

SUCCESSFUL INVESTMENT – MARKET BEHAVIOR AND INVESTING INTELLIGENCE COMPATIBILITY RESULT

Aleksandras Vytautas Rutkauskas¹, Alina Kvietkauskienė²

^{1,2}*Vilnius Gediminas Technical University, Faculty of Business Management,
Saulėtekio ave. 11, LT-10223 Vilnius, Lithuania*
Emails: ¹*aleksandras.rutkauskas@vgtu.lt*; ²*alina.kvietkauskiene@vgtu.lt*

Abstract. In this paper the authors concentrate their attention on concretization of the financial market behaviour concept in order to use this for search of beneficial investment opportunities in various markets. By studying the mission of financial markets, the authors emphasize the fact that full-rate understanding, how market, taking advantage of investor interest – to ensure the maximum or at least the adequate return on investment, concentrate their attention on the shares or bonds of progress cherishing subjects. By studying the investment risks authors demonstrate their approach, that formulating risk management as a searches of success, open a new opportunities of risk management and new requirements. In order to consolidate the main targets of financial markets mission and interests of investors, the authors offer an adequate scheme for realization this purpose, when are trying to quantify the market opportunities offered to investor, by encouraging him to create an instrumentation of investment, by invoking market perspicacity, could satisfy his interests in the market at the highest degree.

Keywords: investment, market behavior, investing intelligence, probability distribution, utility function, backtesting.

Jel classification: G, G11.

1. Introduction

Investment in general can be defined as free cash injection into the various forms of financial and material assets, which can provide additional benefits. However, the mission of investment market does not confine only mobilization of free funds. The main purpose of the mission is to polarize towards activities, oriented to economic and social advance. Other purpose of mission is to get higher profit with higher guarantee through interests of investors. At the same time the market makes a significant contribution to the effective allocation of resources that are allocated to solve the problems of perspective.

In order to identify the success, which can generate markets, to use the interests of investors and get the above-mentioned return is necessary to:

- identify the main features of market behaviour, exclude those who modifies the chances of success, and create their quantitative models;
- form the model of investor behaviour in the market, which allows to generate a successful investment strategies;

- overview that, between investment and experience of investment return is always a considerable period.

The investment portfolio, as the most massive operated investment tool, has attracted a lot attention of investment theorists and practitioners, practically is oriented to solution of the above mentioned problems. Constantly advanced mechanism of risk management is an attribute of long-term investment portfolio innovativeness. It is very important, that created new or improved already created investment means accumulated in themselves not only theoretical innovations and investment experience, but also would open to using information and knowledge base by making investment decisions.

Recently, especially intensified the ranking of markets or financial instruments according to their possibilities to be beneficial for investors, but even the classical models of market behaviour analysis does not enter to the details description of investment opportunities: mainly use ratio of average of profitability and risk, examine the opportunities provided by the market, compared to the risk-free instruments or markets. This obviously is not enough for creation the effective investment strategies.

The main purpose of this paper – to use the best opportunities, offered by the market, and investor intelligence, in order to develop efficient investment strategies. For its part risk management must be treated as a search of successes, rather than just avoidance of failures.

In such a way, lowering boats in the investment markets, which is frequently cited as a risk ocean, do not let go the thought that it is going to look for success, but it should not be forgotten that the success and failure are lurking ours on the opposite sides of scales.

With such a choice, try to create methodology of searching the success. Sources of success here are two: the prevailing favourable market opportunities and the investor's personal ability to seize every positive opportunity provided to the market. This the authors will do in the following way: revealing beneficial opportunities by using advanced classical methods:

1. making use of utility function in order to search for investor the most favourable opportunities in the market;
2. using back testing method to disclosure investor's abilities.

2. Investing and market behaviour concept

Investing - is necessary financial deal with future, in pursuance for various duration and objectives with particular emphasis on financial effect of investment both the valuable opportunities guarantee. Attributes of this successful investment are required in order for the naturally existing interest of investor in the financial market – to have the greatest benefit of assets, chosen from investment - would become factor, ensuring necessary investment amount and investment efficiency.

For success of investment is particularly important, that here lingering uncertainty and risk would become a component of success possibilities.

Previously was noted, that for investment success is required - favorable market opportunities, investor intelligence and successful risk management. Investor opportunities in the market are often considered in the context of market behavior. The behavior of financial markets is not very thorough and detailed examined problem. More frequent tests are carried out with different market behavior determinants.

Meanwhile, the market behavior allows setting discrepancy between the price and the actual value. Market behavior analysis can lead the entire investment decision-making process, the choice of investment strategy in respect of time and level and changes of actively managed portfolios of securities. (Reilly, Brown 2003; Belhoula, Naoui 2011). Market behavior analysis should be used regularly in order to decide whether to change the investment strategy or not (Clarke 2004).

Doctor of Philosophy Eugene Fama lay the foundations of Efficient Market Hypothesis (hereinafter - EMH). It is hypothesized, that an active stock market, where there are many well-informed and prepared investor, securities in this case will be evaluated on the basis of all available information (Fama 1965). However, it provides little advice, on how information is collected and under what circumstances accept or reject the fact, that the price and the market is informational efficient (Grossman, Stieglitz 1980; Park 2010).

Banz (1981) suggest that stock market volatility arises from the different processes in the developing and developed countries. They argue that capital market liberalization often increases the correlation between local market returns and the world market. Many researchers described in their works, that assumption for successful investment is fundamental and technical analyzes.

In classical point of view, market behavior primarily depends on market demand and supply for financial resources. (Шевченко 2001; Mittal, Jain 2009). It is important to determine whether investment objects satisfy financial resources supply and demand.

The authors previous studies were analyzed a statement that the constructive details of the investor market opportunities are obtained from the market prices of investment efficiency indicators - profitability, reliability and risk. Possibility of profitability, reliability and the investor's risk is three inseparable components of investment decisions (Rutkauskas 2000; Rutkauskas, Stasytytė, Ginevičius 2008).

To market behavior authors are trying to look through the investor's interest. Changes in market prices are regarded as market behavior. The market's ability to set a price, which encourages continued commercial growth, is a direct reflection of market opportunities. "The principles, that stimulate the market to determine the price, is the biggest secret, and this secret disclosure would have a negative impact on the creative power of the market - constantly shape the right price" (Rutkauskas, Miečinskienė, Stasytytė 2008; Rutkauskas, Ramanauskas 2009). Although the

random walk remains the primary market price behavior model, financial market researchers still seek to determine the mode of action (Malkiel 2000).

So, in order to understand the behavior of financial markets and make use of it, it should be seen within the investor's profit conditions, because the market price changes are treated as market behavior.

Order to develop good investment strategy is not enough to explore only a financial investor behavior and formulate decisions on this basis, whereas it must take account of what the market offers and the uncertainty, which is in the market.

As already was defined above, in the investment market is faced with uncertainty, but none of the classic economic models did not consider the uncertainty in the financial markets. So now, creating investment portfolios, are used the modern models (Sharpe, Markowitz, Treynor and etc.) (Jasienė, Kočiūnaitė 2007).

It should be noted that these (Sharpe and etc.) indicators based solely on the distribution probability of the average value (Sharpe 1966) that, in our opinion, is insufficient in finding constructive investment decisions.

Despite abundance and diversity of forecasting methods, which are used in market analysis, in practice they are not very relevant to the information needed for decision-making point of view either these methods often do not reach the required accuracy and reliability, in order to explain exchange rates or regularity of equity prices change processes.

2.1 Possibilities offered by market and the investor's ability to take advantage of this – is the key assumptions of successful investment

Came to Europe with Arabian merchants Arabic “قزر” wakened the idea that take risks – means searching for success and so on. Maybe that's why in many European languages have survived incitements, as well as shaping provision, that if do not take chances - it is not garner success.

But the reality is that European nations were increasingly pushed to the wall. The reality is that the risk comes with disasters bereavement and other negativity. Perhaps that is why, analysts chosen the perception that “risk is a chance or possibility of danger, loss, injury or other adverse consequences” (The Oxford Modern English dictionary), what is consistent with Chinese hieroglyph “危機”, which is composed of two parts, one of which means danger and the other - opportunity. Thus, the Chinese brought with them understanding, that in the dimension of risk is the extent of the loss and the possibility (read probability).

However, the authors try to get rid of the idea that risk is just bearer of disasters and risk management is a desire to avoid this. We try to activate the idea that risk taking means the searching for success and the risk can be focused only bearer of success. In any case, it is needed to understand that the risk is a substance of existence and the real phenomena illustrate its genetic power.

In the previous text mentioned the classical theories of financial market analysis and modern financial market behavior models, which formed the instrumentation for understanding of market behavior principles. Yet, the ephemerality of the market requires better integration of positive market opportunities. In this case, in order to achieve successful investment decisions, it should appeal to the survival function, which would allow evaluating each market offered opportunity by the size of possibility and guarantee of this size. This scheme will enable quicker, than with all other models and methods, review market opportunities (Rutkauskas, Stasytytė 2007, 2008). The choice of useful options for entity is associated with equivalent recovery of utility function.

Whereas the utility is associated with efficiency, reliability and risk, it is possible to invoke the utility function:

$$U = \frac{f(e) \times f(p)}{f(r)} \tag{1}$$

Where:
f(e) – efficiency, *f(p)* – reliability, *f(r)* – risk.

Anatomy of investment portfolio possibilities and technique, how to find the highest efficiency possibilities by (1) formula means are available in Fig. 1.

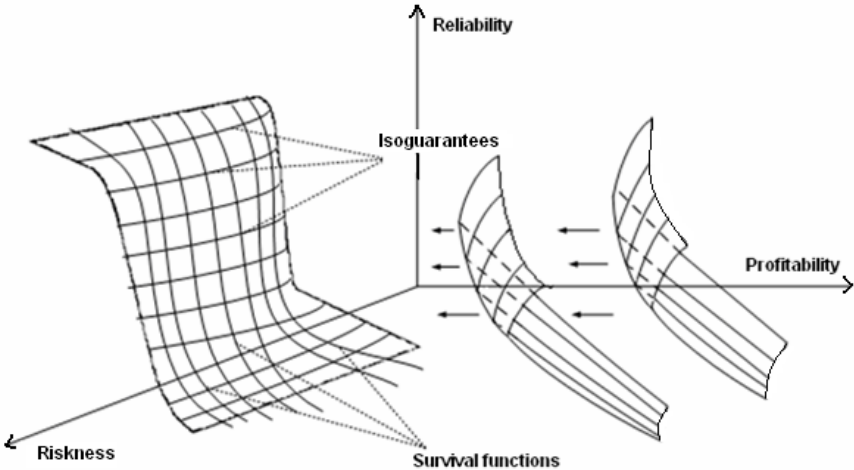


Fig. 1. The general view of three-dimensional efficient surface and respective utility functions (Source: Rutkauskas 2006; Rutkauskas, Stasytytė 2011)

3. Investment market testing

In order to obtain more information about market opportunities and acceptance of the investor, in this part will be done market opportunities research and tested each of the markets effective portfolio solutions.

3.1. What proposes modern financial markets– market opportunities research

In this work in order to explore and identify the opportunities, which the market offers for investors, were taken into account the impact of globalization to financial markets and based on our previous researches, found on approach, that the rate of return stand on financial assets is possibilities probability distribution.

For the financial market research randomly were selected these exchange and capital markets indexes: Australian All Ordinaries, the USA NYSE 100, English FTSE 100, Lithuanian OMXV, the French CAC 40 and SBF 120, Singaporean Straits Times Index, Swedish OMX Stockholm, German DAX and MDAX indexes.

For this financial market analysis has been used financial markets modelling. It has been used markets historical data, i.e., market index close price and daily change percentage data, tested using the „Simulation” program. In order to understand how related opportunities for efficiency and reliability, it turned out that for best-suited Gumbel survival function (Table 1).

Table 1. Opportunities offered by the market distribution (Source: compiled by authors using Market... (2012); World indexes (2012))

Market (index)	Gumbel distribution
Australian market (All Ordinaries)	Gumbel (0.0583, 0.4549)
French market (CAC 40)	Gumbel (0.0467, 0.6164)
French market (SBF 120)	Gumbel (0.0955, 0.7518)
English market (FTSE 100)	Gumbel (0.1242, 0.5463)
German market (MDAX)	Gumbel (0.2576, 0.6758)
German market (DAX)	Gumbel (0.1747, 0.6565)
Swedish market (OMX Stockholm)	Gumbel (0.1429, 0.6660)
Lithuanian market (OMXV)	Gumbel (0.1227, 0.4260)
USA market (NYSE US 100)	Gumbel (0.1209, 0.4935)
Singaporean market (SRAITS TIMES)	Gumbel (0.1147, 0.4632)

The circumstances, that affect the possibility with highest probability and possibility with highest efficiency distribution, are two. It is understood that possibility with highest probability is conditioned of objective market conditions and the possibility with highest utility – it is the entity (market participant) expression of objectives and characteristics. Therefore, the parameters of mentioned layout should be a very important argument in choosing financial instruments.

In this paper, return p of asset ξ during the period t , starting at t -th moment, asset value during the period τ ratio of the value of the underlying security t -th moment setting the model was chosen as setting model:

$$P_t = \frac{\xi_{t+\tau} - \xi_t}{\xi_t} \quad (2)$$

Relative size P_t , where all members have the same changes in the course of time, should generate asset prices using market data and comparable with each other indicators that allow obtaining an objective estimate of the underlying security returns over a long period of time.

Utility function N with individual possibility can be identified with size X of the possibility and the guarantee, measured by the survival function $P \{ \xi > x \}$ product

$$N(x) = x \times P, \quad (3)$$

where:

$$P \{ \xi > x \}.$$

It is assumed that distribution form of symmetric and left symmetry will gain feature of right symmetry, which is becoming attractive to the investor.

The assumption that the form of distribution from symmetric and left symmetry will gain feature of right symmetry was confirmed in many performed calculation. A. V. Rutkauskas (2008a, 2008b) also researched these markets 2007–2009 year period and also monitored right symmetry characteristic of the market. Compared obtained results with obvious results, it can be monitored a very similar market trend.

It should be noted that in both nature and social - economic processes in many cases can be observed left symmetry (Held, *et al.* 2002). For example, even in animal populations is always more abundant smaller than the average agent and rarely larger than average. Similar regularities can be seen in countries and regions. Suppose, the distribution of workers by wage in almost every workers group obeys for left symmetry, objectively estimating students' knowledge in exam grades as well, though not always clearly expressed, obey left symmetry.

It is therefore right symmetry of profitability probability distribution is quite unusual, her movement from left symmetry to the right symmetry can be identified with a particular process in the financial markets, which is caused by the process of globalization.

Between these separate markets, there are situations where assets and index returns probability distributions, formed by market, are not significantly different from each other in both the average and the standard deviation size point of view. In this situation, when the investor making an investment decision, is very important to know which opportunity has the highest performance status.

In view of already existing markets possibilities probability distributions, it can be continued further market analysis. Since the possibilities probability distribution of profitability and utility function of each market shows only what the market offers for investors and what is useful, but not necessarily the option with the highest probability will be most useful, it should be examined to find which option is the best if it was considered to its size and guarantee. In order to select the utility function, which is actually the most useful, it is necessary to take into account the profitability and reliability. Utility function depends on the efficiency and reliability, and reliability is associated with risk, so from the available data are calculated and plot the so-called survival function.

On the basis of calculations and diagrams each market can be ranked according to the investor's utility function approach (Table 2).

Table 2. Market rankings based on utility function (Source: compiled by authors)

Rank. Nr.	Market	Index	Utility	Profitability	Reliability
1	Germany	MDAX	16.5	1.22978022	0.146930747
1	Germany	DAX	12.5	0.635699929	0.200566327
1	France	SBF 120	13.75	0.585897	0.234682901
2	USA	NYSE US 100	11	0.390180488	0.281920812
3	Sweden	Stockholm OMX	10.5	0.360426063	0.291321885
4	United Kingdom	FTSE 100	10.75	0.390481294	0.27530128
5	Singapore	STRAITS TIMES	9	0.325386907	0.276593797
6	Lithuania	OMXV	8.5	0.405331541	0.201704875
7	France	CAC 40	8.5	0.571789851	0.148656014
8	Australia	All Ordinaries	7.75	0.273499953	0.28336429

In view of all three criteria of utility functions: utility, profitability and reliability, it is possible to assess all selected markets. Thus, the market in which for investor is the most useful and safest to invest is German market, tied with MDAX and DAX index and French market, which is associated with SBF 120 index. Well can be assessed USA, Sweden and UK markets. At least attractive to the investor from this list are Lithuanian, French market, coupled with the CAC 40 index and Australian market.

So, having functional expressions of market performance, each investor has to build an effective portfolio of most-favored market financial instruments, which guarantee the most advantageous profitability and guarantee structure.

In order to obtain more accurate information about the market acceptance of the investor, it will be tested all markets effective portfolio solutions, using backtesting method.

3.2. Choice of portfolio decision possibility based on backtesting method

Back testing method is a specific type of historical data testing method, which determines the investment strategies of the results, if they are actually “recruit” a specific period and the market conditions. One of the advantages of the method is that the backtesting is used data from real markets.

The main element that distinguishes this approach from other historical data verification forms, is that backtesting calculates how the strategy should be done, if it had used in the past, so it is checked what options have been in the past. For example, using the Sharpe model or any other offering, we do not find how to check the market. Meanwhile, using this method we can check the market and get an accurate result is to be repeated in market conditions during the period, i.e., using at the current market indexes compositions, and such as they were in the past.

The authors use this backtesting method for a decade on various studies and calculations, in our view, this method provides the opportunity to evaluate not only the market acceptance for investor, but the investor intelligence in the market.

Market test may depend on the investor and from what the market offers for investors (that tells the index). According to Rutkauskas, each investor has the ability to win against an index, the opportunity to “win” is checked using back testing method.

By this method were tested all previously analyzed markets, in each case, selecting at 6 each index shares. 6 shares - is a certain minimum to portfolio investment. Data were collected in daytime (580 day period). The forty-first days were the historical data, on which decisions were prepared daily solutions. Continue to follow these steps: by forecasting and refilled with the available capital distribution among the six shares was disclosed 41 days of historical data and is checked, what it is getting, if 41 day results are not known. This action is repeated with all remaining days. It is coming to the market with 1 unit of capital, which increases or decreases when the solutions are exchanged. The program provides 14 different strategies for each market, makes forecasts and sets single optimal solution from 14 different.

Based on market ranking by utility function, there will be presented only two markets backtesting results: German (DAX), which was one of the best market by ranking of utility function and Lithuanian (OMXV), one of the least attractive to investors.

For German market is chosen optimal strategy from 14 different, prepared by program. Taking advantage of such a strategy, the investor can assure 2.61235 capital growth (Fig. 3).

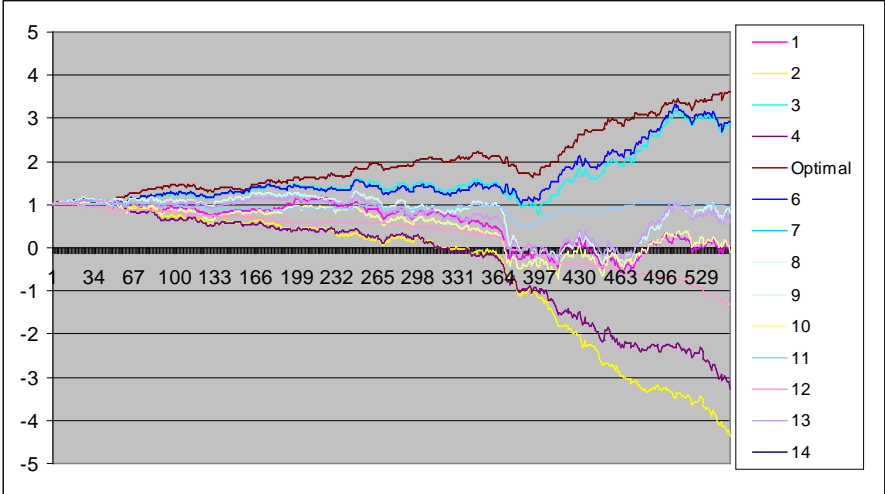


Fig. 3. Backtesting formed strategies for German market (Source:compiled by authors)

Now it should be checked how much increased or decreased the market index during the period considered: increase of DAX index was 11%. Hence, it can be concluded, that the application of our chosen strategy, “is won to the index”, i.e., taking a good solution portfolio, the investor can earn more than was the same increase of index in the same market.

Ranking markets according to their utility functions, the German market in all its aspects was one of the most attractive for investors, market testing is reaffirmed this aspect and selecting the optimal strategy, proposed back-testing method. So, it can be concluded that the market is the most attractive for investors, so it can be recommended to invest in this market.

Lithuanian market, assessing it according to the utility function, was not very attractive to investors. The market testing has formed to this market 14 different investment strategies, but even selecting the optimal strategy, there is no earned, but lost about 0.2% capital. In this case, investing entity has such amount of losses. Although the market is fairly stable, but it is not recommended investing into this market shares, because there is almost no possibility to earn.

It can be concluded that the results, that have been obtained using a utility function, practically coincided with the backtesting results of the method, which proves once again that two analysis methods chosen are highly versatile and accurate.

4. Conclusions

In this work are fulfilled set objectives and are made the following findings:

1. Investing - is necessary financial deal with future, in pursuance for various duration and objectives with particular emphasis on financial effect of investment both the valuable opportunities guarantee. Attributes of this successful investment are required in order for the naturally existing interest of investor in the financial market – to have the greatest benefit of assets, chosen from investment - would become factor, ensuring necessary investment amount and investment efficiency.
2. The circumstances, which are necessary for investment success, are these – favourable market opportunities; the investor's and his used methods intelligence; successful risk management.
3. Uncertainty and risk, lingering in the environment of investment and processes, should not only remind that without ability to handle them, is emerging threat of setbacks and losses, but should become the information about the habitats of potential success and the need to use it.
4. Pragmatic study, which consisted offered market opportunities, taking into account the effect of return and risk, inventory, structuring and adequate market opportunities and connection of investors' interest selection of strategies, findings:
 - 4.1 stochastically informative inventory of market opportunities and utilization of adequate utility functions have shown, that the most effective and safest to invest for investors is the German markets, linked to the MDAX and DAX index and the French market, which is associated with the SBF 120 index. It is also well assessed USA, Sweden and UK markets. At least attractive to investors from the markets concerned and the index list is Lithuanian, French market, coupled with CAC 40 index and Australian market. Based on these results, each investor has to choose the most attractive market.
 - 4.2 backtesting confirmed the utility function constructive and allowed to develop investment strategies sets for each market and to select the optimal portfolio decision-possibility strategy.
5. Investment should be seen as very responsible financial transaction with the future of entity, country or region. Execution and control of this transaction should accrue to financial markets, institutions, which may, through the interests of investors, direct for entities investment social and economic balance. And also financial market should guarantee a rational utilization of the resources for the future. Inseparable attendants of investment - uncertainty and risk - must become a substantial source of investment success.

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Aleksandras Vytautas RUTKAUSKAS is a professor and the Head of the Department of Finance Engineering at Vilnius Gediminas Technical University. His research interests are: investment portfolio management in capital and exchange markets; risk and uncertainty; sustainable development; integrated value and risk management.

Alina KVIETKAUSKIENĖ is master student at Vilnius Gediminas Technical University. Her research interests are: investment portfolio management; financial market behavior; office financial management.