



## Why should naive investors avoid stock markets?

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First Draft: May, 2010

### **Abstract**

The goal of this paper is to present an original and simple analysis aimed to understand why investing in capital markets can be very dangerous for “naive investors”. Stock markets are characterized by instability and subjected to external shocks. The probability of making money on them is often very low, especially in high volatility periods. We will show that, in absence of any “wise” asset allocation strategy and not being professional investors, a risk-free portfolio may perform better than a portfolio composed entirely by risky assets.

### **Keywords**

Asset Allocation, Investment Strategies, Stock Markets, Risk-Free Securities

### **JEL Codes**

G01, G10, G11, G15

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*This Working Paper is published under the auspices of the Department of Economics of the Ca' Foscari University of Venice. Opinions expressed herein are those of the authors and not those of the Department. The Working Paper series is designed to divulge preliminary or incomplete work, circulated to favour discussion and comments. Citation of this paper should consider its provisional character.*

# 1 introduction

Portfolio allocation strategies have always been subjected to numerous studies. It is well known that many economists and practitioners in literature have attempted to describe asset allocation choices that might be good in any situation or in any state of the world. A famous pioneering work in Modern Portfolio Theory, written by Harry Max Markowitz in 1952, studied the effects of asset risk, return, correlation and diversification on probable investment portfolio returns. Basically, Markowitz's contribution solved a linear constrained optimization problem where the goal was to minimize the risk of a portfolio given the portfolio expected return or maximize the portfolio expected return given a certain level of risk. Even if the model appeared to be reasonable from a theoretical point of view, several problems arose from its use in practice. In fact Markowitz's optimal portfolios tend to concentrate on a small subset of the available securities, and appear not to be well diversified. After that a considerable number of models have been presented among the last decades, such as the Black-Litterman Model,<sup>1</sup> which is able to incorporate investor's views in the optimization process, and the Robust Asset Allocation,<sup>2</sup> which provides a solution that has the best performance under the worst case. Even more a large number of investment strategies have been implemented over the years such as Stock Picking, Market Timing and Portable Alpha. But despite their practical success, mean-variance analysis and all the other tactical asset allocation strategies rely on the assumption that investors care only about the distribution of wealth one period ahead. This is highly unrealistic, in fact most investors are interested in the standard of living that their wealth can support over the longer term. Investors must form beliefs about the future and not just about average asset returns and risks, but about the dynamic processes that determine interest rates and risk premia. These beliefs must be consistent with some reasonable view about the equilibrium of the economy and investors must calculate intertemporal hedging demand for assets along the lines pioneered by Robert Merton.<sup>3</sup> Obviously it is hardly realistic to expect individuals to do all this by themselves. Even if a lot of tools have been implemented to get high returns, both in the short-run and in the long-run, financial markets have often proved to be very uncertain and subjected

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<sup>1</sup>See Black F. and Litterman R.: Global Portfolio Optimization, Financial Analysts Journal, September 1992, pp. 28-43.

<sup>2</sup>See R. H. Tütüncü and M. Koenig (2003).

<sup>3</sup>See Robert C. Merton, An Intertemporal Capital Asset Pricing Model. *Econometrica*, Vol. 41, No. 5. (Sep., 1973), pp. 867-887.

to many external shocks. Thus, achieving high returns could be very hard and it often becomes a pure gamble, even for practitioners. In what follows we will demonstrate how allocating resources in financial markets could be not profitable, especially for those investors who do not have sufficient skills to dynamically manage their own wealth, that we have named “naive investors”. To prove this result it will be developed a sort of investment game where we will compare, within a specific investment time horizon, the performance of an equally weighted portfolio composed by ten different stock indices (belonging to different geographic areas) with the performance of an equally weighted portfolio allocated by investing in the risk-free markets. According to the main idea of our game we will also report other results, by using different data, which will confirm the riskiness of investing in stock markets.

## 2 Investment Game and Empirical Analysis

Our investment game represents an ex-post empirical performance analysis between the stock markets and risk-free rate markets. The chosen investment time horizon starts in June 2002 and ends in December 2009. The idea is that our representative investor deposits a certain amount of his/her savings in a bank account investing either in the stock market or in the risk-free market. In this game the stock market performances are captured from the following global stock indices time series: S&P 500, Euro Stoxx 50, CAC 40, DAX, IBEX 35, AEX, FTSE 100, SMI, SSE and Nikkei 225. As proxy for the risk-free securities it has been adopted the short term interest rates, which are represented usually by either the three month interbank offer rate attaching to loans given and taken amongst banks for any excess or shortage of liquidity over several months or the rate associated with Treasury bills, Certificates of Deposit or comparable instruments, each of three month maturity.<sup>4</sup> To get an overview of how investor’s capital is performing it has been assumed to compound the initial capital invested in each index or risk-free security on monthly basis.<sup>5</sup> To increase the value of the initial

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<sup>4</sup>Source: OECD.

<sup>5</sup>Note that for the stock market performances it has been used the rate of change of each monthly stock index time series and for the risk-free rate market performances it has been retrieved the equivalent monthly rate of the per-annum short-term interest rate. Note also that investing in the risk-free market can be approximated to a investment in a Time Deposit or Certificates of Deposit which are financial product commonly offered to consumers by banks, thrift institutions, and credit unions. They are similar to savings accounts in that they are insured and thus virtually risk-free; basically they are “money

amount of capital through the investment process, the investor would like to invest a certain amount (in this game equal to \$ 1000) at time  $t = 0$ . This amount will not be moved until maturity, more precisely the portfolio will be not reallocated.

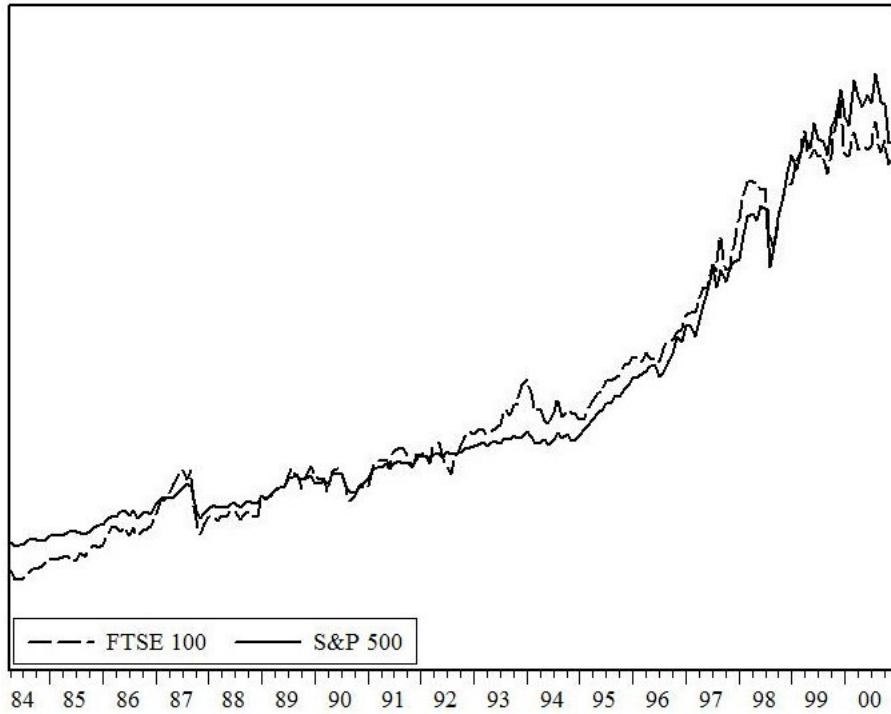


Figure 1: Stock Index - Historical Data. Source: Datastream

As mentioned in the introduction of this paper, portfolio management is built on the concept of diversification. Our main assumption is that investor does not have the knowledge to built optimal portfolios. It is also well known that such knowledge consists of accurate information about the risks and the returns of individual stocks. Variances and covariances are hard to discover just by looking a couple of figures. Basically our representative investor admit to know little about future risks and returns, thus resort to passively indexed portfolios. The investor is more attracted by the stock markets rather than the other one. Such a preference derives from the fact

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in the bank” But they are different form saving accounts in that the Time Deposit or Certificate of Deposit has a specific, fixed term (often three months, six months, or one to five years), and, usually, a fixed interest rate.

that he/she suppose that stock markets will perform better than the risk-free markets. For instance a naive investor's positive view on future stock markets performance can be easily captured by looking at figure 1, which displays an increasing trend. But past literature provides to our investor only a partial support to his/her positive view on future stock markets performance. Ellen R. McGrattan and Edward C. Prescott (2000) find that the market value of productive assets, including both tangible and intangible assets and assets used outside the country by U.S. subsidiaries, is currently about 1.8 times GNP, the same as the market value of equity. Thus they argue that the US stock market boomed, especially in the 90's. Seeking an Answer to the following question: "Is the current stock market value too high?" Glassman and Hassett (1999) have argued that it is not. Furthermore, they have said that the market is undervalued. On the contrary, others have expressed concern that the market is, indeed, overvalued. Federal Reserve Chairman Alan Greenspan (1996), for example, has suggested that the recent high value of the market may reflect "irrational exuberance" among investors. Shiller (2000) has reiterated this concern and said that a 50 percent drop in the value is plausible. For instance, a general concern about an overvalued market is fueled by the experience of Japan in the 1990s. The value of Japan's corporate equity fell 60 percent in 1990, and its economy subsequently stagnated. In literature other empirical facts support the idea of our investor to prefer stock markets rather than risk-free markets. Historical data provide a wealth of evidence documenting that for more than a century, US stock returns have been considerably higher than returns for T-bills. R. Mehra and E. Prescott (1985) show that the average annual real return (that is, the inflation-adjusted return) on the US stock market for the past 110 years has been about 7.9%. In the same period, the real rate of return on a relatively riskless security was a paltry 1.0%. The difference between these two returns, 6.9 percentage points (pps), is the well-known equity premium. Also on this issue literature provides conflicting results. Ravi Jagannathan, Ellen R. McGrattan and Anna Scherbina (2000) demonstrate that the US equity premium has declined significantly during the last three decades. They show that the premium averaged about 7 percentage points during 1926-1970 and only about 0.7 of a percentage point after that. They argue also that such result is shown to be reasonable by demonstrating the roughly equal returns that investments in stocks and consol bonds of the same duration would have earned between 1982 and 1999, years when the equity premium is estimated to have been zero.

In any case the choice of a pure equity portfolio is in line with the behaviour of a naive investor and with the purposes of our investment game. In

Amount of cash to invest: \$1000				
COUNTRY	Global Stock Indexes	%	Portfolio	
CHINA	Shanghai Stock Exchange Composite Index (SSE)	10%	\$100.00	
EU	EURO STOXX 50 Index	10%	\$100.00	
FRANCE	CAC-40 Index	10%	\$100.00	
GERMANY	German Stock Index (DAX)	10%	\$100.00	
JAPAN	Nikkei-225 Stock Average	10%	\$100.00	
NETHERLANDS	AEX-Index	10%	\$100.00	
SPAIN	IBEX 35 Index	10%	\$100.00	
SWISS	Swiss Market Index (SMI)	10%	\$100.00	
UK	FTSE 100 Index	10%	\$100.00	
USA	Standard and Poor's 500 Index (S&P 500)	10%	\$100.00	
GLOBAL	Portfolio	100%	\$1000.00	

Table 1: Naive Investor's Portfolio Allocation

fact within this game investor decides to built an equally weighted portfolio composed (see table 1) by purchasing shares of the most important global stock indexes. The diversification finds place in the fact that the investor allocates 1/10 of its wealth in ten different stock indexes belonging to different geographic areas. Even if each index refers to a different geographical area, the portfolio as a whole can not be considered efficiently diversified. The lack of accurate information regarding future returns and risks, financial investment theory, robust asset allocation, specific investment strategies and integrated financial markets pushes this naive investor also toward naive diversification. In general naive investors acknowledge that they have no useful information about stock markets' behaviour. The lack of above required knowledge and the absence of proper caution within the investment process could result in heavy losses for our investor.

We have already mentioned that financial markets are subject to high volatility and for this reason we can not easily make money by composing a pure equity portfolio and applying to its a passive investment strategy. Roughly speaking the investors cannot wait until maturity, maybe watching TV sitting on the coach, without monitoring the amount in his/her bank account. If you do that, as our naive investor does this investment game, you might be wrong. In absence of any asset allocation skills, the probability of not achieving a predetermined portfolio expected return increase. Results show how investing an initial sum of money and compounding its

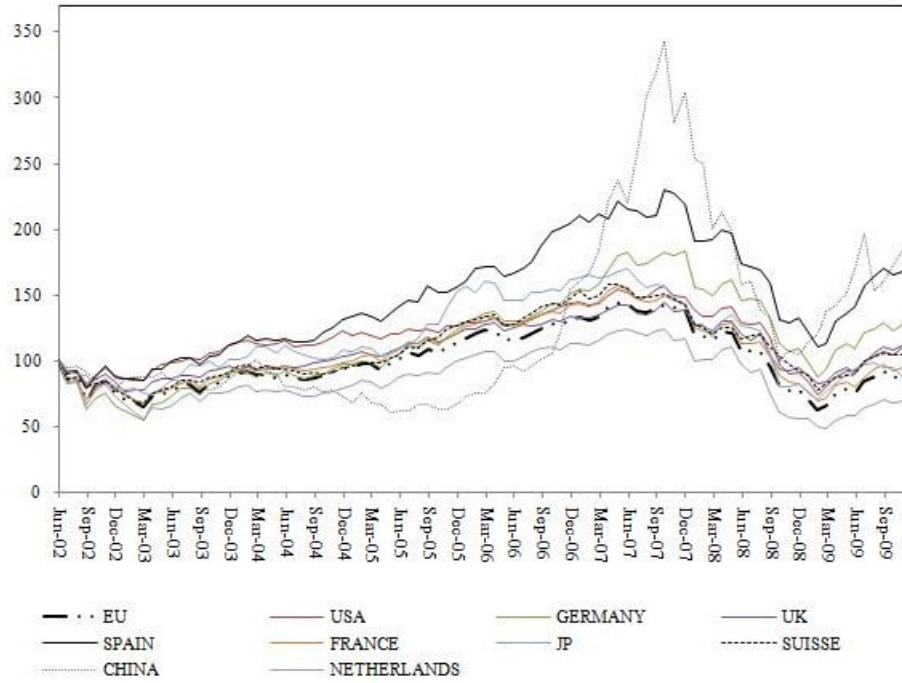


Figure 2: Major Global Stock Indexes (Sample: June 2002 - December 2009).  
Source: Datastream

until maturity either in the stock markets or in the risk-free market could generate strange final numbers. Keeping fix the investment time horizon at maturity (December 2009), the risk-free portfolio's return is higher than the stock-market's portfolio return. According to our investment game idea, from the pure equity allocation the investor obtains a return on initial invested capital equal to 20.74% respect to a 21.12% that he/she could obtain in case of a pure risk-free allocation. This confirms the madness of investing in stock market without taking into account specific stock selection criteria in order to build up a performing portfolio. Results also suggest that investing in the stock market it does not appear to be a simple game, but it requires strong skills. Investing in stock markets has always been a serious matter. Given the high level of uncertainty, in the last decade this issue has become much more serious and influential than in the past. In order to produce a "wise" portfolio aimed at hedging risk and obtaining high expected returns, we need to be well-informed about several issues, both theoretical

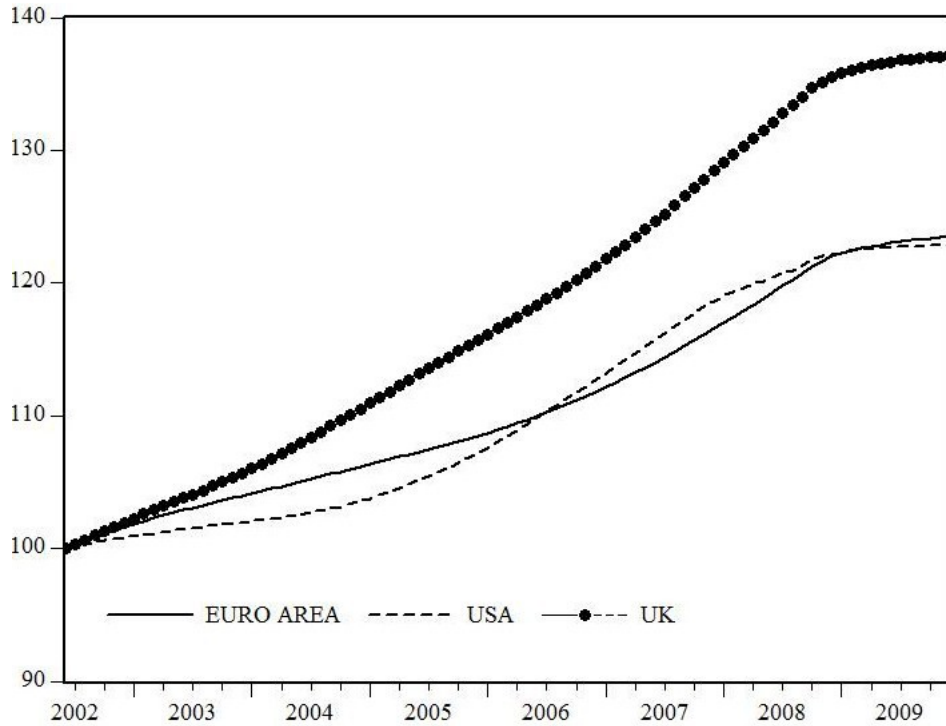


Figure 3: Global Short Term Interest Rates Performances (Sample: June 2002 - December 2009). Source: Datastream

and practical. But usually we have no information about these issues. Table 2 and 3 show the overall performances of the two portfolio allocations. The first thing to note is the large difference in terms of risk. In fact the equally weighted portfolio composed by stock indices is much more risky than the equally weighted portfolio composed by risk-free assets. Assuming that the risk (volatility) of the stock markets is measured by the standard deviation we recognize that the pure equity portfolio displays on average a standard deviation equal to 70% (on annual basis). On the other hand the risk-free portfolio should display a standard deviation equal to zero. We use the conditional form just because of we use a proxy to get a risk-free financial instrument, thus even if in theory the risk should be equal to zero, we get that for the risk-free portfolio the standard deviation is equal to 1% (on annual basis). It is also important to point out that during the chosen period the return of each selected stock index has been substantially low, more precisely the data show a range which goes from a max of 1.14% (on

COUNTRY	Stock Index	Mean	Sd	t(0)	t(1)	Delta %
CHINA	SSE	1.14%	9.24%	100	189.13	89.13%
EU	Euro Stoxx 50	0.12%	5.87%	100	94.74	-5.26%
FRANCE	CAC 40	0.17%	5.56%	100	100.98	0.98%
GERMANY	DAX	0.59%	6.91%	100	135.93	35.93%
JAPAN	Nikkei 225	0.16%	5.80%	100	99.29	-0.71%
NETH.	AEX	-0.06%	6.80%	100	76.27	-23.73%
SPAIN	IBEX 35	0.77%	5.59%	100	172.72	72.72%
SWISS	SMI	0.20%	4.45%	100	109.47	9.47%
UK	FTSE 100	0.26%	4.38%	100	116.25	16.25%
USA	S&P 500	0.24%	4.51%	100	112.66	12.66%
GLOBAL	Portfolio	0.36%	5.91%	1000	1207.44	20.74%

Table 2: Global Stock Indexes - Performance Analysis [t(0)=Jun 2002 and t(1)=Dec 2009]

COUNTRY	Risk-free	Mean	Sd	t(0)	t(1)	Delta %
CHINA	S.T.I.R.	0.22%	0.08%	100	121.59	21.59%
EU	S.T.I.R.	0.23%	0.09%	100	123.51	23.51%
FRANCE	S.T.I.R.	0.23%	0.09%	100	123.51	23.51%
GERMANY	S.T.I.R.	0.23%	0.09%	100	123.51	23.51%
JAPAN	S.T.I.R.	0.03%	0.03%	100	102.83	2.83%
NETH.	S.T.I.R.	0.23%	0.09%	100	123.51	23.51%
SPAIN	S.T.I.R.	0.23%	0.09%	100	123.51	23.51%
SWISS	S.T.I.R.	0.10%	0.08%	100	109.29	9.29%
UK	S.T.I.R.	0.35%	0.12%	100	137.15	37.15%
USA	S.T.I.R.	0.23%	0.14%	100	122.85	22.85%
GLOBAL	Portfolio	0.21%	0.09%	1000	1211.25	21.12%

Table 3: Global Riskless Securities - Performance Analysis [t(0)=Jun 2002 and t(1)=Dec 2009]

monthly basis) gained by the Shanghai Stock Index to a min of -0.06% (on monthly basis) gained by the Amsterdam Exchange Index. Certainly such a scenario should not encourage people to allocate their savings in a portfolio composed only by risky assets. A careful reader might claim that our result leads to the fact that we have chosen a specific investment time horizon and a particular asset allocation, thus we stress the overall investment scenario in favour to our purposes. This is true, but it is in line with our main idea to build up an investment process where the principal actor is a naive

investor with no sufficient skills to manage “dynamically” his/her wealth. To enhance and deepen our understanding of the riskless-risky trade-off in the investment decision process we decide to replicate our investment game using different data, geographic areas and floating investment time horizons. Basically we restrict our analysis on two main areas: the US and the Euro zone. The goal is still to compare the returns gained in case of “riskless” investment to those gained by investing only in stock markets, considering an intermediate-term horizon (5 years). The choice is done at the beginning of the period, there isn’t rebalancing in the meantime and eventually the performances are compared. There is no diversification in this example: this game claims to show that equity investment doesn’t always outperform “riskless” investments in an intermediate-term horizon, as a naive investor could wrongly believe. In Euro area case study, our naive investor can invest in three assets: a 5-year European bond, a short term interest rate (Euribor 3 months) or Morgan Stanley EMU Total Return Index. There are seven 5-year periods, as reported table 4; choosing a 5-year bond, the investor locks the return over the investment horizon (we considered the yield to maturity), so she gets certainly this return. Investing in the Euribor rate the volatility is quite small and the return depends mainly on the macroeconomic environment, in particular to the ECB Main Refinancing Rate (see figure 4 in appendix A). When the naive investor decides to invest all her/his money in the equity index (MSCI EMU Total Return) she/he believes to earn more than investing in “riskless” assets over 5 years, but is it true? Not always. In three out of seven cases that’s true, in particular in the period Jan 2003 - Jan 2008 (+128.9%), but in some periods she/he gets negative return, that is she/he loses money. Choosing riskless investment the return is quite stable during the investment horizon, around 15-20%; she/he wouldn’t become rich, but she/he would earn in every period.

Sample Period	5yr GOVT.	EURIBOR 3M	MSCI EMU
Jan 99 - Jan 04	17.11%	19.15%	-10.40%
Jan 00 - Jan 05	24.25%	18.12%	-26.70%
Jan 01 - Jan 06	22.58%	15.51%	-5.41%
Jan 02 - Jan 07	21.84%	14.12%	40.48%
Jan 03 - Jan 08	16.97%	15.24%	128.90%
Jan 04 - Jan 09	17.48%	17.97%	6.24%
Jan 05 - Jan 10	14.94%	16.91%	19.60%

Table 4: EURO AREA: Riskless Securities & Stock Market - Performance Analysis

Referring to the United States we extended the number of 5-year periods analyzed: now they are seventeen. The investment game results become more interesting: for the most part the MSCI USA performs better than riskless investment (11 out of 17). But focusing on the last nine periods, only twice MSCI USA performs better, whereas the investment in the 5-year bond allows to get the best result five times. Looking at the performance of equity markets during the 90's, a naive investor would have chosen to invest all her/his money in this asset class, but only two out of nine she would have got higher return than riskless investment. This points out why investing in capital markets can be very dangerous for naive investors.

Sample Period	5yr GOVT	TBILL 3M	MSCI US
Dec 88 - Dec 93	45.70%	32.05%	97.22%
Dec 89 - Dec 94	39.30%	26.99%	55.00%
Dec 90 - Dec 95	38.85%	24.44%	124.84%
Dec 91 - Dec 96	29.70%	23.95%	134.64%
Dec 92 - Dec 97	29.93%	26.00%	157.07%
Dec 93 - Dec 98	25.83%	28.29%	192.89%
Dec 94 - Dec 99	39.14%	28.81%	243.75%
Dec 95 - Dec 00	27.01%	29.25%	132.75%
Dec 96 - Dec 01	30.44%	27.16%	63.89%
Dec 97 - Dec 02	28.88%	22.79%	-3.52%
Dec 98 - Dec 03	22.71%	18.19%	-0.67%
Dec 99 - Dec 04	31.37%	14.34%	-8.94%
Dec 00 - Dec 05	25.41%	11.28%	2.75%
Dec 01 - Dec 06	22.23%	12.74%	33.11%
Dec 02 - Dec 07	13.53%	15.92%	86.17%
Dec 03 - Dec 08	16.12%	16.38%	-11.15%
Dec 04 - Dec 09	18.18%	14.95%	4.23%

Table 5: United States: Riskless Securities & Stock Market - Performance Analysis

Table 5 is very explanatory: very high return investing in MSCI USA during the 90's. This paper doesn't claim to analyze the "Roaring Nineties", but that was a very particular period of economic growth thanks to the reduction of US federal budget deficit, the decrease of interest rates (above all in the long part of the curve), the process of deregulation, but it finished with the burst of the bubble in 2001. Looking at past performances can mislead a naive investor: this could have been the case looking at the Nineties,

without knowing financial and economic conditions of those years.

The idea behind our investment games, which states that a naive investor should avoid to allocate his/her wealth in the stock markets, can be also strengthened by using other variables and sample periods. In the appendix we collect other results where we use as proxies for the riskless securities the JPM EMU GOVERNMENT ALL MATS. and the EURIBOR 3 MONTH (for the EURO AREA) and the US BENCHMARK 10/30 YEAR DS GOVT. INDEX and the US TREASURY BILL 2nd MARKET 3 MONTH (for the US).<sup>6</sup> The stock market is then represented by the MSCI EMU and by the MSCI USA Indexes which are a market capitalization weighted indexes maintained by Morgan Stanley Capital International (MSCI) respectively for the EURO AREA and for the US, aimed to measure the performance of stocks based in the European Economic and Monetary Union (EMU)<sup>7</sup> and in the USA.<sup>8</sup>

What we have just depicted is a stressed scenario where the choice to invest in risky (stock) markets can lead to severe disappointment. According to that we simply introduce the role of the financial institutions such as banks, insurance companies, financial advisors and consulting companies, and ask to ourselves if such big players, which often induce investors to enter into the stock markets, take into account particular scenario like the one depicted by our analysis. If so, do they advise “naive investors” in a fair manner?

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<sup>6</sup>Note that the JPM EMU GOVERNMENT ALL MATS. and the US BENCHMARK 10/30 YEAR DS GOVT. INDEX have been managed as Total Return Index

<sup>7</sup>The MSCI EMU Index consisted of stocks in the following 11 developed-market countries: Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal and Spain. The index contains almost 300 stocks and represents about 85% of the market capitalization in these countries.

<sup>8</sup>The MSCI USA Index is a free float adjusted market capitalization index that is designed to measure large and mid cap US equity market performance. The MSCI USA Index is member of the MSCI international equity index series and represents the US equity portion of the global benchmark MSCI ACWI (All Country World Index) Index.

### 3 Conclusion

We have seen that in specific time intervals a naive investor's portfolio allocation can lead to unpleasant incidents. According to our results it is quite easy to recognize that in several cases the investor is subjected to capital losses rather than capital gains. This partially leads to the fact that the investor did not take into account a series of general rules to build up an optimal portfolio that should be considered at the beginning of the investment process. More specifically these general rules are those referring to a "wise" portfolio management strategy. With the term wise we mean a portfolio allocation strategy where the investor is able to implement at least a market timing strategy which does not require specific mathematical skills. In fact a market timing strategy requires the ability to time the market, more precisely to predict the future direction of the market. Even if some investors, especially academics, believe that it is impossible to time the market, on the other hand practitioners, notably active traders, believe strongly in market timing. What we have shown with certainty in our simple investment game is that it's very difficult to be successful at market timing continuously over the long-run. According to a theoretical and empirical asset allocation framework the investor who doesn't have the time (or desire) to watch the market on a daily, weekly or monthly basis, should avoid stock markets.

## A Appendix

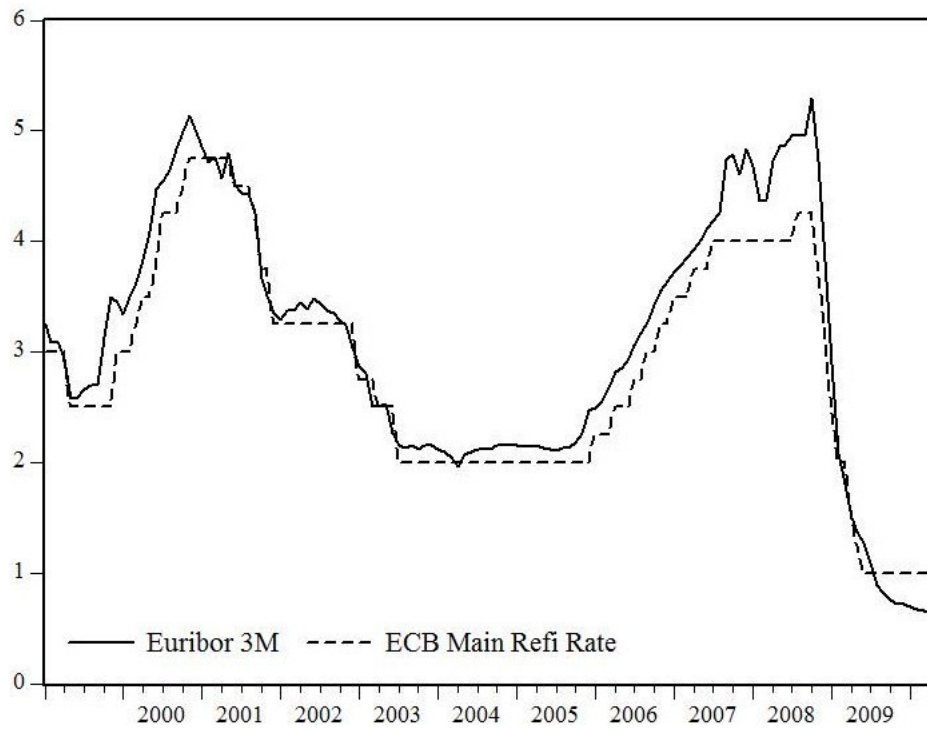


Figure 4: EURO AREA - ECB Refi Rate & Euribor 3 M. Source: Datastream

## B Appendix

	MSCI US	TBILL 3M	10yr GOVT	30yr GOVT
1989	31.36%	8.55%	16.39%	20.19%
1990	-4.74%	7.88%	6.24%	4.34%
1991	21.15%	5.65%	17.34%	17.31%
1992	18.32%	3.55%	6.99%	7.53%
1993	9.95%	3.09%	11.83%	18.29%
1994	3.24%	4.38%	-7.91%	-12.00%
1995	38.19%	5.71%	23.72%	33.73%
1996	26.42%	5.23%	0.95%	-3.56%
1997	29.63%	5.26%	9.83%	13.11%
1998	25.27%	4.96%	13.46%	17.44%
1999	21.17%	4.81%	-7.98%	-14.44%
2000	-6.43%	6.07%	13.99%	19.84%
2001	-10.98%	3.53%	3.11%	2.35%
2002	-23.68%	1.65%	15.69%	18.37%
2003	28.96%	1.03%	0.74%	0.57%
2004	11.08%	1.39%	4.58%	8.35%
2005	5.58%	3.23%	2.63%	9.68%
2006	15.32%	4.89%	1.47%	-1.46%
2007	6.74%	4.51%	9.11%	9.12%
2008	-38.45%	1.43%	23.45%	45.65%
2009	30.31%	0.15%	-10.25%	-26.79%
1989-2009	564.30%	133.38%	312.94%	380.21%

Table 6: United States - Stock & Rf Markets: Performance Analysis (a)

Sample Period	MSCI US	TBILL 3M	10yr GOVT	30yr GOVT
Dec 88-Dec 93	97.22%	32.05%	73.60%	87.12%
Dec 89-Dec 94	55.00%	26.99%	37.35%	37.02%
Dec 90-Dec 95	124.84%	24.44%	59.94%	75.61%
Dec 91-Dec 96	134.64%	23.95%	37.60%	44.35%
Dec 92-Dec 97	157.07%	26.00%	41.26%	51.84%
Dec 93-Dec 98	192.89%	28.29%	43.32%	50.76%
Dec 94-Dec 99	243.75%	28.81%	43.22%	46.57%
Dec 95-Dec 00	132.75%	29.25%	31.95%	31.35%
Dec 96-Dec 01	63.89%	27.16%	34.78%	39.42%
Dec 97-Dec 02	-3.52%	22.79%	41.97%	45.90%
Dec 98-Dec 03	-0.67%	18.19%	26.06%	24.94%
Dec 99-Dec 04	-8.94%	14.34%	43.27%	58.21%
Dec 00-Dec 05	2.75%	11.28%	29.00%	44.80%
Dec 01-Dec 06	33.11%	12.74%	26.95%	39.39%
Dec 02-Dec 07	86.17%	15.92%	19.72%	28.51%
Dec 03-Dec 08	-11.15%	16.38%	46.70%	86.11%
Dec 04-Dec 09	4.23%	14.95%	25.89%	25.75%
1989-1999	599.93%	77.56%	128.95%	141.37%
2000-2009	-5.09%	31.44%	80.36%	98.95%
1999-2009	15.00%	37.76%	65.97%	70.23%

Table 7: United States - Stock & Rf Markets: Performance Analysis (b)

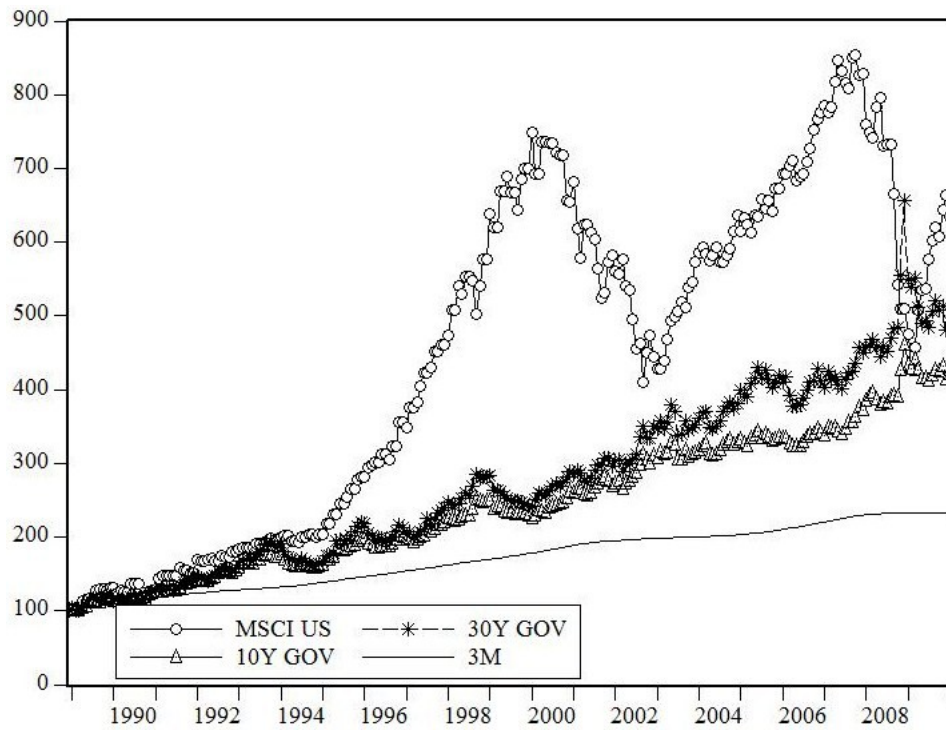


Figure 5: United States - Stock & Rf Markets: Performance Analysis.  
Source: Datastream

## C Appendix

Year	10yr GOVT.	EURIBOR 3M	MSCI EMU
1999	-7.42%	3.07%	39.70%
2000	9.31%	4.55%	-2.19%
2001	4.46%	4.41%	-17.90%
2002	10.31%	3.42%	-33.39%
2003	3.89%	2.39%	19.91%
2004	10.41%	2.18%	14.28%
2005	6.43%	2.23%	26.21%
2006	-1.33%	3.17%	21.93%
2007	1.67%	4.43%	8.54%
2008	16.30%	4.82%	-44.35%
2009	0.46%	1.25%	28.66%
1999-2009	66.86%	42.32%	22.48%

Table 8: EURO AREA - Stock & Rf Markets: Performance Analysis (a)

Sample Period	10yr GOVT.	EURIBOR 3M	MSCI EMU
Jan 99 - Jan 04	21.15%	19.15%	-10.40%
Jan 00 - Jan 05	44.48%	18.12%	-26.70%
Jan 01 - Jan 06	40.67%	15.51%	-5.41%
Jan 02 - Jan 07	32.87%	14.12%	40.48%
Jan 03 - Jan 08	22.47%	15.24%	128.90%
Jan 04 - Jan 09	37.10%	17.97%	6.24%
Jan 05 - Jan 10	24.74%	16.91%	19.60%

Table 9: EURO AREA - Stock & Rf Markets: Performance Analysis (b)

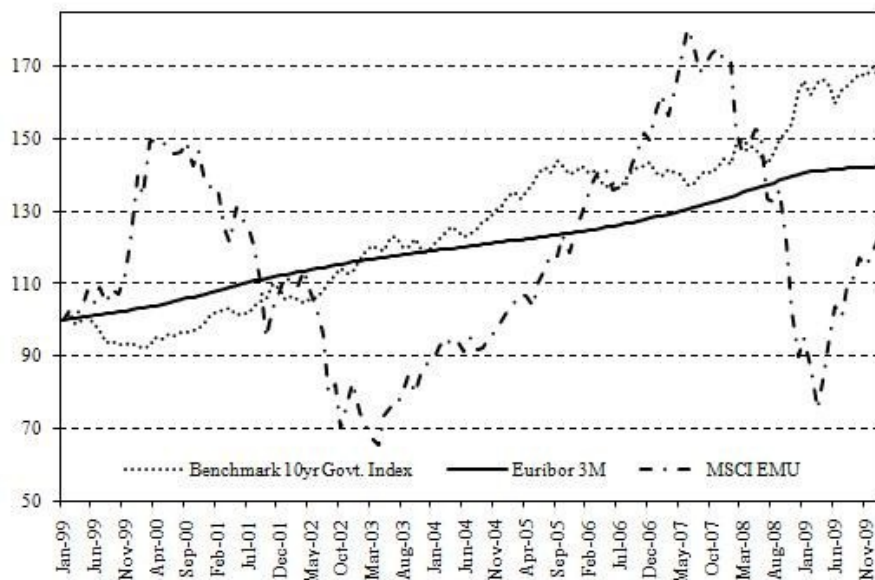


Figure 6: EURO AREA - Stock & Rf Markets: Performance Analysis.  
Source: Datastream

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