

FUNDAMENTAL AND TECHNICAL ANALYSIS ON CROATIAN STOCK MARKET

Veronika Čaljkušić, univ. bacc. oec.
University of Split/Faculty of Economics
Matice hrvatske 31, 21000 Split, Croatia
Phone: ++ 385917274274; E-mail: veronika.caljkusic@efst.hr

ABSTRACT

The main subject of this paper is to find the right approach to the evaluation of stock and predicting the moment in which investors should take action by using different approaches and methods during a certain period of time. This analysis has been made by using stock prices quoted on the Zagreb Stock Exchange (ZSE). This paper identifies how fast and to what extent turbulences in the global economy may have an impact on Croatian stock market. In the paper are estimated situations in which it is better to rely more on indicators of fundamental analysis than on technical analysis and vice-versa. It is also estimated which indicators should be used as the support to these two analyses. In the paper were explored the movements of the stock prices and CROBEX index and whether they can be used as the signal of a “cyclone” in the economy or presented as the result of a slow down in the economy.

Key words: *Fundamental analysis, Technical analysis, SMA – Simple Moving Average, Bollinger bands*

1. INTRODUCTION

Today more and more investors investment reather in funds and securities such as shares on the stock of market. The theme of this paper is to investigate which base their decisions on buying and selling shares and that the methods used in the process of making these decisions. The question is which method gives a better picture of the real values and estimates of future movements shares, and whether the standard methods for quality assessment rely on a comparison with trends in the economy and the correlation with the indicators from the domain of accounting. To better understand investing in stocks and decision-making and managing a portfolio of shares is necessary to introduce techniques that facilitate investors make decisions. Techniques that investors use in practice are fundamental and technical analysis. There is no investor who’s decisions are based only on one method which means that an investor can not be only technician or fundamentalist. In support of fundamental and technical analysis were also used statistical methods of correlation and regression in order to improve support decision-making of investors. Technical analysis studies market trends, primarily by using the chart, in order to predict future price trends. There are three basic types of charts used in the analysis tehnočkoj: line, column charts and candlesticks. In technical analysis is used a lot

of indicators. In this paper, the Bollinger bands are used, the average mean deviation (SMA¹) and the relative strength index (RSI²).

Fundamental analysis assumes a fundamental analysis of company financial statements. Its aim is to discover the fundamental analysis section of the company which, according to these criteria, the market is still undervalued. Its task is also to identify good features observed firms, as well as its weaknesses and get an idea of the value of the company, its assets and business processes. Valuation of each enterprise is determined by assessing its earnings in the future. It uses ratios like: ROA³, ROE⁴, P/E⁵, EPS and Debt/Equity⁶ ratio.

2. TECHNICAL ANALYSIS OF SELECTED SHARES ON ZSE

For technical analysis the have been selected 11 stocks that make up the leading representatives of industries that have the highest value added in GDP as well as their followers. Some of the stocks are part of CROBEX while some of them have a monopoly. Graphs on figure 1 and 2 are showing trends for 3 to 5 years back depending on available data on the stock market and time quotation of the company. The general conclusion of conducted technical analysis is that the same trend was observed in almost all reference stocks, although some slightly milder and stronger in others. Exception to this are the shares of Atlantic group that could be said that has a trend eith parts of horizontal price movement, HT who recorded a stronger drop in 2009. than others and the formation of a vicious head shoulder formation, Hotel Medena which registered a slight decline in prices during the crisis, Koncar whose trend has formed cup with a handle, which points to slower recovery rates in the future that is shown on end of the chart. The main direction of the trend is to be expected given the situation in the country and the capital market and expectations for the future. I believe that soon the prices of all stocks, same as of stocks observed in this study, may experience deja vu in regard to the trend changed again and breaking support for the new lower levels because inflation is again in rise, and thus the government's failure of fixing the damage that crisis has caused.

¹ A simple, or arithmetic, moving average that is calculated by adding the closing price of the security for a number of time periods and then dividing this total by the number of time periods.

² A technical momentum indicator that compares the magnitude of recent gains to recent losses in an attempt to determine overbought and oversold conditions of an asset. It ranges from 0 to 100.

³ An indicator of how profitable a company is relative to its total assets. ROA gives an idea as to how efficient management is at using its assets to generate earnings.

⁴ Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

⁵ A valuation ratio of a company's current share price compared to its per-share earnings.

⁶ A measure of a company's financial leverage calculated by dividing its total liabilities by stockholders' equity.

Figure 1.: Technical analysis

Atlantic Group (ATGR-R-A)



Konzum (KNZM-R-A)



Industgradnja (INDGR-R-A)



Dalekovod (DLKV-R-A)



Podravka (PODR-R-A)



Privredna banka Zagreb (PBZ-R-A)



Source: according to data on www.zse.hr

Figure 2.: Technical analysis

Ina (INA-R-A)



HT-a (HT-R-A)



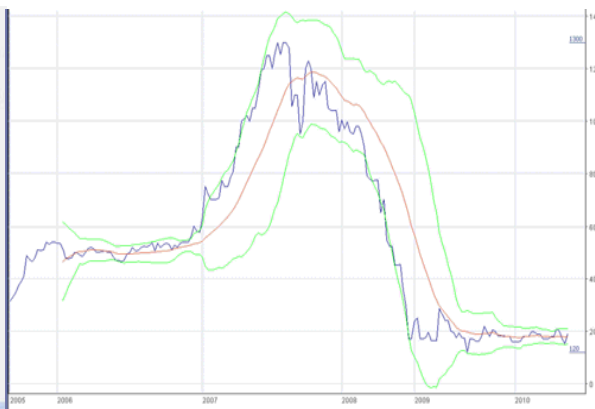
Hotel Medena (HMDN-R-A)



Končar (KOEI-R-A)



Imperial hoteli (HIMR-R-A)



Source: according to data on www.zse.hr

3. FUNDAMENTAL ANALYSIS OF SELECTED SHARES ON ZSE

For the fundamental analysis five companies has been selected: Dalekovod, Podravka, Atlantic Group, and Konzum and Industogradnja because of their added value in GDP and it's strategic importance for the development of Croatian economy for for the period from 2007th to 2009th. Fundamental analysis for these companies is shown in table 1 and 2.

Revenues of Dalekovod are steadily growing, while the slightly stronger growth in expenditures happened during 2008. Net profit rises less than a year earlier. The number of shares is lower. This is why an indicator of earnings per share instead of falling increased because the reduced number of shares by buying its own shares, observing only the individual indicators in the group of indicators for shareholders in this case is not desirable. The ratio of price and earnings per share fall and recorded a negative change in 2008. and 2009. g. The reason for this is a big drop in prices in late 2008. which continued in 2009. g. Is the stock undervalued or not depends on a number of aspects from which the investor is looking at the indicators in the report to the policy of dividend payments. Since the dividend is constant is desirable rear view of the liquidity and debt from which it is evident that the company is vulnerable to general liquidity while the debt in 2009. decreases. Construction is an activity that is affected strong by the crisis, therefore, upward on the value of the shares should be interpreted with caution to speak, but I think that is partly underestimated, because the price is on the lowest levels ever and that is because of the fear of investors, but news from the real estate market every day in the media.

Podravka through the purchase of shares reduces the negative index value for shareholders, although the real decline in these indicators that more was not done buying shares. In 2009 the net result is negative, though the company has a satisfactory state of rapid liquidity ratio but not the general and the share of debt to assets within the desired limits while the share of debt to equity is above the allowable. Therefore, recovery rates, in 2009, But at the lowest levels in the reference period is not surprising.

Price correction, of Atlantic Group stock, that followed in late 2008 did not maintain long and is followed by a recovery that lasted a little longer but this is due to being on the market and the situation in the region. Is the re-growth rates is justified can be seen from the other indicators such as liquidity and debt indicators. General indicator of liquidity in 2009 not satisfactory but is an indicator of rapid liquidity then rose above the standard value of 1. Ratios of debt moved beyond standard limits. The share of debt to equity has exceeded the critical value of 1.35 and the debt-to-assets ratio of 50%. These data point to overvaluation shares in the current year and that should take a short position. Overvaluation of the shares according to fundamental analysis is evident already from 2007, according to indicators of liquidity and debt.

For Konzum company is significantly, given a decline in the indicators for shareholders in 2008 but it was created primarily because of the recapitalization, which was performed Konzum. It could also be an additional signal low status of the company. Despite the growth in net profit for the three years observed

liquidity ratios indicate that the company clearly does not charged at the time of its claims that the accounting profit does not coincide with the growth of liquid assets compared to liabilities of the company. This indicates the stock price overvaluation in 2008, while the technical analysis of the correction notice merely mid-2008. Fundamental analysis for Industogradnja shows that the shares have been underestimated during 2008 because net profit reaches a peak in that year and liquidity indicators are above standard while the debt-to-assets ratio decreased by almost 50%. During 2009 significant change in reported income, expenses and net profit, but it is essential that the company operates a positive and that liquidity is not compromised and that the company is not indebted. These data point to the underestimation of the shares because the technical analysis shows a drop in price while at the fundamentals, there is no basis for that situation and can therefore expect a very recent price correction, probably due to publish the report for 2010.

Table 1. Fundamental analysis of: Dalekovod, Podravka

| Period | 2007. | 2008. | change % | 2009. | change % | 2007. | 2008. | change % | 2009. | change % |
|---|------------|------------|----------|------------|-------------|------------|------------|----------|------------|----------|
| The total number of shares (excluding treasury) | 2268573 | 2259604 | | 2249878 | -0,00430429 | 5343830 | 5267326 | -1,43% | 5242492 | -0,47% |
| Face value | 100 | 100 | | 100 | | 300 | 300 | 0,00% | 300 | 0,00% |
| Net profit | 79198000 | 82515000 | 4,19% | 89088000 | 7,97% | 18336000 | 44596000 | 143,22% | -281208000 | -730,57% |
| Income | 1826917000 | 2280058000 | 24,80% | 2350753000 | 3,10% | 3525805000 | 3947698000 | 11,97% | 3826190 | -99,90% |
| Expenditures | 1726155000 | 2175073000 | 26,01% | 2239240000 | 2,95% | 3491888000 | 3893322000 | 11,50% | 4089732000 | 5,04% |
| EPS | 34,91 | 36,52 | 4,61% | 39,6 | 8,43% | 3,43 | 8,47 | 146,94% | -53,64 | -733,29% |
| P/E | 48,69 | 10,46 | -78,52% | 8,18 | -21,80% | 148,63 | 30,73 | -79,32% | -5,54 | -118,03% |
| BV | 233,95 | 255,81 | 9,34% | 295,44 | 15,49% | 363,97 | 372,77 | 2,42% | 320,04 | -14,15% |
| MkCap | 3856347243 | 863168728 | -77,62% | 728712985 | -15,58% | 2725353300 | 1374772086 | -49,56% | 1556967699 | 13,25% |
| P/Bv | 7,27 | 1,48 | -79,64% | 1,1 | -25,68% | 1,4 | 0,71 | -49,29% | 0,93 | 30,99% |
| P/S | 2,18 | 0,38 | -82,57% | 0,31 | -18,42% | 0,77 | 0,37 | -51,95% | 0,41 | 10,81% |
| DPS | 12,65 | 12,65 | 0,00% | | | | | | | |
| Profitability ratios | | | | | | | | | | |
| EBIT | 127927000 | 161822000 | 26,50% | 148707000 | -8,10% | 90924000 | 152379000 | 67,59% | -168362000 | -210,49% |
| EBITDA | 165124000 | 205850000 | 24,66% | 194416000 | -5,55% | 254440000 | 312403000 | 22,78% | -11778000 | -103,77% |
| ROE | 14,92 | 14,28 | -4,29% | 13,4 | -6,16% | 0,94 | 2,27 | 141,49% | -16,76 | -838,33% |
| ROA | 4,43 | 3,18 | -28,22% | 3,84 | 20,75% | 0,47 | 0,96 | 104,26% | -6,79 | -807,29% |
| Liquidity ratios | | | | | | | | | | |
| Net working capital | 300772000 | 182435000 | -39,34% | 227642000 | 24,78% | 495986000 | 717520996 | 44,67% | 606819000 | -15,43% |
| Current ratio | 1,29 | 1,1 | -14,73% | 1,17 | 6,36% | 1,36 | 1,44 | 5,88% | 1,44 | 0,00% |
| Quick ratio | 1,06 | 0,71 | -33,02% | 0,84 | 18,31% | 0,93 | 1,05 | 12,90% | 0,97 | -7,62% |
| Interst cover ratio | 2,45 | 0,62 | -74,69% | 1,12 | 80,65% | 1,59 | 1,6 | 0,63% | -2,23 | -239,38% |
| Dept coverage ratio | | | | | | | | | | |
| Dept/Equity ratio | 2,36 | 3,34 | 41,53% | 2,37 | -29,04% | 0,95 | 1,32 | 38,95% | 1,34 | 1,52% |
| The ratio of debt to assets | 0,7 | 0,74 | 5,71% | 0,68 | -8,11% | 0,48 | 0,55 | 14,58% | 0,54 | -1,82% |

Source: analysis in Excel according to data from financial statements of the companies on www.zse.hr

| Period | Atlantuc Group, | | | | | Konzum, | | | | | Industogradnja | | | | |
|---|-----------------|------------|----------|------------|----------|-------------|-------------|----------|-------------|----------|----------------|-----------|----------|-----------|----------|
| | 2007. | 2008. | change % | 2009. | change % | 2007. | 2008. | change % | 2009. | change % | 2007. | 2008. | change % | 2009. | change % |
| The total number of shares (excluding treasury) | 2466595 | 2464712 | -0,08% | 2.465.608 | 0,04% | 126127 | 22702860 | | 22702860 | | 235072 | 452400 | | 452400 | |
| Face value | 40 | 40 | | 40 | | 1800 | 10 | | 10 | | 1000 | 1000 | | 1000 | |
| Net profit | 54456000 | 78361000 | 43,90% | 97329000 | 24,21% | 224828000 | 329234000 | 46,44% | 341667000 | 3,78% | -27973000 | 195034000 | 797,22% | 8810000 | -95,48% |
| Income | 1699103000 | 2024619000 | 19,16% | 2225332000 | 9,91% | 10884868000 | 12757544000 | 17,20% | 12662943000 | -0,74% | 288827000 | 641800000 | 122,21% | 194928000 | -69,63% |
| Expenditures | 1627577000 | 1923769000 | 18,20% | 2098245000 | 9,07% | 10587074000 | 12323985000 | 16,41% | 12209952000 | -0,93% | 316800000 | 446766000 | 41,02% | 186118000 | -58,34% |
| EPS | 22,08 | 31,79 | 43,98% | 39,47 | 24,15% | 1782,55 | 14,5 | -99,18% | 15,05 | 3,79% | -119 | 431,11 | -62,28% | 19,473917 | -95,48% |
| P/E | 39,72 | 14,5 | -63,49% | 18,34 | 26,50% | 56,1 | 11,1 | -80,21% | 10,3 | -7,21% | -14,29 | 1,67 | 111,69% | 30,545473 | 1729,07% |
| BV | 245,5 | 300,36 | 22,35% | 307,35 | 2,33% | 7179,66 | 51,71 | -99,27% | 77,05 | 49,00% | 994,7 | 1428,02 | 43,56% | 1463,93 | 2,51% |
| MkCap | 2163228481 | 1136232232 | -47,48% | 1785100192 | 57,11% | 12612700000 | 3655160460 | -71,02% | 3518943300 | -3,73% | 399622400 | 325728000 | -18,49% | 269105616 | -17,38% |
| P/Bv | 3,57 | 1,53 | -57,14% | 2,36 | 54,25% | 13,93 | 3,11 | -77,67% | 2,01 | -35,37% | 1,71 | 0,5 | -70,76% | 0,4063309 | -18,73% |
| P/S | 1,3 | 0,57 | -56,15% | 0,8 | 40,03% | 1,16 | 0,29 | -75% | 0,28 | -3,45% | 1,4 | 0,69 | -50,71% | 1,3805385 | 100,08% |
| DPS | | 4,7 | | 7 | 48,94% | | 2,5 | | 3,5 | 40,00% | | | | | |
| Profitability ratios | | | | | | | | | | | | | | | |
| EBIT | 95118000 | 129400000 | 36,04% | 153841000 | 18,89% | 398661000 | 590340000 | 48,08% | 495683000 | -16,03% | -9342000 | 201372000 | 2255,56% | 22998000 | -88,58% |
| EBITDA | 132330000 | 169306000 | 27,94% | 197029000 | 16,37% | 510037000 | 747143000 | 46,48% | 676820000 | -9,41% | 2853000 | 211529000 | 7314,27% | 30451000 | -85,60% |
| ROE | 8,99 | 10,58 | 17,69% | 12,84 | 21,36% | 24,83 | 28,05 | 12,96% | 19,53 | -30,37% | -11,96 | 21,88 | 282,94% | 0,97 | -95,57% |
| ROA | 3,72 | 4,54 | 22,04% | 5,48 | 20,70% | 4,24 | 5,15 | 21,46% | 4,34 | -15,73% | -3,96 | 3,09 | 178,03% | 1,33 | -56,96% |
| Liquidity ratios | | | | | | | | | | | | | | | |
| Net working capital | 457942000 | 432747000 | -5,50% | 405599000 | -6,27% | -1846211000 | -2017534000 | 9,27% | -1483995000 | -26,45% | 28827000 | 146928000 | 409,69% | | |
| Current ratio | 1,83 | 2,14 | 16,94% | 1,76 | -17,76% | 0,54 | 0,59 | 9,26% | 0,72 | 22,03% | 1,13 | 2,08 | 84,07% | 1,82 | -12,50% |
| Quick ratio | 1,45 | 1,4 | -3,45% | 1,33 | -5% | 0,32 | 0,41 | 28,12% | 0,46 | 12,20% | 0,42 | 1,45 | 245,24% | 1,57 | 8,28% |
| Interest cover ratio | | 2,52 | | 3,73 | 48,02% | 3,29 | 1,36 | -58,66% | 0,72 | -47,06% | -0,48 | 13,24 | 2858,33% | 1,62 | -87,76% |
| Dept coverage ratio | | | | | | | | | | | | | | | |
| Dept/Equity ratio | 1,34 | 1,3 | -2,99% | 1,31 | 0,77% | 4,84 | 4,43 | -8,47% | 3,48 | -21,44% | 1,07 | 0,24 | -77,57% | 0,2469 | 2,88% |
| The ratio of debt to assets | 0,56 | 0,57 | 1,79% | 0,56 | -1,75% | 0,83 | 0,81 | -2,41% | 0,77 | -4,94% | 0,35 | 0,18 | -48,57% | 0,1806 | 0,33% |

Source: analysis in Excel according to data from financial statements of companies on www.zse.hr

After a technical and fundamental analysis seven models, that show the interdependence of macroeconomic variables and capital market variables, has been made. Models and its variables are shown in table 3. Testing showed that in all models there is no problem of multicollinearity, autocorrelation and heteroskedasticity. All models are statistically significant, same as model parameters. On observed models is estimated that the crisis has a positive influence on the GDP, while unemployment has a negative impact. The positive impact of the crisis on the movement of GDP and has no basis and is not in accordance with economic principles, but it is important to note that these are nominal GDP, then the GDP measured at current prices which are influenced by inflation and therefore precisely the crisis in the reference model has a positive sign and a positive effect on GDP growth that is causing its not real but only nominally. The index of expectations as well as total liquid assets have a positive impact on the price of shares of Erste Bank. So with the increase in liquidity and increase expectations index is expected to increase in the share price of Erste Bank. It is stated in accordance with economic theory because if broad money growth of the bank will be able to qualify for more loans that carry her active interest. Table 3 shows the parameters of regression which shows that unemployment has a negative impact on share price of Erste bank since the emergence and growth causes prices to fall, while inflation has a positive impact. The reason for the positive impact of inflation can only be explained by the growth of price levels in all markets and capital markets because there is no fundamental basis for the level of business, because in fact at the time of rising inflation because the banks are losing loans repayable really worth less even though the banks have been trying the risk of inflation to protect the interest rates charged on loans. In the case of inflation neanticipirane banks lose credit with fixed interest and receive a variable interest rate agreed. It was found that the price Končara positively affect change in volume of shares and that the crisis has a negative impact, which means that during a crisis can be expected drop in share price Trawlers parameter while inflation has a negative sign and a separate crisis but not statistically significant because on the share price Končara working through the parameter of the crisis. It was also expected that the expetations index has a negative impact on the volume of shares in periods of optimism, because there is no pressure because we all hold shares in anticipation of growth in future periods when the volume is growing pessimistic mood because everyone wants to get rid of their shares expecting the price drop occurs, and the pressure to sell. Real GDP growth rates also have a negative sign which means that in periods of growth in real GDP can be expected drop in the volume of shares and vice versa and the reason for this is that during the growth of economic activity voluman reduced because all retain existing long positions. The above comes to the conclusion that the index depends largely on the expectations of real growth of GDP. Positive impact on the volume of shares has turnover that is expressed in the currency. This would mean that the traffic growth can be expected to increase because the increase in traffic volume does not necessarily mean a significant price increase, but only increased turnover. Last model shoved that there is positive connection between price of Podravka's share and Z-Score indicator as the indicator that shows probability of bankruptcy of the company and that is not used by fundamental analysis.

It is also concluded that stock market is going to react faster than real economy because stock market is under influence of news and reacts without proof although it doesn't have to be sure every time so I can say that stock prices and CROBEX index can not be used as the signal of a "cyclone" in the economy but economy indicators can be presented as the result of a slow down in the economy which will have significant influence on price and index values if the news turn out to be realistic that will cause price corrections that will last for longer period.

Table 3. Regression models of macroeconomic variables and capital market variables

| Number of model | Model-dependent variable | Model and parameters significance | model parameters |
|-----------------|--------------------------|-----------------------------------|--|
| 1st | Turnover | 0,004 0,037 0,002 | + Constant +Expectations index +Reserve Money |
| 2nd | Annual GDP | 0,000 0,001 0,001 0,030 | + Constant -Unemployment +Crisis +CROBEX |
| 3rd | Erste Bank share price | 0,001 0,001 0,013 | + Constant +Broad money +Expectations index |
| 4th | Erste Bank share price | 0,002 0,001 0,049 | + Constant -Unemployment +Inflation |
| 5th | Share price of Koncar | 0,000 0,000 0,002 0,019 | + Constant +Turnover -Crisis +Inflation |
| 6th | Share volume | 0,000 0,012 0,000 0,001 | + Constant - Expectations index +Turnover -Real GDP growth rate |
| 7th | Podravka share price | 0,001 0,001 | + Constant + Z-Score |

Source: analysis in SPSS according to data on: www.zse.hr, www.dzs.hr

4. CONCLUSION REMARKS

The subject of this research is an analysis tool for making investment decisions in the Croatian capital market (ZSE), that is the basis of technical analysis and fundamental analysis and impact assessment of macroeconomic indicators to better assess future trends in decision-making of investors. This assurance was given by the analysis conducted assessed the representativeness of the model. All models are statistically significant. The results indicated an emphasis on a particular method in a certain period.

Finally it is important to emphasize that the success and profits in the capital markets than of knowledge and experience is important and happiness, and that no investor should not only base their decisions on an individual basis, but combine them all for making the right decisions. Also to point out that the stock market is influenced by fads and short-sightedness of investors in certain situations, therefore the choice of the

moment some decisions should as far as possible to take into account human factors and psychology of people, and its behavior in the future. It is estimated that in order to define buy and sell moments is better to use technical analysis and fundamental if you invest on longer period. In each situation it is desirable to consider developments in the market and market companies in which investments are made and the situation in the whole economy because they have no significant correlation between stock market indicators and macroeconomic indicators. Although the formula for success does not exist and there is no equation that promises to secure profits if they respect its principles, the capital market can always realize any profits in periods of prosperity was in decline and crisis periods, a "catch" in the perception and to assess the psychology and behavior reactions of other market participants as well as knowledge and experience in applying the tools that can be used for evaluation. Despite all the market can always surprise you and the best investors because it is as complex as man. It is made up of people (investors and companies), and without them, in fact, there is no market. This is exactly what makes the opportunity to earn and attractiveness of capital markets, because that each individual is 100% rational and able to assess trends and expectations of others, capital markets would not exist.

REFERENCES

Belak, V. (1995), *Managerial Accounting*, RRIF, Zagreb

Benjamin, G., (2006), *The Intelligent Investor*, Masmmedia, Zagreb

Bodie, Z., Kane, A., Marcus, A.J., (2006), *Essentials of Investments*, IV. Issue, Mate, Zagreb

Foley, B.J., (1998), *Capital markets*, II. Edition, Mate, Zagreb

Michael C. Thomsett, (1998), *Masterin Fundamental Analysis*, Dearborn Financial Publishing

Murphy, J., (1999), *Technical analysis of financial markets*, Prentice Hall Press

<http://www.wallstreetcourier.com> [Accessed 08/02/10]

<http://www.zse.hr> [Accessed 08/02/10]

www.dzs.hr [Accessed 08/02/10]