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Talousjohtaminen

## Stock Portfolios or Mutual funds? From the perspective of a Layman: Evidence from Finland

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## 1 Introduction

The idea for this paper was conceived when thinking about a common situation, in which an average person starts considering investments into the stock markets for the very first time and how lost one can be when the amount of new information is too overwhelming at times. Everybody who currently invests was once a newcomer, and there is nothing to be ashamed of. This paper handles this issue of investing in a very easily understandable way that the goal of gaining capital income for the new investor is the continuing theme of the paper, and this paper is written to help beginners on their road to be more aware in money matters.

It is a common way for a beginner to start when a trusted person such as a friend or a bank employee recommends investing. However in that case the investor-to-be has not necessarily the capability to make an educated decision whether or not to invest. The first question is that will he / she eventually invest into the markets or not, only then it is decided that what will be the available toolbox for the new investment portfolio. This is the carrying theme of this very paper. It is during the study considered exactly, that what kind of uncertainties the new investor must be willing to encounter if the investments are made, and what could be done to overcome the pitfalls, that are there waiting for their victim. This paper explains the reasoning of the different selection criteria of the portfolios and these are explained in an understandable way. Furthermore it is explained why the costs of investing matter for the investor, and why the risks must not only be understood as percentage values, but rather in monetary terms.

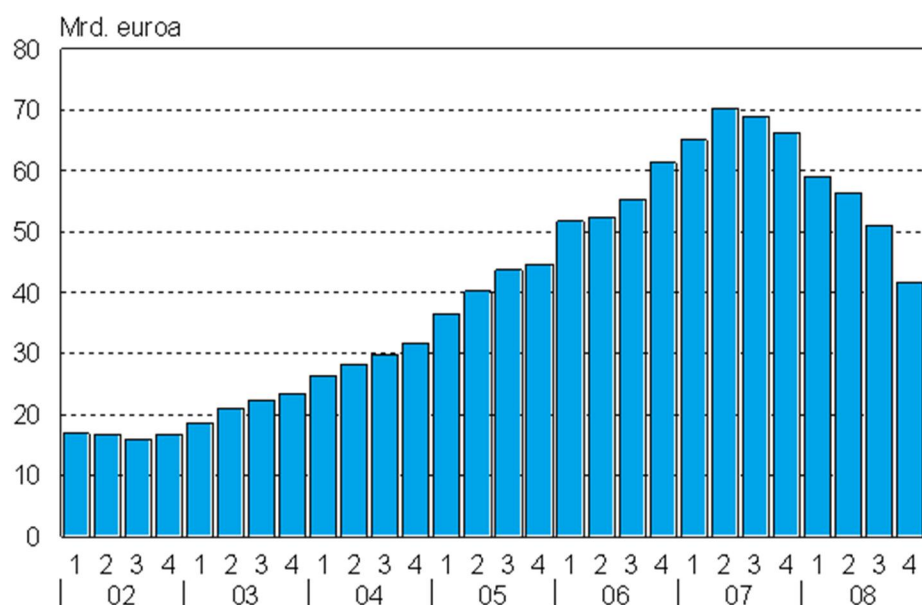
In this paper it is studied that what type of an investment one should purchase, if one invests. Also it is studied that could a simple rule of thumb, in this case the P/E number be used as a quantitative tool to facilitate good decision-making. Then, further on the differences between institutional investors and small investors are taken into account and it is further discussed that what kind of performance evaluation criteria would be practical, and how the performance of different kind of investments should be compared

## 1.1 What are Mutual Funds and how they were born?

A Mutual Fund is a company that pools money from individual investors and invests into stocks or other securities (SEC.) The first mutual funds emerged in the Netherlands in the latter half of the 18<sup>th</sup> century, having apparent motivation of enabling diversification for small investors (Rouwenhorst 2004 pp1.)

Mutual funds of the modern era are claimed to have started in 1940 (Fink 2011) During the years multiple times it was claimed that Mutual Funds have reached the peak of their popularity, yet every time growing considerably larger, year by year.(Fink 2011)

In Finland, which is in this case in the subject of interest, it is noteworthy that the mutual fund value in the end of 2008 was 42 Billion euros. (STAT 2009) That does suggest that these funds are a popular alternative for a saver.



Picture 1. Development of total value of the Finnish mutual funds. (STAT)

## 1.2 The fund value development

In the picture 1, which is from the STAT.fi, it is clearly seen that the growth of the market value of the Finnish mutual funds has been quite remarkable, although noteworthy is

that the picture does not tell us, that into which markets the funds invest, so it is not compared for example with the OMXH index as it is not told in the picture, and therefore it is not known if OMXH is a suitable benchmark. The scale of the amount of wealth in the Finnish funds is large, but it is not discussed in the source material that what proportion of the wealth is invested by Finnish investors and what by foreign. It is also not discussed that what are the proportions of the wealth invested by the Finnish funds are such that are invested in to the Finnish market and what amount of the total wealth is invested into foreign markets. It can be seen, however, that the importance of Funds has been growing until 2007, and the sizable amounts of wealth is invested in Finnish funds. If we by simple arithmetic, calculate the pro capita amounts, by dividing the amount of money in the funds with the population of Finland, we see that the all-time high amount of money is 13 000 euros / every Finnish person, that is invested into the mutual funds. That can be compared with GDP, which in the year 2007 was 35,278 USD which relates to our figure of 13 000 which is the value of investment funds in Finland. That puts the mutual fund industry in to perspective, helps to connect this with something. This also enables to compare the importance of Mutual Funds in Finland to the situation of other nations. (Economywatch.com)

### **1.3 Investor and the fund**

The investor cannot decide the weights of the different shares in the fund portfolio, the fund manager does that. The investor is only able to decide what proportion of total wealth he is investing in to the fund in question. The investor who only invests into funds cannot decide that what the fund does, but it can be decided, what percentage of the whole asset portfolio is in which fund, that gives more than enough room for the investor to decide, as the investor can him/herself construct a portfolio of different stocks, funds and bank savings, as well as real estate holdings. As sake of clarity, the investment alternatives are, however in this study, viewed as alternatives, in practice everyone is able to invest to whichever instrument that there is available, one investment does not prevent other, in any other meanings, that money can only be invested once. The investment is therefore solely a question of allocation of the assets. It is however a

question of practicality to view different investment classes as alternative, not complimentary, as this enables the comparison of these funds with each other. As an opposite view the investor may choose to compose the portfolio all by himself. The alternative approach is that stocks are chosen and simultaneously the division of the investment capital is decided. This is a contrast to investment funds, where all the power to decide anything what the portfolio contains is given to the mutual fund company's employees. Yet an investor may choose a combination of asset allocation, in which partly the invested capital is allocated into funds, and partly directly into stocks of choice. One direct benefit of direct stock investment is that the mutual fund companies typically charge a fee proportionally to the amount of money in the fund, and stocks can be held without any other costs of ownership than transaction fees. One example of such is Nordnet ([www.nordnet.fi](http://www.nordnet.fi)) which charges no money from simply holding the stocks there.

#### **1.4 Stock portfolio and the investor**

The investor can decide however, to formulate the wanted portfolio alone. Here it is compared that what are the differences in investing into a stock portfolio or relying with professionally managed funds. As later it is discussed further, there is contradictory evidence about the abilities of the funds to outperform benchmark index, majority belief is however that cost-adjusted, they fail. Other question there would be, that even if there was a number of actively managed funds that did outperform the market, how to recognize them? It is the question the investor would face, when making the investment decision.

The benefit from self-made stock portfolios are such as no costs to hold the portfolio, the costs of trading are not large and the investor is free to choose from a multitude of securities. When, further it is considered, about the diversification and benefits that arise, it is relatively easy to construct a portfolio that includes companies from a wide range of business.

On the other hand as it is shown, that the amount of money available for investments

may not be very large, it can be claimed, that it is not attainable to create a sufficiently diversified portfolio, as the amount of money available for each security will become smaller, and hence the costs relative, higher. In this study therefore the amount of stocks chosen to represent different selection criteria is set at 5 as a stock portfolio of 5 stocks do not need to be very large, as it can be purchased with relative modest funds. In order to achieve greater returns, than the risk free rate offers, however risk must be taken, otherwise it is not possible to achieve, how the risk affects selection and how it is taken into account is explained later on into much greater detail.

### **1.4.1 Research question**

To formulate a research question, It could be asked, that is it more sensible to let others do all the decision making, and simply invest through mutual funds, or does it pay off in the end of the day to learn a little bit of the stock market and formulate the stock portfolio accordingly, this is to be answered by, risk adjusting the returns, and by measuring the best returns using the Sharpe ratio. The different portfolios are then put into ranking order, using principles that will be explained into detail. This is however retrospective and it actually answers if it was more profitable to do so 5 years ago, but this is a common procedure to study finance-related topics, as there is good amount of data which can be analyzed into detail.

The purpose of this study is to include the financial crisis in to the data set, and to compare which portfolios and which mutual funds performed best throughout the years. The research question is that during especially eventful years, can an investor be better protected from risk, measured by risk-adjusted returns, using professionally managed mutual funds, or can the investor be better off with a strategy that does not include mutual funds? Can the investor protect him/herself by simple investment selection criteria, which takes risk into account, or is the investor better protected using help from professional investors by investing into actively managed funds. The question is a clear and simple dichotomy that carries through the study and everything is linked to the most basic question.

It could be said, that when looking back to 2008-2009 that a wise investor was all in cash. But as far as efficient markets are concerned number of studies including (Fama 1991) states that prices reflect information to the point where information costs exceed its benefits. In the other words when prices fully reflect available information, past prices cannot be used to forecast future and also the forecasting of the market movements is not possible, when superior information (in weak form of the efficient market hypothesis) is not available. Clearly that is the case for small investors.

Through the last 1.5 quarters of 2008 until March 2009 there was a substantial period of bear market in which the stock market fell. This is not a very rare occasion in the market, which has also previously had turbulent times. It further makes the study relevant. In the study we want to provide a view of the investment strategies that could be used when investing into the Finnish stock market. As a matter of clarity following assumptions are made: The strategies do not involve short selling, hedging or any other derivative strategies, The study follows CAP-Model, to be consistent with the investment strategy one does not take personal view of the future with derivatives. The usage of funds and stocks is mutually exclusive, that is, one either invests in funds or in stocks. The strategy only involves holding a stock portfolio because that is the only way for which we can use the CAP-model and achieve consistent results.

The study does not include hedging, short selling or any usage of derivatives, as it is assumed that the portfolios are of size in the range of thousands of euros, not tens or hundreds of thousands, and it is out of question to hedge such a small portfolio. Also such more complex operations are out of reach for a typical small investor, who probably has never even heard of those possibilities.

These assumptions further takes into account that most of the private households, that invest part of their personal wealth are not professionally finance-oriented, most people are not employed by the finance sector, nor have any major education in finance or economics in general. Therefore it is assumed that the investment strategy is one, what could be a strategy of an individual amateur investor. ( Kotitalouksien varallisuus, STAT.fi) A study from year 2009 by the Finnish national statistical center claims that 40%



of Finnish households do possess stock investments, this proves that most of the investors benefit more of investment strategies that are straight-forward and easy to understand. Therefore in this study more sophisticated strategies are omitted. The study further shows that the median value of household's stock portfolio was in the study only 3800 euros and the 9<sup>th</sup> decile has 13700 euros invested into stocks, therefore more sophisticated strategies probably are not beneficial for average investor, as it raises costs more than the benefit could ever be.

The study methodology is a time-series study, in which returns are calculated as well as the risk measured by annual volatility and then compared with each other. We will further discuss the returns of the mutual funds with taking into account the costs of maintaining the portfolio i.e. Net returns of the funds in question is an issue, that is worth remembering, as the net returns are those which matters. This is taken into account that if 2 different portfolios, one fund and one stock portfolio yielded similar returns, then it is the stock portfolio that is the winner of the comparison as the fund investor would end up with less money than the stock investor. The aim of the study is simply put: a comparison in which a set of portfolios that investors might choose are compared with funds that are available for the market in terms of risk and profitability. The goal of the study is to compare these alternatives during exceptional times, during the financial crisis of 2008-2009. The stock portfolio picking is an attempt to realistically imitate investor behavior, yet kept simple. The portfolio selection criteria are explained later on in more detail. The stock portfolios do only include a limited number of different companies stock, as each stock market transaction costs money (Nordnet.fi), and an average Finnish household invests as one form of savings, and the median size of the portfolio is only 3800 euros (Stat.fi), and that scale of investment does not make much sense to be diversified in, say 20 securities, as costs of trading grow.

## **2 Previous studies**

A very interesting topic of study is to compare the performance of these alternative investment strategies. The comparison is made against a benchmark. Many papers

have studied the mutual fund performance (see, e.g., Jensen (1968), Jensen (1969), Blake, Elton, Gruber (1993), Malkiel (1995), Carhart (1997)). In these studies mutual funds have been compared with the market index, risk adjusted. The idea of the comparison is to see that can an investor get extra profit with using professionally managed funds instead of investing into the stock market directly. The fund performance is compared with a benchmark, the market index. These studies generally conclude that mutual funds underperform their benchmark, net of costs. On the other hand contradictory evidence does exist:, Chen, Jegadeesh, Wermers (2000) found that growth-oriented funds had unique skills identifying underpriced large capitalization growth stock. A study however found out that “hot hands” can explain 3 – 4 % excess returns, risk adjusted, against a traditional benchmark (Hendricks, Patel, Zeckenhau 1993 pp.94). Carhart’s (Carhart 1997) article attributes “hot hands” phenomenon to the one year momentum effect of Jegadeesh&Titman. The article documents persistent significant positive returns for past successful stocks, for holding periods of 3-12 months. (Jegadeesh, Titman 1993) Wermers (2000) found that high turnover mutual funds hold stocks that substantially beat the Vanguard index 500-fun, on a net return basis. However, majority of academic papers conclude that actively traded funds underperform their passive counterparts, although countering evidence is available, such as Wermers (2000) where funds outperformed the index benchmark by 1.3% although underperformed by *net returns*. That is of a great importance as the very basic claim of this study is that it is the net returns that ultimately matter the most.

Also such a view exists, such as in the study of Grinblatt and Titman (1989,1994) and Grinblatt, Titman and Wermers (1995) these studies conclude that active funds can give higher returns on average, Grinblatt, Titman and Wermers’ study concluded that 77% of Mutual Funds were momentum investors, and those who did buy past winners did realize significantly better performance. Grinblatt and Titman also tackle the issue of finding an appropriate benchmark, which is not always simple, as they concluded. According to Moskowitz (2000) in a discussion to Wermers (2000) the difference between these two strands of study is that those who have made papers with results that active funds underperform, have studied in net terms i.e. all expenses deducted as

well as transaction costs and an entire fund portfolio (equities, bonds, cash) is analyzed. The second set, such as Wermers (2000) has a different approach, which analyzes only the equity holdings of a portfolio, i.e. creating a hypothetical portfolio out of every fund, which only contains stocks and is measured without any transaction costs or expenses. The differences in these approaches can be put in a simple matter of taste-type of question. On the other hand it is understood that the net returns of the funds, not the gross returns before expenses and all costs are, what matters to the investors. On the other hand it is understandable that when asking, can an investment manager really pick stocks that outperform the market then only the stock holdings of the funds need to be analyzed. This is an academic question, in practice it has to be taken into account that trading actively is not cheap, and the biggest winner might end up being the broker's house. But It still could be claimed, that is there any benefit from marginally exceeding the returns of a market portfolio in gross terms if in net terms the returns fail to reach the market portfolio level. As a remark, we are making a similar comparison of portfolios and index, and with these results comparing the portfolios with each other, and as a mutual fund is basically a portfolio, also own selection portfolios can be assessed similarly. The selection of the type of a comparison, a general net terms-comparison or Wermers' approach, is not a hard thing to choose. It is very clearly more practical to compare net terms and net returns of the portfolio, as these are the returns that are actual returns, and that in the end is what the investment is all about, what is seen on the bank account matters, how it is earned is not important. It is in practice important to earn net return and not to concentrate in a hypothetical what if-type of question. It is not of an interest to an average investor how the Mutual Fund did manage to provide the income, but how much that income was!

However the previous studies about mutual funds have used U.S data and the period of study has not extended over the financial crisis of 2008-2009. Also the comparison with the self-picked stock portfolios is included in this study, but not in those previous studies of mutual fund performance. We are testing the mutual fund performance and self-made portfolio performance on a Finnish data with OMXH as a benchmark index, and with that analysis we will be seeing that is the hypothesis viable. The data that is tested is logarithmic returns of price notations of the Helsinki Stock Exchange and the mutual

funds that have been chosen are funds that invest into the same stock exchange. This study is not only intended to see which portfolios performed the best, but also how much they did differ from each other? The study also incorporates a comparison to more traditional stock portfolio selection, of which later on there is more discussion.

The most of the previous studies, that we have included have stated that in net terms, mutual funds underperform, in some studies reverse has been stated (Wermers 2000) but the majority view does not support active funds. We intend to replicate such analysis and to further develop the question that which is the best way to form a portfolio. We will also analyze these self picked stock portfolios in a similar way that is used with funds. The inclusion of the financial crisis is a topic of interest it will be interesting to see that does the pattern of results of the earlier work by scientists replicate itself?

### **3 Study outline**

#### **3.1 The selection of portfolios**

The study compares the risk adjusted performance of mutual funds with the index and stock portfolios which have been chosen are also compared. The criteria of choice of the portfolios of stocks are as follows.

- **P/E**
- **Sublist of the stock exchange**
- **Diversification**

The portfolios contain stocks from different categories: stocks that have had high P/E, low P/E, stocks from small cap list, middle sized companies and big companies. Each of the portfolios has diversified its assets, totaling 5 sets of stocks, and the portfolios are ranked with P/E number. The portfolios each have 5 different stocks, the portfolio's weight on each stock is 20% and the portfolio is diversified into extent that is possible to reach with the choice of the stocks. The portfolios are all formed according to different

criteria. In practice the different stocks and their historical P/E ratios are arranged into an order, and 5 lowest P/E stock are picked, a second portfolio therefore has to take around average P/E stocks, and third has the most expensive stocks measured by P/E. Then a portfolio is selected from small cap stocks, and one is only large firms.

The portfolios are following:

- Low P/E
- Medium P/E
- High P/E
- Small Cap
- Large Firms

The Study also includes the following 8 Mutual Funds

- Handelsbanken
- Nordea
- OP
- POP
- SEB Gyllenberg
- Danske
- Evli
- Seligson

The Funds of each company is chosen to be that fund which invests into the Finnish stock market. The fund of Seligson is a different from all the other funds, as the fund is an index fund, and it is not actively traded but the rules of the fund limit trading, also the costs are substantially lower than in the other competing funds. The Evli-Fund holds a mixture of Stocks and Bond investments, yielding lower returns as well as risk.

### 3.2 Selection criteria – Reasoning

There has been made studies in the past about stock performance related to P/E, most famously P/E anomaly, which is an anomaly that is widely reported: it states that low P/E stocks tend to outperform high P/E stocks. However in this study we take a more non-traditional stance that put a little greater pressure on the return side of the investments and the reasoning is such: it is not actually volatilities, percentages and such of which the investor is only interested about, but the profit potential is what he / she is interested about, otherwise no investment would be made.

Basu (1977) writes on the P/E hypothesis that low P/E stocks outperform risk-adjusted the high P/E stocks will mean that the prices of securities are biased and the P/E ratio is the bias that therefore is inconsistent with the efficient market hypothesis. P/E is defined as the price of common stock divided by the annual earnings (Basu (1977))

The results were such, that in general low P/E portfolios earned higher returns, both absolute and risk –adjusted than high P/E portfolios, Basu (1977)

That resulting further point of test of data is that does the P/E anomaly still count as an investment strategy in much newer data. P/E is a straight-forward and easy ratio to compute, and if in the study it is found usable. We set a hypothesis about the P/E according to previous studies: Low P/E portfolios will outperform high P/E portfolios. P/E ratio is therefore a good ranking criteria of the stock portfolios. The mutual fund portfolios technically can be “opened up” as many funds declare their possessions at least annually, but as sake of practicality it will not be done. Reasons for omitting the closer lookup are following: it is simply not practical to do it for all funds and for all months of the period not even possible, secondly it is for no use in the strict meaning that the investor is not able to make any other decisions, than buy or sell. Also, as long as the investor is able to decide to own or not to own a stake of a fund, the investor therefore is not worried about the structure of the fund itself. There is always a possibility to “vote with money” and leave. If the investor wants to know more he or she can contact the portfolio manager of the fund, as an example the fund manager of Seligson & Co, Andreas Oldenburg does keep a discussion board for the investors to ask questions about the funds and companies that they do own through the fund

(www.seligson.fi). Also another point to notice is that mutual funds are chosen because of the simplicity of investing, therefore a typical investor of the mutual funds is less likely to be spending time with stock market information, than an investor who invests directly. Therefore what the fund actually contains is not of an interest in this study. Also it is the case, that if an Investor is not totally happy about the Mutual Fund he or she considers investing to, and say, he / she would buy shares of the fund if the fund for example sold off all their assets of stock x, he / she would not quite be listened to if he or she simply called to the manager and told: "I will immediately put my cash in your fund if you kindly get rid of that stock x first, that annoys me". It does not work that way, and therefore it is not viable for this purpose to get into detail and open up the fund. The fund caters to the needs of thousands and thousands of individuals who are willing to pay extra for the fund's services, hedging for the risk, analyzing the market, making investment decisions and being straight-forward and easy tool for savings, it can't be personalized. One good psychological reason behind the widespread popularity of the Mutual Funds can probably be attributed to the fact, that it is easier to blame everyone else when money is lost, and not to take responsibility of a bad investment decision. This can be supported by the fact that "investors sell funds with strong past performance and are reluctant to sell their losing fund investments; they are twice as likely to sell a winning mutual fund rather than a losing mutual fund" (Barber, 2000) That implies that people are reluctant to actually lose money based on their past wrong decisions, and there is a tendency that people do not want to realize the losses, they do not want to admit themselves that they did not win. Investors might therefore use funds because they want to put the blame on others, if they lose.

### **3.3. Selection of the mutual funds – factors affecting fund performance**

What factors affect the selection of a suitable mutual fund is then the logical next step of the paper. A source of controversy is that the benchmark selection, not the funds properties, affects the measurement of the successfulness of the fund in question. The CAPM-approach as Roll (1978) has noted, the benchmark selection is sensitive, and affects the performance evaluation. The analysis of the returns, both absolute and risk-

adjusted is subject therefore a possibly big potential of error, as the funds all are composed differently, and a suitable benchmark is necessarily an approximation. That is a matter that has to be kept in mind when assessing the returns.

When the benchmark does not fit as well with other funds, as it does with some others, we have to accept the consequent imperfect ability to compare. Consequently we have to accept that the OMXH index is not the best benchmark to measure all the stocks and funds in the market. On the other hand it serves as a practical benchmark as the Investor can always compare as a what –if analysis, that was he or she better off, if the investments were done for example via an Exchange Traded Fund (ETF ) Index portfolio, and forgetting altogether the selection of the stock and solely investing on a total portfolio which represents the total stock market, therefore it can be claimed that on that purpose it is suitable to compare against OMXH, as it answers which would have been a better option, stocks, funds or an index fund?

The previous considerations have only been about the performance and the measurement of the performance. The measurement is of course a really important issue as well as what comes to the practical side of the study, but as well as the reliability of the results of the study. Naturally the reliability of the results of the study is a very delicate issue. The statistical power has to be addressed as well. The generalization and the statistical power requires that the study period that is long enough. The reliability issue, with the benchmark bias has to be addressed as well: on the other hand we are only interested about the returns compared to the index; on the other hand our risk adjustment is biased if the benchmark portfolio is biased. As Roll (1978) noted that the selection is sensitive, here we have to have the same benchmark to all of the portfolios, both direct stock portfolios and indirect. Mutual fund performance is affected by what benchmark it is compared to, and as there is a bias, it is different for each portfolio within the data set. When we consider the results of the study we have to keep in mind that potential source of error.

Next we have to consider the tax policy issues as well as the costs of the mutual funds. After all, what matters is the net return, not the gross return. The amount of net return of the mutual fund is the gross return minus the expenses. The reason why it is net, not the gross overall return that matters, is that it is the net return that the investor sees in



his wallet.

The tax policy issue is a matter that affects the choice of an investment strategy. We take the Finnish taxation system into account. In Finland the tax of capital gains is currently at 28%, however investment companies are exempt of the tax, they are much less punished, and they can adjust the portfolio without unnecessary taxes.

The major source of cost that ultimately is directly away from the investment returns is investment funds' management fees. These fees can be as high as 2% p.a. and those are a major source of the difference between owning a portfolio directly or indirectly. These costs play a significant part in the long run. A simple calculation can be made: let an initial investment equal 10 000€ and the average rate of return equal 10%. If the investment is direct and there will therefore be no management fees applicable, after only 20 years the initial investment has grown into 67275 €, and if the investment is done indirectly, with a fund that has a 2% annual fee, we can calculate that the investment is only worth 46609,5€, which is 20665€ , more than twice the initial investment, less than what it had been, had the investment been made directly instead of through a fund. That shows that it is very important to have as little costs and as high returns as possible. That applies when the investment horizon is long. Albert Einstein once said "the most powerful force in the universe is compound interest" That is a suitable thing to quote, when we want to point out that it is very much important to achieve as high net rate of return as possible. Only 2% sounds very little in the first place, after all it is only  $2/100^{\text{th}}$  part of the initial investment in the 1<sup>st</sup> year, which totals in the example 200 euros. But as we see, the difference of the investment alternatives in the long run is undoubtedly remarkable. Therefore we can safely conclude that it is of an utmost importance to calculate the returns net terms. The risk-adjustment of the returns is of course very important to have, as the less the risk the better the investment. Let us briefly discuss Markowitz's classic portfolio theory: It is not enough to diversify into different kinds of assets, as also the covariance of the assets should be low, it is necessary to avoid investing in securities with high covariance, and it is necessary to invest into different industries that have different economic characteristics. (Markowitz 1952 pp89) This is to be understood, that it is important to realize that, say 7% return is not automatically better than 6% return, if the 7% return is earned on much higher risk,

that makes the investment more vulnerable to losses, and therefore it is of importance to take riskiness into account, when making comparisons. Also it is of an importance to diversify into different kinds of companies, as similar companies tend to encounter similar challenges and their value thus move together in the market. In other words, companies that have different economic motivations do make a better diversification, as, say a portfolio of 5 very different companies has much lower variance of returns as a portfolio of 5 forest industry giants.

The comparison of the portfolios of the study is made against the benchmark index, because the index is same for every fund, and the portfolios have to be compared against the index, otherwise it would not prove possible to rank the portfolios. We can take the market index portfolio as a portfolio of a comparison, as one is able to invest it via an ETF for example. Also, the total index simulates the Markowitz efficient portfolio (Markowitz 1952) and it is of a curiosity to see whether the Modern Portfolio Theory holds against more actively chosen portfolios.

### **Factors that affect our analysis**

In this chapter it will be explained further how this paper ultimately differs from the mainstream line of study which is discussed earlier at length. From here on in this paper emphasis is placed solely on appropriate ranking of the different portfolios and how the results ultimately are reported and how it differs from the usual form of study. The research in question puts a strong emphasis on simplicity and modesty. In research of Finance this is somewhat unusual. However to contribute something to the target audience, of which the study is formulated and who ultimately are studied not only as sources of money to the market, but also as a driving force of the market, simplicity is of utmost importance. It is much more beneficial for an average small Investor to know basic set of rules of how the market works, than trying to learn (too) advanced concepts, mostly utilized by Institutional Investors. The rules of the game differ with the scale of the game; some well-known tactics on the risk side of the investment such as hedging are unpractical because of the cost associated as well as complexity. These complex

issues are too costly, the cost will certainly outweigh the possible profit. In this case as the assumption is that the Investor is an average person, he / she will likely have a small sum of money available. When one invests, say 4000 euros into stock market, he or she is likely to be much more interested about the upside profit potential, and less interested about the variance of the investment. When an Investor invests, say 4 Million euros, he or she will be very much interested about the downside loss potential. The Investor might want to consider to hedge as the money-denominated loss potential is very large. Even if the investment loses 10% of the value of the investment, it will be in money terms 100 times more as the small investor's entire investment. The loss potential of large investment might very well be more than lifetime income of small Investor. Therefore the importance of the risk side is of lesser importance for the small investor. It is not practical to always talk about percentages and loss probabilities, it must be understood in the case of a small investor that a reasonable, modest risk can be taken as the risk in money terms is not large. Also that alters the ranking of the portfolios, putting a little more emphasis on the profits, than usual, as there is an acceptable amount of risk. It is not sensible to compare the riskiness in percentages, if the outcomes differ in the scale of hundreds, not millions of euros, it is therefore the profits, where the most emphasis is put on. The risk management is already there, as the potential for a loss of 2 week-salary is not a life-threatening condition, if it materializes, it will be practically no one who ends up in bankruptcy and if so, then the invested capital had been too big in the first place.

The other major difference of small scale investor and an institution is the Investment horizon. Sadly, each and every one of us will eventually die. Some people live well into their 90's and enjoy rather healthy retirement. Some people die rather soon. Banks and other Investment fund companies may very well live forever or at least for a very long time. New investors of the fund slowly replace older, new people in the company replace those who retire. People change, the company can keep up with investing in 200 years of time. The Mutual Fund company is in the business of providing service (against a fee added with a reasonable return of capital for the owners of the company) the companies manage their funds, but they do it in the interest of the shareholders of

the actual company. It is the ultimate question of the study. This question, does it benefit an average investor to act risk averse, when it is the upside potential that matters, and an acceptable rate of risk exists. The acceptable rate of return is the risk free rate added with a risk premium. Anything below that is not worth a single second of time of the investor, everything above it survive into second phase. As the Investor invests such small sums of money it is clearly not the question to minimize the risk in terms of variance, as small changes in variance in direction or other may very well be miniscule in terms of money. However the rate of return is always of an importance: the question is that why to invest in the first place, without intention to gain more money in the process.

It was mentioned, in the last paragraph, that Institutions may very well be eternal, and in our view they are, most major companies will ultimately in some form or other outlive us. What that leads into, is that in perspective of a small Investor, the holding period is much smaller as in the case of, say Retirement Fund. The investor might for example at some point be willing to save money, and to speed things up, invest (part) of it, and then one day, sell investments, and to go to a holiday in Australia together with his girlfriend. That is the reason, that also in this study the holding periods is short, and short are indeed our lives, when we put things into perspective. It must not be omitted, that the Investor has not an infinite investment horizon also because he / she might typically want to enjoy from the wealth earned during their working careers and that also shortens the available time period for the investment

## 4 The performance measurements

### 4.1 The performance of the portfolios

The performance of the portfolios of this study were obtained using following formulae and methodology

These portfolios are divided in this study in 2 subgroups; Stock portfolios and Mutual Funds

The Stock portfolios were formed using Datastream as source. In Datastream the data was obtained in weekly format for 5 years between January 2005 and December 2009.

The Mutual Fund data was obtained from Kauppalehti, the data was in daily format for the same time frame. The data was filtered into weekly format.

The formulae used were as follows:

First Logarithmic Returns were calculated using following formula.

$$U = \ln(S_i) - \ln(S_{i-1}) \quad 1.$$

Where the logarithmic returns,  $U$  equal natural logarithm of daily price observation  $S_i$  minus the natural logarithm of the price observation at time  $t - 1$

Then the Logarithmic Returns were used in the analysis, with the stock portfolios the portfolio return was calculated as follows:

$$E(R_p) = \sum_i w_i E(R_i) \quad 2.$$

Where the:  $E(R_p)$  is the expected return of a portfolio,  $E(R_i)$  is the expected return of one stock and  $w_i$  is the weight of that stock in the portfolio.

Then the portfolio variance was obtained using the Variance-Covariance matrix:

$$\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij} \quad 3.$$

Then the returns were annualized

$$R = 1 + r^t \quad 4.$$

Where Annual Return  $R$  equals 1+ return of that time period  $r$  to the power of  $t$

Then the volatility was calculated as follows:

$$\sigma_T = \sigma \sqrt{252} \quad 5.$$

Where volatility,  $\sigma_T$  equals standard deviation  $\sigma$  times square root of 252, which is the amount of trading days of a year.

For the Mutual Funds the Procedure went as follows: Once again following formula was used, and the returns were converted into logarithmic returns using that formula.

$$U = \ln(S_i) - \ln(S_{i-1}) \quad 6.$$

Where the logarithmic returns,  $U$  equal natural logarithm of daily price observation  $S_i$  minus the natural logarithm of the price observation at time  $t - 1$

The returns were calculated as a sum of returns of time period

The variance was obtained from formula

$$\sigma^2 = \frac{\sum(X_t - \mu)^2}{n} \quad 7.$$

Where variance  $\sigma^2$  equals the sum of deviations of the observation from the mean  $\mu$  to the power of 2, divided by the number of observations.

Annual Volatility was then calculated using the following formula.

$$\sigma_{annual} = \sigma\sqrt{252} \quad 8.$$

These differences in obtaining the results of the study arise from the fact that in a Mutual Fund the portfolio is already an existing portfolio, which is not formed for this study's purposes, but does exist in real life, therefore the returns and the volatilities of the portfolios are directly calculated from the time series. In the stock portfolios of this study this is done differently as these stock portfolios had to be constructed because the portfolios are created for this study. However the differences in obtaining these results are, the results of this study are shown in the next chapter.

## 5. Overview of the results of the study

First, let us take a glance at the performance of the mutual fund data set. The results are shown in a table, then they are explained and then the different investments are put into ranks according to our results.

First, it is reported how they investor would have performed if they had kept the investment for the period of 2005-2009

Then it is reported how these performed during the years 2005-2007, when the market in general was strong. The last table shows how the returns were during the weak market of 2008-2009.

The tables are divided into 2 categories that were studied in the course of the study, Mutual Funds, which will be presented first, and Stock Portfolios, which will be presented after the funds. Then it is discussed in a detail.

Table 1 Performance of Mutual Funds between 2005-2009

Mutual Fund	Annual Return	Volatility
Handelsbanken	6,39 %	22,67%
Nordea	6,69 %	21,60%
OP	3,95 %	19,92%
POP	6,65 %	19,19%
SEB Gyllenberg	2,42 %	22,09%
Danske	5,88 %	23,56%
Evli	1,86 %	9,86%
Seligson	4,89 %	23,27%

In this table it can be seen that during the time period the funds did offer quite steady and similar returns, and the different companies have quite similar results in their funds.



Table 2 Performance of Mutual Funds between 2005-2007

Mutual Fund	Annual Return	Volatility
Handelsbanken	18,47 %	15,41 %
Nordea	16,26 %	13,22 %
OP	10,83 %	12,73 %
POP	16,07 %	13,96 %
SEB Gyllenberg	13,65 %	16,01 %
Danske	16,44 %	15,76 %
Evli	6,28 %	7,78 %
Seligson	15,56 %	16,19 %

In these good years the funds did prove as a good investment alternative; all the funds had a great annual return, and even when they were different one should be happy to see an annual growth above 10%, even for the worst performing all-stock fund, that can be considered as a good investment, as the returns were good.

Table 3, The Performance of Mutual Funds between 2008-2009

Mutual Fund	Annual Return	Volatility
Handelsbanken	-14,48 %	30,35 %
Nordea	-9,62 %	30,00 %
OP	-7,39 %	27,35 %
POP	-9,1 %	24,82 %
SEB Gyllenberg	-16,23 %	28,80 %
Danske	-11,99 %	32,45 %
Evli	-5,17 %	12,31 %
Seligson	-13,03 %	30,88 %

During the Financial Crisis of 2008-2009 our Mutual Funds did not do exceptionally well, as the funds returned such low annualized returns. There the fund performance also varies the most, especially on the fund returns.

The Performance of the Stock portfolios was as follows: The explanations are right below corresponding portfolio.

Table4: The performance of Stock Portfolios between 2005-2009

<b>Stock Portfolio</b>	<b>Annual Return</b>	<b>Volatility</b>
Large Companies	10 %	57,67%
Small Cap	3,99 %	45,52%
Low P/E	4,96 %	43,05%
Medium P/E	6,60 %	35,59%
High P/E	7,37 %	42,21%

Here it is the Large companies that dominated, this might be very well due to the fact that the Helsinki Stock Exchange is a relatively small peripheral exchange. The Finnish Stock Exchange has not got very many high tech Small Caps, and that might very well explain some of the bad performance of the Small Caps

Table5: The performance of Stock Portfolios between 2005-2007

<b>Stock Portfolio</b>	<b>Annual Return</b>	<b>Volatility</b>
Large Companies	19,83 %	38,66 %
Small Cap	14,85 %	36,44 %
Low P/E	10,52 %	35,43 %
Medium P/E	11,04 %	28,82 %
High P/E	18,82 %	38,01 %

It is very noteworthy that these are indeed annualized returns and not returns of the period. All stock portfolios did very well, and all returns can be considered good, including the least performing stock portfolio. The portfolios however fail at this point to support the hypothesis of P/E and Small Cap excess returns

Table6: The performance of Stock Portfolios between 2008-2009

<b>Stock Portfolio</b>	<b>Annual Return</b>	<b>Volatility</b>
Large Companies	-6,59 %	58,20 %
Small Cap	-13,95 %	54,31 %
Low P/E	-3,72 %	45,49 %
Medium P/E	0,37 %	48,29 %
High P/E	-11,84 %	73,36 %

Here it can be seen that small caps are riskier, as they were the worst performers, and that the P/E hypothesis might hold there, as high P/E stocks did much worse than the others, and also noteworthy is the high risk, but still better returns than the Mutual Funds had in general

### **5.1 The total period 2005-2009**

The Results show, that the annual returns during different time periods were extremely variable. The good years provided excellent returns, which were eroded during the bad years. Altogether all of the portfolios reached however profit during the time period involved, so with holding the portfolios for five years an investor would have avoided loss, no portfolios provided negative returns for the time period of 5 years. The returns annually for these 5 years, however were between 4% and 10% for the stock portfolios and 2% and 6.5% for funds. Based on the differences between the groups during the total period funds were outperformed by stocks, as well as one big hypothesis, the P/E anomaly seems to hold. The entire criteria for the selection of the particular stocks for the portfolios of this study were to see if the P/E criteria could be used as an easy guideline for stock selection. However the large companies outperformed the small caps, one explanation could be that the Finnish market is small, it consists of in terms of market value, mostly of large industrials as well as Nokia, and there is not many new

high tech small cap companies. The results would be interesting to see if similar studies were performed on other markets.

## **5.2 Early period 2005-2007**

The results there are consistently best. The best stock portfolio had an annual return of 19.83%, and the least returns were with portfolio “Low P/E” which had 10,52 %, during the same time frame. The Funds showed similar results, best fund having an annual return of 18.47% and worst had 10.83%. The Evli fund is a clear outlier with lower risk and return, and that is due to the fact that it invests into Bonds of Euro Area as well as Finnish stocks, therefore it will not be included in the comparison as such. (<https://www.evli.com>), and it can not be said that that particular fund underperforms in terms of profit it generated, but the entire philosophy in that particular fund is different to others in this study.

There it is also seen that the High P/E stocks provided better returns than the medium and low P/E counterparts, and the riskiness was on a comparable level to all the other stock portfolios as well. The funds of the banks' vary in terms of performance, the best having similar to the study's stock portfolios, but with lesser risk, and the fund of OP having lower returns. The Mutual Funds are however during these bull market years quite similar to each other. It is the more chaotic 2008-2009 that make the most difference.

## **5.3 Late Period 2008-2009**

In the late 2008 the Stock Markets crashed around the world due to the collapse of an American investment bank Lehman Brothers, and that caused the portfolios of this study to perform poorly and lose money. At this time period the performance of the different portfolios varied the most. The portfolio that performed the best was the Medium P/E portfolio that provided an annual return of 0.37%, that was the only one to end up above 0. What is notable the worst performers were Mutual Funds, and the

worst performing Stock Portfolio did similar job as well, returning an annual -13.95%. The funds did however a much better job on the risk side, the volatilities being very much lower than on the stocks. The funds did a poor job to protect the assets of the customers, as one premise of the research question of this study was that is the investor better protected against the storms of the markets and the bad economic times, if they rely on the professionals, and invest into funds instead of stocks. This case does not support that claim, on the contrary, the Stocks did not lose as much as the Funds. However in this study the stocks that did not perform as poorly as all the others, were Low P/E and Medium P/E, and traditionally riskier Small Caps and High P/E stocks were much worse, due to their vulnerability to the movements of the general markets.

#### **5.4 The riskiness**

The riskiness of the portfolios was greater on Stock Portfolios, than on the Mutual Funds. The best stock portfolios provided better returns on the 5 year period than any of the mutual funds did. The riskiness in this case was lower with the mutual funds. However, the risk-avoidance does not come as a free lunch. These returns, as what we have presented, calculating them using our data, are in gross terms, not in net terms. The cost of a risk avoidance through active fund management by professional fund managers as well as a thorough diversification manifests itself in the costs of share owning. The stock portfolios can be owned without other costs apart from a transaction fee. Also, a Mutual Fund do have to buy and sell stocks, even when they would not otherwise do it, to pay off leaving customers who want to cash their owned shares, as well as to buy stocks, when new money flows in. That cost transfers to the clients of the fund, being one major source of typically high fees of ownership. The Funds did exhibit lower risk and reasonable gross returns (as these are not cost adjusted to obtain net returns) but as said the risks in monetary terms in a small investment are less of an importance than the percentages would imply.

## **5.5 Gross vs. net, discussion**

The costs here however alter the results, as it is not very much of an importance how much money is earned before the costs, as that money is never seen in the bank account, but the net terms are these that matter, and there the stock portfolios do have an edge, as they do not provide annual costs of ownership, the stock portfolios can be held without additional costs other than transaction costs. Mutual funds normally do charge an annual fee, and a transaction fee.

The riskiness of the different investment alternatives vary in this study within the sample, but it also must be known, that most studies study the viewpoint of large institutional and rich investors who represent the 1% of the population, as opposed to the viewpoint of this study, which is that how an average person who wants to benefit from investing into the market with the small investment capital he or she has, would be best of. If he / she would invest, how it should be done. This study incorporates a simple; anyone can learn it-type of classification of different kinds of securities, and what should be taken into account if one wants to try the stock market.

## **5.6 How an investor would benefit from learning the basics**

The stock portfolios did have overall higher risk level than the funds, the funds did not do in general, better than the stocks did, and there was a big variance, of the performance of the funds as well. As in the study outline and in the research question, it was asked, that is the Investor better off, if he / she just went to the nearest bank and told that they would like to invest, or does it benefit to gain more knowledge. The question in this case actually puts the Mutual Funds into a lottery machine, so said, that the investor in question, if he / she does not want to know anything to the topic, the Investor would have theoretically 1/9 chance to buy a share of any of the funds in the study. The reasoning is that they would simply go to the bank, they do all the other banking with, and ask what is their offering. If they were more aware of the markets,

they would be categorized to be already in the phase of the learning curve, that they would do some research and then do the decision making, and belonging already to the group of the people who *know*, at least something of the markets, and they would not simply go to the first bank they see and ask there, but do a comparison. In this study that was very much in the center of the of the research question, should an Investor learn, at least the basics and how he or she would benefit from it. It is clear that when one knows, at least a little bit, then he or she is able to judge better the alternatives that the bank has, and they are therefore less likely to be influenced by the bank to invest blindly what they have, but to do a little homework. That is exactly what I want to say with this study, it will not hurt to know more!

### **5.7 The risks: Percentages vs. Monetary risks.**

The overall riskiness does indeed differ in percentage terms. Here we define a new term Acceptable Risk. That does imply that in order to reach profits that exceed the risk level of the risk free rate, some risk has to be taken, but also it is asked that does it matter, how much the risk is, if it is still under certain maximum, that can be lost? And when a small amount of money is invested, the accepted risk can be higher, as the potential loss, in monetary terms would still be low. Therefore it can be claimed, that for a small scale investor, it is more beneficial to think more about the potential profits, than the potential losses, because on the other hand how does it benefit to risk anything if the potential gain is small? Here, as the stock portfolios also are such that not all the money is put on one stock, but the portfolios are diversified, by that the potential loss of everything that once was invested is removed. On these portfolios the stock portfolios had, for a small investor, not that important differences of the levels of the risk. The mutual funds in general had lower risk, somewhat lower profit, but one exception has to be noted. The Evli fund did return much lower risk and return combination, it is due to having a fund that has stocks as well as bonds. If an investor is willing to own both types of assets, they can however compile the portfolio themselves, and not to pay a profit margin for the company to diversify between the asset classes



As a total, the portfolios had quite similar risks between the types of stocks, as well as between different funds. The funds do have costs, and these comparisons do not take that into account, which would put them lower in comparison to the stocks. The funds' advantages are that one can shift the responsibility of a loss to the fund manager, and thank themselves of a wise investment if something is gained. The main thing to remember is that it is always beneficial to learn, at least a bit about the world of investing, that does not necessarily guarantee good outcome, but it does help to recognize the good alternatives from the bad. Also it must be remembered that an investor who does want only simple solutions can end up equally likely with the fund that did not perform well. Knowledge does not make one rich but no-knowledge guarantees that!

### **5.8 The general tendencies in these portfolios**

The portfolios did show a tendency that, higher the P/E higher the returns, but the high P/E portfolio did perform badly during the bear market. The large companies did perform well, and it can be noted that the Finnish Stock Market is and especially used to be very large-business concentrated. The results in other markets, such as the U.S or in the Emerging Markets could be different, it could be anticipated that small cap companies outperform large, established companies. The market that was studied however was the Finnish market, as the newcomer of investing would not think of investing into the markets they do not know at all, and therefore it is not taken into account, but the focus is kept at the home market, which is the most likely alternative to a Finnish small investor.

During the later years, 2008 and 2009 it was, however the Medium and Low P/E stocks that did the best (or least bad) work. That supports the P/E anomaly hypothesis. On the other hand the High P/E stocks did well earlier on, which is contrary, but nevertheless it is the most fundamental question, how the money can be protected during the bad times. During the good times all investments made profit. When we are answering the research question about funds and risk aversion during the bad times: the funds did not

do as well as stocks. It is these times that people are afraid of, and if and when they do want to protect themselves from the risk, and be careful, they are not better off as Fund investors, even as the logic could easily be. The funds, which are supposed to be managed professionally and therefore, be not as prone for losses during bad times, did perform worse, than these stock portfolios, which were after all picked by using a simple set of rules. Also it can be noted that the stocks are different from one another and therefore it can be claimed that rebalancing the portfolio can be a good idea if the economic situation changes.

## 6. Conclusions

In this paper it was studied that what are the alternatives an average person would encounter when investing for the first time. The world of finance is indeed confusing at times even for professionals and students of the subject, therefore it can be claimed to be a so called black box for an average person. Finance is also a much studied subject by the science community and financial institutions are the companies every newspaper writes about almost daily. There exists, however a great gap of knowledge between the average people and the professionals in the field of finance. It is reported by Helsingin Sanomat (11.2.2008), the leading Finnish daily newspaper that over 50% of the Finnish youth do not even know what interest is. That fact might sound a little funny to the ears of finance students, who live with these concepts all the time during their time at the University as well as in the future working life, but however such a gap creates a need for knowledge, to be shared. This bachelor's thesis was written that informational gap in mind.

First it was asked should an investor learn to invest himself or would it be at least equally profitable not to bother and just simply go with the flow and buy whatever the representative of the bank recommends. Then the issue was brought under a more theoretical scrutiny, where a summary of the papers written about Mutual Fund performance was viewed. The scientific community, as always, did not agree unanimously on the topic, but there were 2 different schools of thought. The other claiming that in net terms funds do not outperform the market, and other calculating gross terms, with how the stocks within the funds performed against the index. The funds in general, it was found, do *not* outperform the market in net terms. The reasons for the existence of the Mutual Funds were also studied as well as the history of them. It could be claimed, however, that the very reason for their existence is that they provide profit for the owners of the mutual fund companies, simply said if they did not create profits, they would not exist. The logic beneath *everything* in the world is just so simple. As the Funds do provide profit for the owners, it is the clientele, who will ultimately pay for it, that the Fund Managers live nicely.

In this study however it was studied how the funds perform, and can simple criteria, in this case P/E number is utilized for forming of a stock portfolio. The different criteria of how the portfolios are picked are numerous, and future studying could utilize more criteria to form the portfolios. Some of the results such as the relatively low performance of the small cap stock portfolio could be due to numerous things. One especially comes into mind, that is that the study did a research on the Finnish data, and the Helsinki Stock Exchange is a small one, which is normally volatile, it is a small market and not in the epicenter of the financial world, quite the contrary it is peripheral. New studies could include data from a larger market such as Germany, U.K or the USA. Also in this study the amount of studied Mutual Funds was small, and that is the case, that in Finland there is not too many financial institutions. Also, by studying a larger market one could find more funds to start with and therefore get better results. The type of study, that has in the focus a point of view of an average person is indeed something that can be claimed to have an effect on the society.

In the study a 5 year time span was used as the data for research. Data had 8 different mutual funds and 5 stock portfolios of 5 stocks each, to enable reasonable diversification without overdoing it, as costs will grow if diversification is widened. The evidence supported P/E anomaly in case of the financial crisis of the market as well as that the service that the investor actually pays for, in the case of a fund is related to the riskiness of the investment. The avoidance of risk, measured by volatility of the investment can be claimed not to be worth the extra cost, associated with Fund share ownership, but that fact is left to the decision making of the investor himself. The funds did show more modest levels of the risk, but when the amount of money that typically is invested is small, more risk can be taken to gain more profits, or at least for a potential to gain more in the future. It must always be kept in mind that the ultimate goal and the final logic behind *any* investment is to set money aside from consumption in order to gain *more* consumption opportunities in the future. It is the only reason ever to consider investing, and it is not about the exact percentages that matter, but actual money. That fact in mind, it is concluded that risk can and must be taken if one is ever willing to earn capital income.

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