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MASTER DEGREE THESIS

THE ANALYSIS OF INVESTMENT OPPORTUNITIES IN THE JAPANESE ELECTRICAL MACHINERY AND COMMUNICATION INDUSTRIES

Ljubljana, September 2004 **Primož Krajnik**

Author's Statement

I Primož Krajnik, hereby certify to be the author of this Master's Degree thesis, which was written under mentorship of Dr. Silva Deželan and in compliance with the Act of Author's and Related Rights – Para. 1, Article 21. I herewith agree this thesis to be published on the website pages of ICPE and the Faculty of Economics.

Ljubljana, September 9, 2004 Signature…….……

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List of abbreviations

Abbreviation	**Description**
3G	Third Generation
AC	Alternate Current
ADR	American Depositary Receipts
ADSL	Asymmetric Digital Subscriber Line
APT	Arbitrage Pricing Theory
ARPU	Average Revenue Per Unit
ASBJ	Accounting Standards Board of Japan
ASIC	Application Specific Integrated Circuit
AV	Audio / Video
B	Billion = 1,000,000,000
B/M	Book-to-Market price ratio (the opposite of P/B)
CAPM	Capital Asset Pricing Model
CEO	Chief Executive Officer
CF	Cash Flow
CFO	Chief Financial Officer
CCFL	Cold Cathode Fluorescent Lamp (light source in LCD)
CMOS	Complementary Metal Oxide Semiconductor
CNBC	CNBC television = Consumer News and Business Channel
CNC	Computerized Numerically-Controlled
CR	Current Ratio (of short term assets to debt)
CRT	Cathode-Ray Tube (for monitors and TV sets)
CT	Computed Tomography
CV	Coefficient of variance
D/E	Debt to Equity ratio
DCF	Discounted Cash Flow
DDM	Dividend Discount Model
DPF	Diesel Particular Filters
DPS	Dividend Per Share
DRAM	Dynamic RAM – RAM which has to be continuously refreshed to keep information
DSL	Digital Subscriber Line
DVD	Digital Video Disk
EAFE	Europe, Australasia, Far East
EBIT	Earnings Before Interests and Taxes
EBITDA	Earnings Before Interests, Taxes, Depreciation, and Amortization
ECB	European Central Bank
EMH	Efficient Market Hypothesis
EPS	Earnings Per Share
EU	European Union
FCF	Free Cash Flow
FCFE	Free Cash Flow to Equity
FCFF	Free Cash Flow to Firm
FDD	Floppy Disc Drive (data storage media)
FPGA	Field-Programmable Gate Array
FSA	Financial Services Agency

Abbreviation	**Description**
FY	Fiscal Year
G7	Group of 7 most developed world nations to which Russia was added to form G8
GAAP	Generally Acceptable Accounting Practices
GARP	Growth at a Reasonable Price
GDP	Gross Domestic Product
GNP	Gross National Product
GPS	Global Positioning System
HD	High Definition
HDD	Hard Disc Drive (data storage media)
HID	High Intensity Discharge
IAS	International Accounting Standards
IC	Integrated Circuit (semiconductor chip)
IFO	Institute for Economic Research, Munich
IFR	International Federation of Robotics
IFRS	International Financial Reporting Standards
IPO	Initial Public Offering
IP	Internet Protocol or Intellectual Property
IT	Information Technology
LCD	Liquid Crystal Display
LSI	Large Scale Integration (for semiconductor circuits)
LT	Long Term
M1	Total money supply. M1 includes only checkable demand deposits
M2	Money supply 2is M1 and also savings and other time deposits
MC	Market Capitalization
MOU	Minutes of Usage
MRAM	Magneto-resistive RAM, or Magnetic RAM
MRI	Magnetic Resonance Imagining
MSCI	Morgan Stanley Capital International
NA	Not Available
NAIC	National Association of Investors Corporation
NASDAQ	National Association of Securities Dealers Automated Quotation
NTT	Nippon Telegraph & Telephone
NYSE	New York Stock Exchange
NYU	New York University
OA	Office Automation
OECD	Organization for Economic Cooperation and Development (30 countries)
OPEC	Organization of the Petroleum Exporting Countries
P/B	Price to Book value ratio
P/E	Price to Earnings per share ratio
P/S	Price to Sales per share ratio
PC	Personal Computer
PCB	Printed Circuit Board (board where electronic components are assembled)
PDA	Personal Digital Assistant
PDP	Plasma Display Panel
PEG	Price to Earnings Growth ratio
PEST	Political, Environmental, Social, and Technological
PHS	Personal Handy phone System

Abbreviation	**Description**
PLP	Plastic Laminated Packages
PPP	Purchasing Power Parity
PV	Present Value
RAM	Random Access Memory
QR	Quick Ratio (of short term assets to debt)
R&D	Research and Development
RF	Radio Frequency
ROA	Return on Assets ratio
ROC	Return on Capital ratio
ROCE	Return on Capital Employed ratio
ROE	Return on Equity ratio
S&P 500	Standard and Poor's stock index of 500 firms representing US market
SARS	Severe Acute Respiratory Syndrome
SBI-20	Slovenski Borzni Index = Slovenian Stock exchange index of 20 blue chips
SEAJ	Semiconductor Equipment Association of Japan
SIA	Semiconductor Industry Association
SIC	Standard Industry Classification
SIP	System In Package (electronic components assembled in single package)
SLR	Single Lens Reflex
SME	Small end Medium Enterprises
SOP	System On Chip (electronic system on the same substrate – support)
ST	Short Term
T&M	Test & Measurement
TCA	Telecommunications Carriers Association
TD/SE	Total Debt to Shareholders' Equity ratio
TSE	Tokyo Stock Exchange
TSMC	Taiwan Semiconductor Manufacturing Company
TV	Tele-Vision
US	United States of America
USB	Universal Serial Bus
VCR	Video Cassette Recorder
WACC	Weighted Average Cost of Capital
WWII	World War 2

1 INTRODUCTION

1.1 DESCRIPTION OF THE PROBLEM

With decreasing inflation in Slovenia and low inflation in European Union, interest rates in Slovene banks are falling fast, while the European and the American interest rates are at their historically low levels. In Slovenia, the newly proposed tax legislation suggests that interest will also be taxed after January 1st, 2005; so saving in the banks will become even less appealing. It is therefore expected, that the trend of the last few years (from 2000 onwards) of transferring savings from bank accounts to the stock market will continue and will probably even accelerate. Small investors are more and more informed about different investing opportunities and concerned about placement of their savings.

In addition, with Slovenian population getting older, people are obliged to save more and more for their retirement. The basic government-owned retirement system, in which current employees are paying for the pensions of the retired people, is facing more and more difficulties also in the developed countries, where the ratio of active population compared to the retired population is decreasing. As a result, the European countries are revising their pension systems.

People are becoming more and more inclined to invest their savings for best possible returns. Therefore, they are also getting more and more interested in stocks, as long-term investments. Compared with other financial assets, stocks are known to have the highest returns in the long run. In the United States, for example, the average annul return on investments in period from 1926 till 1996 was about 19% for small stocks and 12.5% for large stocks. For the secure treasury bills, the annual return was only 3.8% on average, with the average annual inflation of 3.2% (Bodie et.al., 1999, p.135).

Due to the significant increase of the Slovenian stock market index SBI20 in the last three years (2000-2003) people started to change their habits and invest more and more in mutual funds, as they represent a very convenient way of investing. There is an ongoing trend of moving savings from the banks into the stocks and mutual funds in the last three years. In 2001, 6.5% of Slovenes invested in mutual funds, but their share increased to 13% in 2003 (Bank of Slovenia, 2004). However, Slovenians still held 4625 billion SIT or 58.4% of the total Slovene financial assets in banks in 2003, compared to only 518 billion SIT or 6.6% in different mutual funds. This represented only 42000 SIT or 210 USD per capita compared to 24751 USD in different funds in the USA (Investment Company Institute, 2002).

With respect to investing in stocks, Slovenia cannot be compared with a country like United States, where stock exchanges have a much longer history and individuals have a large part of their savings in stocks, either directly or as investors in many available mutual funds. Due to the relatively small Slovenian stock market (in terms of the number of listed companies and their size), an increasing inflow of money from private investors and newly established private pension funds, the demand for domestic stocks and bonds is increasing. On the other hand, there is almost no demand for fresh capital from Slovene firms to expand their operations. All these can lead to artificially increasing prices of Slovenian stocks on the Ljubljana Stock Exchange and a danger of creating a bubble. A recent example of such a bubble in the US

happened to the technology stocks listed on NASDAQ, which after a steep climb from 2000 to 5000 points in only a year and a half (between autumn 1998 and April 2000) dropped to below 1200 points by March 2003 (Yahoo.com, 2003). At the end of 2003, the Slovenian stock market index SBI-20 had a similar Price/Earnings (P/E) and Price/Book (P/B) ratios as the US and the biggest western European stock markets. Only Japan had higher ratios due to long lasting recession. This indicates a potential threat of overvaluation of the Slovene stocks and the need for diversification across the Slovenian borders.

From the beginning of 2003 Slovene mutual funds can invest more than 10% of their assets in foreign stocks (Zakon o investicijskih skladih in družbah za upravljanje, 2002). Small investors can do the same since they have the possibility to open accounts abroad and invest there. The problem for both types of investors is to find new opportunities on foreign stock markets to reduce risks associated with a very small and not liquid Slovene stock market.

In this thesis, I decided to take a look at the Japanese stock market as one of the possible foreign market to invest in. Japan is the second largest world economy.

With my background in electrical engineering and based on the seventeen years of experience in the semiconductor industry, I decided to focus my research in this thesis on the search for the possible winners among Japanese stocks in the industries that are related to electrical engineering. After scanning the Nikkei 500 index, the two possible industries turned out, i.e. electric machinery and communications. They are two of the 36 industries classified on Nikkei.net Interactive. In this way I can also use my knowledge and basic understanding of technologies and trends in these two sectors. With respect to the stock selection, the main problem of my thesis will be, which method of analysis to choose and apply, in order to get the best results.

1.2 THE PURPOSE OF THE THESIS

International diversification considerably reduces market risk. More distant the economies are (also in geographic terms) smaller is the correlation between markets and influence on reducing market risk is higher. The purpose of my thesis is to find potentially profitable investment opportunities on the Japanese stock market. Japan is the world's second largest economy, immediately after the US. After a long recession there are some signs of improvements and growth in the Japanese economy, which I would like to exploit. The purpose of my thesis therefore is to try to increase investment returns and to geographically diversify investments in different currencies, to reduce risks of exposure to single market like Slovenia.

International investments pose some problems not encountered in the domestic market. Among these are the following: the presence of the exchange rate risk, restrictions on capital flows across national boundaries, an added dimension of political risk and country specific regulations and different accounting practices in different countries (Bodie et.al., 1999, p.786). For instance, the Japanese accounting practices differ a lot compared to US standards and these differences will be explained in the course of the thesis. These risks will be addressed and compared to the situation in the US mainly.

I will present the Japanese stock market, its historical performance and the two selected industries: Electric Machinery and Communications. I will present the Japanese

macroeconomic environment from 1990 onwards, when a big drop in Nikkei index started and explain why the analysts think Japan is a place to invest in, in the near future.

A top-down and the bottom up stock selection approaches will be presented, as well as different evaluation methods for stock selection. Based on these I will try to develop a decision-making algorithm for finding the possible investment opportunities from selected industries and a model to evaluate and compare them. After the selection process is completed, I also intend to evaluate the performance of selected stocks in the first six months of 2004, to show how successful my approach was, based on the comparison with the performance of the Nikkei 500 index as a whole, and with the two sectors from which the stocks were selected.

1.3 THE GOALS OF THE THESIS

The main goal of the thesis as stated in the title itself is to find the potentially undervalued Nikkei 500 Japanese stocks from electric machinery and communications industry. Through different evaluation models I will try to reduce the selected base of 47 stocks down to 5 or 8 stocks and to position these firms in the Japanese, as well as the world economy.

I will present in short the performance of two industries in the crisis period between 1990 and 2003 in Japan and how similar industries performed in the US during the periods of different market conditions, like recession, high inflation, low inflation and big growth periods to try to estimate the potential for the future, based on past historical market reactions. The two industries had bad returns during the recession period but should perform much better in the growth environment, which is expected in the near future. The first encouraging signs started in the last three quarters of 2003, when the Nikkei 225 average rose by more than 30%.

I will concentrate on the fundamental analysis of stocks, which also includes the ratio analysis. I will try to show, which parameters must be taken into consideration for stock selection and based on the trends in the two selected industries, I will also try to find the stocks that have a potential for high returns.

1.4 METHODS APPLIED IN THE THESIS

Throughout the thesis I will combine the theory with an empirical analysis. For the latter, a top-down analysis will be used to find out firm's prospects. Japan macroeconomic environment will be shown and its position in world economy will be analyzed. I will show the position of the electric machinery and communications industry in their economic environment and the position of selected firms within the industry. A method of comparison will be applied to give a better picture of the Japanese stock market relative to the US market.

Active and passive equity management strategies will be presented. I will focus on active strategy, which seeks to generate abnormal returns after adjusting for risks and transaction costs. Different methods for equity analysis will be compared and applied from the point of

method itself and their historical results, which can be found from different sources. Based on some simpler methods for fundamental stock analysis the basic selection out of 47 surveyed companies in the Nikkei-500 index from electric machinery and communications industry will be made. Using the method of description, the current situation in these two industries and its trends will be provided to give us the needed inputs for the prospects of different companies surveyed.

In second part of the empirical analysis, further financial analysis will be made on the smaller sample of "survival" stocks from the first selection, also using data available from Bloomberg information system and Nikkei.net interactive. A wide range of ratios are used in fundamental analysis, including such income statement data as sales, operating costs, pre-tax profit margin, apparent tax rate, net profit margin, return on equity (ROE), cash flow, and earnings (or income) per share (EPS). On the balance sheet, quantitative measures include various asset and debt ratios, as well as the capital structure of the company.

1.5 STRUCTURE OF THE THESIS

In the second chapter, which follows I will present main investing strategies and risks associated with investing in stocks. I will present value, growth, and growth at a reasonable price equity management strategies, to come to fundamental stock analysis. The principal motivation for fundamental analysis research and its use in practice is to identify wrongly priced securities for investing purposes (Kothari, 2000, p. 71). Different stock valuation models will be presented and when they should be used. At the end I will present market multiples valuation method, which I selected for my work, as I had to make selection between many stocks. I describe my selection criteria and how each of them participates in the final score, where higher score means more interesting stock to invest in.

In third chapter I will present main characteristics of the Japanese stock market, its history, position in global economy, their main indexes, and differences of Japanese accounting practices to other broadly used accounting standards, which can influence financial results used in fundamental analysis. I will show also historical performance of the Nikkei 225 with main factors influencing it in the last two decades.

Chapter four is the core of the thesis. Using the top-down fundamental approach I will look for the position of Japan in global economy and position of its communication and electric machinery industry. I will present and analyze 47 companies in the Nikkei 500 communication and electric machinery industry. First I will try to classify these firms in sub-categories, to compare firms with similar operations, which is the basic for market multiple analysis. I will present these sub-industries, some of their products and trends, and firms I assigned in them. Based on my evaluation formula I will score fundamentals for each of them and compare the results with the rest in the group to make recommendation within and for the group. Finally I will present eight most interesting stocks in my assessment, rank them and present how the evaluation formula developed by me, attributed points for the two most attractive stocks.

2 INVESTING STRATEGIES AND METHODS

When we are investing we have to know what kind and how much risk we can afford to create a portfolio which is best suited to our risk aversion, preferences, age, income, and current financial position. We have to know different risks, different investing strategies, and valuation methods for selecting assets. In this chapter I will present basics for all of them and develop my methodology how to select among analyzed stocks.

2.1 INTRODUCTION TO INVESTING AND RISKS INVOLVED

The investment process consists of two broad tasks. One is security and market analysis, by which we assess the risk and expected return. The second is the formation of an optimal portfolio of assets. The beginning of modern portfolio theory dates back to 1952 when Harry Markowitz (Markowitz, 1952) published a paper titled "Portfolio Selection." His portfolio optimization was employed mainly for the asset allocation decision, i.e. the allocation of capital to stocks, bonds, and real estate (Haugen, 2001, p.1).

When valuating assets and firms, we need to use discounted rates that reflect the risk of the cash flows. In finance risk refers to the likelihood that we will receive a return on an investment that is different from the return we expect to make (Damodaran, 2002, p. 60). Reasons why actual returns may differ from expected returns can be grouped in two categories: firm-specific or stand-alone risk and market wide. The risks that arise from firm-specific actions affect one or a few investments and are called also diversifiable risk, as we can eliminate it by creating portfolios made of diversified assets. The remaining risks after broad diversification is the risk arising from market wide reasons and affect many or all investments.

2.1.1 Business or »Stand-Alone« risk

Even large, established institutions can disappear suddenly and without a trace. Entire industries can decline and fade as their products become obsolete. Other industries find themselves unable to compete in a shifting global economy. Disasters can strike at any time from strange and unexpected directions like lawsuits, strikes, successful and unsuccessful marketing programs, winning or loosing a major contract, and other events that are unique to a particular firm.

Fortunately, this »stand-alone« risk of owning a single company can be reduced to the point of insignificance. Diversification is the basic investor protection strategy. Single companies often go broke. Entire markets do not! As the number of positions held increases, business risk falls very rapidly. Statisticians often claim that as few as 15 to 20 stocks will offer adequate diversification, and that after that, further risk reduction reaches a point of diminishing returns (Armstrong, 1997). It's very important for investors to understand that expected rate of return does not fall as a result of diversification. Only the variation around the expected rate of return falls. And, variation is risk!

Stand-alone risk is measured by the coefficient of variation and depends on standard deviation and expected rate of return.

$$CV = \frac{\sigma}{\hat{r}} \quad (1)$$

CV = coefficient of variation
σ = standard deviation
$\hat{r}$ = expected rate of return

2.1.2 Non-diversifiable or market risk

Market risk is often called "non-diversifiable" risk. No matter how well an individual company performs, its price may be affected by broad market trends. Market risk stems from factors that systematically affect most firms: high oil prices, terrorist threats, war, inflation, recession, interest rates level, consumer confidence, to name just few of them Brigham, 2004, p. 46). Some are explained in more details below.

- **Inflation and interest rate risk**

According to financial theory, interest rates which change all the time are fundamental to company valuation. Interest rates are connected to inflation and there are different opinions which level of inflation is sound and which bad. European union (EU), which is economic monetary union, has inflation criteria for its member states. Inflation cannot be higher than 1 1/2% of the average inflation rate of the three countries with the lowest individual rates (Maastricht, 1998).

For the most part, real and financial assets seem to move together in response to macroeconomic variables. A downturn in the economy seems to affect both adversely, as does a surge in real interest rates. There is one variable, though, that seems to have dramatically different consequences for assets, and that is inflation. Historically, higher than anticipated inflation has had negative consequences for financial assets, with both bonds and stocks being adversely impacted by unexpected inflation. Fama and Schwert, for instance, in a study on asset returns report that a 1% increase in the inflation rate causes bond prices to drop by 1.54% and stock prices by 4.23%. In contrast, unanticipated inflation seems to have a positive impact on real estate (Damodaran, 2002, p. 730).

Basically, a share's fair value is its projected future cash flows discounted to the present using the investor's required rate of return. If interest rates fall, and everything else is held constant, share value should rise.

Investors "require" a higher return for taking on extra risk by investing in stocks instead of in safe Treasury notes, which are guaranteed to pay a certain return. The extra return that investors can theoretically expect from stocks is referred to as the risk premium. Historically, the risk premium in the US runs at around 7% (Ritter, 2002, p. 7). This means that if the risk-free rate (the Treasury note rate) is 4%, then investors would demand a return of 11% from an average stock.

The total return on a stock is therefore the sum of two parts i.e. the risk-free rate and the risk premium. If one wants higher returns, he must invest in riskier stocks because they offer a higher risk premium than blue chips for instance. If the required return rises, the stock price will fall, and vice versa. The required return might rise if the risk premium or

the risk-free rate increases. So, changes in interest rates impact the theoretical value of companies and their shares: Interest rates impact a company's operations too. Any increase in the interest rates that it pays will raise its cost of capital. Therefore, a company has to work harder to generate higher returns in a high interest environment.

Investors must also be aware that the level of interest rates in the economy will have a major influence on all other capital goods. Stocks become less attractive to investors during times of high interest rates. Even if risk premiums don't change, the zero risk rate goes up with high interest rates. The resulting higher return requirements will cause stock prices to contract.

High interest rates are often associated with inflation expectations, generally a sign that the economy is not healthy. Interest costs will impact some businesses much more than others. Financial institutions and highly leveraged companies will suffer. Rising interest rates will tend to depress these stocks in particular.

- **Currency Risk**

When we invest abroad currency risk becomes an important factor. After World War II, the US dollar emerged as the premier currency on the planet. While still a major world currency, events since then have seen the slow erosion of the once-mighty dollar. European Union being largely also a monetary union with growing number of customers is establishing Euro as an increasingly important currency. Country's macroeconomic picture with its GDP growth, inflation, interest rates, unemployment, balance of payment and producer's and consumer's sentiment define attractiveness of its currency on the world market generating big fluctuations in exchange rates (Mencinger, 2004). Japanese Yen appreciated a lot against US$ in the last decade or two making Japanese goods less attractive for US customers and vice versa. Price of Japanese goods in US$ doubled from 1980 till 2000 if price in yen stayed the same (Bodie, 2002, p. 534). It was shown that 25% of the 171 Japanese multinationals' stock returns were positively correlated with contemporaneous exchange-rate changes in period 1970-1993 (He et al. 1997, p. 1).

- **Political Risk**

For good or evil, governments at all levels have a tremendous impact on the investment climate. We often equate political risk with international or emerging market investing, but our own markets are just as sensitive. Political risks include tax, trade, regulation, education and social policies. A government's attitude on capital and business sets the stage for either success or failure of their economy.

- **Globalization Risks**

Globalization is an opportunity for companies, which knows how to adapt to it but is also a threat for the one's which cannot adapt. Manufacturing is going out from developed countries where labor is expensive and moves to less developed countries. India like that is becoming the World service company and China World manufacturer. The problem, which can bite back, is that when these countries will develop they will be able to set the rules. Today's developed countries if not keeping the knowledge in form of R&D might have problems in the future. They have to concentrate on keeping some comparative (Ricardo,

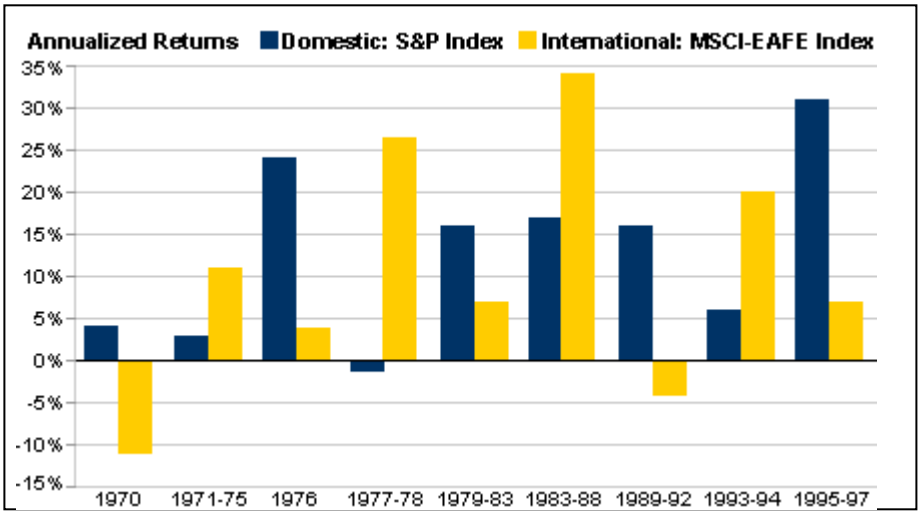
1817) or absolute advantages (Smith, 1776) as basic theories for international markets. Globalization makes markets more efficient also.

2.1.3 Diversification

Fundamentally, diversification is simply the process of spreading risk among different assets in order to reduce volatility. As seen in previous chapters diversification eliminates firm-specific risk. All markets do not move in the same direction at the same time. A properly diversified portfolio will have assets in several markets or segments of markets. Additional step in diversification is global-international diversification. The US market risk had a standard deviation, σ_M of about 20.1% (Brigham, 2004, p.47). International diversification can reduce it down to 11.7% (Bodie, 2002, p.851), as correlation between US and other stocks is well below one. I noticed that correlation is smaller as two markets are more geographically distant and less linked. For example the correlation between the US and Japan stocks is only 0.26, compared to the US versus UK at 0.53 or US to Canada at 0.73 (Bodie, 2002, p.851). Despite sizable trade and financial linkage, the cyclical features of US, Japan and the euro area are quite distinct (McAdam, 2003, p.17).

Many financial experts recommend global diversification more due to magnitude, rather than the direction, of market movement. Schwab research shows that there were nine identifiable periods between 1970 and 1997 when one of the two asset classes clearly outperformed the other, as illustrated in figure 1. In all but three of these periods, both domestic and international securities moved in the same direction. While US stocks have performed better in the last few years, international stocks took the lead as recently as 1993-1994, and through most of the 1980s.

Figure 1: **International vs. domestic (US) stock market compound annualized total returns (i.e., assumes all dividends are reinvested) 1970-1997 (in %)**



Source: Schwab, 2004.

Neither asset class has consistently outperformed the other over any extended period of time (more than five or six years). At the end of 1990s, the US market has clearly

outperformed the international markets as measured by the MSCI-EAFE Index, but the situation may reverse at any time.

Since the early 1990s, investment professionals have been strongly encouraged to diversify their customers internationally in order to take advantage of the correlation (or lack of correlation) between US stocks and those of their international counterparts. The logic behind this strategy is simple. While the United States has the world's largest stock market, more than half of the world's market capitalization is located outside the US. Add the fact that many international markets are affected by different factors than American. Recently, however, the consensus among pundits is that globalization and other factors have caused markets to move more closely together and therefore, greatly reduced the effectiveness of diversifying overseas (Rankin, 2001).

2.1.4 Capital Asset Pricing Model and its critics

Capital asset pricing model (CAPM) is a risk and return model that has been in use the longest and is still the standard in most real-world analysis (Damodaran, 2002, p. 69). This model was developed by Sharpe (1964), Lintner (1965), and Mossin (1966). CAPM model is giving a precise prediction of the relationship between the risk of an asset and its expected return. Expected return (r_i) of equity is a sum of risk-free rate of return (generally long-term treasury bonds) to which we add equities' corresponding risk premium (Mramor, 1993, p. 331).

$$r_i = r_f + (r_m - r_f) * \beta_i \qquad (2)$$

r_f = risk-free rate of return

r_m = requested rate of return on portfolio consisting of all stocks (market portfolio)

$(r_m - r_f)$ = market risk premium of the average risky stock ($\beta = 1$)

β_i = beta coefficient – amount of risk that the stock contributes to market portfolio. Average market beta is one. Stocks with beta above one are riskier and stocks with lower beta are less risky as the market average (Prohaska, 1999, p. 99).

Ibbotson Associates calculates the equity risk premiums for sixteen developed nations. For the period 1970 to 2000 this market-equity premium was 6% for the US and for Japan 6.2% in local currency or 13.6% in US Dollars (Barad, 2001, p. 3). Ibbotson Associates provides also cost of capital report for 172 countries (Ibbotson, 2004).

CAPM model was the most important for nearly 15 years and is still widely used in the real world. In 1976 Richard Roll asked to discard it as he argued as it is still the case today, that it is empirically impossible to verify its single economic prediction. At the same time Ross (1976) developed an alternative model called the arbitrage pricing theory (APT). In addition to that Eugen Fama in 1965 made an argument of the efficient market controversy, as there are thousands of intelligent, well-informed professional investors actively searching for wrongly priced securities. At the end fund managers are just wasting time and money in their attempt to match the market's performance. In past few years many papers question the predictions of some of the major theories of modern finance. It looks now that measures of risk predicted to be important for securities pricing are largely

insignificant to the market. It looks also that the stock market is much less efficient as it looked two decades ago (Haugen 2001, p.3).

Many in academia, including Gordon Gemmill of London City University Business School and Aswath Damodaran of NYU, believe that security prices are semi-strong efficient. Semi-strong efficient implies that all public knowledge is reflected in the price and it is virtually impossible to exploit deviations from the true value based on public information. Only new information will affect the price (Hill, 2004).

2.2 EQUITY MANAGEMENT STRATEGIES

There is no prescription/recipe to pick stocks. Therefore it is better to think of every stock strategy as nothing more than an application of a theory - a "best guess" of how to invest. And sometimes two seemingly opposed theories can be successful at the same time. Perhaps just as important as considering theory, is determining how well an investment strategy fits your personal outlook, time frame, risk tolerance, and the amount of time we want to devote to investing and picking stocks.

For many practitioners stock picking is rather an art than a science. There are a few reasons for this:

- So many factors affect a company's health that it is nearly impossible to construct a formula that will predict its success. It is one thing to assemble data that we can work with, but quite another to determine which numbers are relevant.
- A lot of information is intangible and cannot be measured. The quantifiable aspects of a company, such as profits, are easy to find. But how do we measure the qualitative factors, such as the company's staff, its competitive advantages, its reputation, and so on? This combination of tangible and intangible aspects makes picking stocks a highly subjective, even intuitive process.
- Because of the human (and often irrational) element inherent in the forces that move the stock market, stocks do not always do what we anticipate. Emotions can change quickly and unpredictably. And unfortunately, when confidence turns into fear, the stock market can be a dangerous place. In fact investors sentiment and their expectations have the largest influence on stock prices (Vidic, 2002, p. 79).

First we have to ask ourselves why to invest in stocks, which are very risky assets. As we saw we invest in stocks to get higher returns as on risk free assets like government treasury bills or notes. Historically stocks outperform bonds, treasury bills and cash deposits as investors are looking for risk premium for riskier investments. Common stocks provide an expected future cash flow stream, and a stock’s value is found as the present value of the expected future cash flow stream. The expected cash flows consist of two elements (Mramor, 1993, p. 204):

- The dividends expected in each year and
- The price investors expect to receive when they sell the stock.

Realized returns in stocks can partly depend on dividends that companies pay but we know that not all companies are paying out dividends – especially not at the beginning, when

they can growth faster as the average economy. Increased market value is more important in higher growth industries.

One of the most basic and crucial aspects of stock picking is fundamental analysis, whose theory underlies all of the strategies with the exception of the technical analysis. Although there are many differences between each strategy, they all come down to finding the worth of a company.

There are almost as many investing styles as investing firms and analysts but in general we can find out three main investing styles: Value, growth and the so-called growth at a reasonable price (GARP) (Kleindienst, 2001, p. 316). Next we look at these investing styles in more detail.

2.2.1 Value Investing

Value investing is one of the best-known stock picking methods. In the 1930s, Benjamin Graham and David Dodd, professors at Columbia University, laid out what many consider to be the framework for value investing. The concept is actually very simple: find companies trading below their inherent worth. We could call it a conservative approach which works best in »bad« economic times with low or negative growth, and in times of economic uncertainties also known as the bear market. It suits better to a passive long-term investor not taking care so much on daily volatility and not to active–trader who wants to beat the market by timing it and needs more investor involvement and brings more stress (Investopedia (b), 2004). The value investor looks for stocks with strong fundamentals (earnings, dividends, book value, and cash-flows) that are selling at a bargain price, given their quality. The value investor seeks companies that seem to be incorrectly valued (undervalued) by the market and therefore have the potential to increase in share price when the market corrects its error in valuation. Drop in share price is not a bargain yet but only if it's intrinsic value is higher – we do not compare to historical price but to intrinsic value. Intrinsic value (Graham, Dodd, 1988, p. 41) is the value that would be attached to the firm by an all-knowing analyst, who not only estimates the expected cash flows for the firm correctly but also attaches the right discount rate to these cash flows and values them with absolute precision (Damodaran, 2002, p. 12). One of the greatest investors of all time, Warren Buffet, has proven that value investing can work: his value strategy took the stock of Berkshire Hathaway, his holdings company, from $12 a share in 1967 to $70,900 in 2002 what represents more than 28% annual return. The company beat the S&P 500's performance by about 13.02% on average annually! Although Buffet does not strictly categorize himself as a value investor, many of his most successful investments were made on the basis of value investing principles.

While the efficient market hypothesis (EMH) claims that prices are always reflecting all relevant information, and therefore are already showing the intrinsic worth of companies, value investing relies on a premise that opposes that theory. Markets are not efficient, but they tend to become if their allocation efficiency is increasing and if they are operating with too high expenses (Deželan, 1996, p. 5). Value investors bank on the EMH being true only in some academic wonderland. They look for times of inefficiency, when the market assigns an incorrect price to a stock. Below is a breakdown of some guidelines that value

investors use for picking stocks. Keep in mind that these are, not hard-and-fast rules but merely one set of many possible (Investopedia, 2004).

- Share price should be no more than 2/3 of intrinsic worth.
- Look at companies with P/E ratio at the lowest 10% of all equity securities.
- Price to earnings growth (PEG) should be less than 1.
- Stock price should be no more than tangible book value.
- There should be no more debt than equity (i.e. Debt/Equity (D/E) ratio < 1).
- Current ratio ≥ 2: Current Assets should be two times current liabilities.
- Dividend yield should be at least 2/3 of the long-term S&P AAA bond yield (Damodaran, 2002, p. 79).
- Earnings growth should be at least 7% per annum compounded over the last 10 years.

Value investing is not simply about investing in low P/E stocks. It's just that stocks that are undervalued will often reflect this under valuation through a low P/E ratio, which should simply provide a way to compare companies within the same industry. PEG should be also below one but mainly intrinsic firm value should be higher as market one by some safety margin (Investopedia, 2004). Value stocks seem to have higher returns than growth stocks in markets around the world. Sorting on book-to-market equity, value stocks outperformed growth stocks in twelve of thirteen major markets during the 1975-1995 period (Fama and French, 1998, p. 1997).

2.2.2 Growth investing

The best way to define growth investing is to contrast it to value investing. As mentioned above the value investors are strictly concerned with the here and now; they look for stocks that, at this moment, are trading for less than their apparent worth. Growth investors, on the other hand, focus on the future potential of a company, with much less emphasis on its present price. Unlike value investors, growth investors buy companies that are trading higher than their current intrinsic worth, but this is done with the belief that the companies' intrinsic worth will grow and therefore exceed their current valuations.

As the name suggests, growth stocks are companies that grow substantially faster than others. Growth investors are therefore primarily concerned with young companies, which will not be of my interest in this thesis because in major indexes, such as Nikkei 500, there are mainly established – large capitalization firms. The theory says that growth in earnings and/or revenues will directly translate into an increase in the stock price. Typically a growth investor looks for investments in rapidly expanding industries especially those related to new technologies. Profits are realized through capital gains and not dividends as nearly all growth companies reinvest their earnings and do not pay any dividends. Growth investing gives better results in booming economies (bull markets like it was the case in late 1990s in the US and Europe, for example).

In the US, a National Association of Investors Corporation (NAIC) is one of the best-known organizations using and teaching the growth investing strategy. They suggest that the following aspects should be considered in growth investing (Investopedia, 2004);

1. **Strong historical earnings growth:** The basic idea is that if a company has displayed good growth over the last five- or ten-year period, the company is likely to continue

doing so in the next five to ten years. Growth is in general related to firm's size and industry. For example, an established large-cap will not be able to grow as quickly as a younger small-cap tech company.

2. **Strong forward earnings growth:** Projected five-year growth-rate of at least 10-12%, although 15% or more is more ideal. Analysts, the company, or other credible sources make these projections. The big problem with forward estimates is that, by nature, they are estimates and we have to evaluate their credibility based on industry and stages of industry growth in which firm operates.
3. **Is management controlling costs and revenues?** Focuses specifically on pre-tax profit margins. There are many examples of companies with outstanding growth in sales but less than outstanding gains in earnings. High annual revenue growth is good, but if EPS has not increased proportionately, it's likely due to a decrease in profit margin. We have to compare a company's present profit margins to its past margins and its competition's profit margins, to be able to gauge fairly accurately whether or not management is controlling costs and revenues and maintaining margins. A good rule of thumb is that if company exceeds its previous five-year average of pre-tax profit margins, as well as those of its industry, the company may be a good growth candidate.
4. **Can management operate the business efficiently?** For this the return on equity (ROE) can be used. Efficient use of assets should be reflected in a stable or increasing ROE. Again, analysis of this metric should be relative: a company's present ROE is best compared to the five-year average ROE of the company and the industry.
5. **Can the stock price double in five years?** If a stock cannot realistically double in five years, it's probably not a growth stock. That's the general consensus. This may seem like an overly high, unrealistic standard, but remember that with a growth rate of 10%, a stock's price would double in seven years. So the rate growth investors are seeking is 15% per annum, which yields a doubling in price in five years.

For growth firms the traditional fundamental analysis (comparing last two years data only) can be challenging and potentially unsuccessful (Mohanram, 2003, p. 10). Mohanram received better results in his research, after he modified it by adding growth fundamentals (trends in the last 3-5 years).

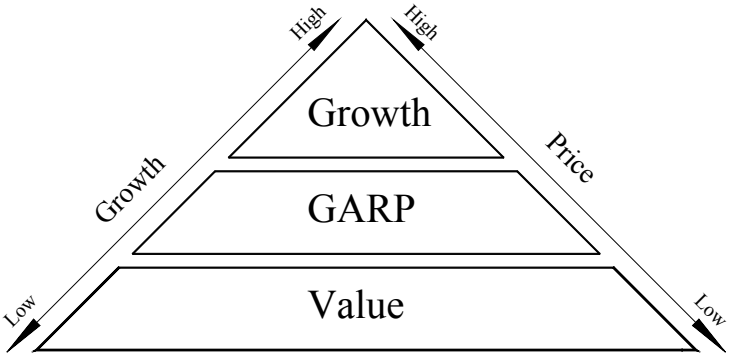
2.2.3 Growth at a reasonable price - GARP

The GARP strategy is a combination of both value and growth investing. One of the biggest supporters of the GARP is Peter Lynch. Many consider Lynch the world's best fund manager, partly due to his 29% average annual return over a 13-year stretch from 1977-1990. GARP »looks« for companies that are somewhat undervalued and have solid sustainable growth potential. The companies chosen fall right in between those sought by the value and growth investors.

In figure 2 I illustrate, how the GARP-preferred levels of price and growth compare to the levels sought by value and growth investors. GARP aims to identify companies that display very specific characteristics. Like growth investors, GARP investors are concerned with the growth prospects of a company: they like to see positive earnings numbers over the past few years, coupled with positive earnings projections for upcoming years. But

unlike growth-investors, GARP investors are skeptical of extremely high growth estimations, such as those in the 25-50% range. Companies within this range carry too much risk and unpredictability for GARPers. To them, a safer and more realistic earnings growth rate lies somewhere between 10 to 20%. For both investing types – growth and GARP, a high and increasing ROE relative to the industry average is an indication of a superior company. They also like positive cash flows or, in some cases, positive earnings momentum (earnings rising above analyst's consensus or company's predictions). Because GARP combines both growth and value I will mostly concentrate on this approach, which gives a lot of freedom to customize it to anybody's personal style.

Figure 2: **Position of Value, GARP and Growth investing strategies in terms of growth and price.**



Source: Ivestopedia, 2004.

GARP strategy looks for higher P/E ratios than value investors do, but does not accept very high P/E ratios favored by growth investors. A growth investor may invest in a company trading at 50 or 60 times earnings, but the GARP investor sees this type of investing as paying too much money for too much uncertainty. GARP looks for reasonable P/Es. Low price to book (P/B) value is also attractive when it is lower as the industry average. A low P/E and P/B are the two more prominent criteria with which GARPers in part mirror value investing. They may use other similar or different criteria, but the main idea is that a GARP investor is concerned with present valuations and looking for stocks which are out of favor but have good fundamentals (Investopedia, 2004), (Contrarian Investor Association, 2004).

The price to earnings growth (PEG) ratio may very well be the most important metric to any GARP investor, as it basically gauges the balance between a stock's growth potential and its value. GARP investors require a PEG no higher than one and, in most cases, closer to 0.5. A PEG less then one implies that, at present, the stock's price is lower than it should be given its earnings growth. To the GARP investor, a PEG below one indicates that a stock is undervalued and warrants further analysis (Investopedia, 2004).

Because a GARP strategy employs principles from both value and growth investing, the returns that GARPers see during certain market phases are often different than the returns strictly value or growth investors would see at those times. For instance, in a raging bull market the returns from a growth strategy are often unbeatable: in the Internet boom of the mid- to late-1990s, for example, neither the value investor nor the GARPer could compete. However, when the market does turn, a GARPer is less likely to suffer than the growth investor.

Therefore, the GARP strategy not only fuses growth and value stock-picking criteria, but also experiences a combination of their types of returns: a value investor will do better in bearish conditions, a growth investor will do exceptionally well in a raging bull market, and a GARPer will be rewarded with more consistent and predictable returns.

2.3 APPROACHES TO SECURITY ANALYSIS

There are two major types of analysis for predicting the performance of a company's stock - fundamental and technical. In general, fundamental is thought of as a long-term strategy, while technical is used more for short-term strategies.

Even if top-down approach is part of the fundamental analysis I am discussing first top-down and bottom-up approach below.

2.3.1 Top-down and bottom-up approach

The prospects of the firm are tied to those of the broader economy and fundamental analysis must consider the business environment in which the firm operates.

It often makes sense to do a "top-down" analysis of a firm's prospects. Macroeconomic and industry circumstances might have a greater influence on profits than the firm's relative performance within its industry. So it is advised to start with a broad economic environment, examining the state of the aggregate economy and due to growing impact of the globalization even the international economy. From there, one considers the implication of the outside environment – PEST analysis (political, environmental, social, technological) on the industry in which the firm operates. We have to take care about business cycles – recurring pattern of recession and recovery as different industries perform differently based on how consumers can adapt consumption. Finally, the firm's position within the industry is examined. This can be done with benchmarking with the best players in the industry. Industry life cycle has to be analyzed as for each technology there is one best period of higher growth. During the rapid and increasing growth stage there is a window of opportunity when innovative firms position themselves in a new industry or with new technology. In later stages when growth starts to stabilize, slow down or even decline they can harvest their success (Timmons, 1994, p. 42).

We can distinguish four major levels of top-down analysis (Bodie et al., 1999, p.502).

1. **Global economy:** International environment affects the firm's export prospects, the price competition from external competitors, or the profits it makes on investments abroad. As explained already in market risk chapter, even if most countries are linked in global macro economy, there is considerable variation between the economic performances across countries at any time. Global environment presents in addition political risks and from September 11th 2001 global terrorism and war in Afghanistan and Iraq have very negative influence on world economy and oil prices. In general economy prefers stable conditions for growth – there are always some branches, which can profit from recent developments like defense, security and oil exploration industry.
2. **Aggregate economy or domestic macroeconomic environment** is where all firms operate. On the example of S&P 500 index it was clearly shown that the level of the

broad market and aggregate earnings do trend together as 50% of sock price variation can be explained by broad market variation (Fisher, Jordan, 1987, p. 90). The ability to forecast the macro economy better as your competitors can translate into spectacular investment performance. Rapidly growing GDP indicated an expanding economy with ample opportunity for a firm to increase sales. One can look for supply and demand shock – factors or events that can affect the demand for goods and services like tax rates changes, fiscal policy, increase in government spending or foreign demand or changes in price of commodities, raw materials and labor force, freezes, floods, or droughts. Business cycles are the result of repeating periods of expansion and contracting. Cycles can be irregular. Three factors determine the sensitivity of a firm's earnings to business cycle: sensitivity of sales, which relates to necessity of goods, operating leverage, which refers to the division between fixed and variable costs and financial leverage. Cyclical industries producing durable goods are not performing well in recession but do better in expansion. Defensive industries on the other side (food producers and processors, pharmaceuticals and public utilities) producing necessities have little sensitivity to business cycle and will perform better as cyclical in recession mainly. In Japan we can expect that with improved sentiment and expansion shown in growth of GDP cyclical industries will perform better after 13 years of recession (looking the stock movements) – or at least deflation. Capacity utilization rate in manufacturing is the most sensitive indicator of business cycles. Some other industries concerned with interest rates like homebuilders and banks are on the other side penalized when interest rates are going higher.

There are so called leading economic indicators, which tend to rise and fall in advance of the rest of the economy. These indexes can start to drop few months in advance. In the US in period from 1959 till 1998 they started to drop from 3 to 15 months in advance (Šimon, 1996, p.52). These indicators are (Bodie, 2002, p. 543): average weekly hours of production workers in manufacturing, initial claims for unemployment insurance, manufacturers' new orders (consumer goods and materials industries), vendor performance – slower deliveries diffusion index, new orders for non-defense capital goods, new private housing building permits, yield curve slope: 10-year treasury minus federal funds rate, stock prices, S&P-500, money supply (M2), index of consumer expectations. There are also coincident and lagging indicators and as their name suggest, they move in tandem with or somewhat after the broad economy.

3. **Industry analysis** is important because not all industries are equally sensitive to the business cycles. For instance earnings growth varies a lot across different industries. Industry groups show even more dispersion in their stock market performance as above-mentioned earnings growth can indicate. This is important to know also for small investors, as there are mutual funds with an industry focus available from the biggest investing firms. Industry boundaries are not so easy to establish when we are looking which firms to put in the same industry. One possibility is to use four-digit codes assigned by SIC - Standard Industry Classification in the US. First two digits of the SIC code denote very broad industry classification, while the last two are used for fine classification. For industry analysis we have to look also where in industry (product) life cycle firm is positioned (Kumar, 2004): 1. In early start-up stage when new products emerge and it is not clear yet which company will emerge and is connected with rapid and increasing growth. 2. Consolidation stage where product

becomes established, industry leaders emerge and industry still grows faster as the rest of the economy. 3. Maturity stage when product reached its full potential, production move to less developed countries and margins shrink and harvesting is used instead of reinvesting, 4. Relative decline – industry becomes less attractive as the rest of economy. For industry structure and performance we can do also five forces analysis (Porter, 1998, p.5) and look for threats of entry, rivalry between existing competitors, pressure from substitute products, and bargaining power of buyers and suppliers. Some also add 6th force – the government, which is important consumer and can change the regulations affecting the business.

4. **Position of the firm within its industry**. Like we can compare different industries we can compare also different firms within the same industry. We can compare:
   - Size of the company (from blue chip big established firms to new micro cap firms)
   - Liquidity on the stock exchange (higher the better for investor)
   - Business model, market positioning,
   - Management team CEO, President, CFO (their background, CV, vision, strategy,..)
   - Firm's value (book value of assets, replacement value)
   - Financial analysis and trends (profitability, margins, P/E, P/S, EBITA, Debt,..)
   - Growth potential
   - Company forecasts

Contrary to the top-down approach, the bottom-up approach de-emphasizes the significance of economic and market cycles. This approach focuses on the analysis of individual stocks. In bottom-up, investing industry and economic conditions are overlooked and considered secondary to the target firm. Advocates of the bottom-up approach simply look to find strong companies with good prospects. What constitutes "good prospects," however, is a matter of opinion. Some investors look for earnings growth while others are attracted to companies with low P/E ratios. A bottom-up investor will compare companies based on these fundamentals as long as these companies are strong in the industry and the business cycle really doesn't matter (Gauthier, 2004).

In my thesis, as I concentrate on two different industries only, I am becoming partly partisan of this later bottom-up approach. On the other side while looking for global trends, macroeconomic situation and industry analysis, I can also venture my opinion if buying stocks at particular moment in analyzed industries is advised or not.

2.3.2 Fundamental stock analysis

Fundamental analysis is a method used to evaluate the worth of a security by studying the financial data of the issuer, which we can find in income statement, balance sheet and cash flow statement, and on expected future dividends and earnings. It scrutinizes the issuer's income and expenses, assets and liabilities, management, and position in its industry. In other words, it focuses on the "basics" of the business (Ameritrade, 2004).

Fundamental analysis focuses on creating a portrait of a company, identifying the intrinsic or "fundamental" value independent of the current sale price of its shares, and buying or selling the stock based on that information. Although there are many different methods of finding the intrinsic value: a company is worth the sum of its discounted cash flows or all

of its future profits added together (Investopedia (a), 2004). The only natural cash flow from a public company to its shareholders is a dividend, and the dividend discount model (DDM) values a company based on its future dividends. However, a company doesn't pay out all of its profits in dividends, and many profitable companies don't pay dividends at all.

Some of other valuation options commonly used to assess company fundamentals, which will be discussed more in details after, include: Cash flow, free cash flow, book value or liquidation price of a company, financial analysis, conservative gearing; history of profit retention for funding future growth; and soundness of capital management for the maximizing of shareholder earnings and returns.

Book value is based on historical costs, not current values, but can provide an important measure of the relative value of a company over time. Book value can be figured as assets minus liabilities, or assets minus liabilities and intangible items such as goodwill; either way, the figure that results is the company's net book value. This is contrasted with its market capitalization, or total share price value, which is calculated by multiplying the outstanding shares by their current market price. Most stocks trade above book value because investors believe that the company will grow and the value of its shares will, too. When book value per share is higher than the current share price, a company's stock may be undervalued and a bargain to investors. In fact, the company itself may be a bargain, and hence a takeover target (Forsythe, 2004).

A crucial question facing fundamental analysts is how to extract value-relevant information from published financial statements and how to incorporate it into the prediction of a firm's intrinsic value (Chung and Kim, 2001, p. 88). Fundamental analysis is based on ratio analysis. We can distinguish four groups of ratios, namely (Jain, 2003, Chapter 4, p.1):

1. Liquidity ratios
2. Solvency ratios
3. Efficiency / activity ratios
4. Profitability ratios

1. **Liquidity ratios** (relevant for short term creditors). They show the ability of the firm to meet its short-term maturing obligations (i.e., current liabilities) as and when they fall due to payment. In the normal course of business, these liabilities have to be paid out of current assets. Current ratio, acid or quick ratio, debtors turnover ratio, creditors turnover ratio, inventory turnover ratio are main liquidity ratios.

- *Current ratio* (CR) is calculated as current assets, divided by current liabilities. It is a measure of a company's liquidity, or its ability to meet current debts. Higher the ratio, better the liquidity. As a rule of thumb, a healthy company's current ratio is 2-to-1 or greater; however, it's important to compare the ratio to that of other companies and to industry standards.

$$Current\ ratio = Current\ assets / Current\ liabilities \quad (3)$$

$$Current\ assets = cash + inventories + accounts\ receivable \quad (4)$$

$$Current\ liabilities = accounts\ payable + income\ tax\ payable + accruals + notes\ payable \quad (5)$$

- *Quick ratio* (QR): Current assets minus inventories divided by current liabilities gives you the quick ratio. Nicknamed the "acid-test ratio," the quick ratio is a measure of a company's ability to meet creditors' short-term demands, as inventory is generally harder to convert to cash than other current assets may be. This is especially important if a company faces a sudden downturn in business. Generally, a good quick ratio is 1-to-1 or higher, but again, it's more important to compare a company's ratio with that of other companies in the same industry (Forsythe, 2004).

$$Quick\ ratio = (Cash + Marketable\ securities) / Current\ liabilities \quad (6)$$

2. **Solvency ratios** are useful in particular for long-term (LT) lenders. They measure the firm's ability to meet obligations arising from long-term borrowings. These long-term obligations are in form of (i) periodic payment of interest or installments as and when it becomes due and (ii) repayment of principal/loan on maturity. Interests are paid from earnings before interests and taxes (EBIT).

   The main solvency ratios are: interest coverage ratio (for interests only as part of EBIT), debt-service coverage ratio (if repaid in installments), total debt to total assets ratio, total equity to total assets ratio, long-term debt to total assets ratio, debt to equity ratio (D/E)…

- *Debt-to-equity ratio* provides a measure of a company's debt level. It is calculated by dividing total liabilities by shareholders' equity. Shareholders' equity ratio of 1-to-2 or lower indicates that a company has relatively little debt. Ratios vary; however, depending on a company's size and its industry, so we have to compare a company's financial ratios with those of its industry peers before drawing conclusions.

- *Total debt-to-shareholders' equity ratio* (TD/SE) is a useful measure of bankruptcy risk. It compares a company's combined long- and short-term debt (TD) to shareholders' equity (SE). Shareholders' equity is share capital plus retained earnings minus treasury shares. It is the amount of the company that is financed through common and preferred shares, or book value. High-debt companies have higher D/E ratios than companies with low debt. According to debt specialists, companies with D/E ratios below 0.5 carry low debt. And that means that conservative investors will give companies with D/E ratios of 0.5 and above a closer look.

$$TD/SE = Total\ debt / Shareholders'\ equity \quad (7)$$

$$Total\ debt = Long\ term\ debt + Short\ term\ debt \quad (8)$$

$$Shareholders'\ equity = total\ assets - total\ liabilities \quad (9)$$

  At the same time, the D/E ratio doesn't always say much on its own. It should be accompanied by an examination of the debt interest coverage ratio or how many times we can cover interest expenses by earnings before interests, taxes, amortization, and depreciation (EBITDA) ratio in the same period.

$$Interest\ coverage\ ratio = EBITDA / Interest\ expenses \quad (10)$$

3. **Efficiency/activity ratios** are concerned with measuring the efficiency of assets utilization and effectiveness of management. They relate assets to sales. Inventory (finished goods, work-in-process, raw materials) turnover ratios (higher the better),

debtors' turnover ratio, current asset turnover ratio, working capital turnover ratio, LT-assets turnover ratio… are the main efficiency ratios.

4. **Profitability ratios** are of crucial importance for existing shareholders and potential investors. They can be determined on the basis of (i) sales and (ii) investments.

- ***Profitability ratios related to sales*** can be divided on profit side (revenue – expenses). Higher are better. Profitability ratios are gross profit ratio/margin, operating profit margin and net profit margin. On the expense side (lower the better) we have: cost of goods sold ratio, administrative expense ratio, selling expense ratio, operating expense ratio, and financial expense ratio.
- ***Profitability ratios related to investments,*** which are divided in three major categories: return on assets (ROA), return on capital employed (ROCE) and return on shareholders' equity (ROE). We can define also investment ratios like earnings per share (EPS), dividends per share (DPS), and price/earnings (P/E) ratio. Screening on price multiples is common investment practice for identifying under- and over-priced stocks (Penman and Zhang, 2002, p. 8).

- *Price to earnings ratio* (P/E) is the most widely used and misused of all multiples (Damodaran, 2002, p. 468). It is calculated as follows

$$\textit{Price–to-Earnings ratio} = P/E = \textit{Market price per share} / \textit{Earnings per share} \quad (11)$$

While there's no set rule as to what's a good P/E, a low P/E is generally considered good because it may mean that the stock price has not risen to reflect its earning power. A high P/E, on the other hand, may reflect an overpriced stock or decreasing earnings. As with all of these ratios, however, it's important to compare a company's ratio to the ratios of other companies in the same industry. Graham (1951) used low P/E ratios as a screen for finding undervalued stocks. Studies (Basu, 1977, p. 663, 1983, p.129) confirmed that low P/E stocks outperformed high P/E stocks in a period from 1967 to 1988.

- *Price to book ratio* (P/B) is also commonly used ratio and many proved that (Damodaran, 2002, p. 139). Capaul, Rowley, and Sharpe showed that stocks with low P/B ratio outperformed the market globally by 1.88% and in Japan by 3.43% annualized between 1981 and 1992 (Capaul et al., 1993, p. 27).

$$\textit{Price-to-Book ratio} = P/B = \textit{Market value of equity} / \textit{Book value of equity} \quad (12)$$

Stock with low P/B ratio and high equity return spread which is (ROE – cost of equity k_e) is undervalued as we can connect P/B with dividend discount model (Damodaran, 2002, p. 515).

$$P/B = \frac{ROE - g_n}{k_e - g_n} \quad (13)$$

$$\textit{ROE} = \textit{Net income after preferred dividends} / \textit{Book value of common equity} \quad (14)$$

k_e = cost of equity
g_n = growth rate in dividends (forever)

- *Book-to-market ratio* (B/M) is the ratio of a firm's book value of equity to its market value of equity. This ratio is the opposite of P/B and is often used by researchers (Fama and French, 1992, Ohlson, 1995, Piotroski, 2000), who showed that financially strong-

high B/M firms outperform the market. There is one advantage of B/M relative to its peers. Since book value is a "stock" variable, while earnings, cash flow and sales are "flow" variables; there is a tendency for B/M rankings to be somewhat more stable over time than the rankings based on the other variables like earnings, sales or cash flow. This reduces portfolio turnover for strategies that are based on B/M rankings (Davis, 2001).

- *Price to earnings growth ratio* (PEG) is used as a measure of relative value, with a lower value believed to indicate that a firm is undervalued. Mainly analysts tracking firms in high-growth sectors are using this ratio (Damodaran, 2002, p. 487).

$$PEG\ ratio = (P/E\ ratio) / Expected\ growth\ rate \quad (15)$$

  As with the P/E ratio, the PEG ratio is used to compare the valuations of firms that are in the same business.

Ratio analysis is a commonly used tool of financial analysis because it makes related information comparable and hence more meaningful, relevant and useful. In order to judge how well a firm has performed, we have to compare it with other firms in one of the following ways:

1. *Historical or trend analysis* is concerned with comparing the firm's performance in the past. This shows the trend and indicates whether the performance has improved, deteriorated or virtually remained steady over the years.
2. *External/inter-firm comparison* is concerned with comparing the firms, engaged in the same line of business or the industry as a whole. Benchmarking, where we have to compare with the best-managed firms in the industry, does this. This comparison reflects the firm's own performance in relation to its competitors and enables to judge its position vis-à-vis other firms operating in the same industry. Finding similar firms is not always easy also because many big companies have several divisions acting in different industries.
3. *Comparison with firm's own set of standards or plans* to judge the actual performance with its pre-set standard/budget figures based on management's expectations.

A solid business model remains the bedrock of every successful investment. To distinguish the great companies from the losers, investors should learn how to describe and evaluate companies' business models. Joan Magretta, former editor of the Harvard Business Review, highlights two critical tests for sizing up business models. When business models don't work, it's because they don't make sense and/or the numbers just don't add up to profits. The savvy investor should also watch out for unusual share price declines. Almost all corporate collapses are preceded by a sustained share price decline. Enron's share price started falling two years before it went bust. The same holds true for WorldCom.

Investors should take profit warnings very, very seriously. While market reaction to a profit warning may appear swift and brutal, there is growing academic evidence to suggest the market systematically under-reacts to bad news. As a result, a profit warning is often followed by a gradual share price decline (Hong et al, 2000, p. 265).

Companies are required to report, by way of company announcement, purchases and sales of shares by substantial shareholders and company directors. Executives and directors have the most up-to-date information on their company's prospects; so heavy selling by one or

both groups can be a sign of trouble ahead. While recommending that investors buy his company's stock, Enron chairman Kenneth Lay sold $123 million in shares in 2000. That was nearly three times his gains in 1999, and nearly ten times what he made in 1998. Admittedly, insiders don't always sell simply because they think their shares are about to sink in value, but insider selling should give investors pause.

The sudden departure of key executives (or directors) can also signal bad news. While these resignations may be completely innocent, they demand closer inspection. Warning bells should ring the loudest when the individual concerned has a reputation as a successful manager or a strong, independent director.

One should also be wary of the resignation or replacement of auditors. Naturally, auditors tend to jump ship at the first sign of corporate distress or impropriety. Auditor replacement can also mean a deteriorating relationship between the auditor and the client company, and perhaps more fundamental difficulties within the client's business.

We have to take care not to assess the performance of the firm in isolation because we do not have the complete picture without industry comparison. We have to exclude also extra-ordinary items such as, abnormal losses, abnormal gains, capital work-in-progress and amount spent on modernization or expenses of the firm, against which commercial production has not yet commenced.

All in all, performing fundamental analysis is a lot of hard work. But that is, arguably, the source of its appeal. By taking the trouble to dig into a company's financial statements and assess its future prospects, investors can learn enough to know when the stock price is wrong. Those investors able to spot the market's mistakes can make a lot of money. At the same time, buying companies based on intrinsic, long-term value protects investors from the dangers of day-to-day market flux. Many research works showed that fundamental analysis could bring abnormal returns (Abarbanell and Bushee, 1997, p. 28) mainly when associated with one-year ahead earnings changes (Ou and Penman, 1989, p. 297).

However, the fact that fundamental analysis shows that a stock is under-valued does not guarantee that it will trade at its intrinsic value any time soon. Things are not so simple. In reality, real share price behavior relentlessly calls into question almost every stock holding, and even the most independent-minded investor can start doubting the merits of fundamental analysis.

On the other side research showed that short sellers (selling borrowed stocks from your broker and buying them back when the price would drop and profit from the price difference) are looking for overvalued stocks based on fundamental analysis to make profits. (Dechow, 1999, p. 20) Short sellers position themselves generally in stocks with low fundamental to price ratio Cash Flow/price, E/P, B/P, Value/Price and that with their action they help to bring the stock value to its fundamentals.

2.3.3 Technical analysis

Technical analysis is a method used to evaluate the value of a security by studying market statistics. Unlike fundamental analysis, technical analysis disregards an issuer's financial statements. Instead, it relies upon market trends to ascertain investor sentiment to predict how a security will perform.

Technical analysis is looking for peaks, bottoms, trends (most commonly used moving averages are the 20, 30, 50, 100, and 200 day), patterns, and other factors affecting a stock's price movement and then making a buy/sell decision based on those factors. Technical analysts believe that historical performance of the stock and the market are indications of future performance. Today, the world of technical analysis is huge. There are literally hundreds of different patterns and indicators investors claim to be successful.

2.3.4 Which type of analysis is better?

Fundamentalists and technicians have been at odds with one another since the advent of investing. There is no clear answer as to which is right. Sometimes it appears that the technicians make better picks. Other times it seems the fundamentalists are making the right call. Three variants of popular answers are (Ameritrade, 2004):

- If you are a "long-term" investor looking for companies with solid foundation, growth and income potential, the fundamentals may sway you.
- If you are a "short-term" investor (trader) looking for companies who are "on the verge" of being discovered, fundamentals will be useful to you.
- If you are a "long-term" investor who is not as concerned about one company's basics because you will diversify to minimize risk, or you are a "short-term" investor waiting for investor sentiment to change, then technical analysis will be helpful to you.

Today, many investors find both fundamental and technical analysis helpful in painting a more complete and colorful picture on the investment canvas. Whether you use an asset allocation, buy and hold, or market timing strategy, you will find useful information from both the fundamentalists and technicians. The technicians can tell you about the broad market and its trends. The fundamentalists tell you whether an issue has the "basics" necessary to meet your investment objectives.

2.4 STOCK VALUATION MODELS

In general there are three approaches to evaluations. The first, discounted cash flow (DCF) valuation, relates the value of an asset to the present value (PV) of expected future cash flow on that asset. The second, relative valuation, estimates the value of asset by looking at the pricing of comparable assets relative to a common variable such as earnings, cash flows, book value or sales. The third, contingent claim valuation uses option-pricing models to measure the value of assets that share option characteristics (Damodaran, 2002, p. 11).

While discounted cash flow valuation is only one of the three ways of approaching valuation and most valuations done in the real world are relative valuations, it is the foundation on which all other valuation approaches are built (Damodaran, 2002, p. 11). Relative method is useful to measure relative values, while the discounted cash flow method is better way to measure absolute values (Yao, 2004, p.34). Discounted cash flow valuation formula sums all future cash flows of an asset over its lifetime and for this we have to make assumptions about future growth what is not easy.

$$Value = \sum_{t=1}^{t=n} \frac{CF_t}{(1+r)^t} \tag{16}$$

n = life of the asset
CF_t = cash flow in period t
r = discount rate reflecting the risk of the estimated cash flows

A number of different assumptions about growth-rate patterns have been made and embodied in valuation models. The three most widely used are presented in figure 3 and described below (Elton and Gruber, 1995, p. 450):

2.4.1 Gordon's constant growth model

This constant-growth dividend discount model (DDM) is based on a future series of dividends that grow at a constant rate. Given a dividend per share that is payable in one year, and the assumption that the dividend grows at a constant rate forever (in perpetuity), the model solves for the present value of the infinite series of future dividends. Scenario of constant-growth is shown in figure 3.

$$P_0 = \frac{DPS_1}{k_e - g} \tag{17}$$

P_0 = current stock price
DPS_1 = expected dividend per share one year from now.
k_e = required rate of return for equity investor = cost of equity
g = growth rate in dividends forever

The Gordon (1962) growth model is best suited for stable firms growing at a rate equal or lower than the nominal growth in the economy and which have well established dividend policies that they intend to continue into the future. Like regulated companies, such as utilities, large financial service companies, real estate investment trusts. It is very simple and does not give very good results. For high growth stocks not paying any dividend is not usable. In addition k_e and g have very important influence on final result.

2.4.2 Multistage growth model

This is an improved stable growth DDM formula, which can adapt to a certain degree to the industry's life cycle (two to three stages are used normally), which takes into account different dividend growth rates in the future. But again, our estimates are no better as the assumptions we use in formula. Below is stock evaluation formula for two-stage growth:

$$P_0 = \frac{DPS_0 + (1+g) + \left(1 - \frac{(1+g)^n}{(1+k_{e,hg})^n}\right)}{k_{e,hg} - g} + \frac{DPS_{n+1}}{(k_{e,st} - g_n)(1+k_{e,hg})^n} \tag{18}$$

DPS_t = expected dividends per share in year t
k_e = cost of equity (hg: high growth period, st: stable growth period)
g = extraordinary growth rate for the first n years
g_n = growth rate forever after year n

Since the two-stage dividend model is based on two clearly delineated growth stages – high growth and stable growth – it is best suited for firms that are in high growth and expect to maintain that growth rate for a specific time period, after which the sources of the high growth are expected to disappear. Figure 3 shows different growth scenarios for which these formulas are developed.

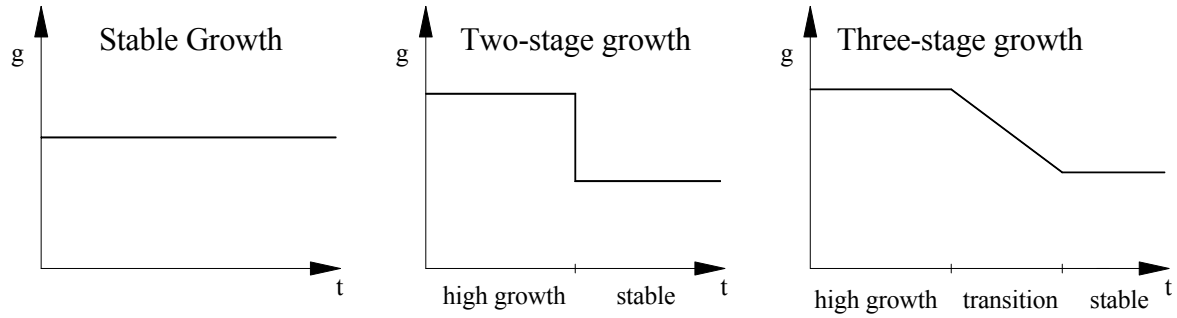
More complicated are H Model and three-stage dividend discount model, which is the combination of the two-stage model and the H model [(1)] (Damodaran, 2002, p. 341).

$$P_0 = \sum_{t=1}^{t=n1} \frac{EPS_0 \times (1 = g_a)^t \times \prod_a}{(1 + k_{e,hg})^t} + \sum_{t=n1+1}^{t=n2} \frac{DPS_t}{(1 + k_{e,t})} + \frac{EPS_{n2}(1 + g_n) \times \prod_n}{(k_{e,st} - g_n)(1 + r)^n} \qquad (19)$$

High –growth rate Transition Stable growth phase

EPS_t = earnings per share in year t
DPS_t = dividends per share in year t
k_e = cost of equity (*hg*: high growth period, *t*: transition, *st*: stable growth period)
g_a = extraordinary growth rate (lasts *n1* periods)
g_n = growth rate forever after year n
Π_a = payout ratio in high-growth phase
Π_n = payout ratio in stable growth phase

Figure 3: **Presentation of stable growth, two-stage growth and three-stage growth for dividend or cash flows.**



Source: Damodaran, 2004.

2.4.3 Free cash flow models

The discounted dividend model is based on the premise that the only cash flows received by stockholders are dividends. But this does not work for firms paying no dividends or firms with very low payout ratio. Another possibility is to use the free cash flows model instead of the one based on dividends.

(1) "H" model is a two-stage model for growth, but unlike the classical two-stage model, the growth rate in the initial growth phase is not constant but declines linearly over time to reach the stable growth rate in steady stage. Illustration of this is if we take only the transition and stable growth phase from the three-stage model in figure 3.

Free cash flow measures what a firm has left over after it's paid all its operating expenses and laid out the necessary cash to keep replenishing its factories, equipment, etc. as they wear out. A firm with negative free cash flow may have to borrow money, issue shares or cut back operations to stay viable. A firm with positive free cash flow has the means to pay dividends, pay down debt, buy back shares or make acquisitions.

Cash flow is much more important to look at than earnings, as it shows how much money a company really has to continue its current operations. Earnings can be falsified by slow depreciation or credit sales, which have not entered yet. Special attention should be made if reported earnings exceed the cash flow it generates from operations. Earnings information is found in the income statement and cash flow information in the statement of cash flows (Forsythe, 2003).

The *free cash flow to equity* (FCFE) measures the cash left over for equity investors after all reinvestment needs are met (net capital expenditures and working capital needs) and after all debt commitments have been fulfilled (interest expenses and principal payments) (Damodaran, 2002, p. 252).

The *free cash flow to firm* (FCFF) is the sum of the cash flows to all claim holders in the firm, including stockholders, bondholders and proffered stockholders. This is a measurement of a company's profitability after all expenses and reinvestments (Damodaran, 2002, p. 382–383).

$$\begin{aligned} \textit{Free Cash Flow to Equity (FCFE)} = \textit{Net income} &- (\textit{Capital expenditures} - \textit{Depreciation}) \\ &- (\textit{Changes in noncash working capital}) \\ &+ (\textit{New debt issued} - \textit{Debt repayments}) \end{aligned} \quad (20)$$

$$\begin{aligned} \textit{Free Cash Flow to Firm (FCFF)} = \textit{FCFE} &+ \textit{Interest expense (1-Tax rate)} \\ &+ \textit{Principal repayments} - \textit{New debt issued} + \textit{Preferred dividends} \end{aligned} \quad (21)$$

$$\textit{FCFF} = \textit{EBIT (1-Tax rate)} + \textit{Depreciation} - \textit{Capital expenditure} - \Delta\textit{Working capital} \quad (22)$$

The free cash flow models correspond to figure 3 growth scenarios and equations are the same as for the discounted dividend model valuations except that we replace the dividend per share (DPS) with free cash flow to equity (FCFE) when valuating equity and free cash flow to firm (FCFF) when evaluating firm.

We have to be careful which cash flows we discount. The discount rate should be consistent with the cash flow being discounted. Cash flow to equity model uses the cost of equity k_e, while cash flow to firm model is used with the cost of capital k_c as a discount rate.

We should use equity valuation for firms, which have stable leverage, whether high or not, and if equity (stock) is being valued. We have to use firm valuation: (i) for firms which have high leverage, and expect to lower the leverage over time, because debt payments do not have to be factored in the discount rate (cost of capital) does not change dramatically over time, (ii) for firms for which you have partial information on leverage (eg: interest expenses are missing, (iii) and in all other cases, where we are more interested in valuing the firm than the equity (Damodaran, 2004).

Table 1: **Summary of the characteristics of the valuation models**

	Dividend Discount Model	FCFE Model	FCFF Model
Stable Growth Model	• Growth rate in firm's earnings is stable. (g of $firm_{economy}$+1%) • Dividends are close to FCFE (or) FCFE is difficult to compute. • Leverage is stable	• Growth rate in firm's earnings is stable. ($g_{firmeconomy}$+1%) • Dividends are very different from FCFE (or) Dividends not available (Private firm) • Leverage is stable	• Growth rate in firm's earnings is stable. ($g_{firmeconomy}$+1%) • Leverage is high and expected to change over time (unstable).
Two-Stage Model	• Growth rate in firm's earnings is moderate. • Dividends are close to FCFE (or) FCFE is difficult to compute. • Leverage is stable	• Growth rate in firm's earnings is moderate. • Dividends are very different from FCFE (or) Dividends not available (Private firm) • Leverage is stable	• Growth rate in firm's earnings is moderate. • Leverage is high and expected to change over time (unstable).
Three-Stage Model	• Growth rate in firm's earnings is high. • Dividends are close to FCFE (or) FCFE is difficult to compute. • Leverage is stable	• Growth rate in firm's earnings is high. • Dividends are very different from FCFE (or) Dividends not available (Private firm) • Leverage is stable	• Growth rate in firm's earnings is high. • Leverage is high and expected to change over time (unstable).

Source: Damodaran, 2004.

Although DDM and FCFE valuation models are based on vastly different information, theoretically they should provide the same value of the equity. Integrating the cash flow inputs of these two equity valuation models results in the creation of an implied terminal growth rate of dividends. The implied terminal dividend growth rate causes a discounted stream of dividends to equal a discounted stream of free cash flows to equity (Gentry et al., 2002, p.16).

When we discount cash flow to equity we should use the dividend discount model for: (i) firms, which pay dividends (and repurchase stock) which are close to the Free Cash Flow to Equity (over a extended period), and (ii) for firms where FCFE are difficult to estimate (Example: Banks and Financial Service companies).

On the other side we use the discount cash flow to equity FCFE for: (i) Firms, which pay dividends that are significantly higher or lower than the free cash flow to equity. (As a rule of thumb, if dividends are less than 75% of FCFE or dividends are greater than FCFE) (ii) For firms where dividends are not available (Example: private companies, IPOs) (Damodaran, 2004).

The value of the firm is obtained by discounting the free cash flow to the firm at the average cost of capital. Embedded in this value are the tax benefits of debt (in the use of the after-tax cost of debt in the cost of capital) and expected additional risk associated with debt (in the form of higher costs of equity and debt at higher debt ratios). As with the

dividend discount model and FCFE model, the version of the model used depends upon assumptions made about future growth.

As with the dividend discount and FCFE models, a firm that is growing at a stable rate that it can be sustain in perpetuity – a stable growth rate – can be valued using a stable growth model.

$$Value\ of\ firm = V_0 = FCFF_1 / (WACC - g_n) \quad (23)$$

$FCFF_1$ = expected $FCFF$ next year
$WACC$ = weighted average cost of capital
g_n = growth rate in the $FCFF$ forever

2.4.4 Valuation based on market multiples

While in theory when discussing valuation we tend to focus most on discounted cash flow valuations, the reality is that most valuations are relative valuations. In relative or market multiple valuation, the value of an asset is derived from the pricing of comparable assets, standardized using a common variable such as earnings, cash flows, book value, or revenues. Unlike discounted cash flow valuations, which are a search for intrinsic value, market multiple relative valuation as name tells relies much more on the market (Damodaran, 2002, p. 18).

While the discounted dividend method applies valuations concepts in a precise manner, focusing on expected cash flows, market multiple analyses is more judgmental. Many of multiples used in fundamental analysis were mentioned above already so here I am listing six different strategies Zacks investing firm proposes and what returns they brought. We have to be careful because all data's about returns are not directly comparable – not for the same period. The majority of firms try to maximize their attractiveness and set the scale to give the best picture possible when advertising their products. This is very well seen also in Slovenia when investing firms propose their funds.

Examples of Zacs investing strategies and returns of corresponding portfolios are listed below: (Source: Zacks, 2004)

- **Earnings and margins**: Earnings are the single most important metric for a company. When combined with a healthy net profit margin such portfolio returned +58.5% gain in 2001 and an even more incredible +103% return in 2003.
- **Return on equity**: One of the quickest ways to gauge whether a company is creating assets or gobbling up investor's cash is to look at their ROE. Such portfolio screened for highest ROE brought +70.4% in 2003 and is up almost +10% already in 2004 (Thru 4.16.2004).
- **Upgrades and revisions**: This screen focuses on earnings per share (EPS) Revisions, along with analyst ratings and rating changes. According to Zacks Investment Research "earnings estimate revisions are the most powerful force impacting stock prices". Return of such strategy was 310% over the last few years (1.5.2001-4.16.2004). This confirms research from Womack who found out that when stock is added to buy it added 7-8% in one and three months period after upgrade (Womack, 1996, p.137).

- **Recent price strength**: This strategy proves that the "trend is your friend" with a +111.9% return in 2003. This screen looks for stocks trading in the upper range of their 52-week highs. These stocks have generated an average annual return of +61.4% over the last 3 years. This approach is more technical analysis based so I give it here just for information.
- **Price to earnings growth** (PEG): The PEG ratio compares a stock's price/earnings (P/E) ratio to its expected EPS growth rate. If the PEG ratio is equal to one, it means that the market is pricing the stock to fully reflect the stock's EPS growth. This is "normal" in theory because, in a rational and efficient market, the P/E is supposed to reflect a stock's future earnings growth. PEG based portfolio brought a +114.4% return in 2003.
- **Growth and income**: This profit track looks for stocks that are maximizing dividend payouts to its shareholders. Although a longer term and less risky screen, it still managed to return +50.8% in 2003 including a dividend yield averaging over 8%.

2.5 CRITERIA FOR SELECTING STOCKS

In this section I describe the method that I will apply in order to choose stocks with the best fundamentals from selected industries. I will use the market multiples analysis and a comparison between firms, as I am going to look at companies in two specific industries. I have an advantage to compare them directly in order to find out the ones most promising for future capital gains and to quickly eliminate the ones, which look overpriced relative to the others in that industry.

First, firms of the two surveyed industries will be divided further in sub-industries or sectors, to compare firms with similar operations - producing and marketing similar products or services. I will show some main characteristics of each of these sub-industries and present firms classified within them. Based on all used literature and hundreds of interviews with analysts heard on CNBC, I selected a set of different market multiples and trends which seems the most important for me to evaluate the stock.

As every analyst has his/her own model, I also developed my own, in which I am trying to take into account many different ratios and trends. As the stock price reflects mainly future returns I will put more emphasis on forward-looking statements that companies publish. The problem is that firms are reluctant to disclose them, also due to the recession in the beginning of this decade and unstable economic environment.

In my model for stock evaluation I will be using a scoring system. For market multiples I will put data directly in the table as found or recalculate them from other available data. I will calculate the multiples' average of all firms for the sub-industry. By comparing firm's multiple with sub-industries average I will assign points for each criteria as explained in chapter 2.5.1. (Personal selection criteria and their use in the final model). In the same chapter it is also explained how I will assign points for multiple's trends, which are used in my model. The sum of all assigned points give the final score. The higher the total score, the more attractive the firm looks to a potential investor.

For my analysis, I will use mainly the data from Bloomberg information system, Nikkei.net interactive, Ameritrade online broker database and Yahoo financial sites. My

second main sources of information are the annual reports of analyzed firms, which are available on the Internet. When I looked at how analysts and researchers select stocks I saw that they typically take only a couple of ratios out of a hundred or more available. I found out that most often used ratios are P/E, P/B, ROE, P/Sales, and free cash flow (Jermaniš, 2003, p 6-7, Sekavčnik, 1998, p. 20-30, Navellier, 2003, p. 4).

In my selection process I will use the following criteria (corresponding abbreviation used in tables after for each of criteria is shown in parenthesis on the right hand side):

1. Current P/E ratio	(P/E)
2. P/E trend of the last five to six years	(P/E trend)
3. Forward P/E ratio for the whole fiscal year	(Forwd P/E)
4. Net profit for the last two years	(2net profit)
5. Return on equity	(ROE)
6. ROE trend of the last five to six years	(ROEtrend)
7. P/B ratio	(P/B)
8. PEG ratio	(PEG)
9. PEG points	(PEG points)
10. Market capitalization points	(MC points)
11. Free cash flow per share divided by price	(FCF/s/P*f)
12. Stock's liquidity on the Japanese stock exchange	(Liquidity)
13. Future growth expectations	(Gr.Expect.)
14. Sales growth trend of the last five to six years	(Sales Gr tr.)
15. Total debt to total shareholder equity ratio	(TD/SE)
16. Trend of total debt to total shareholder equity ratio	(TD/SE tr)
17. Current ratio	(CR)
18. Current ratio trend of the last five to six years	(CR trend)
19. Inventory trend as a percentage of total assets in last five to six years	(Invent.trend)
20. Dividend trend of the last five to six years	(Dividend tr.)
21. Last FY cash and short -term investments as a % of total assets	(Cash/Assets)
22. P/EBITDA ratio	(P/EBITDA)
23. Beta	(BETA)
24. My points	(My points)

2.5.1 Personal selection criteria and their use in the final model

In this chapter I present all criteria and their corresponding formulas showing how points are assigned to each criteria. I developed my formulas, which try to simulate expected relationship between criteria and stock performance and assigned subjective weights used to balance the influence of all criteria for the final score. This was a demanding process, which took many iterations to come to the state I present.

1. **Current P/E ratio**: For the current P/E ratio I took data from Nikkei.net on July 17th 2004 for the communication industry and on July 24th for the electric machinery firms.

(24)

$P/E_{av,subind}$ = average sub-industry current *P/E* ratio
P/E_{firm} = firm's current *P/E* ratio

2. **P/E trend of the last five to six years**: I took consolidated fiscal yearly data to filter out seasonal effects of the P/E ratio. For technology firms having higher volatility it is difficult to extract this trend as P/E can vary considerably from year on year and sometimes it is not available due to firm's losses. Where it was possible I compared the results from two sources. This was possible only for couple of big firms, which are listed also in the US as an American Depositary Receipts (2) (ADRs). When looking for the P/E trend my approach is to linearize the trend of the last five to six years and note down the slope. If trend is towards lower P/E ratio the result is positive, otherwise the result is negative. To get attributed points I multiplied the result by …. Values for this trend are limited in range from –7 to +7 points and are directly added to final score.

3. **Forward P/E ratio for the whole fiscal year**: Data from Bloomberg financial report is used. I attributed weight of …, as these are only forecasts.

(25)

$P/E_{av,subind}$ = average sub-industry forward *P/E* ratio
P/E_{firm} = firm's forward *P/E* ratio

4. **Last two years net profit**: Sum of the last two FY net profits from Bloomberg. I took two last fiscal years due to volatility, as there were a lot of firms without positive net profit in the last year. Weight is made through division by … and power of ….

(26)

If this profit was negative I subtract this result, if positive I add it to final result.

5. **Return on Equity**: Information was taken from Nikkei.net on July 17th 2004 for the communication industry and on July 24th for the electric machinery firms.

(27)

If ROE was negative I subtract this result, if positive I add it to final score.

6. **ROE trend of the last five to six years**: This trend is calculated in the same way as the P/E trend. Bloomberg was the source for historical ROE. Points were directly added to result. Values for this trend are limited in range from –9 to +5 points.

7. **P/B ratio**: Data were taken from Nikkei.net on July 17th 2004 for the communication industry and on July 24th for the electric machinery firms.

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(2) The stocks of most foreign companies that trade in the US markets are traded as American Depositary Receipts (ADRs). US depositary banks issue these stocks. Each ADR represents one or more shares of foreign stock or a fraction of a share. If you own an ADR, you have the right to obtain the foreign stock it represents, but US investors usually find it more convenient to own the ADR. The price of an ADR corresponds to the price of the foreign stock in its home market, adjusted to the ratio of the ADRs to foreign company shares (US Security & Exchange Commission, 2004).

(28)

$P/B_{av,subind}$ = average sub-industry current *P/B* ratio

P/B_{firm} = firm's current *P/B* ratio

Together with points of *P/B* alone, I add also points depending on ROE/(P/B) related to whole sub-industry.

(29)

$[ROE/(P/B)]_{av,subind}$ = average industry ratio of *ROE* to *P/B*

8. **Price to earnings growth**: This was one of the most difficult ratios to get. If available, I took estimated PEG from Bloomberg. If not I tried to make my own valuation. This result does not go directly to final results but was transferred to PEG points discussed under the following point. PEG is one of the most important factors in the GARP investing strategy.

9. **PEG points**. Points were attributed based on PEG reading as shown in table 2 below and are directly added to final result.

Table 2: **Personal attribution of PEG points based on PEG reading**

PEG	<0.6	0.6-0.65	0.66-0.7	0.71-0.8	0.81-0.9	0.9-1	1-2	2-4	4-6	6-8	8-10	10+
Points	8	5	4	3	2	1	0	-1	-2	-3	-4	-6

10. **Market capitalization**: Bigger the company means in general more sure investment. I took recent market capitalization from Nikkei.net. For communication industry I took data on July 17th 2004, for electric machinery on July 24th 2004. Values for market capitalization are in the range from –2 to +6 points and are directly added to the final result.

Table 3: **Personal attribution of Market capitalization (MC) points where market cap is expressed in ¥ Billion (B) or trillion (T)**

Market Cap	<100B	100B+	200B+	400B+	800B+	1.6T +	3.2T +	6.4T +
I give points	-2	0	1	2	3	4	5	6

11. **Free Cash Flow per share price**: Based on Bloomberg data I took FCF/share and I divided it by share price. Based on the trend I multiplied the result by –2 when the trend was towards strong falling of FCF/share, to up to factor +2 when this trend was very positive.

(30)

factor = [-2, -1, 0, 1, 2] dependent on trend. When trend is negative and slow I multiply by –1, when positive and slow I multiply by +1, when stronger trend I multiplied by +2 or –2, dependent on trend. If the number under square root is positive I add the points, otherwise I deduct them. Function and factor … is used to assign the proper weight to this criterion.

12. **Stock's liquidity on the Japanese stock exchange**: Data from Nikkei.net are used. I multiply the number of shares traded in the last 12 months by its price and based on that I receive estimation of money exchanged in that stock in one year at last price. If I would look only the volume without share price, results would not be so good as stock prices differ a lot.

$$Liquidity = Volume\ (in\ 1000) * Price\ (in\ 1000) \quad (31)$$

Table 4: **Personal attribution of liquidity points calculated on volume in the last 12 months multiplied by stock price data.**

Liquidity	< 100K	100K +	200K +	400K +	800K +	1600K +	3200K +
Liquidity points	-5	0	1	2	3	4	5

13. **Growth expectations**: Bloomberg data for the long-term (LT) growth were taken and based on reading points were attributed as shown in Table 5. These points were directly added to final result.

Table 5: **Personal attribution of Gr.Expect points**

LT growth[%]	<-2	[-2,0]	+[0,2]	+[2,4]	+[4,8]	+[8,16]	> +16
Growth points	-3	-1	1	2	3	4	5

14. **Sales growth trend of the last five to six years**: Bloomberg data from financial report were surveyed and points attributed in the same way as for the P/E trend. If sales were stable in the last five to six years result is 1. Points were directly added to final result.

15. **Total debt to total shareholder equity ratio**: I divided the total liabilities by shareholders equity from last available financial year's data from Bloomberg. I decided to look for the total debt to total shareholder equity as proposed by Jain (Jain, 2003, p.4/21) and not only long term debt as Peter Lynch proposed (Lynch, 1989, p. 201).

(32)

Constant 0.6 was taken as approximation of very sound TD/TE ratio and added in the first part of the equation not to favor firms with very low TD/TE ratio too much. Multiply factor 3 is used to give a weight to so calculated ratio. Points were added to final result.

16. **Trend of total debt to total shareholder equity ratio**: Bloomberg data from last five to six years were checked and linearized as for the P/E ratio. In case ratio was very stable the result can be also +1 or –1. Points were directly added to final result.

17. **Current ratio**: Direct data from Bloomberg were taken and compared with the average sub-industry result. These points were added to the final result to respect the logic that higher CR means better result for the firm to cover its short-term obligations. Multiply factor … is used to assign proper weight to this criterion. In the second part of the equation (8) I added to CR number 1.5, which starts to be a reasonable CR to eliminate the disproportion for firms having this ratio very low.

(33)

18. **Current ratio trend of the last five to six years**: Bloomberg data were used and trend points calculated in the same way as for the P/E trend with linearization of this trend and multiplying the slope result by factor …. Rising CR gives positive points while falling CR gives negative points. Received points are directly added to the result.

19. **Inventory trend as a percentage of total assets in the last five to six years**: Points are attributed in the same way as for the P/E trend based on Bloomberg data. Rising inventories give negative points, as it is bad for the company. Points are directly added to result.

20. **Dividend trend of the last five to six years**. Bloomberg data are used and I divide latest stock dividend with the average from 5-6 years ago to get points. If dividends are stable over the last five to six years I give zero points, if they tripled I give three points. Points are directly added to final result.

21. **Cash and short-term investments as a percentage of total assets**. I summed Cash data and short-term investments from Bloomberg data for the last available fiscal year. Higher cash position means that firm has higher value by itself and that profits are in fact done on smaller working assets.

(34)

So received points are added to final result.

22. **P/EBITDA**: I took this ratio from Bloomberg. From the average sub-industry ratio in which I classified the firm I deducted firms ratio. Like that firms with higher P/EBITDA ratio as average receive negative points and firms with lower P/EBITDA positive points.

(35)

23. **Beta coefficient**: I have not used it really as technology firms are known to be more volatile. In fact I was surprised to see that Japanese technology stocks do not have too high 12 month trailing betas. Information for beta was taken from Bloomberg.

24. **My points**: Based on the total impression of above data, but mainly the prospects of the products or services that firm produces or provides, comments from the firm's management, and recent news I attributed my points and added them directly to the final score for each company. I limited my points in the range of –2 up to +3.

I entered the data in established formulas based on which I calculated the final score for each firm. I tried to implement expected relationships similar as Pahor and Mramor (2001, p. 4) did between ROE and financial ratios. Formulas changed during the process, as I tried to attribute points in a way to simultaneously filter data, to balance the final score and to give each of above parameters the appropriate weight. This formula could, of course, be quite different and surely every analyst has his/her own preferences for some parameters and weights associated with them. In my case, total debt to total shareholders equity and trend of this ratio gets quite an important weight. For technology firms, sales growth is very important, together with expected price to earnings growth (PEG).

3 CHARACTERISTICS OF THE JAPANESE STOCK MARKET

In this chapter I will first present a short history of the Japanese stock market, its importance in the global economy and main characteristics of the Nikkei stock exchange indexes. Nikkei 225 historical performance in the last two decades will be presented and the comparison of the Japanese generally acceptable accounting practices (GAAP) to other broadly used standards will be shown.

In the 1870's, a securities system was introduced in Japan and public bond negotiation began. This resulted in the request for a public trading institution; and, the "Stock Exchange Ordinance" was enacted in May 1878. Based on this ordinance, the "Tokyo Stock Exchange Co., Ltd." was established on May 15, 1878; and trading began on June 1st 1978.

In March 1943, the "Japan Securities Exchange Law" was enacted to reorganize the Stock Exchange as wartime controlled institution. On June 30, 1943, 11 stock exchanges throughout Japan were unified and a quasi-public corporation, the "Japan Securities Exchange", was established (dissolved in April, 1947).

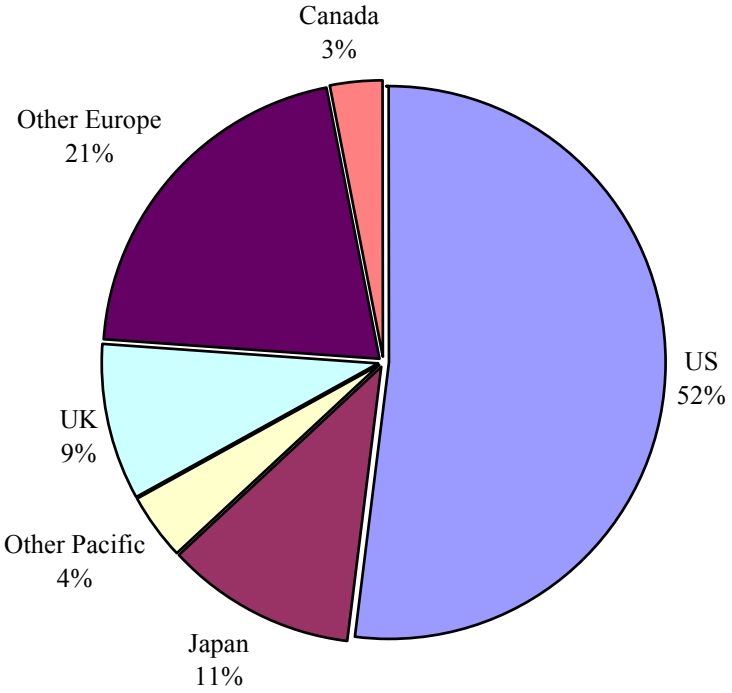
With worsening war conditions and air raids on the main island of Japan, the securities market was forced to suspend trading sessions on all securities markets from August 10, 1945. It was difficult to re-open the Stock Exchange by a Memorandum of Supreme Commander of Allied Powers (SCAP) in September 1945; however, trading was restarted by unofficial group transactions in December of 1945.

The Securities and Exchange Law was enacted in March of 1947, and entirely revised in April of 1948. On April 1, 1949, three stock exchanges were established in Tokyo, Osaka and Nagoya. Trading on these exchanges began on May 16. In July of that same year, five additional stock exchanges were established in Kyoto (merged into Osaka Securities Exchange in March 2001), Kobe (dissolved in October 1967), Hiroshima (merged into Tokyo Stock Exchange in March 2000), Fukuoka and Niigata (merged with Tokyo Stock Exchange in March 2000). In addition, the Sapporo Securities Exchange was established in April 1950. Consequently, Japan now has five stock exchanges (TSE, 2001).

Japan had the financial leadership over the Pacific Basin region until Japanese crisis started in 1990s, when this leadership switched to the US. This switch can be read also as an indication of openness of the Asian markets towards a unique, global financial market (Busetti, 2003, p. 15). Globalization is seen by increasing foreign ownership of Japanese equities (18,6% in 1999), mainly by foreign institutional investors who made 38.6% of the total TSE trading volume in 1999 (Hiraki, 2003, p. 3).

Based on figures from the year 2002 Japanese stock market capitalization represented 11% of world capitalization making it the second larges stock market. As there are countries with different GDP growth also global picture in market capitalization changes over time. In the year1970 US stocks represented 66% of total world market capitalization, in the year 2002 this share dropped to 52% and is still falling.

Figure 4: **World market capitalization estimation by countries at the end of 2002**.



Source: World Market Capitalization by Country—Morgan Stanley Capital International Blue Book[SM]. Exchange Rates 1980–1987, OECD Main Economic Indicators Historical Statistics, The Wall Street Journal & NYSE.

3.1 CHARACTERISTICS OF THE NIKKEI STOCK AVERAGE

Nihon Keizai Shimbun-Sha, a well-known financial newspaper-publishing firm, started to publish Nikkei index.

Main Japanese stock indices are:

- Nikkei 225 Stock Average
- Nikkei 500 Stock Average
- Nikkei Stock Index 300
- Nikkei JASDAQ Average
- Nikkei All Stock Index
- Nikkei Style Indices (Value and Growth by size)

3.1.1 Nikkei 225 stock average

The Nikkei Stock Average is Japan's most widely followed index of stock market activity and has been calculated continuously since September 7, 1950. (Before that date, the Tokyo Stock Exchange calculated the Tokyo Stock Exchange Adjusted Average Stock Price, so index-based measurement of the market actually goes back to May 16, 1949.)

The current calculation method, called the Dow Jones method, has been used since 1950. The 225 components of the Nikkei stock average are among the most actively traded issues on the first section of the TSE. The index reflects the ex-rights-adjusted average stock price.

Since the Nikkei stock average is expected to represent the performance of stocks on the first section - and by extension the market in general - the mix of components has been rebalanced from time to time to assure that all issues in the index are both highly liquid and representative of Japan's industrial structure.

The previous round of rule changes governing deletion and addition of components took place in October 1991. The revisions mandated replacement of issues whose trading volume had declined considerably with highly liquid alternatives, all with an eye to maintaining balanced representation by the various industrial sectors. Japan's economic and industrial environment has changed rapidly over the past 10 years and activity in the stock market has reflected this.

In recent years, the pace of change has accelerated. Notably, an entirely new industry has emerged around information technology (IT). During this period of change, Japan has been suffering through a protracted recession characterized by sluggish capital investment and weak consumer spending.

These circumstances have resulted in a situation where lines are being clearly drawn between winners and losers, and these corporate strength differentials are driving a wave of mergers and acquisitions. A state of bi-polarization has thus come to shape the stock market.

In response to these changes, Nikkei in October 1993 introduced the Nikkei 300 (Nikkei Stock Average of 300 Selected Issues), a weighted average based on market capitalization of 300 component stocks. This was followed in June 1998 by the launch of Nikkei Style Indexes (Value and Growth), which was created to recognize diversification in asset management styles.

The debut of new indices illustrates Nikkei's recognition of the need to measure stock market performance from a variety of perspectives. The benchmark Nikkei Stock Average "225 Selected Issues" is constantly assessed to assure that it accurately represents Japan's economic conditions, industries and markets. It was these changes in the industrial and investment environments that necessitated revisions to the rules covering selection (addition and deletion) of index components.

In modifying the selection rules, Nikkei used input from the Index Committee, a closed group of academics and professionals formed to review the index. Revisions to the selection criteria led Nikkei to replace a relatively large number of issues in an effort to make sure the Nikkei average accurately reflected structural changes in industry and the stock market. Adherence to the principals governing calculation of the index ensures historical continuity -one of the most important characteristics of the Nikkei Stock Average.

3.1.2 Nikkei 500 stock average

The Nikkei 500 Stock Average (Nikkei 500) as Nikkei 225 is calculated using the Dow Method. The only difference is that it incorporates the prices of 500 issues listed on the 1st section of the Tokyo Stock Exchange. Components are reviewed on a regular basis to ensure the index accurately reflects the general trend of equity prices.

Nikkei began calculating the index on January 4, 1972 (its first reading was 223.70) and publicly announcing it on January 4, 1982. Using groups of stocks from among the same 500 issues, Nikkei also calculates and announces industry-specific sub-indexes (Nikkei Stock Average by Industry). Indexes are calculated for a total of 36 sectors. For my analysis here I selected two of these 36 industries that are closest to my professional background. These two industries are communication and electric machinery.

Nikkei 500 index is a weighted average calculated as shown below:

$$Nikkei\ 500 = Sum\ of\ stock\ prices\ of\ 500\ components/Divisor \quad (36)$$

The systems for determining price priorities and adjusting divisors are the same as those used for the Nikkei Stock Average. This divisor was 770.050 on August 26th, 2004 (Source: Nikkei.net, 2004).

Index components are re-selected each year by ranking stocks based on trading volume, trading value and market capitalization. A total is calculated for each stock using its scores in each of these three categories for the preceding three years. Approximately 30 issues are removed and the same number added each year.

3.2 HISTORICAL PERFORMANCE OF NIKKEI 225 AND ITS MAIN FACTORS BEHIND

The performance of the main Japanese stock index - Nikkei 225 from the recession in 1982, until the beginning of 1990 was extraordinary. From a low of about 7000 points this index had a phenomenal run with an average 24% gain in the next eight years until 1990 when it topped around 40000 point. A "bubble economy" developed, the stock market boomed (Markham, 2002, p. 61). This period was followed by a 13 years of drop, which brought index down to 7800 points in spring 2003. Japan was in a stock market recession with a very low inflation and deflation. Japan had the biggest recession of all developed countries after WWII and it even deepened after1997 with negative GDP growth (Pfajfar, 2002, p.1).

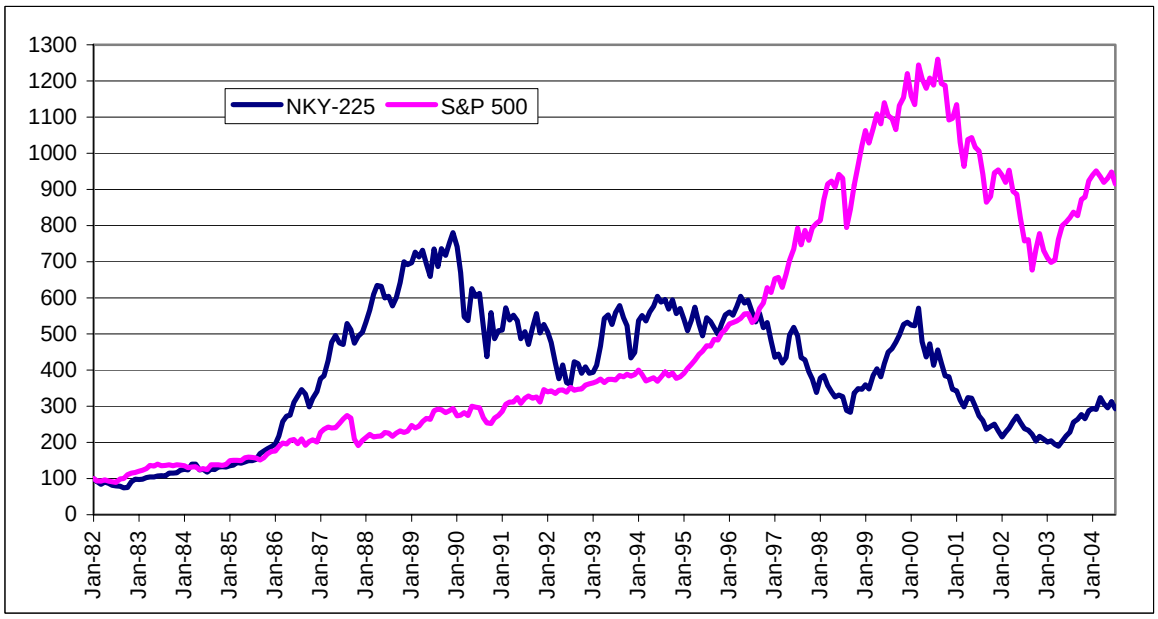
In the 1990s and in the beginning of the 21st century Japanese economy was characterized by the following events (Mori et al. 2001, p. 56):

- Real estate and stock exchange bubble from 1980s exploded and many banks, companies, funds and individuals suffered huge wealth drop.
- Very long low GDP growth – sometimes even negative one.
- Very low (also negative) growth of monetary aggregates
- Company's balance sheet worsening and accumulation of non efficient bank loans
- Jen appreciated a lot in 1990s and exports to US and Euro area suffered.

Figure 5: **The performance of Nikkei 225 stock index in period January 1994 - July 2004 (monthly closing prices)**

Source: Yahoo Finance, 2004.

Figure 6: **Performance of NIKKEI-225 compared to S&P-500 from January 1982 till the end of July 2004 (in %)** (both index had 100% at the end of January 1982)

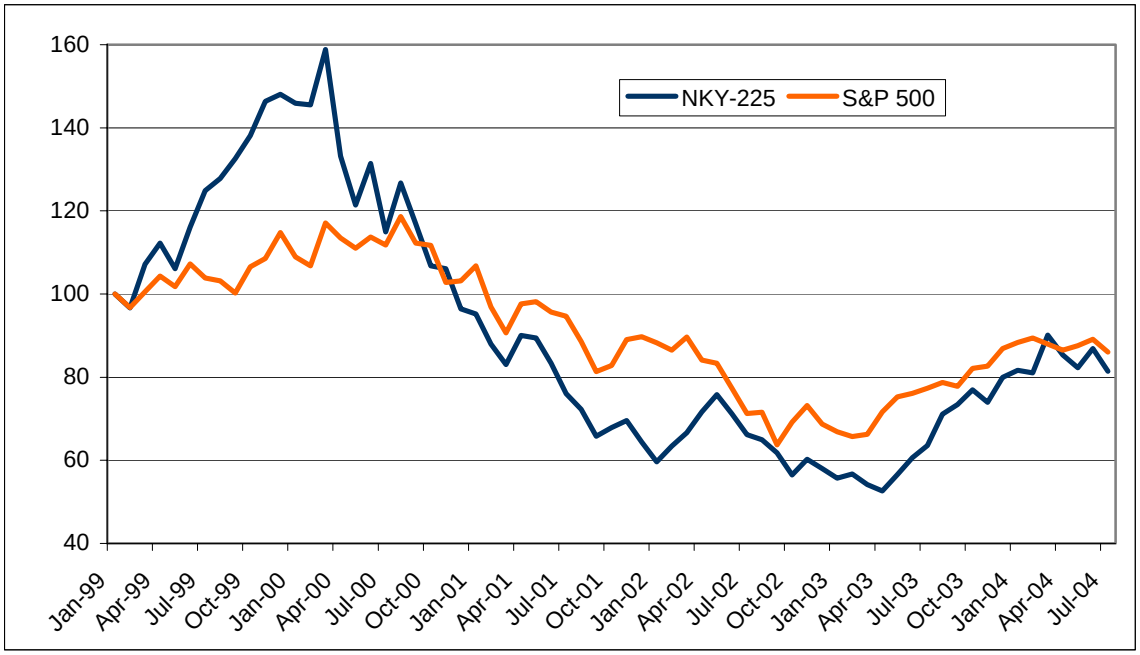


Source: Bloomberg, 2004.

In the last 22 years investment in S&P index brought a more than three times higher return as investment in Nikkei 225 stock index. From Japanese recession in 1982 on, Nikkei largely outperformed the S&P 500 till 1990 when Japanese bubble burst and trends reversed. Highest drops were when Japanese economy entered official recession in 1991 and 2001. Figure 7 in which I compare the performance from January 1999 until the end of

July 2004, shows completely different picture. Globalization of Japanese financial markets has made them more efficient and the performance of its main index with S&P 500 is well correlated (Park et al., 2002, p. 331). Fewer analysts' coverage slows the adjustment of stocks to common information (Hameed, 2003, p.3). Markets are more efficient as economy is globalizing and more global investors analyze Japanese stocks.

Figure 7: **Nikkei 225 and S&P 500 index from January 1999 to the end of July 2004 (in % -** both indexes started at 100% in January 1999**)**



Source: Bloomberg, 2004.

Giving predictions is very difficult but one very reasonable tells that the Nikkei stock average will move between 10,500 and 12,750 through the end of 2004. Judging from price-earnings ratios and other yardsticks, Japanese stocks are still attractive global investment targets, notes Akio Yoshino, chief economist at SG Yamaichi Asset Management Co. Japanese equities are undervalued relative to domestic bonds if measured against the yield spread between them (Yashino, 2004). I find this prediction reasonable because US S&P 500 is almost flat for the year 2004 while Nikkei 225 is more robust and up by more than 6% at 11463 (July 17th 2004 close) in the same period.

3.3 A COMPARISON BETWEEN JAPANESE GENERALLY ACCEPTABLE ACCOUNTING PRACTICES (GAAP) AND INTERNATIONAL ACCOUNTING STANDARDS

Generally Acceptable Accounting Practices (GAAP) is different all over the world but as economy is more and more global, there is a trend to establish comparable accounting practices. Existing practices have still some "holes" as showed also the Enron case, which strengthen the case for IAS International Accounting Standards (Woof, 2003, p.1663).

Japanese GAAP differs from US GAAP in many ways, such as the equity method of accounting and accounting for unrealized gains and losses on debt and equity securities, capitalization of interest costs, compensated absence and severance lump-sum payments, impairment of long-lived assets, derivative financial instruments and income taxes (prior to the year ended March 31, 2000). For the "old" system a few differences are listed below:

- The concept of corporate earnings as funds that can be distributed to stockholders, as opposed to the US/UK concept of measure of corporate performance.
- Significant off-balance sheet assets and liabilities, leading to deceptively low earnings per share (and consequently unrealistically high price-earnings ratio.
- Tax laws allowed the creation of reserves for 40 per cent of retirement payment liability computed on the basis that all employees retired at the current balance sheet date. Such reserves are usually not funded.

Recently accounting practices tend to converge and improve towards globally accepted standards. An article by the Confederation of Asian and Pacific Accountants and a document by the Financial Services Agency (FSA) recently showed a brief comparison of Japanese accounting standards (JGAAP) with those of International Accounting Standards (IAS)/International Financial Reporting Standards (IFRS) and United States GAAP standards, in order to give an update of the status of the JGAAP. The FSA concluded that Japanese GAAP is one of "high quality internationally recognized accounting standards" mentioned in the G8 Declaration on "Fostering Growth and Promoting a Responsible Market Economy in June 2003". There are few differences between Japanese GAAP and IFRS, except for some relatively minor ones. Financial statements prepared by listed companies in accordance with Japanese GAAP have high comparability for investors with those in accordance with IFRS or US GAAP (FSA, 2004).

Convergence of accounting standards is an important goal, considering the fact that Japanese securities issuers participate in global business and fund-raising activities using financial statements prepared in accordance with Japanese GAAP, they have strong incentive for the convergence of accounting standards. Convergence process would progress more efficiently by making use of such incentive inherent in market participants.

The Accounting Standards Board of Japan ("ASBJ") established in July 2001, has committed continuously to improve Japanese GAAP in line with developments in other major internationally recognized accounting standards including IFRS and US GAAP. As part of this effort, the ASBJ will continue to work together with the IASB to develop high quality accounting standards. Through such process, current differences between Japanese GAAP and IFRS will be reduced.

Table 6 on the next page is a comparison of Japanese accounting standards (JGAAP) with those of International Accounting Standards (IAS) / International Financial Reporting Standards (IFRS) and United States GAAP standards.

4 FUNDAMENTAL ANALYSIS OF SELECTED NIKKEI 500 COMMUNICATION AND ELECTRIC MACHINERY INDEX STOCKS

In a top down approach I will first show the global economic situation in the first half of year 2004. Japanese domestic economic situation will be discussed next. I will show some Japanese macroeconomic trends and problems. Business cycles and technology cycles related to Nikkei 500 communication and electric machinery firms with list of different products and services will be listed, before I categorize firms in each of two industries in detail and analyze them to give recommendations in which stocks investment looks to be attractive.

4.1 TOP-DOWN APPROACH TO FUNDAMENTAL ANALYSIS OF JAPANESE STOCKS

The world economy is becoming more and more a single melting pot, where trade barriers are removed one by one even if there are big battles against wild globalization. Developed countries to stay competitive in global economy are outsourcing more and more and are losing manufacturing capacities due to cheaper work force in less developed countries, especially in the far-east like China, Taiwan, Philippines, Indonesia. Specially China is becoming a world manufacturer, while India having advantage of wide spread English speaking and young population is becoming a service for other companies from all over the world. India has a very well developed software industry and enough well qualified white-collar workers to satisfy rising needs for cheaper services, which can be outsourced. If both these countries stay on course, their economic influence will double due to their high growth, supported by real appreciation of their currencies (Delong, 2004).

There are three well developed big regions: United States, European Union and Japan. One of US top ranked stock analysts Louis Navellier said couple of days ago: “American business has gotten itself into more trouble in the last 5 years than in the last 50…” (Navellier, 2004, p. 5). Their politics of one single super power and world policeman not taking in account United Nations and majority of other countries put them, and whole world in a very uncertain position, which economy does not like. They certainly did also a lot of good but some almost unilateral decisions like war in Iraq and looking too much on their own interests brought instability, bigger threat of terrorism, high oil prices, hostile sentiment toward US and their allies from Arab and especially Islamic world. The US defense and security industries flourished and few of them profit from this. But the reverse side is that additional security brings new charges. People, who are losing their freedom, start to be afraid and are limited in their movements (personal observations and conclusion based on CNBC and other news).

On the other hand there is European Union, recently extended to 25 countries, where differences between them became bigger as before. Common market and regulations can help but many different interests can also block its future development. Japan looks to be coming out from the biggest recession one developed country experienced after the WWII and is also vulnerable as it depends on global economy.

The world's stock markets are more closely linked than ever before. The US economy as the largest world economy sets the tone for the global economy, and from its performance and patterns we are taking lessons how other economies can react in similar situations. US equities represented 49.02% of total world capitalization in year 2000. Japan is also developed country like US and has the second largest part of 12.2% in world capitalization in 2000 (Bodie, 2002, p.849). There was a recession in USA, Europe and continued one in Japan after the Internet bubble burst at the beginning of year 2000. In addition, September 11th 2001 terrorists attack brought new geopolitical instability and all major stock indices were corrected and reached their bottom in spring 2003 when US attacked Iraq to remove Saddam Hussein under excuse to eliminate weapons of mass destruction he should posses. At that time there were so many negative factors in stocks that they started to go up in hope it can not become worse any more.

The US stocks continue to grind higher as persistent geopolitical and election uncertainty, fears of a hard landing in China (from very high GDP growth levels), and concerns that the US federal reserves may be forced to hasten its monetary tightening amid evidence of inflationary pressures appear to have been absorbed by the market. While increased input costs (particularly oil) have sparked some signs of retail inflation, unit labor costs remain contained amid robust productivity growth, raw material prices have moderated as China attempts to restrain an overheating economy, and OPEC recently lifted its production quota.

The major risks faced by the US and global economy (Sonders, 2004):

- Persistent strength in crude oil prices could hinder economic growth and spur inflation amid simmering geopolitical risk, lean US crude inventories, and tight supply.
- A sharper-than-expected slowdown in China's economy could hamper global growth, with potentially negative consequences for profit growth in the US and elsewhere as China is crucial for global growth for all countries somehow involved with their economy. China is one of the most important Japanese trade partners.
- The tight US presidential race has introduced potential tax policy uncertainty, with unknown implications for corporate profits, consumer spending, and equity performance.
- Continued hyper-stimulative monetary and fiscal policy, as well as a renewed surge in commodity prices, could spark undesirable inflation, significantly boosting interest rates and detracting from the relative appeal of equities.
- The massive US current account deficit continues to be subsidized by foreign investment. A sudden change in policy or a substantial outflow of private capital could initiate a destabilizing drop in the greenback.
- Danger of and eventual terrorist attacks in the US or their allies.

The European economy is lagging behind the US and its growth is much lower as it did not use similar instruments as US to boost the economy (tax cuts and incentives, accelerated depreciation, lower interest rates, ect). In general Europe is lagging behind the US for at least 6 months in economic cycles. While a continuation of the global expansion will likely support modest economic growth via strong exports, European domestic demand remains weak. Strength seen in recent economic reports, particularly in the manufacturing sector, may support overall consumption, but this does little to offset concerns that structural

problems will continue to weigh on growth and profits. Some of the key drivers showing that European stocks are not the best to invest in at the moment, include (Sonders, 2004):

- Domestic demand and consumer confidence remain relatively weak, particularly in Germany, amid sluggish employment growth.
- Business confidence is mixed among the EU countries, with the latest German IFO survey continuing to reflect declining sentiment.
- The recent increasing trend in inflation, if it continues, could put the European Central Bank in a position where it is forced to raise interest rates, further jeopardizing meager economic growth expectations.
- While the ECB maintains that liquidity is sufficient, the decline in money supply growth bares watching.

As I discuss Japan in the next chapter, I will hereby mention some other emerging markets. Against the backdrop of a potential hard landing in China, the current moderation in Chinese growth and commodity prices, and the maturing nature of the global recovery, there is a reduced likelihood of out performance in emerging markets over the next 6-12 months. India is other very big country announcing about 7-8% GDP growth, which will help to stabilize global economy (Sonders, 2004), (CNBC, 2004).

Some key factors to consider for emerging markets include (Sonders, 2004):

- Valuations remain attractive—the Morgan Stanley Emerging Markets Free Index currently trades at a discount to the G7 developed market index.
- Decent US economic growth continues to promote global growth and may soften the impact of a slowdown in China.
- China has implemented numerous measures to slow its torrid pace of growth, and they are working, according to some indicators. While analysts believe that China's domestic drivers: its strong foreign reserves position, and the preemptive handling of bad loans are positives, the risk of crisis and a hard landing of its economy are moderately high.
- Pacific Rim and other emerging countries with commodity exposure, which benefited the most from strong demand by China, are showing signs of moderation in economic activity.
- Emerging market sovereign yield spreads remain well below levels seen in previous crises, but the events unfolding in the Russian banking system are concerning. An escalation of the issue could significantly impact capital flows into emerging markets.
- New diseases like SARS or Chicken flue which appeared lately in Asia are of great danger for economy also as people are restrained to travel and do business.

4.1.1 The Japanese macroeconomic situation

Many analysts have lately been pointing at Japan as a market with relatively good potential in the near future. Japan does not have a problem of a huge budget deficit and a deficit in external trade, like the US does. In the last decade Japan lost its competitive advantage in high technology development but it still has its advantages in mass production technologies (OECD, 2003). It is possible that Japanese crisis was also a result of big Jen appreciation. In 1990 Japanese yen had 50% higher buying power as USD. From 1990 the purchasing power parity

of Japanese Jen compared to USD is slowly falling and in 2002 the Japanese Jen appreciated over USD only for 22%. (OECD, 2003) The rising demand for capital goods from countries like China is also helping the Japanese economy (CBS.MarketWatch.com, 2004), and there is a potential for Japan to renew with growth again. Its 2% GDP prediction is also higher than for the Western Europe (below 2%) for 2004 (OECD, 2004). It is also known that when an economy is in its boom (growth) or low inflation, stocks are performing much better than the money market instruments, which perform as good or better as stocks in the high inflation environment (Bodie et.al., 2003, p.139).

In 2004 Japan can be viewed as the new economic force, rising in Asia. Growing at an annual pace of 7% in the last quarter of 2003, it left both the old guard of Europe and the big shot, America, for dust. With its exports surging by 17.9% (at an annualized rate) in the three months from October to December, its monetary authorities are struggling to keep its currency down. Meanwhile, its firms are scrambling to add capacity to meet the demands of customers at home and abroad: investment in fixed capital grew by 22% in the final quarter of 2003 annually (Source: Economist.com, 2004).

Japans' GDP figures for the fourth quarter, released on February 18th 2004, were at its best for over 13 years. GDP growth of 7% may not be sustainable. The figure may also be flattered by continued deflation: Japan produced 7% more output, but the money value of that output grew by a more modest 2.6%. Still, after a comatose decade or more, Japan's metabolism may finally be picking up.

The signs have been there for some time. The Bank of Japan has been pumping more money into the country's anemic financial system, via more channels than ever before. When the bank's newest governor, Toshihiko Fukui, says that he will persist until he prevails over deflation, people are starting to think he means it. On May 1st 2004 he said that long-running price declines that are hobbling the world's second-largest economy could ease in 2005 if overall economic growth and corporate reforms continue. Bank of Japan (BOJ) raised its growth forecast for the year to grow 3.1 percent in the fiscal year that began April 1, up from the previous forecast of 2.5 percent it made in October. Strong exports to the United States and Asia are fueling the recovery (BOJ, 2004).

Still, deflation continues to plague the Japanese economy, eroding corporate profits and personal paychecks and curtailing economic activity. The BOJ has forecast a 0.2 percent fall in core consumer prices - a benchmark for deflation trends in 2004. Core consumer prices exclude volatile energy and food prices.

Fukui said he hopes the central bank's super-easy monetary policy of keeping short-term interest rates near zero and flooding the financial markets with cash will increasingly curb deflation. But ending deflation won't be an economic panacea, he said. Instability in Iraq and in global economic growth could also affect Japan's recovery, he said. Reducing growth in US and attempts to cool-down growth in China can have big impact connected with globalization and less and less stable environment.

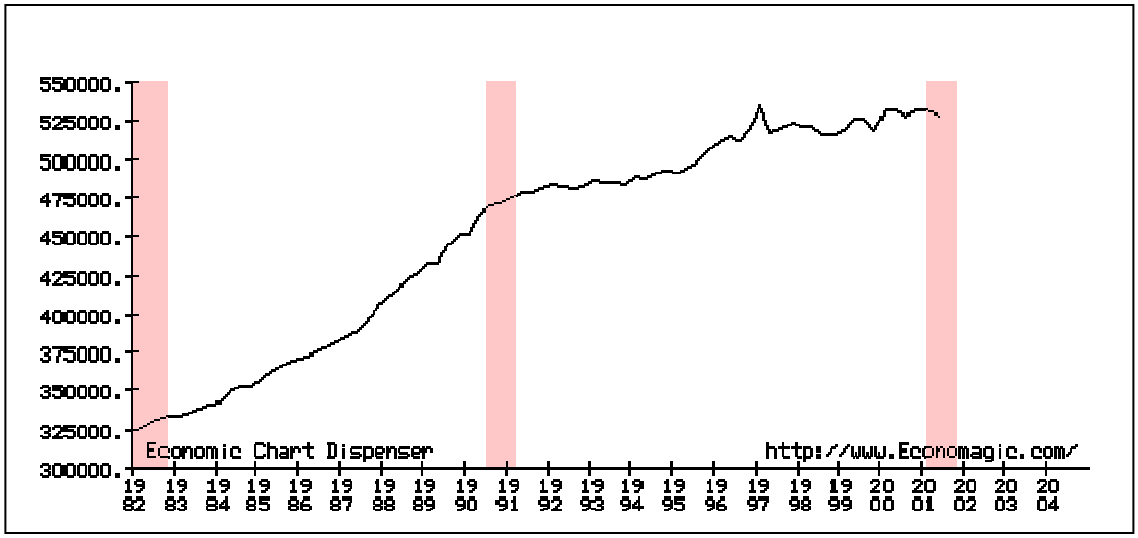
For comparison, the OECD statistics tell us that in the G7 countries, quarterly GDP growth in the fourth quarter of 2003 varied from 0.0% in Italy to 1.6 % in Japan. Quarterly growth accelerated in Canada, Japan and the United Kingdom but slowed in Italy and the United States. In most G7 countries annual growth was stronger than in the preceding quarter. The

United States had the highest annual growth rate (4.3%) while Germany had the lowest (0.0%) (OECD, 2004).

Main economic characteristics which helped Japan advance with extraordinary rapidity to the rank of second-most-technologically-powerful economy in the world after the US and third-largest economy after the US and China are: government-industry cooperation, a strong work ethic, mastery of high technology, high domestic rivalry which is positively associated with international trade performance (Sakakibara, Porter, 2000, p.18), and a comparatively small defense allocation (1% of GDP). One notable characteristic of the economy is the working together of manufacturers, suppliers, and distributors in closely-knit groups called keiretsu – a favorable industrial policy. A second basic feature has been the guarantee of lifetime employment for a substantial portion of the urban labor force (Tezuka, 1997, p. 42). Both features are now eroding. Industry, the most important sector of the economy, is heavily dependent on imported raw materials and fuels. The much smaller agricultural sector is highly subsidized and protected, with crop yields among the highest in the world. Usually self-sufficient in rice, Japan must import about 50% of its requirements of other grain and fodder crops. Japan maintains one of the world's largest fishing fleets and accounts for nearly 15% of the global catch.

For three decades overall real economic growth had been spectacular: a 10% average in the 1960s, a 5% average in the 1970s, and a 4% average in the 1980s. Growth slowed markedly in the 1990s, averaging just 1.7%, largely because of the aftereffects of over investment during the late 1980s and concretionary domestic policies intended to wring speculative excesses from the stock and real estate markets. Government efforts to revive economic growth have met with little success and were further hampered in 2000-2003 by the slowing of the US, European, and Asian economies. Japan's huge government debt, which is approaching 150% of GDP, and the ageing of the population are two major long-run problems. Robotics constitutes a key long-term economic strength with Japan possessing 410,000 of the world's 720,000 "working robots." Internal conflict over the proper way to reform the ailing banking system continues.

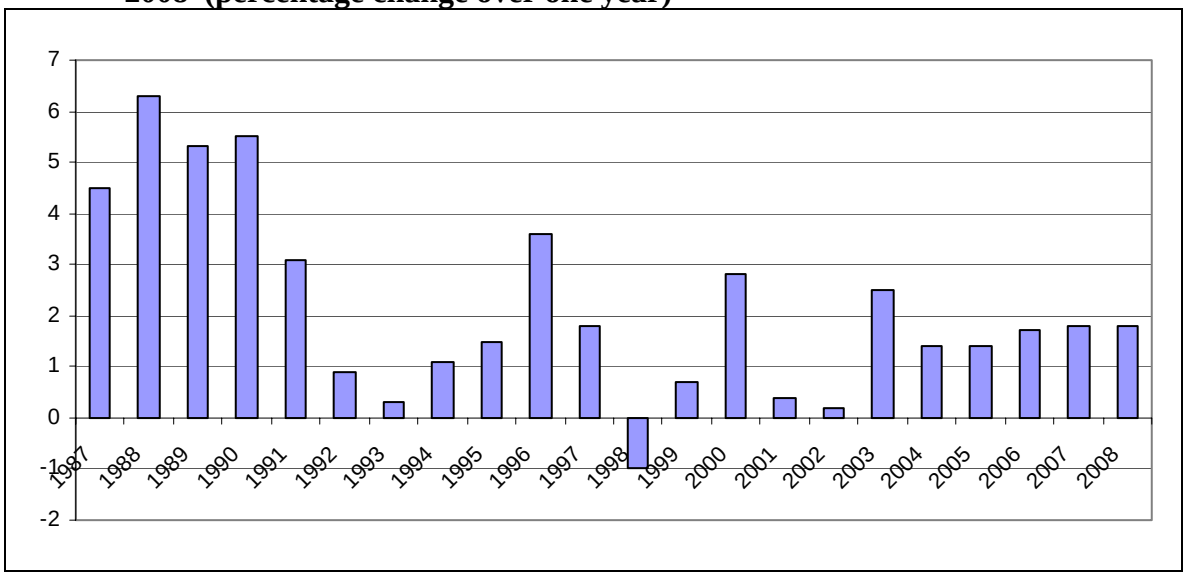
Figure 8: **GDP growth in Japan in period 1982-2001(in constant 1990 prices)**



Source: Economagic, 2004.

Figure 8 shows a fast growth of Japan's GDP in 1980s. Private consumption was stronger in 1980s compared to 1990s (in the range of 55-56%), while the government consumption increased a bit in 1990s (from 13.1% in 1982 up to 16.6% in 2001) to try to pull out the country out of crisis (Economagic, 2004). Shadowed areas are recession periods.

Figure 9: **Japan's historical real GDP growth rates and the forecast for period 1987-2008 (percentage change over one year)**



Source: Global insight, 2003.

In figure 9 we can see that predictions for 2004 were below the latest BOJ predictions of 3.1%. So we can hope that more robust growth as predicted has some reserve to better resist possible global economic growth decline after China looks to "cool down" a bit and the growth of US economy has to be confirmed as it is jeopardized by high oil prices.

Table 7: **Comparison of Japan with some other economies with respect to some macroeconomic factors in 2000.**

Country	GDP Growth	Per-capita GDP (PPP)	Per-capita GNP (nom.)	Inflation	Exports (in billi.)	Current. Account (in billions)	Reserves (in billions)	Savings /GDP	Popul. (m.)	Popul. Growth. %	Life Expct. (Year.)
Suisse	2.5%	$26,420	$37,748	0.8%	$93.9	$32.5	$31.4	27%	7.2	0.6%	79
Canada	4.0%	$24,482	$20,242	2.9%	$274	$12.8	$33.2	21%	30.7	0.9%	79
US	1.1%	$33,872	$33,799	3.5%	$773	-$435.4	$54.3	17%	282.3	1.2%	77
France	2.8%	$21,897	$24,018	1.4%	$299	$26.9	$39.6	21%	59.4	0.5%	78
Japan	2.3%	$23,780	$34,715	-0.1%	$460	$117.5	$357.1	30%	126.9	0.3%	80
Germany	1.9%	$22,623	$25,488	2.6%	$548	-$25.1	$56.6	23%	82.2	0.2%	76

Source: ASIAWEEK, No.15, 2001.

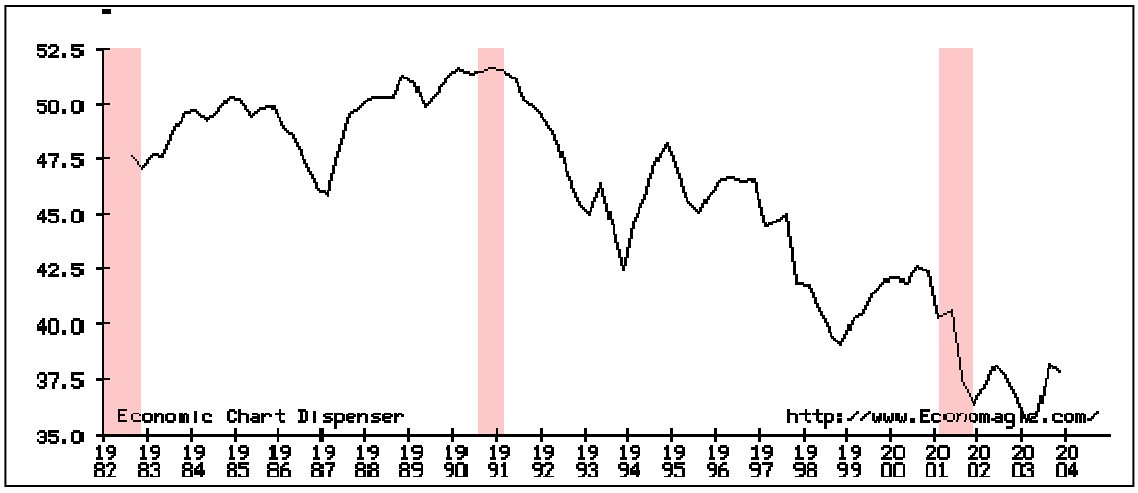
GDP: purchasing power parity - $3.651 trillion (2002 est.)

GDP composition by sector: *agriculture:* 1.4%, *industry:* 30.9%, *services:* 67.7% (2001 est.)

GDP – per capita: purchasing power parity - $28,700 (2002 est.)

Table 7 shows that Japan is one of the reaches countries measured in per capita GDP with worlds' third largest export and largest positive current account balance. Its population has the longest life expectancy. In combination with low and reducing population growth this brings increasing problem to their social security system due to aging population.

Figure 10: **Income growth consumer confidence index for Japan in period 1982-2004.**



Source: Economagic, 2004.

Figure 10 above shows how consumer confidence index of income growth was high and slowly rising in 1980s and how it deteriorated in 1990s till mid 2003 when it started to turn higher. We can see that this index correlates very well with Nikkei 225 stock performance in the same period. Shadowed areas are recession periods.

4.1.2 Japanese economic recovery

Capital investment in 2003 has become the primary driving force behind the recovery of the Japanese economy. It should not be seen merely as another cyclical recovery in capital spending but as the one, which is both structural and sustainable in nature (Mizuho securities, 2004, p. 1).

First, Japanese products are making spectacular advances in terms of sophistication. Japanese companies for several years have concentrated their investments overseas, specially in Asian countries looking for opportunities abroad mainly for cheaper labor and new markets. From last summer there is a new trend seen as refocusing of capital expenditures to within Japan. Four key sectors: precision equipment, electric machinery, chemicals and automobile parts turned to increasing domestic investment with greater product sophistication.

Second, since the middle of 2003 the average length of service (capital vintage) for capital stock within Japan became much smaller. In 2002 it peaked with the average period of use for capital equipment at 7.08 years and since then it has been on the decline. Japanese firms now do not engage in outflow of high technology overseas and instead shifted to a strategy of focusing the production of hi-tech goods at home and have stronger will to replace older facilities with new ones to greatly boost productivity.

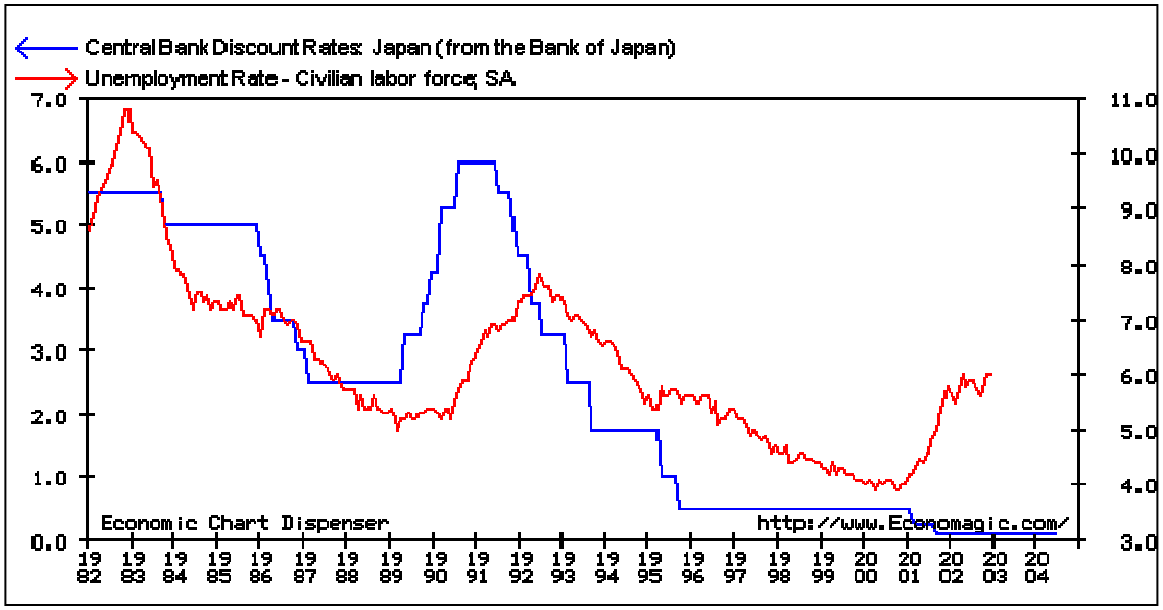
Third, they believe that balance sheet corrections at Japanese firms have been more or less completed. Growth from 1983 till 1990 created a bubble and small and medium enterprises (SME) just lately reduced the debt level on the balance sheets to more sound level. Land prices have also adjusted to the level of three decades ago and it seems fair to say that the structure of excessive credit that ballooned to truly abnormal proportions during the bubble has returned to a more appropriate level. Only in fiscal year (FY) 2003 listed firms, excluding financial companies and those listed on the new exchanges for start-ups, reduced their consolidated interest-bearing liabilities by 7.2% to a combined 155 trillion yen as of March 31. This represents the highest reduction rate in the past four fiscal years, the period for which comparisons are possible. The figure stood at only 1.3% for the year ended March 31, 2002, which was during the information technology sector slump, then expanded to 6.6% the following year as corporate earnings recovered (Nikke.net, 2004c).

Forth, there are tentative signs of a recovery in a personal consumption started with consumer durables. Hiring improved and Japan's seniority-based remuneration system, which begins to break down, stimulates consumption by young people. In figure 10 we can see that during the boom market of 1980s income growth consumer confidence was very high and rising till 1991 when signal of crisis were well established already. After that we can see constant drop with few cycles and reaching the bottom in spring 2003. First signs of recovery are here and with increasing predictions for GDP growth and falling unemployment this trend should have some legs to continue. Latest unemployment data for march 2004 shows additional drop of 0.3% drop from previous month down to 4.7% falling for 10 months in a row. Japan has still very low unemployment compared to the US and specially EU.

That sentiment is improving is also evident from the recent news that 80% of Japanese firms plan a higher capital spending in FY 2004 (Nikkei.Net Int. (b), 2004).

The stock market is in general a good predictor about future growth prospects of the economy. If we are looking first the interest rates in 1980s we can see that they were dropping. In situation of dropping interest rates, investments become more attractive and this correlates with stock market and real estate boom at the same period. The problem was that stock market increased at annual rate of 24% in late 1980s while GDP growth started to decrease and was at about 4-5%. With lowering interest rates companies were able to expand and employ new workers so the unemployment rate also fell during 1980s from almost 7% to 2%. As Central Bank discount rate reached 2.5% at the end of 1980s at historical low level after the WWII and Japanese economy overheated the stock market bubble exploded at the beginning of 1990s and maybe interest rates increased too much too fast, to push Japan in recession in second half of 1990 and first quarter of 1991. At that time Central Bank started to drop interest rates again - this time to almost 0% as Japanese economy fight to start with better growth during all 1990s and first couple of years in 21st century. At the beginning of 2000s Japanese crisis was additionally prolonged with crisis in the US and Europe. Japan was helped on the other side with big growth in some Asian economies like China being an important partner for them. The unemployment drop in 1990s continued just to this crisis in US and Europe. In June 2004 unemployment dropped to 4.6% based on www.kansas.com, July 2004.

Figure 11: **Japan's unemployment rate (right-hand side) and the Japanese Central Bank's discount rate (left-hand side) in period 1982 – 2004 (in %).**



Source: Economagic, 2004.

After numerous false starts in the past decade, it appears that Japan's recovery may finally have legs. This is being reflected in the strong relative performance of Japanese equities over the 2003. Although there is risk associated with the potential for a hard landing in China, which could result in a sizable drag on Japanese export growth, it looks that Japanese domestic demand has become a sustaining component of the recovery amid improving employment and expectations for continued monetary stimulus. While a concern with the slow growth in money supply remains, there are a number of positive factors currently in play for Japan (Mizuho securities, 2004, p. 4-6):

- Valuations have come down as forward earnings growth expectations have risen substantially amid strong improvements in corporate balance sheets.
- The Bank of Japan sees deflation risk eventually abating and the potential for a self-sustaining recovery as domestic demand improves, while pledging to maintain monetary stimulus.
- Property values may be forming a bottom, which could further improve the health of banks and consumer sentiment, as well as promote retail participation in the equity market.
- Businesses have become much more optimistic, capital spending has improved, and increases in personal income may be beginning to unleash pent-up demand after the extended period of cautiousness.

All this information about global economy and Japanese situation are showing that Japan is becoming an attractive place to invest compared to other regions. There are global problems, which are not in favor of equities at the moment as geo-political situation is not stable due to terrorist threats and situation in Iraq, and high oil prices, which put global economic recovery under threat.

4.1.3 Business cycles and Japanese economy

In section 2.3.1, I have already touched the business cycles related to the countries' macroeconomic situation. Japan spent most of the past 13 years as the dog of international markets. High valuations, lackluster domestic spending and a sluggish economy made Japanese stocks unappealing to most foreign investors. Even short-term booms in Japanese stocks over the past couple years have typically not shown follow-through.

Avoiding Japan turned out to be a wise move for foreign investors after the 1980s, as its stock market under performed most other international markets. But if Japan's recent gains continue, investors will likely increase their allocations as they start to believe in the long-term success of Japanese stocks, and as they seek to match the growing weight of Japan in international indexes. Equity market valuations have long been a negative for Japan. Back in the late 1980s, Japanese stock market valuations were abnormally high. These valuations were supported in part by accounting differences between Japan and other non-US markets but caused a lot of people to become hesitant towards investing in Japan.

This has changed. Accounting practices have improved, and earnings have picked up. Based on 2004 earnings estimates, Japan's average price/earnings ratio is slightly lower than that of the S&P 500. Versus the United Kingdom and Europe, both Japan and the United States may be termed expensive, but they have better economic growth prospects, which may support higher valuations (Elefson, 2004).

There's also the possibility that the Japanese economy experiences another false start, and numbers just don't come through, and politics may pose risks too. Elections for Japan's lower house are scheduled to take place July 11. The incumbent party fared poorly in the previous lower party elections and the possibility exists that a poor showing could be repeated.

Characteristics of the latest development in Japanese business cycle are encouraging and are summarized below:

- Consumer spending is starting to rise. The Index of "salaried working household spending" rose 6.9% in February year-over-year, the highest increase in 13 years. At the same time, unemployment levels look to be declining.
- A byproduct of rising consumption may be inflation, which after years of being nearly non-existent, is starting to resurge.
- Business confidence is rising. Recent business sentiment surveys have shown rising optimism, which we believe should stimulate capital spending in the coming months.
- Retail investors' account for a large portion of the volume traded on the stock exchange, and recent market gains may increase their feeling of wealth.
- Property prices, which also support a feeling of "wealth," have bottomed and have recently started to rise.
- After a recent show of confidence in Japan's growth from the Organization for Economic Cooperation and Development (OECD), the International Monetary Fund (IMF) revised upward its estimate of Japan's real economic growth in 2004 to 4.5%, a number on a par with the US. An earlier estimate put growth at 3.4%.

Business cycles for technology firms depend on the state of global economy and technology itself. Below I am showing at which state of hype cycle some technologies discussed in communication and electric machinery sector are: (Gartner, 2004). The Gartner hype cycle places technologies and the strategies they enable into a natural and recurring life cycle. Technology adoption depends heavily on the maturity of technology, which is uneven across enterprises, industries and geographies.

On the rise
- Smart Home Appliances
- Digital Media Centers
- Video Telephony
- Home-Theater PC
- Three-Dimensional LCD Displays
- 64-Bit Desktop Computing
- Multicore Processors
- Tablet PC
- Wireless USB
- Silicon RF Power Amplifiers
- Network on Chip
- Plastic Transistors
- Optical CMOS
- 4G Wireless technology

At the peak
- Digital Photo Printers
- Satellite Radio
- Digital Camcorders
- High-Definition TV Displays (Plasma, LCD, others)
- Blu-ray vs. HD DVD
- TVPC
- Micro Fuel Cells
- Inkjet Processes
- MRAM
- High-Capacity Optical Drives

Sliding Into the Trough
- DVD Recorders
- Interactive TV
- Bluetooth Peer-to-Peer
- Video on Demand
- Telematics
- Personal Video Recorders
- Network Outsourcing
- Embedded FPGA Cores
- Organic Light-Emitting Diodes
- Ferroelectric RAM

Climbing the Slope
- Digital Music Players
- PDAs
- Wireline Home Networking
- Broadband
- Household Wi-Fi
- IP Telephony
- Semiconductor Intellectual Property
- Platform ASICs
- Disk-to-Disk Backup/Restore
- Wi-Fi Protected Access

Off the Hype Cycle
- E-Book Readers
- Internet Shopping

Entering the Plateau
- Digital TV (Cable, Satellite, Broadcast)
- Digital Cameras
- DVD Players
- E-Payment
- Home Theater
- Game Consoles (Xbox, PS2, others)
- ADSL/Cable Modem
- Flat-Panel Displays
- Smart-Card Reader
- USB Flash Drives
- RF CMOS
- SiGe Integrated Circuits

4.1.4 US counterparts for Japanese electric machinery and communication industry

Electric machinery and communication industry are both pure examples of technology sector, which is one of the most if not the most volatile sector. These can be seen already by higher then average beta. These sectors relay more than others on innovations and as they do not produce necessities we can put mainly electric machinery also under cyclical industry. For cyclical firms it is known that earnings and cash flows tend to follow economy – rising during economic booms and falling during recessions.

In table 8, I present the US industries, which are related to the two Japanese industries, I will analyze and use them for comparison with the analyzed firms. I will compare the US cable TV, entertainment, and entertainment technology industries with the Nikkei 500 companies in broadcasting sub industry. Internet, telecom equipment and services, and wireless networking I will use when comparing Nikkei 500 telephone operators. Industries in the second part of the table 8 will be used for the wide Nikkei 500 electric machinery segment. The last line represents the market average of all companies. The numbers are based on the Value Line database, for 6958 firms.

Table 8: **Selected parameters for the US electric machinery and communication industry, as of January 2004**

Industry	Number of Firms	ROE	Fundamental Growth	P/B	Beta	ROC	Price/Current EPS	Price/Forward P/E	Expected Growth In EPS
Cable TV	24	-5.49%	NA	2.51	1.95	6.47%	84.20	147.34	13.08%
Entertainment	84	0.99%	0.43%	1.71	1.43	7.30%	121.61	53.38	17.46%
Entertainment Tech	32	2.21%	2.19%	4.36	2.18	13.35%	61.04	35.17	26.94%
Internet	289	-19.18%	NA	6.97	2.72	0.21%	106.87	60.80	25.04%
Telecom. Equipment	124	-6.76%	NA	5.41	2.72	2.72%	90.47	55.91	16.90%
Telecom. Services	137	10.70%	2.71%	2.71	1.69	17.85%	32.60	60.96	17.89%
Wireless Networking	63	-52.67%	NA	4.91	2.65	4.31%	72.98	58.24	21.58%
Electrical Equipment	86	18.69%	8.72%	4.48	1.64	17.11%	45.03	45.18	12.84%
Electronics	181	-5.62%	NA	2.49	1.68	3.43%	56.60	44.85	16.94%
Semiconductor	113	2.89%	1.58%	4.28	2.98	10.98%	71.16	72.14	21.12%
Semiconductor Equip	15	-2.77%	NA	4.23	2.97	4.27%	224.06	134.03	13.15%
Market	**6958**	**10.12%**	**5.59%**	**3.02**	**1.16**	**10.24%**	**41.40**	**30.90**	**15.56%**

Source: Damodaran, 2004.

From above table 8 we can see that betas are really high. For all shown industries betas are higher as for the market average. Price to book value (P/B) differs a lot and is especially high for Internet, wireless networking and semiconductor related industries. ROC was the best for telecom services (phone providers) and electronic equipment. The lowest ROC and negative ROE we can see for new Internet industry, which on the other hand has one of the highest, expected growth in earnings per share. We can see also that higher the growth expected, higher are current and forward P/E as stocks reflect future earnings and cash flows. Current P/E and forward P/E ratio of these US industries are also above market average.

4.2 ANALYSIS OF THE NIKKEI 500 COMMUNICATIONS STOCKS

The Nikkei 500 constituents that come from the communication industry are shown in table 9 below. There are nine of them. In the table 9, I show the code under which the stock is traded – similar to a ticker in the US, primary exchange where it is listed and traded, the name of the company, industry to which it belongs and main characteristics. In Japan, firms are traded under their code, so I put this code in the first column in the table and I repeat it again when I present each company.

I divided the nine firms in two major sub-industries or categories:

- **Telecommunication**, described in next section, represented by the firms in the first part of table 9 and
- **Broadcasting**, treated in the section afterward; these firms are listed in the second part of table 9.

Table 9: **Basic characteristics of the companies in communication industry inside of Nikkei 500 index, as of January 2004**

Code	Primary Exchan.	Name	Industry Name	Market Capitalization	P/E	P/B	ROE
9433	Tokyo	**KDDI CORP**	Telephone-Integrated	2574287	35.24	1.42	4.03%
9434	Tokyo	**VODAFONE HOLDINGS KK**	Telephone-Integrated	990522.9	28.87	1.03	3.55%
9437	Tokyo	**NTT DOCOMO INC**	Cellular Telecom	12143560	19.43	1.21	6.20%
9432	Tokyo	**NIPPON TELEGRAPH & TELEPHONE**	Telephone-Integrated	8108266	34.75	1.44	4.14%
9613	Tokyo	**NTT DATA CORP**	Networking Products	1220175	44.88	2.88	6.41%
9442	Tokyo	**JSAT CORP**	Satellite Telecom	146365	12.46	2.13	17.06%
4676	Tokyo	**FUJI TELEVISION NETWORK INC**	Television	522111.8	57.15	3.49	6.11%
9401	Tokyo	**TOKYO BROADCASTING SYSTEM**	Multimedia	305994.9	23.60	1.55	6.59%
9404	Tokyo	**NIPPON TELEVISION NETWORK**	Television	394418.8	42.72	2.80	6.56%

Source: Damodaran, 2004.

4.2.1 Telecommunication sector

Telecommunication sector as I defined it, consists from fixed and mainly mobile phone operators. These are: Nippon Telegraph and Telephone Corp. (NTT) and its big part NTT DoCoMo, where NTT owns a 63.58% interest. NTT Data Corp. is more network infrastructure oriented company, while KDDI Corp. and Vodafone Holdings K.K. are almost pure mobile phone companies. In Damodaran's classification above, these companies correspond to telephone-integrated and cellular telecom industry name classification.

Until the mid 1980s, Japanese telecommunications was a monopoly run by the public corporation Nippon Telegraph and Telephone (NTT). Since then, the industry has weathered a number of major turning points, including (Kohiyama, 2003, p. 1):

- The privatization of the telecommunications industry in the mid 1980s.
- The competition between pager, personal handyphone system (PHS) and keitai (cell phones) in the mid 1990s. PHS was developed in Japan in 1989 as a cordless telecommunication system operating within the band 1895MHz to 1918MHz. The aim was to provide cordless access to the personal handy phone system (PSTN) and thus had similar operating characteristics to cellular systems.
- The establishment of a successful NTT DoCoMo business model in the late 1990s.

1985 was a turning point in Japanese telecommunications with the privatization of NTT and the acceptance of new common carriers into the communications industry.

Within NTT, wireless was a minor player. In this era, before the introduction of pagers and mobile phones, wireless communications were used as one element of hybrid wired/wireless long-distance relay infrastructures. Using a microwave relay system, wireless communications comprised approximately 50 percent of the connections for long distance calling.

In the meantime, in 1992, when new common carriers were accepted into the mobile communication industry, the primary use was the car phone. Although there were large hopes for the future, at the time there were only approximately 1 million subscribers. Nobody anticipated the adoption rates that we see today.

The mid-1990s was a pivotal period in Japanese mobile communications. When the keitai was introduced in 1990, business use dominated. It was a luxury item; an executive tool supplied by the corporation to a select few. Subscribers in 1992, the year NTT DoCoMo was established, numbered approximately 1 million. By this time, the pager was already a widely used communications device. Like the keitai, it was initially used almost exclusively for business purposes. The number of pager subscribers in 1992 was approximately 7 million (Nikkei.net, 2004).

Subsequently, the personal handyphone system was introduced as a product that extended the range of a cordless phone to be used outdoors. Competition between these three products was intense from 1994 to 1996.

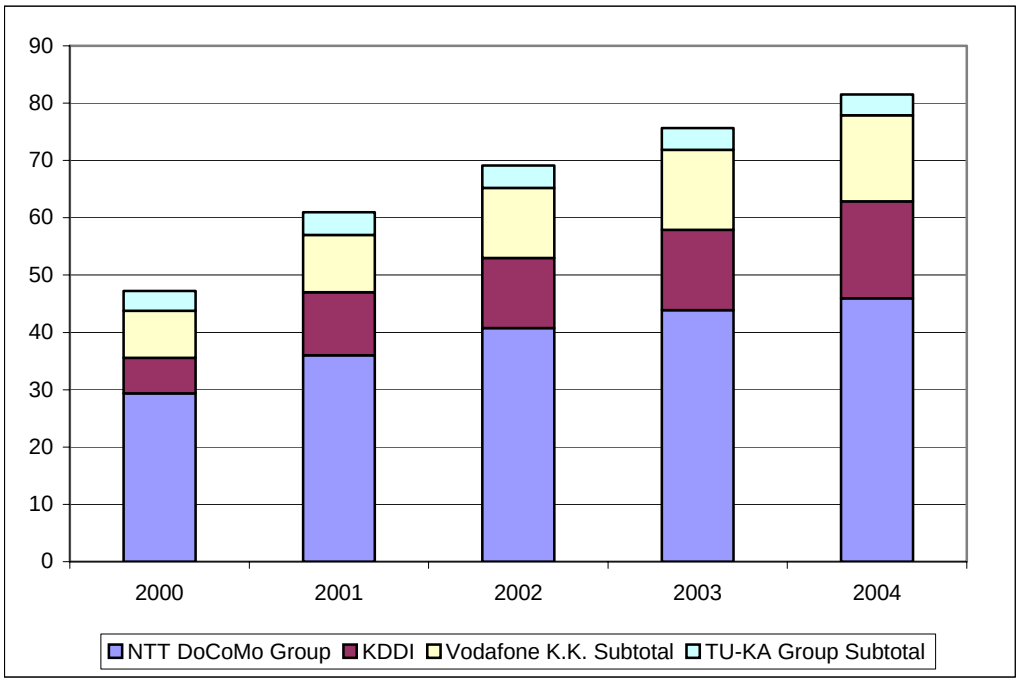
The difference in the financial conditions of NTT DoCoMo and the other two companies is even larger than the difference in their market shares due to how the companies deal with sales and distribution of handsets/keitai terminals in Japan. In the midterm accounting of 2002, all three companies turned a profit, but those of AU and J-Phone were less than one-tenth of DoCoMo's. Even DoCoMo, however, has faced business difficulties. In 1996, DoCoMo's share of the keitai market dropped below 50 percent. Although this is not widely known, one of the factors that salvaged the situation for them was the streamlining of operations.

The success of i-mode (a revolutionary mobile phone service that has revolutionized wide-ranging aspects of work and leisure in Japan. Offering easy access to more than 81,000 Internet sites, it has attracted more than 41 million subscribers since its introduction in February 1999 (NTT DoCoMo, June 2004) is a notable example among recent Japanese

business successes. It not only made Internet access an established element of keitai ownership, but also succeeded in charging for Internet content. The keitai Internet network is built on a telecommunications industry model. For Internet people the open architecture of the Internet is its central appeal. However, for at least some keitai users, the more limited and easy-to-use network has proven to be a selling point.

What is the secret to this success? One is that DoCoMo already had a national network for packet communications. A new division board was organized, which included people brought in from the outside to develop new competitive services -- such as e-mail -- that fell outside of the bounds of the telephony market. Their primary mission was to find ways to effectively utilize the packet network.

Figure 12: **The number of Japanese mobile phone subscribers by operators from March 2000 till March 2004 (in millions).**



Source: Telecommunication Carriers Association (TCA), 2004.

The current trend in mobile communications is the broadband access giving the possibility of faster data transfer, allowing transfer of images and other higher volume data. Mobile phones integrate camera, global positioning system, can be used as organizers, TV or radio receiver, video or music player, and mobile Internet access. Japan has the highest mobile Internet usage in the world. Media houses, cellular carriers and content providers overseas are starting to pay more attention to the technologies and business models that make mobile media increasingly successful in Japan or at least they should be.

From above data we can see that sequential subscription growth is decreasing from 19.17% yearly (between March 2000 and March 2001) to 7.75% for the year ended in March 2004. At end of June 2004 there were almost 65 mobile phone subscriptions per 100 people compared to more than 86 in Finland. Both growth rate and penetration shows that

majority of stake is acquired and that it looks there will be only three operators left in Japan. Compared to Italy there is still some room for growth, as it looks some people having more than one subscription. This is maybe to distinguish the private and business phone.

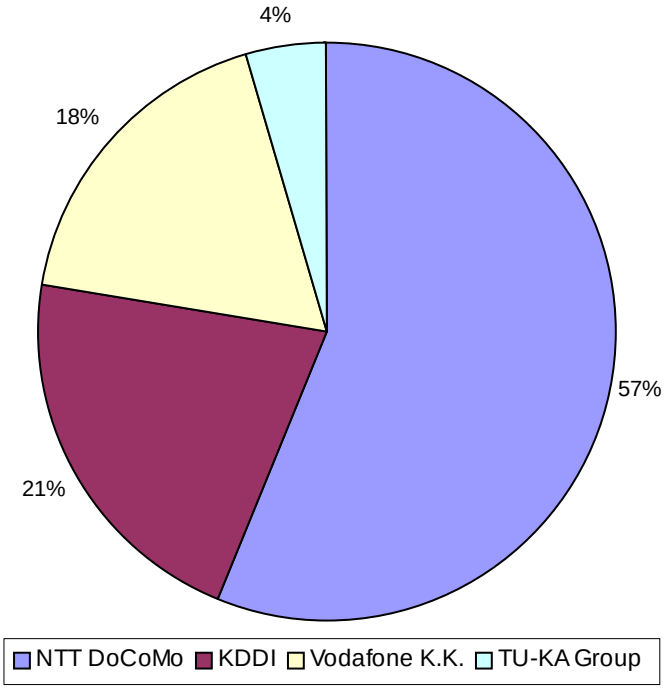
Table 10: **Mobile phone penetration for Japan, Italy and the US – end of year 2003**

Country	No. of subscribers per 100 population
Japan	67.96
Italy	101,76
United States	54.30

Source: Bloomberg, 2004.

New technology and business plans are making third Generation (3G) networks profitable for NTT DoCoMo and other Japanese carriers, as well as for content providers. Powerful terminals, workable billing and rich content all contribute to fast growth. Japanese carriers also made key business model decisions, which helped determine the ultimate success of Japan's mobile Internet.

Figure 13: **The market shares of Japanese mobile phone operators at the end of June 2004**



Source: TCA, 2004.

The future of mobile media distribution is being made in Japan, and there may be profound business and cultural reasons for that, reasons that may preclude similarly complex systems from being realized elsewhere anytime soon. Professor Takahiro Fujimoto of the University of Tokyo said in Nov. 2003 that Japanese manufacturers excel at "products whose functions require many components to be designed in careful detail and mutually

adjusted for optimal performance." He explained that this requires close teamwork within a company as well as cooperation with suppliers (Nikkei.net, 2004).

The biggest growth in the last five years was achieved by KDDI, which increased its relative market share by 70.7% in last four years. The biggest player NTT DoCoMo maybe was not aggressive enough to keep its position and lost some ground toward other two major players. On the other side Tu-Ka group will soon or less disappear by selling their assets to one of big three or by natural migration of their customers to one of three survivals.

In the fixed line communications, broadband Internet is the fastest growing business. The number of digital subscriber line (DSL) service contracts increased 60% year on year to some 11,197,000 in the year through March 2004. The growth of the DSL market, however, will likely slow down if fiber optics services capable of higher data rates begin to replace DSL and other slower transmission media.

Table 11: **Market shares of the Japanese DSL service providers at the end of year 2003, compared to the end of year 2002.**

Rank	Company Name	Part of	Share [%]	Point Change
1	Softbank BB Corp.		35.8	2.2
2	NTT East Corp.	NTT (9442)	20.4	0.0
3	NTT West Corp.	NTT (9442)	16.1	0.0
4	eAccess Ltd.		13.4	-0.1
5	Acca Networks Co.		10.4	-1.4

Source: Multimedia Research Institute, 2004.

Communication – phone service sector is moving from fixed line to wireless. Fixed line business is loosing steam and price cuts in wireless phone business are transferring customers toward the later one. Industry's best times of high subscriber growth are over and companies are looking how to get and keep customers with competitive service and pricing.

Competition is increasing and average revenue per unit (ARPU) is decreasing. With higher number of subscribers average Minutes of Usage (MOU) is decreasing a bit. DoCoMo found out a decrease from 168 minutes in FY 2003 to 158 minutes in FY 2004 (NTT DoCoMo 2004 annual report). There will be only three players left, from which NTT DoCoMo is the biggest and has a big support in its parent company Nippon Telegraph and Telephone Corp. (NTT, 9442).

Migration to 3G mobile services continues bringing new possibilities with higher data transfer speed, enabling video transmission also. Unfortunately Operators have to support old and new systems at the same time while transition to 3G will not be finished.

Japan is a country with the highest Internet utilization over mobile phone and as showed in broadcasting sector, Internet advertising increased 40% in 2003 and is becoming an important source of revenue for mobile companies.

Very bad is that there are many 3G standards and some operators at the end will be losers if not having the final standardized version. On the other hand once it will be done it will bring the cost of equipment down. Vodafone and DoCoMo have adopted 3G W-CDMA system while KDDI has adopted the 3G cdma2000 system, which is used in Americas, China, and Australia. System selected by KDDI allows them to upgrade to 3G at lower cost, as it is the case with the 3G W-CDMA.

One of the possibilities for industry analysis I found also in Porter's five forces and below are my observations of them for the Japanese telecommunication firms:

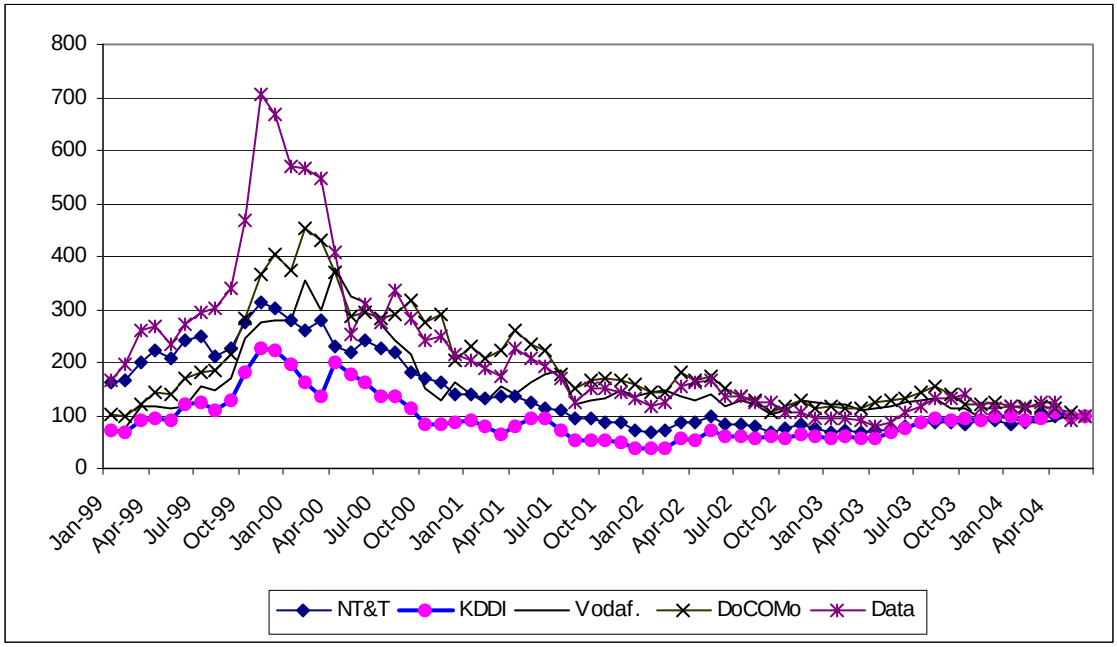
- **Threat of entry**: Entering this business is very costly as infrastructure and licenses are very expensive, so here I cannot see any danger. Margins are contracting, growth is contracting and only big global players would have the chance to come in. Consolidation is present in the business. Until mobile phone numbers are easily transferred from one operator to other this threat is even lower. In this business economy of scale is important, as infrastructure cost is similar for all players.
- **Rivalry among existing firms**: Problems of their business is that due to intensified competition in their operating environment and increased costs to enhance the attractiveness of its offerings. It is very easy to change the subscription – sometimes you have to wait until your current subscription is finished, if time-constrained subscription was taken. Despite an increased effort of cost cutting there is a reality in form of increase in 3G equipment depreciation costs, an increase in customer retention cost and incremental cost related to operating the 3G network. While migrating to 3G, there are additional costs of supporting old and new network
- **Bargaining power of customers**: Is very high as it is very easy to change operator. This is also one of the problems of companies in this business – keeping customers is costly and difficult. By fiscal year 2006 portability of phone numbers must be introduced, which will add costs to the operators and give even more freedom to customers.
- **Bargaining power of suppliers**: Somehow firms are self-sufficient. For equipment there are different providers like Erricson, Nokia, Alcatel, Lucent, etc. and suppliers do not have so much bargaining power. DoCoMo has for instance 100 suppliers. One bigger problem as seen in Japan and lately pointed out by KDDI chief Onodera is threat of monopoly. He has warned of a return to the days when Nippon Telegraph and Telephone Corp. (a majority owner of NTT DoCoMo, which is the biggest mobile phone operator) held a monopoly in Japanese telecommunications. NTT is asking that the government reconsider the company's obligation to allow other firms to use its fiber-optic communications lines. "This would mean a return to the NTT monopoly," (Nikkei Net Int. (a), 2004). Here we can see government, as the sixth force some authors added to Porter's five. We have similar situation in Slovenia with Mobitel being a daughter company of Telekom Slovenia having the easiest and cheapest access to fiber-optic lines.
- **Pressure from substitute products**: The shift to IP phone systems using less costly networks will erode the earnings bases of repair and maintenance firms affiliated with telephone companies. Recognizing that the shift toward IP (Internet Protocol) telephony cannot be stopped, even mighty Nippon Telegraph and Telephone Corp. and other telecommunications carriers are mapping out survival strategies centered on offering comprehensive IP communications services. However, this strategy has its problems as

well. As NEC Corp. (6701), Hitachi Ltd. (6501) and other information technology firms step up efforts to sell their own IP phone systems; telephone companies face an uphill battle to compete with them on their turf.

4.2.1.1 Telecommunication sector firms, included in Nikkei 500

Firms I have assigned to telecommunication sector are: NT&T (Nippon Telegraph & Telephone 9422), which includes majority of interests in DoCoMo (NTT DOCOMO Inc. 9437), and Data (NTT Data Corp. 9613). The other two big mobile business players are KDDI (KDDI Corp. 9433) and Vodafone Holdings KK- 9434. Figure 14 shows the monthly stock price of these companies from January 1999 on, when strong bull market lifted the Internet stocks and more or less all other technology stocks.

Figure 14: **Stock price performance comparison of telecommunications firms in the Nikkei 500 in period Jan. 1999 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

The worst performer in the last 12 months was DoCoMo (-41%), and the best were NT&T and KDDI (17% and 15% respectively). NTT Data Corp. was the most volatile one and dropped the most as it was closely related to Internet highfliers in late 1999. DoCoMo had the second biggest drop – bigger as other (Vodafone and KDDI) what can be explained by relative drop of subscribers compared to other two, which gained them. Poorest performance of KDDI in Dec 2001 is the result of its merger activities in late 2000.

In figure 14 and other figures showing stocks' historic price performance I took "time-reversed" relative performance comparison because I did not have available data for the whole period for all firms. For all firms, the stock price on June 30th 2004 is assigned to be one (or 100%) and the historical prices are adjusted to that price. If price in the past was below 1 or 100% the price increased, if it was more than 1 (or 100%) the price has decreased until end of June 2004.

In Appendix A, I present some basic information about surveyed firms. After complete name of the company the code under which the company is traded in Japan was added along with the firms' English Internet page address from which some information was taken. Other sources of information were Bloomberg and Nikkei.net Interactive.

4.2.1.2 Selection of stocks in the telecommunication sector

Based on the available information and my evaluation formula, which I developed and explained in Chapter 2.5.1, I got the results, as shown in table 12.

Table 12: **Selected ratios, attributed points for trends and the final score for selected telecommunication firms, as of July 2004.**

	DoCoMo	**KDDI**	**NT&T**	**Data**	**Vodafone**	**Vodafone**	**Verizon**
Code	**9437**	**9433**	**9432**	**9613**	**9434**	VOD.L (UK)	VZ (USA)
Nikkei -	225	225	225	225	500	--	--
P/E	13.9	21.38	13.89	33.92	100	12.25	13.68
P/E trend	5	5	4	1	1	0	2.6
Forwd P/E	18.26	16.18	15.78	67.12	20	15.56	14.24
2Net profit	17.3	6.16	7.94	6.61	0	-61.93	10.6
ROE	13.92	8.83	4.68	5.32	-34.64	-7.49	9.31
ROE trend	2	4	3	1	3	1	-2
P/B	2.44	2.48	1.4	1.99	2.54	0.72	2.85
PEG	0.89	0.62	3.26	3.02	1	1.02	2.58
PEG points	1	4	-1	-1	2	0	-1
MC points	6	4	6	3	3	5	6
FCF/s/P*f	23.4	33.7	37	9.4	-1.4	1.2	22.3
Liquidity	4	3	3	1	1	4	4
Gr.Expect p	5	6	4	4	4	4	3
Sales Gr tr.	1	1	1	2	-1	5	1
TD/SE	0.69	1.56	1.42	1.29	1.72	0.28	1.87
TD/SE tr	2	4	2	3	3	-3.3	1
CR	1.38	1.07	1.07	1.35	0.43	0.78	0.69
CR trend	1	2	1	2	2	1	0
Invent.trend	1	0	2	3	-2	1	2
Dividen tr.	5	2	0	2	0	2	0
Cash/Assets	13.38	7.46	7.37	6.49	0.05	3.94	1.73
P/EBITDA	5.14	3.83	2.36	6.75	2.09	6.42	3.79
Beta	0.95	0.94	0.89	1.45	1.01	0.98	0.78
My points	2	2	1	1	-1	2	2
Total score	66.8	58.2	47.6	22.3	-1.1	25.5	32.9

Source: Bloomberg, Nikkei.net, Yahoo.finance.com, and own calculations.

The fastest growth of sales revenues per employee has Vodafone; otherwise absolutely the highest sales/employee has DoCoMo. This result of all three pure mobile phone operators is much higher as for NTT and Data.

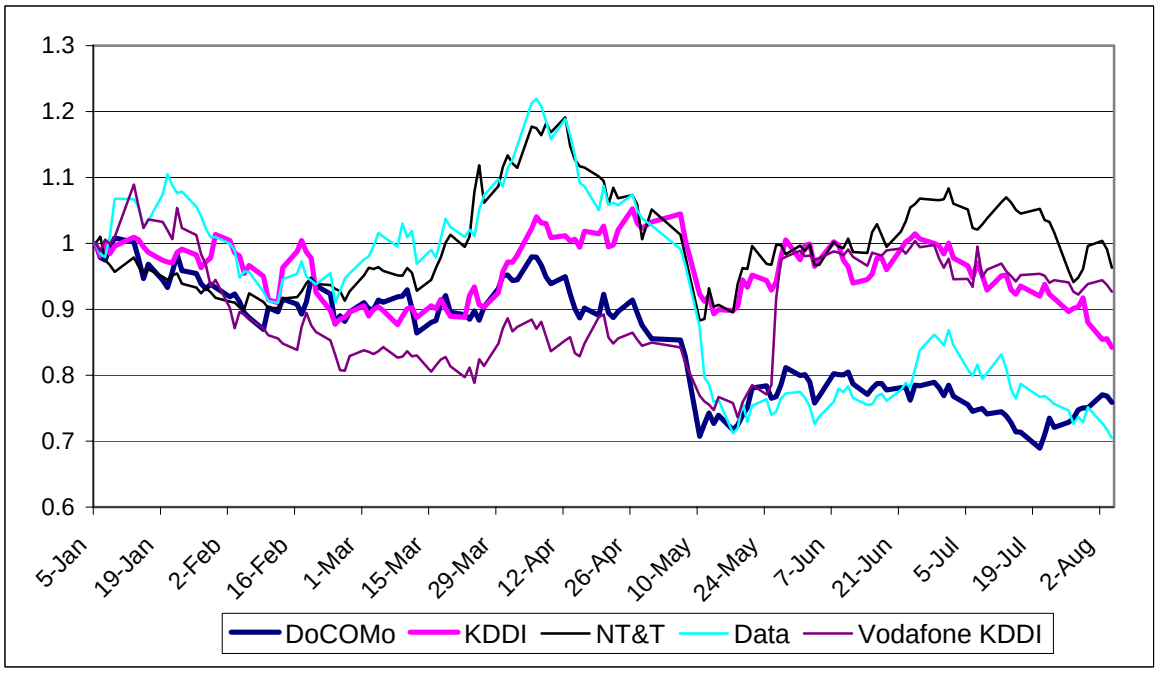
Using the above data and my formula results in the following list: DoCoMo as the best and KDDI as second. NTT comes at the third place, followed by Data and Vodafone.

Compared to the two of the world's biggest global telecommunication firms: Vodafone PCS (which owns majority of Japanese Vodafone Holding K.K) and Verizon from the US, we can notice that three Japanese firms look more attractive. Global players have better (lower) P/E. Vodafone PCS and Verizon both have low current ratios. Vodafone scored bad results due to very poor net profits in the last two years and low ROE.

4.2.1.3 Price performance of stocks in the telecommunication sector

From figure 15 below we can see that telecommunication industry under performed the broad Nikkei 225 index. Despite weak performance, fundamentals look to be good for DoCoMo and KDDI.

Figure 15: **Stock price performance comparison of telecommunications firms in the Nikkei 500 in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: own calculations based on Bloomberg.

Table 13: **Changes in stock prices of telecommunication firms from the Nikkei 500 index from June 30th 2003, Jan. 1st 2004 and April 1st 2004 till August 4th 2004 (in %).**

	DoCoMo	KDDI	NT&T	Data	Vodafone KK	SubInd	Nikkei225
from 30.6.03	-25.97	14.88	11.75	-20.64	-23.05	-9.18	21.21
from 1.1.04	-24.12	-15.75	-3.68	-29.51	-7.35	-16.24	2.06
from 1.4.04	-19.60	-13.26	-14.10	-37.44	6.95	-16.99	-6.35

Source: own calculations based on Bloomberg data.

DoCoMo under performed even weighted telecommunication sub industry index calculated on five firms I put in it for the last two periods from January 1st 2004 and April 1st 2004. From table 13 we can see that the majority of stock price drop came lately – in

the last three months mainly. We can correlate this drop also by NASDAQ in the US, which dropped also by 10% in the same period. Vodafone Holding KK as mentioned in company description (Appendix A) has better performance due to public offer made by Vodafone PCS to buy shares they did not already own with 20% price premium.

One positive sign for DoCoMo and KDDI is that for these two companies the direction starts to improve a bit while for Nikkei 225 index it deteriorated, if we compare returns from January 2004 with the ones from April 2004. But I am very lucky to be able to say that from the time of my first recommendation of DoCoMo on July 20th (date when I released first draft) till August 27th, stock increased by 17.4% while Nikkei 225 lost just a fraction (-0.4%).

4.2.2 The broadcasting sector

In the broadcasting sub-industry I have assigned the remaining four companies from the Nikkei 500 communication industry index, which were not classified and discussed in previous telecommunication sub-industry. These companies (shown in the second part of table 9) are: JSAT (JSAT Corp. 9442) a satellite provider, which has a bit different business as other three firms, which can be directly compared: FUJI (Fuji Television Network Inc. 4676), TvBS (Tokyo Broadcasting System 9401) and NTvN (Nippon Television Network 9404) which main business is broadcasting and production.

Japan's television broadcasting market is divided into three main types of distribution systems: terrestrial, satellite and cable television (SKY Perfect, 2004, p. 23):

1. **Terrestrial television broadcasting** began in Japan in 1953 and is the most widely used television distribution system in Japan. At the end of March 2004, there were 127 terrestrial TV broadcasters, but only six companies with major broadcast networks. Nippon Hoso Kyokai (NHK) has two channels, both of which are pay channels. The remaining five companies, Asahi National Broadcasting CO. Ltd., Fuji Television Network, Inc., Nippon Television Network Corp., Tokyo Broadcasting System Inc., and Television Tokyo Channel 12, Ltd. provide their broadcasting service free of charge. As of March 2004, approximately 90% of Japanese households receive more than six terrestrial television channels. From December 2003, terrestrial broadcasting was launched with the ultimate goal to completely replace analog with digital one by 2011.
2. **Cable television** is available in Japan since 1955. When introduced, cable TV was supplemented the terrestrial broadcasting system, serving the role of re-transmitting programming to areas with poor reception. Till 1993 cable operators were restricted to a single local area and single source content. As of the end of March 2004, there were 571 independent cable television broadcasters, serving a total of over 16.5 million households. The digitization of cable television will also progress gradually in accordance with the digitization of terrestrial broadcasting.
3. **Satellite broadcasting**. Japan launched the world's first broadcast satellite (BS) in 1984 and shortly thereafter NHK initiated analog satellite broadcasting. In 1991, a commercial broadcaster, Japan Satellite Broadcasting (JSAT), entered the market using the service name of Wowow. There are four BS analog channels in Japan: Wowow has

one and NHK has three channels including one used for broadcasting in high definition TV (HDTV) format. At the end of March 2004, NHK had 12.01 million BS service subscribers, while Wowow had 2.48 million subscribers. Monthly fees are from ¥ 945 to ¥ 2300. Digital broadcasting began on December 1st 2000.End of March 2003 there were 10-16 digital channels based on time slots and had approximately 3.08 million BS set -top boxes in the market.

The spread of digital broadcasting and broadband communications, and the convergence of both technologies, have brought the broadcasting industry to a major turning point. Analog terrestrial broadcasting will be changed to digitized till 2011. Asymmetric Digital Subscriber Line (ADS), digital cable TV and telecom fiber-optics with its broadband (high-speed, high capacity) will help establishment of high definition TV (HDTV) with more realistic pictures using liquid crystal displays - flat panel screens which sales are overtaking the classical cathode-ray tube (CRT) screens in June 2004 (Nikkei.net, 2004). There is a convergence of broadcasting and telecommunication in terms of diversification of content distribution platforms, including IP broadcasting using communications technology, and content distribution through mobile phones.

With an improving economy the advertising is increasing again. A recent report from Dentsu Inc. (Dentsu, 2004, p. 3) shows that advertising dropped in 2003 for the third consecutive year but started to increase from October 2003 on. Advertising expenditures are expected to rise by 2.3% in 2004 helped by Olympic games and digital products (Dentsu, 2004, p.16). The higher jump was seen in Internet advertising +40% in 2003. Television got 34.3% of advertising budget what represented 1950 B ¥ in the year 2003.

From table 8 we can see also that entertainment, entertainment technology and Cable TV have very low single digit or negative ROE, and high P/E ratios.

Porter's five forces for the Japanese broadcasting communication sector are:

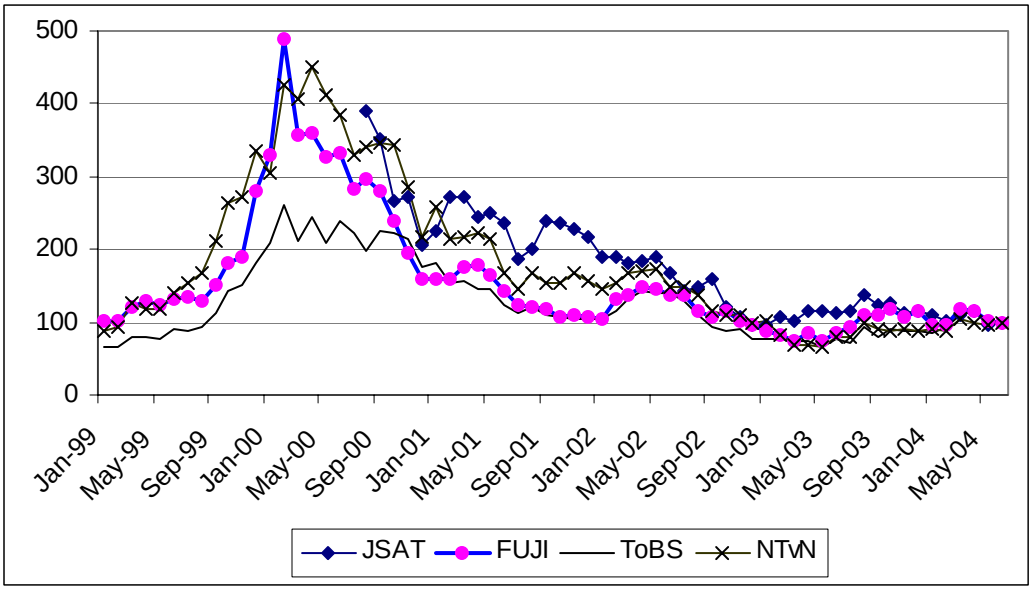
- **Threat of substitutes**: Commercial television networks are cautious about server-style broadcasts, which Wowow Inc. and Japan Broadcasting Corp. (NHK) announced they would launch as early as in fiscal 2005. The new broadcasting style - in which shows would be sent to servers in viewers' homes so that they can be watched anytime - threatens to escalate commercial-skipping, an important issue for TV networks. Advertising revenue increased much more in Internet, which can be received on mobile phones also.
- **Threat of entry**: Entering this business is not so costly, but you need an infrastructure, which can be provided by others. Digital broadcasting and high-definition TV systems require vast capital expenditures for infrastructure. As seen there are hundreds of broadcasters but less than ten are really important in Japan. Creating original content is more costly. In last years we can see consolidation between operators as advertising revenue was shrinking and there were only few broadcasters – the biggest ones in general who were able to stay positive. SKY Perfect Inc. is an example of what works in an industry. With mergers and acquisitions it achieved a critical mass – enough subscribers to become profitable.

- **Bargain power of customers**: Nothing easier as to zip-zap across different channels. Provider can be changed also so companies have to offer attractive pricing, that customers can support it and they do not change to quickly.
- **Bargaining power of suppliers**: Basic infrastructure – fixed lines, fiber optics, TV cable or satellites are becoming cheaper. Equipment can be purchased from many sources and suppliers have to fight for customers. This is especially true until the economy is not very robust and there are still threats that economic growth started from mid 2003 will not last. Bargain power of some other suppliers like companies having the right to transmit high watched events like Olympic games, World football or Volleyball championship on the other side have very high bargaining power and all TV stations can not afford to program them.
- **Rivalry among existing firms**: Companies are in competition for audience and advertising money. Here again fixed costs are more or less equal for all and content generation and service quality makes the difference to attract more viewers and with them more advertising money.

4.2.2.1 Broadcasting sector firms, included in the Nikkei 500

At the end of June 2004, three out of four analyzed broadcasting firms had almost identical share price as in the beginning of 1999. Figure 16 shows historical performance of surveyed broadcasting firms in the last five years. The worst performer in the last 12 months was JSAT (-15%), and the best was ToBS (+41%). In the observed period FUJI was the most volatile but if looking for the period for which we have all data JSAT was the most volatile one. When looking how it relates with Nikkei 225 index we can see that performance is similar as it was shown that majority of stock value (about half) can be explained by economic cycles (Damjanovič, 2000, p. 8).

Figure 16: **Stock price performance comparison of broadcasting firms in the Nikkei 500 in period January 1999 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

In appendix B, I present some basic information on the analyzed firms. Besides the complete name I give first the code under which security is traded in Japan and its Internet page from which I was looking for additional information.

4.2.2.2 Selection of firms in the broadcasting sector

Appling my formula and based on the collected data I ranked the firms as follows. The best candidate to invest in is Fuji, second JSAT and far away NTvN and last is ToBS. I would look for opportunity only in Fuji, which otherwise did not enter top eight stocks. Second JSAT is already relatively 30% less attractive, is not liquid enough and is a small cap stock.

Table14: **Selected ratios, attributed points for trends and the final score for selected broadcasting firms in the Nikkei 500, as of July 2004**

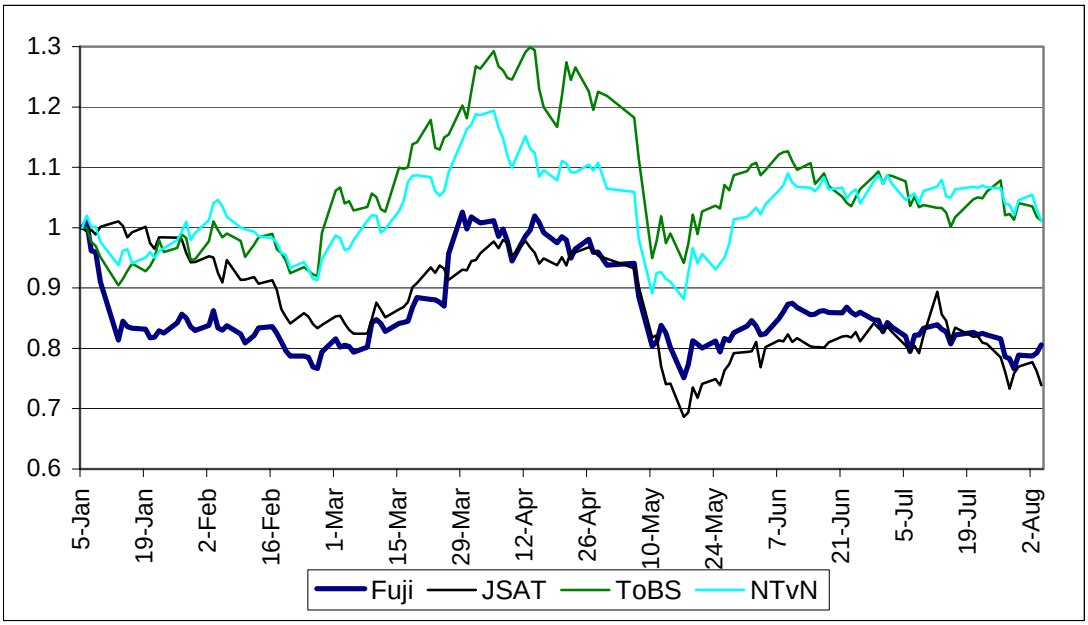
	FUJI	**JSAT**	**ToBS**	**NTvN**
Code	**4676**	**9442**	**9401**	**9404**
Nikkei	500	500	500	500
P/E	25.47	19.69	79.93	23.1
P/E trend	5	4	-7	1
Forwd P/E	28.92	20.81	27.47	43.9
2Net profit	8.01	14.4	4.97	11.93
ROE	5.13	6.16	1.39	5.08
ROE trend	1	0	-9	-5
P/B	1.25	1.22	1	1.26
PEG	8.69	4	1.59	9.89
PEG points	-4	0	-1	-4
MC points	2	0	1	2
FCF/s/P*f	7.3	19.8	-2.4	-9.6
Liquidity	1	-5	0	0
Gr.Expect pts	2	-1	5	3
Sales Gr tr.	3	1	2	0
TD/SE	0.23	0.71	0.48	0.43
TD/SE tr	2	1	2	1
CR	4.01	1.03	2.03	1.6
CR trend	2	1	1	-1
Invent.trend	2	2	-1	-2
Dividen tr.	1.5	1	1	1
Cash/Assets	32.23	3.56	12.11	23.21
P/EBITDA	9.54	4.82	8.93	9.06
Beta	1.06	1.07	1.28	1.20
My points	-1	-2	0	0
Total score	**33.2**	23.7	-10.4	0.3

Source: Bloomberg and own calculations.

4.2.2.3 Price performance of stocks in the broadcasting sector

This year's stock price performance of firms classified in the broadcasting sub category of the Nikkei 500 communication industry is shown in figure 17. In the last three months prices are stabilizing after big drop in April. From table 15 we can see that Japanese telecommunication stocks also under performed the Nikkei 225 index. First recommended Fuji Television is even a bit worse as weighted average (by market capitalization) of these four companies.

Figure 17: **Stock price performance comparison of broadcasting firms in the Nikkei 500 index in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: own calculations based on Bloomberg.

Table 15: **Changes in stock prices of broadcasting firms from the Nikkei 500 index from June 30th 2003, January 1st 2004 and April 1st 2004 till August 4th 2004 (in %).**

	Fuji	JSAT	ToBS	NTvN	SubInd	Nikkei
from 30.6.03	14.85	-20.34	23.67	17.81	13.92	21.21
from 1.1.04	-19.40	-26.13	1.15	1.11	-9.62	2.06
from 1.4.04	-20.39	-21.95	-20.20	-14.89	-18.93	-6.35

Source: own calculations based on Bloomberg.

As seen from table 15 when compared to table 13, the broadcasting sector performed worse as compared to telecommunication sector from April 1st 2004. Broadcasting does not look to be so attractive and these firms have much smaller market capitalization compared to the telecommunication sector. If somebody is really interested in investing in broadcasting sector in Japan, then Fuji Television might be the choice, but looking at the whole communication industry I would not select it, as its relative result is much lower 33.2, compared to 66.8 for DoCoMo and 58.2 for KDDI.

The final selection in the communications industry would be as follows: First NTT DoCoMo, second KDDI, both coming in top eight stocks and if broadcasting industry firm should be selected than this would be Fuji Television Network (4676).

4.3 ANALYSIS OF THE NIKKEI 500 ELECTRIC MACHINERY STOCKS

Nikkei 500 index's electric machinery industry consists of 55 companies (Nikkei.net, July 28th 2004) and I analyzed 38 of them. These companies are producing from basic components, parts, modules, manufacturing and testing equipment and instruments to final consumer electronic products. In this industry we can find audio/video (AV) product companies, some specialty companies in semiconductors, circuit boards, office automation and equipment, up to handheld tools and diversified chemicals. First I divide these companies to sub-industries using Damodaran's classification, as of the end of January 2004. Later I will use the market capitalization data from this table to calculate weighted stock performance of selected sub-industries.

Table 16: **Selected characteristics of the chosen electric machinery firms from the Nikkei 500 index, as of January 2004**

Symbol	Primary Exchan.	Name	Industry Name	Market Capitalization	P/E	P/B	ROE
4062	Tokyo	**IBIDEN CO LTD**	Circuit Boards	170550.8	200.00	1.85	0.78%
6479	Tokyo	**MINEBEA CO LTD**	Electronic Compo-Misc	203575.7	NA	2.07	0.00%
6501	Tokyo	**HITACHI LTD**	Electric Products-Misc	2408209	86.42	1.30	1.50%
6506	Tokyo	**YASKAWA ELECTRIC CORP**	Electronic Compo-Misc	206069.3	NA	6.73	13.45%
6586	Tokyo	**MAKITA CORP**	Tools-Hand Held	167988	24.99	0.92	3.69%
6592	Tokyo	**MABUCHI MOTOR CO LTD**	Electronic Compo-Misc	398732.7	22.12	1.78	8.04%
6701	Tokyo	**NEC CORP**	Electronic Compo-Misc	1707402	NA	4.76	0.00%
6707	Tokyo	**SANKEN ELECTRIC CO LTD**	Electronic Compo-Semicon	189866.8	47.44	3.26	6.87%
6752	Tokyo	**MATSUSHITA ELECTRIC INDUST**	Audio/Video Products	3981306	NA	1.25	0.00%
6753	Tokyo	**SHARP CORP**	Electric Products-Misc	2150315	65.97	2.38	3.61%
6754	Tokyo	**ANRITSU CORP**	Electronic Compo-Misc	108815.8	NA	1.83	-18.60%
6758	Tokyo	**SONY CORP**	Audio/Video Products	4048439	35.05	1.77	5.06%
6762	Tokyo	**TDK CORP**	Computers-Memory Devices	1038882	86.44	1.88	2.17%
6767	Tokyo	**MITSUMI ELECTRIC CO LTD**	Capacitors	91013.89	NA	1.03	6.09%
6770	Tokyo	**ALPS ELECTRIC CO LTD**	Electronic Compo-Misc	279946.1	15.99	1.88	11.76%

Symbol	Primary Exchang.	Name	Industry Name	Market Capitalization	PE	PBV	ROE
6773	Tokyo	**PIONEER CORP**	Audio/Video Products	578004.8	35.95	1.82	5.05%
6806	Tokyo	**HIROSE ELECTRIC CO LTD**	Electronic Connectors	522270.7	45.82	3.08	6.71%
6792	Tokyo	**VICTOR COMPANY OF JAPAN LTD**	Audio/Video Products	272026.1	42.94	1.86	4.33%
6810	Tokyo	**HITACHI MAXELL LTD**	Audio/Video Products	157260.6	27.67	0.82	2.95%
6841	Tokyo	**YOKOGAWA ELECTRIC CORP**	Electronic Measur Instr	414221.8	NA	3.14	-0.10%
6857	Tokyo	**ADVANTEST CORP**	Electronic Measur Instr	918007.1	NA	4.36	-5.67%
6902	Tokyo	**DENSO CORP**	Auto/Trk Prts&Equip-Orig	1918429	17.28	1.37	7.94%
6923	Tokyo	**STANLEY ELECTRIC CO LTD**	Electric Products-Misc	401893	30.83	3.54	11.48%
6925	Tokyo	**USHIO INC**	Lighting Products&Sys	260686.8	56.05	2.47	4.41%
6951	Tokyo	**JEOL LTD**	Instruments-Scientific	62845.95	NA	3.22	-0.55%
6952	Tokyo	**CASIO COMPUTER CO LTD**	Electric Products-Misc	315336.4	55.84	2.39	4.28%
6954	Tokyo	**FANUC LTD**	Electronic Compo-Misc	1616679	40.91	2.57	6.27%
6963	Osaka	**ROHM CO LTD**	Electronic Compo-Semicon	1657280	31.27	2.45	7.83%
6965	Tokyo	**HAMAMATSU PHOTONICS KK**	Instruments-Scientific	121885.3	75.15	2.39	3.18%
6967	Tokyo	**SHINKO ELECTRIC INDUSTRIES**	Electronic Compo-Semicon	113769.7	29.51	1.33	4.50%
6971	Tokyo	**KYOCERA CORP**	Electronic Compo-Misc	1503691	36.53	1.50	4.10%
6976	Tokyo	**TAIYO YUDEN CO LTD**	Capacitors	197476.7	66.00	1.29	1.96%
6981	Osaka	**MURATA MANUFACTURING CO LTD**	Electronic Compo-Misc	1485231	37.63	2.15	5.70%
6988	Tokyo	**NITTO DENKO CORP**	Chemicals-Diversified	988685.3	51.39	4.16	8.10%
6991	Tokyo	**MATSUSHITA ELECTRIC WORKS**	Bldg&Construct Prod-Misc	713414.3	34.94	1.28	3.66%
6997	Tokyo	**NIPPON CHEMI-CON CORP**	Capacitors	57730.32	51.54	0.87	1.70%
7735	Tokyo	**DAINIPPON SCREEN MFG CO LTD**	Electronic Compo-Misc	177938.3	NA	3.95	1.54%
7751	Tokyo	**CANON INC**	Office Automation&Equip	4582829	24.03	2.88	11.98%

Source: Damodaran, 2004.

I tried to divide the companies in table 16 in sub-industries, based on Damodaran's classification and detailed information about their revenues. Classification is not easy and could be done differently also, as many companies are in fact conglomerate of hundreds of smaller companies, what I found as a Japan specialty. I depicted seven subcategories discussed in the chapters that follow.

Seven sub industries, which I found out in the electric machinery industry, are:

1. Audio / Video Products
2. Robots, automation equipment, system engineering
3. Electronic measurement equipment, scientific instruments
4. IT solutions, computer and peripherals, CD-ROM, disk drives, LCD displays
5. Electronic components: Semiconductors, IC, semiconductor equipment, passive components, resistors, capacitors, circuit boards and el. components assembly
6. Lighting, auto parts
7. Miscellaneous electric machinery

Electric Machinery industry is part of technology sector, which is one of more volatile sectors lately. Normally technology sector performs above average when we are in booming economy and below average when economy is contracting. Its performance depends on constant innovations and launching of new products, which might be interesting for consumers. It demands high R&D costs and changes in technologies are every day faster and faster. There are some very large multinationals like Sony, Matsushita, Canon, Hitachi, etc with very well established brand names and quite good position in the market. They are slow growers as they became very big. These are basic blue chip well established companies. On the other side there are smaller firms – more niche players, which are a lot more volatile and which in general can expect higher growth. Japan is known to be the country where they industrialized, and started mass production of high tech electronic products, which were originally developed mainly in the US, but really exploited for broad market in Japan. With their culture and expertise in miniaturizing they became a leading producer of audio and video products like digital cameras, camcorders, DVD recorders and players, LCD television sets, computer notebooks and monitors, copy and fax machines, robots, computer automation machines, and digital watches to name few of them.

June's 2004 Bank of Japan (BOJ) report shows that business sentiment is improving and that in general all companies from different industries forecast higher amount of capital investment in fiscal 2004. Capital investment will likely to rise for a second year, with an upward adjustment of 0.6% points. Capital investment should continue to rise in the general machinery and electric machinery sectors against a backdrop of export growth, among other factors, and is also likely to see a recovery in the materials industry, under the influence of improving conditions in the goods markets, and sectors such as telecommunications and information services. In the manufacturing sector, although the improvement among major corporations is likely to be small (around 4% points), the index is set to begin rising among small and medium enterprises and on all sizes of company basis, the index is likely to resurface. The recovery is increasingly clear to see. Exports continue to grow and, on the domestic demand front, production of slim line TV sets, DVD

recorders and other consumer electronics is expanding rapidly and orders for machinery, which had slumped in the January-March quarter have begun to rally. The rise in materials prices is exerting a downward pressure on revenues and profits. However, at least at the macro level, the benefits of the increase in sales volume are greater, and the negative impact on the business sentiment diffusion index will be limited (Tankan, 2004).

In the manufacturing sector, in view of the continued recovery of overseas economies and growth of the digital consumer electronics market, the stance of the general machinery and electrical machinery sectors on capital investment is likely to remain positive and the improving conditions in the goods markets are likely to boost investment in capacity expansion in the materials industry. There are signs that the trend of transferring production activities to overseas bases is coming to an end and investment plans are likely to remain relatively firm in all industries and among all sizes of company (Tankan, 2004).

Meanwhile, South Korean, Taiwanese and Chinese manufacturers are fast gaining on their Japanese counterparts, and the trend has prompted major Japanese producers, such as Matsushita Electric Industrial Co. to try and make key components in-house, since their fortune will likely depend very much on whether they can acquire the technology controlling such devices.

Asian markets are assuming ever greater importance in Japanese companies' global business strategies as they have become an important engine for propelling their earnings upward. The companies are now pondering how to make successful moves in Asia outside Japan in order to boost their overall earnings. According to a quarterly survey released by the Ministry of Economy, Trade and Industry on March 26 2004, sales by Japanese firms based abroad saw double-digit growth in Asia for the sixth consecutive quarter in dollar terms. The rate of sales increase in Asia has been persistently higher than those registered in North America and Europe.

Electric Machinery firms mainly produce consumer products and there is a prediction, that Asia/Pacific's consumer electronics production revenue will grow 9.7 percent annually to $170.9 billion in 2008. Emerging digital products are slowly replacing low-value analog devices (Gartner, 2004).

As in semiconductor industry, we can see the same trend also in industry connected with big LCD and plasma flat displays, that only the richest and most powerful companies will be able to produce such parts, as capital investments in this sort of industry are huge. For instance in of the latest semiconductor factories TSMC is putting in operation investment came to USD 3 Billion. Due to that as seen alliances are formed to reduce the cost of production through economy of scale. Sony and Samsung may launch joint 8G LCD panel production in '07. Capital expenditures for large LCDs are very high and companies have to look for alliances and synergies to create production of scale, to be able to compete with others.

4.3.1 Audio and video products sector

In this sector Japanese has the longest tradition of mass production and very well established brand names. Who has not heard for Sony or Canon? Firms in the audio/video (AV) products sector addresses the final customers on global markets and as we will be

able to see Japanese companies are the world leaders in mass production of the AV products. Main audio/video products are TV sets, videocassette recorders, home cinemas, audio components and systems like CD and DVD players, tuners, and power amplifiers. Very important are also video camcorders and digital cameras.

In consumer market there is a trend towards the high definition TV, LCD and plasma flat screen displays are bigger and bigger and they just overtook the classical CRT TV sets sales in June 2004. Digital cameras are taking over classical ones and found place in mobile phones. There is a new generation of DVD players (blu-ray) with higher data storage capacity. Behind this audio and video production and office automation products for final private and business consumption, there are a lot of supporting industries like firms making diversified electronic components, semiconductors and discrete electronic components, tools, production and test equipment, parts for displays...

Tables 17 and 18 show Japanese and global market share distribution for LCD TVs at the end of 2003. In Japan five Japanese firms cover already more than 95% of the market, while on global scale three Japanese firms occupy top three places and cover alone more than 76% of the market. We can see that Sharp is loosing its market share in Japan and globally while Matsushita Elec. Industrial and Sony are increasing it.

Table 17: **Japanese domestic market share for LCD TVs at the end of 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Market share (%)	Change (%)
1	Sharp	56.6	-14.6
2	M"shita Elec Industrial	17.8	5.8
3	Sony	12.9	4.2
4	Toshiba	5.6	-0.1
5	Hitachi	2.4	1.6

Source: Nikkei estimates, 2004.

Table 18: **Global market share for LCD TVs at the end of 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Market share (%)	Change (%)
1	Sharp	48.1	-13.0
2	Sony	14.9	7.6
3	M"shita Elec Industrial	13.1	3.6
4	Samsung Elec	10.1	4.3
5	LG Electronics	7.2	0.3

Source: Nikkei estimates, 2004.

However, as rival companies made a full-fledged entry into the markets one after another, Sharp saw its domestic share decline 14.6 points to 56.6% and global market share shrink 13.0 points to 48.1%. Matsushita Electric Industrial Co. Ltd. came in second and third place in the domestic and global market rankings, respectively, with Sony ranked second globally and third in the domestic market. In the global market, two South Korean firms - Samsung Electronics Co Ltd and LG Electronics Inc. - steadily expanded their shares, as both firms" products use LCD panels made in-house or by their group companies.

Companies have been aggressively releasing new models in 2004, partly to take advantage of the summer Olympic games in Athens. The panels for their LCD TVs are getting bigger, with Sharp starting to sell 45-inch models made at its state-of-the-art plant in Kameyama, Mie Prefecture (Nikkei.net, Aug. 5th 2004). Samsung reduced prices and others had to follow and this sent share prices of LCD panel manufacturers down lately. New capacities were added and prices will reduce further. Problem with big displays is that their production yield is not very good yet and like that prices cannot come down faster.

One major advantage that LCD panels hold over PDPs (plasma display panels) is that they use 50-60% less power. Further energy savings delivered by the new LCDs will enhance this advantage. Canon Inc. has developed a color LCD that runs on about 30% less power than conventional LCDs, which due to limitation in number of colors will not target TV sets market. Prices of flat-panel TVs, which are expected to enjoy surging demand thanks to the upcoming summer Olympic games in Athens, are likely to decline further due to the falling production costs of their panels, which comprise 30-50% of the total production costs. Flat panel prices were high until recently mainly because glass substrates - their key components -were in short supply. However, panel makers have recently made substantial capital investments to expand production facilities, a move that has raised their output efficiency.

The LCD TV market is full of growth potential, with the Japan Electronics and Information Technology Industries Association projecting global demand to jump from 2.78 million units in 2003 to 23.7 million units in 2008. At a time when Japanese manufacturers are competing to market value-added LCD TVs as a way to secure solid earnings, the emergence of Taiwanese firm TECO Electric and Machinery Co. and its lower-priced products could hamper such plans. Sharp is also going after AUO, which supplies the panels alleged to have infringed on its patents.

A July 15 ceremony celebrating the establishment of S-LCD Corp., a joint venture between Sony Corp. and Samsung Electronics Co., signals new competition for Sharp Corp., the market leader in liquid-crystal displays for television sets. New plant in Tangieong in South Korea is scheduled to begin operating in mid-2005 and will fabricate 7G LCD displays. At 1.9 x 2.2 meters in size, 7G substrates offer about 50% more area than the currently largest 6G products that are being produced at Sharp's Kameyama Plant, which started operations in January. The larger size will cut costs significantly. By 2010, Samsung plans to have invested about 2 trillion yen to build four LCD production lines at the factory, and projects 1 trillion yen in annual sales once the facility is completed.

DVD players are presented in chapter 4.3.4, where DVD manufacturers are discussed.

Digital cameras are another large part of the audio/video sector. Its resolution is improving all the time and now middle class standard moved to 5-mega-pixels already giving the same results on formats 13 x 18 cm as classical film cameras. For digital cameras it is expected that in the 2004, growth in the Japanese domestic market will likely slow. However global demand, of which Japanese manufacturers hold a 90% share, is expected to expand further. Total domestic shipments reached 8.43 million units in year 2003 (Camera & Imaging products association, 2004), up by 28.8% compared with 2002. Table 19 shows digital cameras domestic shipments share distribution by Japanese firms.

Table 19: **Japanese digital cameras domestic shipments market share in 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Shipments share (%)	Change (%)
1	Canon	16.6	1.5
2	Fuji Photo Film	15.0	-5.2
3	Sony	14.6	-2.1
4	Casio Computer	13.0	1.9
5	Olympus	12.0	-1.2

Source: Nikkei estimates, 2004.

Camcorders are moving from analog, using different tapes as storage medium, to more convenient silicon memory solutions. With this move also their size and weight is reducing. Japanese, as regards digital cameras are champions in miniaturization of these Hi-Tech "gadgets". Camcorders resolution is already ahead of standard TVs and is still improving as videos and pictures can be viewed on higher definition computer monitors and high definition TVs. Best camcorders allow also taking pictures with 3-mega-pixel resolution. There are not a lot of followers of this trend as this reduces the market share for digital cameras as one can buy only good camcorder instead of both products. Japanese domestic shipment of camcorders was 1.67 million units in 2003 (up 17.5% form year before) (Japan Electronics and Information Technology Industries Association, 2004). Five Japanese firms left only 0.2% of shipment shares to others as shown in table 20. On global scale as shows table 21, four top places are occupied by Japanese firms, which took more than 90% shipment share of totally 13.85 million camcorders shipped in 2003 (up 4.1% from year 2002). Fifth Samsung from South Korea is slowly reducing the gap.

Table 20**: Camcorders shipments market share in Japan in 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Shipments share (%)	Change (%)
1	Sony	38.3	-2.7
2	Matsushita Electric	25.2	-2.8
3	JVC	16.5	-1.6
4	Canon	10.7	3.4
5	Sharp	9.1	4.2

Source: Nikkei estimates, 2004.

Table 21: **Camcorders global shipment market share of Japanese producers in 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Shipments share (%)	Change (%)
1	Sony	38.3	-3.7
2	JVC	20.9	0.2
3	Matsushita Electric	18.9	2.0
4	Canon	12.5	1.0
5	Samsung Electronics	8.2	2.0

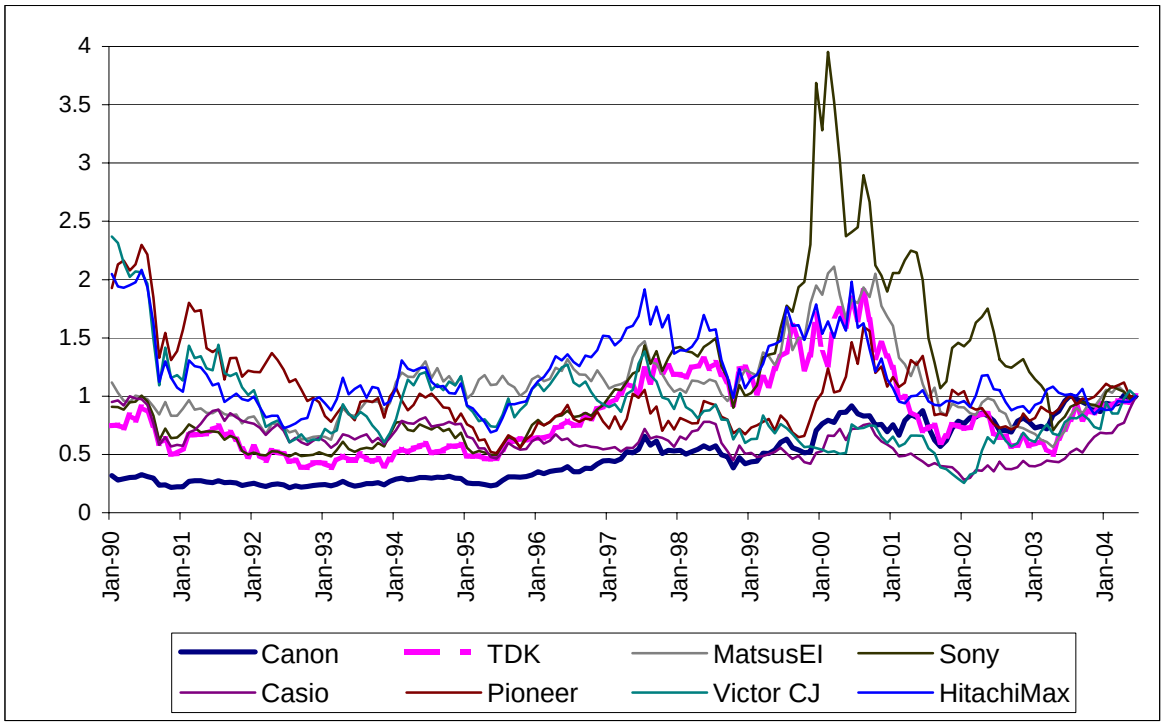
Source: Nikkei estimates, 2004.

We can see that Japanese firms have very large global market share in audio/video products. Their market share is in danger from new Asian tigers like South Korea and China. Japanese firms have the know-how, which they have to keep and improve to stay ahead of others. Japan is already saturated with these products so only improved and new products will find the market. For the rest of the world potential is much better.

4.3.1.1 Selected audio / video products sector players in Nikkei 500

In this sector I have classified eight out of 38 surveyed firms. These firms are: Canon (7751), TDK (6762), Matsushita Electric Industrial (6752), Sony (6758), Casio (6952), Pioneer (6773), Victor Company of Japan (6792), and Hitachi-Maxell (6810). They are all established known companies. First I am showing the past stock price performance for these firms.

Figure 18: **Stock price performance comparison of selected audio/video firms from the Nikkei 500 in period January 1990 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

The best performer in the last 12 months was Casio, with incredible +115% increase in price, followed by Matsushita Electric Industrial with +43.1% and TDK with + 39.6%. Best selection Canon appreciated by +4.4%, the same as Pioneer. The worst performer was Hitachi Maxell falling by 1%. From figure 18 we can see that my favorite Canon made the biggest progress in difficult period from the beginning of January 1990. In fact it is the only stock from the above selection to have positive return from January 1990 till the end of June 2004. In appendix C, I provide a short description and the major characteristics of analyzed firms in this sub-industry.

4.3.1.2 A selection of stocks in the audio/video sector

My selection together with data and my final recommendation is shown below in table 22.

Table 22: **Selected ratios, attributed points for trends and the final score for selected audio/video firms in the electric machinery Nikkei 500 index, as of July 2004.**

	Canon	**TDK**	**Casio**	**Pioneer**	**MatsuEI**	**Victor**	**Sony**	**Hit Max**
Code	**7751**	**6762**	**6952**	**6773**	**6752**	**6792**	**6758**	**6810**
P/E	17.45	22.93	29.09	18.27	80.54	16.83	41.06	22.89
P/E trend	2.8	2	2	3	1	2	2	4
Forwd P/E	20.84	77.22	39.12	66.71	30	142.4	21	38.01
2Net profit	15.11	8.36	3.99	5.91	0.30	2.34	2.73	5.9
ROE	15.95	7.45	10.26	7.63	1.27	10.21	3.80	3.66
ROE trend	3	3	3	3	2	9	1	2
P/B	2.58	1.67	2.86	1.36	1.02	1.65	1.53	0.83
PEG	1.64	2.5	2.85	7.54	0.81	7	0.61	19
PEG points	0	-1	-1	-3	2	-3	5	-6
MC points	5	3	2	2	5	1	5	0
FCF/s/P*f	5.3	13.46	23.6	-1	6.4	14.9	-5.6	7.52
Liquidity	4	3	1	2	3	0	4	-5
Gr.Expect	12.67	30.78	13.5	8.85	45	11	35	5
Sales Gr tr.	2.3	1	2.5	2.3	1	-2	1	-1
TD/SE	0.57	0.28	2.37	1.06	1.08	2.10	2.79	0.54
TD/SE tr	3	0	-1	-1	-1	-2.8	-2.7	0
CR	2.33	4.13	1.85	2.15	1.47	1.62	1.13	2.26
CR trend	2.7	2.6	1	0	-1	1	-2.4	-1
Invent.trend	2.4	1	2.5	1	2.6	-1	3.3	2.5
Dividen tr.	2.94	0	1.2	2.5	0	1.7	0	0
Cash/Assets	21.73	29.54	25.09	26.63	19.46	19.98	12.41	13.08
P/EBITDA	7.50	9.83	9.10	5.38	7.01	6.12	7.94	7.54
beta	0.87	1.10	0.85	0.97	1.15	0.84	1.05	0.81
My points	2	2	3	1	2	2	2	4
Last Y-EPS	313.81	317.80	51.99	141.58	18.15	61.09	95.97	71.52
Next EPS	348.67	351.18	67.64	142.51	27.17	31.49	NA	78.52
Next+1 EPS	396.80	NA	NA	NA	NA	NA	NA	90.8
Total score	65.6	44.4	28.8	28.5	27.1	25	17.6	15.6

Source: Bloomberg, Nikkei Net Interactive, Yahoo.finance.com, and own calculations.

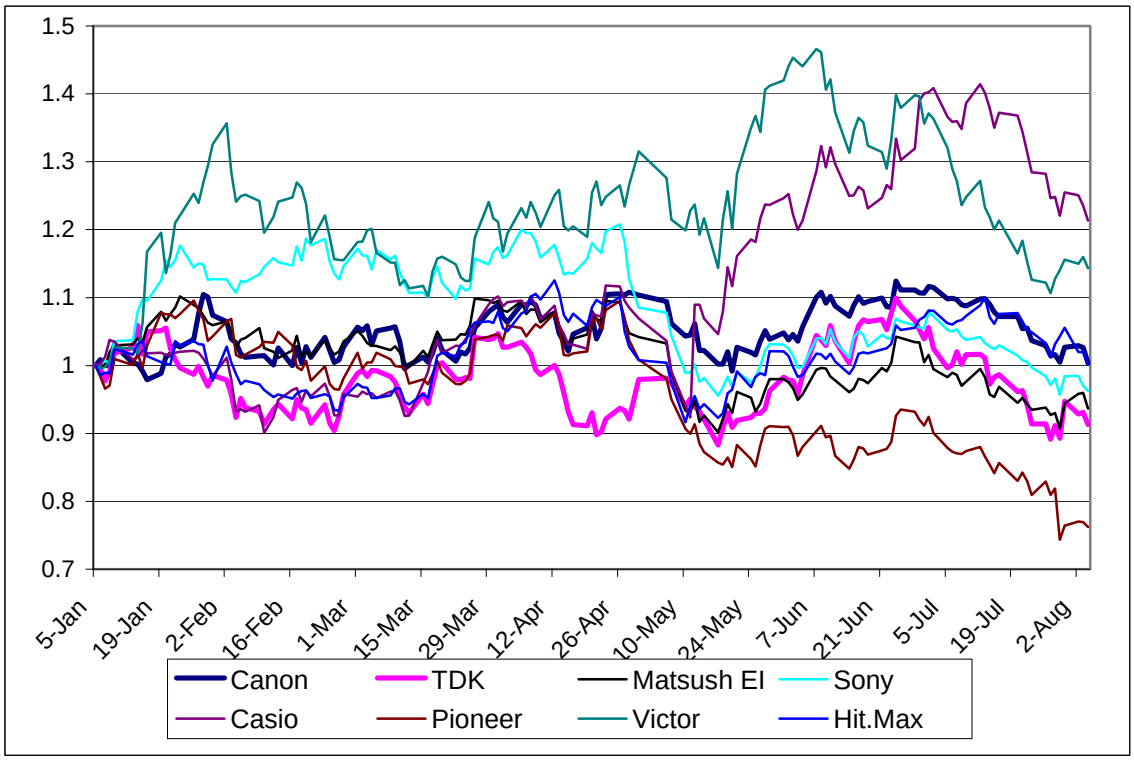
As we can see in table 22, the best result of all eight firms in the audio/video sector according to my criteria scored Canon. TDK is the second, followed by Casio, Pioneer, Matsushita Electric Industrial and Victor. The worst two companies are Hitachi-Maxell, and Sony. In case of Sony if I would give credit to its brand name the result should be better. Canon has attractive current and forward P/E, which is the lowest among compared firms. Canon has higher ROE as other firms. Canon stands well also looking to short-term and long-term debt. Certainly Canon is one of top five stocks from my report. Second TDK is already less attractive as it's score is more than 30% lower as Canon's. Free cash flow

and growth expectation are better for TDK compared to Canon but otherwise it is less attractive.

4.3.1.3 Price performance of stocks in the audio/video sector

The price performance of all selected companies from the audio/video sector from January to August 4th 2004 is below Nikkei 225. Audio/video product firms are part of technology sector, which under performed the broad Nikkei index this year and especially from April 2004 on. From figure 19 we can see that Canon was very stable in 2004 and was trading in a narrow ± 10% range what we could expect also from its low beta.

Figure 19: **Stock price performance comparison of audio/video firms in the Nikkei 500 index in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: own calculations based on Bloomberg.

In table 23, I show the returns on stocks in three different periods starting at the end of June 2003. Canon, which scored the second best overall result, was traded in a narrow range this year and lately resisted better as Nikkei 225 average. Canon resisted much better as average technology company and much better as the average of all companies I am analyzing in my report. Casio outperformed with large margin all other firms in the sector. Casio's strength is in second highest ROE, good ROE trend and mainly in good free cash flow per share as a percentage of share price. In this factor Casio is the best. Surprisingly I notice, that JVC with second best score in this parameter had the second best performance from January and April till now. And surprise is not over as Matsushita Electric Industries with almost similar score as Casio is number three. Again we can see, that FCF/Price

looks to be an important performance factor. This correlation should receive an attention to be explored in detail outside of this work. I would add TDK only for a bit more risky portfolio.

Table 23: **Changes in stock prices of audio/video firms from the Nikkei 500 index from June 30th 2003, January 1st 2004 and April 1st 2004 until August 4th 2004 (in %).**

Code	7751	6762	6752	6758	6952	6773	6792	6810		
	Canon	TDK	Matsus. Elect.In	Sony	Casio	Pioneer	Victor	Hit.Max	Sub-Ind	Nikkei-225
from 30.6.03	-5.32	22.77	33.35	11.06	86.70	-12.65	8.51	-7.49	13.22	21.21
from 1.1.04	0.37	-8.68	-6.33	-3.73	21.33	-23.79	14.34	0.13	-3.39	2.06
from 1.4.04	-6.34	-11.07	-13.35	-16.88	11.59	-26.47	-2.07	-5.09	-11.69	-6.35

Source: own calculations based on Bloomberg.

Casio is a clear winner in the stock price return for all three periods shown in table 23. Its forward P/E start to increase over the average one and I think its fast stock appreciation will not continue. On the other hand Canon which stock price was very stable is becoming more solid in its fundamentals and can break upwards.

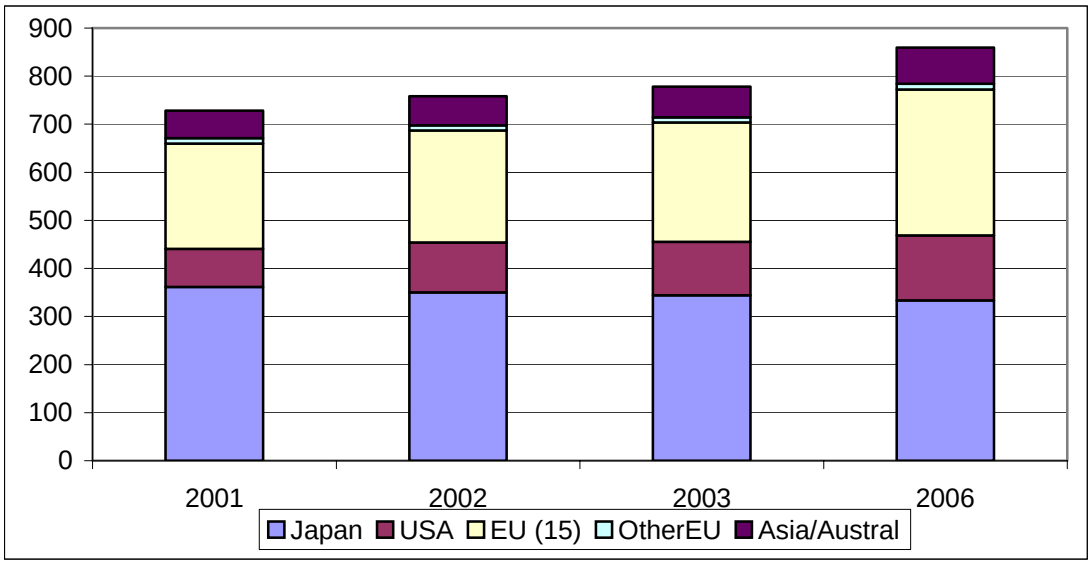
4.3.2 The robots, automation equipment, and system engineering sector

Japan is the country with the highest number of robots and automation. In 1990 Japan had 70% of world's robots and this share is slowly falling as other countries are catching up. This can be seen from figure 20 showing the number of operational multipurpose industrial robots. At the end of 2003 Japanese share was still 41% of global share with 344,000 operational robots (International Federation of Robotics (IFR), 2003). Lately South Korea has the highest growth of installing new robots. I expect China will follow, as more and more car manufacturers are installing their operations there, and knowing that car industry is one of the largest employers of robots.

Worldwide sales of multipurpose industrial robots peaked in 1990 when they reached over 80,000 units. Following the recession in 1991-1993, worldwide sales fell to about 53,000 units in 1993. The world robot market then started a period of strong recovery, which peaked in 1997 when it reached a level of 82,000 units. In 1998, however, sales plunged by 15% to just under 69,000 units. The market recovered sharply in 1999 with sales of nearly 80,000 units, an increase of almost 15% over 1998. In 2000, growth accelerated to 24%, attaining a record of almost 99,000 units. In 2001 and 2002, however, the world market fell by 21% and 12%, respectively, reaching 68,600 units (IFR, 2004).

The first half of 2003 was the best first half ever recorded for robotics. Looking at the first half of 2003, the UNECE/IFR quarterly survey on order intake of industrial robots, which includes most of the world's largest companies, showed that worldwide order intake increased by 26%, compared with the same period in 2002. This shows that robots and automation belongs to cyclical industries. When economic situation is getting better companies invest in new equipment while in bad times they have to look how to cut costs and they postpone capital expenditures.

Figure 20: **Operational stock of multipurpose industrial robots in 2001, 2002 and forecasts for 2003-2006 (in 1000s).**

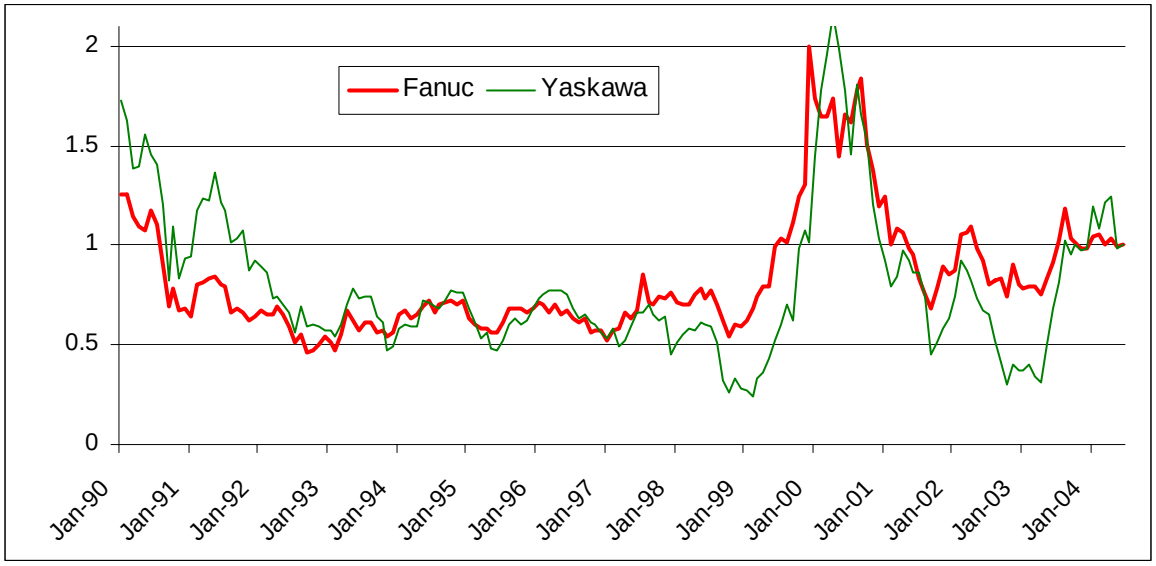


Source: UNECE, IFR and national robot associations, 2003.

4.3.2.1 Robots, automation equipment, system engineering sector players

In this sub-industry I only assigned two companies: Yaskawa Electric Corporation (6506) and Fanuc (6954). In figure 21, I present historical stock price performance of both companies relative to June 30th 2004, when both stock prices are normalized to one.

Figure 21: **Stock price performance comparison of selected robots, automation equipment and system engineering firms from the Nikkei 500 in period January 1990 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

From figure 21, stock price performances of both firms in the last 14 years and a half we can see that they have both very similar pattern. Fanuc outperformed Yaskawa in that period. Yaskawa is smaller player, is more volatile but in the last year it clearly outperformed Fanuc. We can see that both stocks are trading lower as at the beginning of 1990. Both stocks had a big push in 1999 when technology stocks raised globally and peaked at the top of NASDAQ cycle to form a bubble, which exploded in year 2000 and pushed stocks down for the next three years. From that peak in 2000 both stocks lost about 50% till the end of June 2004. A short description of both companies can be found in appendix D.

4.3.2.2 A selection of firms in the robots, automation equipment, system engineering, and electronic measurement equipment & scientific instruments sector

The overview of the evaluation results for both firms in robots and automation sub-industry, together with the electronic measurement equipment and scientific instruments sub-industry, (which will be discussed later) is presented in table 24.

A clear recommendation from the robots, automation equipment, and system-engineering firms is Fanuc, scoring 46.8 points, which put it in the top eight stocks. Fanuc is bigger as Yaskawa, has a lot of money which it looks it has problems to spend efficiently. Fanuc is less volatile, and has very small long-term debt and current debt. It is more profitable one. Fanuc is cash rich company and has more than half of its assets in cash and marketable securities. Its forward P/E looks better as for Yaskawa, which had a very good growth in ROE lately and current ROE is more than twice the one of Fanuc. Yaskawa looks to have better growth potential.

Looking at these results closely I am surprised by the difference in points. It looks like the high ROE is due to very high TD/SE ratio, which is 40 times higher for Yaskawa compared to Fanuc. Yaskawa has TD/SE of five, which is well above recommended value below one. When taking in account also observations from the previous paragraph I can say that there is no doubt here – play big and sure – play Fanuc.

From the electronic measurement equipment and scientific instruments I would recommend only Advantest. It is one of the world's leaders in the electronic test & measurement (T&M) arena. It is the biggest of all analyzed firms in the sector and with upturn in semiconductor cycle in 2003 its situation improved a lot. It has attractive forward P/E – below average of compared firms, it has high growth expectations, low debt levels, high cash reserves, and they just increased their guidance for fiscal year (FY) 2005 earnings. Second Yokogawa scored just a fraction weaker rating but is smaller, with higher debt but attractive ROE. Other firm's result is even worse and I would not recommend any of them.

Table 24: **An overview of evaluation criteria for Japanese robots, automation equipment, system engineering and electronic measurement equipment, scientific instruments firms in the Nikkei 500, as of July 2004.**

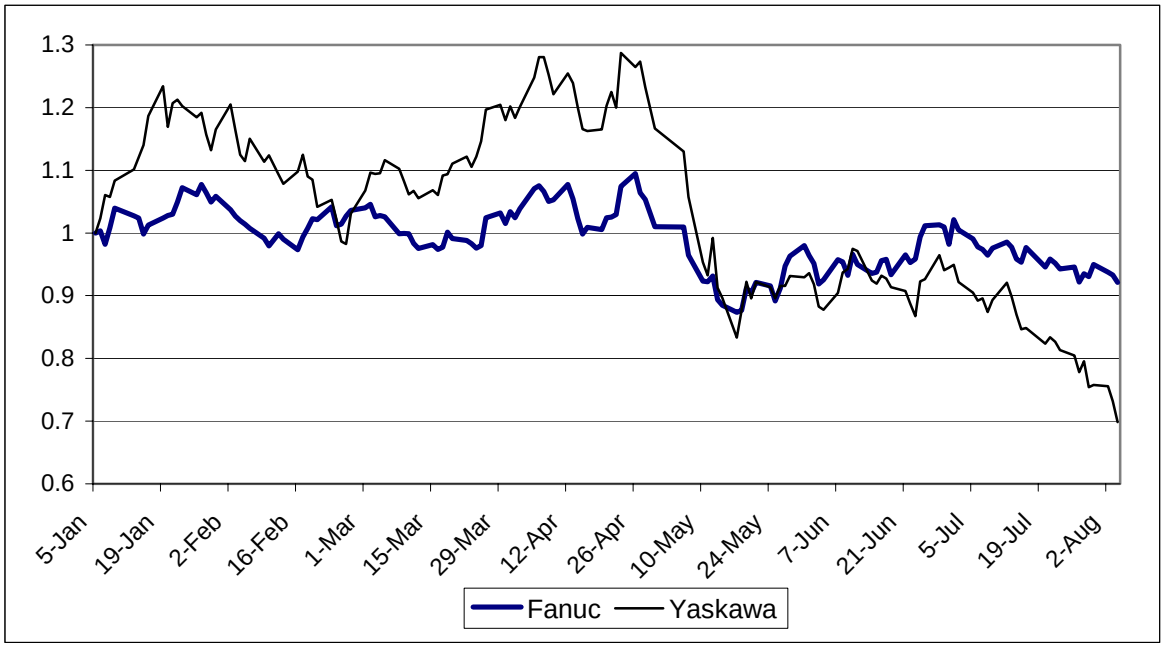
	Robots, automation		Electronic measurement eq. & scientific instruments					
	Fanuc	Yaskawa	Advantest	JEOL	DScreen	Yokogaw.	Hamam.	Anritsu
Code	**6954**	**6506**	**6857**	**6951**	**7735**	**6841**	**6965**	**6754**
P/E	26.7	23.77	37.43	73.66	28.30	13.38	83.72	73.6
P/E trend	2	3	1	-3	-2	1	1	1
Forwd P/E	30.04	44.33	20.78	83.04	13.14	26.42	31.91	83.8
2Net profit	40.09	1.09	-3.34	0	0.47	-1.45	7.57	1.40
ROE	8.79	17.28	8.01	3.42	7.92	16.64	3.19	1.84
ROE trend	2	4	2	1	2	4	-2	1
P/B	2.27	3.77	2.92	2.33	1.77	2.03	2.66	1.35
PEG	3.32	0.78	0.6	0.6	1.3	2.65	2.42	4
PEG points	-1	3	5	8	0	-1	0	-1
MC points	3	0	2	-2	0	1	0	-2
FCF/s/P*f	7.29	17.26	7.55	7.01	10.87	-1.74	5.4	11.14
Liquidity	3	1	3	0	0	1	-5	-2
Gr.Expect	8.17	63.20	50.13	325.9	10	7.53	21	10
Sales Gr tr.	1	2.3	2	2	1	2.5	2.6	-3
TD/SE	0.12	5.0	0.49	2.83	2.08	1.42	1.18	1.47
TD/SE tr	2	-2	0	1	3.5	-1	1	-1
CR	8.78	1.10	3.84	1.37	1.45	2.16	2.18	4.21
CR trend	-2	-2.2	-2	2	1	1	-1	3.2
Invent.trend	0	0	1	-1	-2.3	-2	1	2.5
Dividen tr.	0	-1	1	-2	0	0	1.2	-2
Cash/Assets	54.33	6.94	30.58	13.46	13.39	9.06	16.96	23.75
P/EBITDA	14.57	7.70	15.24	12.05	8.84	9.90	9.57	13.96
beta	1.05	1.82	1.49	1.12	0.94	1.09	0.99	1.31
My points	3	2	-2	3	2	2	1	3
Last Y-EPS	254.62	24.80	176.37	10.92	22.98	99.84	23.09	8.38
Next EPS	227.47	34.58	383.57	18.86	50.0	32.92	36.84	13.33
Nxt+1 EPS	NA	NA	312.3	27.86	38.56	NA	NA	31.56
Total score	46.8	23.8	43.4	19.9	34.0	42.5	12.9	6.7

Source: Bloomberg, Nikkei Net Interactive, and own calculations.

4.3.2.3 Stock price performance of the robots, automation and system engineering firms

This years' Fanuc and Yaskawa stock price performance is negative. My favorite Fanuc performed much better compared to Yaskawa as we can see from figure 22 and table 25. Fanuc's last three months performance is starting to outperform even the broad Nikkei 225 index. Few reasons I put already in two previous chapters. I expect that they will perform well if Japanese recovery continues as they produce automation equipment and robots companies have to upgrade and complete after a long recession. Japanese firms are stronger as in the last decade and they are still one of the biggest robots employer. Others countries have to follow with robot installations to be competitive. Asia tigers – mainly South Korea and China might have the biggest demand for them.

Figure 22: **Stock price performance comparison of robots & automation firms in the Nikkei 500 in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: Bloomberg, 2004.

Table 25: **Changes in the stock prices of robots, automation equipment and system engineering firms in the Nikkei 500 index from June 30th 2003, January 1st 2004 and April 1st 2004 till August 4th 2004 (in %).**

Code	6954	6506		
	Fanuc	Yaskawa	Sub-Ind	Nikkei-225
from 30.6.03	2.65	8.28	11.69	21.21
from 1.1.04	-7.87	-30.13	-16.90	2.06
from 1.4.04	-10.07	-40.97	-20.09	-6.35

Source: own calculations based on Bloomberg.

Table 25 shows much better performance of Fanuc stock price compared to Yaskawa. Fanuc resisted well even compared to Nikkei 225, as it did not loose as much ground as average technology companies I analyzed. Fanuc has good fundamentals and real potential for its stock price to increase if economic rebound in Japan and globally will confirm, as it is a cyclical company, which performs well when economy expands.

4.3.3 The electronic measurement equipment and scientific instruments sector

The test and measurement (T&M) industry is struggling to keep up with various challenges: the battle to lower testing costs; an increasing number of versatile test systems' reliance on the PC; and growing IC device complexities and performance levels that crave more cost-effective T&M solutions. The emergence of many new applications like telecom, automotive, biomedical, and consumer and optical electronics demand a new breed of testing methods. What's the bottom line? Users demand greater functionality and

flexibility from their T&M tool and at a cost-effective price. Testing is taking a bigger bite out of a device's fabrication price tag. It probably won't get any better, as devices get even smaller and more sophisticated (Allan, 2003).

Lowering instrument costs is one of the biggest challenges facing T&M instrument manufacturers. This is difficult to do, particularly for instruments used during the development phase of sophisticated microprocessors and system-on-a-chip (SoC) devices.

One of the most promising areas for T&M equipment suppliers is the telecom sector. Despite its horrendous downturn, many instrument makers remain committed to this market and continue to churn out telecom T&M products. The T&M industry must ready itself for the telecom arena and many other areas, including biomedical, automotive, and industrial electronics, where measurements of optical and magnetic properties are just as important as those for currents, voltages, and frequencies. Of particular note is the rapidly emerging field of nano-technology, where test-equipment designers will face heady challenges as they attempt to measure current and voltage levels at the atomic and molecular scales.

Advantest as one of top T&M maker has seen a surge in orders since the third quarter of 2002. In fiscal 2001 Advantest experienced a massive drop in sales, down 63 percent year on year. Advantest's' president and CEO, Toshio Maruyama does not think we will see a repeat of that, because more and more semiconductors are being applied in various kinds of products such as mobile phones, DVD players and automobiles. Furthermore, even if sales of computers in advanced countries level off, sales volumes in China, Russia and other emerging markets will be rising (Iwata, 2004).

Logic testers are based on high-mix, small-quantity production. Also, support requires considerable time and labor. The profit margin for low-end products is slim because the barrier to market entry is low and competition focuses on price. To solve this problem, firms intend to reduce the development cost by using open architecture. In addition they are rationalizing everything they can by thoroughly revamping the production line and reducing production time.

Another area that could drive sales in the semiconductor test market: Chips are replacing PCBs, with as many as seven chips populating a single system-in-package, and four-chip SIPs becoming commonplace (Nelson, 2004).

The semiconductor ATE industry is enjoying a boom. Market researcher VLSI Research says the market rose to $3.3 billion in 2003—a $1 billion increase over 2002. Advantest led the gains race with a 115% sales increase, which VLSI Research attributes to Advantest's dominance in DRAM test. For system-on-chip testers, sales were less spectacular yet still respectable. That's fine with Tom Newsom, VP and general manager of Agilent Technologies' SOC business unit: "I'd love to have a couple 13%-per-year years. The 50%-per-year ones scare me because of what's on the other side of that coin" in an industry famous for boom and bust cycles (Nelson, 2004).

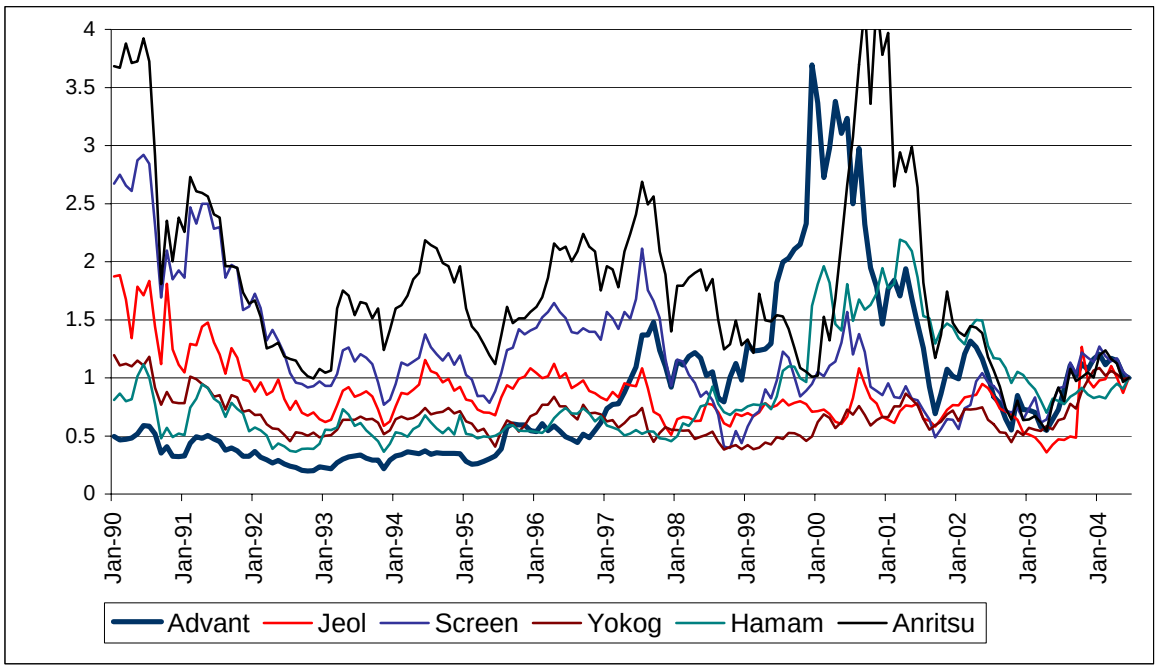
As seen this is cyclical industry closely related to semiconductor industry and overall economy. From the end of 2002 this area is in expansion and this should last couple of years more. Current cycles should be lower as semiconductors are not going mainly only in personal computers but their use is widening in everyday' life and is covering more and

more areas. The biggest problem is price pressure and increasing part of testing cost in final product price as they become more and more sophisticated with increasing number of features. T&M industry certainly has a future due to that.

4.3.3.1 Japanese electronic measurement equipment and scientific instruments firms

In this category I classified: Advantest (6857), which is the second biggest semiconductor test and measurement company after KLA-Tencor, Anritsu (6754), JEOL (6951) and Yokogawa (5841) making different measurement and scientific instruments. In this category I also put Hamamatsu Photonics (6965) and Dainippon Screen (7735).

Figure 23: **Stock price performance comparison of electronic measurement equipment and scientific instrument firms in the Nikkei 500 index in period January 1990 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

Anritsu was the most volatile stock observed in the period from January 1990 until the end of June 2004 (see figure 23). From January 1990 until the end of June 2004 the Advantest stock increased the most – its price doubled. The only other stock with positive performance in the same period is Hamamatsu Photonics. For the same period all other stocks were lower at the end of June 2004. Advantest had the second highest peak at the end of year 1999 from where it dropped by 85% what was quite common for technological firms, as also US NASDAQ, a broad technology index, dropped by more than 75% at the same time. Technology firms have been hammered down again in the last three months, and should form a base from which they should return in positive territory once the oil crisis and the US presidential elections are over. In appendix E, I provide a short description of analyzed firms in this sector.

4.3.3.2 Stock price performance of the electronic measurement equipment and scientific instruments firms

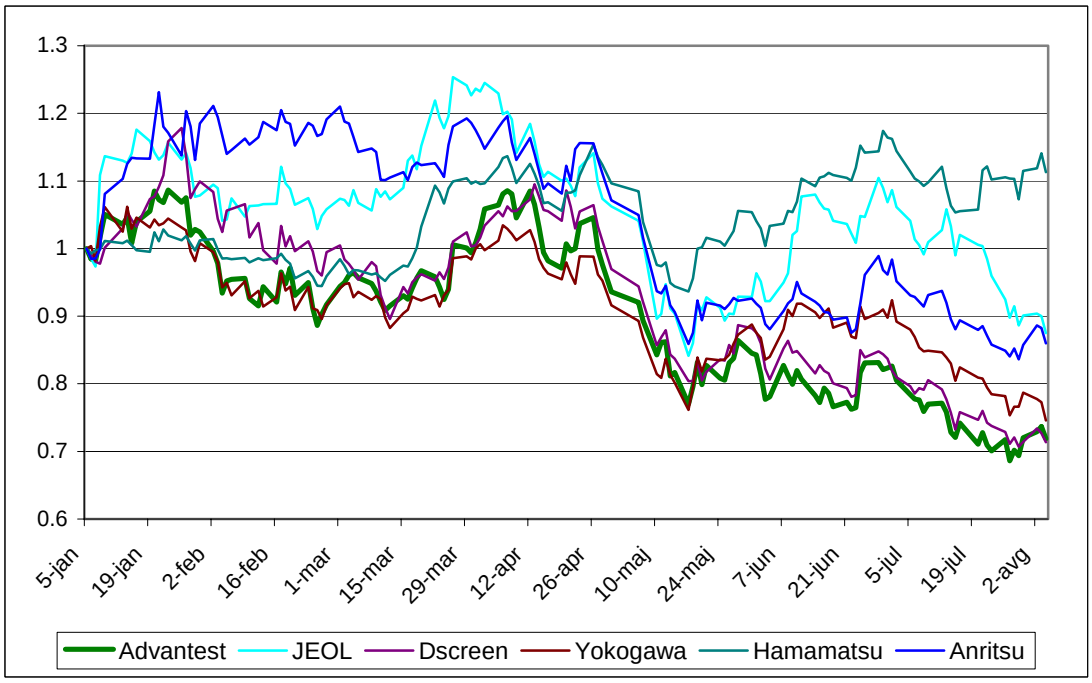
Bad investment climate for technology firms is very well seen in this sector, as it largely under performed the broad Nikkei 225 index in the last year (see table 26). My favorite Advantest has been the worst in this sector. It looks even more attractive after recent drop as its forward P/E is below average for this sector, it has very nice PEG ratio of only 0.6 and in addition it is the biggest firm with the highest liquidity from firms I compared in this sector. Its performance is similar as from KLA-Tencor in the US, which is its direct bigger competitor and which price dropped also about 30% in this year.

Table 26: **Changes in the stock prices of electronic measurement equipment and scientific instruments firms from the Nikkei 500 index from June 30th 2003, January 1st 2004 and April 1st 2004 till August 4th 2004 (in %).**

Code	6857	6841	6951	7735	6965	6754		
	Advantest	Yokogawa	JEOL	Dscreen	Hamamatsu	Anritsu	Sub-Ind	Nikkei
from 30.6.03	19.94	30.42	73.45	-6.64	19.36	-2.52	11.69	21.21
from 1.1.04	-28.10	-25.42	-12.52	-28.64	11.32	-14.02	-16.90	2.06
from 1.4.04	-30.11	-25.91	-29.01	-29.76	1.60	-26.01	-20.09	-6.35

Source: own calculations based on Bloomberg data.

Figure 24: **Stock price performance comparison of electronic measurement equipment and scientific instruments firms in the Nikkei 500, in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: Bloomberg, 2004.

When looking at this years relative stock price performances, in figure 24 we can see that drop continue after the plunge in mid first half 2004. Hamamatsu is the only stock in this sub-industry with positive return this year while the largest increase from June 30th 2003 was made by JEOL, which lost a lot of ground in the last four months. Advantest with decreasing forward P/E ratio and in general solid fundamentals (except lack of net income which is crucial) should find the bottom and start to rise. First signs are there as Advantest stock price went up by more than 10% in the last month (observation made on August 27th 2004).

4.3.4 The IT solutions, computer and peripherals, CD-ROM, disk drives, LCD displays sector

This is one of the broadest category of firms producing modules, and parts for computer industry and audio/video industry. Competition in this industry is very high and it depends on innovations different actors propose. The speed of improvements in these sorts of products is very high. Innovative, faster, higher density, higher resolution, smaller, cheaper, better performance, less power consuming, environmental friendly are main key factors for growth and development of this industry.

One of the biggest consumers of these parts is personal computer (PC) industry. In 2003 12.81 million PCs were sold in Japan (2.8% more as in year 2002). Overall Japanese domestic PC shipments are expected to rise 6.5% to 13.65 million units in 2004, with strong sales growth likely to continue at foreign-affiliated PC makers (International Data Corporation (IDC) Japan). Table 27 shows how market share is distributed among different firms and the advance of Dell Japan from the 5th to 3rd place.

Personal computers became commodity and margins are low. Desktop PC market share is going down while laptop PCs are increasing their market share. In PC industry flat panel LCD monitors overtaken CRT ones. PCs with Linux operating systems are taking market share from workstations; as such systems are much cheaper for the same performance due to mass production. Instead of CD-ROM almost everybody start to implement DVD players and blu-ray DVD technology is on the rise. PC is becoming also home theater center. Pocket PCs and organizers are getting more customers also. In Japan foreign intruder Dell made the biggest progress in PC sales in the last year.

Table 27: **Personal computers market share in Japan by producers at the end of 2003 (in %) and its change from the year 2002 (in %).**

Rank	Company name	Market share (%)	Change (%)
1	NEC	21.2	-0.3
2	Fujitsu	19.8	-0.2
3	Dell Japan	9.7	2.0
4	Toshiba	7.9	0.4
5	Sony	7.8	-3.9

Source: IDC Japan, 2004.

Dell Japan is expected to further narrow the gap with the top two firms in the sector, while Hewlett-Packard Japan Ltd., which moved up to seventh place in 2003 due to a 36% jump in shipments, could come in fifth or higher in 2004.

I put the digital video-disc (DVD) producers in this category as DVD module can be used in different applications. DVD players are replacing old fashion tape video recorders, which represent big market, they are used in PCs, and they can replace compact disk (CD) music players. Shipments of DVD players in Japan in 2003 totaled 1.96 million units what was up an incredible 214.9% from 2002 (Japan Electronics and Information Technology Industries Association, 2004), showing that there is still place for future expansion. Table 28 shows how shipments of DVD recorder/players were distributed among Japanese firms where top five firms made 98% of all shipments. Table 29 shows the global distribution of shipments for DVD recorder/players where European company Royal Philips Electronics occupies second place and increased its market share compared to 2002. Global shipments of DVD recorder/players reached 3.6 million units (Japan Electronics and Information Technology Industries Association, 2004) and have a bright future ahead when we compare the Japanese shipments and growth expectations to global shipments. Tables show also that Toshiba and Pioneer lost some share, while Sony made the biggest progress.

Table 28: **DVD Recorder/Players shipments market share in Japan in 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Shipment share (%)	Change (%)
1	Matsushita Electric Indust.	41.5	1.2
2	Toshiba	17.8	-9.0
3	Pioneer	14.8	-10.8
4	Sony	14.1	12.5
5	Sharp	9.8	6.2

Source: Nikkei estimates, 2004.

Table 29: **DVD Recorder/Players global shipments market share in 2003 (in %) and its change from the year 2002 (in %)**

Rank	Company name	Shipment share (%)	Change (%)
1	Matsushita Electric Indust.	42.5	-7.5
2	Royal Philips Electronics	14.8	4.7
3	Pioneer	14.2	-4.0
4	Sony	12.2	11.2
5	Toshiba	11.0	-3.0

Source: Nikkei estimates, 2004.

New models using DVDs as recording media may turn out to be a key product, which will determine companies' market shares in the near future. Sony, Matsushita and Hitachi Ltd. are leading in this area so far.

LCD display market is also very strong. Main applications are for TV sets, PC monitors, and laptop computers. Japanese shipments of liquid crystal display TVs with the screen size of 10 inches or more jumped 95.7% from a year earlier to 1.23 million units in 2003, while global shipments posted a 2.3-fold increase to 2.78 million units. Consumers liked their slim designs and energy-saving features. Sharp Corp grabbed the leading shares of both the domestic and global markets, as consumers favored its wide product lineup, ranging from 13- to 37-inch models, as well as the fact that its products were equipped with high-quality LCD panels made in-house.

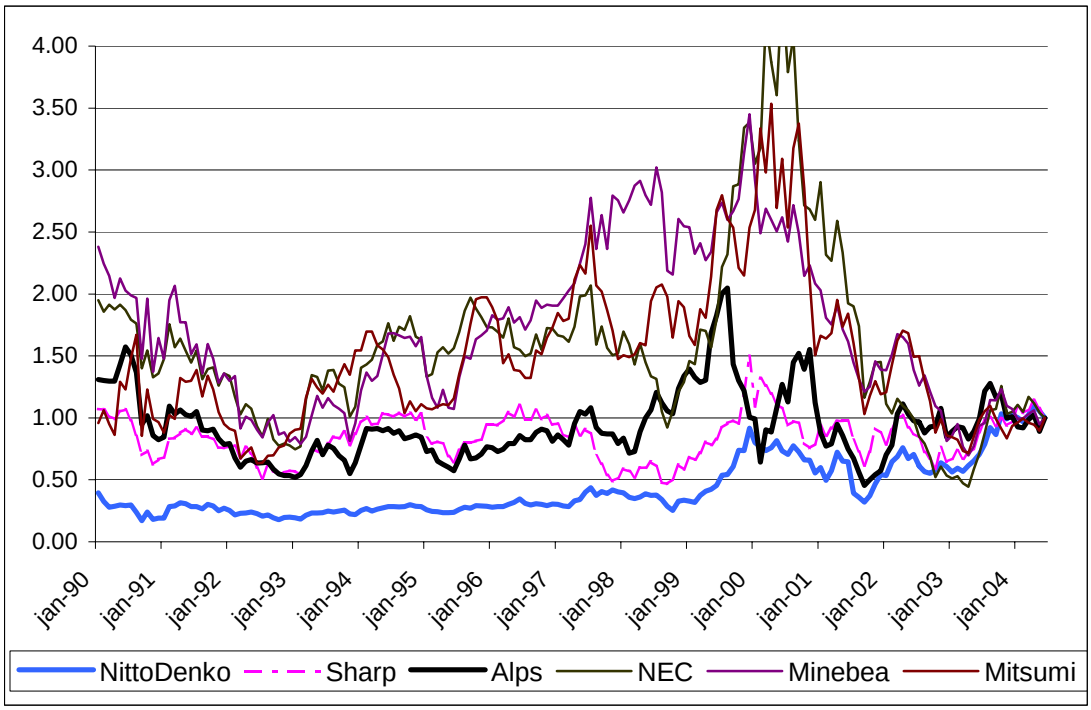
Smaller displays are used also in mobile phones, game consoles, different measurement equipment and electronic toys. Despite softening demand in Q2, global LCD panel production is forecast to rise 50% on the year to 23 million sq. meters in 2004. We can see (table18) that more than 90% of LCD TVs are made in Asia, where Japan has the biggest share.

As for all technology sectors also this one is pressured by falling prices. There is demand for these products and as soon one firm start to make good profits and technology starts to standardize other follow and add additional capacities. These capacities bring in a year or two increased inventories and with oversupply falling prices. On top of that there are economic cycles, which amplify the cyclical nature of this sector. The same is valid for semiconductor industry also, which supplies firms in this sector.

4.3.4.1 Analyzed IT solutions, computer and peripherals, CD-ROM, disk drives, LCD displays sector firms

In this group I classified six firms. These firms are: Nitto Denco (6988), Sharp (6753), NEC (6701), Alps (6770), Minebea (6479) and Mitsumi (6767).

Figure 25: **Stock price performance comparison of the analyzed IT solutions, computer and peripherals, CD-ROM, disk drives, LCD displays firms in the Nikkei 500 index, in period January 1990 - June 2004, relative to the end of June 2004.**



Source: Bloomberg, 2004.

Nitto Denko is besides Mitsumi the only firm with positive return from January 1990. Minebea's returns in the same period are the worst from compared firms. The most volatile company in the same period was NEC, which quadrupled first in 1999 to fall down by almost 90% after the Internet bubble burst. Many of these firms are already entering semiconductor and basic electronic components sector, which will be discussed after. In appendix F, I provide a short description with major characteristics of analyzed firms.

4.3.4.2 A selection of firms in the IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays sub-industry

My evaluation results are summarized in table 30. The most attractive seems to be Alps followed by Nitto Denco, which is a producer of basic ingredients for LCD displays. It is a niche player. Nitto Denco has attractive P/E ratios and good P/E trend in last five years, has the highest growth potential and ROE among compared firms.

Table 30: **Evaluation of the Japanese IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays firms in the Nikkei-500, as of June 2004.**

	Alps	Nitto Denco	Sharp	NEC	Minebea	Mitsumi
Code	**6770**	**6988**	**6753**	**6701**	**6479**	**6767**
P/E	15.45	25.55	29.09	32.41	32	97.47
P/E trend	3	3	1	1	1.5	-2
Forwd P/E	37.73	25.07	26.32	54.08	41.57	29.88
2Net profit	4.83	12.45	4.32	0.32	1.35	-2.1
ROE	10.97	14.59	6.58	7.68	6.27	1.04
ROE trend	1	4	4	3	1	-6
P/B	1.61	3.82	1.87	1.87	2.05	1.04
PEG	7.92	1.58	1.48	7	2	5.97
PEG points	-3	0	0	-3	0	-2
MC points	1	3	4	3	1	-2
FCF/s/P*f	-4	4.7	3.8	16.36	-5	-4.3
Liquidity	2	2	3	3	1	0
Gr.Expect	4.75	24.75	17.70	8	19	5
Sales Gr tr.	2.3	2.7	2.5	1	-2	-2.3
TD/SE	1.23	0.66	1.26	3.33	2.34	1.14
TD/SE tr	2.8	-1	-1	1	-3	2
CR	1.81	1.53	1.21	1.22	0.83	1.53
CR trend	2.6	-2.6	-2	1	-2.6	1
Invent.trend	0	-1	1	1	1	2.6
Dividen tr.	1.2	2.3	1.5	-1	0	-2
Cash/Assets	13.80	12.62	17.2	12.28	7.87	17.6
P/EBITDA	3.88	10.17	6.76	3.46	4.67	6.88
beta	1.25	1.00	1.02	1.53	0.97	1.24
Last Y-EPS	93.27	197.99	55.37	23.67	15.08	12.36
Next EPS	96.98	247.46	68.76	36.33	21.71	43.08
My points	1	2	2	0	-2	0
Total score	39.3	36.2	35.2	21.7	1.8	-16.8

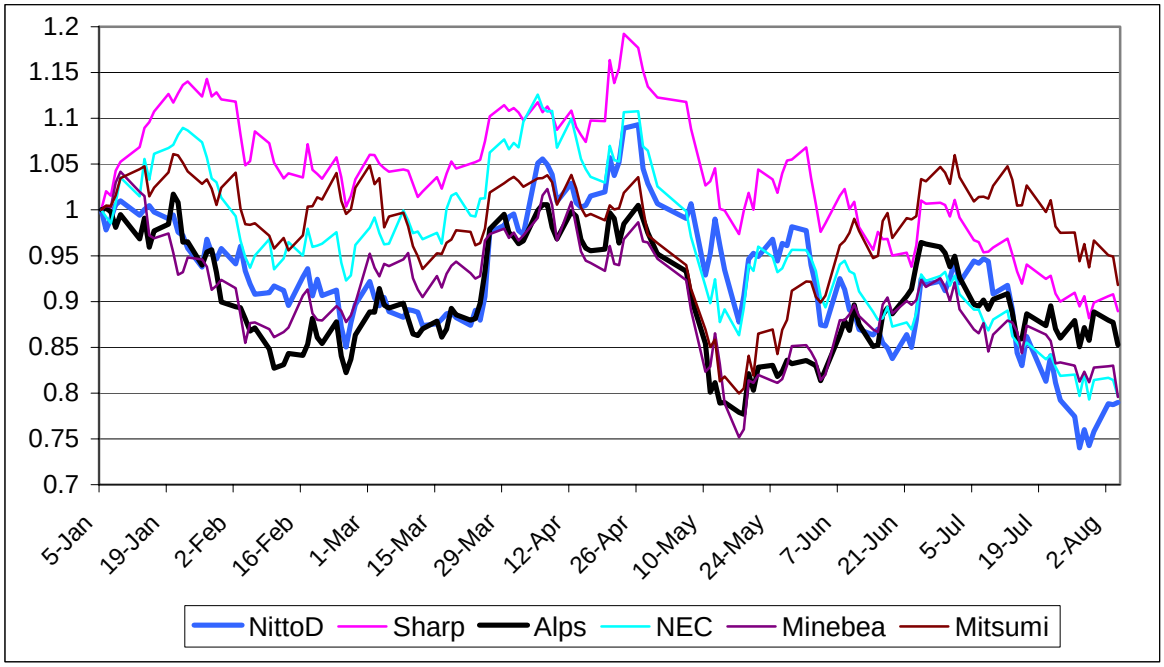
Source: Bloomberg, Nikkei Net Interactive, own calculations.

While I was improving recommendation formula Alps and Nitto Denco changed their places. Alps has low P/B and P/EBITDA and solid ROE that moved the balance in Alps favor at the end. Sharp also looks attractive. It has a much lower P/B value but when looking also at ROE, then its ROE/(P/B) ratio is similar to Nitto Denco's. This is the method Damodaran proposes in order to compare firms (Damodaran, 2002, p. 530). Chung and Kim (2002, p. 78) research confirmed that current P/B is significantly related to current ROEs as well as those in the succeeding five years. Alps scored some extra points compared to other two for ROE/(P/B) ratio, but has one of the worst FCF/Price, what is negative for stock. Nitto Denco has better debt ratios. Knowing that LCD makers are reducing prices and that Sharp is loosing market share I would select Alps from this sector due to obtained result and Nitto Denco for the market exposure.

4.3.4.3 Stock performance of the IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays firms

Latest performances of firms in this sector are seen in figure 26 and table 30. My favorite Alps is improving lately and has the second best result from April 2004. Knowing that it seems even more attractive. Alps performance is much better as for the whole sub-industry. Interesting is maybe the fact that Nitto Denco and Sharp follow the same trend as they are both in the LCD business, except Sharp had an extra 14% share price jump in January 2004. NEC lost the most in the last period from April 1st 2004. General investment sentiment, which is not favorable to technology stocks, is well reflected in all analyzed firms of this sub-industry.

Figure 26: **Stock price performance comparison of the IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays firms in the Nikkei 500 in period January 1st 2004 - August 4th 2004, relative to Jan. 1st 2004.**



Source: Bloomberg, 2004.

Table 31: **Changes in stock prices of the IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays firms in the Nikkei 500 index from June 30th 2003, Jan. 1st 2004 and April 1st 2004 until Aug. 4th 2004 (in %).**

Code	6770	6988	6753	6701	6479	6767		
	Alps	NittoD	Sharp	NEC	Minebea	Mitsumi	Sub-Ind	Nikkei225
from 30.6.03	-8.25	21.19	1.33	22.05	-5.72	-9.24	**10.54**	21.21
from 1.1.04	-14.72	-21.04	-11.07	-20.36	-20.43	-8.20	**-16.31**	2.06
from 1.4.04	-11.44	-19.21	-19.62	-25.44	-17.69	-11.00	**-20.74**	-6.35

Source: Bloomberg, 2004.

The IT solutions, computer and peripherals, CD-ROM, disk drives, and LCD displays sub-industry firms are operating in very competitive environment. Frankly for me this sub-industry does not offer the best prospects and I would avoid it. The reasons are: average or low total score received from my evaluation, and that this is one of two worst performing sub-industries this year. On one side this could be an opportunity, but the risk is still too high compared to other firms from other sub-industries which look much more attractive. Normally peripherals producers and modules producers have lover value added (margins) as producers of final customer products. For instance LCD modules are certainly attractive, but TV set producers earn most of the money normally.

4.3.5 The electronic components: Semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly sector

At the bottom of all electronic products is industry of basic electronic components. These are companies producing semiconductors – integrated circuits (IC) we can find already everywhere around us. In PCs, audio/video products, cars, phones, domestic appliances, in the shops to prevent thefts, toy industry, and still penetrating. There are also passive electronic components (resistors, capacitors, coils…) makers and companies that package these devices and printed circuit board (PCB) makers, where these basic components are assembled in electronic circuits. This industry is one of the most difficult ones as competition is high – and profits are made mainly when you are first on the market with something new or better performance. The rapid growth in semiconductor technology is driving an unprecedented insertion of new functionality in today's electronic products. Mobile phones, for example, no longer serve as simple audio transceivers but rather as mobile entertainment systems through built-in MP3, GPS, PDA, 802.11, Bluetooth, and digital camera functionality. As they are supplying industry of PCs, peripherals, DVDs, and LCD modules they are also victims of cycles, which they help to create themselves. Known are cycles of computer memory prices in the 1990s, when just a year was needed to go from shortage to oversupply. Prices of basic components are falling all the time – so new developments have to be done to replace old products – and products in semiconductor industry are old in less than a year.

This is the industry I am working in as a designer for 17 years for international customers from Europe and US and battle for each project and each customer is more and more difficult. Margins are slim for established products and only innovative solutions are really bringing money and nice margins. Highest capacities are in Asia and new capacities are

added mainly in China lately. Capital investments for semiconductor wafer factory are also sky rocketing as one of the latest operations TSMC – the biggest worlds semiconductor factory opened are running at $ 3 billion. Asia is also representing 70% of all semiconductor manufacturing equipment sales where Japan holds a big stake as pointed out CEO of Applied Materials (CNBC TV, Aug, 18th 2004).

Worldwide sales of semiconductors rose to $17.8 billion in June, a sequential increase of 2.8 percent from the $17.3 billion reported in May and a 40.3 percent increase from June of 2003 when global sales amounted to $12.7 billion. In the second quarter of 2004, global sales reached $53.45 billion, an increase of 9.5 percent from first-quarter sales of $48.8 billion. Worldwide semiconductor sales amounted to $38.1 billion in the second quarter of 2003. Source: Semiconductor Industry Association (SIA), August 2nd 2004.

"Worldwide microchip sales remain on pace to reach a record of more than $214 billion this year," said SIA President George Scalise. "While we expect sales in the second half of 2004 will remain strong, we expect that the growth rate going forward will be somewhat slower." Scalise said third quarter sales are expected to be 4 to 6 percent higher than the second quarter based on the SIA's analysis of inventories, production capacity, and end-market demand.

Despite all good news investors predicting that earnings growth was the highest in Q2, 2004 and will start to drop sent semiconductor related stock prices down to 12 months low for many of big companies like Intel, TSMC, Infinion, National Semiconductor, Texas Instrument, to name just few of them. An oversupply of computer chips is also forecasted for mid-2005, when plants currently under construction will start full operations. The semiconductor industry is currently performing strongly.

Taiwan's four major memory chipmakers are planning to make record capital investments to keep up with their Japanese and South Korean rivals. China invested more than US$12.1 billion into the industry in the last two decades to develop integrated circuits and software. This investment, which is expected to increase by an additional US$6 billion by 2005, will be doubled by 2010 to reach US$36.3 billion (China Daily, 2004).

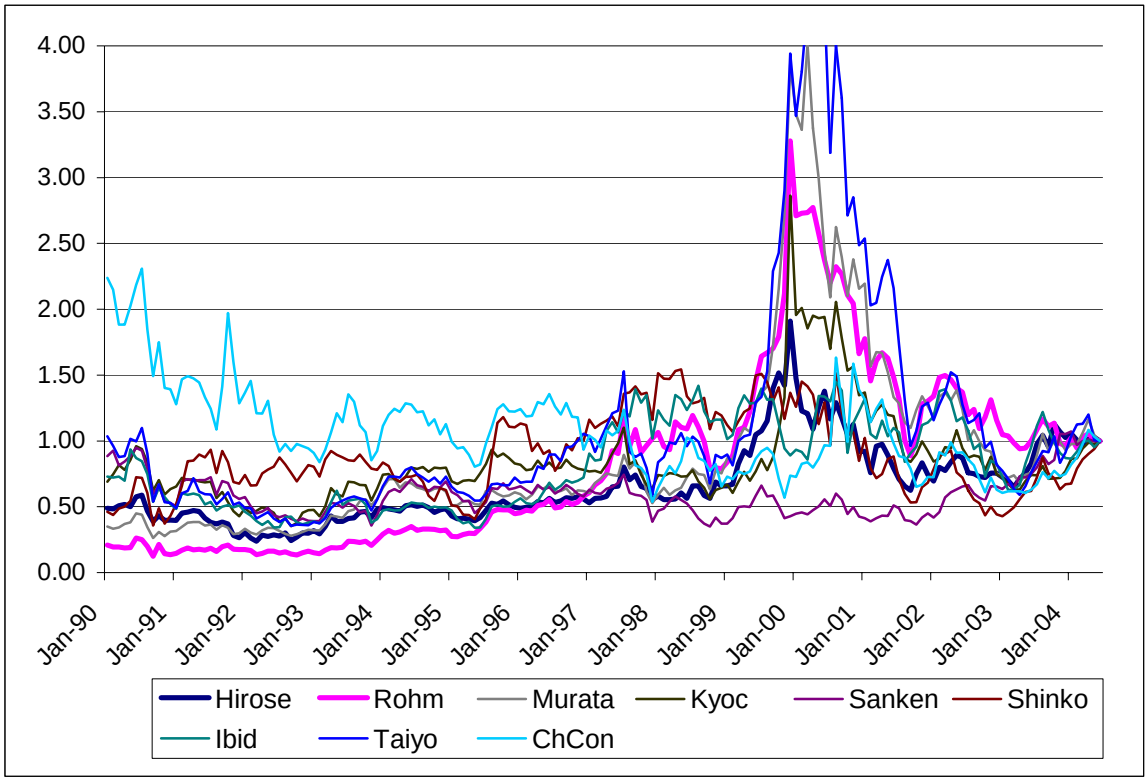
4.3.5.1 Japanese firms in the electronic components: Semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly sector

Japan is very strong in this sector and I found nine candidates from 38 firms, which I analyzed in the Nikkei 500 electric machinery industry. These firms are: Hirose (6806), Rohm (6963), Murata (6981), Kyocera (6971), Sanken (6707), Shinko (6967), Ibiden (4062) and Nippon Chemi-Con (6997). In appendix G, I present them briefly.

In figure 27 I present historical stock price performance relative to June 30th 2004 closing price. This sub-industry is one of rare analyzed sub-industries where almost all firms in it traded higher at the end of June as in January 1990. Rohm – a semiconductor company performed the best in this period. Its stock price has more than quadrupled. In the same period Murata, Shinko and Hirose at least doubled. The worst stock– loosing more than

half of its price in that period was Nippon Chemi-Con which main production are capacitors. During the Internet industry related bubble Taiyo Yuden, Murata and Rohm increased the most what was followed with their relative bigger drop after bubble exploded.

Figure 27: **Stock price performance of the electronic components: semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly firms (in Nikkei-500 Electric Machinery industry) from January 1990 until the end of June 2004, relative to the end of June 2004**



Source: Bloomberg, 2004.

4.3.5.2 A selection of firms in the electronic components: semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly

Using my evaluation formula Hirose Electric scored the best total score from all nine companies. Its strength is in having very high cash position (almost 70% of their assets is in cash and marketable securities what was the highest percentage of all analyzed firms). This is not really the advantage for the stockholders as a lot of money is on the side lines and can give an impression that firm does not know how to use it better in its own operations. Hirose has comparable P/E ratios with other firms but if we deduct cash they posses, than its P/E on working capital becomes one of the lowest one. It has the highest net income, and the highest growth potential. Hirose is not a semiconductor player, as they are producing connectors. It is value play concerning cash, low debt ratio, but relatively high P/E excludes it for being a pure value strategy selection. From table 32 we can see

that these companies are generating very low free cash flow as a percentage of stock prices and like that they are more vulnerable to overall economic situation.

Table 32: **Selected ratios, attributed points for trends and final calculated result for semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly firms in the Nikkei 500, as of July 2004.**

	Hirose	Rohm	Kyocera	Murata	Shinko	Sanken	Ibiden	Chemi.C	TaiyoY
Code	**6806**	**6963**	**6971**	**6981**	**6967**	**6707**	**4062**	**6997**	**6976**
P/E	28.23	22.09	23.77	26.21	17.68	26.75	23.79	52.73	100
P/E trend	2	4	1	2.5	2	2	1	-1	-3
Forwd P/E	37.24	33.32	32.60	39.01	23.47	32.59	42.94	52.65	72.84
2Net profit	35.83	33.05	9.82	21.71	9.12	6.67	3.63	2.42	0.82
ROE	8.68	9.15	6.31	6.97	9.09	9.58	7.64	1.97	-1.26
ROE trend	1	-1	2	1	3	8	1	1	-7
P/B	2.40	1.97	1.40	1.81	1.55	2.47	1.76	1.03	1.12
PEG	2.89	3	2.69	3.7	3.15	3.5	5.56	4.14	6.67
PEG points	-1	-1	-1	-1	-1	-1	-2	-2	-3
MC points	2	3	4	3	0	0	0	-2	0
FCF/s/P*f	2.90	-6.1	-1.5	3.7	3.9	-4.9	10.04	2.35	-2.6
Liquidity	0	-4	3	-4	-4	0	0	-5	1
Gr.Expect	12.53	8.98	11.88	11.05	7.45	10	7.55	5.00	10.83
Sales Gr tr.	1	0	1	0	1	1	1	-1	1
TD/SE	0.15	0.18	0.49	0.2	0.67	1.30	1.15	0.94	0.08
TD/SE tr	2	2	1	1	2.6	2.7	-1	1	1
CR	7.94	6.0	2.48	6.91	2.18	1.76	1.64	2.06	2.29
CR trend	2.4	3	1	-1	1	0	1	1	-1
Invent.trend	3	0	1	3	2.4	0	-1	0	2.7
Dividen tr.	0	3	0	1.4	0	0	1.2	-1	0
Cash/Assets	69.15	40.86	20.33	49.64	13.16	12.58	18.82	7.99	20.94
P/EBITDA	13.21	10.21	8.52	10.59	4.95	7.84	6.10	5.72	5.43
beta	1.08	1.09	1.21	1.41	1.24	0.86	1.10	1.17	1.66
My points	3	1	1	1	-2	2	0	0	0
Last Y-EPS	382.26	55.62	364.79	208.46	177.7	47.07	60.10	10.07	-15.9
Next EPS	293.0	564.62	256.02	222.08	174.9	59.24	71.12	15.77	58.67
Next+1 EPS	NA	NA	NA	NA	183.56	72.18	78.78	NA	NA
Total score	40.6	33.9	32.6	31.8	30.8	18.6	13.4	-8.8	-16.4

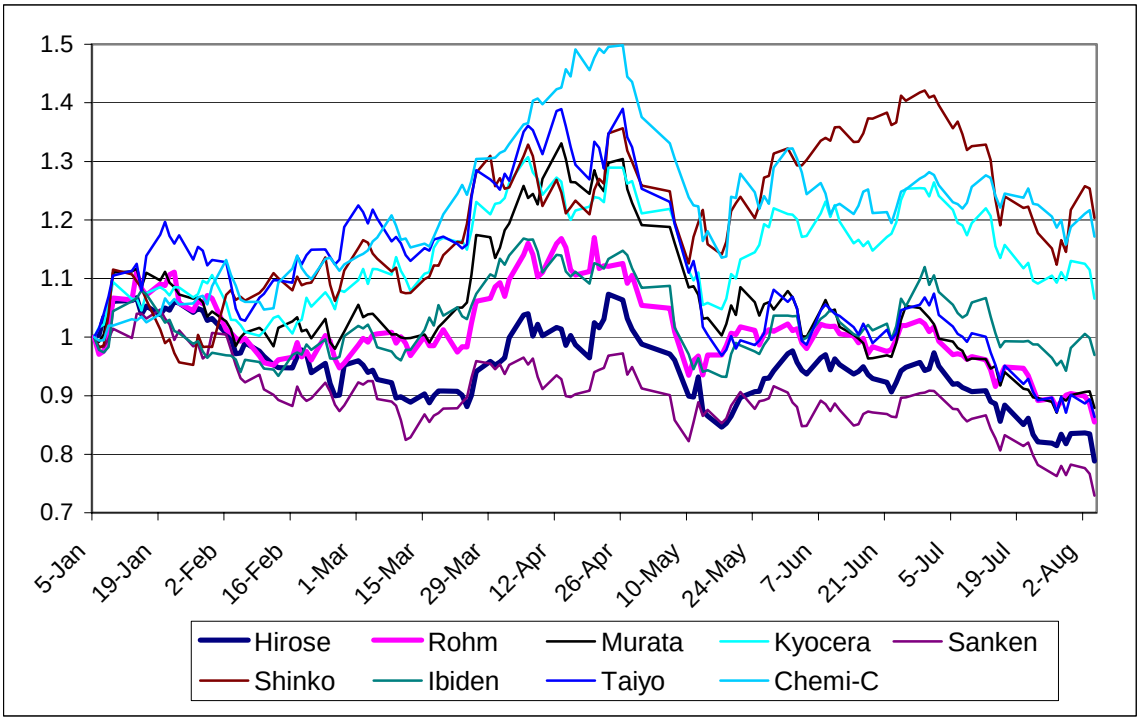
Source: Bloomberg, Nikkei Net Interactive, and own calculations.

Only 3.1 points separate Rohm, Kyocera, Murata and Shinko ranked second to fifth place between them in this sub-industry, but their score is already almost 20% lower as for Hirose. I classified Hirose among top five stock due to their relative good performance in the broadest sub-industry I analyzed and overall above average total score.

4.3.5.3 Stock performance of the electronic components: semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly sector

Once again, the selected company's stock price does not show good performance this year (see figure 28 and table 33). Hirose's performance was just a fraction weaker compared to the weighted average for the sector. The smaller two firms Shinko and Chemi-Con, performed best in the sector but scored poorly also due to low liquidity.

Figure 28: **Stock price performance comparison of electronic components sector: semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly firms in the Nikkei 500 in period January 1st - August 4th 2004, relative to Jan. 1st 2004.**



Source: Bloomberg, 2004.

Table 33: **Changes in stock prices of electronic components sector: semiconductors, IC, semiconductor equipment, passive components, circuit boards and assembly firms in the Nikkei 500 index from June 30th 2003, January 1st 2004 and April 1st 2004 until August 4th 2004 (in %).**

Code	6806	6963	6981	6971	6707	6967	4062	6976	6997		
	Hirose	Rohm	Murata	Kyocera	Sanken	Shinko	Ibiden	Taiyo	Chemi-Con	Sub-Ind.	Nikkei 225
Fr. 30.6.03	0.69	-15.43	12.11	15.76	7.31	37.57	-6.70	7.63	44.84	1.96	21.21
from 1.1.04	-21.18	-14.48	-12.10	6.55	-27.07	20.38	-3.04	-13.65	17.15	-7.02	2.06
from 1.4.04	-18.29	-20.02	-25.65	-13.91	-22.14	-3.96	-13.71	-32.49	-11.13	-17.87	-6.35

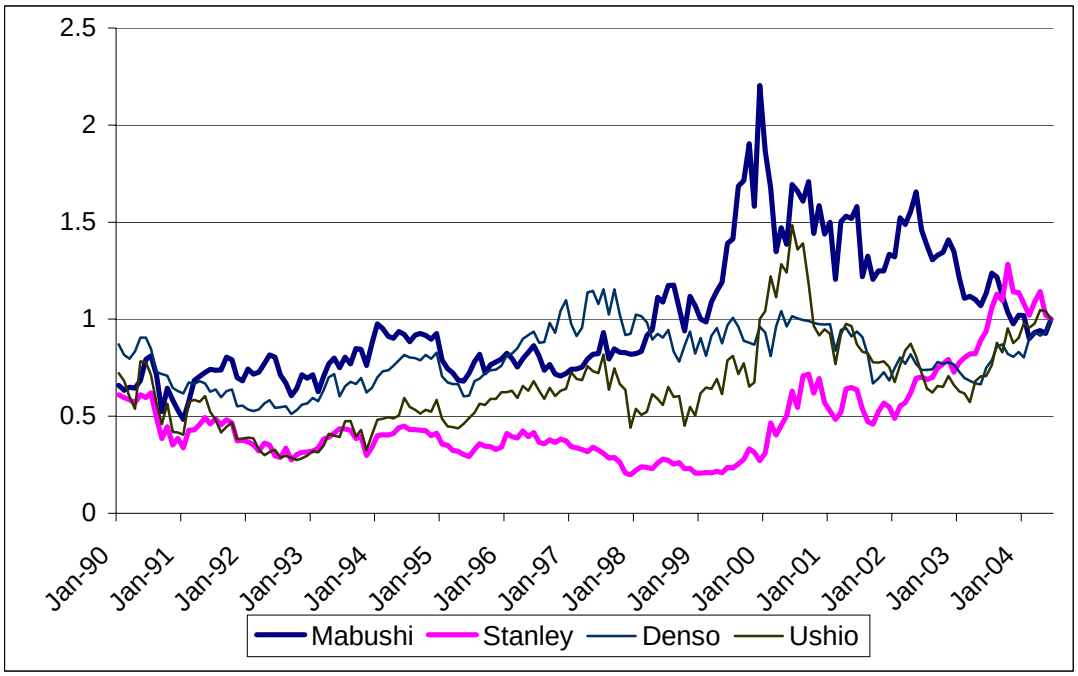
Source: Bloomberg, 2004.

There is a slight trend for Hirose, which can be seen from table 33. Stock price drop starts to decrease slower in relative terms when we compare the latest two periods with other firms. In case of Hirose drop starts to reduce form –21.18% for the period from January 1st to –18.29% for the period from April 1st compared to industry where this trend worsen as majority of drop was made lately (-7.02% increased to –17.87%). Shinko, which has the best performance last year has one of the lowest current and forward P/E ratio and one of the highest ROE, but as mentioned is penalized with very low liquidity, low market capitalization and lower future growth expectations.

4.3.6 Lighting and auto parts sector

I assigned four firms in this sector: Mabuchi (6592) known by small motors for tools and models, Stanley (6923) and Ushio (6925) which are producing different light sources and office automation equipment, and Denso (6902) a leading auto parts maker. As seen these firms are active in office automation and car industry.

Figure 29: **Stock price performance comparison of the selected lighting and auto parts firms in the Nikkei 500 in period January 1990 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

Figure 29 shows historic performance of four stocks in the lighting and auto parts firms from January 1990, when Japanese stock market drop started. As these firms are related to automotive – car industry, their performance was not so volatile and is together with three firms I put in miscellaneous and discussed in next chapter the most stable sector from the ones I am analyzing. In addition these lighting and auto parts firms are the only category, where all firms in it have positive return in this critical period from January 1990 until the end of June 2004. The most volatile of four companies is in fact Mabuchi, which has the

least connection with car industry. Stanley's performance from January 2000 till end of June 2004 is incredible as its share price tripled while great majority of technology firms lost ground and were victims of big share price drop.

Many of these firms have operations in many fields so some of them could be classified in other sectors. In appendix H, I provide a short description of these analyzed firms.(3)

4.3.6.1 A selection of firms in the lighting, auto parts sector, and the not-classified firms

Table 34: **Evaluation of the Japanese lighting and auto parts firms, and three other firms under miscellaneous I had problems to classify in the Nikkei 500 electric machinery industry, as of July 2004**

	Lighting, auto parts				Miscellaneous		
	Mabuchi	Stanley	Denso	Ushio	**Hitachi**	**Makita**	**Matsh EW**
Code	**6592**	**6923**	**6902**	**6925**	**6501**	**6586**	**6991**
P/E	21.47	18.81	21.61	27.22	142	30.04	34.40
P/E trend	3	2.6	1	1	-6	1	2
Forwd P/E	28.54	28.58	25.92	31.86	58.07	26.73	33.50
2Net profit	31.31	11.46	9.05	14.49	0.52	8.01	2.24
ROE	7.66	13.54	7.57	8.37	0.79	4.09	4.11
ROE trend	1	6	3	3	0	4	1
P/B	1.69	2.38	1.58	2.16	1.05	1.19	1.26
PEG	3.5	2.51	2.73	0.91	0.43	1.32	3.35
PEG points	-2	-1	-1	1	5	0	-1
MC points	1	1	4	1	4	1	2
FCF/s/P*f	-4.3	2.22	1.6	-1.6	8.9	4.6	5,2
Liquidity	1	1	2	0	3	-4	1
Gr.Expect	8	11.4	8.85	35.6	10.4	20.20	10
Sales Gr tr.	-2.2	2.5	2.7	3	2.1	1	2
TD/SE	0.07	0.85	0.60	0.43	2.23	0.43	0.79
TD/SE tr	1	-1	-1	-2	-2.7	1	3
CR	11.63	1.58	1.63	2.32	1.33	4.17	1.83
CR trend	1	1	-2.7	-2.6	-1	-1	1
Invent.trend	3.1	2.5	-1	-2.6	2.4	2.4	1
Dividen tr.	0	1.75	3	1	1	0	0
Cash/Assets	40.58	13.14	10.81	16.84	9.83	33.3	11.62
P/EBITDA	11.29	7.20	6.41	13.84	3.09	6.9	6.62
beta	0.93	.80	0.84	0.97	1.46	0.76	0.86
My points	1	1	2	1	1	1	4
Last Y-EPS	375.41	88.38	130.02	67.36	4.81	53.16	28.12
Next EPS	333.43	100.02	108.0	79.78	30.27	88.95	39.60
Next+1 EPS	NA	113.4	114.4	93.4	NA	92.8	43.11
Total score	42.7	44.3	37.5	23.5	9.8	35.5	32.6

Source: Bloomberg, Nikkei Net Interactive, and own calculations.

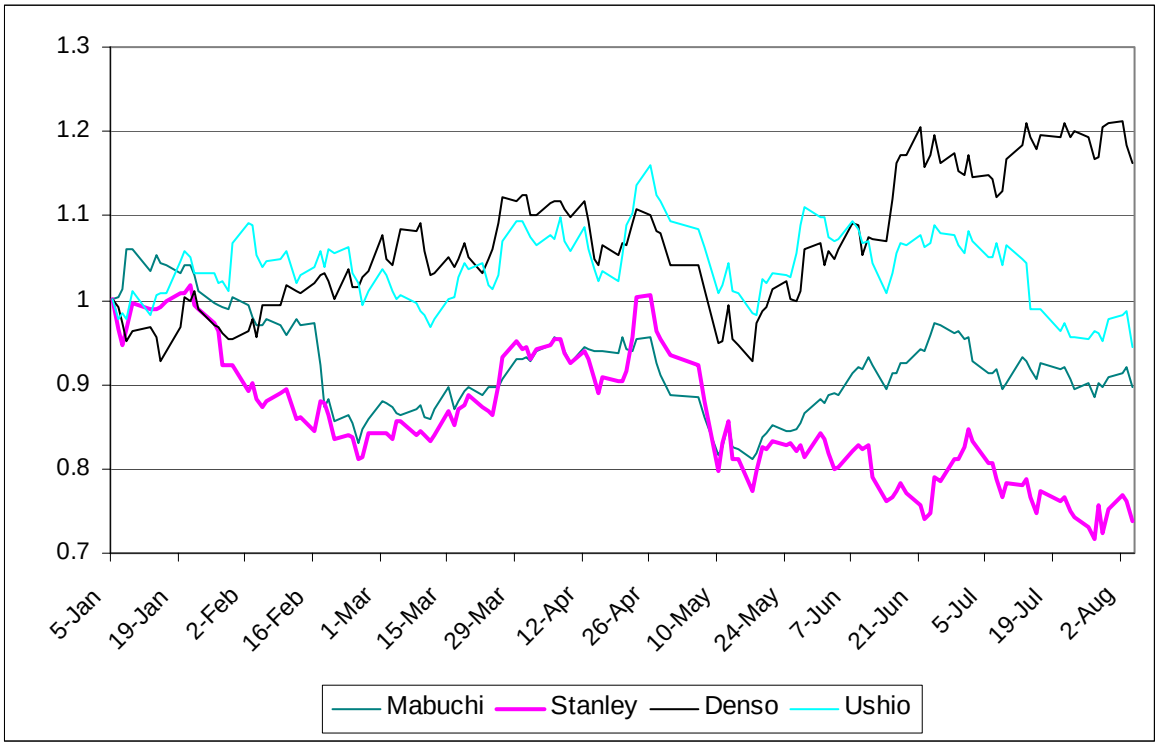
(3) For this category I have not prepared an overview as it is sorting out of electronic related field, which was of my primary concern due to my professional orientation.

Lighting and auto-parts firms being a bit less high tech but implementing proven technological solutions have lower P/E ratios as other firms I analyze. As we can see from table 33 the winner in this sector is Stanley. Its strong points are coming from much higher than average ROE, growing sales trend, higher growth expectations, lower P/EBITDA, and the lowest current P/E ratio of all four firms. Second Mabuchi has a bit below average P/E ratio and good P/E trend, highest last two years net profits, good debt ratios, high cash position but its weak points are latest negative free cash flows. Third Denso and forth Ushio are already less attractive.

4.3.6.2 Stock performance of the lighting and auto-parts sector firms

The performance of stock prices of the companies in this sector is quite different this year (see figure 30). This is the result of different product portfolios and maybe classification, which was difficult for these firms. From table 35 we can see that these firms outperformed the broad Nikkei 225 index in all three defined periods. Highest scoring Stanley is the worst from all four firms while second Mabuchi is performing better as Nikkei 225 from April 2004, when Stanley deteriorated the most. Not far away from these two companies is much bigger Denso, which might be better for more conservative portfolio.

Figure 30: **Stock price performance comparison of the lighting and auto-parts firms in the Nikkei 500 in period January 1st - August 4th 2004, relative to January 1st 2004.**



Source: Bloomberg, 2004.

Majority of Stanley's stock price drop was made from the end of April when its stock price dropped by 20% in two weeks only. Despite very bad recent performance I keep it among the five most interesting stocks.

Table 35: **Changes in stock prices of the lighting and auto-parts firms in the Nikkei 500 from June 30th 2003, January 1st 2004 and April 1st 2004 until Aug. 4th 2004 (in %).**

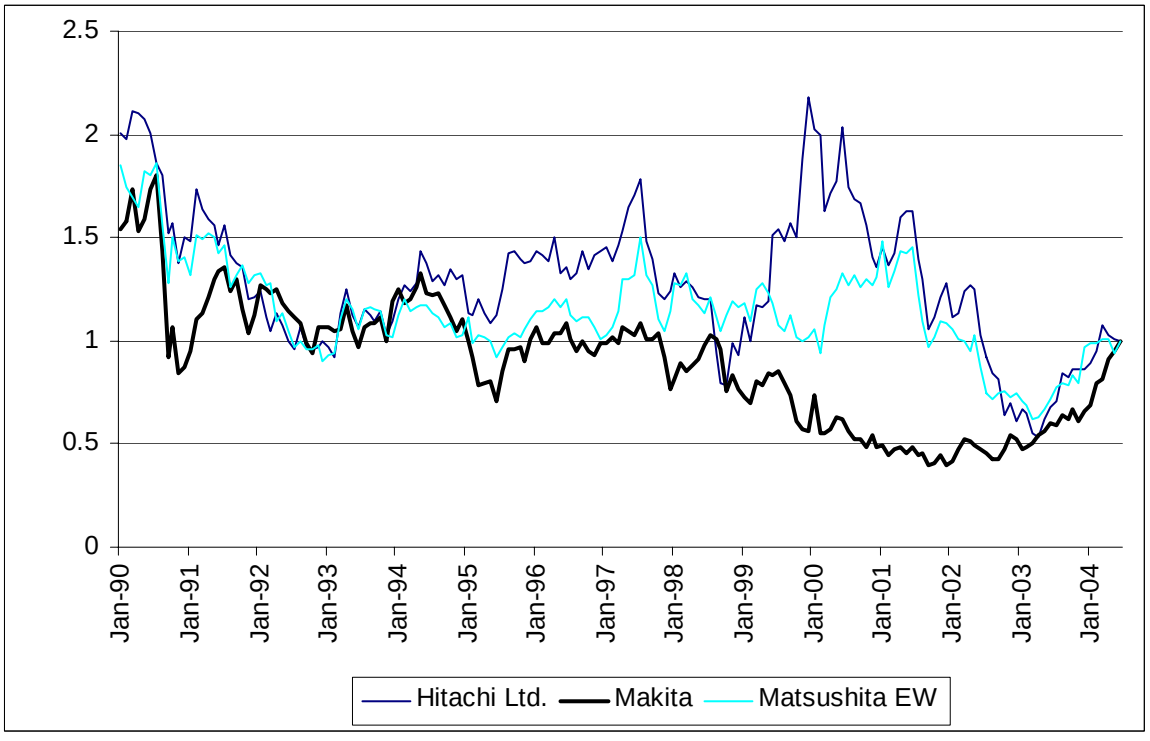
	6592	6923	6902	6925		
	Mabuchi	Stanley	Denso	Ushio	SubInd	Nikkei225
from 30.6.03	-17.20	-4.67	35.20	26.67	22.06	21.21
from 1.1.04	-10.43	-26.25	16.33	-5.55	5.09	2.06
from 1.1.04	-3.39	-20.69	5.61	-12.08	-0.69	-6.35

Source: Bloomberg, 2004.

4.3.7 Miscellaneous

Three firms, which I was not able to classify in one of the previously described groups, I let as a separate group under the name miscellaneous. These firms are: Matsushita Electric Works (6991), Makita (6586) and Hitachi Limited (6501). As seen from firms' short description I provide in appendix I, their operations are going across boarders specified in previous sectors.

Figure 31: **Stock price performance comparison of: Matsushita EW, Makita, and Hitachi in period January 1990 - June 2004, relative to end of June 2004.**



Source: Bloomberg, 2004.

From past stock price performance of these firms (figure 33) we can see that all lost ground but lesser than Nikkei 225 in the same period. Hitachi was the most volatile followed by Matsushita Electric Works. Makita on the other side has better momentum in the last two to three years during which their share price gained over 100%.

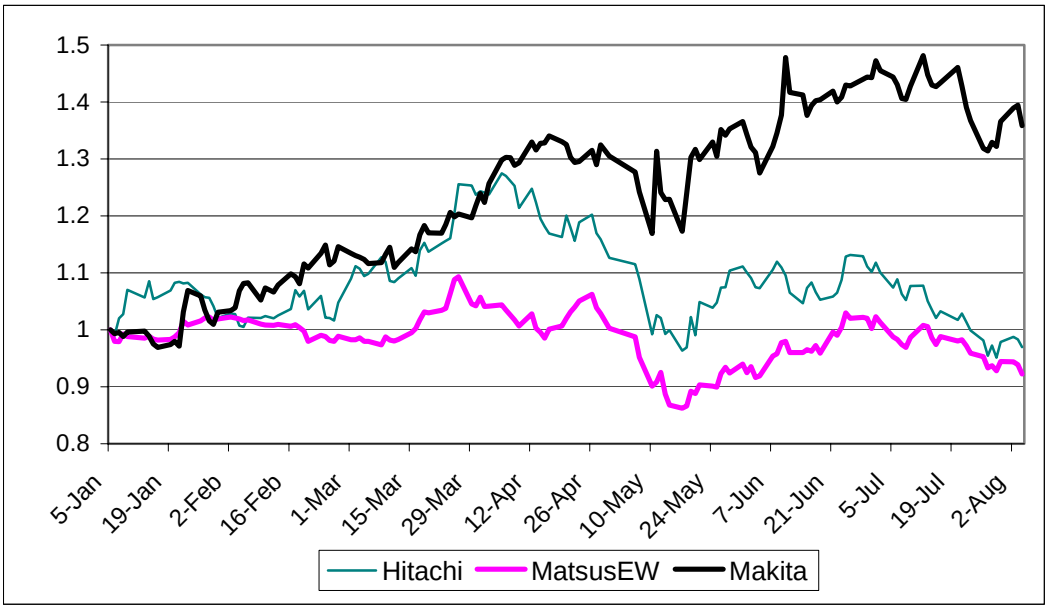
Selection in this group is shown in table 34. Comparing these firms as they differ quite a lot is at the limit of reasonability. If we accept the comparison we can see that Makita is preferred one closely followed by Matsushita Electric Works. Big Hitachi is the last one. Makita has the lowest current and forward P/E ratio, has similar ROE as Matshushita EW, and has good ROE trend. Additional to that Makita has lower P/B ratio, the highest growth potential, good cash position and good debt ratios. Drawback of Makita is that its liquidity is very low. Hitachi was penalized due to very high P/E ratio and its bad trend in last years.

As comparison of these firms is difficult and results not so sure, hence they were not selected among top eight stocks. The decision was simplified by relatively poorer results compared to favorites from other sectors.

4.3.7.1 Price performance of the firms in the miscellaneous group

Makita, my personal preference, outperformed both other firms in this year stock price performance by a big margin, well above Nikkei 225 also (see table 36 and figure 32). Makita's stock price increased by almost 36% from the beginning of this year and maybe went a bit too fast ahead and Matsushita EW might be more attractive today as its liquidity is also higher and is less risky to invest in it. Hitachi, which scored the poorest result under performed both Nikkei 225 as well other two firms.

Figure 32 **Price performance comparison of: Matsushita EW, Makita, and Hitachi from June 30th 2003 in period January 1st - August 4th 2004, relative to January 1st 2004.**



Source: Bloomberg, 2004.

Table 36: **Changes in stock prices of: Matsushita EW, Makita, and Hitachi from June 30th 2003, January 1st 2004 and April 1st 2004 until August 4th 2004 (in %).**

	6586	6501	6991		
	Makita	Hitachi	MatsusEW	Subind	Nikkei225
from 30.6.03	58.02	29.83	28.17	30.91	21.21
from 1.1.04	35.85	-3.03	-7.74	-2.06	2.06
from 1.1.04	11.01	-21.86	-11.38	-17.91	-6.35

Source: Bloomberg, 2004.

Due to limited possibilities to compare them correctly, as they start to sort out of electric machinery industry and their poor recommendation score, I did not select any of them for the top eight spots.

4.4 THE FINAL SELECTION OF THE ANALYSED FIRMS

For the purpose of the final selection I present the top eight stocks in table 37. When deciding on which one of these stocks to select we should know that those 47 stocks from Nikkei 500 Index represents only two out of 36 different industries, and 9.2% of all 500 stocks in the index.

Using the top-down approach, we can say that these two industries should perform better on average if Japanese recovery consolidates, as technology firms are performing better in bullish economy with expanding GDP and higher consumer confidence index of real income will grow.

The two clear recommendations are NTT DoCoMo (9437) from the communication and Canon (7751) from the electric machinery industry.

For NTT DoCoMo we can see that it has very attractive current P/E ratio, excellent P/E trend in the last five to six years (P/E in 1999 and 2000 was around 100). Forward P/E will decrease as they have to fight competition to keep market share and they are obliged to reduce prices for their services but should be still below 20. Last two years they increased net profit and from the top eight firms they had second highest ROE in the last fiscal year (first was Canon). Price earnings growth looks attractive and they generated high percentage of FCF to stock price. DoCoMo has sound TD/SE ratio but a bit low current ratio. Their dividend trend is one of the best from analyzed firms as they increased dividends from 120 yen paid in 1999 and 2000 to 1000 yen paid in 2004. P/EBITDA ratio is below average of all analyzed firms and that is good.

Canon on its side has below average current P/E ratio and forward P/E ratio just above 20 which is also well below average one. They had solid net profit in last two fiscal years and had the highest ROE of top eight stocks. ROE ratio to P/B is one of the best. As DoCoMo, Canon is also a “blue chip” company (as DoCoMo), with high market capitalization and strong liquidity on the stock exchange. PEG ratio and FCF per stock price are two weak points for Canon. Its growth expectations are good and short term or long-term debt are not a problem as its solvency ratios are on the safe side. Canon has also good dividend and inventory trend. Cash and marketable securities relative to total assets are relatively high and its P/EBITDA is just a bit below average of all analyzed firms.

Table 37: **Comparison of selected ratios, trends, attributed points for the top eight stocks and the final selection of five stocks from the communication and electric machinery Nikkei 500 index, as of July 2004.**

	DoCoMo	KDDI	Canon	TDK	Fanuc	Advantest	Hirose	Stanley
Code	**9437**	**9433**	**7751**	**6762**	**6954**	**6857**	**6806**	**6923**
P/E	13.9	21.38	17.45	22.93	26.7	37.43	28.23	18.81
P/E trend	5	5	2.8	2	2	1	2	2.6
Forwd P/E	18.26	16.18	20.84	77.22	30.04	20.78	37.24	28.58
2Net profit	17.3	6.16	15.11	8.36	40.09	-3.34	35.83	11.46
ROE	13.92	8.83	15.95	7.45	8.79	8.01	8.68	13.54
ROE trend	2	4	3	3	2	2	1	6
P/B	2.44	2.48	2.58	1.67	2.27	2.92	2.40	2.38
PEG	0.89	0.62	1.64	2.5	3.32	0.6	2.89	2.51
PEG points	1	4	0	-1	-1	5	-1	-1
MC points	6	4	5	3	3	2	2	1
FCF/s/P*f	23.4	33.7	5.3	13.46	7.29	7.55	2.90	2.22
Liquidity	4	3	4	3	3	3	0	1
Gr.Expect p	19.87	24.7	12.67	30.78	8.17	50.13	12.53	11.4
Sales Gr tr.	1	1	2.3	1	1	2	1	2.5
TD/ShE	0.69	1.56	0.57	0.28	0.12	0.49	0.15	0.85
TD/ShE tr	2	4	3	0	2	0	2	-1
CR	1.38	1.07	2.33	4.13	8.78	3.84	7.94	1.58
CR trend	1	2	2.7	2.6	-2	-2	2.4	1
Invent.trend	1	0	2.4	1	0	1	3	2.5
Dividen tr.	5	2	2.94	0	0	1	0	1.75
Cash/Assets	13.38	7.46	21.73	29.54	54.33	30.58	69.15	13.14
P/EBITDA	5.14	3.83	7.50	9.83	14.57	15.24	13.21	7.20
Beta	0.95	0.94	0.87	1.10	1.05	1.49	1.08	.80
My points	2	2	2	2	3	-2	3	1
Total Sore	**66.8**	**58.2**	**65.6**	**44.4**	**46.8**	**43.4**	**46.8**	**44.3**
Rank	**1**	6	**2**	8	**3**	7	**4**	**5**

Source: Bloomberg, Nikkei Net Interactive, and own calculations.

Table 38 shows how many points were really attributed to different ratios using formula developed in chapter 2.5.1. To have an easier understanding of these points and their influence I grouped criteria in seven groups, which are used in figure 33 as follows:

- ***P/E*** *= current P/E + forward P/E + P/E trend*
- ***P/B, ROE*** *= P/B points + ROE (P/B) + ROE points and its trend*
- ***Debt*** *= TD/SE points and its trend + CR points and its trend*
- ***Growth*** *= PEG + Sales growth trend + Long term growth points*
- ***MC & liq****. = Market Capit. Points + liquidity points*
- ***Cash&profit*** *= 2netprofit + FCF/SP + cash/assets + P/EBITDA*
- ***Other*** *= inventory trend + dividend trend + my points,*

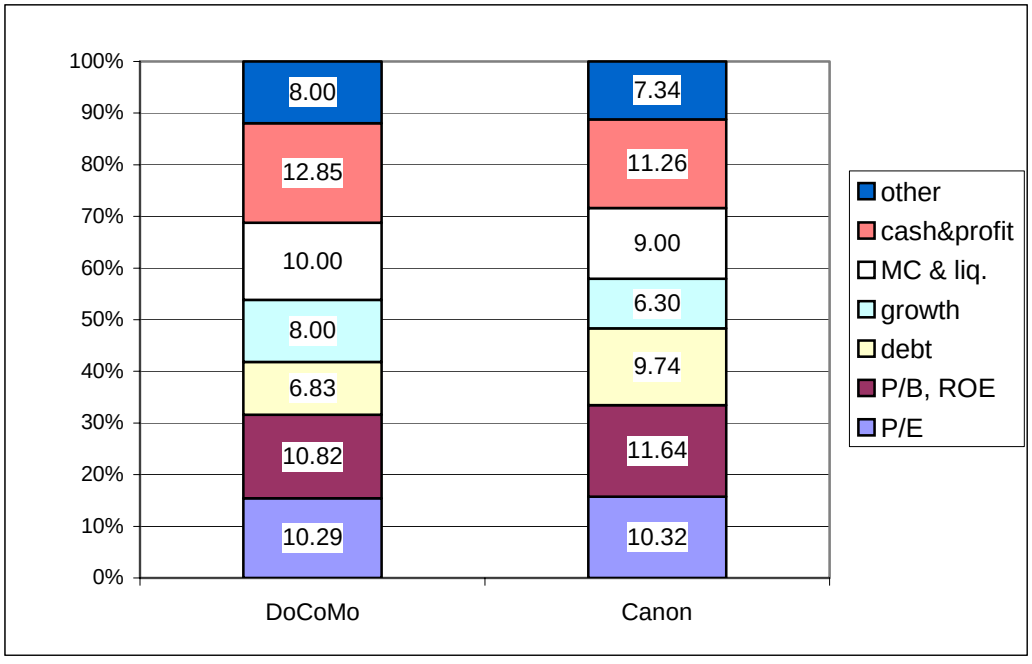
Figure 33 shows how different parts of my evaluation formula contributed to the final score. I tried to balance different market multiples and trends with appropriate weights to get reasonable model based on inputs from different analysts and researchers inputs.

Table 38: **Attributed points for final result in case of NTT DoCoMo and Canon**

	DoCoMo	**points**	Canon	**points**
P/E	13.9		17.45	
P/E trend	5		2.8	
Forwd P/E	18.26		20.84	
2Net profit	17.3		15.11	
ROE	13.92		15.95	
ROE trend	2		3	
P/B	2.44		2.58	
ROE/(P/B)				
PEG points	1		0	
MC points	6		5	
FCF/s/P*f	23.4		5.3	
Liquidity	4		4	
Gr.Expect p	19.87		12.67	
Sales Gr tr.	1		2.3	
TD/ShE	0.69		0.57	
TD/ShE tr	2		3	
CR	1.38		2.33	
CR trend	1		2.7	
Invent.trend	1		2.4	
Dividen tr.	5		2.94	
Cash/Assets	13.38		21.73	
P/EBITDA	5.14		7.50	
My points	2		2	
RESULT		**66.8**		**65.6**

Source: Bloomberg, Nikkei Net Interactive, and own calculations.

Figure 33: **Influence of different categories on the final recommendation for DoCoMo and Canon. Inside the bars points are shown, and the vertical axis shows the contribution to the final score (in %).**



Source: own calculations.

5 CONCLUSIONS

Slovenian stock market is small and not liquid. Slovenian stock prices are going higher as there is a lot of money attracted mainly by mutual funds, which performed very well in the last three and a half years. Small Slovenian stock market is starting to become overheated as there are not so many opportunities and Slovene mutual funds and institutional investors have to invest new deposits from small investors for whom mutual funds are the most attractive investment available. Slovenian stock market was not hurt like other developed stock markets in a slump from year 2000 till middle of the year 2003, but was going higher due to LEK takeover and brewery battles over UNION ownership among others. It is true that blue chips in Slovenia show solid growth but stock prices are increasing much faster. Due to all these factors, mutual funds and also savvy small investors are beginning to look abroad, especially as developed financial markets are closer to Slovenes after Slovenia joined the European Community. Additionally new Slovene regulation allows mutual funds to invest over 10% of their assets abroad. Joining European community is bringing and will bring much wider competition between domestic and foreign owned funds.

To reduce the Slovenian market risk we have to diversify internationally as international diversification can half market risk from 20% to about 11% (as shown in case of US stocks compared to the global portfolio). Market risk drops more when we combine markets, which have lower correlation factor. It is empirically proven that markets having less cooperation have lower correlation and are good match to create lower market risk portfolios. Japanese stocks were found to have the least correlation with Slovenian stocks. As I am primarily an electrical engineer and having international experience in semiconductor business I surveyed in total 47 companies from the Communication and Electric Machinery industry listed on Nikkei 500 index. As number of firms to look was huge I selected market multiple analysis and compared firms among them. First I classified them in sub-industries to compare comparable firms. This task is not always easy, as big Japanese firms are in fact conglomerate of many smaller firms, having different businesses.

Japan is interesting not only due to low correlation factor compared to Slovene stock market but mainly due to improving situation in Japanese corporations and Japan economic situation. There are good signs that Japan might emerge from thirteen years of weak economy as their GDP growth in the last quarter of 2003 and first half of 2004 was one of the highest between the OECD countries. Unfortunately, they are not immune to high oil prices and terrorist threats, which are starting to slow down the global economy, which just started to show signs of improvements in 2003. Technology sector that both selected industries belong to, had a very good rally in the second half of 2003 but as many analyst predict that earnings growth seems to have peaked in summer this year and hence technology stocks, which are among more volatile stocks are hit hard. Both selected industries under performed broad Nikkei-225 index and some technology stocks look historically very cheap, as their earnings improved considerably last years and are now hammered down, the investor fear that drop can be similar to technology heavy NASDAQ index in US which was experienced between springs of year 2000 and 2003 when it dropped by 75%. The important difference this time is that NASDAQ index was well below the 5000 mark in January 2004 (2183 points) from where it started to fall and came to 1750 again in mid August 2004.

While in theory when discussing valuation we tend to focus most on discounted cash flow valuations, the reality is that most valuations are relative valuations (Damodaran, 2002, p. 18). Based on all reviewed literature and hundreds of interviews with analysts heard on CNBC I selected a set of different market multiples and trends, which seem the most important for me to evaluate the stock. I selected 23 criteria from market multiples and trends to which I added my points based on latest information from annual reports, Bloomberg, and Nikkei.net. I developed scoring system model and developed a formula, which changed during the process, as I tried to attribute points in a way to simultaneously filter data, to balance the final score and to give each of used criteria the appropriate weight. This formula could, of course, be quite different and surely every analyst has his/her own preferences for some parameters and weights associated with them. Looking for market multiples we can see that technology firms P/E ratios and P/B value are falling and some established technology firms are starting to be attractive also from the point of value investing strategy.

My final selection is shown in Table 36. From 47 firms I short listed eight and made my list of five favorites, which should profit after technology firms hit the bottom. These are firms with good fundamentals, established market share and brand names. Their P/E, P/B, and PEG ratio are getting historically attractive. Based on Bloomberg and Nikkei interactive data available, firm's annual reports and news in the specialized medias, I checked financial data from the last five years and based on 23 parameters I tried to classify firms in each of sub-industries, which I defined. As in bad times, debt and cash can be a big problem, so I gave a lot of weight also on total debt to shareholder equity ratio (TD/SE), current ratio and cash reserves. I prefer firms with high ROE, as good ROE historical trend is a sign that they are able to compete in difficult markets. Based on these parameters I developed a formula where I am summarizing points of all these parameters.

One major disadvantage of my analysis was the abundance of data I had to consider but good thing was that I was able to compare comparable firms. I anxiously look forward to the price performance of these stocks in the next 12 to 18 months period with hope that global economic situation will calm down a bit. The current events are not favorable for markets, with high oil prices, threat of terrorist attacks, the US presidential election campaign, and the Iraq crisis, to mention just a few. Danger of all these factors slowing down the world economy growth is also reflected in the last Japanese GDP growth rate number. Real GDP rose again for the fifth successive quarter in the world's second-largest economy, but 0.4 per cent growth was 60 per cent lower than the average forecast of one per cent (CNBC, 2004).

Even if this year's performance of these stocks is not good, they are getting even more attractive due to their recent price drop and their solid fundamentals. In difficult times a great majority of stock prices drop in sympathy with the most hammered stocks. This creates the best opportunities for the future, when real value and companies with good solid earnings prevail. In addition study of TSE trading from 1975-1997 showed, that no short/medium term return continuation trend like in the US was observed in Japan, where return reversals are often. Specifically, low trading volume losers in the previous month earn significantly higher returns in subsequent month (Iihara et al., 2003, p. 14).

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APPENDIX

Appendix A

A brief overview of the telecommunication companies in the Nikkei 500 communication industry

NTT DoCoMo Inc. 9437 (http://www.nttdocomo.com/)

NTT DoCoMo is a leading cellular phone service provider popularly known as DoCoMo. DoCoMo and its eight subsidiaries cover all of Japan. It provides various types of telecommunication services including cellular phones, personal handy phone systems (PHS), paging, satellite mobile communication and wireless Private Branch Exchange system services. The company also sells cellular phones, PHS, car phones and pagers. Number of subscribers exceeds 46 million with 56% market share. Aims to offer international mobile phone service as well by linking with AT&T of the US. NTT owns a 64% interest in DoCoMo.

Their main business wireless communication brought them 88.9% of revenues and the rest was due to sales of equipment (annual report 2004).

Positive elements for DoCoMo share price are: Share buyback, rising dividends, NTT behind them (even knowing that they should not be treated favorable compared to competitors), the biggest mobile phone market share, improved free cash flow in 2004, decreased D/E, improved interest coverage ratio…

Due to high competition they will cut prices to keep their customers, so revenues will decrease in 2005. DoCoMo lost some customers in 2004, to its smaller rivals KDDI and Vodafone. Forecasts for 2005 are not rosy as it predicts EBITDA to drop by 13%. Despite that FCF should increase by 13.6%, but ROCE after taxes will decrease from 13.3 to 9.7%.

Based on available data it looks the most attractive stock in all communication sector.

Nippon Telegraph & Telephone Corp – 9432 (http://www.ntt.co.jp/index_e.html)

NTT is the largest telecom operator with annual group sales of more than 10 trillion yen. It provides a variety of telecommunication services, including phone, telegraph, leased circuits, data communication, terminal equipment sales, and related services. NTT split into two regional and one long-distance entity in 1999 under a holding company. NTT was converted to a private company in 1987, but government still owns 53%. Almost half of revenues come as a result of 64% interest in DoCoMo – wireless business; the other part is coming mainly from the fixed line business.

Business is struggling. The market for fixed telephones continues to shrink. The spread of IP phones is also hurting. ADSL and other services are offsetting lower sales, and revenue remains flat. Achieving goals for fiber optics services may be difficult. The benefit of streamlining has temporarily ended and little room for cost cutting remains. NTT pretax profit will likely decline. Parent-only pretax profit is expected to be below the line for dividend resources, but the dividend will be maintained at 5,000 yen per share.

The company will maintain capital spending at 2 trillion yen and place emphasis on fiber optics. NTT, has started to market IP phone systems. The group's NTT Communications Corp. has co-developed with IBM Japan Ltd. a system that can manage both voice and e-mail communications data. It has been selling the system since last autumn.

While Nippon Telegraph and Telephone Corp. expects a 24% plunge year on year in group operating profit in fiscal 2004, due to an ongoing price war, NTT Director Hiroo Unoura underscored the firm's readiness to continue buying back its own shares in large quantities to ease investor concerns about share oversupply, in a recent interview with The Nikkei Financial Daily (Nikkei.net, 2004).

NTT is a big company. Its financial results are improving but it operates in competitive business with difficult times in front. I would avoid despite having a very attractive P/E at the moment. Instead, as they hold the majority stake in DoCoMo, I would rather go there because the rest is more or less »Old fashion – fixed line« business, which goes down and is capital intensive.

KDDI Corporation - 9433 (http://www.kddi.com/english/)

KDDI is a leading provider of telecommunications services. It was born out of the merger of DDI, KDD and IDO in Oct. 2000. KDDI's major shareholders are Kyocera and Toyota Motor. KDDI is teaming up with China Unicom in the field of mobile communications. It plans to open its communications network for EZweb mobile Internet services to other firms.

In the last five years they gained the highest market share and are now second biggest mobile phone provider in Japan. Sales are more or less stable but consolidated net profit jumped a lot from FY 2002 to 2004. They are raising dividend a lot from ¥ 305 to ¥ 2400.

In the fiscal year ended March 2004, KDDI eclipsed the industry giant NTT DoCoMo Inc. in terms of new subscribers.

KDDI is expecting 190 billion yen in-group net profit in the current fiscal year through next March, up 62% from a year ago and a record high for the second straight year. Their PEG ratio is the best in the industry and is a candidate for GARP strategy.

If they will continue to have access to NTT fiber optics under the same conditions as DoCoMo they should do well. As a smaller dynamic rival it looks even more attractive as DoCoMo.

NTT Data Corp. 9613 (http://www.nttdata.co.jp/en/)

NTT Data group consists of 90 companies (as of March 2004, 68 subsidiaries and 22 affiliates). NTT Data was formerly a communication operation headquarters of Nippon Telegraph and Telephone Corp. It is the largest information service company. Its main clients are government offices and financial institutions. NTT Data designs, installs and maintains general disaster prevention information system, online accounting system, and credit card management online system. It also handles system leasing. The company is a subsidiary of Nippon Telegraph & Telephone Corp - NTT.

NTT Data plans to spend more than 50 billion yen by 2008 to configure Japan's first large-scale information system to be shared by credit card companies. They have experience in developing and operating the data telecommunication system of all banks in Japan, a system used for settlement between financial institutions. By common system they expect that credit card companies would be able to cut their cost by 20-30%. And cost cutting in this sort of business is a good business (Nikkei.net, July 8th 2004).

They plan to aggressively acquire companies over the next three years starting in fiscal 2004 and have earmarked roughly 20 billion yen for this initiative. Under its medium-term business plan, NTT Data aims to beef up its marketing to manufacturers and retailers to reduce its excessive reliance on financial firms and the public sector. To this end, it wants to acquire companies with strong ties to the private sector as well as bolster its marketing and development efforts.

NTT Data has slower growth as mobile phone companies but stable. Sales are going slowly up. Interesting company. They plan to increase sales to ¥1 trillion and revenues to ¥ 75 B what many analysts do not believe and they send the stock down. This news from the end of May 2004 looks to good to be true.

At this moment stock looks not to be attractive. Similar as in Vodafone's case if management will be able to come close to their long-term plan, situation will change dramatically.

Vodafone Holdings K.K – 9434 (http://www.vodafone-holdings.co.jp/english/)

Vodafone Holdings K.K., a subsidiary of Vodafone Group PLC, provides mobile communication services such as car and cellular phones. The company also provides long-distance and international telephone services. Vodafone Holdings also provides engineering work and cable TV service, and sells cellular phone equipment. Its stock prices increased mid May 2004, after Vodafone Group PLC announced that it would launch a tender offer to increase its stake in Vodafone Holdings KK from the previous 66.7%. Tender offer was successful and Vodafone now owns almost 87.7%. As tender offer gave 20% bonus on previous price the stock is not attractive in short term. In fiscal year 2001, J-Phone contribution to the group increased revenues dramatically as its operations represented 72.9% of consolidated operating revenues of the whole group. That's why I made an analysis only on data from 2001 on.

Table A1: **Evolution of Vodafone Holdings K.K. revenue structure (in %) in the last three fiscal years ending end of March.**

	2004	2003	2002
Mobile business	91.1	80.76	78.43
Fixed-Line bus.	10.6	18.95	21.16
Others		0.30	0.40

Source: Annual reports, 2004 and 2003. Business structure – please note that result does not equal 100% as there were some eliminations also.

Vodafone's strategy is to concentrate exclusively on the mobile communication services what is confirmed with the trend shown in table A1 above. This is shown as assets in fixed line business decreased in 2004. The new management team from October 2001, after Vodafone obtained management control looks to perform better, as the old team as they have big multinational – one of the biggest wireless telecom company behind, which is one of their strengths of being a global player of scale. The CEO being also president was changed again on June 23rd 2004 what talks against stability in the company. The new management is also the result of merger between Vodafone Holdings K.K and Vodafone K.K, which expected to become effective on October 1st, 2004.

In addition their predictions for 2005 are in reduced sales revenues as it concentrates on mobile business to cut cost and is going out of less and less profitable fixed-line business. Like that it predicts return to profit for 2005, what seems possible, because in 2003 it sold some subsidies bringing loss of ¥ 153 B. Vodafone also repaid some debt and big part of investment in 3G infrastructure is done.

Currently the stock is not attractive mainly due to last years' result in addition it has big relative debt and dangerous current ratio of only 0.43, which is improving toward higher values. One should survey new quarterly data as the situation can dramatically change in their favor due to extraordinary events in 2003.

Appendix B:

A brief overview of the broadcasting companies in the Nikkei 500 communication industry

Fuji Television network – 4676 (http://www.fujitv.co.jp/en/index2.html)

Fuji TV network leads the private Japanese television broadcasting companies in total sales. Fuji is the nucleus of some 100 companies in the Fuji Sankei group. It operates nationwide network comprising 27 affiliated stations. It is investing in Sky PerfectTV (a broadcasting network) as a first step for expansion into digital satellite broadcasting. Fuji broadcasts drama and entertainment programs with high viewer rating. Broadcasting and broadcasting related activities represent about 81.4% of their total revenue. For 21 years it is the biggest private broadcasting company in sales in Japan. Fuji is the only public broadcaster to record an increase in both sales and revenues in fiscal year 2003.

Fuji Television Network Inc. will expand into the animated-movie production business by purchasing a 10% stake in Gonzo Digimation Holding Co. for an estimated 350 million yen (Nikkei.net, 4.30.2004).

Without issuing new shares in February 2004 they would have negative cash flow in FY 2004. But even increasing equity their ROE improved, what is a good sign.

JSAT Corp. – 9442 (http://www.jsat.net/en/index.html)

JSAT is a leading satellite operator in the Asia-Pacific region. It was established in 1985 by a consortium led by trading firm Itochu. JSAT owns nine communications satellites and is offering them for use by broadcasters and telecom firms. NTT group companies are its main clients.

Only 383,000 Shares and low liquidity look to be their major problem on stock exchange. In 2003 they repurchased 28,150 shares what is a good sign for the stock but on the other side liquidity is even smaller.

It has the second best score but due to liquidity problems I would eliminate it.

Tokyo Broadcasting system, Inc – 9401 (http://www.tbs.co.jp/eng/tbs.html)

Major private broadcasting firm managing both television and radio, boasting most extensive networks among private broadcasters with Japan Radio Network and Japan News Network for TV. The company offers a variety of TV programs and film production, visual and music software production, and cable television programming. The company provides digital satellite broadcasting. Broadcasting represents 87.7%, real estate 1.3% and other businesses 10.9% of their revenues (Annual report, March 2003 data).

Currently it has the highest P/E mainly due to high extraordinary charges connected with pension fund but future P/E is at 27.5 which is similar as the one for Fuji. In FY 2003 it took some market share from Fuji. Trend looks to reverse a bit in 2004. Total debt to shareholders equity (TD/SE) went down from 66% to 48% in last five years.

Cash flow is going down for the last three years, but expenditures are going up – due to digital broadcasting in 3 major cities. ROA and ROE are going down for the last 3 years and predictions for 2004 are bad. Net profit in 2004 dropped a lot also due to ¥ 10.44 B paid to retirement beneficiaries.

It scored the worse result and I would avoid it. For the current year ToBS predicts very good results. Net profits should jump more than three folds as an effect of extraordinary charge in 2003. Lately some analysts cut its recommendation.

Nippon Television Network Corp. - 9404 (http://www.ntv.co.jp/english/)

NTvN is an affiliate of the Yomiuri Shimbun group. It is actively engaging in CATV. NTvN is a commercial television broadcaster, which provides program through a national network system. The company is expanding into digital satellite broadcasting. Nippon Television also operates publication and entertainment business such as concerts and exhibitions.

Sales are dropping a bit; current ratio is worsening and is at 1.6, being the worst of three broadcasters if we exclude JSAT.

On the web it is impossible to get valid information as their English reports are blocked somehow during transfer.

Appendix C:

A brief overview of the analyzed audio and video products companies in the Nikkei 500 electric machinery industry

Canon Inc. – 7751 (http://www.canon.com/index.html)

Canon is the major office automation equipment company making networked multifunctional devices, digital and analog copiers, computer peripherals, facsimile machines, and image-filing systems. Manufactures also camera (camcorders, cameras and lenses). Its business covers also broadcast and medical equipment, and telemedicine system. In addition it actively works in the field of environmental technology with the aim of improving the global environment, such as by commercializing solar cells. Overseas investors held 50.9% of Canon Inc.'s outstanding shares, as of the end of June 2004, making the firm's foreign ownership the highest among all publicly traded companies that are not managed by foreigners.

Revenue and profit will likely hit all-time high. Spread of cell production is contributing to falling production cost ratio, which comes below 50%, offsetting higher sales promotion costs. The company plans to sell 15 million digital cameras in fiscal 2004 by releasing nearly 20 new models compared with 11 models in 2003 fiscal year, when they sold 9 million of them. Canon aims to grab 60% of the global share for single lens reflex (SLR) digital cameras, which is one of the fastest growing segments. Projections in June 2004 shows better results as initially projected. Group operating profit will likely climb 14% to 520 billion yen, rising from an earlier forecast of 499 billion yen.

Canon Inc. and 51 group companies have begun streamlining their parts procurement on a global scale with the goal of halving the number of suppliers to 3,000 (from current 6000) and reducing procurement costs by 10% until 2006.

Dell Japan Inc. has begun Internet and telephone sales of personal and business printers in 2004 priced 30% below comparable Japanese products. With this move Canon got a serious competitor in its home market. Canon will stop making analog camcorders this summer and concentrate on digital camcorders, which record on MiniDV tapes or DVDs.

TDK Corporation – 6762 (http://www.tdk.co.jp/tetop01/)

TDK is a major electronic component manufacturer, with high name recognition worldwide in audio and videotape industry. It has 50% global market share in ferrite. TDK was established to commercialize magnetic ceramics containing this ferrous oxide invented by two college professors. Mainstay product now is magneto-resistance heads used in personal computer hard disk drives. Recording devices showed the biggest gain in the last year (+30.8%) to represent 35% of total sales.

Sales of electronic materials, electronic devices and recording media materials will likely fall short of the initial plan, but those of recording devices are expected to be strong thanks to brisk sales of HDD heads. Sales prices are falling, but operating profit should jump 90% through restructuring. Net profit will likely rebound 2.5 times.

TDK plans to start mass production of 120 gigabyte-type magnetic heads by April '04.

In the future, tremendous growth is expected in electronics fields, the core of TDK's business activities, particularly in the IT home electronics appliances, broadband network, and car electronics fields.

Just over one month after TDK Corp. released its financial statement for fiscal 2003 in late April, its stock price has risen by 10%, boosted by securities analysts who upgraded their investment ratings.

TDK projects group operating profit will rise 10% for fiscal 2004, partly on the back of growing demand for parts used in digital appliances. Masashi Itaya, an analyst at UFJ Tsubasa Securities Co. (8621), noted that "TDK's business results for the current year will likely outperform its own projections."

Matsushita electric industrial Co., Ltd. – 6752 (http://www.panasonic.co.jp/global/)

Matsushita electric industrial Co., Ltd is one of the world's leading consumer electronics makers, known for its Panasonic, National, Technics, Victor, JVC, and Quasar brands. Focusing on digital audiovisual, mobile and electronic devices. It develops data communications, energy and housing equipment and expanding output of LCD products. Moving to scrap its vertical system of product-based divisions, a structure put in place by founder Konosuke Matsushita about 70 years ago. The company has associated companies around the world. Three major segments are: audio video communication networks with 52%, home appliances with 10% and components & devices, and other with 38% of sales. They are looking for economy of scale to have mass production of products, which they can sell in high volume.

Their "Destruction and Creation" strategy is looking to streamline operations and reduce costs what starts to bring results. They target 5% operating margin, which was not achieved in first years. They want to create more value.

It is anticipating double-digit growth in full-year operating profit. DVD recorders and plasma televisions are profit drivers. Its cellular phone business, which posted a loss in the previous term, will likely turn profitable in 2004. Sales of charge-coupled diodes are brisk. Device division is expecting full-year profit to grow 39%. Additional profit of 260 billion yen from streamlining measures will offset falling sales prices.

Matsushita Electric Industrial Co. said on July 1st 2004, that a subsidiary has developed an air filter that is more than 99% effective against the virus that causes severe acute respiratory syndrome (SARS).

Competition to control the standard for the next generation of DVD technology is moving from laboratories to the market. Matsushita Electric Industrial Co., Sony Corp. (6758) and their allies will release the first "Blu-ray" DVD recorders in late July, challenging the camp led by Toshiba Corp. (6502), which established the current DVD format and which now advocates the "HD DVD" standard (Nikkei.net, July 1st 2004).

Matsushita Electric Industrial Co. is to build a state-of-the-art plant for television plasma panels on the former site of Kansai Electric Power Co.'s (9503) thermal power plant, the symbol of the old smokestack industry, in Amagasaki, Hyogo Prefecture, at a cost of 90 billion yen. The plant with monthly capacity of 250,000 panels, combined with the company's existing plasma panel plants, will meet half of the world's demand when it comes on-stream in autumn of next year.

Matsushita Electric Industrial Co. is set to make a full-fledged drive into the Russian market for household appliances and audiovisual equipment.

Matsushita Electric Industrial Co. intends to jettison a little more than 3,000 jobs, 3%-plus of its group work force in Japan as well as halt domestic production of unprofitable products, mainly in the areas of electronics and batteries in the current fiscal year ending March 2005.

Matsushita Electric Works and its group companies became consolidated subsidiaries of Matsushita Electric Industrial on April 1st 2004.

Sony Corporation – 6758 (http://www.sony.net/index.html)

Sony is the leading manufacturer of audio/video equipment such as VCRs and DVD players. Sony is renown for high-definition TV and minidisks. This electronics segment represented more than 65% of FY 2004 sales. Sony is putting effort into development of multimedia products. Domestic shipments of PlayStation 2 consoles have passed 3 million units since they hit the market in March 2000. Next generation of play station is announced for the year 2005.

The company recorded 168.1 billion yen restructuring expense, mainly for the electronics division, and operating profit dropped 46.7% and net profit 23.4% compared to year ended in March 2003. With fixed expense cuts and development of new products, the company aims to improve operating margin to 10% in the year through March '07.

Sony will spend 300 billion yen over the next three years for plant reorganization and personnel cuts. Annual cost savings of 200 billion yen is expected.

Sony Corp. is aggressively signing partnerships and integrating business with leading companies across industries worldwide. New partners include Samsung Electronics Co., IBM Corp., and soon Bertelsman AG of Germany, the world's top music company.

The Sony initiative, tantamount to reorganizing industry leadership to cover both software and hardware, may change the established manner in which specialized companies dominate their own fields, like Microsoft Corp. and Intel Corp.

Casio Computer Co., Ltd – 6952 (http://world.casio.com/)

Casio is a major manufacturer of wristwatches and hand-held calculators. Produces also mobile and electronic devices. It introduced purely electric compact calculators without gears in 1957. Since then, it introduced many products such as digital wristwatches, electronic musical instrument, electronic organizers, digital still cameras which was the fastest growing part and the most profitable one, and hand-held personal computers.

Casio Computer Co. is expected to report a consolidated net profit of 14 billion yen for the fiscal year 03 ended March 31st 2004, up 150% from fiscal 2002 and better than its initial forecast of 12.5 billion yen. In the last year its market price doubled!

Profit increased thanks to cost cuts and strong sales of the company's mainstay products such as digital cameras and cellular phones. Group sales apparently climbed 18% to around 520 billion yen, an increase of about 20 billion yen from its previous forecast.

Along with digital cameras and cell phones, the firm saw robust sales of electronic dictionaries, radio-controlled watches and LCD (liquid crystal display) parts.

They are marketing a super-thin electronic dictionary containing 32 dictionaries. President Kazuo Kashio is far from being complacent. "The more we sell, the higher the costs tend to become so we intend to focus on cutting costs to solidify the foundation for earnings," he says. To this end, the company is trying to reduce the number of components used as well as the number of parts vendors it purchases from. Casio also aims to outsource about 50% of the production to China within this year; up 20% from the current level as labor costs are about 40% lower in China than in Japan. The company also plans to purchase more parts there.

In the US and Europe, where rival manufacturers such as Canon Inc. and Sony Corp. enjoy considerable name recognition, Casio aims to counter the competition by highlighting the capabilities of its products.

Casio Computer Co. has developed the world's smallest fuel cell for use in laptop personal computers, and aims to market it in 2007.

Victor Company of Japan, Ltd.–6792 (http://www.jvc-victor.co.jp/english/global-e.html)

Known also under brand name JVC. Victor is a major audiovisual equipment maker and is the Matsushita Electric Industrial group company. It is strengthening electronic device and software businesses. It established multimedia strategy headquarters in 1995 and established AV and data communications divisions two years later. JVC is renowned for linking hardware and software in technology and development of products such as small digital video cameras and D-VHS video decks.

Sales in the software division are robust thanks to hit music products. Sales prices continue to fall, but operating profit will rise 10% thanks to benefits from cost reduction and restructuring. With extraordinary losses waning, net profit will leap 70%.

JVC is introducing new products one after another, including plasma televisions (four models are planned to be released in June 2004), liquid crystal televisions and DVD recorders compatible with two existing formats.

It predicts sales growth of 11% and operating income of 14%, but predict a loss of ¥ 7.6B.

JVC will close four or five production sites (from 28 at home and abroad), such as those that make key components for cathode-ray tubes for (CRT) televisions and slashing 12% of its parent-only work force. The electronics manufacturer's operating profit margin in fiscal 2003 is expected to be 2.5%, and JVC aims to raise this to 5% in fiscal 2006.

The company projects that its sales in fiscal 2006 will reach 1.1 trillion yen, 10% higher than in fiscal 2003, and aims to raise its operating profit from 25 billion yen to 55 billion yen in the same time frame.

The firm plans to boost its R&D expenses from 43 billion yen to 50 billion yen and use it to develop mainly flat-panel TVs and optical discs such as DVDs.

As for its product strategy, JVC intends to boost its production of LCD and plasma TVs and plans to release in the US this summer a projection TV that employs new technology.

Pioneer Corporation – 6773 (http://www.pioneer.co.jp/index-e.html)

Pioneer is a major audiovisual equipment manufacturer for household, industrial and automobile use. Its strength lies in car audiovisual and navigation systems. It turns out plasma display panel TVs also. Pioneer licenses its patented technologies for optical disks to other businesses.

Sales of set top boxes are weak in the US and Europe, but those of DVD recorders are brisk. In addition, new plasma television products are off to a good start, and operating profit will likely grow 30%. Net profit is also expected to rise. With enforcement of strict inventory management, inventory asset turnover ratio is improving. They intend to reduce inventory turnover from 53 days to 43 days.

Pioneer Corp. expects its group operating profit to increase to about 52 billion yen in the current fiscal year, up roughly 20% from fiscal 2003 estimates, representing the company's third consecutive year of double-digit growth.

If this projection comes true, it will mark the first time since fiscal 1991 that the firm's group operating profit tops 50 billion yen.

The company sees its fiscal 2004 group sales climbing 10% to about 800 billion yen. Shipments of DVD recorders are forecast to rise 100% to more than 1 million units, following the nearly 200% increase in fiscal 2003. Shipments of plasma TVs are likely to

double to more than 300,000 units, compared with the 60% growth in fiscal 2003. They are working to improve management transparency.

Hitachi Maxell Ltd. – 6810 (http://www.maxell.com/)

Manufactures and sells information media products such as audio-video tapes, floppy disks, optical and IC cards. It is affiliated with Hitachi. It has significant presence in optical disk and lithium-ion battery markets. Batteries are produced under Maxell brand name.

Profit is expected to dip in the information media division, but sales of recordable DVDs are brisk. Revenue will climb moderately. Group operating profit is expected to dip 4% for the full year due to lingering uncertainty in the economic environment in the second half. With extraordinary losses waning, net profit will increase.

Hitachi Maxell Ltd. will raise monthly capacity for camera-phone-use aspheric lenses by more than 400% on the year to 8 million units within fiscal 2004 as part of its move to strengthen optical parts operations. Production capacity will be further raised to 20 million lenses a month in fiscal 2006.

In response to the growing demand for DVD recorders and other devices worldwide, Hitachi Maxell Ltd. will bolster its production lines for DVD-RAMs and boost monthly output in June to 2 million from 1 million.

I thought magnetic tapes are dead but Hitachi Maxell found a solution to pack up to 10TB (tera=10^{12}) on one tape. By using this NanoCap technology, it plans to release a magnetic tape with a recording density of 1TB in 2006 and follow this up with a tape that can store 10TB of data by 2010.

Approval to return the future part of the substitute portion of the employee pension program to the government would boost profit by 3 billion yen at the present time.

Appendix D:

A brief overview of the analyzed robots, automation equipment and system engineering companies in the Nikkei 500 electric machinery industry

Fanuc – 6954 (http://www.fanuc.co.jp/eindex.htm)

Fanuc holds 50% world market share in numerically controlled apparatus. It operates sales/service bases on all five continents. Fanuc established solid position as the world leader in production of factory automation and industrial robots. The Company's products include computerized numerically-controlled (CNC) equipment, servo motors, laser systems, industrial robots, wire-cut electric discharge machines, and CNC drill. Fanuc participates in a joint venture with General Electric in the FA field.

Sales of industrial robots to the Japanese, European and US automobile industries are brisk, as are sales of injection molding machines to DVD manufacturers in Southeast Asia and Europe. Fanuc is raising monthly production of industrial robots to a record 1,500 units and monthly output of injection molding machines to a record 500 units. Factory automation equipment orders are also solid domestically. Fanuc looks to post record net profit. It is setting up a sales and support company in Russia in partnership with Mitsui & Co., as it is putting priority on expanding sales.

Company announced that consolidated sales grew 24% to 264.8 billion yen and net profit increased 45% to a record 57.3 billion yen in the fiscal year ended March 31st 2004. Fanuc announced a record 15 billion yen capital investment budget for the current fiscal year. Fanuc still faces the challenge of effectively utilizing the 410 billion yen the company has in cash and savings.

Fanuc is enjoying strong orders for robots from automakers worldwide, and its CNC systems are breaking production records every month, according to a company executive, as machine-tool makers ramp up production.

Yaskawa Electric Corporation – 6506 (http://www.yaskawa.co.jp/en/)

Yaskawa holds a leading share in system electric machinery for the steel industry. Yaskawa aims to be a "total solution company" in three business fields: motion control, robotics automation, and systems engineering. Yaskawa has sold over 40,000 industrial robots since 1977 and is the world leader in total shipments of multi-joint robots. The Company's products include spindle controllers, computerized numerical control (CNC) systems, and system engineering. Yaskawa is putting effort into development abroad by starting robot production in the US and local production in Sweden, China and Malaysia.

Demand for automobile and liquid crystal-related robots is growing. With capital spending by semiconductor manufacturers growing, sales of alternate current (AC) servo motors used in production system are rebounding. Higher operating profit is expected thanks in part to lower production costs resulting from spin-offs and narrowing of suppliers. Gains from land sales are offsetting pension fund-related loss, and the company will likely turn profitable on a net basis for the first time in three years.

To improve results they introduced a strategic plan Win21 Plus. Plan calls for pretax margin of 10% in the year through March '06, and revenues of ¥300B.

Yaskawa's new three-year business plan (FY2003-2005), Win21 Plus, builds and expands on the business, corporate, management and financial structural reforms of the past mid-term plan Win21. The “Win21 Plus” goals are: To double value-added productivity, increase ordinary income ratio to 10%, and reduce debt to equity ratio to 1.0 or less.

Appendix E:

A brief overview of the analyzed electronic measurement equipment and scientific instruments companies in the Nikkei 500 electric machinery industry

Advantest – 6857 (http://www.advantest.co.jp/en-index.shtml)

Advantest is a world-class producer of IC test systems and memory test systems. It developed memory tester with world-best 250 MHZ capability, and first tester in world for the LSI system. Over 50% of its total sales are coming from overseas. Its subsidiaries in China, Singapore, Malaysia, South Korea and Taiwan are growing rapidly. Their results depend largely on capital expenditures of semiconductor manufacturers, test houses and foundries. Advantest covers about 60 percent for the entire memory tester market. They would like to raise that to 70 percent. Their shares of the DRAM and flash memory packaging testing markets are around 80 percent. For DRAM wafer testing it's about 60 percent but for flash memory wafer testing it's only 20 percent. They are under price pressure. In a bid to make itself less vulnerable to the silicon cycle, Advantest starts to introduce two-fold strategy to reduce its dependence on memory testers and rationalize parts procurement. They are in a cyclical industry related with semiconductors, which were hit very hard in 2001 and 2002.

Orders for testers are rebounding, driven by higher semiconductor demand in the digital consumer electronics field. New products are also contributing significantly, so sales will rise in the July-September quarter as well. Advantest will turn profitable in the fiscal half-year as initially projected thanks to restructuring including staff reduction and reevaluation of production procedures. Profits for the full year will likely top expectations.

The Semiconductor Equipment Association of Japan (SEAJ) sees sales of Japanese semiconductor-manufacturing equipment, including exports, increasing 24.5% on the year to 1.45 trillion yen in fiscal 2004 - an upward revision of more than 10% from its projection released in January 2004.

Group profits for the quarter ended June 30 2004 showed a huge rise on year due to hefty demand for digital gadgets, stable DRAM prices and improving capital investment among chipmakers. They reported net profit of Y14.00 billion, compared with a scant Y143 million that the company generated a year ago. The profit figure in the three-month period was close to an Y17.33-billion profit the company earned in the full year ended March 2004.

Advantest is planning 20 billion yen R&D investment, keeping it around 20% of total revenue. On July 28th they increased sales and net income forecast for the fiscal year 2005 ending end of March 2005. Increase for net income is almost 20%.

JEOL Ltd. – 6951 (http://www.jeol.co.jp/english/)

JEOL Ltd. manufactures electronic optics instruments and analytical instruments including electronic microscope (largest producer), X-ray diffractometer and spectrometer and thermographs. JEOL is a member of Mitsubishi group and has a worldwide reputation for engineering capability. JEOL is expanding into analyzers such as semiconductor inspection apparatus, electronic guns and nuclear magnetic resonance instruments for medical. It is in partnership with diagnostic medicine division of Bayer USA for sales of biochemical automatic analyzers.

Inquiries for products related to semiconductor devices are increasing. Emerging benefits from drastic reevaluation that has included shortening of project times and the creation of overseas procurement bases will offset falling prices, so profitability will improve. Pretax profit is expected to jump significantly but will remain meager. It is expecting to turn profitable on a net basis but planning to skip paying dividends.

In cost cutting effort it is streamlining its operations and moving assembly of electron microscopes to a subsidiary in Yamagata.

Jeol Ltd., a leading maker of electron microscopes, signed a cooperation agreement with Nissan Diesel Motor Co. (7210) on June 14th 2004, under which they will jointly develop and mass-produce high-performance capacitors for use as auxiliary power sources, in place of batteries, in low-pollution trucks and such business at high oil prices can be attractive.

Many other companies, including Samsung Electronics Co. of South Korea, have also proposed technological tie-ups with Jeol, which has developed a capacitor whose storage capacity is 10 times greater than ordinary capacitors. "We will select partners in each field of application," said Yoshiyasu Harada, the company's president. A prototype developed jointly by the two companies is one-fifth the size of a capacitor currently being produced by Nissan Diesel. The aim is to eventually install the capacitor in passenger vehicles.

JEOL Ltd. has developed a three-dimensional electron microscope that measures samples to a tolerance of five to 10 nanometers. On July 9th 2004 a new factory opened in Tendoshi, Yamagata prefecture with which they will increase the production of Field Emission Transmission Electron Microscope.

Jeol's strategic "Bright plan 1000" (started in march 2002) in FY ended March 2004 did not give expected results – they were well below but in line with revised plan.

Jeol is a niche player. The high capacity capacitor can be a major breakthrough! Even in their field competition is present and cost cutting of their clients is affecting them.

Anritsu Corporation – 6754 (http://www.anritsu.co.jp/E/)

Anritsu is a midsize electronic systems and equipment manufacturer - a leading maker of measuring equipment for telecommunications. It enjoys growth in equipment related to fiber optics also. It boasts expertise in high precision measuring instruments. Anritsu is maintaining large market share by developing measuring instruments for digital portable communications. It is striving to expand overseas sales and production.

Revenue for core optical and digital communications measuring instruments continues to decrease due to sluggish North American demand. However, growth in sales of products used in next-generation cell phones and streamlining measures are contributing to 8 billion yen increase in operating profit for the measuring instrument division. Personnel cuts of the previous term are contributing more than 12 billion yen in fixed expense savings. It recorded 4.8 billion yen extraordinary profit from sale of headquarters.

Anritsu is enforcing stricter management of investment and profitability by division and for each new business. EVA sales are expected to turn profitable in fiscal 2005. Sales in FY2003 were 78.4 billion yen and operating margin 2.3%. Forecasts for FY 2004 are predicting sales of 86.5 billion yen and 5.8% operating margin, and for 2005 100 billion and 10% respectively.

Anritsu Corp. plans to increase its global market share of measuring instruments for cellular communications systems from less than 10% to 20% by coordinating the operations of local units in the US, Europe and Asia.

Prices are solid for mid-range equipment such as one-box testers for W-CDMA manufacturing (mobile communication), and they don't expect those prices to decrease. With the spread of third-generation mobile communications handsets, they can expect growth in lower-priced equipment such as testers for handset maintenance and base stations, but they will continue to be active in high-end equipment for development. Overall, they don't foresee any major changes (Anritsu - CEO, 2004).

Yokogawa Electric Corp. – 6841 (http://www.yokogawa.com/)

Yokogawa is the largest industrial measuring instrument manufacturer composed from 95 subsidiaries and 15 affiliated companies. It is competing with Honeywell Inc. of US for the top spot in the world. Particularly, its petroleum and chemical instruments are doing well. Yokogawa develops, manufactures, and markets information technology (IT) solutions, measuring and control equipment, semiconductors, and electric components. The company's products include IT controllers, flow meters, pressure sensors, analyzers, data recorders, switching power supplies, and AC (alternating current) adaptors. It emphasizes on medical instruments also. It is developing a system in which photographic data from imaging diagnostic apparatus such as CT and MRI are controlled by a single large capacity server.

Sales of testers for camera-equipped mobile phones and liquid crystal televisions are growing overseas, especially in South Korea. Orders will be triple the previous year's figure. In the control equipment business, sales related to oil are brisk in the Middle East. Orders from the steel and paper industries are also rebounding. Yokogawa is cutting costs by some 4 B yen by reducing staff and streamlining its production sites. To increase profitability it is outsourcing production. As a part of its restructuring program, Yokogawa closed 15 domestic factories by the end of fiscal 2003.

Yokogawa Electric Corp. plans to establish around October 2005 an R&D center in Kanazawa (up to 500 employees), Ishikawa Prefecture, at a cost of 8-10 billion yen to pursue the development of next-generation medical and information technologies. They are expending in general their R&D to keep competitive advantage. As many Japanese firms they are looking on China's transformation into a market economy as a great opportunity to expend their sales.

Hamamatsu Photonics KK – 6965 (http://www.hamamatsu.com/)

Hamamatsu Photonics KK is a top photoelectric transfer tube maker active in R&D. It is boosting output of opto-semiconductors. Toyota Motor holds a 6.2% stake in the company. Its mainstay products include highly sensitive and responsive photoelectron multiplier tubes used in such products as TV remote controls, fire alarms, auto focus cameras, optical sensors, LED, and video camera used for measuring equipment.

Sales of semiconductor wafer inspection devices at the US subsidiary remain sluggish. The market for semiconductor devices for optical sensors is expanding and revenue is rising, but pretax profit felt 30% in the fiscal year ending September 2003. It is aiming for a rebound in the year ending September 2004.

It developed new process to cut wafers with Tokyo Seimitsu Co. replacing diamond blade by laser. It is building a diagnostic facility in Shizuoka Prefecture that will use proprietary optical technology to detect early-stage cancer and dementia. It is cultivating this into a new business start-up location. Hamamatsu Photonics is a relatively small and not liquid company getting poor score so I did not look it further.

Dainippon Screen mfg. Co. Ltd. – 7735 (http://www.screen.co.jp/index.html)

Dainippon screen products are divided in two major categories: Electronic equipment in which segments they produce semiconductor production equipment, flat panel display (FPD) production equipment, PCB production equipment, measurement equipment for silicon wafers, LCDs, and PCBs, and shadow masks and aperture grilles for CRT displays. Second category is graphic arts and desktop publishing equipment including color imaging & processing systems, input and output hardware devices and peripherals (scanners, film recorders, plate recorders, digital presses, digital color proffers), digital fonts, step & repeat machines, gravure engravers, and network services.

Appendix F:

A brief overview of the analyzed IT solutions, computer and peripherals, CD-ROM, disk drives, LCD displays sector firms in the Nikkei 500 electric machinery industry

Nitto Denco Corp. – 6988 (http://www.nitto.com/)

Nitto Denco is a comprehensive materials maker, with tapes as mainstay. It also manufactures products for LCDs/semiconductors and materials for medical use. It supplies various industries, including construction, automobiles, agriculture and medicine. Excels in adhesives and has leading share in packaging and double-sided tapes. It is developing highly functional electronic materials such as semiconductor epoxy packaging materials.

Sales of liquid crystal display materials such as phase-contrast film are leading the way. Nitto is market leader for these materials. It declares itself as a global niche – top products producer. It has nice growth in sales of new optical film for liquid crystal televisions. It is concentrated on flat panel displays oriented production what is good. In response to meet growing demand it is building a new liquid crystal film plant in Hiroshima. Nitto achieved better results as planned in FY 2004. It is expecting record group operating profit, which may top expectations. Its sales are distributed among electronics (48.5%), industrial (42.4%) and functional products (9.1%). A Hitachi subsidiary, which was the Nitto's largest shareholder, sold its stake to institutional investors via Nomura Securities. Part of this was purchased as part of the stock buyback.

Nitto Denco Corp. plans to add a factory for processing and cutting polarizing film in both South Korea and Taiwan to meet local demand increases for the key liquid crystal display component in those two major LCD-producing countries. The establishment of the two new plants is estimated to cost around 10 billion yen. The company already has one plant in each country.

The move is part of the company's plan to bolster its group production capacity for the LCD films by around 50% to about 64 million sq. meters in fiscal 2005. Nitto Denko plans to allocate 31.5 billion yen of its capital investment budget of 59 billion yen for the current fiscal year to achieve the goal.

Nitto Denko Corp. expects its group operating profit to come to roughly 38 billion yen for the fiscal half through Sept. 30, up 77% on the year and above the forecast to date of 34 billion yen.

Sharp Corporation – 6753 (http://sharp-world.com/index.html)

Sharp is a top liquid crystal producer, strong in flat-panel TVs and other products with LCD displays. It has balanced product portfolio among home appliances, information equipment and electronic parts (flash memory and IC).

Group operating profit will likely reach an all-time high. Profit from electronics division is expected to increase 7% and from electronic parts division 14%. In the April-June 2004 quarter, the IC division, led by charge couple diodes, enjoyed brisk sales. Revenue from liquid crystal televisions is rising 46%. Home appliance division is struggling, but sales of bactericide ion mounted products are growing steadily.

Kameyama plant in Mie Prefecture began production in January 2004. Sharp is improving supply structure for large screen liquid crystal televisions. Sharp's 45-inch TV, which will feature 6.22 million pixels and a picture resolution that is double that of plasma TVs of the same size, is set to carry a manufacturer's suggested retail price of 997,500 yen.

Sharp Corp. has announced a goal to raise its operating profit margin to 8% by the end of the year through March 2007, up from 5.4% in fiscal 2003. The operating profit margin of its LCD panel business currently already stands at 7.2%, so the company needs to significantly raise the figures for its other businesses to achieve the target. This will not be easy as new production capacities and competition are reducing prices.

Alps Electric Co., Ltd. – 6770 (http://www.alps.co.jp/index_e.htm)

Alps, a major electronic component manufacturer celebrated its 50th anniversary in 1998, as a leader in the electronics industry. Its major businesses include communications and broadcasting components, information equipment and car-mounted electrical parts. They are pioneering in new market of personal computer peripherals with cutting-edge printer and hard disk technology.

Higher demand for hard disc drives (HDD) magnetic heads is expected. In addition, sales of information/communications equipment and peripherals are brisk. However, sales of audio products, mainly in North America, will likely slow, and operating profit will likely decrease. With recording of 5.5 billion yen gains from return of portion of pension fund managed on behalf of the government as extraordinary profit, net profit should be higher.

Their strategic plan calls for operating margin of 10% for electronic parts division in the year through March 2006 by expanding vehicle-mounted electric parts business.

NEC Corporation – 6701 (http://www.nec.com/index.html)

NEC aims to be the leading multimedia company in 21st century. Its strategy advocates C&C (integration of computers and communications) since 1977. It possesses world-class technology in communications, computers and electronic devices. NEC covers a wide range of fields from PHS to satellite communications, personal computers, color liquid crystals and super-LSI. Main sources of their revenues are: IT solutions with 43%, network solutions with 36% and electron devices with 19% of total sales.

Exports of portable terminals are starting in earnest, and domestic orders are growing steadily. Earnings for semiconductor division are improving with restructuring. Recovery for service division is slow due to capital spending cutbacks by clients. Material cost cuts are offsetting lower sales prices, and operating profit is expected to grow. Gains from sale of the subsidiary stock in conjunction with initial public offering (IPO) of the subsidiary are pushing profit higher. They will partner with Sorectron of US on 3G cellular phone businesses. Aiming to expand production capacity for export products.

As all companies in “problems” they target much better operating margin of 7% and ROE of 15%.

NEC Corp. is bolstering its lineup of personal computer server products in an effort to counter the low-priced offerings of Dell Inc., which entered Japanese market and is expanding its market share aggressively. NEC has similar problem with Dell in personal computer field, as Canon in the field of printers. NEC on other side made an alliance with Chinese partner to sell PCs and servers there. They expect to increase sales of these products in China from this cooperation ten folds compared to 2003.

They are in a very competitive global business where margins are slim and only the strongest survive. They have the scale and brand mark on their side at least. As I was not able to get information for future growth I estimated points myself.

Minebea Co., Ltd. – 6479 (http://www.minebea.co.jp/english/index.html)

Minebea is a leading producer of miniature-bearings. Company also makes instruments' ball bearings, DC motors, servo motors, stepping motors, spindle motors, pivot assemblies, rod-end and spherical bearings, fasteners, switching power sources, FDD magnetic heads, hybrid ICs, measuring instruments, and aircraft- mounted equipment. Electronic equipment (computer keyboards) and parts currently account for over half of sales and there is the toughest competition, sending price lower even despite increasing PC sales in the last year. Demand for miniature-bearings increasing thanks to downsizing of computers. Minebea has production facilities in Thailand and Singapore.

Recovery is different for each product. Orders for aircraft motors continue to be weak, but those for information/communications equipment are growing. Making efforts to lower production costs through review of purchasing and production process to counter falling sales price. Facility utilization is expected to further improve in the second half, and margins will rise. Minebea will establish a new motor vendor firm with Matsushita Electric Industrial. The company has many products that hold the world's top market share.

Minebea management said that lower interest payments and smaller special losses helped it post a group net profit of ¥6.02 billion for the year ended March 31st 2004, after a net loss of ¥2.43 billion a year earlier.

The integration of motor operations by Matsushita Electric Industrial Co. (6752) and Minebea Co. will create the world's second-largest producer of small precision motors for information equipment. The new joint entity will be poised to compete with the world's largest producer of such motors, Nidec Corp. (6594), setting the stage for fierce competition.

Mitsumi Electric Company, Ltd. – 6767 (http://www.mitsumi.co.jp/english/)

Mitsumi Electric Company is a major electronic component maker renown for video, data and audio equipment. It is the leader in cutting-edge technology in wide range of products from audio / video equipment to computer peripherals such as floppy disk drives, CD-ROM drives and keyboards. It produces also basic parts like coils, filters, connectors, switches and transformers. Mitsumi has 20 affiliates and 17 factories overseas, mainly in China and Southeast Asia.

Profits are below predictions and they blame costs related to starting up production of new products and falling prices of optical pickup parts. Mitsumi also removed predicted increase in dividend.

It is taking over production subsidiaries in Tochigi and Akita prefectures in an effort to improve management. It will establish four operation headquarters system and expand semiconductor device business.

Appendix G:

A brief overview of the analyzed electronic components: Semiconductors, IC, semiconductor equipment, passive components, and circuit boards firms in the Nikkei 500 electric machinery industry

Rohm Co. Ltd. – 6963 (http://www.rohm.com/products/index.html)

Rohm is a chipmaker specializing in large-scale integration (LSI) and is renowned for custom technology. It is leading in development of ferroelectric random access memory. It is gaining attention in applications such as noncontact cards, including electronic money. Rohm tied up with US semiconductor maker Cree to enter the markets for blue light-emitting diodes and semiconductor lasers. Its overseas production output ratio is close to 50%. It provides a large range of semiconductor products. Sales are made from IC (43.7%), discrete semiconductors (39.1%), displays (10.3%), and passive components (6.9%).

Rohm Co.'s group net profit for the year ended in March 2004, jumped by 20.2% to ¥63.72 billion, up from ¥53.00 billion a year earlier, thanks to solid demand for products such as light emitting diodes, liquid crystal display modules, and semiconductor lasers for use in mobile phones and DVD recorders.

Severe price competition with rival makers intensified, hurting sales of the company's mainstay customized chips.

Sanken Electric Co., Ltd – 6707 (http://www.sanken-ele.co.jp/en/)

Sanken is an electronics maker with strength in power semiconductors (diodes, transistors and analogue integrated circuits) and power sources. It is strengthening its production structure with emphasis on multimedia, household and industrial equipment, and automobiles. Sanken entered liquid crystal backlight business through subsidiary in 1997. It established also production subsidiary in Indonesia to expand resonant switching power source product line.

Full production of cathode fluorescent tube (CCFL) backlighting for LCD displays continues. Sanken will raise their monthly production to 7 million units including tubes used in liquid crystal televisions. North American subsidiary will begin collecting investment return through production reform such as concentration of production lines. Operating profit is expected to hit an all-time high, while cash flow is decreasing by 50%, to 10 billion yen in FY 2003, due to higher spending on CCFL and completion of inventory asset reduction for now.

Sanken plans to strengthen its level of profitability by aggressively developing new businesses, based on the principles expressed in its motto: "constantly aggressive; growing even stronger." In the final year covered by this plan, which is fiscal year ending March 2006, the company plans to achieve ordinary income of ¥17 billion, and net income of ¥10 billion, or 250% of the current figures, and generate free cash flow of ¥30 billion over the 3-year period covered by this plan. If they can come half way of this plan it will be good for their shareholders.

Taiyo Yuden Co., Ltd. –6976 (http://www.ty-top.com/)

Taiyo Yuden is an electronic component manufacturer with hybrid ICs, ceramic products and ferrite products as mainstays. It developed CD-R writable optical disk ahead of the rest of the world. It is also developing high frequency filters and power amplifiers necessary in portable communications and power sources for notebook PCs. Company manufactures and markets

capacitors, inductors, hybrid integrated circuits, ferrite, power supplies, CCFL inverters, optical disks, filters, coils and thermistors. It has 21 overseas sites and is starting production in Malaysia and China.

Prices of capacitors for personal computers and mobile phones are falling more than initially anticipated. Profitability is deteriorating. Recording media and module sales are brisk, but this will not be enough to offset other declines. Profit will decrease. Taiyo Yuden will pay an additional 1.7 billion yen in taxes accompanying the recovery of technology fees from overseas subsidiaries. The net loss is expected to widen.

Bought back all 4.5 billion yen in company stock authorized in order to bolster stock price.

Taiyo Yuden Co. plans to double its combined monthly production capacity for DVD-Rs and DVD+Rs to 40 million units by building a factory and upgrading the existing one. Demand for the discs is growing sharply as sales of DVD recorders soar.

Kyocera Corp. – 6971 (http://global.kyocera.com/index.html)

Kyocera is a leading manufacturer of semiconductor components and fine ceramics. It is developing unique products in a wide range of fields. It boasts strong performance in the energy sector thanks to development of polycrystalline silicon solar cells. Actively promoting advanced communications devices such as PHS (Personal Handy System), which business unfortunately is contracting. Kyocera acquired Qualcomm Corp.'s mobile phone unit in February 2000.

Murata Manufacturing Co., Ltd. – 6981 (http://www.murata.com/)

Murata, a general electronic component manufacturer was founded in 1944 as ceramic capacitor maker. Capacitors represent 34.1% of its total sales. It commercialized numerous electronic components and systems using ceramic materials. It produces also piezoelectric sound components (18.2% of sales), microwave components (15.7% where growth was the highest), filters, thermistors, resistors, noise suppression components, coils, power supplies, sensors, and hybrid IC. It operates some 40 domestic and overseas affiliates. Murata is maintaining robust earnings thanks to product design and marketing strength. They are linked to mobile phone industry, PC industry and audiovisual consumer industry mainly.

Nippon Chemi-Con Corporation – 6997 (http://www.chemi-con.co.jp/Welcome_e.html)

Nippon Chemi-Con produces various capacitors and is domestic leader in aluminum electrolytic capacitors. It produces also tantalum electronic capacitors, ceramic and film capacitors, ceramic varistors, sensors and connectors. Its manufacturing is vertically integrated from materials through production facility development and it possesses its own R&D. Overseas production in South Korea and in the US exceeds 50% of its total output.

Demand growth is slowing in North America and other parts of Asia, but sales will be propped up by brisk sales of high-value-added capacitors for digital consumer electronics and automobiles. Aiming for 100 billion yen in gross revenue for the first time in three years. It is starting to see benefits from restructuring of overseas production in countries such as China, so profit will rebound. Firm is introducing an information system to manage product prices and shorten delivery times. Giving that this is a relatively small and not liquid company, which got a poor score, I did not look at it any further.

Ibiden Co., Ltd. – 4062 (http://www.ibiden.co.jp/)

Ibiden is a major manufacturer of printed circuit boards. It is strong in high-performance packages used in micro processing units for PCs. Ibiden was founded in 1912 to develop power sources, and

grew into technology development company producing new technology through the merging of existing technologies. Ibiden is meeting customer needs through small- lot production.

Sales of semiconductor packages will be steady thanks to larger orders from Intel. Shift to next generation packages will contribute to its earnings. Sales of DPF (diesel particulate filter) will continue to be robust thanks to more vehicle models using the product. Overseas factories that began operations in the previous year will turn profitable. Pretax profits will likely rise helped by absence of foreign exchange losses. Ibiden is raising the overseas production ratio from the current 30% to 50% over the next five years and is studying the possibility of expanding factory production facilities.

Ibiden Co. is expanding production of diesel particular filters (DPFs) to meet growing demand from European automakers. This is anyway a relatively small firm, which is outsourcing production of simpler products to China to reduce production costs. On the other side they keep R&D and more profitable product manufacturing in home country what is usual for Japanese firms.

Shinko Electric Industries Co., Ltd. – 6967 (http://www.shinko.co.jp/e_index.htm)

Specialist in semiconductor mounting technology, particularly multi-pin lead frames. It started production of lead frames for IC plastic packages in 1968, and now boasts world-class technology and production scale. Company designs, manufactures, and markets advanced electronic materials such as semiconductor packaging, including lead frames and currently developed PLP (Plastic Laminated Packages). With the construction of a new wing at Wako factory, they are introducing mass production of their major products.

Demand for IC packages is climbing as more functions are added to mobile phones and digital cameras. The expanded production structure is in place, so profit will rise. Revenue from lead frames will dip due to withdrawal from unprofitable products. The effects of stiff price competition will be offset by cost reduction, so operating profit will increase.

Business in last year was booming at electronics parts makers, which benefited from the popularity of digital home electronics products. Lately this trend is going down and technology firms are sold off.

Hirose Electric Co., Ltd. – 6806 (http://www.hirose.com/)

Hirose is specializing in connectors. Multiple connectors used in electronic equipment such as personal computers are mainstay. It is emphasizing connectors for mobile communication equipment in order to cope with rapid spread of wireless telephones and car navigation systems. Hirose develops and manufactures a vast range of well over 50 thousand different types of products. It is active in overseas sales and materials procurement with local corporations established in the US and South Korea. Connector sales have been concentrated on highly profitable models for digital consumer electronics and mobile phones. It is raising the overseas production ratio to reduce costs. Even conservative projections are showing 12% increase in operating profit and profit margins topping 30%. If net profit is strong, the dividend may be increased. Hirose plans to double capital spending to 7.3 billion yen to proactively cope with new products. Its R&D expenses will also be increased.

Appendix H:

A brief overview of the analyzed lighting and auto-part companies in the Nikkei 500 electric machinery industry

Denso Corp. – 6902 (http://www.denso.co.jp/en/)

Denso is a member of Toyota Motor group and is a leading auto parts maker in the world, particularly in fast growing car electronics field. Denso is a global company with bases in 23 countries. Company's products include automobile air conditioners, air bags, ignition systems, generators, power steering systems, and spark plugs with iridium electrode to computer chips. ABS brakes and airbags are doing very well. Denso is expanding in the information communication field, factory automation and environmental equipment.

Denso holds the world's top market share in 19 product categories, including ignition systems and alternators. It plans to increase that number to 23 by fiscal 2005. While benefiting from growth at Toyota, lately Denso has been getting more independent. Toyota's share of total Denso sales has shrunken from nearly 60% in fiscal 1985 to 47% in fiscal 2003. Denso is a key player in the Toyota Motor Corp. (7303) group, and had 115 overseas production bases as of March 31st 2004, more than Toyota itself.

Sales of car air conditioners and fuel injection systems are expanding thanks to new shipments to General Motors in addition to deliveries to Toyota. Denso will benefit from cost reduction and a weaker yen than the 115-yen to the dollar assumed in initial projections. It is expecting record pretax profit and on April 27th 2004 they announced a record 196.2 billion yen in consolidated pretax profit, up 18% year-on-year. In terms of sales, which grew by 9.8% year-on-year, it likely outperformed Mazda Motor Corp. (7261) and Mitsubishi Motors Corp. (7211), taking it to fourth place in the Japanese automotive industry.

Denso is streamlining its production to reduce costs. It is building a new car air conditioner plant in the US state of Arkansas in a bid to expand business in the southern US aiming to have it in service in 2005.

Stanley Electric Co., Ltd – 6923 (http://www.stanley.co.jp/e/)

Stanley was founded as major automobile lighting equipment manufacturer, with R&D now progressing in all optic-related fields in addition to car electronics. Manufactures lighting equipment including head-lights, High Intensity Discharge (HID) assist lamps, and rear combination lamps for automobiles. They produce also LCD (Liquid Crystal Display) and LED (Light Emitting Diode) lamps for communication equipment, office automation equipment, and information displays. Stanley is internationally renowned for technology and handling everything from basic research through production and sales. It is opening overseas sites in Southeast Asia, Europe and the US.

Automotive equipment represented 58% of total sales in first half of FY 2003. Orders for automotive lamps are robust. Sales volume to Honda and Nissan are rising. Motorcycle lamp sales are growing thanks to increased production. Use of high-intensity discharge lamps is expanding. In the electronic equipment business representing almost 41% of total sales, the orders for LEDs used in mobile phones are up. Revenue rose by 30%. With improving profitability, record profit is expected for the whole fiscal year. Due to low liquidity they de-listed from Osaka and Frankfurt stock exchange in 2003.

Stanley Electric Co. is planning a big increase in production of the light sources used in large LCD (liquid crystal display) televisions. The light sources used in LCD TVs are known as CCFLs (cold-

cathode fluorescent lamps). About 10 CCFLs, each just a few millimeters thick, are used in each LCD TV.

Ushio – 6925 (http://www.ushio.co.jp/english/index.html)

Ushio is a manufacturer of special lamps and industrial light sources using halogen and xenon for semiconductor and office automation equipment. It is expanding operations into optical energy apparatus and light sources used for printing plate production, and movie theaters. It is active in global expansion such as establishment of production sites and marketing bases in US, Europe, Singapore, South Korea, Taiwan and Hong Kong.

Ushio sales are distributed among electronics (31%), which was the fastest growing sector lately with increased LCD sales, flat TVs, visual lamp equipment (32%), office automation equipment (10%), and illumination (16%).

Sales of light sources used in manufacturing semiconductors are sluggish, but sales of light sources used in manufacturing liquid crystals are brisk in Taiwan and South Korea. It is enjoying growth in sales of products for office equipment in China. Earnings at its North American subsidiary are getting on track thanks to cost reduction. Profit will likely grow and it is expecting higher net profit.

Ushio is seeking a start-up company with which to partner in the fields of biotechnology and medicine, which are expected to grow in the future. It is entering the inspection equipment business to give a boost to its highly profitable optical equipment operations. As the first phase, the company will release early next month an automated inspection system for checking the quality of the special printed circuit boards used in LCDs (liquid crystal displays). Ushio is more a niche player for some production steps in field, which expands like LCD Flat Panes Display.

The company expects record group net profit for the first time in three years for the year ending March 31st. "Whichever of LCD, plasma display or electro-luminescence proliferates, it will boost our bottom line," said Shinichiro Kanzaki, a company executive.

They increased number of shares by about 20% in FY04, and predict 14% sales increase for FY 2005. As economy improves they might be doing well. They also implemented cost cutting as everybody, as this is easier to improve financial bottom-line results compared to acquiring new markets.

Mabuchi Motor Co., Ltd – 6592 (http://www.mabuchi-motor.co.jp/english/)

Mabuchi Motor started with small magnet motors for tools and models, and grew into leading manufacturer with over 50% global market share in small motors used in audio / video equipment, automobile electrical equipment and precision and OA machinery. Nearly 100% of its products are produced in China, Taiwan, Malaysia and Vietnam. Mabuchi sells about 1.8 billion small motors a year, what represents more than 50% of the global market share. It makes about 80% of its small motors in China. It intends to increase production in China by 30% and to install design unit there.

Despite that motor sales volume hit all-time high of 1.8 billion units, lower sales prices pushed profit down by 8 billion yen. Operating profit will likely decrease 14% despite efforts to cut costs and increase sales volume. Net profit is expected to rise with lower effective tax rate. Management changed lately and new management's vision is to increase sales by 50% in the next five years, through new business strategies for sales growth, cost reductions, to maximize the potential of existing businesses, expansion in new products and consolidation of management to follow and support this vision.

Appendix I:

A brief overview of the analyzed miscellaneous (not-classified) firms in the Nikkei 500 electric machinery industry

Matsushita Electric Works - 6991 (http://www.mew.co.jp/e-index.html)

Matsushita electric works (MatsushitaEW), Ltd. is a manufacturer of building materials and light equipment. The company also produces electrical appliances, information equipment, electronic materials, and automated controls. Matsushita Electric Works is a sister company of Matsushita Electric Industrial Co. It is placing emphasis overseas in Asia, particularly China, actively promoting business and pursuing various joint ventures.

Sales of new products released in the past two years are strong. It is expecting that sales of wrist blood pressure meters and ion dryers to grow. All divisions reported operating profit in the half-year ended May 2003. With additional structural overhaul expenses expected in the residential construction materials division, group net profit for the full year will fall 3 billion yen short of initial projections.

Matsushita Electric Industrial Co. aims to reduce group parts and materials procurement costs by 430 billion yen, or 10.5%, from its earlier estimate of 4.15 trillion yen for fiscal 2004. It plans to do so through joint purchasing of parts and materials with Matsushita Electric Works Ltd., which became a consolidated subsidiary in April.

Cost cutting in form of reducing the number of different parts used in manufacturing – is going toward standardization to cut costs in procurement and production. Matsushita forecasts that the cost-cutting efforts will help it increase group operating profit for the year by 43% to 280 billion yen.

With demand for digital electronics holding brisk, Matsushita is poised to see profit gains in electronic materials and automation controls. As a result, it projects net profit to climb 32% to 27 billion yen.

Sales are likely to rise 5% to 1.3 trillion yen, up 10 billion yen from a prior forecast. Matsushita is projected to post sales increases in all six of its business areas, which also include lighting products, information equipment, building products and home appliances.

The company's operating profit is likely to increase 15% to 58 billion yen in the fiscal year ending in November 2004 and top an earlier forecast by 2 billion yen. Profit generated by its electronic materials operations is expected to more than triple to 3.9 billion yen. Thanks to brisk Chinese market demand for connectors used in cell phones, the automation controls business is expected to see a 46% gain in operating profit to 12.3 billion yen. Positive influence on their financial results has recovering housing market. Successful structural reforms, and new products are also bringing expected results.

Makita Corporation – 6586 (http://www.makita.co.jp/data/a1_1.htm)

Makita is one of the leading producers of electric power tools, including battery operated power tools, stationary wood working machines, pneumatic devices, and gardening tools. The company also produces power tool attachments/accessories and provides parts replacement and repair service. Selling products to more than 100 countries, mainly to the US. Operates a total of seven production units in the US, Canada, Brazil, the U.K., Germany and China. Developing sales network with 113 locations throughout Japan and 31 subsidiaries overseas.

Stone cutting power tool sales are growing in Europe. Sales are brisk in Southeast Asia with introduction of new products. Strong sales in Europe and Southeast Asia are offsetting weak sales in North America and Japan, where the housing demand continues to be sluggish. Overall revenue will likely remain unchanged. With larger production in China, the cost ratio is improving, and operating profit is expected to rise 9%. Continuing share buyback what is good for stock price.

Four branch offices in the US will manage product inventory. They are closing 20 repair centers in an effort to lower costs by 400 million yen per year.

Hitachi Ltd. – 6501 (http://www.hitachi.com/)

Hitachi is the largest comprehensive manufacturer of electrical machinery and is renowned for technological capability. As it is a huge conglomerate it is pushing forward with structural reform by entering new businesses and withdrawing from others. It manufactures communication and electronic equipment, heavy electrical and industrial machinery, and consumer electronics. The company's diverse product line ranges from nuclear power systems to kitchen appliances. Hitachi also operates subsidiaries in the wire and cable, metal, and chemical industries.

Losses are expanding for recently acquired HDD business. Domestic demand for home appliances and heavy electric equipment is weak. Higher pension-related expense last year is a heavy burden. Despite working to offset lower revenue with cuts in material purchasing costs, downward revision is a concern. Net profit will likely decrease due to change in tax burden. Earnings may fluctuate depending on changes in business structure.

Hitachi is promoting pension fund reform such as return of a portion of pension fund managed on behalf of the government and implementation of retirement payment interlocked with market interest rate.

Hitachi is a huge company with very diversified portfolio. Stable and sure investment compared to smaller rivals, which can be more cyclical. On the other side diversification is not as good as it demands efficient management and this is seen also in very low ROE.