

# GAZDASÁG & TÁRSADALOM

Journal of Economy & Society

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World Events Impact The German Stock Market:  
DAX Analysis January 2000 to October 2009

Konecsny Jenő – Havay Dóra:  
A magyarországi részvénykockázati prémium becslése különféle eljárásokkal

Bruder Emese – Obádovics Csilla:  
A dolgozó szegények jellemzői az egyéni jövedelmek alapján

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Gazdasági válságból szociális válság?  
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Marisová – Fandel – Ilková – Malatinec:  
Efficiency of Single Contact Points Services for Entrepreneurs: Case of Slovakia

Beke Jenő:  
International Accounting Standardization in the Changing Economic Environment

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# **World Events Impact the German Stock Market: DAX Analysis January 2000 to October 2009**

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ABSTRACT Actual stock market developments can be explained by looking at headlines, topics and omnipresent kinds of daily information to comprehend their relationship. Objective of this paper is to analyze the major market movements of the DAX from 2000 to 2009 regarding to news events impacts. The New Institutional Economics only offers a certain explication to some extent. Human rational behavior of the concept of the Homo Economicus cannot be completely transferred to reality. The theory of Behavioral Finance offers a closer approach of a more realistic explanation of irrational behavior on stock markets. Impacts on the financial markets are related with macroeconomic information, non-economic news and market anomalies. Macroeconomic information and activities have dissimilar influences on the stock market. Non-economic news also affects the stock markets in an uncertain way. The analysis of the DAX containing data from 2000 to 2009 30 major daily changes of the DAX become evident. 57 percent of these movements are clearly related to specific events or news, whereas 43 percent cannot be explained by specific news events. The time period is mainly affected by two major events in the recent years: the 9/11 in 2001 and the subprime crisis in 2008. A research of news and popular headlines does not seem to be representative.

KEYWORDS Stock market, DAX Analysis, Behavioral Finance

## **Introduction**

Stock exchange trading happen at established times. The main functions the exchange itself fulfills are the following: Supply and demand are brought together, which is the so called market function. An environment is established, in which companies are able to raise capital by granting securities. This is called mobilization function. Furthermore there is the substitution function, which means, it is guaranteed that securities can be disposed and relinquished at all times. Last but

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not least the present market price is calculated for an individual stock, and thus the market value of the respective enterprise. This is the valuation function.

The trading of securities is forced by different kinds of information which affect the trading itself with its involved players / partners and every kind of influence on the traded securities. According to the well-known Principal Agent Theory and the different kinds of information asymmetries the organized markets are characterized by imperfect market conditions like information disequilibrium. Due to this fact it seems very close to explain actual stock market developments by looking at actual headlines, topics and omnipresent kinds of information to comprehend their relationship.

To analyze the interdependencies between the stock market development and any available and possibly influencing information the German Stock Exchange index DAX will be analyzed. Objective of this assignment is the analysis of the major market movements of the DAX from 2000 to 2009 regarding to news events impacts. These news and information might be of economic and non-economic origin. Both types will be appreciated in detail; their subclasses will be regarded as well.

Beginning with the problem definition and the objective of the assignment selected financial theories in the context of financial markets will be presented. Therefore the Homo Economicus with its rational behavioral will be highlighted. In the real world not all decisions are driven by rationality. An answer for irrational behavioral can be explained by the Behavioral Finance Theory.

After the theoretical foundation possible influencing impacts on the stock market, e.g. macroeconomic and non-economic news are presented.

Afterward the result of the empirical analysis of major market movements of the DAX from 2000 to 2009 is presented. The biggest daily movements were identified and scanned regarding macroeconomic and non-economic events.

The assignment ends by drawing a conclusion and presents a short outlook regarding further research.

### **Fundamentals of Selected Financial Theories**

In the actual financial theories two types of human behavior can be pointed out. Non rational behavior contradicts the goal of the individuals. It does not contain any comprehensible behavioral background. Rational behavioral has its roots in the field of classic economic theory and can be described as the principle of Homo Economicus. In the following both theoretic assumptions will be presented.

In Literature the term 'Homo Economicus' is a synonym for a fictive player in the field of economic theory and science. In this regard, Homo Economicus means a human being who acts in his own interest. His decisions are always rational and support the maximization of his benefit. He reacts on possible restrictions but

always wants to achieve his personal preferences. All his activities base on complete information.<sup>4</sup> He can be characterized by the following six dominating items:<sup>5</sup>

1. Self-interest
2. Rational behavior
3. Complete information
4. Maximization of benefit
5. Respond to restrictions
6. Personal preferences

In the field of political economics the microeconomic theory describes the activities of single players in the world of economies, especially with focus on the characteristics of private households and companies. On the contrary the macroeconomic view combines different kinds of single players to so called 'aggregates' like consumption, savings, investments, etc.<sup>6</sup>

In this context also financial markets like the German stock exchange are affected by the theory of Homo Economicus and its assumptions. The events at the stock exchange are enormous influenced by information as a consequence of fluctuation of the listed companies and aggregated indices like the DAX.

Different macroeconomic news and information are accepted factors in the field of stock exchange developments.

As a method dealing with such irrationalities, behavioral finance is introduced in the following. Serving as an introductory section on that field of research, within this chapter an overview on behavioral finance is given. Behavioral finance is to be understood as a newer approach to financing theory. Below that behavioral concept is subsumed into the complex of financial theory, the basics are presented.

Behavioral finance belongs to the newer financing theories standing in a contrast to the neoclassical or modern financial market theory. In the following the development of the two theoretical concepts will be outlined.

Markowitz's "Portfolio Selection" published in 1952 is commonly regarded to constitute the ground work for the modern capital market research.<sup>7</sup> Basing on that theoretical approach further fundamental studies by Sharpe, Lintner, Mossin, Black and Scholes contributed to the establishment of a firm theoretical construction, the neoclassical financial market theory. In its main intention the neoclassical financial market theory attempts to analyze and forecast the conditions on the financial markets in order to fundamentally investigate the interaction

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4 See Voigt, S. (2009), pp. 19-21.

5 See Kirchgässer, G. (2008), pp. 45 ff.

6 See Kirchgässer, G. (2008), pp. 63-93.

7 See Olsen, R. (1998), p. 13.

between return and risk.<sup>8</sup> For doing so, the theory is based upon the assumptions of a rationally acting individual which aims to maximize his utility via conscious behavior as well as that of the existence of an efficient capital market. However, not every market participant is supposed to decide rationally in the sense of the expected utility theory, but eventually occurring bounded rationalities may be balanced on the market level as a result from arbitrage transactions. Nevertheless, due to the restrictive assumptions within that model and the selective perception, the neoclassic arrived at its limitations explaining empirical cohesions.<sup>9</sup>

Parallel, a bunch of different theoretical approaches developed commonly pooled under the term of newer financing theory. As a part of those research fields an alternative view of financial markets, consciously grappling with the efficient capital market hypothesis<sup>10</sup> and focusing on the behavior of market participants, has emerged. That concept is based upon the basic idea of less perfect market participants compared to the neoclassical theory making institutional arrangements necessary. Thereby, the microeconomic oriented new institutional economy serves as the basis for the research approach of that so called behavioral finance as well as the market micro structure theory. Behavioral finance is to be understood as a cross-sectional field of research of behavioral economics based upon the research results of cognitive psychology and therefore enhancing the modern capital market theory.<sup>11</sup>

Behavioral finance refers to the findings of cognitive psychology and decision research.<sup>12</sup> It is defined as the sum of all research approaches which deal empirically or like a paradigm with the decision behavior of (market) players and analyze information cognition and processing as well as the formation of expectations and decision criteria. The decisive focus is put on the consideration of the real behavior of market participants for an improved understanding of the events on the financial markets.<sup>13</sup> In addition, by comprehension of the human emotions and cognitive errors systematically influencing the investment decisions, market anomalies shall be recognized from which an economic advantage can be derived.

In contrast to the neoclassical financial market theory, behavioral finance is based upon the assumption of a quasi-rational heterogeneous behavior of the market participants resulting from a bounded rationality and diverse, socio dynamic motives, incomplete information due to information asymmetries

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8 See Olsen, R. (1998), p. 13.

9 See Shleifer, A. (2000), pp. 16-23.

10 See Fama, E.F. (1970), pp. 383 ff.

11 See Oehler, A. (2002), pp. 846-848.

12 See Jaunich, A. (2008), p. 25.

13 See Oehler, A. (2000), p. 978.

and diffusion,<sup>14</sup> systematical irrationalities on the market level which cannot be compensated and arbitrage which is assumed to be a much weaker and more limited force than supposed by the efficient market theory.<sup>15</sup>

The following table highlights the main differences between the neoclassical and the behavioral financing theories.

**Table 1: Comparison of Neoclassical Financial Market Theory and Behavioral Finance**

Criteria	Neoclassical Financial Market Theory	Behavioral Finance
<b>Rationality Principle</b>	Homo Oeconomicus: rational behavior according to Bernoulli Principle	Decision maker with heterogeneous, incomplete information cognition and processing capabilities, quasi-rational behavior
<b>Information</b>	Complete information (complete, correct, free and simultaneous)	Incomplete information (incomplete, defective, payable, time-delayed)
<b>Market Level</b>	Market in total is rational, irrationalities of single individuals are eliminated	Irrationalities also on market level, enhancement of individual behavioral anomalies is possible
<b>Arbitrage Chances</b>	Risk-free arbitrage chances on the path to equilibrium, at equilibrium no arbitrage	Arbitrage chances restricted

*Source: According to Müller, S. (2003), p. 94; Rapp, H. (2000), p. 92.*

The research approach of behavioral finance is of descriptive nature. That theory is centered on the problem, how decision making takes place in reality. Descriptive approaches are to explain why a decision making process led to a specific decision and not to a different one. The very aim is thereby to get into the position to estimate or to manage decisions within concrete decision situations on the basis of the knowledge on behavior patterns.<sup>16</sup>

Initiated to find explanations for the behavior of investors, the field of research is (initially) less axiom- than much more empiricism driven. Both, the psychological basics as well as findings on the financial market are based upon ex ante specified theories, which can be summed up to an increasingly coherent theoretical model. By renunciation of the assumptions' ambiguity and the falsifiability of the

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14 See Rapp, H. (2000), p. 92.

15 See Shleifer, A. (2000), p. 2.

16 See Laux, H. (2007), p. 2.



theoretical prognoses made, behavioral finance meets the scientific requirements. Within the theoretical approach psychological and financing theoretical findings are closely linked. So, the studying of capital markets for anomalies may on the one hand lead to confirming the existing capital market oriented models with behavioral elements or on the other one to providing findings as a basis for alternative normative approaches.<sup>17</sup>

Besides the approach of regarding psychological phenomena in terms of their impact on the financial market development also the contrarily proceeding is imaginable, identifying the market phenomena not explicable with the modern capital market theory and providing explanations via behavioral findings or institutional conditions.<sup>18</sup>

Nothing is as dangerous as the persuasion of rationality in irrational markets. As will be highlighted in the following, the approach of behavioral finance assumes bounded rationality of the market participants and therefore an inefficient market in its conceptual framework.

While the approaches of the neoclassical capital market theory introduced in the last chapter “from a behavioral perspective, assume a world dominated by Homo Oeconomicus, a virtually omniscient decision maker, who is completely rational and focused on utility (wealth) maximization”<sup>19</sup>, behavioral finance supposes the individuals to be bounded rational. Bounded rationality is a central assumption and shall be understood as the starting point of behavioral finance.<sup>20</sup>

The concept of bounded rationality from 1955 is to be ascribed to Simon.<sup>21</sup> Constituted on the criticism of the prior assumption of unbounded rationality, it implies the idea of acting imperfectly rational as a result of the individuals’ bounded cognitive ability to take things in and process information, combined with problems in communicating, due to a limited information processing capacity of the human brain.<sup>22</sup> Pursuant to the described neurophysiologic restrictions human beings are not able to receive and analyze all relevant information, which especially in view of the complex economic reality with scarce transparency and uncertainty overstrain the individuals. Therefore, human beings have to be satisfied at a certain know-how level, which meets certain minimum demands. The communicative sphere

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17 See Oehler, A. (1992b), p. 3.

18 See Weber, M. (1999), p. 8.

19 Olsen, R. (1998), p. 13.

20 See De Bondt, W. (1998), p. 831.

21 See Simon, H.A. (1955), pp. 99 ff.

22 See Ebers, M., Gotsch, W. (1995), p. 210.

in terms of bounded rationality comprises further limitations on the submission of knowledge and the individual capability restricted by the language.<sup>23</sup>

Accordingly, individuals rely within their decision making on certain cognition processes adjusted to their living conditions as well as rules of behavior and thumb in order to save themselves the information search. As a consequence, individuals within their decision making are subject to systematical errors and misjudgments. Especially in more complex decision situations, their behavior distinguishes widely from the assumptions of the rational decision theory. Due to the employment of the rule of thumb, complexity is reduced on the costs of the alternatives' variety, which may lead to imprecise and biased results.<sup>24</sup>

Moreover, it is of special importance in that cohesion, that also the behavior assumptions of the information efficient markets are questioned, as the individuals' behavior is described to be systematic and inter subjectively correlated and not random and independent.<sup>25</sup> Such behavior is called anomalous, irrational or deficient and leads to anomalies, irrationalities or biases,<sup>26</sup> as elements of the inefficient market focused below.

Due to the theory of information efficient markets, the neoclassical capital market theory is built upon, "a market in which prices always fully reflect all available information is called efficient"<sup>27</sup>. Individual anomalies of market participants are only of random nature and disappear on market level. However, empirical difficulties exist verifying the existence of that information efficiency. Moreover, the existence of an always efficient capital market has been already questioned for a long time.<sup>28</sup>

Besides, various literatures in terms of behavioral finance documents market anomalies, like the size effect or the mean reversion phenomenon, staying in contrast to the theory of market efficiency. Market participants suffer from bounded rationality, so that the individuals' behavior may be anomalous, irrational or deficient, if their conscious or unconscious simplification strategies turn not to work. Resulting, systematically occurring, not collectively or by market forces disappearing irrational human behavior<sup>29</sup> gives reasons for market anomalies. As the "systematic and significant deviations from efficiency are expected to persist

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23 See Arrow, K.J. (1980), p. 38.

24 See Stock, D. (2002), pp. 176-177.

25 See Rapp, H. (2000), p. 94.

26 See Oehler, A. (1992a), pp. 99-100.

27 Fama, E.F. (1970), p. 383.

28 See Oehler, A. (2002), pp. 851-852.

29 See Weber, M. (1999), p. 9.

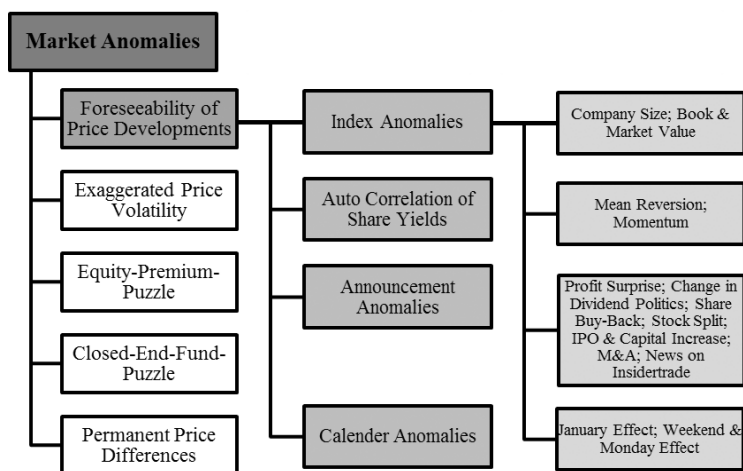
for long periods of time<sup>30</sup> and make price bias expectable<sup>31</sup>, economics theory leads to the expectation of an inefficient market.

### Impacts on Financial Markets

The following chapter deals with the impacts on the financial markets. First market anomalies will be discussed. Anomalies can often be explained by macroeconomic information and activities. Their impact on financial markets is almost well known and can be taken in consideration of the value of the stock-market price. Further information which has no economic background has to be taken in consideration of the possible development of financial markets.

The term market anomaly characterizes divergent market developments from scientific explanations and capital market models of the neoclassical capital market theory.<sup>32</sup> “Market anomalies are repetitious, predictable price patterns in the financial markets. Market anomalies are variously theorized to be related to investors’ collective moods, misperceptions, processing errors, and misbehaviors.”<sup>33</sup> Due to today’s increasing data processing capabilities of computers, the research on biased market developments becomes inflationary. In the following an overview on the main anomalies, economics literature<sup>34</sup> in particular deals with, is given:

**Figure 1: Overview on Market Anomalies**



Source: According to Jaunich, A. (2008), p. 43.

30 Shleifer, A. (2000), p. 2.

31 See Hirshleifer, D. (2001), p. 1540.

32 See Barberis, N., Thaler, R.H. (2001), p. 31.

33 Peterson, R.L. (2006), p. 686.

34 See Hirshleifer, D. (2001), pp. 1555 ff.

Empirical studies document that the future share price developments can partly be foreseen. Indicators utilized as a basis for forecasting are especially company figures, historical share price developments, the announcement of certain information or the date. As the efficient capital market theory assumes the current share price also to include all information that shed light on the future yield development,<sup>35</sup> the foreseeability of price developments is not accordable with that theoretical concept. In the following the index anomalies, the auto correlation of share yields, the announcement effect and calendar anomalies are introduced.

Within an efficient market the capital asset pricing model (CAPM) assumes yield differences between commercial papers to be explicable by differences in the risk described as beta. However, studies document that the beta does not completely elucidate the yield discrepancies; instead different company specific indexes are often accountable for such deviations. The size effect deals with the phenomenon of small companies achieving higher yields on their shares than stocks of big companies, which are not explicable by the higher beta of shares from small capitalized companies in accordance with the capital market models.<sup>36</sup> Moreover, the value effect indicates a positive relation between the share yield and the book-to-market-value ratio (B/M-ratio). I.e. value-shares which are stocks with a high B/M-ratio yield a higher return than glamour-shares, such with a low B/M-ratio.<sup>37</sup>

Further studies show that future share price developments can be forecasted on the basis of historical data, that there is a certain auto correlation of share yields. In the short-term under-reactions or auto-correlations are expected, whereas in the long-run there is a tendency to overreactions rather negative serial correlations. The momentum effect says that historical share yields can be regarded as an indicator for future yields, which cannot be explained by the systematic risk according to the capital asset pricing model. Companies recording a good respectively bad yield within the previous three to twelve months are also assumed to achieve a positive respectively negative yield surplus in the following three to twelve months. Furthermore, mean reversion signifies the existence of serial correlation of share prices as well as the tendency of stock prices to revert to the mean.<sup>38</sup> Short-term mean reversion is on shares achieving exceptionally high rather low returns within one day, week or month and negative rather positive yield surpluses within the subsequent days, weeks or months. Long-term mean

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35 See Fama, E.F. (1970), p. 388.

36 See Banz, R.W. (1981), pp. 3 ff.

37 See Fama, E.F., French, K. (1992), p. 441.

38 See Oehler, A. (2000), p. 981; Fama, E.F. (1998), pp. 283 ff.

reversion refers to the reversal of share prices to their long-term mean, which often equals the fundamental value of the shares.<sup>39</sup>

Though newly announced information is said to be immediately processed within efficient markets, the price of the concerned shares is not necessarily promptly actualized to its fundamentally justified level. Concerns are raised over the completeness of fast price adjustments after an announcement stating that short-term price corrections can also be the beginning of long-term adjustments.<sup>40</sup> I.e. biased, incomplete or exaggerated immediate price corrections can be a consequence of announcements, so that further price alignment patterns to the fundamental value after a short-term price reaction can be regarded as predictable. The announcement effect can occur in terms of earnings surprises, changes in dividend politics, share splits, share buy-backs, initial public offerings or capital increases, mergers or acquisitions as well as insider transactions and may make the share price development foreseeable.

Calendar anomalies refer to positive surplus yields on shares within certain, regularly periods of time. The most important calendar anomaly is the January effect due to which above average yields become obvious within January, and in particular during the first day respectively week of trade.<sup>41</sup> Beyond, diverse further calendar anomalies are named within economics literature, as exemplarily the month effect, the Monday or weekend effect or the trade day effect.

Also the anomaly of exaggerated price volatility stays in contrast to the theoretical approach of efficient capital markets, which supposes the share price only to change when price relevant information become public.

Moreover, the Equity-Premium-Puzzle questions the equity risk premium of shares in comparison to the risk free interest rate. Contrarily to the reasonable average share risk premium calculated with a model assuming rational market participants, the real premium exceeds the fundamentally justified height as investigated empirically.

In addition, the development of the market value of closed-end funds cannot be explained by the neoclassical financial market theory, as transaction costs, management performance and fiscal effects cannot outweigh the deviations from the fundamentally justified value.<sup>42</sup>

Furthermore, the anomaly of permanent price deviations is to be named. Enduring price biases cannot be explained with the neoclassical financial market theory, as it assumes unrestricted arbitrage chances. In reality, however, arbitrage

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39 See De Bondt, W., Thaler, R.H. (1985), p. 800.

40 See Busse, J., Green, T. (2002), p. 428.

41 See Keim, D. (1983), pp. 21 ff.

42 See Shleifer, A. (2000), pp. 53 ff.

may involve risks like the noise-trade-risk, leading to the upcoming of inefficient prices.<sup>43</sup>

There are different macroeconomic information and activities that have the possibility to affect the stock price:<sup>44</sup>

- dividends payments,
- industrial production,
- money supply,
- long- and short-term interest rates,
- and inflation rate.

The amount of the dividend is determined every year at the company's annual general meeting, and declared as either a cash amount or a percentage of the company's profit. The dividend consists of the company's unappropriated profit and the expected profit for the following period. At the annual general meeting the Executive Board and the Supervisory Board suggest the sum which will be paid out to shareholders. Most firms try to pay out the same sum each year. At most companies, however, the amount of the dividend remains constant. This helps to reassure investors, especially during phases when earnings are low, and sends the message that the company is optimistic with respect to its future performance.<sup>45</sup>

The industrial production, e.g. the total output of the factories of a country is a key economic indicator. In Germany it is monthly released by the Federal Ministry of Economics and Technology of Germany.

The production index reflects the monthly performance of the German industry sector. Concerning its periodicity, its fast availability and detailed breakdown by branches of economic activity, it is an important and topical indicator of the development of business activity.<sup>46</sup>

The money supply is defined by the total amount of money available in an economy at a particular point in time. Usually data of money supply is published by the central bank. Public and private-sector analysts have long monitored changes in money supply because of its possible effects on the price level, inflation and the business cycle.

That relation between money and prices is historically associated with the quantity theory of money. There is strong empirical evidence of a direct relation between long-term price inflation and money-supply growth. Nowadays the trust in monetary policy obtains as resolvent for the inflation problems. Heterodox

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43 See Barberis, N., Thaler, R. H. (2001), pp. 9 ff.

44 See Cutler, D.M. et. al. (1989), p. 5.

45 See Deutsche Börse AG (2007), p. 58.

46 See BMWI (2009), no page.

economists belief that the money supply is endogenous and that inflation is based on the distributional structure of the economy.<sup>47</sup>

Changes in the interest rate affect the stock market. Investors want their invested capital increase in value. This can increase by stock price appreciation or dividends payments. If company growth is unimaginably for a shareholder, stock ownership will be unattractive.

Investing in stocks can be viewed as too risky compared to other investments. The interest rate, e.g. government securities are viewed as risk free investments. They will usually experience a corresponding increase in interest rates. Investing in stocks must be more attractive than investing in risk-free investments e.g. investing in government securities. Stock investors expect a higher return for the higher risks. The preferred return for investing in stocks is a sum of the risk-free rate and the risk premium. In general, several investors have different risk premiums, depending on their own acceptance for risk and the company they are buying. In common, as the risk-free rate goes up, the total return required for investing in stocks also raise. If proportion between return and risk is unacceptable, investors will change their stocks to another asset.<sup>48</sup>

Monetary policy should not affect real stock prices in the long run. Historically there is no correlation between real stock returns and inflation. Furthermore it is a coexistent effect of real economic activity on inflation and stock returns. For the long term there is no evidence that real stock returns are influenced by the inflation, but for the short term researchers found out that monetary policy can affect real stock prices In addition the kind of monetary policy regime can affect the performance of asset markets over longer period.

Macroeconomic and financial instability were a consequence of the policy which was pursued by the central banks and it could explain the negative correlation between real stock prices and inflation. Rising inflation, for example, tended to depress stock returns because higher expected inflation would increase long-term interest rates (and thereby raise the rate at which investors discount future dividends) and because monetary policy actions to limit inflation would tend to slow economic activity.<sup>49</sup>

The survey of Bordo, Dueker, and Wheelock shows that unanticipated changes in inflation rate played an important role for major movements of stock market. Interest rate shocks have large, negative impacts on stock market conditions.<sup>50</sup>

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47 See Mitchell, C. (2009), no page; Bordo, M.D. et al. (2008), pp. 1-17.

48 See Müller, J. (2009), no page.

49 See Bordo, M.D. et al. (2008), pp. 1-3.

50 See Bordo, M.D. et al. (2008), pp. 16-17.

Cuttler et al. analyzed macroeconomic news regarding the US stock market and presented that a substantial fraction of changes in the stock market cannot be explained by macroeconomic news.<sup>51</sup> Only one fifth of their used macroeconomic news explains the movements in the stock prices. Furthermore increases in real dividends and increases in industrial production have positive effects on the share prices. Inflation has negative and statistically significant effects on the stock market. The other macroeconomic news has a less significant effect on share prices.<sup>52</sup>

Therefore further other information, besides the assumed macroeconomic news must have influence on the stock prices.

Shareholders are mainly future-orientated. The invest money today in anticipation of a future return. That will be a problem then uncertainty affects their future anticipation. Uncertainty can initiate by non-economic news like:<sup>53</sup>

- wars,
- changing of the political leadership,
- or speculative bubbles.

Wars or terrorist attacks should have negative influence on the price of stocks because the government with high taxes and borrowings is in competition with investors.<sup>54</sup> But international markets react not only negatively to wars. International traders only welcome conflictive events whose anticipated costs lift the uncertainty over the future course of action and promise a less costly resolution of the conflict than originally anticipated.<sup>55</sup> Raising market often escort the start of expected wars is a typical illustration. The collective reaction of international traders is thus a useful signal to belligerents what kind of outcome they expect from armed conflicts.<sup>56</sup>

Empirical stock market reactions to the international conflicts were most negative. But also not all conflicts affect the stock market in the same way. The markets react in unstable sensitivity to the events. In general wars influence the stock market strongly. The stock market reactions to international crises thus largely depend on the severity of an international event and the market participant's belief that an expected event will materialize.<sup>57</sup>

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51 See also Fama, E.F. (1970), pp. 383-418.

52 See Cutler, D.M. et. al. (1989), p. 5.

53 See Siegel, J.J. (2007), pp. 226-227.

54 See Siegel, J.J. (2007), p. 231.

55 See Gartzke, E., Li, Q. (2003), p. 129.

56 See Schneider, G., Troeger, V.E. (2006), pp. 639-641.

57 See Schneider, G., Troeger, V.E. (2006), pp. 640-641.



The different political parties have different political programs, based on this parties try to implement policies. On the basis of parties present and realize their economic policies rational investors are interested in maximizing their capital, the effect of future political developments and decisions will be price into the today's stock prices. The price changes will reflect the anticipated impact of policies on future profits, by that indicating the direction and the strength of wealth transfers as a consequence of government partisanship.<sup>58</sup>

Not really clear is how much partisanship influences the stock market. That policy does influence the markets, but it's usually unforeseen.

Speculative transactions are conducted in anticipation of short-run price movements.<sup>59</sup> A basic requirement for speculation is uncertainty about future price movements. Speculators have presumptions and opinions about the outcome of future incidents. Uncertainty motivates them to attempt to transform their expectations into capital profit, because they believe that they have the ability to predict future price trends.

It has to be distinguished between speculation and investment. In contrast to speculation, an investment has a long term perspective, is geared to the real economy and focuses on dividends and the intrinsic value.<sup>60</sup>

In literature the term speculative bubble is not clearly defined. There are a few definitions, but these definitions do not correspond completely with each other. Speculative bubbles are characterised by prices which increasingly move away from their fundamental value,<sup>61</sup> or a speculative bubble is a long-run deviation in the share price with a subsequent correction in price.<sup>62</sup>

Share prices often rise over a relatively long period and decline relatively fast afterwards. The more prices move away from their fundamental values the higher the probability of a crash.<sup>63</sup>

Even when every market participant knows that prices are not consistent with their fundamental value, they rise sometimes. People believe that prices will continue to rise and this is enough to induce further increases in price. Fundamental values are irrelevant when the market is in a speculative bubble.

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58 See Bechtel, M.M., Füss, R. (2007), pp. 23-24.

59 See Aschinger, G. (1995), p. 18.

60 See Bandulet, F. (2005), p. 104.

61 See Aschinger, G. (1995), p. 118.

62 See Kugler, F. (1994), p. 144.

63 See Gaulke, J. (1994), p. 113.

As long as the majority of investors anticipate that prices continue to rise, they effectively continue to rise.<sup>64</sup>

### Analysis of Events Impact the DAX

After a short introduction to the DAX, in the following chapter the main results of the analysis of major market movement of the DAX during the period January 1, 2000 to October 9, 2009 will be presented. The DAX consists of the 30 firms with the highest market capitalization in Germany.

A stock index is an indicator of the value of a stock portfolio at a particular point in time and is calculated daily by stock exchanges, or other experts. It is calculated for individual market segments, sectors or groups of shares. Stock indices are calculated as price or performance indices or both. If the development of a stock index is tracked over time, it provides information on the performance of the underlying stock portfolio and can be a useful indicator for market sentiment, the economy, or trends in the sectors. It can also serve as the underlying instrument or benchmark for certain financial instruments, such as stock index options.<sup>65</sup>

DAX was launched on 1 July 1988 by the Frankfurt Stock Exchange, the Association of German Stock Exchanges and a German stock exchange newspaper. The shares of the DAX account for approximately 85 percent of trading volume in German equities. DAX stocks are admitted to trading in the Regulated Market segment and are listed in Prime Standard. The criteria for weighting the stocks in the index are: trading volume and market capitalization as well as the basis of the number of shares in free float, and the position in the respective sector.<sup>66</sup>

The actual formation of the DAX is presented in the following table.

**Table 2: Individual Shares in the DAX (12 October 2009)**

Name of Shares	No. of Shares	Market Cap. (in Mio. €)	Weight	Name of Shares	No. of Shares	Market Cap. (in Mio. €)	Weight
ADIDAS AG O.N.	193.515.512	6.724,66	1,34%	HENKEL AG+CO.KGAA VZO	178.162.875	5.558,68	1,11%
ALLIANZ SE VNA O.N.	453.050.000	39.509,00	7,85%	INFINEON TECH.LAG NA O.N.	1.086.742.085	4.314,37	0,86%
BASF SE O.N.	918.478.694	35.223,66	7,00%	K+S AG O.N.	165.000.000	4.742,85	0,94%
BAY.MOTOREN WERKE AG ST	601.995.196	10.778,74	2,14%	LINDE AG O.N.	168.609.746	12.692,94	2,52%
BAYER AG NA	826.947.808	39.842,35	7,92%	LUFTHANSA AG VNA O.N.	457.937.572	5.465,48	1,09%
BEIERSDORF AG O.N.	252.000.000	4.140,13	0,82%	MAN SE ST O.N.	140.974.350	5.759,41	1,15%
COMMERZBANK AG O.N.	1.181.352.926	6.064,68	1,21%	MERCK KGAA O.N.	64.621.126	4.453,69	0,89%
DAIMLER AG NA O.N.	1.060.965.432	29.725,58	5,91%	METRO AG ST O.N.	324.109.563	4.214,57	0,84%
DEUTSCHE BANK AG NA O.N.	620.859.015	33.619,94	6,68%	MUENCH.RUECKVERS.VNA O.N.	197.401.624	22.199,52	4,41%
DEUTSCHE BOERSE NA O.N.	195.000.000	10.699,29	2,13%	RWE AG ST O.N.	523.405.000	26.260,51	5,22%
DEUTSCHE POST AG NA O.N.	1.209.015.874	10.669,11	2,12%	SALZGITTER AG O.N.	60.097.000	2.653,45	0,53%
DT.TELEKOM AG NA	4.361.319.993	28.060,12	5,58%	SAP AG O.N.	1.225.964.588	29.621,36	5,89%
E.ON AG NA	1.809.169.676	47.767,38	9,50%	SIEMENS AG NA	837.061.002	49.609,89	9,86%
FRESEN.MED.CARE KGAA ST	294.413.474	6.312,17	1,25%	THYSSENKRUPP AG O.N.	514.489.044	8.051,79	1,60%
FRESENIUS SE VZ O.ST O.N.	80.596.926	3.298,83	0,66%	VOLKSWAGEN AG ST O.N.	294.997.957	4.970,85	0,99%

Source: According to Börse Frankfurt (2009), no page.

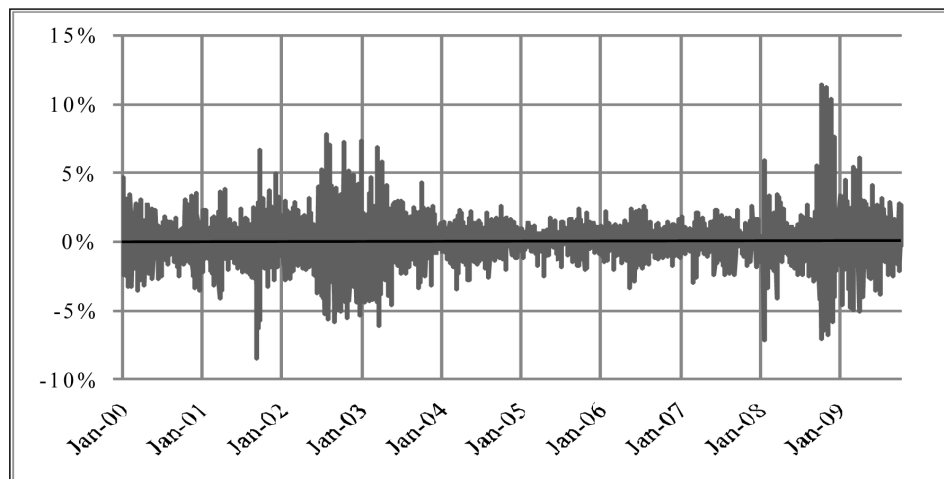
64 See Moosa, I.A. (2003), p. 207.

65 See Deutsche Börse (2007), p. 8.

66 See Deutsche Börse (2007), pp. 48-49.

In figure 2 below a general overview during the period is given. At first glance, the biggest market movements occur in the years 2001, 2002 and 2008.

**Figure 2: Daily Changes in the DAX (January 2000 - October 2009)**



Source: According to *Finanzen.net* (2009), no page; own calculation.

The next step the 30 major daily up- and downward movements have been extracted and presented in the following table.

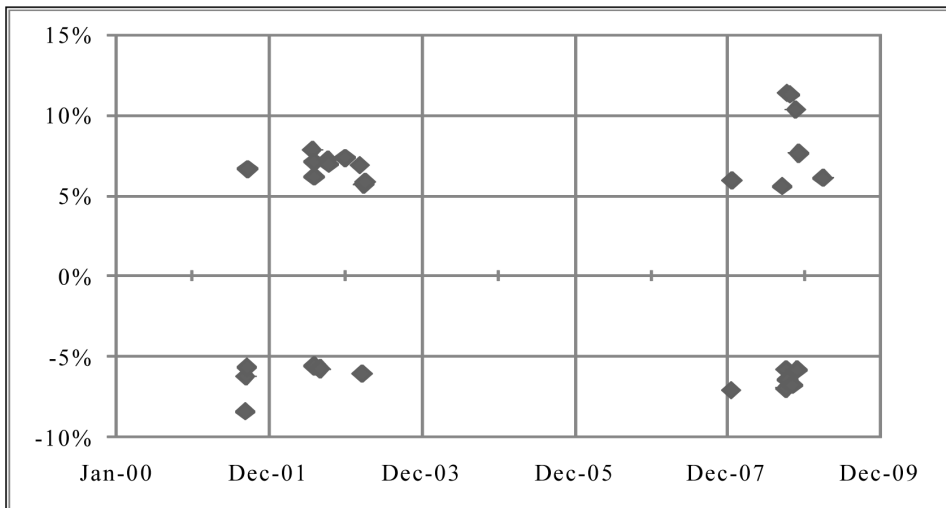
**Table 3: 30 Biggest Changes in the DAX (January 2000 - October 2009)**

Rank	Date	Change	Rank	Date	Change
1	October 13, 2008	11,40%	16	September 24, 2001	6,64%
2	October 28, 2008	11,28%	17	October 15, 2008	-6,49%
3	November 24, 2008	10,34%	18	September 14, 2001	-6,29%
4	September 11, 2001	-8,49%	19	August 8, 2002	6,17%
5	July 29, 2002	7,85%	20	March 24, 2003	-6,14%
6	December 8, 2008	7,63%	21	April 2, 2009	6,07%
7	January 2, 2003	7,34%	22	January 24, 2008	5,93%
8	October 11, 2002	7,23%	23	December 1, 2008	-5,88%
9	January 21, 2008	-7,16%	24	October 8, 2008	-5,88%
10	August 6, 2002	7,08%	25	April 7, 2003	5,84%
11	October 6, 2008	-7,07%	26	September 3, 2002	-5,83%
12	October 10, 2008	-7,01%	27	September 20, 2001	-5,74%
13	October 15, 2002	6,95%	28	April 2, 2003	5,68%
14	March 13, 2003	6,87%	29	August 5, 2002	-5,66%
15	November 6, 2008	-6,84%	30	September 19, 2008	5,56%

Source: According to *Finanzen.net* (2009), no page; own calculation.

The above presented movements are arranged according to size. Recent superior changes of the DAX are located in the fourth quarter of year 2008, the daily news reported extensively about drumbeats of negative impacts on the widely enlarging financial crisis, although the time of the financial crisis includes the highest positive changes of the DAX. Related to the effects of the bad news according to the world-affecting financial crisis, up to the extent of 10 percent and more, the DAX changed very similar as a post-result of the terroristic attacks dated on 9/11.

**Figure 3: 30 Biggest Changes in the DAX (January 2000 - October 2009)**



Source: According to Finanzen.net (2009), no page; own calculation.

As described above the 30 biggest movements of the DAX occur especially in the years 2001 and 2008. As a consequence of that these superior changes can be allocated as a result of far-reaching news. These facts, as determined in chapter 2 and 3, can be of economic and non-economic origin. Micro- and macroeconomic news can affect single companies, as it can be seen looking at the example of OPEL, or even a whole national economy. Non-economic news and information as well can have a very similar effect on stock exchange as economic-based developments. In case of that the 30 biggest movements of the stock market index DAX have been analyzed to find news-related input which might be a possible explanation for changes in the trading of shares and in consequence for the stock market movement. In table 4 it is obvious that the highest positive change occurs on the 13th and 28th of October in 2008 which dues to the engagement of government support, especially the European rescue package for banks. The

second highest change of the DAX is related to a speculative bubble; the automotive producer Porsche affirmed to be interested in an acquisition of Volkswagen and acknowledged possible share deal intentions.

**Table 4: Largest News-Related Movements in the DAX  
(January 2000 - October 2009)**

Rank	Date	Change	News Headline
1	October 13, 2008	11,40%	European rescue package for banks
2	October 28, 2008	11,28%	Porsches speculation in the Volkswagen share
3	November 24, 2008	10,34%	Timothy Geithner new minister of finance USA
4	September 11, 2001	-8,49%	Terrorist attack New York
9	January 21, 2008	-7,16%	US subprime crisis; big losings of WestLB
11	October 6, 2008	-7,07%	Unclear situation at Hypo Real Estate
15	November 6, 2008	-6,84%	IMF expected global economic recession
18	September 14, 2001	-6,29%	Wall Street opening after terrorist attack; fear of US military strike
19	August 8, 2002	6,17%	IMF loan for Brasilia
20	March 24, 2003	-6,14%	No hope of a quick end of the iraq war
21	April 2, 2009	6,07%	Only low reduction of the key interest rate in Europe
23	December 1, 2008	-5,88%	Bad economic indicators in US
25	April 7, 2003	5,84%	Military success in the iraq war
26	September 3, 2002	-5,83%	Bad economic indicators
27	September 20, 2001	-5,74%	Fear of terrorism in Germany; start of the US military strike
28	April 2, 2003	5,68%	US army starts the run on Bagdad
30	September 19, 2008	5,56%	Rescue package for US banks

*Source: According to Finanzen.net (2009), no page; Welt & Welt am Sonntag ePaper-Archiv (2000-2009), no page; own calculation.*

Although news and information are very closely directed to economic and non-economic circumstances not every change of the stock exchange rates can be clearly assigned to certain news. Of course it can happen that stock indices like the DAX rise or decline although the differences do not base on relatable influences. About 30-40 percent of the differences of the stock index seem to be not the effect of economic or non-economic development. Due to this finding the major movements of the DAX which are not related to specific events have to be considered as well.

The watched period from January 2000 to October 2009 contains 13 calendar dates which consist of relatively high changes, upwards and downwards as well. The differences reach from -7,01 to 7,85 percent compared to the previous day. The economic-related changes in the DAX movements have mainly been located in 2001 and 2008. The below listed DAX movements (table 5) also contain calendar dates in 2002 and 2003. The time between March 2003 and January 2008 does not contain any movements which are listed in the top 30 DAX movements in the observed period.

**Table 5: Largest Non-News-Related Movements in the DAX  
(January 2000 - October 2009)**

Rank	Date	Change
5	July 29, 2002	7,85%
6	December 8, 2008	7,63%
7	January 2, 2003	7,34%
8	October 11, 2002	7,23%
10	August 6, 2002	7,08%
12	October 10, 2008	-7,01%
13	October 15, 2002	6,95%
14	March 13, 2003	6,87%
16	September 24, 2001	6,64%
17	October 15, 2008	-6,49%
22	January 24, 2008	5,93%
24	October 8, 2008	-5,88%
29	August 5, 2002	-5,66%

Source: According to *Finanzen.net* (2009), no page; *Welt & Welt am Sonntag ePaper-Archiv* (2000-2009), no page; own calculation.

These listed 13 of 30 announced DAX movements cannot be explained by any analyzed economic or non-economic news and information which could be the crucial factor of pre- or post-affecting nature.

## Conclusion

Regarding the problem definition, actual stock market developments can be explained by looking at actual headlines, topics and omnipresent kinds of information to comprehend their relationship, the objective of this assignment was to analyze the major market movements of the DAX from 2000 to 2009 regarding to news events impacts.

As shown in the previous chapters the new institutional economics only offers a certain explication to some extent. The rational behavior of the concept of the Homo Economicus cannot be completely transferred to reality. A better approach for the explanation of irrational behavior on stock markets seems to be the theory of Behavioral Finance.

Impacts on the financial markets are driven by macroeconomic information, non-economic news and market anomalies. The different macroeconomic information and activities have different influences on the stock market. For example increasing dividends and increases in industrial production can force positive tendencies; inflation has negative effects on the share prices. Other macroeconomic news has less significant effects.

Non-economic news also affects the stock markets. The influences of these impacts are most uncertain.

The analysis presents 30 major daily changes of the DAX during the period from January 1, 2000 to October, 9 2009. 17 of these movements are clearly related to specific events or news. Furthermore 13 changes cannot be explained by specific news events.

The time period of nearly nine years of the detected changes of the DAX are mainly affected by two major news events: the terror attacks in 2001 and the subprime crisis in 2008. To get a more detailed result according to the surveyed time spread a longer time period should be analyzed and a deeper measurement of economic and non-economic activities and circumstances has to be taken into consideration. The single research of news and popular headlines is not representative.

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