51	
Hungary	0,33	0,83	0,48	
Poland	0,36	0,45	0,35	
Austria	0,49	0,50	0,72	
Canada	1,26	0,80	0,77	
Germany	0,50	1,72	0,73	
Spain	0,94	1,68	0,89	
France	0,94	1,18	0,93	
United Kingdom	1,46	1,23	0,48	
Greece	0,58	0,60	0,79	
Ireland	0,64	0,57	0,52	
Italy	0,50	1,48	1,29	
Portugal	0,44	0,81	0,82	
Sweden	1,29	1,37	0,84	
United States	1,40	1,81	1,67	

Table 2 Major Characteristics of Croatian Stock and Bond Markets compared toselected EU countries, 2006

(Zagreb Stock Exchange, 2009, World Bank, 2009)

Table 3 Listed and traded JSC companies on Varazdin and Zagreb Stock Exchange2003-2007

JSC quotation	2003	2004	2005	2006	2007
ZSE listed	108	116	121	125	128
ZSE traded	45	59	77	80	105
VSE listed	111	115	120	118	119
VSE traded	36	56	76	89	101

(Zagreb Stock Exchange, 2009)

Year	Mean	Standard Deviation	Observations
2002	0.388	0.232	161
2003	0.408	0.239	162
2004	0.423	0.245	162
2005	0.422	0.251	161
2006	0.435	0.250	159
All	0.416	0.243	805

 Table 4 Total debt to total assets ratio, traded Croatian companies, 2002-2006

Table 5 Earnings before tax to total assets ratio, traded Croatian companies, 2002-2006

Year	Mean	Standard Deviation	Observations
2002	0.107	0.075	152
2003	0.004	0.106	157
2004	0.002	0.098	158
2005	0.006	0.102	158
2006	0.009	0.073	156
All	0.006	0.092	781

Table 6 Total assets, traded Croatian companies, 2002-2006

Vaar	Mean (million	Standard	Observations
Tear	kn)	Deviation(million kn)	Observations
2002	352.72	380.34	160
2003	361.69	405.18	162
2004	384.48	463.40	162
2005	414.10	503.44	161
2006	443.69	538.42	159
All	391.21	461.83	804

Year	Mean	Standard Deviation	Observations
2003	0.034	0.166	160
2004	0.052	0.158	162
2005	0.070	0.210	159
2006	0.069	0.184	159
All	0.056	0.181	640

 Table 7 Change in assets to assets ratio, traded Croatian companies, 2002-2006

Table 8 Property, plant and equipment to assets ratio, traded Croatian companies, 2002-2006

Year	Mean	Standard Deviation	Observations
2002	0.57	0.28	160.00
2003	0.56	0.28	162.00
2004	0.56	0.27	162.00
2005	0.53	0.28	161.00
2006	0.53	0.28	159.00
All	0.55	0.28	804.00

Table 9 Total debt regression

	Dependent variable = total debt / total assets				
	Full sample	The most profitable	The least profitable		
Independent variables	(1)	(2)	(3)		
Profitability	-0.22*	-0.21*	-0.10		
	-1.80	-1.82	-0.56		
Investment	0.08*	0.25***	-0.07		
	1.71	6.08	-0.91		
Volatility	0.00	0.17***	-0.17**		
	0.11	3.85	-1.97		
Tangibility	-0.05	0.04	-0.16		
	-0.75	0.64	-1.48		
Year 2004	0.01	-0.01	0.03***		
	1.18	-1.54	2.12		
Year 2005	0.01	-0.04***	0.05***		
	0.95	-3.97	3.32		
Year 2006	0.02	-0.03***	0.05***		
	1.57	-2.24	2.8		
Intercept	0.34	-2.86***	3.8***		
	0.41	-3.41	2.26		
Firm fixed effects	Yes	Yes	Yes		
Observations	619	314	305		
R^2	0.91	0.95	0.90		
R^2 (firm effects not					
included)	0.13	0.06	0.18		

	Dependent variable = long term debt / total assets				
	Full complete The most profitable The least profitable				
	Full sample	The most profitable	The least profitable		
Independent variables	(1)	(2)	(3)		
Profitability	-0.15***	-0.15	-0.12		
	-2.28	-1.52	-1.29		
Investment	0.10***	0.11***	0.09		
	2.31	2.59	1.21		
Volatility	0.07*	0.09***	0.04		
	1.91	2.41	0.5		
Tangibility	0.02	0.07	-0.03		
	0.31	1.05	-0.47		
Year 2004	0.00	-0.01	0.00		
	-0.24	-0.79	0.28		
Year 2005	-0.01*	-0.02***	0.00		
	-1.75	-2.64	-0.23		
Year 2006	-0.02***	-0.03***	-0.02		
	-2.39	-2.09	-1.32		
Intercept	-1.14*	-1.53***	-0.51		
	-1.68	-2.26	-0.35		
Firm fixed effects	Yes	Yes	Yes		
Observations	619	314	305		
R^2	0.86	0.87	0.86		
R^2 (firm effects not					
included)	0.13	0.10	0.15		

Table 10 Long term debt regression

	Dependent variable = short term debt / total assets				
	Full sample	The most profitable	The least profitable		
Independent variables	(1)	(2)	(3)		
Profitability	-0.07	-0.06	0.02		
	-0.88	-0.88	0.14		
Investment	-0.02	0.15***	-0.16***		
	-0.52	3.52	-4.01		
Volatility	-0.06*	0.08*	-0.21***		
	-1.76	1.86	-3.49		
Tangibility	-0.06	-0.03	-0.13*		
	-1.31	-0.45	-1.76		
Year 2004	0.01*	-0.01	0.03***		
	1.69	-0.88	2.36		
Year 2005	0.02***	-0.02*	0.05***		
	2.85	-1.7	4.21		
Year 2006	0.04***	0.00*	0.07***		
	4.48	-0.17	4.96		
Intercept	1.48***	-1.33	4.31***		
	2.13	-1.58	3.72		
Firm fixed effects	Yes	Yes	Yes		
Observations	619	314	305		
R^2	0.91	0.93	0.91		
R^2 (firm effects not					
included)	0.20	0.14	0.26		

Table 11 Short term debt regression

	Dependent variable = shareholder's equity / total assets				
	Full sample	The most profitable	The least profitable		
Independent variables	(1)	(2)	(3)		
Profitability	-0.37***	-0.17***	-0.54***		
	-2.77	-2.32	-2.56		
Investment	-0.36***	-0.33***	-0.39***		
	-7.49	-11.15	-4.49		
Volatility	-0.26***	-0.28***	-0.23***		
	-5.76	-12.33	-2.55		
Tangibility	-0.02	0.05	-0.02		
	-0.38	1.26	-0.26		
Year 2004	-0.02*	0.00	-0.04***		
	-1.89	-0.62	-2.05		
Year 2005	-0.02*	-0.01	-0.03***		
	-1.76	-0.94	-1.79		
Year 2006	-0.02*	0.00	-0.05***		
	-1.72	-0.39	-2.17		
Intercept	5.65	5.85	5.16		
	6.42	13.37	2.92		
Firm fixed effects	Yes	Yes	Yes		
Observations	619	314	305		
R^2	0.94	0.98	0.19		
R^2 (firm effects not					
included)	0.31	0.35	0.90		

Table 12 Shareholder's equity regression

	Dependent variable = total debt / total assets				
	Full sample	Listed prior the act	Not listed prior the act		
Independent variables	(1)	(2)	(3)		
Profitability	-0.22*	-0.28***	-0.19		
	-1.80	-2.87	-1.14		
Investment	0.08*	0.13*	0.07		
	1.71	1.94	1.15		
Volatility	0.00	0.05	-0.01		
	0.11	0.88	-0.16		
Tangibility	-0.05	0.01	-0.05		
	-0.75	0.24	-0.56		
Year 2004	0.01	-0.02*	0.02***		
	1.18	-1.69	2.00		
Year 2005	0.01	-0.03*	0.02*		
	0.95	-1.91	1.94		
Year 2006	0.02	-0.02	0.03***		
	1.57	-1.07	2.17		
Intercept	0.34	-0.54	0.60		
	0.41	-0.53	0.63		
Firm fixed effects	Yes	Yes	Yes		
Observations	619	164	455		
R^2	0.91	0.94	0.9		
R^2 (firm effects not					
included)	0.13	0.05	0.18		

Table 13 Effect of being listed prior to the Securities Market Act of 2002 regression

		Leverage	Profitability	Investment	Size	Tangibility
	Mean	0.36	0.03	0.05	686,340,000	0.55
Listed prior	Standard					
the act	Deviation	0.22	0.10	0.17	665,674,949	0.27
	Mean	0.44	0.00	0.06	287,540,000	0.56
Not listed	Standard					
prior the act	Deviation	0.25	0.09	0.18	302,909,693	0.30

Table 14 Effect of being listed prior to the Securities Market Act of 2002, characteristics

Table 15 Effect of being listed prior to the Securities Market Act of 2002 MANOVA

MANOVA Test Criteria and Exact F Statistics for the Hypothesis of No Overall Traded prior JSC Effect

H = Type III SSCP Matrix for TradedpriorJSC

E = Error SSCP Matrix

S=1 M=1.5 N=308.5

Statistic	Value	F Value	Num DF	Den DF	Pr > F
Wilks' Lambda	0.810	29.13	5	619	<.0001
Pillai's Trace	0.190	29.13	5	619	<.0001
Hotelling-Lawley Trace	0.235	29.13	5	619	<.0001
Roy's Greatest Root	0.235	29.13	5	619	<.0001

The GLM procedure									
Dependent									
variable									
		Sum of	Mean						
	DF	Squares	Square	F Value	Pr > F	R-Square	Coeff Var	Root MSE	Mean
Leverage	1	1.09	1.09	18.63	<.0001	0.029034	56.8523	0.241457	0.424708
Profitability	1	0.12	0.12	13.66	0.0002	0.021451	1908.34	0.094733	0.004964
Investment	1	0.05	0.05	1.46	0.2281	0.002331	302.656	0.180426	0.059614
LnSize	1	85.60	85.60	110.36	<.0001	0.150489	4.55267	0.880699	19
Tangibility	1	0.04	0.04	0.5	0.4779	0.000809	50.6875	0.276336	0.545175

Table 16 Effect of being listed prior to the Securities Market Act of 2002 ANOVA

CEU eTD Collection



Figure 1 GDP growth, Croatia 1999 – 2006

(Croatian National Bank, 2009)



Figure 2 Unemployment rate, Croatia 1999-2006

(Croatian National Bank, 2009)

Figure 3 Yearly Inflation, Croatia, 1999 – 2006



(Croatian National Bank, 2009)



Figure 4 External debt as a percentage of GDP, Croatia, 1999 - 2006

(Croatian National Bank, 2009)



Figure 5 Average interest rate for EUR denominated debt, Croatia, 1999 - 2006

(Croatian National Bank, 2009)



Figure 6 Listed JSC companies on Varazdin and Zagreb stock exchanges, 2003 – 2007

(Zagreb Stock Exchange, 2009)





(Zagreb Stock Exchange, 2009)

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