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A study of factors influencing the deviation between companies' market value and book value in Hungary

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1. INTRODUCTION

In the last decade – first in international, later also in Hungarian literature – several studies highlighted the difference between the market value and book value of companies and the changes (first increase, then decrease) in the related trends.

Examining the data relating to the period between 1978–1998 of more than 10,000 listed companies in the Unites States, Boulton, Libert and Samek [2000] found that the book value of the companies represented 95% of their market value at the beginning of the period in question, but this figure decreased to 28% by its end. They cite Microsoft as an outstanding example, with a market value of USD 600 bn and a book value of only USD 31.6 bn as at the end of 1999.

Analysing data of a total of 14,643 listed companies in three European countries – Germany, Norway and the United Kingdom – for the period between 1982–1996, King and Langli [1998] revealed a smaller average deviation between book values and market values. According to data presented in their study, the average value of the book value/share price (BV/P) index was 0.41 in Germany, 0.58 in Norway and 0.63 in the UK.

According to a study by Arce and Mora [2002], examining 22,436 observation units in eight European countries in the period between 1990–1998, the average value of the BV/P_0 index showed major differences in the individual states. The rate was the lowest in Germany at 0.559, but may also be considered low in the Netherlands (0.660) and in the UK (0.670). Increasingly higher index rates were measured in Belgium (0.787), France (0.790), Spain (0.880) and Switzerland (0.892), while Italian listed companies scored highest at 0.995. This latter value indicates that on average no significant deviation was found between the share prices and book values of the companies.

According to data by Gornik, Tomaszewski and Jermakowicz [2001] who examined 77 listed companies in Poland between 1996–1998, the average BV/P index value of 0.61 may be considered rather low compared to other European countries.

A comparative study by Hellström [2006] on Czech and Swedish listed companies brought very interesting results in contrast with former research. Dividing the subject period 1994–2001 in two parts (1994–1997 and 1998–2001), he found

that during the two cycles, the market value/book value (MV/BV) ratio decreased from 0.74 to 0.57 in the case of the companies listed on the Prague Stock Exchange, while increased from 2.35 to 2.67 in the case of the companies listed on the Stockholm Stock Exchange. These data have two peculiar aspects: first, the average book value of the Czech companies (increasingly, but perpetually) exceeded their average market value; and second, the value of the index changed in opposite directions in the two countries in the given period.

According to a study by Brimble and Hodgson [2007] on data relating to Australian listed companies in the period between 1973–2001, the average value of the BV/P rate is 0.80, showing that in line with certain European countries and in contrast with research results respecting the US, in Australia there is no significant discrepancy between the book value of companies and their share prices.

The above cited examples from international literature show that there are substantial differences between individual countries concerning the deviation between the market value and book value of companies, and that this deviation is the strongest in the United States.

Comparable information relating to Hungarian companies was published in a study by Juhász [2004] on data between 1999–2002, revealing that in line with international average trends, the average market value/book value (MV/BV) ratio also decreased in the case of the examined Hungarian companies, with an indicator descending under 1.0 by 2002 (meaning that at that time the book value of the firms exceeded their market value). Since the above mentioned study by Juhász [2002], data concerning the relation between the market values and book values of Hungarian companies have not been published until three years ago, and even then predominantly in stock exchange analysts' reports.

In September 2008 Korányi [2008a] wrote that companies listed on the Budapest Stock Exchange (BÉT) were actually worth somewhat less than 150% of their book values. Some of them were being traded at 30–40% of their book value, which means that their market values were significantly lower than their book values. Korányi cites OTP shares as an example, having had a market value equalling five times their book value two years earlier, but displaying a share price/book value (P/BV) index of only 216% at the time of the study.

In November 2008, Mezősi [2008] mentions the fact that the shares of A-class companies are bought for less than the value of the equity per share, which he

evaluates as characteristic of the pessimistic climate at BÉT. According to Mezősi [2009a], the situation further deteriorated by March 2009, with share prices at an average of 70% of their book value. In autumn 2009 the trend was reversed: the market value of companies exceeded their book value. Mezősi [2009] makes note of a 129% average P/BV index for A-class shares traded on BÉT.

On the basis of research results published in international literature, information available on Hungarian companies and my own random sampling checks, I consider that a theoretical analysis of the factors influencing the discrepancies between the market values and book values of companies as well as an empirical research of the same subject performed on a sample of Hungarian companies might prove to be an interesting and useful study subject.

The aim of my research is to explore, by way of empirical analysis, the deviations between market values and book values and the factors affecting their development, in order to offer an explanation concerning those deviation trends. Accordingly, my research is prominently of an exploratory and explanatory nature.

When identifying the factors which impact on the deviations, I will lay special focus on the aim, perception and method of the determination of market value and book value, and on the analysis of the issue of recognisability and inclusion in the balance sheet.

Two groups of hypotheses will relate respectively to the examination of the value relevance of accounting data, and to the deviation between market value and book value. I will use multivariate statistical methods to verify my hypotheses.

Research concluded on 31 March 2011.

2. THEORETICAL FUNDAMENTALS

I shall begin the presentation of the theoretical fundamentals by delimiting the subject matter of my research and by operationalising the terminology used in the dissertation. I will then proceed to the issue of book value, including its theoretical accounting background, a detailed analysis of the factors influencing its evolution, and the presentation of book value as calculated in accordance with present day Hungarian and international accounting standards. The analysis of market value will follow, with a brief overview of its different definitions and the compilation of the factors impacting on its variations. The section on theoretical fundamentals is concluded by an analysis of the deviations between market value and book value and of their potential reasons, as well as the introduction of a proposed multipurpose balance sheet model.

2.1. DELIMITATION OF THE FIELD OF RESEARCH AND DEFINITIONS

In view of the fact that the chosen research subject is situated on the meeting point of several disciplines of economics, and as the present research shall not be able to cover all of the related issues, it is necessary to precisely delimit its subject matter.

The present research:

- applies an accounting-based approach to the subject matter;
- presumes conformity with the principle of continuity;
- uses the definitions presented in the section on operationalisation of concepts and operates within their framework;
- conducts an empirical analysis of a sample of companies operating in Hungary; as a consequence already in the theoretical fundamentals section, in addition to other viewpoints published in relation to the issue, it predominantly focuses on the characteristics of Hungarian accounting regulations and economy.

'Market value' and 'book value' are two fundamental concepts related to the subject matter of my research, also included in the title of this dissertation. It is therefore necessary to provide an exact definition of those key terms first.

'Market value' shall mean the market price of the company, the value at which the present owner of the company would sell and a buyer would acquire the firm; that is, the price at which the transaction would actually be concluded in reality. In the case of listed companies trading in public, this value is incorporated in the share price: the market value of the company is thus equal to the daily price quotation multiplied with the number of issued shares.

'Book value' shall mean the values registered in the balance sheet of the company, showing the value of the wealth of the company in the double dimension of the origin of the wealth and its role in the reproduction process, at a given time. The book value of a company as a whole shall mean the value of its shareholders' equity as indicated in its balance sheet.

The definitions of both concepts essentially correspond to their counterparts used in Hungarian and international literature. The definitions also contain the indicators related to the concepts. In the case of market value, this means the amount for which the given company may be sold, the amount included in the sales documents and, for listed companies, publicly announced in the form of the share price. Accordingly, the indicator of the market value of the company shall be the product of the share price and the number of shares. In the case of the company's book value, the indicator shall be the value of the equity as indicated in the balance sheet drawn up using different evaluation principles; for the sake of comparability with share prices, also the book value per share shall be determined.

Both concepts denote quantifiable and unequivocal data, as the interpretation of the different numeric values should be identical for everyone. Therefore no dimensions (determined aspects or considerations) related to these concepts should be considered.

In addition to the above, I deem it necessary to define the concept of 'deviation', as my research is aimed at the analysis of the phenomenon of deviations between the market values and book values of companies.

'Deviation' shall mean a quantified difference between values.

The above definition of the concept already contains its studied dimensions, as it states that the research focuses on the mathematical meaning and aspect of the concept. The indicator in this case shall be the quantified value of the difference and/or the ratio.

For all of the three concepts defined above, the variables shall be measured on a rating scale: as we are dealing with values expressed in monetary value, it may be established whether they are different or whether one of them is higher or lower, and their difference and ratio may be quantified.

It ensues from the nature of the research subject – aiming to analyse the data contained in the account statements of companies showing a deviation between the market value and book value (and other transactions not displayed in their accounts, as well as the effects of these) – that we may not establish any kind of typology, that is, we may not create categories globally illustrating the common features of two or more variables.

2.2. BOOK VALUE

'Book value' is an accounting concept related to the financial statements of companies. In order to get acquainted with the meaning and content of the concept as well as the factors influencing it, we need to clarify its background from the point of view of accounting theory.

2.2.1. The concept and role of accounting

The concept of 'accounting' has undergone several modifications since its introduction; "today it means the theory and practice of the quantification, monitoring and communication of wealth and its changes" (Baricz [2008], p. 3.).

This formulation makes it clear that the accounting activity is articulated around the wealth – and changes in the wealth – of companies. Its role is to provide information, as the result of practical activity, about the wealth (economic resources and claims), any changes therein, and any effects of these changes.

Accounting, according to a definition by Chambers [1965], may be considered as a kind of language system, subject to substantial interest as a result of its economic subject matter. This general interest in economic data justifies the existence of a set of symbols. Chambers's approach also implies that the main task of accounting is to provide information.

This provision of information may target:

- "first, outside stakeholders getting into contact with the company, to provide a basis for their decisions and for *ex post* evaluation;
- second, the company management, to support executive management decisions and their *ex post* evaluation;
- third, any individuals performing administrative tasks within the framework of the corporate processes, to support their work" (Baricz [2009], p. 17).

In order to ensure that accounting is able to perform its role as a provider of information in line with the users' expectations, it is necessary to display, monitor and communicate on the wealth (economic resources and claims) and its changes.

For the purposes of the present research, aspects related to outside information provision, targeting external stakeholders getting into contact with the

company shall be of outstanding importance, as the book value of a company is determined on the basis of the financial report, and the related balance sheet, drawn up for these actors.

2.2.2. Stakeholder theories

Private individuals and legal entities entering into contact with the company and requesting information thereof represent diverse interests in relation to the company, and therefore their information needs are also different. The mapping of these diverging interests and the information requirements of the different stakeholders greatly contributes to the determination of the objectives of the financial report. And it is especially important to know the aim of the financial report, because it serves as a basis for the deduction of the contents of the values it contains.

Baricz [1999] provides a detailed overview of the theories formulated in relation to the delimitation of the scope of stakeholders. It was in the early 1960s that a connection was first established between the aim of the financial report and the interests of stakeholders. Before that time, the aim of the financial report was deduced from the balance sheet aims, that is, the aims related to the review of the wealth and the determination of the earnings. However, by the 1950s it became evident that these aims are not sufficient to explain the changes in the form and content of the financial report and, within, the balance sheet. Later research confirmed that changes in the form and content of the financial report may be traced back to the changes in the stakeholders' interests and to the evolution of their capacity to assert their interests.

Among the traditional theories concerning the scope of stakeholders, Baricz [1999] highlights the ones relating to owners, units, bases and management.[1] A deficiency of traditional theories is that they fail to identify persons or groups of persons whose interests should be taken into account (cf. unit or basis theory), or they strongly restrict the scope of stakeholders focusing on the interests of individual groups (cf. owner and management theory). The main problem relating to all of these

[1] For further information on these theories, cf. Baricz [1999], pp. 10–11.

interpretations is that in absence of a full mapping of stakeholders, they are unable to provide an explanation for the actual depth and extensiveness of financial reports in practice.

In contrast with former theories, coalition theory[2] considers the company as a coalition grouping together all the individuals and legal entities in direct contact with the company. According to this interpretation, the management of the company compiles the financial report for the other members of the coalition, so that the aim of the financial report is to fulfil the information needs of the members of the coalition, diverse as a result of their diverging interests. All this entails numerous difficulties in the course of the compilation of the financial report, and is evidently conditional on compromises. The aim of the financial report – and as a consequence, the content of the data and values it contains – changes depending on how the interests of the stakeholders are concerted.

The scope of stakeholders comprises all individuals and legal entities entering into direct contact with the company: the owners, the creditors, the managers, the employees, the market partners (suppliers and buyers), the state and the eventual advocacy groups. The members of the different groupings may overlap, but it is the responsibility of the concerned person to resolve that situation by deciding which interest or need they consider as priority in the given situation.

The most complex one of the above mentioned interest groups – and one playing an especially important role in relation to the subject matter of the present research – is the group of owners. Owners may have different objectives in investing their mobile assets into a company. They may acquire ownership in the firm so as to enjoy a dividend on the income it produces and realises. They may be motivated by the prospect of realising a profit by selling their share in the company,[3] in case its value has increased. It also happens that investment into ownership is not driven by one of the above mentioned factors related to income generation, but other economic reasons (such as aspects connected to acquisition or sales, more advantageous

[2] For further details concerning coalition theory, cf. Baricz [1999], pp. 11–19.

[3] Including other ways of extracting their share.

conditions for production etc.) In the latter case the decision of the owner is not based on accounting information; so the mapping of the interests and information needs of the coalition members necessitates the examination of the owners investing with the aim to earn profits.

However, even this group of owners may not be considered homogeneous: one needs to differentiate on the basis of the volume and projected period of the investment, as these factors determine their interests and, consequently, their information needs. Short-term investors[4] strive to maximise profit on the short term, therefore they are interested in the full payment of the divisible earnings produced and realised by the company. On the other hand, owners investing in the long term[5] are also interested in the growth of the company and in the prospect of realising higher profits in future as a result of the withholding of the present profits. Owners with higher shares are able to interfere with the operation of the company; on the other hand, smaller shares are easier to sell, with presumably no substantial loss on their value.

Owners' interests are therefore varied, and so are their information needs. Nevertheless, the following pieces of information are requested by each and every owner:

- a profit and loss account, indicating the extent of and developments in the earnings produced and realised;
- information concerning dividends;
- information on the increases in the value of their investments and its evolution in time.

The next group of stakeholders is that of the creditors who provide financial assets to the company for a limited period of time in order to earn an income from interests. The main interest of creditors is that the company repays the financial assets made available to it within the deadline and with the interest set out in the contract. Therefore they will require information mainly on the future solvency of the

[4] Called 'investors' by Ulbert [1990].

[5] 'Owners' in Ulbert's typology[1990].

company and its willingness to pay. On the basis of past information extracted from accounting data, they try to draw conclusions concerning the future of the company.

Managers as stakeholders shall mean the group of managers employed to perform the executive activities in the company. The interests of this group are related to the maximisation of their earnings and to the achievement of their career goals. If their income is related to the profitability of the company, they are interested in maximising its past and future profits. This will at the same time increase the contentment of owners, resulting from the higher amount of dividend they receive. To achieve their personal career goals, managers need to know the position and potential of the company, and their information needs in this respect are quite as diverging as in relation to other issues concerning, for example, the management of the company or strategic or operative decision-making.

Employees are interested in the proper increase of their salaries, as well as in secure employment and continuously improving working conditions. To this end, information needs of employees and their advocacy groups cover the impacts of past events interfering with their interests, and future-related information affecting their interests.

Market partners are interested in safe and long-term relations with the company, therefore they need information about the acquisition, sales and price policies of the firm in the first place. In the case of cooperations of greater value, they may also be interested to know the economic and financial position of the company.

The state relates to the company predominantly through taxes, and it seeks to earn ever increasing tax revenues as a result of the latter's increasing incomes. Consequently, it needs information on the receipts of the company; at the same time it is also interested in ensuring that the company respects the tax regulations and calculates payable taxes accordingly.

On the basis of the above it may be established that the stakeholders' information needs extend to the past and future conditions of the company

concerning financial position, its changes and earnings position. Among these elements, accounting provides information on the past, using the financial report as its instrument. Coalition members need clear (understandable and transparent), relevant, reliable (accurate, neutral, prudent and complete) and comparable information,[6] and the financial report needs to meet all these quality requirements.

Coalition theory is adapted to explain the depth and extensiveness of the financial report in practice, so I will continue the analysis of the financial report along this line.

2.2.3. True and fair view

Accounting is responsible for providing information to coalition members, according to their interests and needs. However, it is neither able nor expected to fully satisfy all the information need of every stakeholder. The drawing up of a financial report assumes compromises, as it necessitates the synthesis of the different interests and the resolution of eventual conflicts of interest. It shall be the task of the regulator[7] to decide which of the manifold stakeholder interests should be prioritised in the financial report compiled for the coalition members. This decision bears weight, as this choice determines the exact aim of the financial report and, consequently, the values it will contain.

On the basis of the above detailed interests and information needs it may be established that the financial report should show the nominal value of the company's wealth and equity (the financial position of the company) as well as the value of the divisible earnings achieved throughout the period (the earnings position of the company) and changes in its financial position.[8]

[6] For information requirements see Baricz [2009], p. 10.

[7] For the necessity of regulation, see Bosnyák [2003], p. 13.

[8] See Baricz [1999], p. 27.

The financial report should be conform to the philosophy of accounting, and it should provide a true and fair view[9] of the above mentioned factors. To satisfy all these requirements, the financial report should comprise two sections: numbers and text. The numeric part should always contain the balance sheet and a profit and loss account, which may be complemented by other statements depending on the national accounting rules, such as a cash flow statement or a statement of changes in equity. The textual part, called a 'supplementary annex' or 'notes', contains explanations and supplements to the data communicated in the numeric section. These together constitute the financial statement, a complex system, which as a whole is liable to provide a true and fair view of the company's financial position, of changes in financial position and of its earnings position.

For the purposes of the present research, the value of the company's wealth (economic resources and claims) and equity is the most relevant of the information presented in the financial report. These data are provided in the balance sheet constituting part of the financial statements, so my analysis will subsequently concentrate on this statement.

2.2.4. The principle of going concern

The aim of the balance sheet, determined as a result of the prioritisation between the interests of coalition members, will be decisive in the choice of the elements (and their values and forms) that will constitute the balance values describing the company's wealth (economic resources and claims) and, as a consequence, the book value of the company.

In economy, situations occur which influence the priorities established within the interests of the coalition members and, through this, the content of the balance sheet drawn up in the various situations. Such an event may be the discontinuation of the company (or else restructurings which entail the discontinuation of one of the concerned companies). In such cases, priority is accorded to the determination of the

[9] This is the phrasing used in Hungarian accounting practice: as for its content, it is largely similar to terminology used in international practice, and it covers the quality requirements listed above concerning the report.

current value of the wealth in order to support the clearance of accounts between the owners, and the valuation is performed in the light of the principle of time value, at balance sheet date prices.

To avoid the contorting effect of special economic situations, in my research I presumed conformity with the principle of going concern of the company's activity, for this makes it possible to deduce the book value and interpret the different balance sheet models purely along the lines of coalition theory.

The principle of going concern is deemed to prevail if and when the company wishes and is able to maintain its activity in the foreseeable future.[10] In the subsequent part of my dissertation, I will continue to discuss the theoretical fundamentals with this presumption, and the balance sheet theories presented in the next subsection will also be based on this principle.

2.2.5. Balance sheet theories

With the development of accounting, different models appeared, which reacted to new challenges by determining, on the basis of the priorities within the stakeholders' information needs, the primary aim of the compilation of the balance sheet, and consequently by deciding what should be considered as an element; thus they formulated the activation and passivation criteria, and answered the questions relating to valuation theory and structuration theory. Valuation theory means the whole set of valuation principles and the valuation procedures supporting their practical achievement; structuration theory applies to the grouping of elements and to the structural setup of the balance sheet. The ensuing models, called 'balance sheet theories' in literature, synthesised into one coherent, non-contradictory system all of the rules applicable to the compilation of the balance sheet which should be respected to ensure that the balance sheet objective set as a priority may be achieved.[11]

Research into balance sheet theories began early in the 20th century, but relapsed after the 2nd World War, as the focus of accounting research shifted to other

[10] For a comparable interpretation, see e.g. Baricz [2009], p. 21.

[11] For a systematic exposition of balance sheet theories, see Baricz [1999], pp. 139–165.

issues. In the 1960s, the determination of the earnings serving as a basis for taxation – and, as a result, the issue of balance sheet theories – attracted renewed attention. In the 1970s, due to the worldwide appearance of inflation and the elaboration of coalition theory, research into balance sheet theories faced new challenges; as a result, balance sheet theory research extended, beyond the issues related to the compilation of the balance sheet, to the analysis of the relationship between the balance sheet and the coalition members.

Balance sheet theories may be divided into two main groups: materialistic (or classic) and realistic balance sheet theories. Materialistic balance sheet theories start from one balance sheet aim each to deduce the rules of balance sheet compilation (activation and passivation criteria, valuation principles and procedures, structuring of the balance sheet) which allow to reach the planned balance sheet objective. Realistic balance sheet theories, on the other hand, depart from the stakeholders' information needs to analyse the different possible choices in the compilation of the balance sheet, and propose additions to the balance sheet so as to be able to influence the behaviour of coalition members.

Materialistic balance sheet theories were conceived in the second half of the 20th century. On the basis of their main elements – the balance sheet objective, the activation and passivation criteria, the rules of valuation and structuration – the numerous balance sheet theories created in that period may be further broken down into three groups: static, dynamic and organic balance sheet theories.

A common feature of static balance sheet theories is that they prioritise the value of the corporate wealth, and more exactly the value of the equity, and they either do not seek to determine the value of the earnings or they consider it as a subordinate objective. According to these balance sheet theories, the role of the balance sheet is to determine and properly structure and present the company's wealth and, more precisely, the value of the equity. Among static balance sheet theories, the paradigm elaborated by Nicklisch may be deemed as the most significant, as it created the basis of the currently valid structuration system. For the purpose of the compilation of the balance sheet, he recommends the application of the time value principle, although this theory does not yet offer detailed rules for the compilation of balance sheets. Furthermore, mention should be made of Le Coutre's balance sheet concept which is situated somewhat nearer to the next subset of

materialistic balance sheet theories, as its valuation theory is already built on the principle of realisation, although the main focus is still on the presentation of the company's capital structure.

The name and first coherent systematisation of dynamic balance sheet theories was elaborated by Schmalenbach who, when drawing up his balance sheet theory, departed from the fact that in the case of a company that still exists and wishes to maintain its activity, it is less important to know how much its equity would be worth in the case of an eventual liquidation. Accordingly, dynamic balance sheet theories give priority to the determination of the earnings in comparison with the exact establishment of the value of the wealth and the equity. As far as the statements of the financial report are concerned, Schmalenbach stresses the importance of the profit and loss account, and used the balance sheet as a tool to determine the profit realised. His valuation theory builds on the realisation principle, and he recommends the use of historical costs in the valuation procedures. Another prominent system is Kosiol's pagatoric balance sheet theory, identical with Schmalenbach's dynamic theory in its fundamentals, but different in that it deduces the results of the given period from the movements of funds. He also bases his valuation on the realisation principle, and especially on valuation procedures at historical cost.

Organic balance sheet theories did not prioritise between the determination of the realistic wealth value and the calculation of the value of the realistic profit: both of these have an equal weight among the balance sheet objectives. To achieve this, they use a dual valuation in their valuation theory; that is, they recommend the application of the time value principle and valuation at current prices for the establishment of the realistic value of the wealth, while for the calculation of periodic profit the model proposes the realisation principle and valuation at historical costs. The most prominent representative of these balance sheet theories is Schmidt, who recommended compiling two separate balance sheets for the balance sheet date: one by the lines of the time value principle to establish the realistic wealth value, and another by the realisation principle to determine the exact profit.

Realistic balance sheet theories, the other major group of balance sheet theories, made their appearance in accounting research from the 1960s. By this time, researchers became aware that the key values in the balance sheet – the wealth

(economic resources and claims), including the equity, and the earnings – are not sufficient to fully satisfy the coalition members' information needs. For instance, they are not in line with the needs of the owners wishing to trade with their share in the company, who are mainly interested to know how much the elements in possession of the company are worth from the point of view of their potential future uses and prices, and how this affects the profits of the given period.

Part of the research on realistic balance sheet theories intend, in continuation of classic balance sheet theories, to deal with the provision of information within the balance sheet, while another group thinks it possible out of the balance sheet only.

Of the theories promoting the in-balance method, future oriented balance sheet solutions may represent interest for the purpose of the present research. These concepts are based on the idea that beside past company results, the stakeholders also need information about the expected future developments of the profit. They consider that the balance sheet may also be drawn up using future prices, for the determination of which the individual researchers propose different methodologies. A common problem of future oriented balance sheet concepts is that the prediction of future profits brings an uncertain element to the valuation, which results in the fact that the deduced value of the wealth (economic resources and claims) and equity is rather subjective.

Research going beyond classic balance sheet theories consider that additional information may be provided by way of supplementary balance sheets. Of these theories I would like to highlight Heinen's multipurpose balance sheet theory, which states that the information needs of the coalition members (and, as a consequence, the balance sheet objectives) may not be simplified, but should be mapped out precisely. Heinen regrouped the balance sheet objectives, drawing up individual balance sheet compilation rules, activation and passivation criteria, and a valuation and structuration theory for each of them. His model is based on a basic balance sheet compiled at historical prices, showing the value of the realised profit and the company assets at actualised historical prices. This basic balance sheet would then be supplemented by several further balance sheets compiled for different purposes, such as the valuation of the shares.[12] This balance sheet theory reserves a great potential

[12] For details on this balance sheet model, see Heinen [1986].

for the purposes of the present study, so I will come back to it after the detailed analysis of the factors influencing the deviation between the book value and the market value of the companies.

During the description of balance sheet theories, it became evident that when discussing the compilation of a balance sheet, there is a need to determine the activation and passivation criteria adapted to the objective of the balance sheet, and the valuation and structuration solutions to be applied. For the purposes of the present study, the key factors are valuation theory and activation and passivation criteria, so I will concentrate on these in the following sections.

2.2.6. Valuation theory

Valuation theory concerns valuation principles and procedures. 'Valuation principle' expresses the theoretical interrelations between the applied valuation procedures and the value of the wealth, equity and profit, and points out to which of the above listed indicators the balance sheet grants priority. 'Valuation procedure' means the method of valuation, the actual form that the activity takes.[13]

In order to understand the book value of a company, I think it essential to know what are the objectives of and, consequently, the values contained in the company's balance sheet. In this section I will describe the valuation principles and applicable valuation procedures corresponding to the individual priorities, and show what value the above principles and procedures attribute to the wealth, the equity and the profit in the balance sheet.

The realisation principle, and the historical cost model building on the former, give priority to the establishment of the income, and aim to determine a profit which, if extracted from the company, would leave the value of the wealth (economic resources and claims) and the equity unchanged. For this, the assets and equity and liabilities of the company should be valuated at actualised historical prices. Depending on the type of element, the historical price may represent the purchase price, the production cost or the nominal value. By the time of the

[13] For details concerning valuation principles and procedures, see Baricz [1999], pp. 61–79.

compilation of the balance sheet, the historical price is corrected through positive or negative write-offs, in conformity with the changes in value over time, and the deduced actualised historical value will appear as book value in the balance sheet.

In the case of this valuation principle, the wealth (economic resources and claims) and equity figure in the balance sheet at their nominal value of the balance sheet date, showing how much the assets at the disposal of the company (or facing equity in the balance sheet) cost in the past and how much they are worth at present, at actualised historic prices. The value of the earnings in this case expresses the value of the realised profit, as this is the earnings value which, if taken out of the company, leaves the nominal value of the company's equity unchanged.

So the realisation principle subordinates the calculation of the value of the wealth (economic resources and claims) and equity to the establishment of the divisible profit, which means that a balance sheet compiled along the lines of realisation principle should not be expected to show the real value of the wealth and the equity at the balance sheet date.

An advantage of a balance sheet compiled on the basis of a realisation-principle-based historical cost model is that the prices serving as a basis for the valuation of assets and equity and liabilities are, in the majority of the cases, documented historical prices. This should be deemed an advantage even if the actualisation somewhat distorts the overall view, as write-offs are based on estimations. Another advantage of the application of the valuation principle is that it shows the value of the divisible profit, which is required by coalition members; while a disadvantage is that it does not take into account the need, expressed by owners, to determine the real value of the wealth and equity as of the balance sheet date.

The time value principle and the revaluation model built on it give priority to the establishment of the wealth (economic resources and claims) and the equity, and aim to compile a balance sheet which shows the real value of the wealth and the equity. For this, the assets and equity and liabilities of the company should be valuated at current, balance-sheet-date prices. In case the valuation is performed at balance-sheet-date prices, the assets and equity and liabilities are valuated at fictitious prices based on the actual prices at the time of valuation. The valuation should start from the prices corresponding to the assumed market position (replacement price or sales price), which should then be corrected to take into

account the technical state of the given asset, considering the scale of prices available on the market. In the case of unquantifiable assets and equity and liabilities, the book value shall mean the starting point, which should then be corrected with a view to market conditions.[14]

Thus, in case of application of this valuation principle, wealth (economic resources and claims) and equity are displayed in the balance sheet at their real value of the balance sheet date, so their value shows for what amount the assets at the disposal of the company (or facing equity in the balance sheet) could be bought or sold at current prices valid at the balance sheet date. In this case, the value of the earnings is fictitious, as it comprises, in addition to the realised profit, the unrealised effects of the appreciations or depreciations performed during the compilation of the balance sheet.

The time value principle thus subordinates the determination of the earnings to the calculation of the real value of the wealth and the equity, although this earnings, being fictitious, may not constitute a basis for profit distribution.

An advantage of the balance sheet compiled on the basis of a revaluation model based on the time value principle is that it seeks to satisfy the owners' information needs relating to the real value of the wealth (economic resources and claims) and the equity, although it uses current prices which are not underpinned by actual transactions, so their validity may be contested. A disadvantage of the balance sheet compiled along these lines is that the earnings it contains may not be used as a basis for profit distribution, as it also comprises unrealised profits from valuations.

The application of any of the above valuation principles and procedures offers choices concerning the valuation of elements. The question arises if the lowest or the highest of the available prices should be chosen during the compilation of the balance sheet. Account taken of the fact that coalition members are interested in the safe operation of the company in the future, which will entail profit production, it is justifiable to follow the principle of prudent estimation when drawing up the balance sheet in order to create reserves. This principle represents that during the compilation of the balance sheet, the values chosen for application are the lowest ones in the case

[14] For present price valuation procedure, see Philips [1968].

of assets, and the highest ones in the case of equity and liabilities. This entails the introduction of two further principles: the lowest value principle for assets and the highest value principle for equity and liabilities.

2.2.7. Recognition of the elements of balance sheets

To understand the meaning of the company's book value, it is important to clarify, in addition to the issues related to valuation theory described in the previous section, what we consider as elements, in other words, what should be included in the balance sheet, which elements fulfil the criteria of being admitted.[15]

The balance sheet is a document containing the elements at the company's disposal at a given time, in aggregated form, in monetary value, partly as assets (considering their roles in the reproduction process) and partly as equity and liabilities (according to their origins) (Baricz [2009], p. 33.).

In order for the philosophy of true and fair view to prevail (which is a prerequisite towards balance sheets), the balance sheet should meet the following requirements:

- the principle of accuracy,
- the principle of completeness,
- the principle of transparency,
- the principle of consistency,
- the principle of continuity.[16]

Out of the above, the principles of accuracy and completeness apply to the elements which may and should be included in the balance sheet. The principle of accuracy means that the elements displayed in the balance sheet should be really existing, retrievable and verifable, and that they should be valuated using principles and procedures which are in line with accounting rules. The principle of completeness demands that the balance sheet should contain every element that

[15] In this respect see further Bellinger–Vahl [1992], pp. 52–57.

[16] For the detailed explanation of basic requirements concerning the balance sheet, see Baricz [2009], pp. 34–36.

meets the activation and passivation criteria determined on the basis of the aim of the balance sheet.

Activation and passivation criteria mean the conditions of suitability for the balance sheet, that is, the requirements that the given element should satisfy so that it may be activated as an asset or passivated as equity and liabilities. When examining suitability for the balance sheet, we should depart from the concept of 'wealth'.

"Wealth means the totality of phenomena which are at the company's disposal at a given time, with contents identifiable on the basis of their characteristics, and which are measurable and carry economic content (value) for the company" (Baricz [2009], p. 21.).

In the light of the above it may be established that an element may, and indeed should, be included in the balance sheet as an asset (in other words, such an element is recognisable, suitable for presentation in the balance sheet) if:

- it has been created as a result of past activity (or an activity which ensues from processes of the concluded period but will only be settled later);
- it is at the company's disposal at the balance sheet date;
- it carries economic value, i.e. brings profit to the company;
- it may be measured independently, its value may be expressed in monetary value;
- it may be commercialised independently, i.e. may be sold individually;
- it is used either directly or indirectly.

An element may, and indeed should, be included in the balance sheet as equity and liabilities (in other words, such an element is recognisable, suitable for presentation in the balance sheet) if:

- it has been created as a result of past activity (or an activity which ensues from processes of the concluded period but will only be settled later);
- it carries economic value, i.e. has corresponding assets or corresponds to a liability that is reasonably secure;
- it may be measured independently, its value may be expressed in monetary value;

- its payment may be enforced towards the company through economic or legal procedures.[17]

The International Financial Reporting Standards describe similar criteria as requirements for presentation. On the basis of the Framework, it may be stated that an element may be recognised as an asset when:

- it is controlled by the company;
- it is the result of past events;
- it is probable future economic benefit will flow to the entity;
- its cost or value can be reliably measured.

Comparably, an element may be recognised as a liability when:

- it is a present obligation of the company;
- it is arising from past events;
- its settlement is expected to result in an outflow from entity of resources embodying economic benefits;
- its payable value can be reliably measured.

The Framework defines equity as the residual interest in the assets of the enterprise after deducting all the liabilities.

The activation and passivation criteria formulated above seem to be evident and unequivocal. However problems increasingly tend to arise concerning their application in practice, and the scope of elements recognised in the balance sheet is frequently criticised. These observations generally concern immaterial assets.

With the development of economy, new factors emerge which provide competition advantage to the given company. Naturally, following the principle of completeness, every element in possession of a company which complies with the presentation criteria should be included in the balance sheet. This also applies to certain newly emerging or expanding factors which historically did not use to appear in the financial statements. However, in the case of these factors it should be analysed in detail whether the given factor really meets activation and passivation criteria, i.e. if they should actually be presented. Frequently the problem with these

[17] For detailed information on activation and passivation criteria, see e.g. Baricz [1999], pp. 50–51, and Baricz [2009], pp. 40 and 60–61.

factors is that they are difficult to measure and to express in monetary value, which means that they may not be considered as elements and presented in the balance sheet of the company. Obviously, the philosophy of accounting being based on a true and fair view would be prejudiced if the balance sheet contained elements in respect of which no proven and secure valuation methods exist.[18]

This problem is of vital importance for the purposes of the present study, so I will come back to it when discussing the factors influencing the deviation between the book value and the market value of companies.

2.2.8. Current practice

2.2.8.1. Hungarian accounting rules

The rules pertaining to accounting in Hungary and the pillars of the applicable balance sheet model are set out in Act C of 2000 on Accounting. In the light of the above described balance sheet models, it may be established that "our accounting system is built on the further development of the classic dynamic balance sheet theory" (Bosnyák [2003], p. 20.). Accordingly, the determination of the realised profit enjoys priority in the balance sheet assuming business continuity, therefore respecting valuation theory, a historical value model based on the principle of realisation prevails.

When actualising historical prices, in the case of immaterial and tangible assets, it is possible to deduct a predetermined depreciation as a result of the amortisation during use. The Act on Accounting provides for a review at the end of the accounting period based on the market value as known at the time of drawing up the balance sheet. In line with the principle of prudence, when the market value is permanently and significantly inferior to the book value, accelerated depreciation or loss in value should be accounted, depending on the type of asset; when, on the other hand, the market value is permanently and significantly higher, then – easing the classic rigour of the principle of prudence – the Act allows to write back the accelerated depreciation or loss of value previously accounted.

[18] For a similar argument, see Baricz [2008], p. 5.

In addition to the above provisions aiming to assert the historical value model based on the principle of realisation, in the case of certain elements, the Act on Accounting also contains valuation possibilities based on the time value principle, so that the elements in question may appear in the balance sheet at their real value. Such a possibility is the statement of value adjustment; the appreciation to market value should be performed against the equity. In the case of the revaluation of elements in foreign currency according to the exchange rate valid at the balance sheet date, the appreciation of assets and depreciation of liabilities serve the same purpose, but the unrealised effect of this procedure on profit appears in the periodic earnings of the company, and the effect of the depreciation of assets and the appreciation of liabilities likewise, only with an opposite effect (decreasing the profit). For a certain determined set of financial instruments, the Act on Accounting provides for the possibility of valuation at fair value, which is again an assertion of the time value principle, and is accounted partly against equity partly against earnings.

On the basis of the above, it may be stated that in a balance sheet compiled in line with the provisions of the Act on Accounting, the book value of the company fundamentally corresponds to the net wealth calculated according to the historical value model;[19] consequently, the book value of the equity equals the actualised historical value of the assets after deduction of the value of outside funds. However one must be aware for which elements the Act allows the application of a valuation procedure based on the time value theory, and when analysing the book value of a firm, it is advisable to consult the notes to the balance sheet to see whether the company has taken advantage of the possibility to valuate at current prices, so as to take this into account during the assessment of the value of its net wealth.

2.2.8.2. International Financial Reporting Standards

As a result of the legislative harmonisation following the accession of the country to the European Union, the Act on Accounting provides that in respect of consolidated financial statements of listed companies, from 1 January 2005,

[19] For details on the concept of net wealth, see Bosnyák [2003], pp. 20–21.

International Financial Reporting Standards (IFRS)[20] shall be obligatorily applied. With regard to the fact that I seek to perform the empirical study through the analysis of Hungarian listed companies, I deem it necessary to describe the contents of the balance sheet compiled in line with IFRS and, consequently, of the book value of companies.

The IFRS system is built on the coalition theory, and recognising the fact that a general purpose financial report is unable to satisfy all stakeholder needs, it prioritises the interests and information needs of a certain chosen set of stakeholders: investors, lenders and other creditors. Respecting valuation, the Framework recognises that currently different combinations of several valuation procedures appear in the financial report; these are:

- historical cost (for which the asset was purchased or the liabilities was recorded at the amount of proceeds received in exchange for the obligation);
- current cost (for which the asset could be purchased or the liability could be settled at present);
- realisable (settlement) value (which could be realised from the selling of the asset or expected to be paid to satisfy the liabilities in the normal course of business);
- present value (the value of estimated future cash in- or outflow discounted to present value).

At the same time the Framework states that the measurement basis most commonly adopted in financial statements is historical cost, although usually combined with other valuation procedures. Accordingly, in the balance sheet compiled in application of IFRS, the historical cost model based on the realisation

[20] The International Accounting Standards Committee (IASC), operative between 1973–2001, elaborated International Accounting Standards (IAS). In 2001, IASC was replaced by the International Accounting Standards Board (IASB), which entailed the modification of the name of the standard to IFRS. The former IASs will remain valid, with an unchanged name, until amended or repealed. The standard system is constituted of IAS and IFRS standards and their interpretations, drawn up by the Standing Interpretations Committee (SIC) until 2002 and subsequently by the International Financial Reporting Interpretations Committee (IFRIC) (Balázs et al. [2006], p. 7.).

principle, and the revaluation model based on the time value principle are present in parallel.

IASB is now working on the revision of the Framework: the result of this lengthy work process will probably affect not only the issue of valuation but also that of display, i.e. of recognition in the balance sheet.

2.2.9. Which way to go now? – Diverging views in valuation theory

In the light of current practice, having got acquainted with the contents of the book value as appearing in the balance sheet, it is worth mentioning that neither in accounting science, nor in regulation (standardisation) is there agreement between experts on which valuation principle and procedure should preferably be used in practice. Let us now analyse the differences in the approaches to that subject.

2.2.9.1. Diverging views in valuation theory on accounting science

Staubus's [2004] view, dating back to several decades, is best reflected in current international practice. This approach is based on the idea that the main objective of the financial report is to be useful to decision making. Among stakeholders, it focuses on present and future shareholders whose interest (according to Staubus [2004]) is mainly directed to the future solvency of the company. Considering that these investors make their decisions on the basis of cash flow, they are primarily interested in the cash flow of the company, based on expected future developments. Obviously, this has an impact on assets and equity and liabilities, which – according to this approach – should preferably be valuated at market value. Due to the specific nature of the individual assets, their effective market value could only be known after their eventual outflow from the company; therefore this market value should be made up for by different replacement values. It is important that the replacement values should be determined in a way that they reflect market conditions and economic principles. Accordingly, Staubus [2004] considers that several different valuation procedures may appear in relation to book values, depending on which of them reflects best the market value related to the outflow.

Another view based on the time value principle, also described by Staubus [2004], was expressed by Chambers. Chambers [1965] builds on the idea that accounting as a language system is responsible for conveying information about the company. In his approach the priority stakeholders are the managers and owners who, in Chambers's opinion, request information on the financial position and the current solvency of the company. To satisfy this information need, elements have to be valuated at market value. According to Chambers, elements having a positive effect on solvency (assets) need to be included in the balance sheet at their net realisable values; on the other hand, elements detrimental to solvency (equity and liabilities) should be indicated at the value of an eventual settlement at present. The main difference between this approach and Staubus's is that while the latter allows the coexistence of different valuation procedures in the balance sheet, the former only accepts one procedure.

Also Baricz [2008] supports the application of a homogeneous valuation procedure, arguing that mixed cost estimates confuse value relationships within the balance sheet, which entails that the values contained in the statement fail to allow fair comparison on the basis of the indicators requested by stakeholders. Baricz [2008] considers that a balance sheet with elements valuated in different ways in the different lines does not reflect a clear and accurate view of the company's position, so such values may only be presented in the statement if it contains another set of values based on a homogeneous valuation principle. The duplicating of the value sets of the balance sheet is inevitable to allow differentiation between values that are comparatively secure (homogeneous) and those which contain an element of insecurity (mixed cost). Because of the double effort intensity, Baricz [2008] considers this solution to be applicable only in case of a restricted set of companies. Furthermore he calls attention to the dangers of a situation where only the interests of a limited scope of stakeholders are asserted in the regulatory process.

The three approaches outlined above also highlighted the fact that prioritisation within stakeholders' interests plays a vital role in the choice of values contained in the balance sheet, and consequently in the development of the book value of the company. Actually, the designated priorities determine the aim of the balance sheet, which defines the valuation theory and procedure necessary to achieve these goals.

2.2.9.2. Diverging views on fair value in standard generation

As I already mentioned in the review of the present IFRS practice, the revision of the Framework is under way, which will also encompass, among other things, the activation and passivation criteria and the valuation procedures to be generally applied during balance sheet compilation. Concerning issues related to valuation theory, two views are dominant among standard developers: the fair value approach and an alternative approach contesting the former.

Whittington [2008] describes both views in detail: I confine myself to highlight their principal characteristics. Both approaches support valuation at current prices: the difference is in the choice of the current prices they prefer to use for the valuation.[21]

According to the fair value concept, the aim of the financial report is to effectively support economic decisions. Among stakeholders, priority is accorded to present and future investors, mainly oriented towards the forecast of future cash flow. The primary requirement towards the financial report is relevance. Reliability is a less important requirement in this respect, and tends to be replaced by the criterion of faithful representation. According to this view, accounting information should reflect not the past but the future; past transactions have only a peripheral relevance, in as much as they impact on the future developments of cash flow. Market prices provide an informative, not company specific estimate of cash flow, so the convenient basis for valuation would be the fair value, defined as the market sales price. The fair value approach assumes that markets are generally complete and efficient enough to ensure faithful representation. Within the financial statements, the balance sheet is considered to be the basic statement; the earnings displayed in the profit and loss account is consistent with the changes in the net asset values.

According to the alternative approach, in contrast with the above, the financial report would aim not only to ensure usefulness but also to support account settlement towards the present shareholders. This demonstrates clearly enough that the group prioritised by this approach is that of the present investors, whose reactions

[21] On this subject see also Ronen's [2008] study examining the above problem in relation to corporate governance, and Turley [2008] on the former.

to the financial statements impact on management decisions. This view considers it important that the financial statements should be reliable, as it seeks to dissolve information asymmetry in a world full of uncertainty; for the same reason, prudence also plays a significant role by strengthening reliability. Past transactions and events are important not only for the purpose of account settlement, but also because they constitute inputs for the forecast of future cash flow; consequently, past or present cost may be a relevant basis for valuation. The alternative approach supposes that the markets are neither perfect nor complete, so market opportunities are company specific. Accordingly, the financial statements need to reflect the financial performance and situation of the firm as well, and in a way (specific to the company) which throws light on its market opportunities. This view considers it possible, in certain circumstances, that the changes in financial situation and the presentation of the earnings may be more important in the financaiol statements than the balance sheet, but the consistency between the statements for the given period and the balance sheet should not be lost.

Whittington [2008] represents that the above described alternative view is not yet fully elaborated: it does not constitute a consistent model, but carries numerous variable elements. In his opinion, the so-called 'deprival value model', already published in academic literature, is a well-founded approach which contains the elements of this view. This approach does not support the imposition of a valuation procedure for general use, but professes that the valuation procedure to be chosen should be adapted to the company's management model, implying that it allows for the use of several valuation procedures in parallel.

It is evident from the description of the above views that the difference lays primarily in the choice of priorities among the stakeholders, and consequently in the identification of the aim of the balance sheet.

It would be interesting to perform a detailed analysis of the valuation principles and procedures to be applied in future, but this might constitute the subject matter of another individual research. Considering that it is necessary to know the content of the book value as applied in current practice in order to ensure a good theoretical foundation to empirical research, I will dispense with a more detailed discussion of the possible trends in expected future changes.

2.3. MARKET VALUE

2.3.1. Concepts and interpretations relating to the market value of companies

2.3.1.1. Market value and intrinsic value

Literature uses different concepts and interpretations relating to the market value of companies.

Pratt [1992] uses the term 'fair market value' which he defines as 'the cash or cash equivalent price at which asset would change hands between a willing buyer and willing seller, neither being under a compulsion to buy or sell and both having a reasonable knowledge of the relevant facts' (Pratt [1992], p. 12.). An important element of the definition is that the parties are able and willing to enter into the transaction. Accordingly, fair market value represents a price at which the transaction is concluded or would be concluded at a given time in the given conditions. In relation to this, Bélyácz [1995] calls the attention to the fact that a real market value may only come into being as a result of a transaction that has actually been enacted; in all other cases it is nothing but an unfounded estimate.

In connection with the notion of market value, I need to mention the concept defined by Pratt as 'investment', 'basic' or 'intrinsic' value. This means the amount that the given investor considers as the "real", "actual" value of the share. Several methods are described in literature for the definition of intrinsic value, such as the Gordon model based on the estimation of future dividends; or another paradigm which developed in parallel with the former, Miller and Modigliani's dividend irrelevance model, laying dividends aside and concentrating on investments instead; or even the continuous value concept taking net profit as its starting point and introducing free operating cash flow, which was elaborated by Weston and Copeland

and further developed by Copeland, Koller and Murrin by dividing the time horizon in two sections.[22]

In case of an efficient stock market, the fair market value (the price) of a company corresponds exactly to its intrinsic value. This is only possible if the enterprise represents the same subjective value for all parties present on the market, that is, their individual estimates as to the value are identical: in this case the subjective intrinsic value may become an objective fair market value. A sales transaction enacted in such balanced conditions would not entail any profit or loss to either party. In absence of potential gains, however, investment literature considers that in such a case it is not justified to buy or sell on the stock market. When the market value is below the intrinsic value, purchase, and in the opposite case, selling may be considered as a reasonable decision. However intrinsic value and the sales decision should be constantly reassessed on the basis of available information.[23]

In their work considered as the Bible of stock analysis, Graham and Dodd [1934] also draw attention to the difference between *intrinsic value* and *market value*. By intrinsic value they mean the values determined on the basis of facts – such as assets, profit, dividend and forecasts – as opposed to market prices based on artificial manipulation or distorted by psychological effects. They also stress the fact that intrinsic value is not as evident and easy to determine as market price.

In relation to the value of the enterprise, Bélyácz [1992a] mentions three dimensions of value: *individual*, *market* and *intrinsic value*, and stresses the importance of their comparison. In his opinion, "intrinsic value is the centre of mobility of the on-market testing of the individual estimation of value" (Bélyácz [1992a], p. 7.). According to this approach, the subjective, *ex ante* estimate of value is 'individual value'; the *ex post*, figure describing the "real" value is 'intrinsic value'; while the price appearing in the sales transaction is 'market value'. Bélyácz [1995] stresses that the estimation of intrinsic value may be based on the cash flow of

[22] For more details on the definition of intrinsic value, see e.g. Bélyácz [1995], Copeland–Koller–Murrin [1999] and Damodaran [2005].

[23] For more details, see Bélyácz [1992a], pp. 12–17, and Pratt [1992], p. 15.

anticipated future yields, but the relationship of the latter with market value is far from being clarified.

Like Pratt, Hitchner [2003] deduces market value from price, defining the market value of companies as the product of the share price and the number of issued shares.

2.3.1.2. The concepts of wealth value and capital value

Bélyácz [1992a] also reveals that when analysing the value of a company, difference needs to be made between its *wealth value* and its *capital value*. These two dimensions of value should be distinguished and may not supersede each other.

Wealth value means the value of the wealth elements of the enterprise. As accounting uses this approach, its features have been developed in detail in the chapter on book value.

The capital value approach is based on the estimation of the revenue and cash flow generated by the future operation of the elements. This is a future oriented concept, considering the enterprise as an operating system and focusing on its future opportunities. In the operation of the enterprise, Bélyácz [1992a] regards wealth as the passive factor and the human capital operating it as the active factor. In this approach, capital value means the permanent capacity of the company to produce income, which always depends on the quality of the management. Thus, capital value is "determined by the human capital, intellectual capacity and entrepreneurship within the company, as well as its market relations and the quality of its management" (Bélyácz [1992a], p. 11.). This clearly shows that capital value greatly depends on the activity of the managers who operate the wealth.

Also Ulbert [1994] discusses wealth value and capital value in detail, although he calls the latter the 'yield value' concept. He considers that intrinsic value is a certain combination of wealth values and capital values, representing the centre of mobility for market value from which it may not diverge for a longer period. He does not state whether it is the wealth value or the yield value concept which reflects intrinsic value more faithfully; he considers these two principles to be two different yet equivalent ways to approach intrinsic value. At the same time he states that "no

direct relationships have been revealed between either market value and wealth value or market value and yield value" (Ulbert [1994], pp. 100.).

2.3.1.3. The concept of market value in the intrepretation of the present study

Building on Pratt's [1992] definition of fair market value, by 'market value' I mean in the present study the market price of the company, that is, the value at which the present owner of the company would sell and a buyer would acquire the firm; the price at which the transaction would actually be concluded in reality. In the case of the listed companies trading in public which I included in my research, this value is incorporated in the share price: the market value of the company is thus equal to the daily price quotation multiplied with the number of issued shares.[24]

In my empirical research I examined listed companies, as this is the type of enterprise relating to the market value of which information is publicly available. Share prices indicate the prices applied for the purpose of sales transactions performed at a given date, which provides research values which relate to transactions that have actually been carried out and are not merely based on estimations of the market value of the companies.

In the following sections I will examine market efficiency, as well as share prices and the factors influencing their development, to support the description of the theoretical background of the research.

2.3.2. The issue of market efficiency

In the case of a stock market functioning as a perfectly competitive market, the best indicator of a company's value is the share price.[25] A perfectly competitive market is a market with no entry and exit barriers where the perfectly informed players consider share prices as an external feature; the prices are determined by the balance of supply and demand and reflect the totality of available information.

[24] This phenomenon is also called 'market capitalisation' in literature.

[25] For more details see Bélyácz [1992a], p. 9.

In Bélyácz's [1995] view, on an efficient stock market the market value and the intrinsic value should be identical. Consequently we may consider a market to be efficient if the value of each of the securities reflect at all times all the available information that ensures the correspondence of the market value and the intrinsic value. If we consider a balance situation resulting in the identity of the market value and the intrinsic value to be the prerequisite of efficiency, then very rarely could we consider the market to be efficient, for the equivalence of market value and intrinsic value prevail only on the average of a longer period of time.

Jaksity [1998] thinks that the yields achieved by investors indicate if the market is efficient. On an efficient market there is a situation of balance, so it is impossible to reach a yield that is higher than the average. However there are some investors who consistently earn higher yields than the average (i.e. extra profit), which points to the fact that the efficiency of the market is not faultless.

In Higgins's [2000] opinion, the market may be considered efficient if prices react to new information quickly, and the present prices fully reflect all the information available in connection with the traded instrument.[26] [27]

An interesting idea in Higgins's [2000] approach is that "rather than being an issue of black or white, market efficiency is more a matter of shades of grey", meaning that a market may be more efficient or less efficient. He also thinks that account should be taken of the fact that market efficiency is a matter of point of view, perceived differently by actors in possession of differing pieces of information.

Accordingly, he distinguishes three forms of efficiency: weak, semistrong and strong. On a "weak" efficient market, all past market prices and data are fully reflected in present securities prices. The "semistrong" form of efficiency asserts that all publicly available information is fully reflected in securities prices. In case of

[26] As far as the reaction of the market to new information is concerned, Higgins [2000] cites a study published in 1995 by Louis Ederington and Jae Ha Lee, who think that regularly issued news change prices within 10 seconds of their publication, and it does not take more than 40 seconds for their effect to reach its full extent.

[27] On the theory of efficient markets see also Bodie–Kane–Marcus [2005], pp. 401–441, and Damodaran [2006], pp. 111–150.

"strong" market efficiency, all private and public information is fully reflected in securities prices.[28]

It is clear from the above that the assessment of market efficiency is far from being homogeneous in literature; thus it is justified to examine how perfect and/or efficient the markets should be considered according to the views currently accepted in economics.

In the last decades of the 20th century, neoliberal economics marked by the names of Friedrich Hayek and Milton Friedman and with a stress on 'free market' and 'laissez-faire', replaced Keynesian economics and became dominant. The paradigm, also known as 'market fundamentalism', is based on the idea that the only solution that works for market competition is deregulation, privatisation and a non-interventionist free market.[29]

As a result of the financial and economic crisis of 2008, in recent years the efficacy of the neoliberal ideology seems to be challenged ever more frequently. In Stiglitz's [2009] view, the market is unable to regulate itself and to efficiently allocate resources; he states that the neoliberalists were mistaken in their faith in the 'invisible hand', the hand being 'invisible' because it does not exist at all. He considers that other trends in modern economic theories (such as his own, the theory of imperfect information) explain why the markets failed to function as perfectly as had been expected. His concept could be summarised by stating that in cases of imperfect or asymmetric information or imperfect risk markets, the market balance failed to establish itself in a Pareto efficient way. To this he cites the recent financial and economic crisis as an example. According to the neoliberal economic approach, in such cases patience is required, as in the long run the self-regulating market mechanism will become operational and re-establish balance. Stiglitz [2008b], citing Keynes, reacts to this view by arguing that we cannot wait for this to happen, because "in the long run we are all dead".[30]

[28] For details see Higgins [2000], pp. 168–172.

[29] For more details see Berend [2004].

[30] For details on the lack of market efficiency, see e.g. Stiglitz [2009], [2008b], [2008c].

On the basis of the above ideas we may conclude, overall, that views prophesising the supreme perfection and efficiency of the market seem to be defeated. Nevertheless for the purposes of empirical research, share price may be conveniently used in the analysis of the company's market value, as it is based on enacted transaction and consequently reflects effective prices instead of uncertain estimates.

2.3.3. Share price: intrinsic vs. speculative value?

Barker [2001] stresses the need to differentiate between types of share prices: in his opinion these may reflect either fundamental (that is, intrinsic) value or speculative value. Fundamental value means the value of long-term capital investment, while speculative value represents the value realisable on the short term through speculative trading.[31]

In his opinion, there is no guarantee that at any given minute, the share price would reflect the fundamental value. Citing J. M. Keynes, he states that in most cases the speculative value prevails in share prices, for the stock markets are driven by the investors' mood and rationality, and as a result of this speculative behaviour, market value is bound to diverge from fundamental value.

Keynes identifies future uncertainty and liquidity as two features of stock markets leading to speculative behaviour. These two factors, according to Keynes's theory, generate a speculative bubble. The key feature of the first factor, the future uncertainty factor, is that it is determined by the investors' perception of the present stock market values. In Keynes's opinion, on the basis of present information, market investors form generally accepted beliefs (expectations) regarding the uncertain

[31] In relation to this, mention should be made of the fact that literature differentiates between the categories of investor and speculator. For details, see e.g. Jaksity [1998], pp. 388–389., or Graham–Dodd [1934], pp. 50–56.

future, assuming that the present situation remains unchanged. In addition, there is the aspect of liquidity in the background.[32]

To illustrate the relevance of Keynes's theory, Barker [2001] cites the internet bubble of the late 1990s when the rise in share prices was incorporated into the investors' expectations, leading to an increase in demand and, consequently, to further price rally, until the bubble finally burst out.[33]

2.3.4. Factors influencing the development of share prices

2.3.4.1. On the development of share prices

Market value is always the result of a consensus which assumes that the transacting parties need to adjust their individual estimates; furthermore, several other factors influence the development of market value. Bélyácz [1992a] (p. 12) considers that "market value always depends on the momentary individual preferences and caprices of the participants of the business transaction, on the psychological climate of organised stock markets, on the volatility of business trends, on political circumstances, on the general trends of economic development, and several similar factors". In addition, the current volume of market sales also directly impacts on the evolution of market value.

According to Pratt [1992], individual estimates are based, in addition to the value of the company's assets, on information concerning the expected future profit and dividend and on projected future growth rate. The subjective value estimated on the basis of these pieces of information are necessarily different for each market player, for in addition to the differences in their estimates of future data, there may also be a variation in their willingness to take risks, their position concerning taxation, and the synergies of the share with their other interests.

[32] Examining the reasons for deviations of share prices from analyst forecasts, also Graham and Dodd [1934] (pp. 20–22) reach a comparable view. In their opinion, the reasons for the deviation are the erroneous starting data, future uncertainty and the irrational behaviour of the market.

[33] For further details, see Barker [2001], pp. 5–10.

In Tompa's [1995] opinion in addition to the book value of the wealth, the market value of companies is influenced by the current market value of the wealth and also by yield value. More precisely, the share price is scarcely influenced by the wealth value; much more substantially by the calculated yield value which depends on the after-tax profit and the business perspectives of the company.

He thinks that the development of share prices is influenced mostly by public information such as the equity capital of the company, the nominal value and issue price of listed shares, the evolution of the profit and profitability data of the company, the amount of payable and expected dividend, and the value of the P/E indicator calculated as the fraction of the share price and the after-tax earnings, quantifying the return on equity. Furthermore, the variations in share prices are also influenced by other factors such as demand and supply, stock exchange turnover and liquidity, the appearance of large-scale investors, stock exchange speculation, and the confidence or lack of confidence in the shares.

Similarly, also Bélyácz [1995] stresses that numerous factors impact on share prices. They may be deprecated as a result of factors such as general shortage of capital, limited access to the market, unsatisfactory management competence, restrictions on global competitiveness, or a situation where a substantial number of owners simultaneously seek to get rid of their shares.

Barker [2001] highlights that valuation on financial markets is always relative, as the investor assesses the yield offered by he given investment in the light of the yields realisable through other possible investments. This emphasises the fact that all valuation is relative, and nothing may be assessed in itself only.

In Rappaport's [2002] view, share price is the clearest indicator of market expectations concerning future performance. He conceives stock exchange valuation as a process which departs from data relating to corporate planning and performance assessment, then proceeds through reports and statements towards the assessment by the stock market of the information communicated to the market players; it is as a result of this process that share price is formed, reflecting the expectations concerning the future performance of the company. A peculiar feature of

Rappaport's theory is the idea that share prices, in turn, influence the performance of the company; as a result, he draws up stock exchange valuation as a cyclic process.[34]

Also Damodaran [2006] is of the opinion that the market value of the company reflects market expectations concerning the future cash flow of the company and its ability to earn profit.

2.3.4.2. Different approaches to share valuation

Woolridge and Gray [2003] explain that there are three approaches to share valuation, each of them tracing back the development of share prices to different factors, and presenting different ideas as for the relationship between share price (as market value) on the one hand, and intrinsic value on the other hand.

According to the technical analysis, share prices are influenced on the short term by changes in market psychology and in supply and demand. Consequently, according to this approach, the movements in share prices would be driven exclusively by psychological, technical and cosmic factors, and as a result there would be no necessary relationship between share price and intrinsic value.

Fundamental analysis holds that the value drivers of share prices are profit and dividend; thus, share price is determined by the present and future operation and financial performance of the company. According to this philosophy, share price conforms to intrinsic value on the long run, and is ultimately identical with value.

Modern portfolio theory declares that risk and return on equity are the drivers of the evolution of share prices. This philosophy considers the market to be efficient, where all information is quickly incorporated into prices and, as a result, the share price always equals the intrinsic value. According to this view, no over- or undervalued shares may ever exist.[35]

[34] For details, see Rappaport [2002], p. 118.

[35] For details, see Woolridge–Gray [2003], pp. 15.5–15.11.

2.3.4.3. Classification of the factors influencing share prices

After a systematic review of the approaches published in academic literature, I think that factors influencing share prices may be classified as described in the following sections.

Corporate data and forecasts

As we could see above, the development of share prices is influenced, among other things, by the value of the wealth of the company. However, it was stated that this influence is minor. A more influential factor is the capital or yield value, meaning a subjective estimate concerning the value of the future profit and dividend. These future expectations also imply an assessment of the competence of the company management, for human capital governing the company's wealth is of vital importance from the point of view of yield values.

In relation to the above, I need to mention that also news about the investment plans of companies bear upon the evolution of share prices, as they influence future expectations.

It is a popular idea among investors that the stock exchange forecasts variations in the companies' results. This idea is based on the view that share prices are determined by the forecast of earnings and dividend data: according to this scenario, share prices are able to forecast the development of the earnings, supposing that the estimates concerning the earnings and dividends proved to accurately approximate later actual values. Reacting to this assumption, Lovas [2010c] declares that experience contradicts this idea, as in his opinion they show that the market is not able to do more than reflect present earnings data, and even that only in an optimal case.

Business environment

In addition to (and actually through) the ability of the company to earn profits, its environment also bears on the development of share prices. Such influencing factors may be the characteristic features of global, national and sectoral

economy, the trends in economic development, the evolution of the situation regarding competitiveness, and general politics.

Also Bodie, Kane and Marcus [2005] draw attention to the fact that by affecting future profitability, macroeconomic and sectoral circumstances greatly influence the share prices of a company. Regarding the analysis of the business environment, they stress that the broader environment, the special features of the global and national economy, as well as the immediate environment such as sectoral characteristics, should equally be given consideration.

Thus, the stock market and share prices reflect the economic situation. Lovas [2009g] demonstrates that this also holds true for the labour market situation. He argues that experience from the last 60 years shows that a stable rise in share prices necessitates a robust labour market. This is explained by the fact that the restoration of labour market stability (i.e. the decrease of unemployment) necessitates a rise in economic activity, which also contributes to a rise in share prices.

Within the effects of politics on the stock exchange, Lovas [2010b] examined the influence of elections. Citing a research made in the United States concerning the period between 1833–2004, he states that markets perform best in the years preceding presidential elections; also significant rises are registered in the years of the elections; while in the first year after, and even in the first half of the presidential term, share prices only rise in a much more modest fashion. However this phenomenon was not described in relation to the Hungarian stock market; fallbacks following parliamentary elections always had international reasons.

Psychological and other factors

The development of share prices is influenced, in addition to those stated above, by various psychological and other factors. Technical analysis considers that in the short term, these are the only factors that shape share prices. Such factors may be, among others, the stock exchange climate, the evolution of supply and demand, the volume of the transaction, the appearance of large-scale investors, speculation, as well as confidence in the stock markets, the country, the national economy, the sector or the given company.

Koller, Goedhart and Wessels [2005] stress the fact that the market tends to overreact to information such as negative news about company managers or faulty

construction found in a minor product of the company, even if it is only one of a range of more important good quality products.[36] They draw attention to the opportunities offered by cycles in case of sectors of a cyclic operation, which may affect the effectiveness of the company, and consequently may also impact on share prices.

Damodaran [2006] proposes a theory on behavioural finance, which essentially analyses the investors' irrational behaviour using psychological models. The major sign of irrational behaviour is the aptitude of investors to overreact certain information, and to buy and sell in herds. This behaviour may cause significant deviation between share prices and their actual intrinsic value, which may also lead to bubble formation.[37]

Share prices are also influenced by such other factors as investor manipulation and speculation. An example of this behaviour is presented by Lovas [2009i], while Kostolany [1990] cites several.

Damodaran [2006] shares another interesting observation: share prices significantly rise in January, due to the trading habits of institutional investors. who (for reasons related to taxation) sell those investments at the end of the year which have lost price over the year, thus realising the loss, and begin to buy again in the first days of the new year.[38]

2.3.4.4. Graham and Dodd on share prices

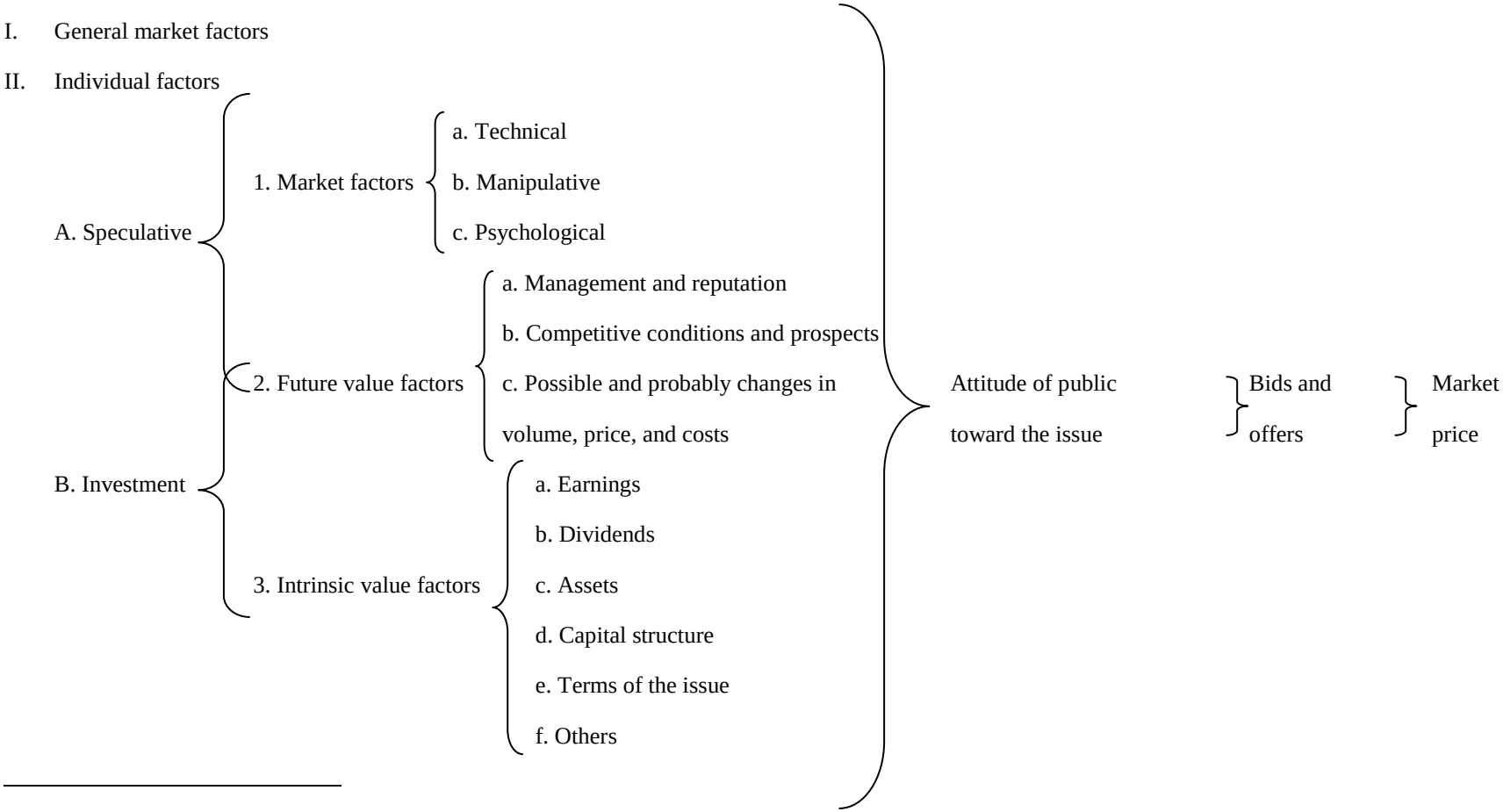
Graham and Dodd [1934] assembled several factors influencing share prices in the following figure, showing how the different elements build up share price.

[36] Also De Bondt and Thaler [1985] analyse the aptitude of the market to overreact.

[37] For more information on the theory of behavioural finance, see Damodaran [2006], pp. 130–131.

[38] About the 'January effect', see Damodaran [2006], pp. 139–141. The same study also contains observation data on the 'weekend effect'.

RELATIONSHIP BETWEEN INTRINSIC VALUE FACTORS AND MARKET PRICES[39]



[39] Graham–Dodd [1934], p. 23.

Among factors influencing share prices, Graham and Dodd [1934] differentiate between general market factors and individual factors. Individual factors comprise investor and speculative effects, the former being fact-based while the latter containing elements deterring from factuality.

Intrinsic value factor is considered to be a factor of partial and indirect influence. Partial because it shapes the value of share price in concurrence with purely speculative factors; and indirect because it exerts influence through the intermediary of individuals' opinions and decisions. They compare markets to voting machines registering the choices, based partly on rational arguments and partly on feelings, of innumerable market players.

Because of its uncertainty, they classify future value factor as both an investment factor and a speculative factor.

They call the third large group of individual factors 'speculative market factors', containing, besides technical elements, various manipulative and psychological components.[40]

[40] For details, see Graham–Dodd [1934], pp. 23–26.

2.4. POSSIBLE EXPLANATIONS FOR DEVIATIONS BETWEEN MARKET VALUE AND BOOK VALUE

2.4.1. Explanation of the deviation by items missing from the book value

2.4.1.1. Review of the missing items

Certain studies having researched into this subject explain the deviations between market value and book value by certain deficiencies of the accounting system. These approaches depart from the fact that the characteristics of economy have changed, and examine the issue from the viewpoint of value creation.

Boulton, Libert and Samek [2000] explain that the world of business has changed, market competition has been transformed, and the companies need to adapt to this.[41] To illustrate this, they use the results of their own research which found that in the period between 1978 and 1998, the ratio between book value and market value decreased from 95% to 28%. They cite Microsoft as an outstanding example, with a market value of USD 600 bn and a book value of only USD 31.3 bn at the end of 1999.

For the operation of companies and value creation, different and new asset types are needed compared to what had been sufficient in previous decades. Such key assets are, among others, buyers, brands, suppliers, employees, licences and ideas. These assets of an immaterial type[42] necessitate a different kind of management and measurement than those used previously.[43] In their opinion, the balance sheet of a company (and, as a consequence, its book value) should also

[41] Similarly, Eckstein [2004] draws attention to the expansion of knowledge-based companies.

[42] I call these factors 'of an immaterial type' so as to differentiate them from the concept of 'immaterial assets' used in accounting.

[43] Among others, Eckstein [2004] as well as Barber and Strack [2005] stress the relative increase and the importance of assets of an immaterial type.

contain these factors, as a successful combination of these has the potential to create the greatest value for the shareholders.

Boulton, Libert and Samek [2000] classify assets into five categories:

- Physical assets: land, building, equipment and stocks, i.e. assets of a tangible form.
- Financial assets: Financial instruments, claims, investments, relations with owners and creditors, i.e. factors that determine the financial position of a company.
- Employees and suppliers as an asset: each element of the supply chain, i.e. the members of the chain of value creation.
- Buyers as an asset: also including the market relations of the company.
- Organisational assets: the broadest category, comprising structural and intellectual assets such as leadership, strategy, corporate culture, different values, systems, processes, innovative capacity, brands and knowledge.

The above categories of assets contain those which appear in the balance sheet, but also items that may not be presented in the balance sheet, and which consequently are not taken into account for the purposes of the book value.

In the authors' opinion strategy, i.e. finding the optimal combination of the above assets, would be the key factor in the success and value creation of a company.

For a better understanding of the assets, they have elaborated the following basic principles:

- Assets may be materialised or of an immaterial type.
- Assets may be defined as sources of future value.
- Assets may be owned or not owned, controlled or not controlled by the company.
- Each asset has an output, which may be mapped.
- Each asset has a life cycle.
- Assets need to be managed in order to be able to create value.
- Assets have inside and outside sources of value; thus outside relations are also considered as assets.

If we compare these basic principles with the criteria applicable to the recognition of the elements in the balance sheet (as described in Chapter 2.2), we experience deviations on several points; as a result it may be established that not all of the asset categories determined by the above authors may be included in the balance sheet.

From the study described above, we may see that it approaches the market value of a company primarily from the point of view of value creation. It assumes that market value is determined by factors playing a role in the company's value creation. Furthermore, it fails to analyse the objective of the balance sheet and, consequently, to establish what kind of value book value represents.

We could enumerate a great number of studies based on this approach. The individual researchers make up different categories of the items not included in the balance sheets, which they identify as intellectual capital, mental capital or immaterial property; yet the basic idea behind their research is the same. For the sake of comparison, I shall enumerate some examples of systematisation.[44]

Maritan and Schnatterly [2002] stress the importance of assets of an immaterial type and use these to explain the deviations between market value and book value. According to their approach, these assets of an immaterial type include technologic resources and facilities such as accumulated knowledge, ability and reputation, as well as management systems such as policies and processes, communication mechanisms and compensation system.

In their empirical study they examined 195 companies active in technology-intensive sectors in 65 units composed of 3 companies each, these units containing enterprises active in the same industry, with low, average and high market value/book value ratios respectively. They were trying to find out which factors of an immaterial type are different in the companies with low, average and high indicators (i.e. differences between their market and book values). The result of their research showed that although the examined companies pursued a technology-intensive activity, the companies with high indicators were different from the ones with lower

[44] For the description of further systematisations, see e.g. Juhász [2004], pp. 80–84.

indicators not in factors related to technology, but in their management systems. Companies with high MV/BV ratios were significantly delimited from the ones with medium and low indicators by their stronger control systems and by their detailed strategic reports on the use of their resources and abilities. However, there were no significant differences between companies with medium and low indicators – not even in their management systems.

Sveiby [2001] identifies the difference between share price and net book value as an intangible asset, which he breaks down into three categories. He considers that external structure, internal structure and the competence of the personnel are the components of intangible assets. Competence includes the skills and know-how the employees possess; at the same time it is a source of internal and external structure. The preservation of the internal structure is the task of the management and support staff: consequently this category comprises related factors such as organizational culture, patents, models, administrative and IT systems. The external structure consists of, e.g., brands, trademarks, image and the relations with customers and suppliers.

Herbály-Tóth [2004] describes Stewart's system, classifying intellectual capital – in a manner comparable to Sveiby – in three categories. Stewart differentiates between human capital, organisational capital and social (or customer) capital. Human capital is the intellectual capital of the individuals constituting the organisation, such as the employees' skills, motivation, knowledge, professional competence, experience, know-how etc. Organisational capital includes factors like process quality, corporate culture, the capital inherent in the organisation's structure, information systems, databases etc. The category of social (or customer) capital comprises customer relations, brands, trademarks, the value of, and the opportunities inherent in, the customer base.[45]

For the purpose of the categorisation of intellectual capital, Picot and Scheuble [1998] draw attention to a well-known model elaborated by the Swedish

[45] For a comparable approach, see Picot–Scheuble [1998] and Gyökér–Gősi [2004].

company Scandia. Also this model uses intellectual capital to explain the deviations between market value and book value, and similarly to the previous approaches, it breaks it down into three units. It differentiates between customer capital, organisational capital and human capital. Customer capital represents the customer base, customer relations and customer potential. Organisational capital should be made up of processes, culture and innovation. The elements of human capital are deemed to be fundamental value, relationship value and potential value.

2.4.1.2. Analysis of the recognisability of the items missing from the balance sheet

We could see above that although different researchers have elaborated different classifications concerning the items they considered as missing from the book value, yet the items of the differing classifications were more or less the same.

Following the principle of completeness, every element in possession of a company which complies with the recognition criteria should be included in the balance sheet. Certainly, this also applies to certain newly emerging or, as a result of economic changes, expanding factors which historically did not use to appear in the balance sheet. However, in the case of these factors it should be analysed in detail whether the given factor really meets the recognition criteria described in Chapter 2.2.

In the following section, I will examine the missing items (based on Stewart's classification) to establish if they may be considered recognisable or not.

The category identified as 'human capital' by Stewart comprises the intellectual capital of the individuals constituting the organisation, such as the employees' skills, motivation, knowledge, professional competence and experience. These factors do not meet the recognition criterion which stipulates that the assets should be owned or controlled by the company, and also their measurement may be problematic. In connection with these factors, as the saying goes, "the assets walk home in the evening". This expression is a good illustration of the lack of ownership or control.

Factors called 'organisational capital' include elements connected to the company such as process quality, corporate culture, the capital inherent in the

organisation's structure, information systems, databases. Out of these factors, those which are properly documented (or even legally protected) could represent a value for others if they possessed them and if their values could be precisely determined using some methodology (such as, perhaps, information systems and databases); these could perhaps be included in the balance sheet, although the eventual problems related to their measurement may challenge their recognition. The assertion of the philosophy of true and fair view might be endangered by the inclusion in the balance sheet of factors regarding which no accepted valuation techniques exist. On the other hand, certain factors embedded in and inseparable from the companies may not be presented in the balance sheet because they may not be traded independently, and in lack of a market, may not be measured easily. Such factors are, among others, corporate culture, processes and the organisation's structure.

In Stewart's systematisation, the category of social (or customer) capital comprises customer relations, brands, trademarks, the value of, and the opportunities inherent in, the customer base. Among these factors, some may already be presented in the balance sheet: an example of this might be the trademark. Also brand name may appear in the balance sheet in certain cases, as in case of a sales transaction. In the case of an own brand, the situation is more complex, as in absence of an active market, measurement may present difficulties. Several methods exist to determine the value of a brand, but these are only estimations, and the inclusion of the resulting values in the balance sheet would risk to compromise the philosophy that accounting needs to present a true and fair view. Concerning customer relations and the customer base, the most important issue is to analyse the terms of contract and to overcome the difficulties of measurement. It may happen that these factors meet the recognition criteria.

Consequently, it becomes clear that certain factors related to value creation could conceivably be presented in the balance sheet. However, we need to stress that even factors satisfying all other recognition requirements may only be presented in the balance sheet if they possess accepted measurement and valuation methods, as the lack of these would jeopardise the assertion of the philosophy that accounting needs to present a true and fair view. In most cases, the main reason for the given elements not being considered as recognisable is the lack of reliable measurement techniques.

We need to mention here that in case of a buyout transaction, the impact of the value creation factors missed from the balance sheets (upon the assumption that they influence market value through future expectations) actually do appear in the value of goodwill, and is consequently presented in the balance sheet. As a result of the enacted sales transaction, it presents no difficulties anymore to measure or valuate goodwill (i.e. the extra value paid for expected future profits) and badwill or negative goodwill (the non-recognised spread to be realised in future as profit), as these factors are already linked to an actual transaction and, as a result, possess a value recognisable in the balance sheet.

Nevertheless we should bear in mind that the values of goodwill and badwill may also contain other factors: these are the values that incorporate the difference between the book value and the market value, and as such, are influenced by other factors which – through or in addition to the ability of the company to earn profits in future – have an impact on the development of the market price. These impacts will be analysed in detail in Chapter 2.4.4.

2.4.2. Analysis of the deviation through the market value/book value ratio

Literature on investment analysis sometimes uses the indicator 'market value/book value of the equity' (P/BV) to examine if a share is under- or overvalued.

In order to compare companies' shares, Damodaran [2006] tried to find out what factors may lead to the deviation between the indicators showing the market value and book value of companies' equities. The main factor in this respect is the difference in return on equity (ROE), but also differences in expected growth rate, dividend payout ratio and risk levels.[46] A higher ROE results in a higher equity P/BV rate, while a lower yield leads to a lower P/BV value.[47]

[46] Similarly, Hellström [2006] thinks that profitability, dividend payout policy and expected return play the most important role in the development of the P/BV indicator.

[47] For details see Damodaran [2006], pp. 550–581.

This deduction shows that the main factor influencing the deviation between companies' market values and book values is profit. This may be traced back to the view that the market value of a company is primarily determined by the yield value, or in other words, by the expectations concerning the future profitability and cash flows of the company.

2.4.3. Research into the value relevance of accounting data

Research into the transformation of the economy and the expansion of knowledge-based companies outlined, among others, by Boulton, Libert and Samek [2000], make mention of an increase of the deviation between the market value and book value of companies, and explain it with accounting deficiencies. As a result of this idea, several studies have recently analysed the deviations between market value and book value and the value relevance of accounting data. These studies aimed to find out if the relationship between share prices on the one hand and book value or profits on the other hand has really weakened recently.

According to Thinggaard and Damkier's [2008] definition of value relevance, information gained from the financial statement is value relevant if there is a statistical correlation between the accounting information and the market value or the earnings.[48]

Let us now review the results of a few studies concerning the changes in the deviation between companies' market values and book values, and the value relevance of accounting data.

King and Langli [1998] used the data pertaining to the 1982–1996 time period of a total of 14,643 listed companies from three European countries, Germany, Norway and the United Kingdom, to analyse the deviation between book value and market value as well as the value relevance of accounting data (the book value of the equity and the earnings per share).

[48] The other studies I am going to present here use a comparable interpretation of the concept of value relevance.

According to data presented in their study, the average value of the book value/share price (BV/P) index was 0.41 in Germany, 0.58 in Norway and 0.63 in the UK. Concerning the value relevance of accounting data they stated that both the book value and the earnings per share were in significant relationship with the share price. Concerning the difference between the examined countries, they found that book value was more relevant in Germany and Norway, whereas earnings per share was the more relevant factor in the UK.

According to data by Gornik, Tomaszewski and Jermakowicz [2001] who examined 77 listed companies in Poland between 1996–1998, the average BV/P index value of 0.61 may be considered rather low compared to other European countries.

Analysing the book value and the value relevance of the earnings, they concluded that both showed a significant and strong relationship with share prices. From the two factors inspected, the explanatory value of book value proved to be superior. Concerning the correlation of the two explanatory variables they found that their correlation was weak, thus they rejected the possibility of multicollinearity. In case of loss-making companies, however, the explanatory value of the book value was limitedly significant; nevertheless, this was still the only explanatory variable.

According to a study by Arce and Mora [2002], examining 22,436 observation units in eight European countries in the period between 1990–1998, the average value of the BV/P_0 index showed major differences in the individual states. The rate was the lowest in Germany at 0.559, but may also be considered low in the Netherlands (0.660) and in the UK (0.670). Increasingly higher index rates were measured in Belgium (0.787), France (0.790), Spain (0.880) and Switzerland (0.892), while Italian listed companies scored highest at 0.995. The latter value represents that on the average, there was no substantial discrepancy between the share prices and book values of companies.

Along with the rate of book value and market value, they also studied the value relevance of accounting data (the earnings and the book value of equity). Their research justified the value relevance of accounting data. Dividing the sample into two subgroups, they also found that in countries using the continental accounting system, where credit institutions play a more important role, the book value was

more relevant, having a stronger relationship with the share price; whereas in England and the Netherlands, where the capital market plays a more important role in the financing policy of companies, earnings are the more relevant indicator. Among the countries using the continental system, France is an exception with a stronger relationship between the earnings and the share price. The results obtained for Belgium and Italy were not significant.

Dontoh, Radhakrishnan and Ronen [2004] studied the strength of the relationship between share prices and accounting data (earnings and the book value of equity) along with the business activity, analysing data of companies based in the United States for the period between 1983–2000, and found that the strength of the relationship decreased due to an increase in non-information-based business activity. Quoting Grossman, non-information-based business activity refers to share acquiring and selling transactions the cause of which is not related to the payouts of the share, but instead, for example, to reallocation of capital between industrial branches, risk preferences, liquidity needs, unanticipated investment opportunities etc.

According to their view, non-information-based business activity drives share prices apart from the real (intrinsic) value of the share, thus weakening the relationship between share prices and accounting data.

Their research has shown that non-information-based business activity is inversely proportional to the strength of the relationship (R^2) between share prices and accounting information. Consequently, in parallel with the increase in the rate of non-information-based business activity, a decrease could be observed in the strength of the relationship between share prices and accounting information. Their study has also shown that this applies especially to companies with high market value/book value rates. On this basis they concluded that in case of companies with a significant difference between market value and book value, the decrease in the strength of the relationship between the share price and the accounting information is mainly due to non-information-based business activity, rather than to the inadequacy of the accounting data.

Based on their survey results, they concluded that the actual decrease in the value relevance of the accounting data may not be as strong as suggested by the changes in the relationship.

A comparative study by Hellström [2006] on Czech and Swedish listed companies analysed the alterations of the market value/book value rate, and brought very interesting results in contrast with former research. Dividing the subject period 1994–2001 in two parts (1994–1997 and 1998–2001), he found that during the two cycles, the market value/book value (MV/BV) ratio decreased from 0.74 to 0.57 in the case of the companies listed on the Prague Stock Exchange, while increased from 2.35 to 2.67 in the case of the companies listed on the Stockholm Stock Exchange. These data have two peculiar aspects: first, the average book value of the Czech companies (increasingly, but perpetually) exceeded their average market value; and second, the value of the index changed in opposite directions in the two countries in the given period.

Concerning the statistical connection between accounting data and share prices, Hellström found that the value relevance of accounting data is lower in the Czech transition economy than in the well developed Swedish economy. According to his results, the value relevance increases as the country progresses in the procedure of transition.

According to a study by Brimble and Hodgson [2007] on data relating to Australian listed companies in the period between 1973–2001, the average value of the BV/P rate is 0.80, showing that in line with certain European countries and in contrast with research results respecting the US, in Australia there is no significant discrepancy between the book value of companies and their share prices.

Furthermore, their study examined if the value relevance of the earnings had decreased during the concerned period. They found that in Australia the value relevance of the earnings had not decreased, and that as far as the alteration of share prices is concerned, the book value (the relevance of which had not decreased either) plays a less important role than the earnings, and a less important role than in the United States. They concluded that the observed change is not a decrease in the value relevance of the accounting data, but rather an increase in the complexity of the economical environment.

Thinggaard and Damkier [2008] analysed data of Danish companies for the period between 1983–2001 to establish whether the value relevance of accounting data had decreased in that period. The results show that the value relevance of

accounting did not decrease but remained unchanged, both for the smaller and the larger companies.

Comparing their results with other similar analyses, they came to the conclusion that the data they revealed were conform to the results of other European studies which also refuted statements, based on data from the United States, concerning the decreasing value relevance.

The above cited examples from international literature show that there are substantial differences between individual countries concerning the deviation between the market value and book value of companies, and that this deviation is the strongest in the United States. Results concerning value relevance also show great variety. The most remarkable difference emerges between results from Europe and from the United States: in the case of Europe, researchers did not observe a decrease in the value relevance of accounting data; however they did so in the case of the United States. The other difference observed was that in countries using the continental accounting system, the book value, whereas in countries using the Anglo-Saxon system, earnings possessed more explanatory power concerning share prices. We need to stress the results of the survey on Czech companies which show that the value relevance of accounting data is lower in transition economies.

2.4.4. A possible explanation for the deviation: The diverging objectives and perspectives of book value and market value

In Chapter 2.2, I discussed the issue of companies' book value in detail. On the basis of the information given in that chapter, it may be established that according to present accounting rules, the book value of a company (i.e. the value of its equity as indicated in the balance sheet) is mainly determined using a historical cost model founded basically on the realisation principle, presuming business continuity. Thus most items appear in the balance sheet at their actualised historical value.

We should also stress that the balance sheet may only contain elements which meet the recognition criteria. Consequently, book value is only constituted by elements owned or controlled by the company, resulting from past events and

producing an expected profit in the future, which may be measured reliably, for it is the only way to ensure the assertion of the philosophy that accounting needs to present a true and fair view.

Also the objective of accounting needs to be taken into account when analysing the developments of the book value, as this provides the explanation for the book value being just what it is. Through the intermediary of the balance sheet, accounting provides information to stakeholders about the current financial position of the company. Naturally it is impossible to satisfy the information needs of all coalition members, so priority should be established among the individual interests. As a result, in current accounting practice the aim of determining the earnings enjoys priority, and the calculation of the values of wealth (economic resources and claims) and equity are subordinated to this objective.

The market value of companies was analysed in Chapter 2.3. According to the statements of that chapter it may be established that the evolution of the market value of a company – i.e. the share price – is influenced by numerous factors.

Assuming an efficient market, the share price reflects the expectations regarding the future performance of the company. In addition to the impacts related to the business environment and other factors, the market players' expectations are also based on the book value and profitability data of the company. As a result, also research into value relevance has shown that share prices are in significant relationship with book value and earnings, respectively. This also highlights the fact that wealth value and yield together shape the market value of the company.

Examining the issue of market efficiency, we concluded that many economists and researchers confirmed that the operation of the market is not fully efficient. Investors frequently act irrationally and show speculative behaviour. As a result, share prices are also influenced by psychological factors as well as by current supply and demand. Research also shows that a reason of the fact that the strength of the relationship between share price and book value (i.e. value relevance) decreased in the United States may be the expansion of such influencing factors, in other words, of non-information-based business activity.

This summary reveals that substantial differences exist between the aim, approach, way of determination and influencing factors of book value and market

value. Book value provides information about historical evidence; market value substantiates future expectations. Book value represents the value of the wealth of the company; market value is the result of the impact of wealth value, yield value and several other factors. The balance sheet of the company, and consequently book value, seeks to satisfy the information needs of the totality of stakeholders, whereas share price (i.e. market value) examines the value of the company purely from the point of view of the present owners and future investors.

I consider that the differences in the objective, perspective and influencing factors provide satisfactory explanation for the deviations between market value and book value. In my empirical research, I wish to test my hypotheses based on this assumption.

2.5. SUGGESTION FOR THE SATISFACTION OF A BROADER SCOPE OF INFORMATION NEEDS

In the previous chapter it was made clear that book value and market value have different aims. The financial report provides information to all stakeholders of the company, while market value specially targets present owners and future investors.

Accounting is unable to satisfy all information need of each and every coalition member at the same time, within one single report: there is a need to prioritise. Keeping the principle of business continuity in mind, in the typical report the priority today goes to the determination of the result, the calculation of the values of wealth (economic resoursec and claims) and equity being secondary objectives only.

Thanks to the development of information systems, at this date it would actually be possible (not only in theory, but also in practice) to satisfy the coalition members' information needs in parallel. As a possible solution, I would like to highlight Heinen's multipurpose balance sheet theory: this balance sheet model states that the information needs of the coalition members (and, as a consequence, the balance sheet objectives) may not be simplified, but should be mapped out precisely. Heinen regrouped the balance sheet objectives, drawing up individual balance sheet compilation rules, activation and passivation criteria, and a valuation and structuration theory for each of them. His model is based on a basic balance sheet compiled at historical cost, showing the value of the realised profit and the company assets at actualised historical cost. This basic balance sheet would then be supplemented by several further balance sheets compiled for different purposes, such as the valuation of the shares.[49]

The detailed analysis of this issue may not be attempted within the framework of this study – it might rather constitute the subject matter of another research. However, the subject matter of the present research required an enumeration of the possibilities opened up by this balance sheet theory, which at the same time provided

[49] For details on this balance sheet model, see Heinen [1986].

an explanation for the fact that the balance sheet model applied at present fails to reflect the market value of the company.

3. RESEARCH HYPOTHESES

When setting up my hypotheses, I built on the statements made as a result of the overview of relevant academic literature.

In the framework of the research into the deviation between book value and market value, I considered it necessary to test the value relevance of accounting data. In doing so I intended to observe the strength of the relationship between the book value of equity and earnings on the one hand, and share prices on the other hand. Understanding the existence, direction and strength of these relationships not only provides valuable information for comparison with the results of former international research, but also serves as a starting point for the verification of further hypotheses and for the analysis of the factors determining the deviation between the market values and book values of companies. The first three hypotheses relate to the value relevance of accounting data.

Hypothesis 1: A positive relationship exists between a company's book value and market value.

Hypothesis 2: A positive relationship exists between a company's earnings and market value.

Hypothesis 3: The value relevance of book value is higher than the value relevance of earnings.

The remaining hypotheses aim to examine the factors influencing the deviation between market value and book value. When formulating these hypotheses, I intended to highlight that these two values serve different purposes, and as a consequence also their methods of determination and the scope of the factors directly influencing their development need to be different. This necessarily leads to a deviation between the two values. The innovative nature of these hypotheses primarily lies in the fact that they set up a cause and effect relationship between the above described characteristics and the deviation between market value and book value. In connection with the above, I formulated the following three hypotheses:

Hypothesis 4: A deviation exists between market value and book value because market value is not determined on the basis of wealth value.

Hypothesis 5: A deviation exists between market value and book value because market value depends on factors such as expectations concerning the ability of the company to earn profits in the future; the characteristics of the given country and region; global and macroeconomic trends; industrial cycles; and other influences of a psychological nature.

Hypothesis 6: A deviation exists between market value and book value because there is a difference between the factors influencing book value and those determining market value.

In my draft PhD dissertation a seventh hypothesis was included in addition to the six described above; but considering certain observations made on the occasion of the defence of the draft dissertation, I embedded it in hypothesis 6. The content of that hypothesis was not distinctly delimited from the statement of hypothesis 6, which made it possible and necessary to contract the two hypotheses.

4. VERIFICATION OF THE HYPOTHESES

4.1. STATISTICAL POPULATION ANALYSED IN THE RESEARCH

4.1.1. Population, observation unit

In my research I consider as population the totality of Hungarian companies in case of which there is a deviation between market value and book value, in other words, where the phenomenon I wish to analyse occurs. The conclusions I shall draw will apply to this set of companies.

The observation units of the present research shall be the companies issuing shares listed at the Budapest Stock Exchange (hereinafter: "stock exchange").[50] The observation units are the companies themselves, as the data used for the analysis were obtained from their published reports and statements and (regarding major events in the company's history) from their extraordinary notifications to the stock exchange and the investors. I limited the set of companies analysed in this research to listed companies because of the availability in their case of market prices based on actual transactions implying an effective change in the ownership. Consequently, in the case of these companies it is possible to observe the difference between market value and book value because in addition to book value, also market value is known; whereas in the case of most unlisted companies (the ownership structure of which remains unchanged) only the book value is known, and the market value may only be established by way of estimations.

However, the units of analysis are not identical with the observation units, for in this case I made my observations about the units of analysis in an indirect manner. The units of analysis examined in this study shall be the phenomena occurring in the observed companies: that is, the individual market values and book values, as well as the values of the factors influencing their deviations.

[50] Except for financial enterprises, because owing to their specificities, the obtained result would not be adequately comparable.

4.1.2. Sampling, set of companies examined

Resulting from the nature of the research, the number of observation units (i.e. of listed companies) was low enough for me to be able to avoid sampling and conduct my research by covering the data obtained on the totality of the observation units.

The research covers the five-year period between 2005 and 2009. At this date, apart from financial enterprises, there were 30 companies in Hungary of which the shares were traded on the spot market[51] of the Budapest Stock Exchange all along these five years. Due to the low number of observation units, I attempted to expand the scope of companies examined in this research by considering the eventual use of two samples. I asked myself how far the number of observation units could be increased if, on top of the companies issuing listed shares all along the period between 2005–2009, I also involved in my research the set of companies whose shares were listed in at least 3 years within the examined five-year period. Such a three-year period could consist in the first or last three years of the five-year period in question. I found 4 companies having issued shares listed on the stock exchange in 2005–2007 and a further 3 whose shares were traded in the period between 2007–2009. However, the number of elements in either of these groups failed to reach a level which would have justified their consideration, especially in view of the problems related to the shortness of the three-year time periods.

Further examining the 30 companies having issued listed shares during the five-year period, I also found that four of them failed to compile a report in accordance with the rules set out in the International Financial Reporting Standards. Considering that the accounting rules applied have a bearing on the value of the company's equity (and thus on the book value), I thought it important to ensure that all of the examined population should be homogeneous concerning the system of applied accounting rules;[52] as a consequence, I excluded these four companies from the research.

[51] Our research shall not cover the futures market.

[52] This clearly refers to the homogeneity of the framework only, not to identical choices in the items and combinations applied.

As a result, the total number of observation units was 26. This fact might challenge statistical stability if not taken into proper consideration during the evaluation of the study results.

4.2. DATA AND DATABASE USED FOR THE RESEARCH

4.2.1. Research period

During my research, I collected the data at one given date and not over a longer period; but I also studied the changes in those values over time, using data from the period between 2005 and 2009. The reason for the choice of this period is that reports about the financial year 2010 were not yet available at the date of data collection, so I had to close the research period with data relating to the financial year 2009. I chose the financial year 2005 as the starting point of the research period, for from 1 January 2005 each listed company is obliged to draw up an IFRS-conform consolidated financial report, as a result of which the book values of the observation units may be considered homogeneous with respect to the financial reporting system. The resulting five-year period is long enough to illustrate changes over time.

Although I collected data at one date in time, the study is not cross-sectional, as I paid special attention to changes over time. Thus changes over time have not been observed by way of a longer-term (longitudinal) research but based on historical data; accordingly, my research may be considered to be of quasi-longitudinal nature.

4.2.2. Methodology of data collection

In absence of available databases compiled during former studies that I might have used, my research is entirely based on primary data collection performed through the analysis of the companies' consolidated financial statements and quarterly and mid-year statements and by collecting and assessing other published corporate information. During the analysis of the consolidated financial statements and quarterly and mid-year statements I primarily considered data from balance sheets, statements of changes in equity and profit and loss accounts; in case of companies where the factors causing the change of these data over time could not be clearly traced on the basis of these statements, I also relied on textual information contained in the notes and flash reports. I also used the notes to ferret out the owner structure of the companies.

I determined the companies' market value based on information relating to share prices published on the website of the Budapest Stock Exchange.[53] On the same site I also found data relating to the trading of the individual periods, as well as extraordinary notifications and other communications published by companies in addition to financial reports and flash reports.

In order to throw light on the factors influencing the deviation between market value and book value, I also involved into my research the development of certain global economic indicators which I will describe in detail in the section on the verification of the related hypothesis.

During the planning of the research, I intended to use questionnaires to collect all required information not included in financial statements, flash reports and other forms of published data. The research would have been greatly supported by an access to the reasons motivating share owners to buy and sell. Knowing that this population is difficult to identify and reach, I planned to perform the data collection through questionnaires with the help of stock brokers. However after the first interviews I had to face the fact that no relevant information would be given out concerning my subject in this way; consequently I had to abandon this method of data collection.

I used Microsoft Office Excel 2007 to compile the database.

[53] http://www.bet.hu/.

4.3. STATISTICAL PROCEDURES USED DURING THE RESEARCH

I used multivariate statistical methods to verify my hypotheses. The statistical tests related to the created database were performed using PASW Statistics 18.0; consequently, the supporting tables and graphs in the annex are the outputs of this software package.

During verification of the hypotheses related to the value relevance of accounting data, I tested the existence as well as the direction, stability, strength and nature of the relationship between book value and earnings[54] on the one hand, and market value on the other hand. I used correlation and regression analysis as a method to examine the relationships between the above mentioned metric values. I performed the same calculations not only for the totality of the companies involved in the research, but also for two subgroups into which I had divided the companies according to their sizes, so as to observe if any differences arise on this basis.

For the purpose of the other hypotheses, I analysed time series and performed trend estimations. To find the factors influencing the deviations between market value and book value, I examined the changes in the market value over time for each company, then identified for each of them the periods when a substantial deviation could be observed in the changes of the two values, and reviewed public information in order to establish whether they offered adequate explanation for these differences in value changes.

I used cross correlation analysis to reveal any covariance of the market value and the book value. Cross correlation function reveals the direction and strength of the relationship between two time series and the quantity of information that the two time series produce in comparison with each other, that is, the eventual existence of any forecasting relationship between the two. I also used diagrams to compare the variations in these two values, which made it possible to identify the periods in which there was a significant deviation between the evolution of the market value

[54] I examined several categories of earnings: the values included in the calculations were earnings before interest and taxes (EBIT), earnings before taxes (EBT), and comprehensive earnings.

and the book value of the individual companies. Subsequently, I collected detailed information about each company for these identified periods of time.

I also examined, through additional trend estimation, the covariance of certain indicators with market value and book value and their eventual forecasting potential, identifying the indicators influencing only one or both of the values. For these calculations I also used the method of cross correlation analysis.

4.4. VERIFICATION OF THE ESTABLISHED HYPOTHESES

4.4.1. Verification of the hypotheses established in relation to the value relevance of accounting data

The first three hypotheses were intended to examine the value relevance of accounting data; in order to test the results, I analysed the direction and strength of the relationship between the companies' market value, book value and profit figure.

I calculated market values by multiplying the share prices as at 31 December of the specific years by the quantity of shares covering the total equity capital, thus receiving the companies' total market value. For the purposes of this paper, shareholders' equity figures as at 31 December were applied as book values.

As regards profit figures, I extended the analysis to the values of not only one, but three profit categories, which enabled me to examine the impact of individual profit categories on the relationships under review. The profit categories thus involved in the calculations included EBIT, EBT and comprehensive earnings. In case of the profit figures, calculations for individual companies were based on the respective earnings of full financial years.

In the case of two observation units, the financial year did not overlap with the calendar year. In these cases I relied on the profit figures of the business years belonging to the balance sheet date closest to 31 December, which enabled me to analyse the respective earnings of full financial years for the companies concerned in a fashion that ensured the largest possible overlap between the altered financial year and the calendar year.

I examined the direction and strength of the relationships between the presented values by calculating linear ("Pearson's r") and partial correlation coefficients and verifying the significance level by performing a two-sided test. I accepted the correlation coefficient values thus received at the 1% statistical significance level; however, I separately analysed the correlation coefficients pointing to significance levels between 1% and 5% to account for the impact of the small sample on the significance level. I deemed it necessary to determine the values of the partial correlation coefficient because this allowed me to measure the strength

of the relationship between two variables while excluding the effect of the third variable.

Since correlation calculation is extremely sensitive to outliers, I looked for possible outliers among end-of-year equity and market value data by means of boxplots. I set up a group for companies which reported extreme values both in terms of equity and market value, and proceeded to examine this group separately. As a result, a group was formed of the companies posting outlier values – which was composed of companies with higher capital values –, while companies without outliers remained in the group of companies representing lower capital values. Since I excluded outlier values pertaining to all dates under review for the sake of accurate calculations, the resultant groups were not entirely homogeneous. At the end of 2005 and 2006 the group of more highly capitalised companies included 9 firms, of which one company was transferred to the group of less capitalised companies at the end of 2007, leaving the former group with 8 companies in total. However, at the end of 2009 and 2010, respectively, along with the company that dropped out previously another company was added to the group of more highly capitalised firms, increasing the number of firms constituting this group to 10. In line with the above, the group of companies representing lower capitalisation was composed of 17 firms at the first two dates under review, 18 companies at the end of 2007 and 16 companies at the last two dates.

Consequently, besides examining the observation units together, I also performed correlation calculations separately for both groups of the population under review.

4.4.1.1. Verification of hypothesis 1

During the verification of hypothesis 1, I calculated the Pearson's correlation coefficient and the partial correlation coefficient in order to examine the existence, direction and strength of the relationship between the book value and market value of individual companies. I calculated both types of the correlation coefficient for the five balance sheet dates of the period under review, both for the entire population and separately for the two groups composed of companies with higher and lower capitalisation. In calculating the partial correlation coefficient, data associated with the individual profit categories represented the controlled variables both together and

separately. The detailed result tables of the calculations performed are included in Annex 1.

Results for the entire population under review

Table 1 below sums up the correlation coefficient values of the book value and the market value calculated for the entire population under review. The significance level of the value highlighted in light grey exceeded 1%, but remained below 5%. All other correlation coefficient values indicated a significance level below 1%.

In respect of the entire population involved we may conclude that there was a statistically significant, strong positive relationship between the book value and the market value[55] throughout the five years under review. This is indicated by the linear Pearson's correlation coefficient, which took a positive value close to 1 on 31/12/2005 (0.990) and did not deviate from this value significantly throughout the subsequent years, either. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.993, 0.969, 0.977 and 0.974, respectively. Each correlation coefficient value indicated a significance level of 0%.

As regards partial correlation coefficients, their values did not point to a relationship of similar strength; in addition, they tended to change rather substantially over the review period. This notwithstanding, a positive, at least medium-strong relationship was maintained in all cases; thus the controlled variables

[55] Correlation coefficient (r) values are generally interpreted as follows: the positive or negative sign of the coefficient indicates the direction of the relationship, while its value shows the strength of the relationship. A value of $r=1$ implies a perfect positive, equation-like, linear relationship; $0.7 \leq r < 1$ implies a strong positive association; $0.2 \leq r < 0.7$ implies a medium positive association; while $0 < r < 0.2$ points to a weak positive association. A value of $r=0$ points to the total lack of a linear relationship; $-0.2 < r < 0$ implies a weak negative association; $-0.7 < r \leq -0.2$ implies a medium negative association; $-1 < r \leq -0.7$ implies a strong negative association; while $r=-1$ points to a perfect negative, equation-like, linear relationship. For further details about the typical interpretation of correlation coefficients, see for example Sajtos–Mitev [2007], p. 205.

offered only a partial explanation to the strength of the relationship between book value and market value. The direction of the changes between specific years was identical with that of the Pearson's correlation coefficient and accordingly, the values indicating the strength of the relationship increased between 31/12/2005 and 31/12/2006, decreased by 31/12/2007, and increased again by 31/12/2008 before declining once again by 31/12/2009. Two correlation coefficient values differed markedly from the others: the partial correlation coefficient value computed for 31/12/2008; firstly, when comprehensive earnings were applied as a controlled variable and secondly, when all profit categories were regarded, together, as a controlled variable. Even the significance level deteriorated in these cases.

The coefficient values proved different depending on which profit category was considered to be the controlled variable. We may conclude overall, that EBIT and EBT exerted a greater impact on the relationship between book value and market value than comprehensive earnings. This is reconfirmed by the fact that the difference between partial correlation coefficient values and linear correlation coefficient values was statistically less significant when comprehensive earnings were considered to be the controlled variable rather than EBIT or EBT.

Such changes in the results obtained may be attributed to the multicollinearity existing between the variables because, of the individual profit categories, book value proved to have the strongest relationship with EBIT and the weakest relationship with comprehensive earnings, although even the latter demonstrated a fairly strong positive relationship. Due to the interdependence of the profit categories, there was a strong positive relationship between individual profit figures as well, given that EBIT constitutes the determinant component of the other two profit figures. The profitability of firms' financial management was largely influenced by the efficiency of their business activity in the given period, which is reflected in the value of EBIT. For the most part, the values of the remaining profit categories changed in function of the above figure and as a result, the farther I moved from EBIT, the less explanatory power profit categories had over the strength of the relationship between book value and market value. This is also reconfirmed by the test result received; namely, that the strong, significant positive relationship between book value and EBT or comprehensive earnings lost its significance once I computed the partial correlation coefficient for these variables while keeping EBIT as controlled variable.

In order to eliminate the effect of the multicollinearity between the individual profit categories, I computed the partial correlation coefficient in such a way that all three profit categories were included in the calculation as controlled variables.

While keeping the comprehensive earnings variable constant, with the exception of 31/12/2008, there was a strong positive relationship between book value and market value, with a significance level varying between 0% and 1%. On 31/12/2005, 31/12/2006, 31/12/2007 and 31/12/2009 the value of the partial correlation coefficient was 0.769, 0.891, 0.818 and 0.893, respectively. The coefficient computed for 31/12/2008 showed a significant difference: pointing to a medium positive association, its value stood at 0.493 and even its significance level deteriorated to 1.2%. This was the only date at which comprehensive earnings represented the profit category demonstrating the closest relationship with book value, which was also reflected by the value of the partial correlation coefficient.

As opposed to the rest of the dates under review, with EBT included as a controlled variable, only a medium positive relationship was detected between the book value and the market value for 31/12/2005 and 31/12/2009; however, all partial correlation coefficients indicated a significance level of 0%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.600, 0.862, 0.715, 0.753 and 0.697, respectively.

When I examined EBIT as the controlled variable for the calculation of the partial correlation coefficient, I observed a medium positive relationship for 31/12/2007 as well. Accordingly, only two dates remained (31/12/2006 and 31/12/2008) at which a strong positive relationship existed between the book value and the market value, but even in these cases the partial correlation coefficient indicated a significance level of 0–1%.

On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.631, 0.870, 0.539, 0.799 and 0.657, respectively.

Except for 31/12/2007, the partial correlation coefficient values were very similar to those received in the context of controlled EBT. 31/12/2007 was the only date at which EBIT had a closer relationship with the market value than with the book value. This was the only date at which the partial correlation coefficient, which

was computed with book value as a controlled variable, indicated a significant relationship between market value and EBIT. This is the reason why EBIT has such a high explanatory power in respect of the relationship between book value and market value.

During the 2007 financial year, the market value of a vast majority of the companies under review increased substantially and, simultaneously, EBIT also surpassed, in most cases, the value recorded for the previous year. While this parallel increase may have exerted the above described impact on the correlation coefficients, it obviously does not imply a cause and effect relationship between the changes in these two values.

After I excluded, one by one, the effect of each profit category on the relationship between the book value and the market value, I computed the value of the partial correlation coefficient while simultaneously controlling the values of the three profit categories. The coefficient values thus received showed clearly, without the distorting effect of profits, the relationship between book value and market value.

Except for 31/12/2008, when they pointed to a medium strong positive relationship, the resultant correlation coefficient values indicated a strong positive relationship at all dates, with significance levels varying between 0% and 0.2%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.841, 0.901, 0.726, 0.601 and 0.971, respectively.

The relationship became progressively stronger over the course of the review period, as indicated by the difference between the values of the correlation coefficient computed for 31/12/2005 and 31/12/2009. The values of the partial correlation coefficient fell less and less behind those of the Pearson's correlation coefficient and as a result, the linear and the partial correlation coefficients reached nearly identical values by 31/12/2009. This suggests that the impact of the profit variables on the relationship between book value and market value decreased gradually during the review period.

This trend, however, faltered on 31/12/2007 and on 31/12/2008, when the strength of the controlled relationship decreased against the backdrop of significant changes in market values. By 31/12/2007 the market value of many of the companies under review (22 firms) rose sharply, while the companies concerned did not experience changes of similar magnitude in their book value. In the wake of the

economic crisis, by 31/12/2008 25 companies under review saw a steep fall in their market value, but the deterioration was not reflected in their book value.

Based on the above we may conclude, overall, that there was a significant, strong positive relationship between book value and market value for the entire population involved in the review throughout the review period. While the strength of this relationship weakened somewhat, it remained significant even when profit categories were included in the analysis as controlled variables.

Table 1: The correlation coefficients of book value and market value for the entire population

Correlation coefficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
Pearson's	0,990	0,993	0,969	0,977	0,974
Partial (EBIT)	0,631	0,870	0,539	0,799	0,657
Partial (EBT)	0,600	0,862	0,715	0,753	0,697
Partial (Comprehensive earnings)	0,769	0,891	0,818	0,493	0,893
Partial (All three profit categories)	0,841	0,901	0,726	0,601	0,971

Results received for the group of companies with higher capitalisation

The correlation coefficients of book value and market value computed for the companies with higher capitalisation are summed up in Table 2. The significance level of the values highlighted in light grey exceeded 1%, but remained below 5%. As regards the values highlighted in dark grey, their significance level exceeded even 5%; therefore, these correlation coefficient values may not be considered significant even at a 95% confidence level. All other correlation coefficient values indicated a significance level below 1%.

In respect of the group of companies with higher capitalisation we may conclude that there was a significant, strong positive relationship between book value and market value throughout the five years under review. This is indicated by the linear Pearson's correlation coefficient, which took a positive value close to 1 on 31/12/2005 (0.986) and did not deviate significantly from this value throughout the subsequent years, either. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009

this value stood at 0.990, 0.964, 0.969 and 0.968, respectively. Each correlation coefficient value indicated a significance level of 0%.

Comparing the linear correlation coefficients computed for this group of companies to those received for the entire population under review reveals that the relationship between the book value and market value of the more highly capitalised companies was only slightly less strong (0.003–0.008) than the indicator values received for the entire sample.

A review of the partial correlation coefficient values suggests that there were only five cases where the value of the coefficient could be considered acceptable at a significance level of 1%. In nine other cases the significance level was higher than 1% but lower than 5%, thus the value of the partial correlation coefficient would have been acceptable at a confidence level of 95%. All of the described partial correlation coefficient values indicated a strong positive relationship. In the remaining six cases the partial correlation coefficient values indicated a medium positive association; however, given that the significance level exceeded 5%, these results cannot be considered significant.

In evaluating the results it is important to bear in mind that the group of companies with higher capital values included very few (only 8–10) companies. The small sample may have contributed to the fact that some of the correlation coefficient values may not be considered significant.

The received partial correlation coefficient values were in line with the corresponding values computed for the entire population. As was the case with the Pearson's correlation coefficients, the partial correlation coefficient values were lower than the coefficient values computed for the entire population in all cases where the controlled variable was a profit category. Once all profit categories were controlled simultaneously, the partial correlation coefficient values computed for the group of more highly capitalised companies exceeded the corresponding coefficient values of the entire population, which suggests that there was a closer relationship between book value and market value in the group of more highly capitalised companies than in the case of the entire population.

The direction of the change in the values of the partial correlation coefficient was identical with the direction of the change in the Pearson's correlation coefficient and with that observed in respect of the correlation coefficient values computed for

the entire population. The coefficient values proved different depending on which profit category was considered to be the controlled variable. Even in this regard, the values received corresponded to the results observed for the entire population.

When keeping the comprehensive earnings variable constant, there was a strong positive relationship between book value and market value at all dates under review except 31/12/2008, but the significance level fell between 0% and 1% at two dates only – 31/12/2006 and 31/12/2009 –, and at 31/12/2005 and 31/12/2007 it would have been acceptable only with the acceptance of a 5% significance level.

On 31/12/2005, 31/12/2006, 31/12/2007 and 31/12/2009 the value of the partial correlation coefficient stood at 0.711, 0.856, 0.796 and 0.894, respectively. The coefficient computed for 31/12/2008 showed a pronounced difference: pointing to a medium positive association, its value stood at 0.468; however, with a significance level of 20.4% it was not considered to be significant. Given that while controlling the other two profit variables and all profit variables together I could not observe either a similar degree of weakening in the relationship or such a high significance level, in all likelihood, the stronger explanatory power of the comprehensive earnings over the relationship between book value and market value should not be considered existent. This assumption is also reconfirmed by the deterioration of the significance level, to which the sample's small number of elements may have contributed.

As opposed to the rest of the dates under review, with EBT controlled, only a medium positive relationship was detected between book value and market value on 31/12/2005 and on 31/12/2007; however, with significance levels of 22.2% and 12.1%, these partial correlation coefficients were not significant. Even the partial correlation coefficient values, which had indicated a strong positive association in previous years, showed higher than desirable significance levels between 1% and 5%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.486, 0.813, 0.641, 0.747 and 0.705, respectively.

When I examined EBIT as a controlled variable for the computation of the partial correlation coefficient, I found that the association was medium positive on 31/12/2009 as well; however, at 5.4%, the significance level was, once again, higher

than desirable. At 19.6%, the significance level of the coefficient computed for 31/12/2005 surpassed this value, while the level established for 31/12/2007 was even higher, 32.5%. Based on these data, the partial correlation coefficients computed for the above dates may not be considered significant. In the case of this partial correlation coefficient, there were only two dates (31/12/2006 and 31/12/2008) at which a strong positive relationship existed between book value and market value, but even these coefficient values were borderline acceptable only, indicating a significance level of 1% and 1.2%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.511, 0.832, 0.438, 0.786 and 0.658, respectively.

The partial correlation coefficient values I received after having controlled the three profit categories simultaneously appeared to be very similar to those computed for the entire population under review, the only difference being that the coefficients computed for this group pointed to a slightly stronger relationship at all dates. Moreover, there was a difference in significance levels, since in the case of these companies only the coefficients computed for 31/12/2006 and 31/12/2009 showed a significance level close to 0%. I received a significance level above 1% pertaining to the coefficient defined for 31/12/2005, and values close to 5% for 31/12/2007 and 31/12/2008. Accordingly, the correlation coefficients computed for these dates could have been acceptable only at a confidence level of 95%. Nonetheless, given the small number of elements in the group, I reviewed these computed results as well.

The values of the partial correlation coefficient indicated a strong positive relationship at all dates. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.903, 0.961, 0.881, 0.767 and 0.981, respectively.

The relationship became progressively stronger over the course of the review period, as indicated by the difference between the values of the correlation coefficient computed for 31/12/2005 and 31/12/2009. The values of the partial correlation coefficient fell less and less behind those of the Pearson's correlation coefficient and as a result, by 31/12/2009 the partial correlation coefficient value exceeded that of the linear correlation coefficient. This suggests that the impact of the profit variables on the relationship between book value and market value

gradually dissipated during the review period, and by 31/12/2009 it points to a correlation partially suppressed by the profit variables.

This trend, however, faltered on 31/12/2007 and on 31/12/2008, when the strength of the controlled relationship decreased against the backdrop of significant changes in market values. Although the decline for this group was not as pronounced as that observed for the entire population, it had the same underlying reasons. By 31/12/2007, a half of the reviewed companies saw a sharp increase in their market value, but they did not experience changes of such magnitude in their book value. All companies were hit by the effects of the economic crisis, which deteriorated their market value significantly by 31/12/2008; this, however, was not reflected in book value.

Based on the above we may conclude, on the whole, that there was a significant, strong positive relationship between the book value and the market value throughout the review period in the case of companies with higher capitalisation, although the strength and the significance of this relationship weakened somewhat once the profit categories were included in the analysis as controlled variables. The small number of elements may have contributed to such developments in the significance levels.

Table 2: The correlation coefficients of book value and market value for the companies with higher capitalisation

Correlations coefficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
Pearson's	0,986	0,990	0,964	0,969	0,968
Partial (EBIT)	0,511	0,832	0,438	0,786	0,658
Partial (EBT)	0,486	0,813	0,641	0,747	0,705
Partial (Comprehensive earnings)	0,711	0,856	0,796	0,468	0,894
Partial (All three profit catgories)	0,903	0,961	0,881	0,767	0,981

Results received for the group of companies with lower capitalisation

The correlation coefficients of book value and market value computed for the companies with lower capitalisation are summed up in Table 3. The significance level of the value highlighted in light grey exceeded 1%, but remained below 5%.

Since the significance level of the values highlighted in dark grey exceeded 5%, these correlation coefficient values may not be considered significant. All other correlation coefficient values indicated a significance level below 1%.

In respect of the group of companies with lower capitalisation we may conclude that there was a significant, strong positive relationship between the book value and the market value at four dates during the period under review. The values of the linear correlation coefficient approached the lower bound of a strong relationship (0.7) at a number of dates, and even dropped below this value on 31/12/2006; whereby at that point there was only a medium strong positive relationship between book value and market value, which may also be considered significant.

On 31/12/2005 the value of the correlation coefficient reached 0.738, which resulted in a more pronounced difference in subsequent years relative to the analyses performed for the former group and for the entire population under review. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.696, 0.792, 0.852 and 0.719, respectively. All of these correlation coefficient values indicated a significance level between 0% and 0.2%.

The values of the Pearson's correlation coefficient computed for this group were consistently lower than the linear correlation coefficient values computed for both the entire population and for the group of companies with higher capitalisaton.

In some cases, partial correlation coefficient values indicated a stronger, in other cases, a weaker relationship than the Pearson's correlation coefficient computed for the corresponding dates; in addition, they tended to deviate significantly from changes in the linear correlation coefficient over the review period. This notwithstanding, a positive, at least medium-strong relationship was maintained in all cases; thus the controlled variables offered only a partial explanation to the strength of the relationship between book value and market value.

With the exception of 2008, the direction of the changes in the partial correlation coefficient values between the specific dates was identical with that of the Pearson's correlation coefficient and accordingly, the values indicating the strength of the relationship decreased between 31/12/2005 and 31/12/2006, increased by 31/12/2007, and increased further by 31/12/2008 before declining once again by

31/12/2009. Of the partial correlation coefficients computed for 31/12/2008, only one coefficient mirrored these developments: the one computed with controlled EBT.

I observed two cases where the value of the partial correlation coefficient could not be considered significant: these were the values computed for 31/12/2006 with EBT and comprehensive earnings, respectively, included in the calculation as controlled variables. In these cases the coefficient reflecting the strength of the relationship took substantially lower values, pointing to a significance level of 14.4% and 8.4%, respectively. The significance level established for 31/12/2009 while keeping the three profit variables controlled simultaneously is 4.8%, but even that may be considered acceptable only in the context of a 95% confidence level.

The partial correlation coefficient values showed similar differences from the corresponding values computed for the entire population to the difference I observed from the results of the Pearson's correlation coefficient; i.e. at times overshooting and occasionally undershooting the corresponding values.

The coefficient values proved different depending on which profit category was considered to be the controlled variable. We may conclude overall that, as opposed to the entire population where EBIT and EBT exerted a more significant impact on the relationship between book value and market value than comprehensive earnings, in this group of companies I could not determine such an impact with any certainty.

Similarly to the group of companies with higher capital values, in evaluating the results it is important to bear in mind that the group of companies with lower capital values is also composed of few (only 16–18) businesses. The small sample may have contributed to the fact that some of the correlation coefficient values may not be considered significant.

While keeping the comprehensive earnings variable constant, with the exception of 31/12/2006, there was a strong positive relationship between book value and market value, with significance levels varying between 0% and 0.3%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the value of the partial correlation coefficient stood at 0.736, 0.445, 0.872, 0.867 and 0.715, respectively. The coefficient value computed for 31/12/2006 showed a marked difference from the results received for the remaining dates: pointing to a medium positive association, it stood at 0.445 and, having a significance level of 8.4%, it

could not be considered statistically significant. At this date comprehensive earnings were in a significant, strong positive relationship with book value, which was also reflected by the value of the partial correlation coefficient.

The partial correlation coefficient values computed for 31/12/2005 and 31/12/2009 did not show a notable difference from those of the Pearson's correlation coefficient for the corresponding dates, which suggests that comprehensive earnings did not have a significant impact on the strength of the relationship between book value and market value. This is also reconfirmed by the fact that I did not detect a significant relationship between comprehensive earnings and book value as at the above dates. By contrast, the partial correlation coefficient values received for 31/12/2007 and 31/12/2008 were higher than those of the linear correlation coefficient computed for the corresponding dates, which points to a partially suppressed correlation.

The partial correlation coefficient values received when EBT was used as the controlled variable closely mirrored those obtained when comprehensive earnings were considered to be the controlled variable.

The coefficient values computed for 31/12/2005 were identical in both cases under review. The value computed for 31/12/2006 proved to be not significant, as was the case with the scenario when comprehensive earnings were used as a controlled variable. At this date EBT was also in a significant, strong positive relationship with book value, which was reflected in the value of the partial correlation coefficient. By contrast, the partial correlation coefficient values received for 31/12/2007 and 31/12/2008 were also higher than those of the linear correlation coefficient computed for the same date, which suggests a partially suppressed correlation.

The only deviation was observed in the case of the coefficient values computed for 31/12/2009, as the partial correlation coefficient value in this case dropped below that of the Pearson's correlation coefficient for the same date, which suggests that EBT had a partial explanatory power over the strength of the relationship between book value and market value.

With the exception of the value computed for 31/12/2006 which indicated a 14.4% significance level, all partial correlation coefficients pointed to significance levels between 0% and 1%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and

31/12/2009 the correlation coefficient value was 0.736, 0.382, 0.846, 0.860 and 0.654, respectively.

When I included EBIT as the controlled variable in the calculation of the partial correlation coefficient, I observed a medium positive relationship for 31/12/2006 and 31/12/2009. As at the rest of the dates there was a strong positive relationship between the book value and the market value.

The partial correlation coefficient value computed for 31/12/2005 was higher than that of the linear correlation coefficient for the same date, which indicates a partially suppressed correlation. In the remaining cases the partial correlation coefficient values received were lower than those of the Pearson's correlation coefficient for the corresponding dates, which suggests that EBIT had a partial explanatory power over the strength of the relationship between book value and market value.

In this case each partial correlation coefficient indicated a significance level of 0–1%. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.857, 0.641, 0.771, 0.745 and 0.662, respectively.

When all three profit categories were controlled simultaneously, the partial correlation coefficient values received proved to be different from those computed for the entire population and for the companies with higher capital values. Indeed, in the case of this group, at the first three dates the value of the partial correlation coefficient exceeded, and at the last two dates stood below that of the linear correlation coefficient. At the first three dates, this indicates a correlation partially suppressed by the earnings variables, while at the last two dates it points to the partial explanatory power of the profit categories.

The partial correlation coefficient values showed significance levels of 0–1% except for the last date under review, when the acceptance of the coefficient value would have been possible only at a confidence level of 95%. As at the first three dates there is a strong positive relationship between book value and market value, followed by a medium positive relationship at the subsequent dates. On 31/12/2005, 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 the correlation coefficient value was 0.922, 0.826, 0.915, 0.685 and 0.556, respectively.

As opposed to the results received for the entire population and for the group of companies with higher capital values, the strength of the relationship weakened in the course of the review period, as indicated by the difference between the values of the correlation coefficient computed for 31/12/2005 and for 31/12/2009, although we should bear in mind that the coefficient value computed for the last date approached the 5% significance level. The strength of the relationship was weakened by the economic crisis, which deteriorated the market value significantly by 31/12/2008; this, however, was not reflected in book value. As opposed to companies with higher capital values, this trend continued throughout 2009 for the majority of this group of companies, which pushed down the partial correlation coefficient value even further. It would be interesting to examine the correlation value as at 31/12/2010, as it would reveal whether what we observe are effectively the lingering effects of the crisis in the case of companies with lower capitalisation.

Based on the above we may conclude, overall, that there was a significant, strong (and in one case, a medium strong) positive relationship between the book value and the market value throughout the review period in the case of companies with lower capital values, although the strength and the significance of this relationship weakened somewhat in certain cases and strengthened in other cases, once the profit categories were included in the analysis as controlled variables.

Table 3: The correlation coefficients of book value and market value for the companies with lower capitalisation

Correlation coefficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
Pearson's	0,738	0,696	0,792	0,852	0,719
Partial (EBIT)	0,857	0,641	0,771	0,745	0,662
Partial (EBT)	0,736	0,382	0,846	0,860	0,654
Partial (Comprehensive earnings)	0,736	0,445	0,872	0,867	0,715
Partial (All three profit categories)	0,922	0,826	0,915	0,685	0,556

In respect of the entire population and the group of companies with lower and higher capitalisation alike, based on the results detailed above we may conclude that there was a significant, at least medium strong positive relationship between book value and market value throughout the period under review. This at least medium

strong positive relationship was maintained even when profit categories were included in the calculation as controlled variables; however, the thus computed partial correlation coefficient values did not prove to be significant in certain cases. This problem arose in the case of groups composed of a small number of elements; the results of the calculations for the entire population proved to be significant.

In the group of companies with higher capital values the partial correlation coefficient values evolved similarly to those computed for the entire population; however, when all profit categories were controlled simultaneously, they indicated a stronger relationship than the coefficient values computed for the entire population. The relationship between book value and market value appeared to be less strong in the group of companies with lower capitalisation; however, the profit categories did not have such a clear, partial explanatory power than in the case of companies with higher capitalisation. In the case of companies with lower capital values, in addition to the sharp decline in market values in 2008, the economic crisis set off the downturn observed in 2009 as well, which led to a further erosion of the strength of the relationship between book value and market value. Among the companies with higher capital values, however, this effect dissipated by 31/12/2009.

Based on the results received we may conclude, overall, that there is a positive relationship between a company's book value and its market value; hypothesis 1, therefore, should be accepted.

4.4.1.2. Verification of hypothesis 2

During the verification of hypothesis 2, I calculated both Pearson's and partial correlation in order to examine the existence, direction and strength of the relationship between the earnings and the market value of individual companies. The values of the three profit categories reviewed at testing hypothesis 1 were separately included in the calculations performed to determine their relationship with market value. I calculated both types of the correlation coefficient for the 5 financial years and balance sheet dates of the period under review, both for the entire population and separately for the two groups of companies with higher and lower capitalisation. In determining the partial correlation coefficient, the controlled variable applied was the book value. The detailed result tables of the tests performed are included in Annex 2.

Results for the entire population under review

Table 4 sums up the correlation coefficient values of the individual profit categories and the market value calculated for the entire population. The significance level of the values highlighted in light grey exceeded 1%, but remained below 5%. Since the significance level of the values highlighted in dark grey exceeded 5%, these correlation coefficient values may not be considered significant. All other correlation coefficient values indicated a significance level below 1%.

It holds true for the entire population involved that there was a significant, strong positive relationship between all three profit categories and the market value throughout the five years under review. This is indicated by the positive values of the linear Pearson's correlation coefficient, which remained close to 1 and did not deviate markedly in function of the profit category involved in the calculation.

Over the period under review, the linear correlation coefficients changed in the opposite direction between specific years than those computed for book value and market value. Accordingly, in the case of all three profit categories, the values reflecting the strength of the association decreased from 31/12/2005 to 31/12/2006, increased by 31/12/2007, declined again by 31/12/2008 and increased once again by 31/12/2009. One correlation coefficient value differed significantly from the others: the Pearson's correlation coefficient value computed for 31/12/2009, when the relationship between comprehensive earnings and market value was tested. However, this can be attributed to the fact that the coefficient value computed for 31/12/2008 did not indicate such a sharp decline compared to the previous year than that observed in the case of the other two profit categories. We may conclude, overall, that the strength of the relationship between market value and all three profit categories declined in the course of the review period; nevertheless, the relationship remained very strong and positive.

The linear correlation coefficient value computed for the relationship between comprehensive earnings and market value stood at 0.985 on 31/12/2005, and did not change markedly in the course of subsequent years. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.965, 0.982, 0.974 and 0.952, respectively. Each correlation coefficient value indicated a significance level of 0%.

The linear correlation coefficient value computed for the relationship between EBT and market value stood at 0.988 on 31/12/2005, and did not change markedly in the course of subsequent years, either. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.973, 0.983, 0.950 and 0.968, respectively. Again, each correlation coefficient value indicated a significance level of 0%.

The Pearson's correlation coefficient value computed for the relationship between EBIT and market value stood at 0.983 on 31/12/2005, which did not change markedly in the course of subsequent years, either. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.974, 0.984, 0.934 and 0.960, respectively. Again, each correlation coefficient value indicated a significance level of 0%.

As regards the partial correlation coefficients computed with book value as the controlled variable, their values did not point to such a strong relationship; moreover, in several cases they were not even significant. That notwithstanding, a positive, at least medium-strong relationship was maintained in all cases when the coefficient value indicated a significance level below 1%. This implies that, invariably, the book value controlled variable offered only a partial explanation to the strength of the relationship between the reviewed profit category and market value.

An examination of the relationship between comprehensive earnings and market value reveals that there were three dates at which the association may be deemed significant. The variables had a medium strong positive relationship (0.626) on 31/12/2005 and a strong positive relationship (0.899 and 0.797) as at 31/12/2007 and 31/12/2009. At these dates the significance levels indicated by the partial correlation coefficients were around 0%. On 31/12/2006 the value of the coefficient was not significant, while even the coefficient value computed for 31/12/2008 – 0.410 – indicated a significance level close to 5%.

The relationship between EBT and market value was significant at two dates only. On 31/12/2007 the partial correlation coefficient stood at 0.853, indicating a strong positive association, while on 31/12/2009 its value of 0.609 implied a medium positive association. Both coefficients showed a significance level close to 0%. At a level of 1.2%, the coefficient indicating a medium strong relationship (0.495)

approached the bound of significance on 31/12/2005. Coefficient values computed for 31/12/2006 and 31/12/2008 were not significant.

The partial correlation coefficient computed for the relationship between market value and EBIT remained significant on 31/12/2007 only, having taken a value of 0.789 at a significance level of 0%. Values computed for the rest of the dates under review were not reliable.

There was only one date at which the partial correlation coefficient values computed for the entire population implied a significant relationship between the individual profit categories and market value. This date was 31/12/2007 when, at a 0% significance level, a strong positive relationship was detected for all profit categories. At this point, a weakening could be observed in the strong positive relationship between the individual profit categories and book value, which was also reflected in the high values of the partial correlation coefficient.

By contrast, the coefficients computed for 31/12/2006 were not significant in either profit category, and took a negative value in all cases. For the majority of the companies under review, the market values increased throughout both years, albeit to a different degree. As regards comprehensive earnings, one third of the companies generated losses in 2006, while only three companies recorded a negative result for 2007. This fact may have contributed to the above developments in the correlation values and to the loss of significance in the case of the coefficients computed for 31/12/2006. The situation was similar in 2008 when the number of loss-generating companies was remarkably high again, which had an adverse effect on the value and significance of the correlation coefficients.

Based on the above we may conclude, overall, that there was a significant, strong positive relationship throughout the review period between the values of the specific profit categories and market value in the case of the entire population involved in the analysis. This relationship, however, weakened somewhat and lost its significance in most cases when book value included in the analysis as a controlled variable.

Table 4: The correlation coefficients of profit and market value for the entire population

Profit category	Correlation coeficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
EBIT	Pearson's	0,983	0,974	0,984	0,934	0,960
	Partial (book value)	0,126	-0,377	0,789	0,007	0,373
EBT	Pearson's	0,988	0,973	0,983	0,950	0,968
	Partial (book value)	0,495	-0,233	0,853	0,272	0,609
Comprehensive earnings	Pearson's	0,985	0,965	0,982	0,974	0,952
	Partial (book value)	0,626	-0,110	0,899	0,410	0,797

Results received for the group of companies with higher capitalisation

The correlation coefficients of individual profit categories and market value computed for the companies with higher capitalisation are summed up in Table 5. The significance level of the coefficients highlighted in light grey exceeded 1%, but remained below 5%. Since the significance level of the values highlighted in dark grey exceeded 5%, these correlation coefficients may not be considered significant. All other correlation coefficient values indicated a significance level below 1%.

It holds true for the group of companies with higher capitalisation that there was a significant, strong positive relationship between all three profit categories and the market value throughout the five years under review. This is indicated by the positive values of the linear Pearson's correlation coefficient, which remained close to 1 and did not deviate markedly in function of the profit category involved in the calculation.

The direction of the coefficient values computed for this group changed in line with the linear correlation coefficients computed for the entire population, and even their values remained close to each other. The results received for 31/12/2008 and 31/12/2009 were slightly lower than the coefficients computed for the entire population; nevertheless, even this difference was not pronounced. We may conclude, overall, that the strength of the relationship between market value and all three profit categories declined in the course of the review period; nevertheless, the relationship remained very strong and positive.

The linear correlation coefficient value computed for the relationship between comprehensive earnings and market value stood at 0.984 on 31/12/2005 and declined slightly by the end of the review period. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.964, 0.980, 0.967 and 0.937, respectively. Each correlation coefficient value indicated a significance level of 0%.

The linear correlation coefficient value established for the relationship between EBT and market value stood at 0.987 on 31/12/2005, and barely changed throughout the subsequent years. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.973, 0.981, 0.934 and 0.958, respectively. Again, each correlation coefficient value indicated a significance level of 0%.

The Pearson's correlation coefficient value computed for the relationship between market value and EBIT stood at 0.982 on 31/12/2005 and, as was the case with the relationship between EBT and market value, did not change markedly over the course of subsequent years, either. On 31/12/2006, 31/12/2007, 31/12/2008 and 31/12/2009 this value stood at 0.974, 0.981, 0.917 and 0.951, respectively. Again, each correlation coefficient value indicated a significance level of 0%.

As regards the partial correlation coefficients computed with book value as the controlled variable, their values did not imply such a strong relationship; moreover, the results obtained proved to be significant in one case only. This was the partial correlation coefficient value computed for 31/12/2007 – 0.891 –, which indicated a strong positive relationship between comprehensive earnings and market value at a significance level of 0.7%. Two coefficients indicated a strong positive relationship with significance levels below 5%; therefore, these coefficient values would have been acceptable at a 95% confidence level. This was observed in the case of the partial correlation coefficient computed for the relationship between EBT and market value, which stood at 0.832 on 31/12/2007, and the coefficient value of comprehensive earnings and market value, which was 0.783 on 31/12/2009. The rest of the partial correlation coefficients did not indicate a significant relationship between the value of the individual profit categories and market value.

In examining the partial correlation coefficients it should not be overlooked that the number of elements included in the group was extremely low, which, in addition to the factors described in respect of the total population under review, may have contributed to the deterioration of the significance level.

Based on the above we may conclude, overall, that there was a significant, strong positive relationship throughout the review period between the values of the individual profit categories and market value in the case of companies with higher capital values. This relationship, however, weakened somewhat and lost its significance in most cases when book value was included in the analysis as a controlled variable.

Table 5: The correlation coefficients of profit and market value for the companies with higher capitalisation

Profit category	Correlation coefficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
EBIT	Pearson's	0,982	0,974	0,981	0,917	0,951
	Partial (book value)	0,078	-0,407	0,750	0,018	0,375
EBT	Pearson's	0,987	0,973	0,981	0,934	0,958
	Partial (book value)	0,511	-0,202	0,832	0,266	0,592
Comprehensive earnings	Pearson's	0,984	0,964	0,980	0,967	0,937
	Partial (book value)	0,639	-0,064	0,891	0,417	0,783

Results received for the group of companies with lower capitalisation

The correlation coefficients of individual profit categories and market value computed for the companies with lower capitalisation are summed up in Table 6. The significance level of the value highlighted in light grey exceeded 1%, but remained below 5%. Since the significance level of the values highlighted in dark grey exceeded 5%, these correlation coefficient values may not be considered significant. All other correlation coefficient values indicated a significance level below 1%.

It holds true for the group of companies with lower capitalisation that, as opposed to the results received for the entire population and for the group of companies with higher capital values, in this case there was no significant, strong positive relationship throughout the five years under review between all three profit categories and market value. This is indicated by the values of the Pearson's correlation coefficient, which did not show a significant relationship at all dates and

for all three profit categories, and even when they proved to be significant, they pointed to a weaker relationship.

The linear correlation coefficient value computed for the relationship between comprehensive earnings and market value only proved to be significant, with a significance level of 1%, on 31/12/2006 and 31/12/2009, when it stood at 0.606 and 0.665, respectively, pointing to a medium positive association. Since the coefficient values indicated a significance level of over 5% at the remaining dates, they were not considered significant, and even a 95% confidence level would not have made a difference in this regard.

Similarly to the case described above, the linear correlation coefficient value computed for the relationship between EBT and market value only proved to be significant, with a significance level of 1%, on 31/12/2006 and 31/12/2009, when its respective values of 0.630 and 0.750 pointed to a closer – initially a medium, then a strong – positive relationship. Since the coefficient values indicated a significance level of over 5% at the remaining dates, they were not considered significant, and even a 95% confidence level would not have made a difference in this regard.

Except for the value established for 31/12/2007, the Pearson's correlation coefficient computed for the relationship between EBIT and market value proved to be significant and indicated a medium or a strong positive relationship. On 31/12/2005, 31/12/2006, 31/12/2008 and 31/12/2009 this value stood at 0.696, 0.730, 0.729 and 0.737, respectively, pointing to a significance level below 0.2% throughout these periods.

The partial correlation coefficients computed with book value as the controlled variable were higher in one case, and lower in four cases than the linear correlation coefficient value established for the corresponding dates. On one occasion, the partial correlation coefficient turned out to be significant while the Pearson's correlation coefficient computed for the relationship between the same profit category and market value was not significant as at the corresponding date.

There were two dates at which the partial correlation coefficient reflecting the relationship between comprehensive earnings and market value had a significance level below 1%. For the first time, this happened on 31/12/2007, when the coefficient took the value of –0.632, and the second time on 31/12/2009, when it stood at 0.659. At the former date the linear correlation coefficient was not significant; thus this

value, which implies a medium negative relationship, may not be compared to it; nevertheless, the negative relationship should be considered non-existent. At the latter date the partial correlation coefficient value slightly undershoots that of the Pearson's correlation coefficient, which points to the partial explanatory power of book value.

The partial correlation coefficient value, which reflects the relationship between EBT and market value, indicated an acceptable value on 31/12/2009, when it stood at 0.693 at a significance level of 0.4%. This is slightly less than the value of the Pearson's correlation coefficient computed for this date, which suggests that the book value has partial explanatory power. Similarly to the coefficient computed for the relationship between comprehensive earnings and market value, standing at –0.552 on 31/12/2007, the coefficient indicated a medium strong negative relationship in this case as well; however, with a value of 2.1%, the significance level proved to be higher than 1%. As at the remaining dates the values of the partial correlation coefficient were not significant.

There were three dates at which the partial correlation coefficient reflecting the relationship between EBIT and market value had a significance level below 1%. For the first time, this happened on 31/12/2005 when the coefficient took a value of 0.836, and subsequently on 31/12/2006 and on 31/12/2009, when it stood at 0.683 and 0.684, respectively. At the first date the value of the partial correlation coefficient surpassed that of the linear correlation coefficient computed for the corresponding date, and indicated a strong positive relationship and a 0% significance level, which implies a correlation partially suppressed by the book value. At this date the book value did not show a significant relationship with the value of either profit category, which explains this difference in the direction of the partial correlation coefficient. At the two latter dates the partial correlation coefficient value showed significance levels of 0.4% and 0.5%, respectively, and was slightly lower than that of the Pearson's correlation coefficient, which points to the partial explanatory power of book value. As at the remaining dates the values of the partial correlation coefficient were not significant.

In examining the partial correlation coefficients it should not be overlooked that the number of elements included in the group was extremely low, which, in addition to the factors described in respect of the total population under review, may have contributed to the deterioration of the significance level.

Based on the above we may conclude that, as opposed to the results received for the entire population and for the group of companies with higher capital values, in the case of companies with lower capitalisation the significant, strong positive relationship between the individual profit categories and market value was not maintained throughout the five years under review. This relationship weakened and lost its significance in most cases once book value was included as the controlled variable.

Table 6: The correlation coefficients of profit and market value for the companies with lower capitalisation

Profit category	Correlation coefficient	31/12/ 2005	31/12/ 2006	31/12/ 2007	31/12/ 2008	31/12/ 2009
EBIT	Pearson's	0,696	0,730	0,353	0,729	0,737
	Partial (book value)	0,836	0,683	0,218	0,491	0,684
EBT	Pearson's	0,456	0,630	0,295	0,248	0,750
	Partial (book value)	0,451	-0,012	-0,552	0,329	0,693
Comprehensive earnings	Pearson's	0,392	0,606	0,258	0,150	0,665
	Partial (book value)	0,386	-0,121	-0,632	0,341	0,659

In respect of the entire population and the group of companies with lower and higher capitalisation alike, based on the results detailed above we may conclude that there was a significant, at least medium strong positive relationship between the values of the individual profit categories and the market value throughout the period under review. This association weakened and, especially in the group of companies with higher capital values, even lost its significance in most cases, once book value was included as a controlled variable in the research.

The results of the calculations performed for the group of less capitalised companies did not always indicate an acceptable significance level in respect of the Pearson's correlation coefficient either, and involving the controlled variable increased the number of these cases further. Consequently, in the case of this group we may not conclude that there was a significant relationship between the individual profit categories and market value throughout the entire review period.

It should not be overlooked, however, that the number of elements included in the population under review was rather low, which may have contributed to the deterioration of the significance level.

Based on the results received we may not conclude, overall, that there is a positive relationship between a company's earnings and its market value; hypothesis 2, therefore, must be rejected.

4.4.1.3. Verification of hypothesis 3

Upon testing the third hypothesis I examined whether it was the book value or the profit figure that had a stronger relationship with the market value in the course of the review period. The application of the linear regression calculation method is very appropriate for this purpose. Upon the estimation of the regression coefficients, the standardised coefficients obtained as a result of the significance t-test, i.e. the β weights, indicate which independent variable involved in the analysis has a greater relative weight; in other words, which one has a greater explanatory power over the dependent variable. However, as the reliability of β weights deteriorates in line with the increase in multicollinearity, regression calculation is only applicable in the lack of a strong correlation between the explanatory variables involved in the research.

In the case of the entire population and the group of companies with higher capitalisation there was a significant, strong positive relationship between the examined explanatory variables, the book value and the values of the individual profit categories throughout the entire period under review. Since the existence of multicollinearity did not allow for the performance of a linear regression calculation, in the case of these two groups I drew conclusions from the comparison of the results of the calculations performed during the testing of the first two hypotheses.

In reviewing the Pearson's correlation coefficients I concluded that, without exception, it was the book value that proved to have a closer relationship with the market value. This is reconfirmed by the fact that, in the case of the individual profit categories, the partial correlation coefficients computed with book value as the controlled variable either proved to be not significant, or their value was lower than the corresponding values of the partial correlation coefficient computed for the relationship between book value and market value.

As the multicollinearity problem did not arise in relation to companies with lower capitalisation, regression calculation was feasible; the t-test of the constant term, however, did not indicate an acceptable significance level. In the case of this group, neither was the significant relationship between the individual profit category values and market value maintained at all dates under review. This leads to the conclusion that it was the book value that had a stronger relationship with market value.

It should not be overlooked, however, that the number of elements included in the population under review was rather low, which may have contributed to the deterioration of the significance level.

Based on the results received we may conclude, overall, that the value relevance of book value was greater than that of earnings; hypothesis 3, therefore, should be accepted.

4.4.2. Hypotheses relating to the deviation between market value and book value

To verify my hypotheses relating to the deviation between market value and book value, I effectuated trend estimations. I performed the examination separately for each company.

To analyse time series, I used quarterly data in cases where I had to use variables relating to which no more frequent data were available. Such variables were book value and value of wealth (economic resources and claims). In the case of trend estimations where the values of the variables were available on a monthly basis, I built up the time series from end-of-month data to get a better understanding of the trends.

Trend estimation requires stationary data series; consequently I used the variations in the values of the time series. In the case of variables determined in absolute values, I used the difference from 1 of the rate of the analysed value and its previous value, which shows the rate of increase or decrease from one date to another in the form of a decimal fraction. For variables in a percentage form, I determined the change in the examined value compared to the previous date by substraction,

which I subsequently also transformed into a decimal fraction. The ensuing values denoting change over time, spread around zero, showed the increases and decreases between the different dates.

I used the method of cross correlation to display relationships between time series. Cross correlation makes it possible to illustrate the correlation between two time series, allowing not only to show the immediate relationship, that is, the extent of covariance, but also to observe forecasts over time. When observing time series based on quarterly data, the number of applied shift periods was 8, meaning that I sought to determine the forecast relationship between variables for a period of 8 quarters. For time series based on monthly data, the number of shifts analysed was 12, consequently I reviewed a yearly forecast period.

To demonstrate my hypotheses relating to the deviation between market value and book value, in addition to trend estimations I also performed an individual review of the companies. I drew up, for each company separately, the movements of market value, book value and balance sheet total over time to identify the periods with substantial differences between market value and book value. For all periods with such outliers, I reviewed the major events in the company's history in order to find the factors which might explain the substantial changes in the values.

4.4.2.1. Verification of hypothesis 4

To verify hypothesis 4, I used cross correlation to analyse the relationship of market value and book value with wealth (economis resources and claims) value and their mutual forecasting ability. Having regard to the fact that information concerning book value and wealth value was only available on a quarterly basis, I used end-of-quarter data to build up the time series.

Similarly to the calculations performed to verify the previous hypotheses, I computed market value data as the product of the end-of-period closing share prices and the number of shares covering the whole equity, equalling the entire market value of the company. Just like in the case of the former hypotheses, I used the end-of-period equity values as input data for book value and the end-of-period balance sheet total values as input data for the value of company wealth. To calculate and illustrate cross correlation, for all of the three indicators I used the changes determined in the way described above.

In cases where the company failed to draw up a quarterly report and, as a consequence, no information was available on the equity and the balance sheet total, I replaced the missing value with the last information available (i.e. with the value of the previous quarter). As a result, in such cases the change in the concerned values was 0% in the given quarters.

I analysed forecasts using 4 shifts, i.e. for a period of 2 years. The confidence interval was [-0.5; 0.5]; I only accepted cross correlation values exceeding these values. Annex 3 contains the result graphs of the performed cross correlation analyses.

Results of the analysis of the relationship between book value and wealth value showed that in the case of 18 out of the 26 companies analysed, there was a relationship pointing to immediate covariance, i.e. the cross correlation value showed an acceptable relationship for period 0, i.e. a no-shift period.

For 6 companies, no coefficient value exceeding the boundaries of the confidence interval was recorded for either of the shift periods. In these companies, the equity value (showing book value) and the balance sheet total (showing wealth value) changed in opposite directions several times; furthermore, I observed a substantial and multidirectional variation in the value of the liabilities during the period under review, resulting in the fact that the cross correlation analysis did not point to a relationship between the book value and the wealth value.

I found two companies where, according to the cross correlation analysis, the wealth value forecasted the book value by 2 and 4 quarters, respectively. This was due to the fact that these companies failed to prepare a quarterly report, so there was no available information on the quarterly values of equity and balance sheet total. As a consequence, every second data in the time series showed a 0% variation, which influenced cross correlation.

On the basis of the presented values we may conclude that a relationship exists between book value and wealth value; nevertheless certain elements – typically the variations in liabilities – may modify or even screen this relationship.

The cross correlation analysis of market value and wealth value revealed in the case of 21 companies that there was no relationship exceeding the boundaries of

the confidence interval in the case of either the immediate or any of the shifted coefficients.

I found covariance (i.e. 0-period cross correlation) in 2 companies, due to an increase in the registered capital. As a result of this capital increase, the values of equity, the balance sheet total and the share price rose at the same time, which was reflected in the cross correlation value indicating the relationship between the wealth value and the market value. Due to the fact that the time series contained a small number of observed dates, one such event was sufficient for the cross correlation to signal covariance.

In the case of 2 companies, I observed that the wealth value forecasted the market value by a quarter, but in one of the cases the relationship was negative. In the company in the case of which I found a negative forecast relationship, the decrease of the wealth value was caused by capital reduction, then during the following quarter the majority owner sold its shares, which resulted in an increase of the market value. The other company began to expand after a highly successful financial year (the success of which was also reflected in an increase of its wealth value), and as a result of the acquisitions, its market value rose accordingly. In both cases, the increase in the market value was caused by a factor other than the immediate effect of changes in the wealth value.

In the analysed population, only in the case of one company did the wealth value forecast the market value by two quarters, according to the cross correlation analysis. In the case of this company I did not observe a substantial change in the balance sheet total which might have explained the result of the cross correlation; as a consequence, in the background of this result I assume the effect of the small number of elements of the analysed time series.

From the above, it is clear that there was no basic relationship between the market value and the wealth value; their eventual relationship was mainly due to certain events in the companies' histories. The events having an impact on the registered capital or, through the earnings, the equity of the company, also affected the wealth value. The change in the market was either due to a change in the registered capital or to other events in the company history; as a consequence, the observed relationship between market value and wealth value was due to a third factor.

On the basis of the obtained results we may conclude, overall, that a deviation exists between market value and book value because market value is not determined on the basis of wealth value: consequently, hypothesis 4 should be accepted.

4.4.2.2. Verification of hypothesis 5 and 6

Hypothesis 5 and 6 are strongly interlinked, as they seek to analyse whether certain factors are related to market value (hypothesis 5) and book value (hypothesis 6) respectively. After the review of the factors mentioned in the hypotheses, I performed the verification of the two hypotheses jointly.

As formulated in hypothesis 5, variations in the market value are influenced by expectations concerning the ability of the company to earn profits in future. It is however difficult to illustrate and quantify the expectations (a process indispensable for empirical research), because it is a rather intangible phenomenon interpreted differently by the individual investors. At all events, it may be established that the evolution of expectations concerning the ability of the company to earn profits in future is influenced by information made public in relation to the given company. Such information includes data displayed in the annual, mid-year and quarterly financial reports as well as any published information concerning the future plans and major transactions of the company.

Accordingly, I examined the impact of expectations concerning the ability of the company to earn profits in future on the evolution of market value by individually mapping out all the events made public. For each company, I represented in a diagram the variation of market value and book value over time to identify the periods with substantial differences between market value and book value. For all periods with such outliers, I reviewed the major (published) events in the company's history in order to find the factors which might explain the substantial changes in the values through shaping expectations concerning the ability of the company to earn profits in future.

Further influencing factors identified in hypothesis 5 include national macroeconomy, regional economy, global economic trends, industrial specificities

and other psychological influences. I used cross correlation analysis to test the influence of the characteristics of the country, region, global economy and industry on the evolution of market value. To be able to perform these tests, to the determined influencing factors I assigned indicators which appropriately illustrate the variations in the factor under observation.

I first used the cross correlation analyses to test whether changes in the indicators illustrating the individual factors were related to variations in the market value, and whether a forecast relationship existed between the two in either of the directions. Subsequently I repeated the above procedure regarding the changes in the observed indicators and the book value. To draw up time series, I used the variations between the end-of-month data of the indicators, calculated with the method described above.

The results of the individual analyses

To determine the impact of expectations concerning the ability of the company to earn profits in future on the evolution of market value, in the framework of individual analyses I reviewed the periods when substantial deviation could be observed in the changes in market value and book value. To identify these periods with outlying changes, I represented the quarterly changes in market value and book value in separate diagrams for each company. The diagrams are presented in Annex 4. Subsequently I reviewed the published events which had intervened in the companies' history in the chosen period in order to find the factors which, through shaping expectations, might have influenced the substantial changes in the values.

I examined a total of 77 periods with conspicuous changes, including some periods when several major events had happened in the history of the examined company; however, I also encountered periods with prominent changes in the values when no event was published at all. Furthermore we should not overlook the fact that other influencing factors also had an impact on the variations of market value, which also influenced the deviations observed between market value and book value.

According to the most characteristic scenario, observed in the case of 13 companies, the increase in market value was preceded by expansion, acquisition or a capital increase relating to one of the subsidiaries. However in the case of 5 companies, similar events were followed by a decrease in the market value, which

may have been the result of some other influencing factor. The sale or liquidation of a subsidiary as well as the outsourcing of a division (i.e. the "narrowing" of the company) resulted in the increase of the market value for 3 companies, while entailed its decrease in the case of another. The impacts may have varied according to the investors' favourable or unfavourable opinion on the subsidiary or the division.

The second most frequent transaction I observed as occurring before changes in share prices was dividend payout. In the case of 8 companies, the market value began to increase after the declaration of the dividend payout while the book value remained unchanged; whereas in the one case where the dividend was paid partly to the debit of the accumulated profit reserve, the book value decreased. Two companies lost market value after the publication of the general assembly's decision on dividend payout. Leaving the impacts of other factors out of consideration, this may be explained by the fact that the amount of the dividend may have fallen behind the amounts of the payable dividend declared by other companies, which – for those seeking short term profit – may have represented a motivation to sell/replace these shares. Similarly, a notification of the fact that the company shall not pay out dividend from its current year earnings entailed a fall in the market value.

The declaration of a dividend received from a subsidiary was coupled with the increase of market value in one case and its decrease in another; leaving the impacts of other factors out of consideration, this may be explained by the fact that the amount of the dividend may have fallen behind the amounts of the payable dividend declared by other companies.

The third most frequent event was a change in the registered capital. In the case of 6 companies, the market value rose at a higher rate than the book value following the effectuated capital increase, while for one company, merely the notification of an expected increase had the same effect. In the case of one company, the capital increase coincided with a fall in market value, which may have been due to other influencing factors, such as news of the indebtedness of a subsidiary. One company managed to effectuate a capital reduction in a way that it entailed only the decrease of the book value, while the market value remained unaffected.

Also share transactions were observed to frequently precede substantial changes in market value. Increases in market value occurred after share acquisitions by persons having private information in the case of 6 companies, and following the sale of shares by such persons at 2 companies. Comparable changes in market value

were observed in 4 companies after a share acquisition transaction by a plus-5% owner, and in one company after a similar share sales transaction. I observed acquisitions of own shares in 4 companies and sales of same in 2 companies before a rise in market value. In the case of the above transactions implying sales of shares, it is possible that these sales were (partly) motivated by the rise in the market value.

Falls in market value were preceded by sales of shares by well (privately) informed persons in the case of 3 companies, and by a share purchase by such persons in one company. In this latter case however, another event occurred: an expected lay-off was notified, which also might have affected the change in the market value. In the case of 2 companies, the fall of the market value was preceded by share sales by plus-5% owners, and in 3 others by share acquisitions by the same kind of actors. In the case of the above transactions implying the purchase of shares, it is possible that these acquisitions were (partly) motivated by the decrease in the market value.

In parallel with the decrease in its market value, one company issued an extraordinary notification to confute news that had appeared in the press about the circumstances of its purchase of its own shares: the company declared that their aim in buying own shares was not to drive the shares out of the stock exchange, but to stop the fall in the prices.

Several companies issued news about winning new commissions, concluding new contracts or favourable modifications of the existing partnership contracts of the company. In the case of 6 companies, these notifications were followed by an increase in the market value; however, in another company, a decrease ensued. This latter case occurred in 2008, at a time when a general fall in the market values of companies was an overall trend.

In the case of 3 companies, I found news about major investments or real estate developments preceding increases in their market values. A company received state support as an incentive for investment during the examined period, which also resulted in a rise in the market value.

There is one example for a scenario where a company declared an expected good annual earnings and an increase in the market value followed; and another for the opposite case, i.e. the notification about an expected slowdown in the growth of the company was followed by a fall in the market value.

In the case of three companies, market value increased after, respectively, the deblocking of previously barred employee shares, the transformation of preferred shares into equity shares, or the issuing of redeemable preferred liquidation shares.

Two companies were penalised by the Hungarian Competition Authority and the European Commission, respectively: this was followed in both cases by a fall in the market value. The market value of a company decreased after a litigation with an unfavourable outcome; the market value of another increased after the sales of a litigated outstanding claim of a high amount.

I observed an increase in the market values of 6 companies and a decrease in 3 without the publication of any kind of notification in the given period. In these cases it is clear (and in the others, quite probable) that some other influencing factors must (also) have played a role in the variations in the share prices.

On the basis of the cases described above, we may conclude, overall, that numerous events and published pieces of information which affected expectations concerning the ability of the companies to earn profits in future also had a resulting impact on the evolution of their market values. In the analysed cases, the changes in market value substantially differed from the variations of the book value, which suggests that published information and events are incorporated into expectations and, depending on the nature of the event, either only influence the evolution of the market value but leave the book value intact, or cause major changes in the market value which also appear as an immediate impact in the book value.

The results of the cross correlation analyses

I also examined with the help of cross correlation analyses what impact the remaining enumerated influencing factors mentioned in hypothesis 5, in addition to expectations concerning the ability of the company to earn profits in future, may have had on the changes in market value and book value. To be able to perform these tests, to factors such as the characteristic features of the country, the region, the global economy and the industry I assigned indicators which appropriately illustrate the variations in the factor under observation.

To establish the time series, also in the case of the listed indicators I used values of variations in end-of-month data, determined with the method described above.

To illustrate the determined influencing factors, I used the indicators described below.

As an indicator of the macroeconomic specificities of the country, I used the consumer price index showing year on year changes, as well as the unemployment rate and the 3-month reference yield of government securities. These data were downloaded from the website of the Hungarian Central Bank.[56]

As indicators reflecting the economic situation of the region, I chose two stock exchange indices. One of them was CETOP20, the Central European Blue Chip index, which reflects the performance of the 20 most capitalised and traded Central European companies and serves as a reference for investors interested in the region. The index comprises shares from the Budapest, Warsaw, Prague, Bratislava, Ljubljana and Zagreb stock exchanges, with a limit of simultaneously 7 bonds per stock exchange. I collected the end-of-month values of the index from the website of the Budapest Stock Exchange.[57] The other chosen stock exchange index was the Dow Jones Emerging Markets Index denoted W5DOW of the Dow Jones index group, comprising shares from emerging markets including Hungary, the Czech Republic and Poland. I downloaded the index data from the Yahoo! Finance[58] website.

To illustrate changes in the global economy, I used the variations in the global prices of Brent oil and gold, as well as two stock exchange indices. I downloaded the Brent oil price per barrel from a BP Group[59] webpage, and gold prices from the World Gold Council[60] website. One of the chosen stock exchange indices was the Dow Jones Global Index denoted W1DOW of the Dow Jones index group, which measures the performance of the global share market and covers 95% of the capitalisation of the stock markets all over the world. The other stock exchange index I analysed was DAX (Deutscher Aktien Index), comprising the

[56] http://www.mnb.hu/.

[57] http://www.bet.hu/.

[58] http://finance.yahoo.com/.

[59] http://production.investis.com/bp2/download/brent_oil/.

[60] http://www.gold.org/.

prices of the 30 most active shares of the greatest capital value on the Frankfurt Stock Exchange. I downloaded the index values from the Yahoo! Finance[61] website.

Instead of industrial characteristics, I was able to examine sectoral specificities, which I illustrated by the Dow Jones Sector Indexes. I used the following indices:

- W5BSC (Dow Jones Emerging Markets Basic Materials Index), with observed companies active in the plastics and the chemicals industry.
- W5UTI (Dow Jones Emerging Markets Utilities Index), with observed companies active in the electricity supply industry.
- W5FIN (Dow Jones Emerging Markets Financials Index), with observed companies active in asset and portfolio management and in property management.
- W5CYC (Dow Jones Emerging Markets Consumer Services Index), with observed companies active in hotel industry and trade.
- W5NCY (Dow Jones Emerging Markets Consumer Goods Index), with observed companies active in the textile and beverage industry.
- W5ENE (Dow Jones Emerging Markets Oil & Gas Index), with an observed company active in the petroleum and natural gas industry.
- W5HCR (Dow Jones Emerging Markets Health Care Index), with observed companies active in the pharmaceutical industry.
- W5IDU (Dow Jones Emerging Markets Industrials Index), with observed companies active in the vehicle or machine manufacturing and security printing industry.
- W5TEC (Dow Jones Emerging Markets Technology Index), with observed companies active in the IT industry.
- W5TLS (Dow Jones Emerging Markets Telecommunications Index), with an observed company active in the telecommunication industry.

I downloaded the end-of-month values of the indices from the Yahoo! Finance[62] website.

[61] http://finance.yahoo.com/.

[62] http://finance.yahoo.com/.

To verify hypothesis 5, I used time series drawn up on the basis of changes in the end-of-month values of the market value and of the indicators. For the purposes of the present study, I derived the variations in market value from the end-of-month closing values of the share prices.

I analysed the observations concerning forecasts with 12 shifts, i.e. for a year, as a longer-term forecast result could not have been considered as realistic. Because of the higher number of elements in the time series, the confidence interval was [-0.25; 0.25]; I only accepted coefficient values exceeding this threshold. As a result of the analyses performed, I obtained 1081 diagrams of cross correlations between pairs, out of which 532 were relevant. However this is such a large quantity that I shall be unable to present it within the limits of this paper; the table containing the accumulated results is included in Annex 5.

Reviewing the results of the cross correlation analyses, we may establish that there was only one company in the case of which the changes of each of the examined indicators influenced the market value: either the market value covaried with changes in the indicators or the indicator forecasted the variations in the market value. The market values of 3 companies revealed a relationship with all but one of the examined indicators, and 5 more companies with all but two. The above mentioned 9 companies comprised 5 out of the 6 most capitalised enterprises.

I found 2 companies the market value of which did not show either covariance, or any other relationship shifted in time, with any of the examined indicators. The market value of a further 2 companies changed in relation to the time series of only one or two variables, respectively, among the examined indicators. These four companies mentioned above were characterised by a low (>20%) ratio of public ownership all through the examined period, and the rate of the quantity of their traded shares per year compared to the quantity of shares covering the whole equity capital also remained below this value. The remaining 13 companies were situated somewhere between the above described extremes concerning the covariance with the examined indicators and the related forecast capacity.

Regarding the indicators used for cross correlation analyses, I observed covariance in the selected elements of the Dow Jones index group, as illustrated by the cross correlation graphs and the diagram in Annex 6. As a result, the companies' market values which covaried with one of the indices showed similar cross correlation with the time series of the other indices as well.

Among the indicators describing the macroeconomic specificities of the country, the market values of 13 examined companies neither covaried with the consumer price index nor were anticipated by the variations of that index. I only observed covariance in 2 companies; furthermore, in the case of 4 companies, the evolution of the consumer price index forecasted the changes in the market value, by two months in the case of two of them, and by three months for the remaining two companies. In some companies, the effect of changes in the consumer price index could be observed in the variations of the market value several months later only: after four months in the case of 5 companies, and only six or ten months later for 2 others, respectively.

The cross correlation analysis between market value and unemployment rate revealed a lack of relationship between the two variables in the case of 18 companies. I observed covariance between these factors in one company only; additionally, changes in unemployment rate forecasted variations in the market value by three months in 1 company, by four months in 2 companies and by six months in 4 companies. The market values of these 8 companies, affected by variations in the unemployment rate, also showed cross correlation with most of the time series of the other indicators.

The analysis of the time series of market value and of the reference yields of government securities had similar results. In the case of 16 companies no cross correlation could be observed between the two variables. Out of the remaining 10 companies, 8 showed negative covariance, 1 revealed a negative forecast relationship of two months, and 1 indicated a ten-month positive cross correlation. This latter relationship may not be considered valid because of the positive value of the coefficient.

To illustrate the specificities of the region, I used two stock exchange indices in this study. The market values of 8 companies failed to show any relationship with either CETOP20 or the Dow Jones Emerging Markets Index. Except for one of them, these 8 companies were the same as the group of companies of which the market values did not show any cross correlation with the Dow Jones Global Index either. In the case of 14 companies, the market value covaried with CETOP20; while the movements of the index forecasted changes in the market value by one month for 1 company, five months for 2 companies, and six months for 1 company. In addition to covariance, also a forecast relationship was observed in the case of 7 companies. The

market values covaried with the Dow Jones Emerging Markets Index in 17 companies, while in the case of one company, the movements of the index forecasted changes in the market value by three months. In 9 companies, in addition to covariance, also a forecast relationship of a maximum of five months was observed. The results of the analyses of the two indices were consistent: I observed similarities in the set of companies concerned by relationships of covariance and forecast, as well as in the length of the individual forecast periods.

Among the indicators reflecting the specificities of the global economy, the variations in Brent oil prices covaried with the market values of 11 companies and failed to influence them in the case of another 11. Forecast relationships between Brent oil prices and market values were observed on a one-month term in 2 companies, and on a two- and three-month term for another 2 companies, respectively.

The factor exerting the least influence on market prices was the price of gold on the global market: this indicator failed to reveal a connection with market value in 21 companies, and a covariance between the two time series could only be observed in the remaining 5 companies.

Concerning the stock market indices selected to reflect global economic trends, the market values of 18 companies showed covariance with the Dow Jones Global Index; the market values of the remaining 8 companies did not reveal any cross correlation with this indicator. These companies were characterised by a low ratio between the yearly quantity of their traded shares and the total share capital. In addition to covariance, the index under review forecasted variations in the companies' market values by one month for 3 companies, by two months for another 3 companies, and by five months for 1 company. The firms having a forecast relationship with this indicator were, with one exception, included in the group of companies showing a relationship with a minimum of all but two of the examined indicators.

The cross correlation analysis of the time series of the market value and the DAX index brought similar results. Only in a low number of companies (6) did I fail to observe any relationship between the market value and the examined index; at the same time, the market values of 16 firms covaried with the index. As far as the remaining 4 companies are concerned, their market values were influenced by the movements of the index with a one-, five- or nine-month shift. In the case of 9

companies the market value of which showed covariance with the index, a forecast effect could also be observed. I could also establish that the market values of those companies which revealed a relationship with the DAX index also showed cross correlation with the movements of the Dow Jones Global Index.

I revealed significant overlaps between the Dow Jones Sector Indexes used to reflect industrial characteristics. The market values showing or lacking cross correlation with the Dow Jones Emerging Markets Index and the Dow Jones Global Index behaved in a similar way in relation to the time series of the sector indices. Furthermore, with the exception of 7 companies, it could be observed that whenever the changes in the market value was connected with the movements of one of the sector indices, it also showed cross correlation with the variations of several other sector indices. This is a result of the close relationship between the observed members of the Dow Jones index group, due to the fact that in addition to sectoral specificities, sector indices are also influenced by global economic trends. Only in the case of 3 companies could I establish that the covariance of their market values showed the strongest cross correlation coefficient with the variations of the sector index to which the given company actually belonged. Consequently, we may establish that due to the strong relationship between the members of the Dow Jones index group, the examined indices were unable to reflect the industrial/sectoral specificities and their influence on the changes in market value.

We may conclude, overall, that the cross correlation analyses proved to be very useful in revealing certain interrelations in the variations of the market values and the examined indicators; yet if we seek to perform a more precise analysis of the factors influencing market value, we need to involve more indicators to be able to illustrate the individual influencing factors under review.

For the verification of hypothesis 6, I used the changes determined on the basis of the end-of-quarter values of the book value and of the indicators to produce time series, having regard to the fact that I only had quarterly data about book values. In cases where the company failed to draw up a quarterly report, I replaced the missing value with the last information available (i.e. with the value of the previous quarter). As a result, in such cases the change in the concerned values was 0% in the given quarters.

I analysed the observation of forecasts with 6 shifts, i.e. for a period of 1.5 years. The confidence interval was [-0.5; 0.5], and I only accepted cross correlation values exceeding these values; however, for the sake of comparability with the results of the similar analysis regarding market value, I also made a note of relationships showing lower coefficient values, recognising that due to the lower number of elements in this time series, the results may not be considered fully reliable. Here again, as a result of the performed cross correlation analyses I obtained so many graphs that their presentation would exceed the limits of the present paper.

On the basis of these results we may conclude, overall, that the evolution of the book value did not reveal any relationship with the variations in the indicators under review. In the light of the fact that for a more precise analysis of the relationships, more indicators should be involved to illustrate the individual factors influencing changes in the market value, it shall also be necessary to further examine the relationship of these influencing factors with the book value.

Accepted and/or rejected hypotheses

On the basis of the individual analyses described above, we may conclude that numerous events and published pieces of information which affected expectations concerning the ability of the companies to earn profits in future also had a resulting impact on the evolution of their market values. In the analysed cases, the changes in market value substantially differed from the variations of the book value, which suggests that published information and events are incorporated into expectations and, depending on the nature of the event, either only influence the evolution of the market value but leave the book value intact, or cause major changes in the market value which also appear as an immediate impact in the book value.

The cross correlation analyses proved to be very useful in revealing certain interrelations in the variations of the market values and the examined indicators; yet if we seek to perform a more precise analysis of the factors influencing market value, we need to involve more indicators to be able to illustrate the individual influencing factors under review. As a result, it shall also be necessary to further examine the relationship of these influencing factors with the book value. The timeframe of the present research did not make it possible to involve further indicators in the study.

On the basis of the results of the performed analyses, we may conclude, overall, that we do not need to reject either hypothesis 5 or, consequently, hypothesis 6; however, further research is necessary in order to be able to fully establish their validity.

5. SUMMARY AND CONCLUSIONS

First I provided adequate theoretical fundamentals to the research: through the review of pertaining academic literature, I first drew up the major theoretical approaches relating to the book value and market value of companies, then enumerated different views on the deviations between market value and book value.

In Chapter 2.2, I discussed the issue of companies' book value in detail. On the basis of the information given in that chapter, it may be established that according to present accounting rules, the book value of a company (i.e. the value of its equity as indicated in the balance sheet) is mainly determined using a historical cost model founded basically on the realisation principle, presuming the principle of going concern; yet values determined on the basis of the revaluation model based on the time value principle begin to appear in relation to a growing number of items. Accordingly, in the balance sheet compiled in application of IFRS, examined in the framework of the empirical research, the historical cost model based on the realisation principle and the revaluation model based on the time value principle are present in parallel.

We should also stress that the balance sheet may only contain elements which meet the recognition or presentation criteria. Consequently, book value is only constituted by elements owned or controlled by the company, resulting from past events and producing an expected profit in the future, which may be measured reliably, for it is the only way to ensure the assertion of the philosophy that accounting needs to present a true and fair view.

Also the aim of accounting needs to be taken into account when analysing the developments of the book value, as this provides the explanation for the book value being just what it is. Through the intermediary of the balance sheet, accounting provides information to stakeholders about the current financial position of the company. Obviously it is impossible to satisfy the information needs of all coalition members, so priority should be established among the individual interests. As a result, in current accounting practice the aim of determining the result enjoys priority, and the calculation of the values of wealth and equity are subordinated to this objective.

The market value of companies was analysed in Chapter 2.3. According to the statements of that chapter it may be established that the evolution of the market value of a company – i.e. the share price – is influenced by numerous factors.

Assuming an efficient market, the share price reflects the expectations regarding the future performance of the company. In addition to the impacts related to the business environment and other factors, the market players' expectations are also based on the book value and earnings data of the company. As a result, also research into value relevance has shown that share prices are in significant relationship with book value and earnings, respectively. This also highlights the fact that wealth value and yield together shape the market value of the company.

Examining the issue of market efficiency, we concluded that many economists and researchers confirmed that the operation of the market is not fully efficient. Investors frequently act irrationally and show speculative behaviour. As a result, share prices are also influenced by psychological factors as well as by current supply and demand. Research also shows that a reason for the fact that the strength of the relationship between share price and book value (i.e. value relevance) decreased in the United States may be the expansion of such influencing factors, in other words, of non-information-based business activity.

The facts described above reveal that substantial differences exist between the objective, approach, way of determination and influencing factors of book value and market value. Book value provides information about historical and current evidence; market value substantiates future expectations and the effects of a number of other factors. Book value may be deducted from the value of the wealth of the company; market value is the result of the impact of wealth value, yield value and several other factors. The balance sheet of the company, and consequently book value, seeks to satisfy the information needs of the totality of stakeholders, whereas share price (i.e. market value) examines the value of the company purely from the point of view of the present owners and future investors. The differences in the objective, perspective and influencing factors provide satisfactory explanation for the deviations between market value and book value.

In the framework of the empirical research, I tested two groups of hypotheses. The first group of hypotheses aimed to analyse the value relevance of accounting data; I intended to observe the strength of the relationship between the book value of

equity and the different profit categories on the one hand, and share prices on the other hand. Understanding the existence, direction and strength of these relationships not only provides valuable information for comparison with the results of former international research, but also serves as a starting point for the verification of further hypotheses and for the analysis of the factors influencing the deviation between the market values and book values of companies.

The remaining hypotheses aim to examine the factors influencing the deviation between market value and book value. When formulating these hypotheses, I intended to highlight that these two values serve different purposes, and as a consequence also their methods of determination and the scope of the factors directly influencing their development need to be different. This necessarily leads to a deviation between the two values. The innovative nature of these hypotheses primarily lies in the fact that they set up a cause and effect relationship between the above described characteristics and the deviation between market value and book value.

I verified the established hypotheses on the set of the companies having issued shares listed at the Budapest Stock Exchange in the period between 2005–2009. Resulting from the low number of listed companies, I was able to avoid sampling and conduct a full research. It was a requirement towards each element of the population under review that all through the examined period, their shares must be listed on the stock exchange, and they should prepare their financial reports in accordance with the International Financial Reporting Standards so as to ensure that the population is homogeneous concerning the system of applied accounting rules. Due to their accounting specificities, no financial enterprises were admitted into the population under review. As a result, the total number of observation units was 26. This fact might challenge statistical stability if not taken into proper consideration during the evaluation of the study results.

During verification of the hypotheses related to the value relevance of accounting data, I tested the existence as well as the direction, stability, strength and

nature of the relationship between book value and earnings[63] on the one hand, and market value on the other hand. I used correlation and regression analysis as a method to examine the relations between the above mentioned metric values. I performed the same calculations not only for the totality of the companies involved in the research, but also for two subgroups into which I had divided the companies according to their sizes, so as to observe if any differences arise on this basis.

For the purpose of the other hypotheses, I analysed time series and performed trend estimations. I used cross correlation analysis to reveal any covariance of the market value and the book value with the wealth value. To find the factors influencing the deviations between market value and book value, I examined the changes in the market value over time for each company, then identified for each of them the periods when a substantial deviation could be observed in the changes of the two values, and reviewed public information in order to establish whether they offered adequate explanation for these differences in value changes.

I also examined, through additional trend estimation, the covariance of certain indicators with market value and book value and their eventual forecasting potential, identifying the indicators influencing only one or both of the values. For these calculations I also used the method of cross correlation analysis.

During the verification of hypothesis 1, I calculated the Pearson's correlation coefficient and the partial correlation coefficient in order to examine the existence, direction and strength of the relationship between the book value and market value of individual companies. I calculated both types of the correlation coefficient for the five balance sheet dates of the period under review, both for the entire population and separately for the two groups composed of companies with higher and lower capitalisation. In calculating the partial correlation coefficient, data associated with the individual profit categories represented the controlled variables both together and separately.

In respect of the entire population and the group of companies with lower and higher capitalisation alike, based on the research results we may conclude that there

[63] I examined several categories of earnings: the values included in the calculations were EBIT, EBT, and comprehensive earnings.

was a significant, at least medium strong positive relationship between book value and market value throughout the period under review. This at least medium strong positive relationship was maintained even when profit categories were included in the calculation as controlled variables; however, the thus computed partial correlation coefficient values did not prove to be significant in certain cases. This problem arose in the case of groups composed of a small number of elements; the results of the calculations for the entire population proved to be significant.

In the group of companies with higher capitalisation the partial correlation coefficient values evolved similarly to those computed for the entire population; however, when all profit categories were controlled simultaneously, they indicated a stronger relationship than the coefficient values computed for the entire population. The relationship between book value and market value appeared to be less strong in the group of companies with lower capitalisation; however, the profit categories did not have such a clear, partial explanatory power than in the case of companies with higher capitalisation. In the case of companies with lower capitalisation, in addition to the sharp decline in market values in 2008, the economic crisis set off the downturn observed in 2009 as well, which led to a further erosion of the strength of the relationship between book value and market value. Among the companies with higher capitalisation, however, this effect dissipated by 31/12/2009.

We may conclude, overall, that there is a positive relationship between a company's book value and its market value; hypothesis 1, therefore, should be accepted.

During the verification of hypothesis 2, I calculated both Pearson's and partial correlation in order to examine the existence, direction and strength of the relationship between the earnings and the market value of individual companies. The values of the three profit categories reviewed at testing hypothesis 1 were separately included in the calculations performed to determine their relationship with market value. I calculated both types of the correlation coefficient for the 5 financial years and balance sheet dates of the period under review, both for the entire population and separately for the two groups of companies with higher and lower capitalisation. In determining the partial correlation coefficient, the controlled variable applied was the book value.

In respect of the entire population and the group of companies with lower and higher capitalisation alike, based on the research results we may conclude that there was a significant, at least medium strong positive relationship between the values of the individual profit categories and the market value throughout the period under review. This association weakened and, especially in the group of companies with higher capitalisation, even lost its significance in most cases, once book value was included as a controlled variable in the research.

The results of the calculations performed for the group of less capitalised companies did not always indicate an acceptable significance level in respect of the Pearson's correlation coefficient either, and involving the controlled variable increased the number of these cases further. Consequently, in the case of this group we may not conclude that there was a significant relationship between the individual profit categories and market value throughout the entire review period.

It should not be overlooked, however, that the number of elements included in the population under review was rather low, which may have contributed to the deterioration of the significance level.

Based on the results received we may not conclude, overall, that there is a positive relationship between a company's earnings and its market value; hypothesis 2, therefore, must be rejected.

Upon testing hypothesis 3, I examined whether it was the book value or the profit figure that had a stronger relationship with the market value in the course of the review period.

In the case of the entire population and the group of companies with higher capitalisation there was a significant, strong positive relationship between the examined explanatory variables, the book value and the values of the individual profit categories throughout the entire period under review. Since the existence of multicollinearity did not allow for the performance of a linear regression calculation, in the case of these two groups I drew conclusions from the comparison of the results of the calculations performed during the testing of the first two hypotheses.

In reviewing the Pearson's correlation coefficients I concluded that, without exception, it was the book value that proved to have a closer relationship with the market value. This is reconfirmed by the fact that, in the case of the individual profit categories, the partial correlation coefficients computed with book value as the

controlled variable either proved to be not significant, or their value was lower than the corresponding values of the partial correlation coefficient computed for the relationship between book value and market value.

As the multicollinearity problem did not arise in relation to companies with lower capitalisation, regression calculation was feasible; the t-test of the constant term, however, did not indicate an acceptable significance level. In the case of this group, neither was the significant relationship between the individual profit category values and market value maintained at all dates under review. This leads to the conclusion that it was the book value that had a stronger relationship with market value.

Once again however, it should not be overlooked that the number of elements included in the population under review was rather low, which may have contributed to the deterioration of the significance level.

Based on the results received we may conclude, overall, that the value relevance of book value was greater than that of earnings; hypothesis 3, therefore, should be accepted.

To verify hypothesis 4, I used cross correlation to analyse the relationship of market value and book value with wealth value and their mutual forecasting ability. On the basis of the results of the performed analyses, we may conclude that a relationship exists between book value and wealth value; nevertheless certain property elements – typically the variations in liabilities – may modify or even screen this relationship. The cross correlation analysis showed that there is no basic relationship between the market value and the wealth value; their eventual relationship was mainly due to certain events in the companies' histories. The events having an impact on the registered capital or, through the earnings, on the equity of the company, also affected the wealth value. The change in the market value was either due to a change in the registered capital or to other events in the company history; as a consequence, the observed relationship between market value and wealth value was due to a third factor.

On the basis of the obtained results we may conclude, overall, that a deviation exists between market value and book value because market value is not determined on the basis of wealth value: consequently, hypothesis 4 should be accepted.

Hypothesis 5 and 6 are strongly interlinked, as they seek to analyse whether certain factors are related to market value (hypothesis 5) and book value (hypothesis 6) respectively; therefore I performed the verification of the two hypotheses jointly.

As formulated in hypothesis 5, variations in the market value are influenced by expectations concerning the ability of the company to earn profits in future. It is however difficult to illustrate and quantify the expectations (a process indispensable for empirical research), because it is a rather intangible phenomenon interpreted differently by the individual investors. At all events, it may be established that the evolution of expectations concerning the ability of the company to earn profits in future is influenced by information made public in relation to the given company. Such information includes data displayed in the annual, mid-year and quarterly financial reports as well as any published information concerning the future plans and major transactions of the company.

Accordingly, I examined the impact of expectations concerning the ability of the company to earn profits in future on the evolution of market value by individually mapping out all the events made public. For each company, I represented in a diagram the variation of market value and book value over time to identify the periods with substantial differences between market value and book value. For all periods with such outliers, I reviewed the major (published) events in the company's history in order to find the factors which might explain the substantial changes in the values through shaping expectations concerning the ability of the company to earn profits in future.

On the basis of the individual analyses performed we may conclude, overall, that numerous events and published pieces of information which affected expectations concerning the ability of the companies to earn profits in future also had a resulting impact on the evolution of their market values. In the analysed cases, the changes in market value substantially differed from the variations of the book value, which suggests that published information and events are incorporated into expectations and, depending on the nature of the event, either only influence the evolution of the market value but leave the book value intact, or cause major changes in the market value which also appear as an immediate impact in the book value.

Further influencing factors identified in hypothesis 5 include national macroeconomy, regional economy, global economic trends, industrial specificities and other psychological influences. I used cross correlation analysis to test the

influence of the characteristics of the country, region, global economy and industry on the evolution of market value. To be able to perform these tests, to the determined influencing factors I assigned indicators which appropriately illustrate the variations in the factor under observation.

I first used the cross correlation analyses to test whether changes in the indicators illustrating the individual factors were related to variations in the market value, and whether a forecast relationship existed between the two in either of the directions. Subsequently I repeated the above procedure regarding the changes in the observed indicators and the book value.

We may establish, overall, that the cross correlation analyses proved to be very useful in revealing certain interrelations in the variations of the market values and the examined indicators; yet if we seek to perform a more precise analysis of the factors influencing market value, we need to involve more indicators to be able to illustrate the individual influencing factors under review. The timeframe of the present research did not make it possible to involve further indicators in the study.

On the basis of the results of the cross correlation analyses performed, we may conclude that the evolution of the book value did not reveal any relationship with the variations in the indicators under review. In the light of the fact that for a more precise analysis of the relationships, more indicators should be involved to illustrate the individual factors influencing changes in the market value, it shall also be necessary to further examine the relationship of these influencing factors with the book value.

On the basis of the results of the analyses, we may establish that we do not need to reject either hypothesis 5 or, consequently, hypothesis 6; however, further research is necessary in order to be able to fully establish their validity.

In continuation of the research, I deem it necessary to involve further indicators reflecting the individual factors having an impact on the development of market value, in order to be able to perform a deeper analysis of hypothesis 5 and 6.

A possible direction for subsequent research my be the extension of the length of the period under review, and of the set of companies involved in the research.

ANNEXES

ANNEX 1: RESULT TABLES OF THE CORRELATION COEFFICIENTS OF BOOK VALUE AND MARKET VALUE

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,990	,991
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Market value 31/12/2005	Correlation	,990	1,000	,983
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBIT 2005	Correlation	,991	,983	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBIT 2005	Book value 31/12/2005	Correlation	1,000	,631	
		Significance (2-tailed)	.	,001	
		df	0	23	
	Market value 31/12/2005	Correlation	,631	1,000	
		Significance (2-tailed)	,001	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2006	Market value 31/12/2006	EBIT 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,993	,988
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Market value 31/12/2006	Correlation	,993	1,000	,974
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBIT 2006	Correlation	,988	,974	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBIT 2006	Book value 31/12/2006	Correlation	1,000	,870	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Market value 31/12/2006	Correlation	,870	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2007	Market value 31/12/2007	EBIT 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,969	,957
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Market value 31/12/2007	Correlation	,969	1,000	,984
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBIT 2007	Correlation	,957	,984	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBIT 2007	Book value 31/12/2007	Correlation	1,000	,539	
		Significance (2-tailed)	.	,005	
		df	0	23	
	Market value 31/12/2007	Correlation	,539	1,000	
		Significance (2-tailed)	,005	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,977	,956
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Market value 31/12/2008	Correlation	,977	1,000	,934
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBIT 2008	Correlation	,956	,934	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBIT 2008	Book value 31/12/2008	Correlation	1,000	,799	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Market value 31/12/2008	Correlation	,799	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,974	,962
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Market value 31/12/2009	Correlation	,974	1,000	,960
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBIT 2009	Correlation	,962	,960	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBIT 2009	Book value 31/12/2009	Correlation	1,000	,657	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Market value 31/12/2009	Correlation	,657	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	EBT 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,990	,988
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2005	Correlation	,990	1,000	,986
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBT 2005	Correlation	,988	,986	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBT 2005	Market value 31/12/2005	Correlation	1,000	,600	
		Significance (2-tailed)	.	,002	
		df	0	23	
	Book value 31/12/2005	Correlation	,600	1,000	
		Significance (2-tailed)	,002	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	EBT 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,993	,973
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2006	Correlation	,993	1,000	,985
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBT 2006	Correlation	,973	,985	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBT 2006	Market value 31/12/2006	Correlation	1,000	,862	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2006	Correlation	,862	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	EBT 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,969	,983
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2007	Correlation	,969	1,000	,941
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBT 2007	Correlation	,983	,941	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBT 2007	Market value 31/12/2007	Correlation	1,000	,715	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2007	Correlation	,715	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	EBT 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,977	,950
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2008	Correlation	,977	1,000	,954
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBT 2008	Correlation	,950	,954	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBT 2008	Market value 31/12/2008	Correlation	1,000	,753	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2008	Correlation	,753	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	EBT 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,974	,968
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2009	Correlation	,974	1,000	,949
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	EBT 2009	Correlation	,968	,949	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
EBT 2009	Market value 31/12/2009	Correlation	1,000	,697	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2009	Correlation	,697	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	Compr. earnings 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,990	,985
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2005	Correlation	,990	1,000	,975
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	Compr. earnings 2005	Correlation	,985	,975	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
Compr. earnings 2005	Market value 31/12/2005	Correlation	1,000	,769	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2005	Correlation	,769	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	Compr. earnings 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,993	,965
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2006	Correlation	,993	1,000	,975
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	Compr. earnings 2006	Correlation	,965	,975	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
Compr. earnings 2006	Market value 31/12/2006	Correlation	1,000	,891	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2006	Correlation	,891	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	Compr. earnings 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,969	,982
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2007	Correlation	,969	1,000	,929
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	Compr. earnings 2007	Correlation	,982	,929	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
Compr. earnings 2007	Market value 31/12/2007	Correlation	1,000	,818	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2007	Correlation	,818	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	Compr. earnings 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,977	,974
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2008	Correlation	,977	1,000	,979
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	Compr. earnings 2008	Correlation	,974	,979	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
Compr. earnings 2008	Market value 31/12/2008	Correlation	1,000	,493	
		Significance (2-tailed)	.	,012	
		df	0	23	
	Book value 31/12/2008	Correlation	,493	1,000	
		Significance (2-tailed)	,012	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	Compr. earnings 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,974	,952
		Significance (2-tailed)	.	,000	,000
		df	0	24	24
	Book value 31/12/2009	Correlation	,974	1,000	,894
		Significance (2-tailed)	,000	.	,000
		df	24	0	24
	Compr. earnings 2009	Correlation	,952	,894	1,000
		Significance (2-tailed)	,000	,000	.
		df	24	24	0
Compr. earnings 2009	Market value 31/12/2009	Correlation	1,000	,893	
		Significance (2-tailed)	.	,000	
		df	0	23	
	Book value 31/12/2009	Correlation	,893	1,000	
		Significance (2-tailed)	,000	.	
		df	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005	EBT 2005	Compr. earnings 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,990	,991	,986	,975
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Market value 31/12/2005	Correlation	,990	1,000	,983	,988	,985
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBIT 2005	Correlation	,991	,983	1,000	,997	,989
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBT 2005	Correlation	,986	,988	,997	1,000	,997
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Compr. earnings 2005	Correlation	,975	,985	,989	,997	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
EBIT 2005 & EBT 2005 & Compr. earnings 2005	Book value 31/12/2005	Correlation	1,000	,841			
		Significance (2-tailed)	.	,000			
		df	0	21			
	Market value 31/12/2005	Correlation	,841	1,000			
		Significance (2-tailed)	,000	.			
		df	21	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2006	Market value 31/12/2006	EBIT 2006	EBT 2006	Compr. earnings 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,993	,988	,985	,975
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Market value 31/12/2006	Correlation	,993	1,000	,974	,973	,965
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBIT 2006	Correlation	,988	,974	1,000	,999	,994
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBT 2006	Correlation	,985	,973	,999	1,000	,998
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Compr. earnings 2006	Correlation	,975	,965	,994	,998	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
EBIT 2006 & EBT 2006 & Compr. earnings 2006	Book value 31/12/2006	Correlation	1,000	,901			
		Significance (2-tailed)	.	,000			
		df	0	21			
	Market value 31/12/2006	Correlation	,901	1,000			
		Significance (2-tailed)	,000	.			
		df	21	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2007	Market value 31/12/2007	EBIT 2007	EBT 2007	Compr. earnings 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,969	,957	,941	,929
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Market value 31/12/2007	Correlation	,969	1,000	,984	,983	,982
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBIT 2007	Correlation	,957	,984	1,000	,997	,991
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBT 2007	Correlation	,941	,983	,997	1,000	,998
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Compr. earnings 2007	Correlation	,929	,982	,991	,998	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
EBIT 2007 & EBT 2007 & Compr. earnings 2007	Book value 31/12/2007	Correlation	1,000	,726			
		Significance (2-tailed)	.	,000			
		df	0	21			
	Market value 31/12/2007	Correlation	,726	1,000			
		Significance (2-tailed)	,000	.			
		df	21	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008	EBT 2008	Compr. earnings 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,977	,956	,954	,979
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Market value 31/12/2008	Correlation	,977	1,000	,934	,950	,974
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBIT 2008	Correlation	,956	,934	1,000	,995	,986
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBT 2008	Correlation	,954	,950	,995	1,000	,992
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Compr. earnings 2008	Correlation	,979	,974	,986	,992	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
EBIT 2008 & EBT 2008 & Compr. earnings 2008	Book value 31/12/2008	Correlation	1,000	,601			
		Significance (2-tailed)	.	,002			
		df	0	21			
	Market value 31/12/2008	Correlation	,601	1,000			
		Significance (2-tailed)	,002	.			
		df	21	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009	EBT 2009	Compr. earnings 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,974	,962	,949	,894
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Market value 31/12/2009	Correlation	,974	1,000	,960	,968	,952
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBIT 2009	Correlation	,962	,960	1,000	,994	,961
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBT 2009	Correlation	,949	,968	,994	1,000	,984
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Compr. earnings 2009	Correlation	,894	,952	,961	,984	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
EBIT 2009 & EBT 2009 & Compr. earnings 2009	Book value 31/12/2009	Correlation	1,000	,971			
		Significance (2-tailed)	.	,000			
		df	0	21			
	Market value 31/12/2009	Correlation	,971	1,000			
		Significance (2-tailed)	,000	.			
		df	21	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,986	,994
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Market value 31/12/2005	Correlation	,986	1,000	,982
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	EBIT 2005	Correlation	,994	,982	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
EBIT 2005	Book value 31/12/2005	Correlation	1,000	,511	
		Significance (2-tailed)	.	,196	
		df	0	6	
	Market value 31/12/2005	Correlation	,511	1,000	
		Significance (2-tailed)	,196	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2006	Market value 31/12/2006	EBIT 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,990	,991
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Market value 31/12/2006	Correlation	,990	1,000	,974
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	EBIT 2006	Correlation	,991	,974	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
EBIT 2006	Book value 31/12/2006	Correlation	1,000	,832	
		Significance (2-tailed)	.	,010	
		df	0	6	
	Market value 31/12/2006	Correlation	,832	1,000	
		Significance (2-tailed)	,010	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2007	Market value 31/12/2007	EBIT 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,964	,958
		Significance (2-tailed)	.	,000	,000
		df	0	6	6
	Market value 31/12/2007	Correlation	,964	1,000	,981
		Significance (2-tailed)	,000	.	,000
		df	6	0	6
	EBIT 2007	Correlation	,958	,981	1,000
		Significance (2-tailed)	,000	,000	.
		df	6	6	0
EBIT 2007	Book value 31/12/2007	Correlation	1,000	,438	
		Significance (2-tailed)	.	,325	
		df	0	5	
	Market value 31/12/2007	Correlation	,438	1,000	
		Significance (2-tailed)	,325	.	
		df	5	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,969	,945
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Market value 31/12/2008	Correlation	,969	1,000	,917
		Significance (2-tailed)	,000	.	,000
		df	8	0	8
	EBIT 2008	Correlation	,945	,917	1,000
		Significance (2-tailed)	,000	,000	.
		df	8	8	0
EBIT 2008	Book value 31/12/2008	Correlation	1,000	,786	
		Significance (2-tailed)	.	,012	
		df	0	7	
	Market value 31/12/2008	Correlation	,786	1,000	
		Significance (2-tailed)	,012	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,968	,953
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Market value 31/12/2009	Correlation	,968	1,000	,951
		Significance (2-tailed)	,000	.	,000
		df	8	0	8
	EBIT 2009	Correlation	,953	,951	1,000
		Significance (2-tailed)	,000	,000	.
		df	8	8	0
EBIT 2009	Book value 31/12/2009	Correlation	1,000	,658	
		Significance (2-tailed)	.	,054	
		df	0	7	
	Market value 31/12/2009	Correlation	,658	1,000	
		Significance (2-tailed)	,054	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	EBT 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,986	,987
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Book value 31/12/2005	Correlation	,986	1,000	,987
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	EBT 2005	Correlation	,987	,987	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
EBT 2005	Market value 31/12/2005	Correlation	1,000	,486	
		Significance (2-tailed)	.	,222	
		df	0	6	
	Book value 31/12/2005	Correlation	,486	1,000	
		Significance (2-tailed)	,222	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	EBT 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,990	,973
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Book value 31/12/2006	Correlation	,990	1,000	,987
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	EBT 2006	Correlation	,973	,987	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
EBT 2006	Market value 31/12/2006	Correlation	1,000	,813	
		Significance (2-tailed)	.	,014	
		df	0	6	
	Book value 31/12/2006	Correlation	,813	1,000	
		Significance (2-tailed)	,014	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	EBT 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,964	,981
		Significance (2-tailed)	.	,000	,000
		df	0	6	6
	Book value 31/12/2007	Correlation	,964	1,000	,939
		Significance (2-tailed)	,000	.	,001
		df	6	0	6
	EBT 2007	Correlation	,981	,939	1,000
		Significance (2-tailed)	,000	,001	.
		df	6	6	0
EBT 2007	Market value 31/12/2007	Correlation	1,000	,641	
		Significance (2-tailed)	.	,121	
		df	0	5	
	Book value 31/12/2007	Correlation	,641	1,000	
		Significance (2-tailed)	,121	.	
		df	5	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	EBT 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,969	,934
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Book value 31/12/2008	Correlation	,969	1,000	,940
		Significance (2-tailed)	,000	.	,000
		df	8	0	8
	EBT 2008	Correlation	,934	,940	1,000
		Significance (2-tailed)	,000	,000	.
		df	8	8	0
EBT 2008	Market value 31/12/2008	Correlation	1,000	,747	
		Significance (2-tailed)	.	,021	
		df	0	7	
	Book value 31/12/2008	Correlation	,747	1,000	
		Significance (2-tailed)	,021	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	EBT 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,968	,958
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Book value 31/12/2009	Correlation	,968	1,000	,936
		Significance (2-tailed)	,000	.	,000
		df	8	0	8
	EBT 2009	Correlation	,958	,936	1,000
		Significance (2-tailed)	,000	,000	.
		df	8	8	0
EBT 2009	Market value 31/12/2009	Correlation	1,000	,705	
		Significance (2-tailed)	.	,034	
		df	0	7	
	Book value 31/12/2009	Correlation	,705	1,000	
		Significance (2-tailed)	,034	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	Compr. earnings 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,986	,984
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Book value 31/12/2005	Correlation	,986	1,000	,972
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	Compr. earnings 2005	Correlation	,984	,972	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
Compr. earnings 2005	Market value 31/12/2005	Correlation	1,000	,711	
		Significance (2-tailed)	.	,048	
		df	0	6	
	Book value 31/12/2005	Correlation	,711	1,000	
		Significance (2-tailed)	,048	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	Compr. earnings 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,990	,964
		Significance (2-tailed)	.	,000	,000
		df	0	7	7
	Book value 31/12/2006	Correlation	,990	1,000	,975
		Significance (2-tailed)	,000	.	,000
		df	7	0	7
	Compr. earnings 2006	Correlation	,964	,975	1,000
		Significance (2-tailed)	,000	,000	.
		df	7	7	0
Compr. earnings 2006	Market value 31/12/2006	Correlation	1,000	,856	
		Significance (2-tailed)	.	,007	
		df	0	6	
	Book value 31/12/2006	Correlation	,856	1,000	
		Significance (2-tailed)	,007	.	
		df	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	Compr. earnings 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,964	,980
		Significance (2-tailed)	.	,000	,000
		df	0	6	6
	Book value 31/12/2007	Correlation	,964	1,000	,920
		Significance (2-tailed)	,000	.	,001
		df	6	0	6
	Compr. earnings 2007	Correlation	,980	,920	1,000
		Significance (2-tailed)	,000	,001	.
		df	6	6	0
Compr. earnings 2007	Market value 31/12/2007	Correlation	1,000	,796	
		Significance (2-tailed)	.	,032	
		df	0	5	
	Book value 31/12/2007	Correlation	,796	1,000	
		Significance (2-tailed)	,032	.	
		df	5	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	Compr. earnings 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,969	,967
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Book value 31/12/2008	Correlation	,969	1,000	,974
		Significance (2-tailed)	,000	.	,000
		df	8	0	8
	Compr. earnings 2008	Correlation	,967	,974	1,000
		Significance (2-tailed)	,000	,000	.
		df	8	8	0
Compr. earnings 2008	Market value 31/12/2008	Correlation	1,000	,468	
		Significance (2-tailed)	.	,204	
		df	0	7	
	Book value 31/12/2008	Correlation	,468	1,000	
		Significance (2-tailed)	,204	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	Compr. earnings 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,968	,937
		Significance (2-tailed)	.	,000	,000
		df	0	8	8
	Book value 31/12/2009	Correlation	,968	1,000	,867
		Significance (2-tailed)	,000	.	,001
		df	8	0	8
	Compr. earnings 2009	Correlation	,937	,867	1,000
		Significance (2-tailed)	,000	,001	.
		df	8	8	0
Compr. earnings 2009	Market value 31/12/2009	Correlation	1,000	,894	
		Significance (2-tailed)	.	,001	
		df	0	7	
	Book value 31/12/2009	Correlation	,894	1,000	
		Significance (2-tailed)	,001	.	
		df	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005	EBT 2005	Compr. earnings 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,986	,994	,987	,972
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	7	7	7	7
	Market value 31/12/2005	Correlation	,986	1,000	,982	,987	,984
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	7	0	7	7	7
	EBIT 2005	Correlation	,994	,982	1,000	,996	,986
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	7	7	0	7	7
	EBT 2005	Correlation	,987	,987	,996	1,000	,997
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	7	7	7	0	7
	Compr. earnings 2005	Correlation	,972	,984	,986	,997	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	7	7	7	7	0
EBIT 2005 & EBT 2005 & Compr. earnings 2005	Book value 31/12/2005	Correlation	1,000	,903			
		Significance (2-tailed)	.	,014			
		df	0	4			
	Market value 31/12/2005	Correlation	,903	1,000			
		Significance (2-tailed)	,014	.			
		df	4	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2006	Market value 31/12/2006	EBIT 2006	EBT 2006	Compr. earnings 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,990	,991	,987	,975
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	7	7	7	7
	Market value 31/12/2006	Correlation	,990	1,000	,974	,973	,964
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	7	0	7	7	7
	EBIT 2006	Correlation	,991	,974	1,000	,999	,993
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	7	7	0	7	7
	EBT 2006	Correlation	,987	,973	,999	1,000	,997
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	7	7	7	0	7
	Compr. earnings 2006	Correlation	,975	,964	,993	,997	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	7	7	7	7	0
EBIT 2006 & EBT 2006 & Compr. earnings 2006	Book value 31/12/2006	Correlation	1,000	,961			
		Significance (2-tailed)	.	,002			
		df	0	4			
	Market value 31/12/2006	Correlation	,961	1,000			
		Significance (2-tailed)	,002	.			
		df	4	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2007	Market value 31/12/2007	EBIT 2007	EBT 2007	Compr. earnings 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,964	,958	,939	,920
		Significance (2-tailed)	.	,000	,000	,001	,001
		df	0	6	6	6	6
	Market value 31/12/2007	Correlation	,964	1,000	,981	,981	,980
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	6	0	6	6	6
	EBIT 2007	Correlation	,958	,981	1,000	,997	,989
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	6	6	0	6	6
	EBT 2007	Correlation	,939	,981	,997	1,000	,997
		Significance (2-tailed)	,001	,000	,000	.	,000
		df	6	6	6	0	6
	Compr. earnings 2007	Correlation	,920	,980	,989	,997	1,000
		Significance (2-tailed)	,001	,000	,000	,000	.
		df	6	6	6	6	0
EBIT 2007 & EBT 2007 & Compr. earnings 2007	Book value 31/12/2007	Correlation	1,000	,881			
		Significance (2-tailed)	.	,048			
		df	0	3			
	Market value 31/12/2007	Correlation	,881	1,000			
		Significance (2-tailed)	,048	.			
		df	3	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008	EBT 2008	Compr. earnings 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,969	,945	,940	,974
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	8	8	8	8
	Market value 31/12/2008	Correlation	,969	1,000	,917	,934	,967
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	8	0	8	8	8
	EBIT 2008	Correlation	,945	,917	1,000	,996	,984
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	8	8	0	8	8
	EBT2008	Correlation	,940	,934	,996	1,000	,989
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	8	8	8	0	8
	Compr. earnings 2008	Correlation	,974	,967	,984	,989	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	8	8	8	8	0
EBIT 2008 & EBT 2008 & Compr. earnings 2008	Book value 31/12/2008	Correlation	1,000	,767			
		Significance (2-tailed)	.	,044			
		df	0	5			
	Market value 31/12/2008	Correlation	,767	1,000			
		Significance (2-tailed)	,044	.			
		df	5	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009	EBT 2009	Compr. earnings 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,968	,953	,936	,867
		Significance (2-tailed)	.	,000	,000	,000	,001
		df	0	8	8	8	8
	Market value 31/12/2009	Correlation	,968	1,000	,951	,958	,937
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	8	0	8	8	8
	EBIT 2009	Correlation	,953	,951	1,000	,994	,955
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	8	8	0	8	8
	EBT 2009	Correlation	,936	,958	,994	1,000	,980
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	8	8	8	0	8
	Compr. earnings 2009	Correlation	,867	,937	,955	,980	1,000
		Significance (2-tailed)	,001	,000	,000	,000	.
		df	8	8	8	8	0
EBIT 2009 & EBT 2009 & Compr. earnings 2009	Book value 31/12/2009	Correlation	1,000	,981			
		Significance (2-tailed)	.	,000			
		df	0	5			
	Market value 31/12/2009	Correlation	,981	1,000			
		Significance (2-tailed)	,000	.			
		df	5	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,738	,192
		Significance (2-tailed)	.	,001	,460
		df	0	15	15
	Market value 31/12/2005	Correlation	,738	1,000	,696
		Significance (2-tailed)	,001	.	,002
		df	15	0	15
	EBIT 2005	Correlation	,192	,696	1,000
		Significance (2-tailed)	,460	,002	.
		df	15	15	0
EBIT 2005	Book value 31/12/2005	Correlation	1,000	,857	
		Significance (2-tailed)	.	,000	
		df	0	14	
	Market value 31/12/2005	Correlation	,857	1,000	
		Significance (2-tailed)	,000	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2006	Market value 31/12/2006	EBIT 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,696	,404
		Significance (2-tailed)	.	,002	,107
		df	0	15	15
	Market value 31/12/2006	Correlation	,696	1,000	,730
		Significance (2-tailed)	,002	.	,001
		df	15	0	15
	EBIT 2006	Correlation	,404	,730	1,000
		Significance (2-tailed)	,107	,001	.
		df	15	15	0
EBIT 2006	Book value 31/12/2006	Correlation	1,000	,641	
		Significance (2-tailed)	.	,007	
		df	0	14	
	Market value 31/12/2006	Correlation	,641	1,000	
		Significance (2-tailed)	,007	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2007	Market value 31/12/2007	EBIT 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,792	,285
		Significance (2-tailed)	.	,000	,252
		df	0	16	16
	Market value 31/12/2007	Correlation	,792	1,000	,353
		Significance (2-tailed)	,000	.	,151
		df	16	0	16
	EBIT 2007	Correlation	,285	,353	1,000
		Significance (2-tailed)	,252	,151	.
		df	16	16	0
EBIT 2007	Book value 31/12/2007	Correlation	1,000	,771	
		Significance (2-tailed)	.	,000	
		df	0	15	
	Market value 31/12/2007	Correlation	,771	1,000	
		Significance (2-tailed)	,000	.	
		df	15	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,852	,619
		Significance (2-tailed)	.	,000	,011
		df	0	14	14
	Market value 31/12/2008	Correlation	,852	1,000	,729
		Significance (2-tailed)	,000	.	,001
		df	14	0	14
	EBIT 2008	Correlation	,619	,729	1,000
		Significance (2-tailed)	,011	,001	.
		df	14	14	0
EBIT 2008	Book value 31/12/2008	Correlation	1,000	,745	
		Significance (2-tailed)	.	,001	
		df	0	13	
	Market value 31/12/2008	Correlation	,745	1,000	
		Significance (2-tailed)	,001	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,719	,427
		Significance (2-tailed)	.	,002	,099
		df	0	14	14
	Market value 31/12/2009	Correlation	,719	1,000	,737
		Significance (2-tailed)	,002	.	,001
		df	14	0	14
	EBIT 2009	Correlation	,427	,737	1,000
		Significance (2-tailed)	,099	,001	.
		df	14	14	0
EBIT 2009	Book value 31/12/2009	Correlation	1,000	,662	
		Significance (2-tailed)	.	,007	
		df	0	13	
	Market value 31/12/2009	Correlation	,662	1,000	
		Significance (2-tailed)	,007	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	EBT 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,738	,456
		Significance (2-tailed)	.	,001	,066
		df	0	15	15
	Book value 31/12/2005	Correlation	,738	1,000	,216
		Significance (2-tailed)	,001	.	,406
		df	15	0	15
	EBT 2005	Correlation	,456	,216	1,000
		Significance (2-tailed)	,066	,406	.
		df	15	15	0
EBT 2005	Market value 31/12/2005	Correlation	1,000	,736	
		Significance (2-tailed)	.	,001	
		df	0	14	
	Book value 31/12/2005	Correlation	,736	1,000	
		Significance (2-tailed)	,001	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	EBT 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,696	,630
		Significance (2-tailed)	.	,002	,007
		df	0	15	15
	Book value 31/12/2006	Correlation	,696	1,000	,910
		Significance (2-tailed)	,002	.	,000
		df	15	0	15
	EBT 2006	Correlation	,630	,910	1,000
		Significance (2-tailed)	,007	,000	.
		df	15	15	0
EBT 2006	Market value 31/12/2006	Correlation	1,000	,382	
		Significance (2-tailed)	.	,144	
		df	0	14	
	Book value 31/12/2006	Correlation	,382	1,000	
		Significance (2-tailed)	,144	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	EBT 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,792	,295
		Significance (2-tailed)	.	,000	,235
		df	0	16	16
	Book value 31/12/2007	Correlation	,792	1,000	,684
		Significance (2-tailed)	,000	.	,002
		df	16	0	16
	EBT 2007	Correlation	,295	,684	1,000
		Significance (2-tailed)	,235	,002	.
		df	16	16	0
EBT 2007	Market value 31/12/2007	Correlation	1,000	,846	
		Significance (2-tailed)	.	,000	
		df	0	15	
	Book value 31/12/2007	Correlation	,846	1,000	
		Significance (2-tailed)	,000	.	
		df	15	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	EBT 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,852	,248
		Significance (2-tailed)	.	,000	,354
		df	0	14	14
	Book value 31/12/2008	Correlation	,852	1,000	,090
		Significance (2-tailed)	,000	.	,741
		df	14	0	14
	EBT 2008	Correlation	,248	,090	1,000
		Significance (2-tailed)	,354	,741	.
		df	14	14	0
EBT 2008	Market value 31/12/2008	Correlation	1,000	,860	
		Significance (2-tailed)	.	,000	
		df	0	13	
	Book value 31/12/2008	Correlation	,860	1,000	
		Significance (2-tailed)	,000	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	EBT 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,719	,750
		Significance (2-tailed)	.	,002	,001
		df	0	14	14
	Book value 31/12/2009	Correlation	,719	1,000	,442
		Significance (2-tailed)	,002	.	,086
		df	14	0	14
	EBT 2009	Correlation	,750	,442	1,000
		Significance (2-tailed)	,001	,086	.
		df	14	14	0
EBT 2009	Market value 31/12/2009	Correlation	1,000	,654	
		Significance (2-tailed)	.	,008	
		df	0	13	
	Book value 31/12/2009	Correlation	,654	1,000	
		Significance (2-tailed)	,008	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Book value 31/12/2005	Compr. earnings 2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,738	,392
		Significance (2-tailed)	.	,001	,119
		df	0	15	15
	Book value 31/12/2005	Correlation	,738	1,000	,185
		Significance (2-tailed)	,001	.	,477
		df	15	0	15
	Compr. earnings 2005	Correlation	,392	,185	1,000
		Significance (2-tailed)	,119	,477	.
		df	15	15	0
Compr. earnings 2005	Market value 31/12/2005	Correlation	1,000	,736	
		Significance (2-tailed)	.	,001	
		df	0	14	
	Book value 31/12/2005	Correlation	,736	1,000	
		Significance (2-tailed)	,001	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Book value 31/12/2006	Compr. earnings 2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,696	,606
		Significance (2-tailed)	.	,002	,010
		df	0	15	15
	Book value 31/12/2006	Correlation	,696	1,000	,919
		Significance (2-tailed)	,002	.	,000
		df	15	0	15
	Compr. earnings 2006	Correlation	,606	,919	1,000
		Significance (2-tailed)	,010	,000	.
		df	15	15	0
Compr. earnings 2006	Market value 31/12/2006	Correlation	1,000	,445	
		Significance (2-tailed)	.	,084	
		df	0	14	
	Book value 31/12/2006	Correlation	,445	1,000	
		Significance (2-tailed)	,084	.	
		df	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Book value 31/12/2007	Compr. earnings 2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,792	,258
		Significance (2-tailed)	.	,000	,301
		df	0	16	16
	Book value 31/12/2007	Correlation	,792	1,000	,682
		Significance (2-tailed)	,000	.	,002
		df	16	0	16
	Compr. earnings 2007	Correlation	,258	,682	1,000
		Significance (2-tailed)	,301	,002	.
		df	16	16	0
Compr. earnings 2007	Market value 31/12/2007	Correlation	1,000	,872	
		Significance (2-tailed)	.	,000	
		df	0	15	
	Book value 31/12/2007	Correlation	,872	1,000	
		Significance (2-tailed)	,000	.	
		df	15	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Book value 31/12/2008	Compr. earnings 2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,852	,150
		Significance (2-tailed)	.	,000	,579
		df	0	14	14
	Book value 31/12/2008	Correlation	,852	1,000	-,033
		Significance (2-tailed)	,000	.	,903
		df	14	0	14
	Compr. earnings 2008	Correlation	,150	-,033	1,000
		Significance (2-tailed)	,579	,903	.
		df	14	14	0
Compr. earnings 2008	Market value 31/12/2008	Correlation	1,000	,867	
		Significance (2-tailed)	.	,000	
		df	0	13	
	Book value 31/12/2008	Correlation	,867	1,000	
		Significance (2-tailed)	,000	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Book value 31/12/2009	Compr. earnings 2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,719	,665
		Significance (2-tailed)	.	,002	,005
		df	0	14	14
	Book value 31/12/2009	Correlation	,719	1,000	,322
		Significance (2-tailed)	,002	.	,224
		df	14	0	14
	Compr. earnings 2009	Correlation	,665	,322	1,000
		Significance (2-tailed)	,005	,224	.
		df	14	14	0
Compr. earnings 2009	Market value 31/12/2009	Correlation	1,000	,715	
		Significance (2-tailed)	.	,003	
		df	0	13	
	Book value 31/12/2009	Correlation	,715	1,000	
		Significance (2-tailed)	,003	.	
		df	13	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2005	Market value 31/12/2005	EBIT 2005	EBT 2005	Compr. earnings 2005
-none-[a]	Book value 31/12/2005	Correlation	1,000	,738	,192	,216	,185
		Significance (2-tailed)	.	,001	,460	,406	,477
		df	0	15	15	15	15
	Market value 31/12/2005	Correlation	,738	1,000	,696	,456	,392
		Significance (2-tailed)	,001	.	,002	,066	,119
		df	15	0	15	15	15
	EBIT 2005	Correlation	,192	,696	1,000	,834	,793
		Significance (2-tailed)	,460	,002	.	,000	,000
		df	15	15	0	15	15
	EBT 2005	Correlation	,216	,456	,834	1,000	,996
		Significance (2-tailed)	,406	,066	,000	.	,000
		df	15	15	15	0	15
	Compr. earnings 2005	Correlation	,185	,392	,793	,996	1,000
		Significance (2-tailed)	,477	,119	,000	,000	.
		df	15	15	15	15	0
EBIT 2005 & EBT 2005 & Compr. earnings 2005	Book value 31/12/2005	Correlation	1,000	,922			
		Significance (2-tailed)	.	,000			
		df	0	12			
	Market value 31/12/2005	Correlation	,922	1,000			
		Significance (2-tailed)	,000	.			
		df	12	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/ 2006	Market value 31/12/ 2006	EBIT 2006	EBT 2006	Compr. earnings 2006
-none-[a]	Book value 31/12/2006	Correlation	1,000	,696	,404	,910	,919
		Significance (2-tailed)	.	,002	,107	,000	,000
		df	0	15	15	15	15
	Market value 31/12/2006	Correlation	,696	1,000	,730	,630	,606
		Significance (2-tailed)	,002	.	,001	,007	,010
		df	15	0	15	15	15
	EBIT 2006	Correlation	,404	,730	1,000	,544	,555
		Significance (2-tailed)	,107	,001	.	,024	,021
		df	15	15	0	15	15
	EBT 2006	Correlation	,910	,630	,544	1,000	,960
		Significance (2-tailed)	,000	,007	,024	.	,000
		df	15	15	15	0	15
	Compr. earnings 2006	Correlation	,919	,606	,555	,960	1,000
		Significance (2-tailed)	,000	,010	,021	,000	.
		df	15	15	15	15	0
EBIT 2006 & EBT 2006 & Compr. earnings 2006	Book value 31/12/2006	Correlation	1,000	,826			
		Significance (2-tailed)	.	,000			
		df	0	12			
	Market value 31/12/2006	Correlation	,826	1,000			
		Significance (2-tailed)	,000	.			
		df	12	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/ 2007	Market value 31/12/ 2007	EBIT 2007	EBT 2007	Compr. earnings 2007
-none-[a]	Book value 31/12/2007	Correlation	1,000	,792	,285	,684	,682
		Significance (2-tailed)	.	,000	,252	,002	,002
		df	0	16	16	16	16
	Market value 31/12/2007	Correlation	,792	1,000	,353	,295	,258
		Significance (2-tailed)	,000	.	,151	,235	,301
		df	16	0	16	16	16
	EBIT 2007	Correlation	,285	,353	1,000	,538	,454
		Significance (2-tailed)	,252	,151	.	,021	,058
		df	16	16	0	16	16
	EBT 2007	Correlation	,684	,295	,538	1,000	,994
		Significance (2-tailed)	,002	,235	,021	.	,000
		df	16	16	16	0	16
	Compr. earnings 2007	Correlation	,682	,258	,454	,994	1,000
		Significance (2-tailed)	,002	,301	,058	,000	.
		df	16	16	16	16	0
EBIT 2007 & EBT 2007 & Compr. earnings 2007	Book value 31/12/2007	Correlation	1,000	,915			
		Significance (2-tailed)	.	,000			
		df	0	13			
	Market value 31/12/2007	Correlation	,915	1,000			
		Significance (2-tailed)	,000	.			
		df	13	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2008	Market value 31/12/2008	EBIT 2008	EBT 2008	Compr. earnings 2008
-none-[a]	Book value 31/12/2008	Correlation	1,000	,852	,619	,090	-,033
		Significance (2-tailed)	.	,000	,011	,741	,903
		df	0	14	14	14	14
	Market value 31/12/2008	Correlation	,852	1,000	,729	,248	,150
		Significance (2-tailed)	,000	.	,001	,354	,579
		df	14	0	14	14	14
	EBIT 2008	Correlation	,619	,729	1,000	,497	,414
		Significance (2-tailed)	,011	,001	.	,050	,111
		df	14	14	0	14	14
	EBT 2008	Correlation	,090	,248	,497	1,000	,990
		Significance (2-tailed)	,741	,354	,050	.	,000
		df	14	14	14	0	14
	Compr. earnings 2008	Correlation	-,033	,150	,414	,990	1,000
		Significance (2-tailed)	,903	,579	,111	,000	.
		df	14	14	14	14	0
EBIT 2008 & EBT 2008 & Compr. earnings 2008	Book value 31/12/2008	Correlation	1,000	,685			
		Significance (2-tailed)	.	,010			
		df	0	11			
	Market value 31/12/2008	Correlation	,685	1,000			
		Significance (2-tailed)	,010	.			
		df	11	0			

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Book value 31/12/2009	Market value 31/12/2009	EBIT 2009	EBT 2009	Compr. earnings 2009
-none-[a]	Book value 31/12/2009	Correlation	1,000	,719	,427	,442	,322
		Significance (2-tailed)	.	,002	,099	,086	,224
		df	0	14	14	14	14
	Market value 31/12/2009	Correlation	,719	1,000	,737	,750	,665
		Significance (2-tailed)	,002	.	,001	,001	,005
		df	14	0	14	14	14
	EBIT 2009	Correlation	,427	,737	1,000	,982	,946
		Significance (2-tailed)	,099	,001	.	,000	,000
		df	14	14	0	14	14
	EBT 2009	Correlation	,442	,750	,982	1,000	,972
		Significance (2-tailed)	,086	,001	,000	.	,000
		df	14	14	14	0	14
	Compr. earnings 2009	Correlation	,322	,665	,946	,972	1,000
		Significance (2-tailed)	,224	,005	,000	,000	.
		df	14	14	14	14	0
EBIT 2009 & EBT 2009 & Compr. earnings 2009	Book value 31/12/2009	Correlation	1,000	,556			
		Significance (2-tailed)	.	,048			
		df	0	11			
	Market value 31/12/2009	Correlation	,556	1,000			
		Significance (2-tailed)	,048	.			
		df	11	0			

a. Cells contain zero-order (Pearson) correlations.

ANNEX 2: RESULT TABLES OF THE CORRELATION COEFFICIENTS OF EARNINGS AND MARKET VALUE

Correlations

Control Variables			Market value 31/12/2005	Compr. earnings 2005	EBT 2005	EBIT 2005	Book value 31/12/2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,985	,988	,983	,990
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Compr. earnings 2005	Correlation	,985	1,000	,997	,989	,975
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBT 2005	Correlation	,988	,997	1,000	,997	,986
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBIT 2005	Correlation	,983	,989	,997	1,000	,991
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Book value 31/12/2005	Correlation	,990	,975	,986	,991	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
Book value 31/12/2005	Market value 31/12/2005	Correlation	1,000	,626	,495	,126	
		Significance (2-tailed)	.	,001	,012	,549	
		df	0	23	23	23	
	Compr. earnings 2005	Correlation	,626	1,000	,972	,765	
		Significance (2-tailed)	,001	.	,000	,000	
		df	23	0	23	23	
	EBT 2005	Correlation	,495	,972	1,000	,878	
		Significance (2-tailed)	,012	,000	.	,000	
		df	23	23	0	23	
	EBIT 2005	Correlation	,126	,765	,878	1,000	
		Significance (2-tailed)	,549	,000	,000	.	
		df	23	23	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Compr. earnings 2006	EBT 2006	EBIT 2006	Book value 31/12/2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,965	,973	,974	,993
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Compr. earnings 2006	Correlation	,965	1,000	,998	,994	,975
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBT 2006	Correlation	,973	,998	1,000	,999	,985
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBIT 2006	Correlation	,974	,994	,999	1,000	,988
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Book value 31/12/2006	Correlation	,993	,975	,985	,988	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
Book value 31/12/2006	Market value 31/12/2006	Correlation	1,000	-,110	-,233	-,377	
		Significance (2-tailed)	.	,602	,262	,063	
		df	0	23	23	23	
	Compr. earnings 2006	Correlation	-,110	1,000	,973	,899	
		Significance (2-tailed)	,602	.	,000	,000	
		df	23	0	23	23	
	EBT 2006	Correlation	-,233	,973	1,000	,968	
		Significance (2-tailed)	,262	,000	.	,000	
		df	23	23	0	23	
	EBIT 2006	Correlation	-,377	,899	,968	1,000	
		Significance (2-tailed)	,063	,000	,000	.	
		df	23	23	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Compr. earnings 2007	EBT 2007	EBIT 2007	Book value 31/12/2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,982	,983	,984	,969
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Compr. earnings 2007	Correlation	,982	1,000	,998	,991	,929
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBT 2007	Correlation	,983	,998	1,000	,997	,941
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBIT 2007	Correlation	,984	,991	,997	1,000	,957
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Book value 31/12/2007	Correlation	,969	,929	,941	,957	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
Book value 31/12/2007	Market value 31/12/2007	Correlation	1,000	,899	,853	,789	
		Significance (2-tailed)	.	,000	,000	,000	
		df	0	23	23	23	
	Compr. earnings 2007	Correlation	,899	1,000	,987	,951	
		Significance (2-tailed)	,000	.	,000	,000	
		df	23	0	23	23	
	EBT 2007	Correlation	,853	,987	1,000	,987	
		Significance (2-tailed)	,000	,000	.	,000	
		df	23	23	0	23	
	EBIT 2007	Correlation	,789	,951	,987	1,000	
		Significance (2-tailed)	,000	,000	,000	.	
		df	23	23	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Compr. earnings 2008	EBT 2008	EBIT 2008	Book value 31/12/2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,974	,950	,934	,977
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Compr. earnings 2008	Correlation	,974	1,000	,992	,986	,979
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBT 2008	Correlation	,950	,992	1,000	,995	,954
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBIT 2008	Correlation	,934	,986	,995	1,000	,956
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Book value 31/12/2008	Correlation	,977	,979	,954	,956	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
Book value 31/12/2008	Market value 31/12/2008	Correlation	1,000	,410	,272	,007	
		Significance (2-tailed)	.	,042	,188	,975	
		df	0	23	23	23	
	Compr. earnings 2008	Correlation	,410	1,000	,948	,837	
		Significance (2-tailed)	,042	.	,000	,000	
		df	23	0	23	23	
	EBT 2008	Correlation	,272	,948	1,000	,943	
		Significance (2-tailed)	,188	,000	.	,000	
		df	23	23	0	23	
	EBIT 2008	Correlation	,007	,837	,943	1,000	
		Significance (2-tailed)	,975	,000	,000	.	
		df	23	23	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Compr. earnings 2009	EBT 2009	EBIT 2009	Book value 31/12/2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,952	,968	,960	,974
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	24	24	24	24
	Compr. earnings 2009	Correlation	,952	1,000	,984	,961	,894
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	24	0	24	24	24
	EBT 2009	Correlation	,968	,984	1,000	,994	,949
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	24	24	0	24	24
	EBIT 2009	Correlation	,960	,961	,994	1,000	,962
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	24	24	24	0	24
	Book value 31/12/2009	Correlation	,974	,894	,949	,962	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	24	24	24	24	0
Book value 31/12/2009	Market value 31/12/2009	Correlation	1,000	,797	,609	,373	
		Significance (2-tailed)	.	,000	,001	,067	
		df	0	23	23	23	
	Compr. earnings 2009	Correlation	,797	1,000	,958	,829	
		Significance (2-tailed)	,000	.	,000	,000	
		df	23	0	23	23	
	EBT 2009	Correlation	,609	,958	1,000	,948	
		Significance (2-tailed)	,001	,000	.	,000	
		df	23	23	0	23	
	EBIT 2009	Correlation	,373	,829	,948	1,000	
		Significance (2-tailed)	,067	,000	,000	.	
		df	23	23	23	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Compr. earnings 2005	EBT 2005	EBIT 2005	Book value 31/12/2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,984	,987	,982	,986
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	7	7	7	7
	Compr. earnings 2005	Correlation	,984	1,000	,997	,986	,972
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	7	0	7	7	7
	EBT 2005	Correlation	,987	,997	1,000	,996	,987
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	7	7	0	7	7
	EBIT 2005	Correlation	,982	,986	,996	1,000	,994
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	7	7	7	0	7
	Book value 31/12/2005	Correlation	,986	,972	,987	,994	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	7	7	7	7	0
Book value 31/12/2005	Market value 31/12/2005	Correlation	1,000	,639	,511	,078	
		Significance (2-tailed)	.	,088	,195	,854	
		df	0	6	6	6	
	Compr. earnings 2005	Correlation	,639	1,000	,975	,765	
		Significance (2-tailed)	,088	.	,000	,027	
		df	6	0	6	6	
	EBT 2005	Correlation	,511	,975	1,000	,872	
		Significance (2-tailed)	,195	,000	.	,005	
		df	6	6	0	6	
	EBIT 2005	Correlation	,078	,765	,872	1,000	
		Significance (2-tailed)	,854	,027	,005	.	
		df	6	6	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Compr. earnings 2006	EBT 2006	EBIT 2006	Book value 31/12/2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,964	,973	,974	,990
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	7	7	7	7
	Compr. earnings 2006	Correlation	,964	1,000	,997	,993	,975
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	7	0	7	7	7
	EBT 2006	Correlation	,973	,997	1,000	,999	,987
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	7	7	0	7	7
	EBIT 2006	Correlation	,974	,993	,999	1,000	,991
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	7	7	7	0	7
	Book value 31/12/2006	Correlation	,990	,975	,987	,991	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	7	7	7	7	0
Book value 31/12/2006	Market value 31/12/2006	Correlation	1,000	-,064	-,202	-,407	
		Significance (2-tailed)	.	,880	,631	,317	
		df	0	6	6	6	
	Compr. earnings 2006	Correlation	-,064	1,000	,974	,897	
		Significance (2-tailed)	,880	.	,000	,003	
		df	6	0	6	6	
	EBT 2006	Correlation	-,202	,974	1,000	,969	
		Significance (2-tailed)	,631	,000	.	,000	
		df	6	6	0	6	
	EBIT 2006	Correlation	-,407	,897	,969	1,000	
		Significance (2-tailed)	,317	,003	,000	.	
		df	6	6	6	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Compr. earnings 2007	EBT 2007	EBIT 2007	Book value 31/12/2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,980	,981	,981	,964
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	6	6	6	6
	Compr. earnings 2007	Correlation	,980	1,000	,997	,989	,920
		Significance (2-tailed)	,000	.	,000	,000	,001
		df	6	0	6	6	6
	EBT 2007	Correlation	,981	,997	1,000	,997	,939
		Significance (2-tailed)	,000	,000	.	,000	,001
		df	6	6	0	6	6
	EBIT 2007	Correlation	,981	,989	,997	1,000	,958
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	6	6	6	0	6
	Book value 31/12/2007	Correlation	,964	,920	,939	,958	1,000
		Significance (2-tailed)	,000	,001	,001	,000	.
		df	6	6	6	6	0
Book value 31/12/2007	Market value 31/12/2007	Correlation	1,000	,891	,832	,750	
		Significance (2-tailed)	.	,007	,020	,052	
		df	0	5	5	5	
	Compr. earnings 2007	Correlation	,891	1,000	,990	,959	
		Significance (2-tailed)	,007	.	,000	,001	
		df	5	0	5	5	
	EBT 2007	Correlation	,832	,990	1,000	,989	
		Significance (2-tailed)	,020	,000	.	,000	
		df	5	5	0	5	
	EBIT 2007	Correlation	,750	,959	,989	1,000	
		Significance (2-tailed)	,052	,001	,000	.	
		df	5	5	5	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Compr. earnings 2008	EBT 2008	EBIT 2008	Book value 31/12/2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,967	,934	,917	,969
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	8	8	8	8
	Compr. earnings 2008	Correlation	,967	1,000	,989	,984	,974
		Significance (2-tailed)	,000	.	,000	,000	,000
		df	8	0	8	8	8
	EBT 2008	Correlation	,934	,989	1,000	,996	,940
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	8	8	0	8	8
	EBIT 2008	Correlation	,917	,984	,996	1,000	,945
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	8	8	8	0	8
	Book value 31/12/2008.	Correlation	,969	,974	,940	,945	1,000
		Significance (2-tailed)	,000	,000	,000	,000	.
		df	8	8	8	8	0
Book value 31/12/2008	Market value 31/12/2008	Correlation	1,000	,417	,266	,018	
		Significance (2-tailed)	.	,264	,489	,964	
		df	0	7	7	7	
	Compr. earnings 2008	Correlation	,417	1,000	,951	,859	
		Significance (2-tailed)	,264	.	,000	,003	
		df	7	0	7	7	
	EBT 2008	Correlation	,266	,951	1,000	,961	
		Significance (2-tailed)	,489	,000	.	,000	
		df	7	7	0	7	
	EBIT 2008	Correlation	,018	,859	,961	1,000	
		Significance (2-tailed)	,964	,003	,000	.	
		df	7	7	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2009	Compr. earnings 2009	EBT 2009	EBIT 2009	Book value 31/12/2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,937	,958	,951	,968
		Significance (2-tailed)	.	,000	,000	,000	,000
		df	0	8	8	8	8
	Compr. earnings 2009	Correlation	,937	1,000	,980	,955	,867
		Significance (2-tailed)	,000	.	,000	,000	,001
		df	8	0	8	8	8
	EBT 2009	Correlation	,958	,980	1,000	,994	,936
		Significance (2-tailed)	,000	,000	.	,000	,000
		df	8	8	0	8	8
	EBIT 2009	Correlation	,951	,955	,994	1,000	,953
		Significance (2-tailed)	,000	,000	,000	.	,000
		df	8	8	8	0	8
	Book value 31/12/2009	Correlation	,968	,867	,936	,953	1,000
		Significance (2-tailed)	,000	,001	,000	,000	.
		df	8	8	8	8	0
Book value 31/12/2009	Market value 31/12/2009	Correlation	1,000	,783	,592	,375	
		Significance (2-tailed)	.	,013	,093	,321	
		df	0	7	7	7	
	Compr. earnings 2009	Correlation	,783	1,000	,961	,851	
		Significance (2-tailed)	,013	.	,000	,004	
		df	7	0	7	7	
	EBT 2009	Correlation	,592	,961	1,000	,957	
		Significance (2-tailed)	,093	,000	.	,000	
		df	7	7	0	7	
	EBIT 2009	Correlation	,375	,851	,957	1,000	
		Significance (2-tailed)	,321	,004	,000	.	
		df	7	7	7	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2005	Compr. earnings 2005	EBT 2005	EBIT 2005	Book value 31/12/2005
-none-[a]	Market value 31/12/2005	Correlation	1,000	,392	,456	,696	,738
		Significance (2-tailed)	.	,119	,066	,002	,001
		df	0	15	15	15	15
	Compr. earnings 2005	Correlation	,392	1,000	,996	,793	,185
		Significance (2-tailed)	,119	.	,000	,000	,477
		df	15	0	15	15	15
	EBT 2005	Correlation	,456	,996	1,000	,834	,216
		Significance (2-tailed)	,066	,000	.	,000	,406
		df	15	15	0	15	15
	EBIT 2005	Correlation	,696	,793	,834	1,000	,192
		Significance (2-tailed)	,002	,000	,000	.	,460
		df	15	15	15	0	15
	Book value 31/12/2005	Correlation	,738	,185	,216	,192	1,000
		Significance (2-tailed)	,001	,477	,406	,460	.
		df	15	15	15	15	0
Book value 31/12/2005	Market value 31/12/2005	Correlation	1,000	,386	,451	,836	
		Significance (2-tailed)	.	,140	,080	,000	
		df	0	14	14	14	
	Compr. earnings 2005	Correlation	,386	1,000	,996	,786	
		Significance (2-tailed)	,140	.	,000	,000	
		df	14	0	14	14	
	EBT 2005	Correlation	,451	,996	1,000	,827	
		Significance (2-tailed)	,080	,000	.	,000	
		df	14	14	0	14	
	EBIT 2005	Correlation	,836	,786	,827	1,000	
		Significance (2-tailed)	,000	,000	,000	.	
		df	14	14	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2006	Compr. earnings 2006	EBT 2006	EBIT 2006	Book value 31/12/2006
-none-[a]	Market value 31/12/2006	Correlation	1,000	,606	,630	,730	,696
		Significance (2-tailed)	.	,010	,007	,001	,002
		df	0	15	15	15	15
	Compr. earnings 2006	Correlation	,606	1,000	,960	,555	,919
		Significance (2-tailed)	,010	.	,000	,021	,000
		df	15	0	15	15	15
	EBT 2006	Correlation	,630	,960	1,000	,544	,910
		Significance (2-tailed)	,007	,000	.	,024	,000
		df	15	15	0	15	15
	EBIT 2006	Correlation	,730	,555	,544	1,000	,404
		Significance (2-tailed)	,001	,021	,024	.	,107
		df	15	15	15	0	15
	Book value 31/12/2006	Correlation	,696	,919	,910	,404	1,000
		Significance (2-tailed)	,002	,000	,000	,107	.
		df	15	15	15	15	0
Book value 31/12/2006	Market value 31/12/2006	Correlation	1,000	-,121	-,012	,683	
		Significance (2-tailed)	.	,655	,965	,004	
		df	0	14	14	14	
	Compr. earnings 2006	Correlation	-,121	1,000	,760	,508	
		Significance (2-tailed)	,655	.	,001	,045	
		df	14	0	14	14	
	EBT 2006	Correlation	-,012	,760	1,000	,463	
		Significance (2-tailed)	,965	,001	.	,071	
		df	14	14	0	14	
	EBIT 2006	Correlation	,683	,508	,463	1,000	
		Significance (2-tailed)	,004	,045	,071	.	
		df	14	14	14	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2007	Compr. earnings 2007	EBT 2007	EBIT 2007	Book value 31/12/2007
-none-[a]	Market value 31/12/2007	Correlation	1,000	,258	,295	,353	,792
		Significance (2-tailed)	.	,301	,235	,151	,000
		df	0	16	16	16	16
	Compr. earnings 2007	Correlation	,258	1,000	,994	,454	,682
		Significance (2-tailed)	,301	.	,000	,058	,002
		df	16	0	16	16	16
	EBT 2007	Correlation	,295	,994	1,000	,538	,684
		Significance (2-tailed)	,235	,000	.	,021	,002
		df	16	16	0	16	16
	EBIT 2007	Correlation	,353	,454	,538	1,000	,285
		Significance (2-tailed)	,151	,058	,021	.	,252
		df	16	16	16	0	16
	Book value 31/12/2007.	Correlation	,792	,682	,684	,285	1,000
		Significance (2-tailed)	,000	,002	,002	,252	.
		df	16	16	16	16	0
Book value 31/12/2007	Market value 31/12/2007	Correlation	1,000	-,632	-,552	,218	
		Significance (2-tailed)	.	,007	,021	,402	
		df	0	15	15	15	
	Compr. earnings 2007	Correlation	-,632	1,000	,988	,371	
		Significance (2-tailed)	,007	.	,000	,143	
		df	15	0	15	15	
	EBT 2007	Correlation	-,552	,988	1,000	,490	
		Significance (2-tailed)	,021	,000	.	,046	
		df	15	15	0	15	
	EBIT 2007	Correlation	,218	,371	,490	1,000	
		Significance (2-tailed)	,402	,143	,046	.	
		df	15	15	15	0	

a. Cells contain zero-order (Pearson) correlations.

Correlations

Control Variables			Market value 31/12/2008	Compr. earnings 2008	EBT 2008	EBIT 2008	Book value 31/12/2008
-none-[a]	Market value 31/12/2008	Correlation	1,000	,150	,248	,729	,852
		Significance (2-tailed)	.	,579	,354	,001	,000
		df	0	14	14	14	14
	Compr. earnings 2008	Correlation	,150	1,000	,990	,414	-,033
		Significance (2-tailed)	,579	.	,000	,111	,903
		df	14	0	14	14	14
	EBT 2008	Correlation	,248	,990	1,000	,497	,090
		Significance (2-tailed)	,354	,000	.	,050	,741
		df	14	14	0	14	14
	EBIT 2008	Correlation	,729	,414	,497	1,000	,619
		Significance (2-tailed)	,001	,111	,050	.	,011
		df	14	14	14	0	14
	Book value 31/12/2008	Correlation	,852	-,033	,090	,619	1,000
		Significance (2-tailed)	,000	,903	,741	,011	.
		df	14	14	14	14	0
Book value 31/12/2008	Market value 31/12/2008	Correlation	1,000	,341	,329	,491	
		Significance (2-tailed)	.	,214	,231	,063	
		df	0	13	13	13	
	Compr. earnings 2008	Correlation	,341	1,000	,997	,554	
		Significance (2-tailed)	,214	.	,000	,032	
		df	13	0	13	13	
	EBT 2008	Correlation	,329	,997	1,000	,565	
		Significance (2-tailed)	,231	,000	.	,028	
		df	13	13	0	13	
	EBIT 2008	Correlation	,491	,554	,565	1,000	
		Significance (2-tailed)	,063	,032	,028	.	
		df	13	13	13	0	

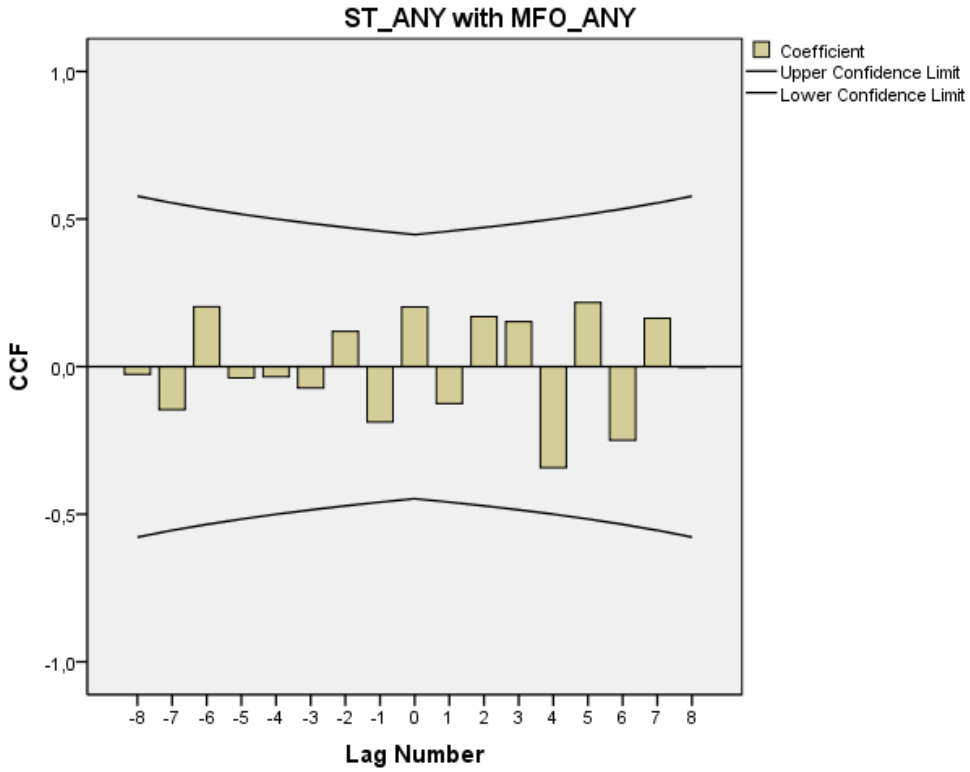
a. Cells contain zero-order (Pearson) correlations.

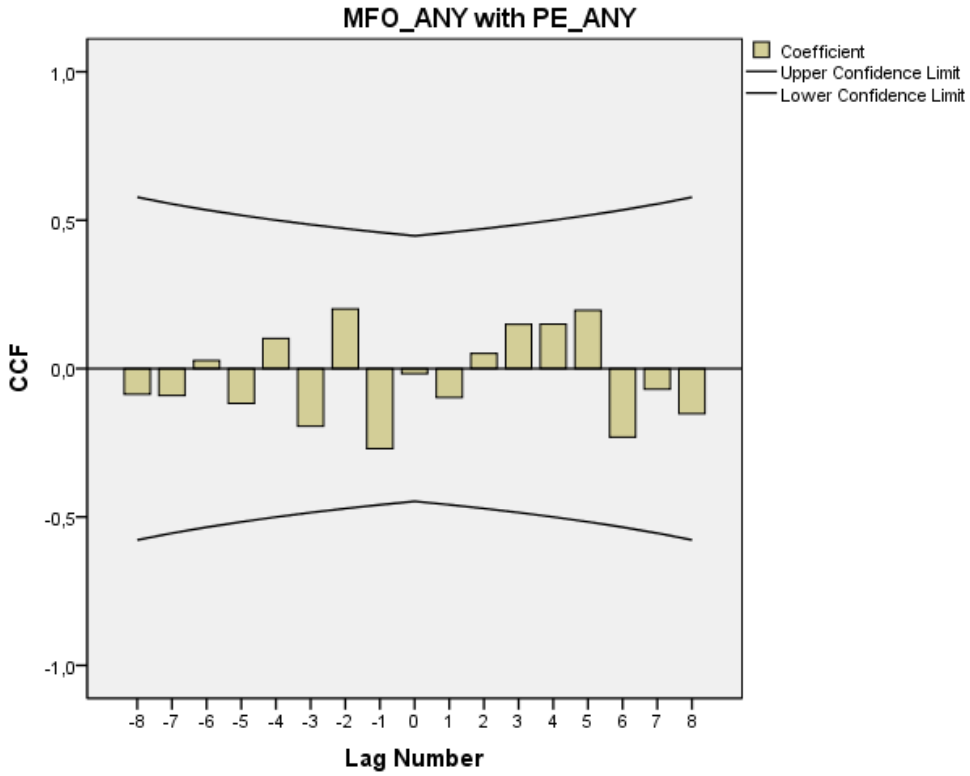
Correlations

Control Variables			Market value 31/12/2009	Compr. earnings 2009	EBT 2009	EBIT 2009	Book value 31/12/2009
-none-[a]	Market value 31/12/2009	Correlation	1,000	,665	,750	,737	,719
		Significance (2-tailed)	.	,005	,001	,001	,002
		df	0	14	14	14	14
	Compr. earnings 2009	Correlation	,665	1,000	,972	,946	,322
		Significance (2-tailed)	,005	.	,000	,000	,224
		df	14	0	14	14	14
	EBT 2009	Correlation	,750	,972	1,000	,982	,442
		Significance (2-tailed)	,001	,000	.	,000	,086
		df	14	14	0	14	14
	EBIT 2009	Correlation	,737	,946	,982	1,000	,427
		Significance (2-tailed)	,001	,000	,000	.	,099
		df	14	14	14	0	14
	Book value 31/12/2009	Correlation	,719	,322	,442	,427	1,000
		Significance (2-tailed)	,002	,224	,086	,099	.
		df	14	14	14	14	0
Book value 31/12/2009	Market value 31/12/2009	Correlation	1,000	,659	,693	,684	
		Significance (2-tailed)	.	,008	,004	,005	
		df	0	13	13	13	
	Compr. earnings 2009	Correlation	,659	1,000	,977	,944	
		Significance (2-tailed)	,008	.	,000	,000	
		df	13	0	13	13	
	EBT 2009	Correlation	,693	,977	1,000	,978	
		Significance (2-tailed)	,004	,000	.	,000	
		df	13	13	0	13	
	EBIT 2009	Correlation	,684	,944	,978	1,000	
		Significance (2-tailed)	,005	,000	,000	.	
		df	13	13	13	0	

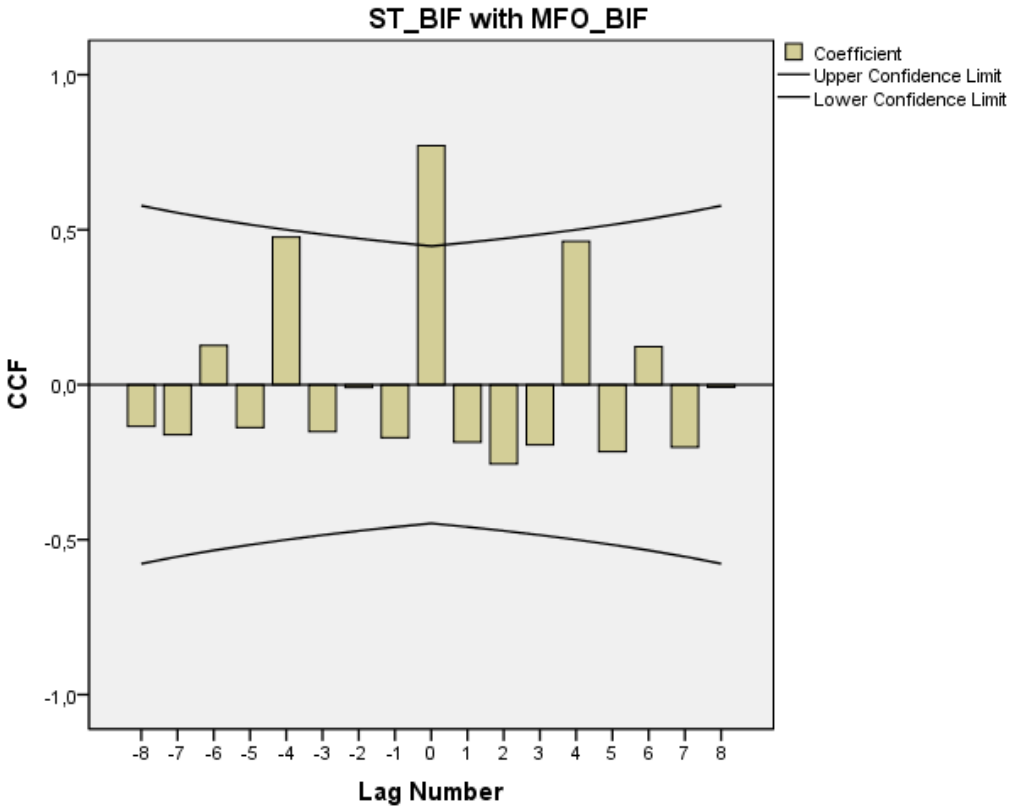
a. Cells contain zero-order (Pearson) correlations.

ANNEX 3: RESULT GRAPHS OF THE CROSS CORRELATION ANALYSES[64]





[64] ST = book value; MFO = wealth value; PE = market value.


ST_BIF with MFO_BIF
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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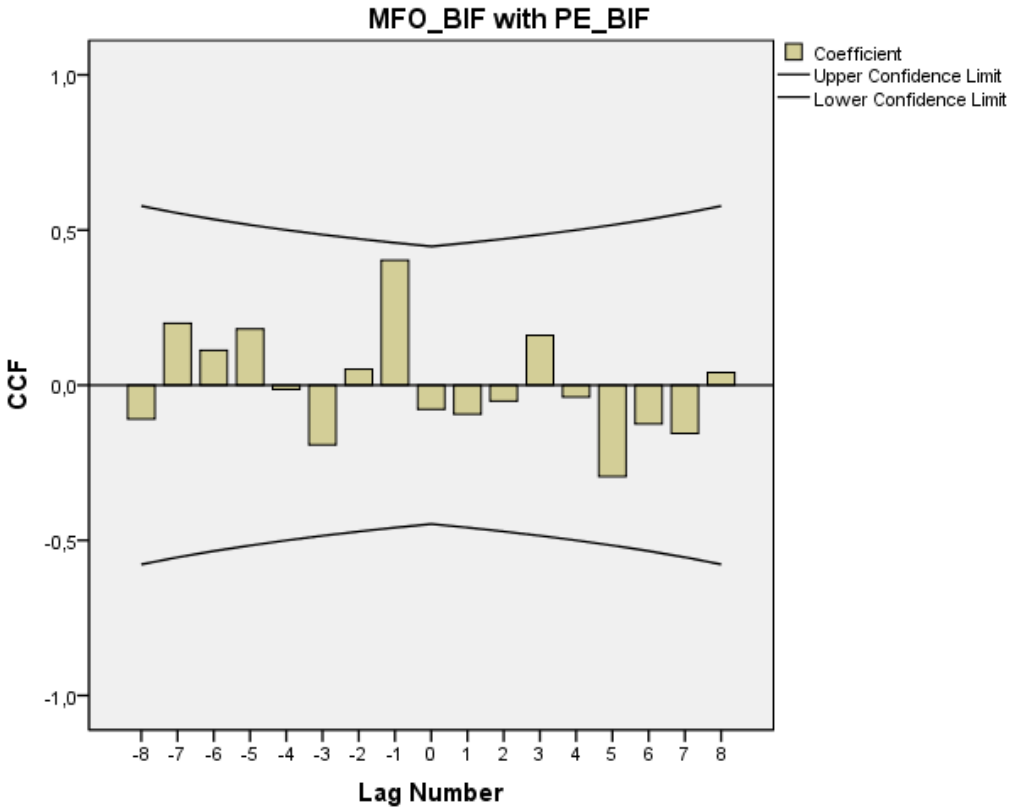
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_BIF with PE_BIF
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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0,0
-0,5
-1,0
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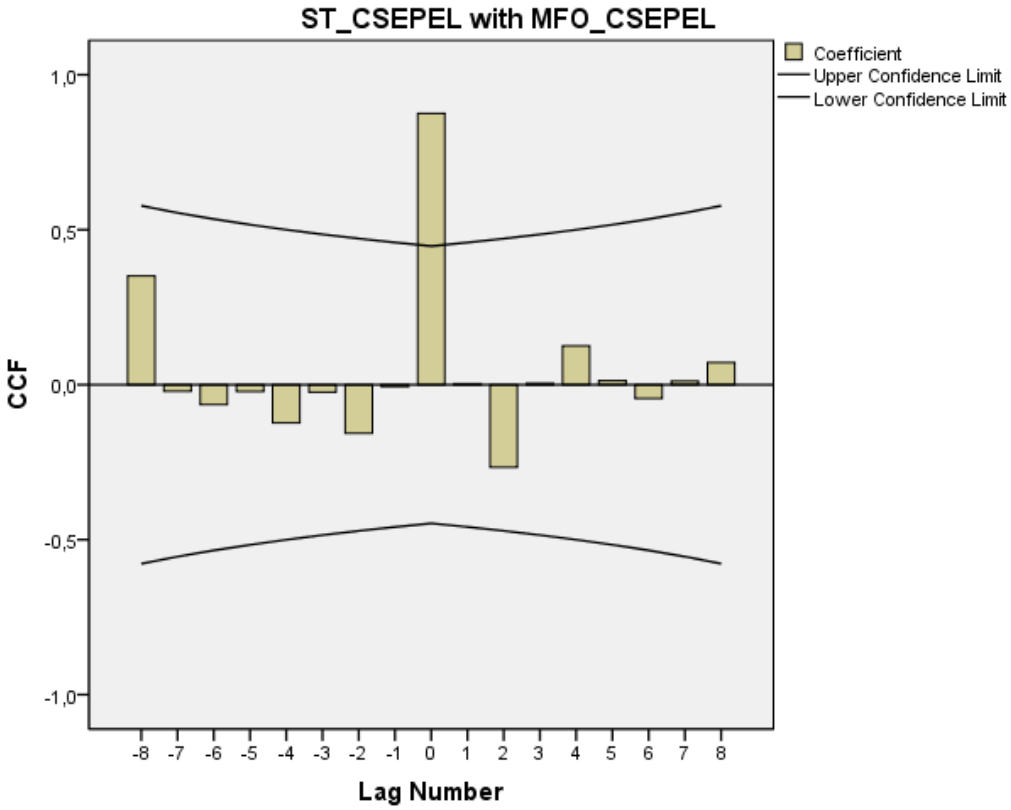
Lag Number


ST_CSEPEL with MFO_CSEPEL
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-0,5
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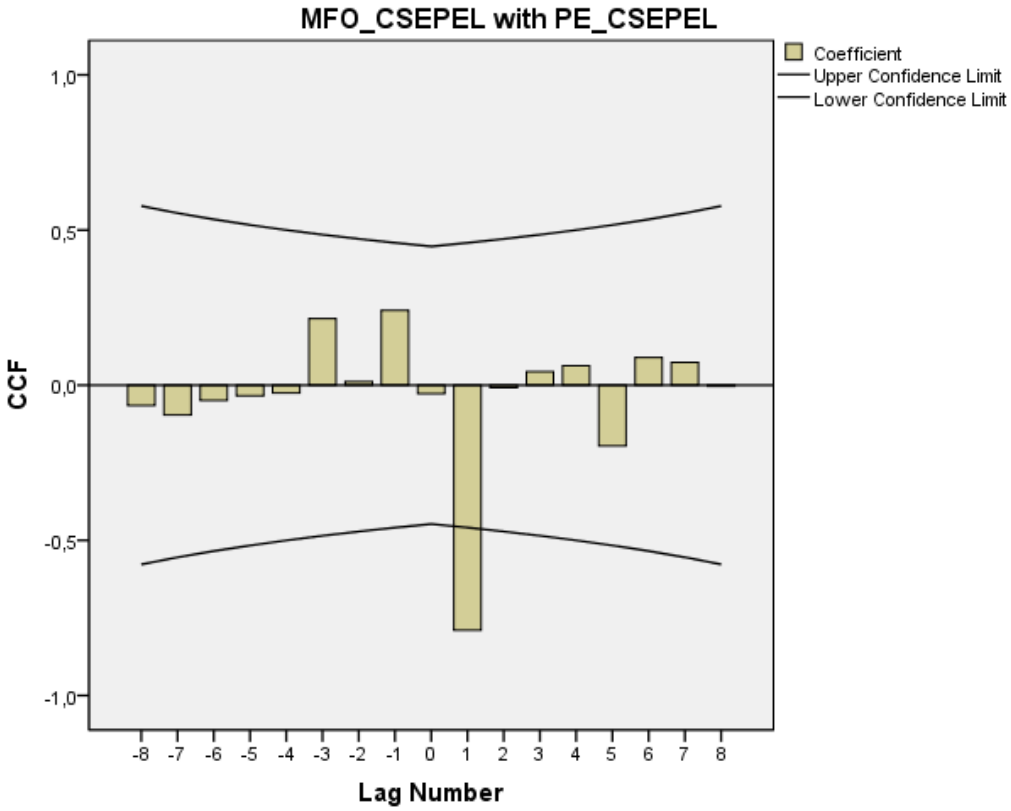
Lag Number


MFO_CSEPEL with PE_CSEPEL
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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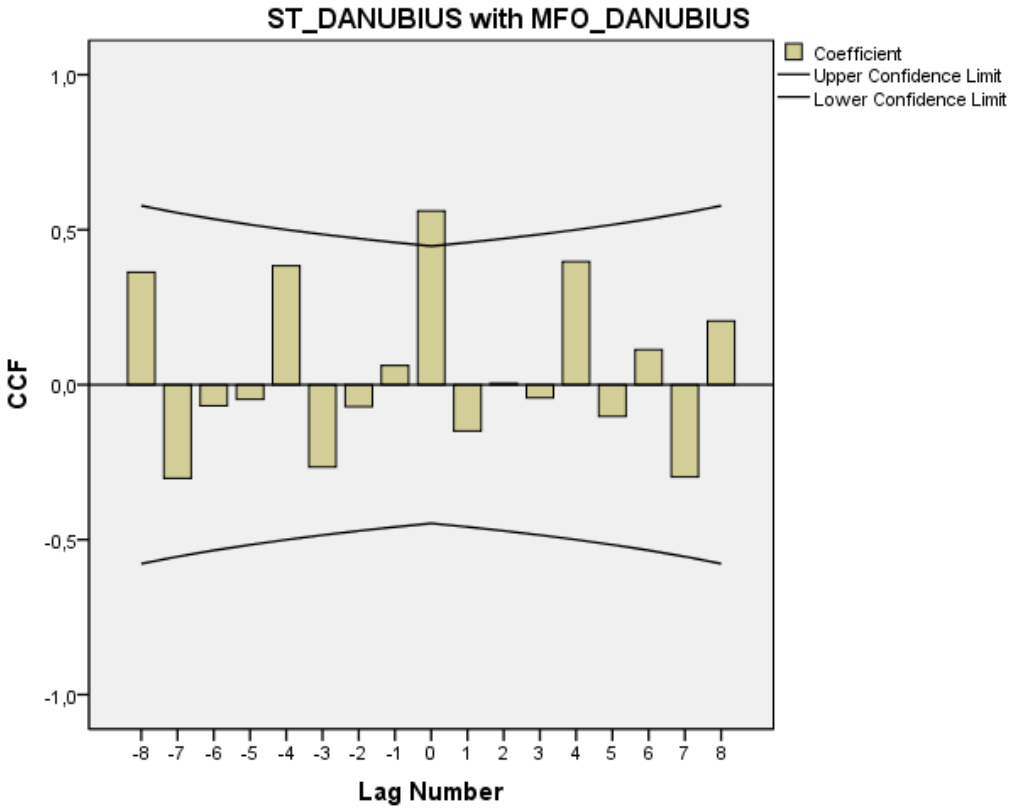
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_DANUBIUS with MFO_DANUBIUS
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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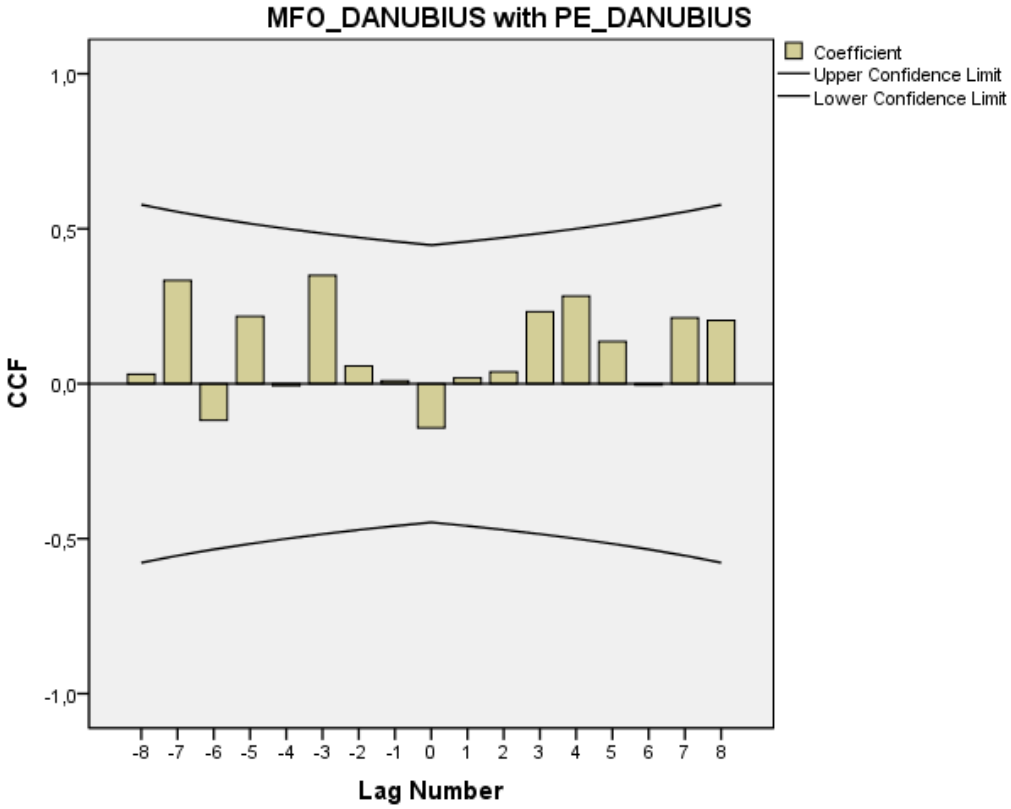
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_DANUBIUS with PE_DANUBIUS
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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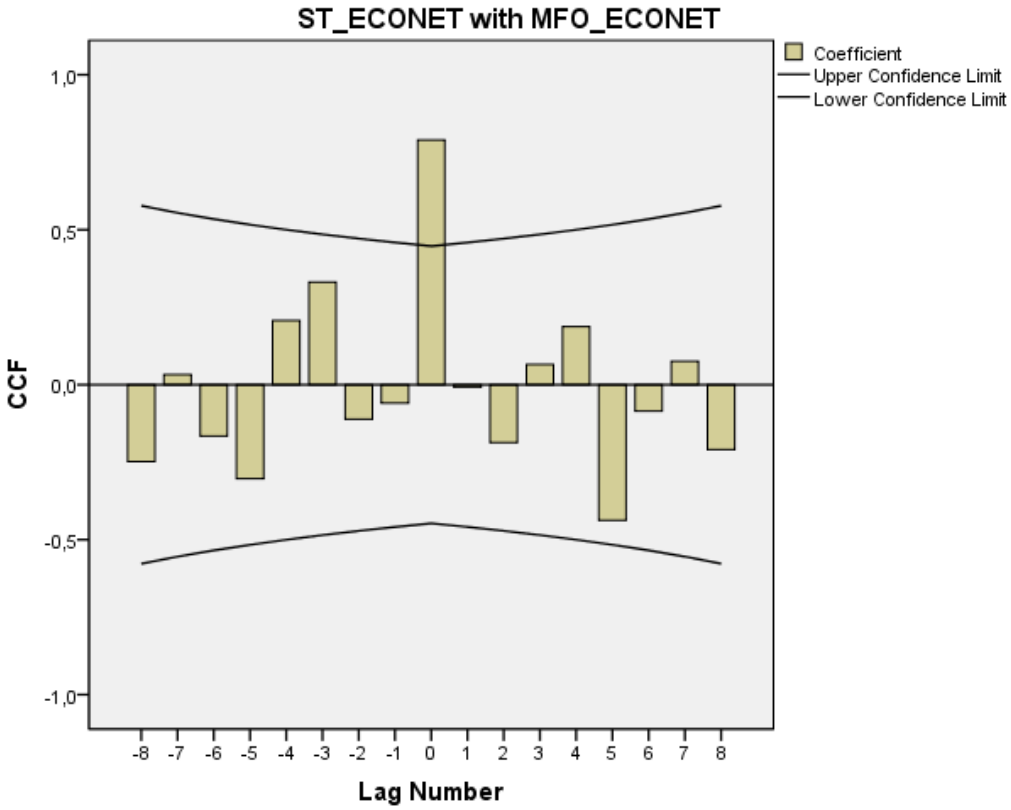
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_ECONET with MFO_ECONET
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-0,5
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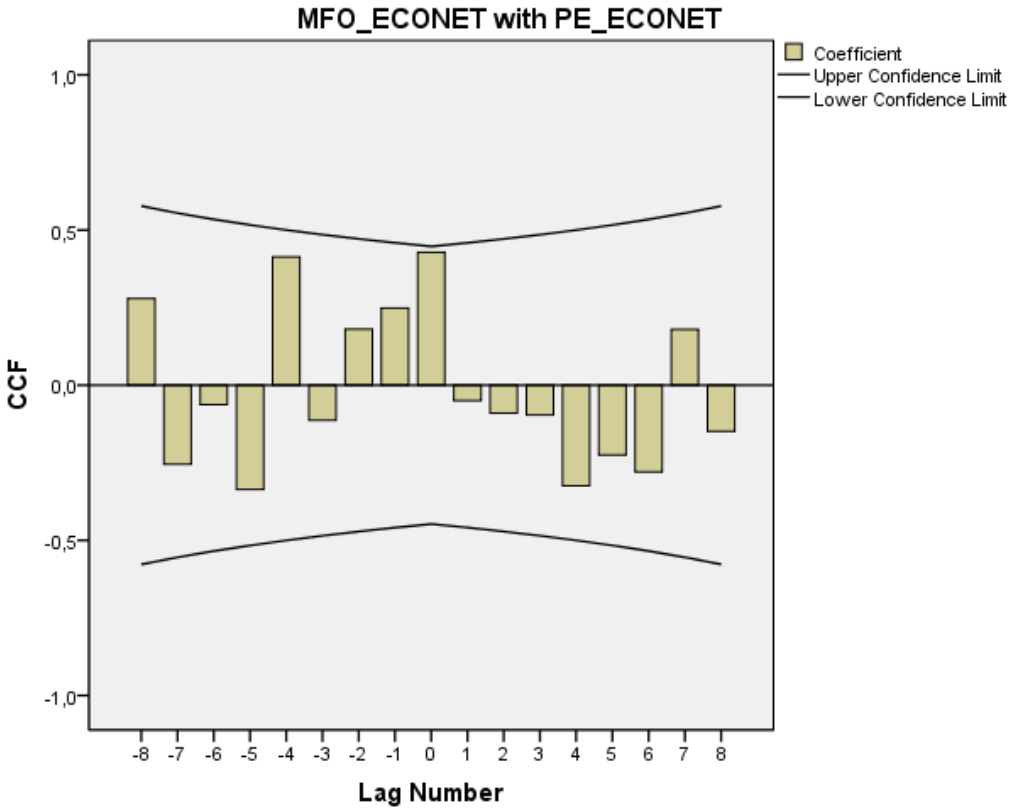
Lag Number


MFO_ECONET with PE_ECONET
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-0,5
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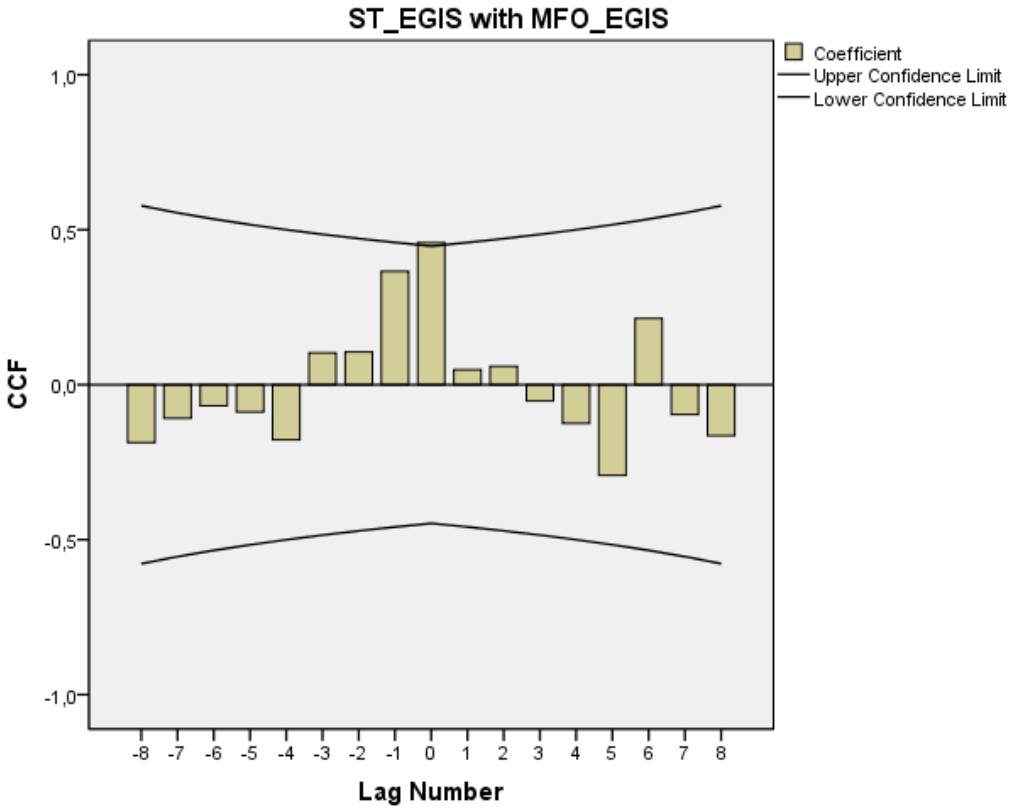
Lag Number


ST_EGIS with MFO_EGIS
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-0,5
-1,0
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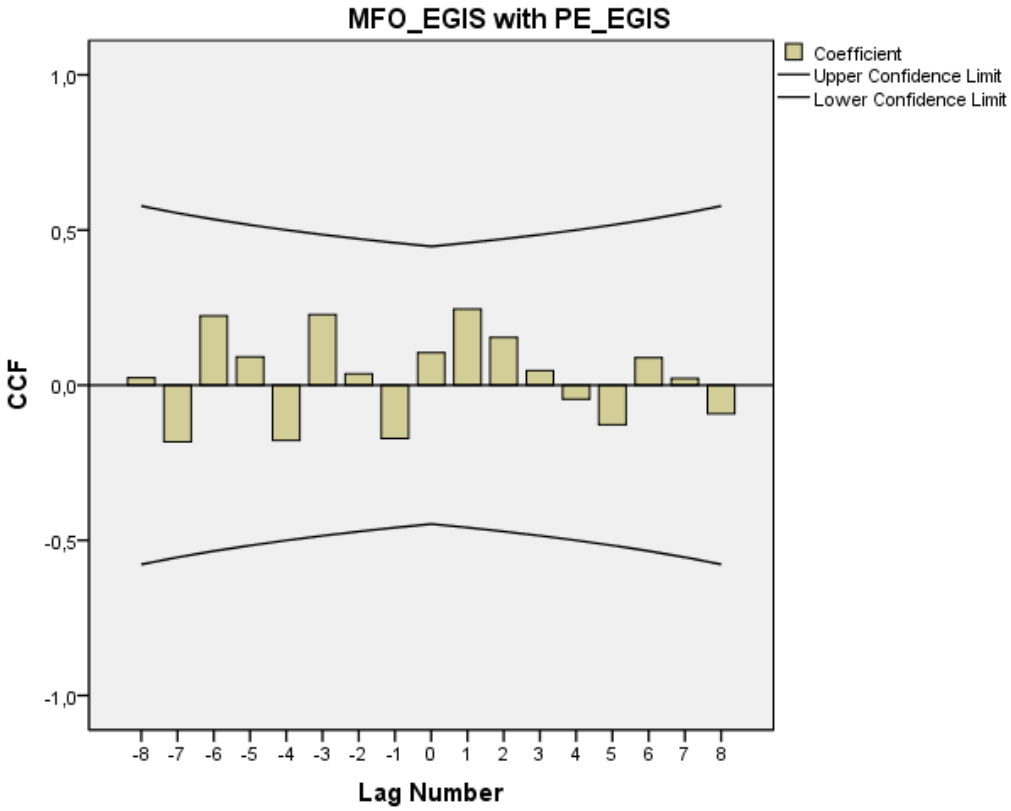
Lag Number


MFO_EGIS with PE_EGIS
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-1,0
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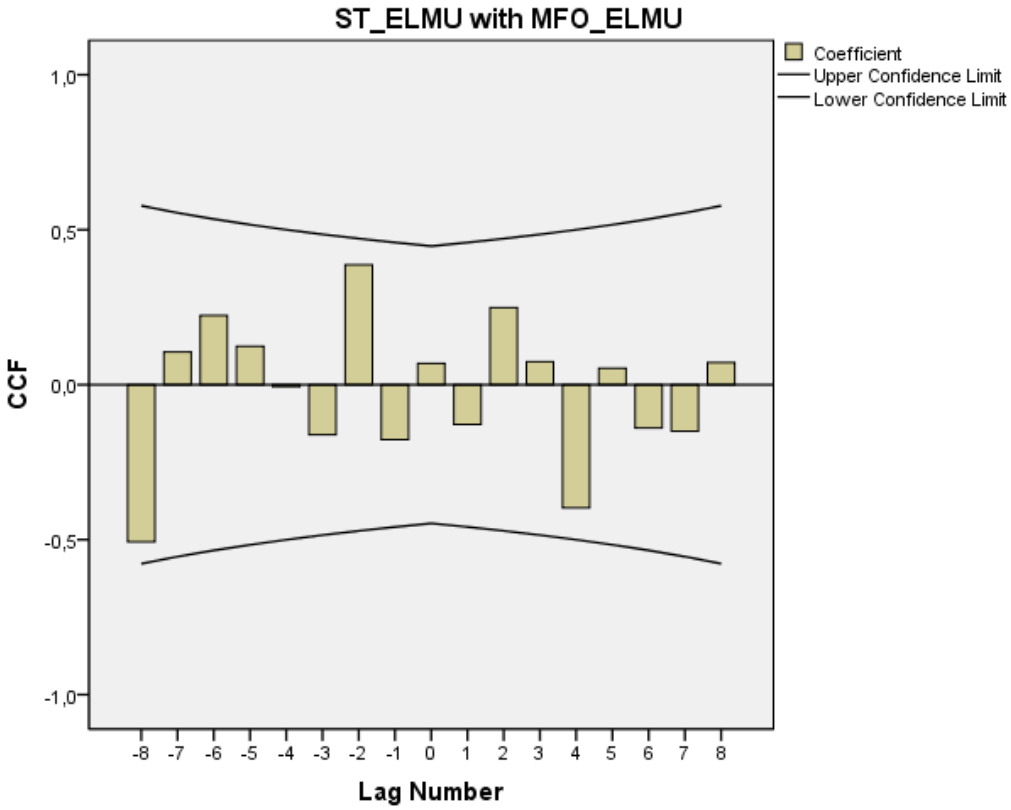
Lag Number


ST_ELMU with MFO_ELMU
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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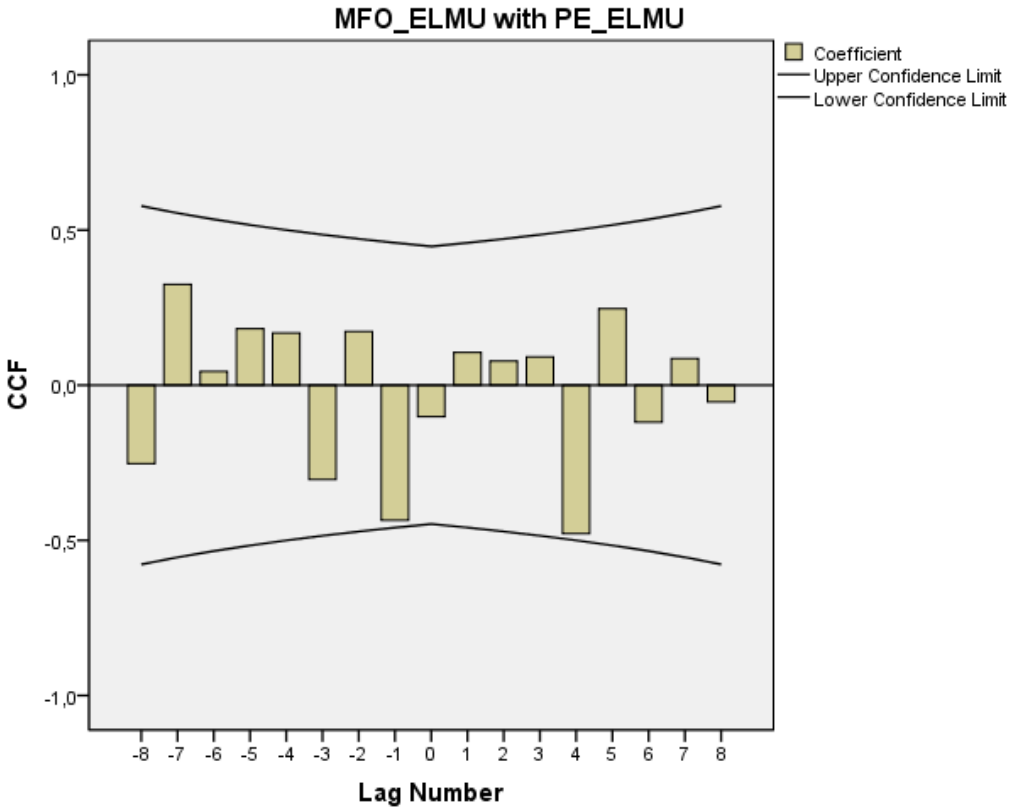
Lag Number


MFO_ELMU with PE_ELMU
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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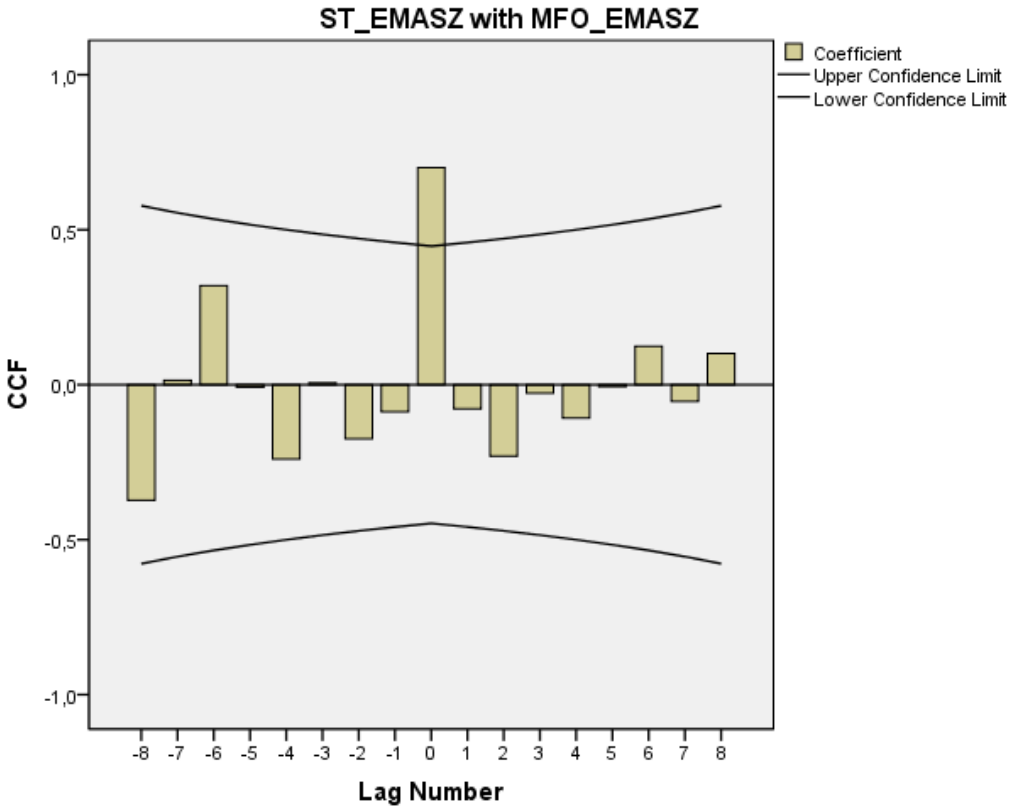
Lag Number


ST_EMASZ with MFO_EMASZ
Coefficient
Upper Confidence Limit
Lower Confidence Limit
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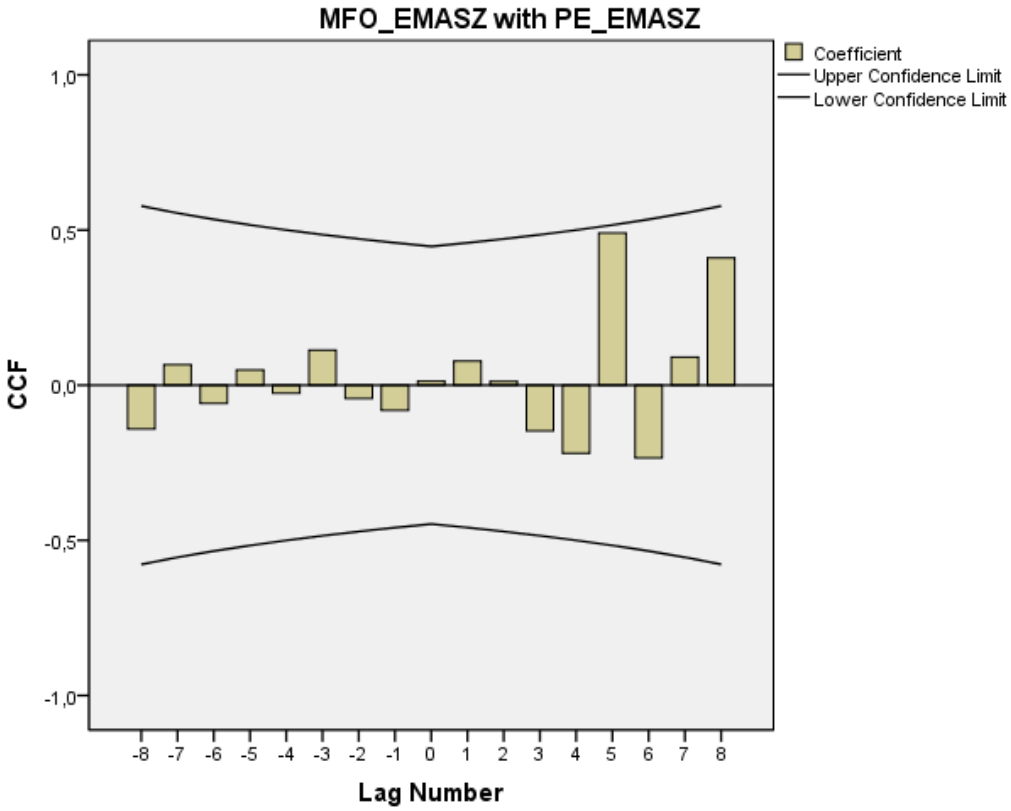
Lag Number


MFO_EMASZ with PE_EMASZ
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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-0,5
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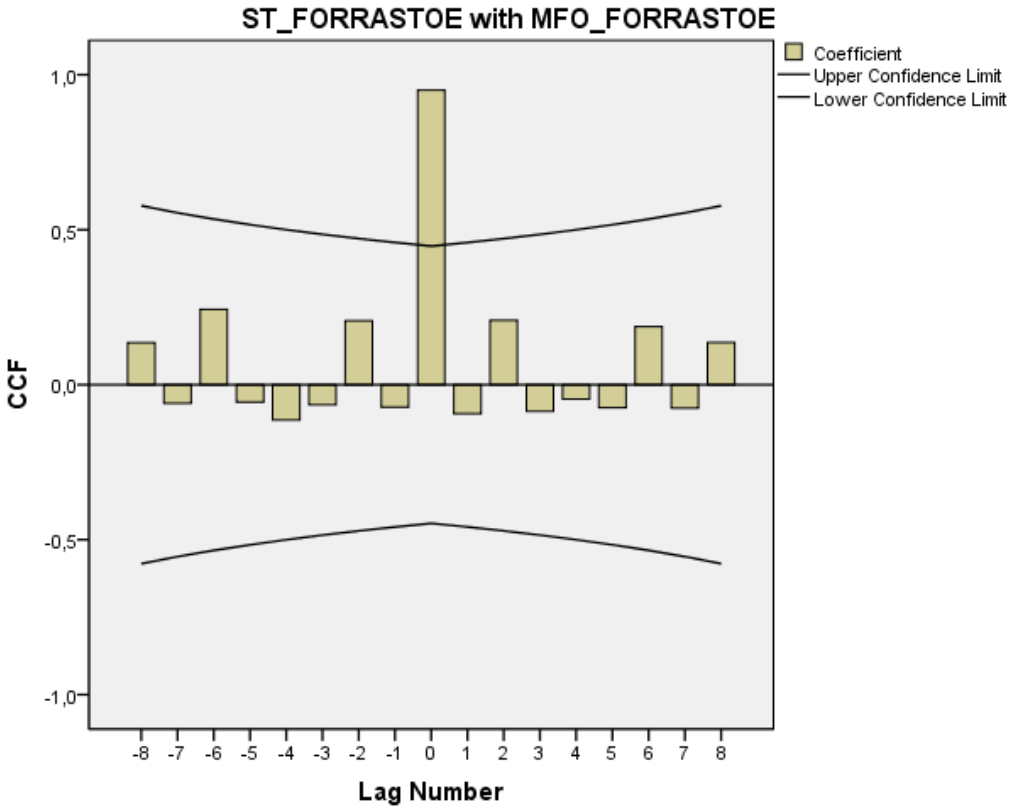
Lag Number


ST_FORRASTOE with MFO_FORRASTOE
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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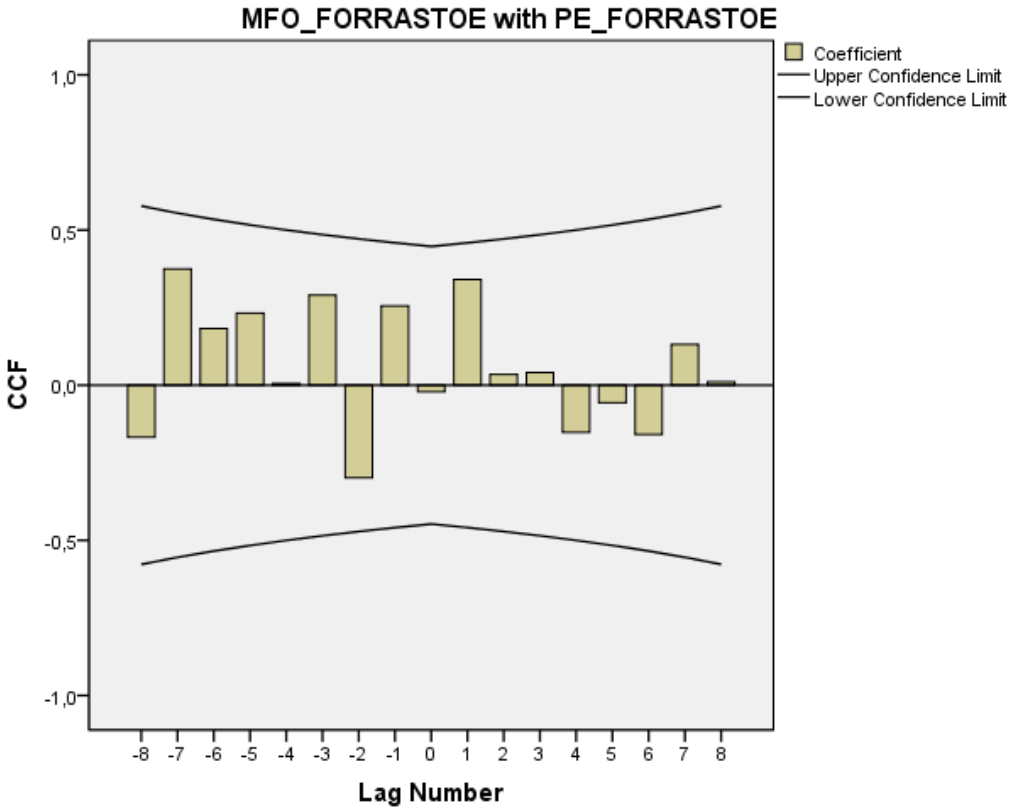
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_FORRASTOE with PE_FORRASTOE
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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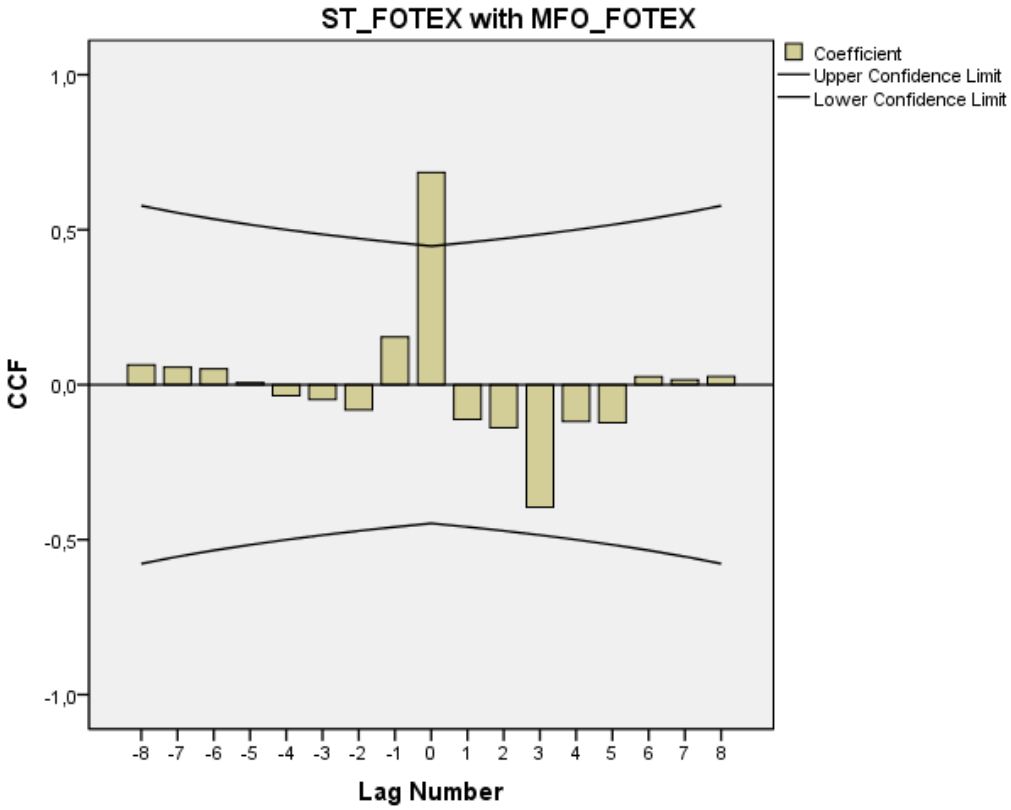
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_FOTEX with MFO_FOTEX
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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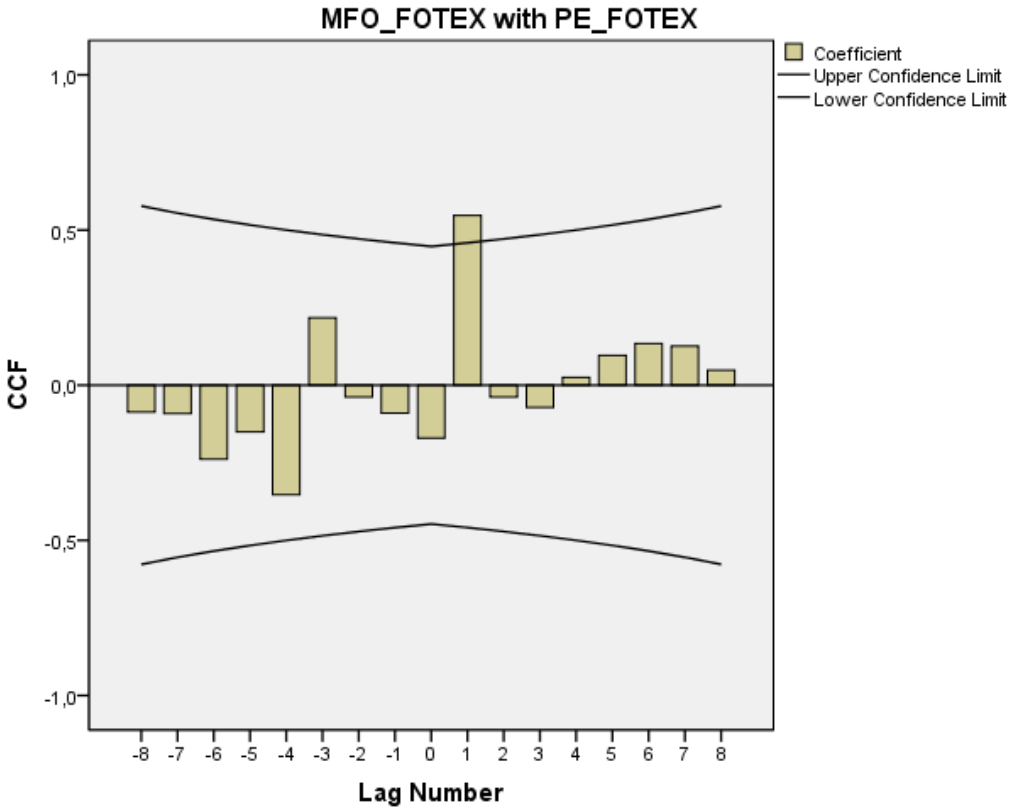
Lag Number


MFO_FOTEX with PE_FOTEX
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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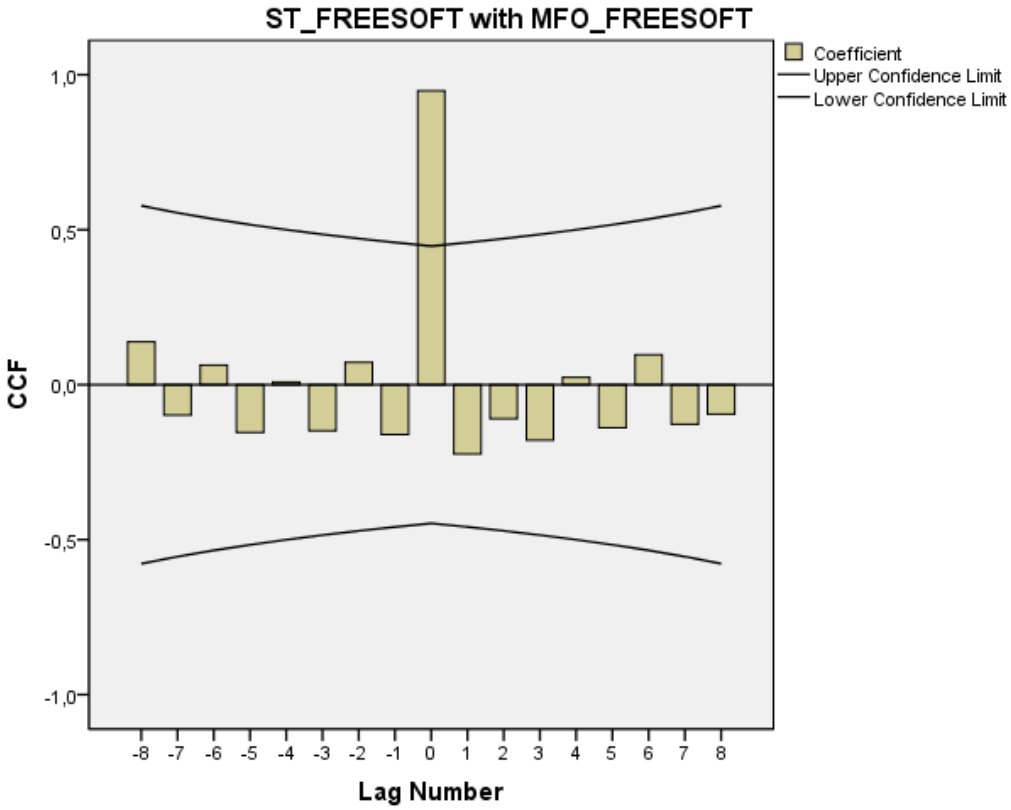
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_FREESOFT with MFO_FREESOFT
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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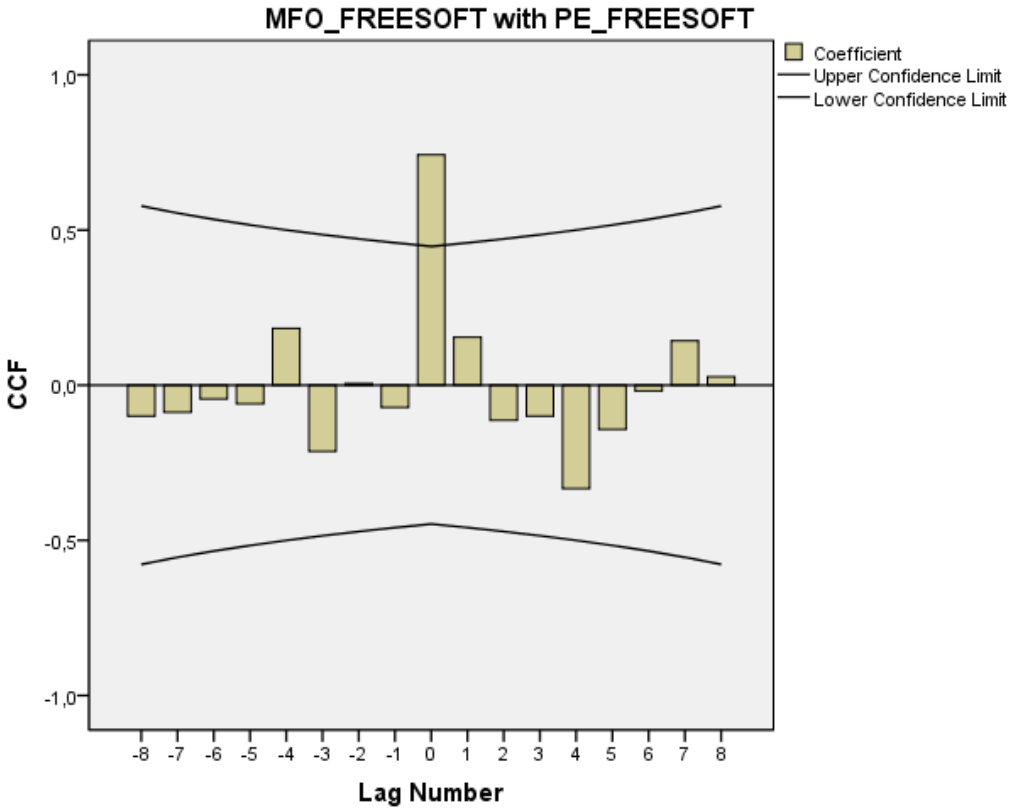
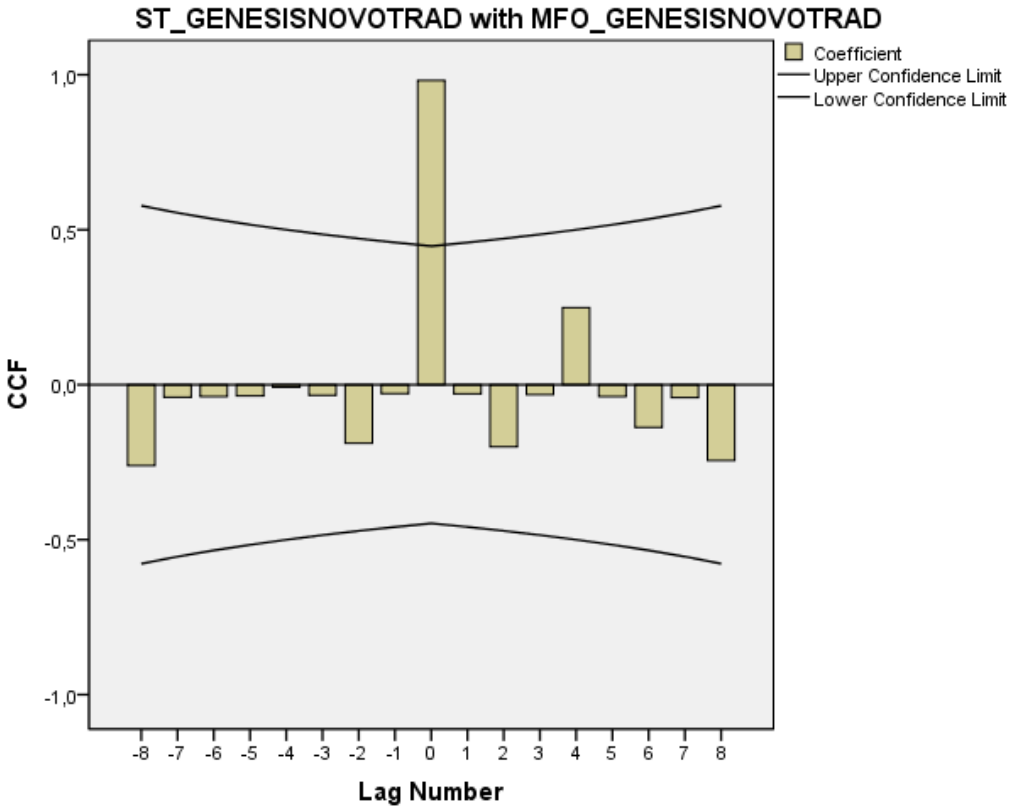
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_FREESOFT with PE_FREESOFT
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_GENESISNOVOTRAD with MFO_GENESISNOVOTRAD
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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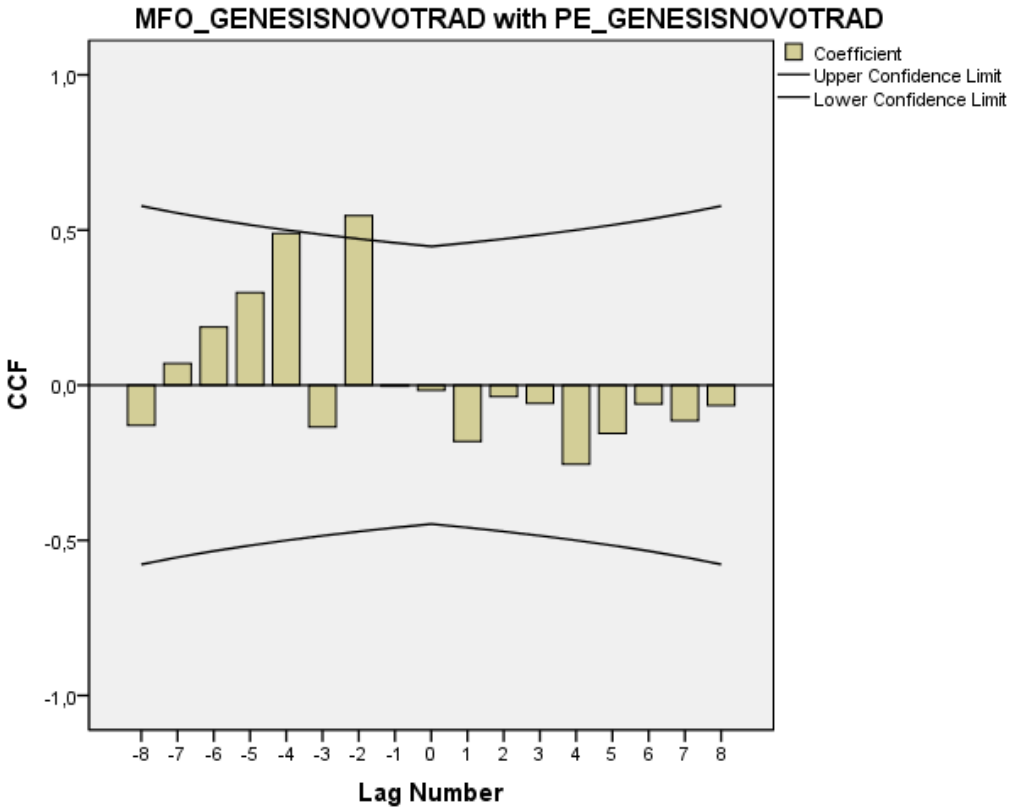
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_GENESISNOVOTRAD with PE_GENESISNOVOTRAD
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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0,0
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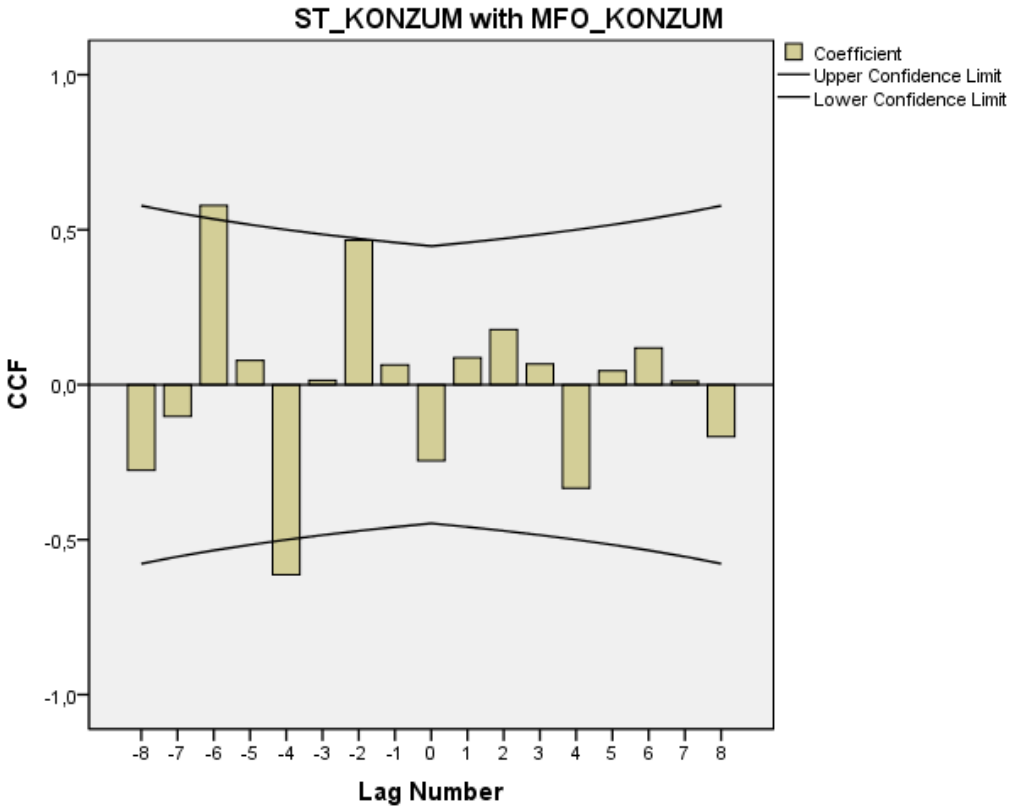
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_KONZUM with MFO_KONZUM
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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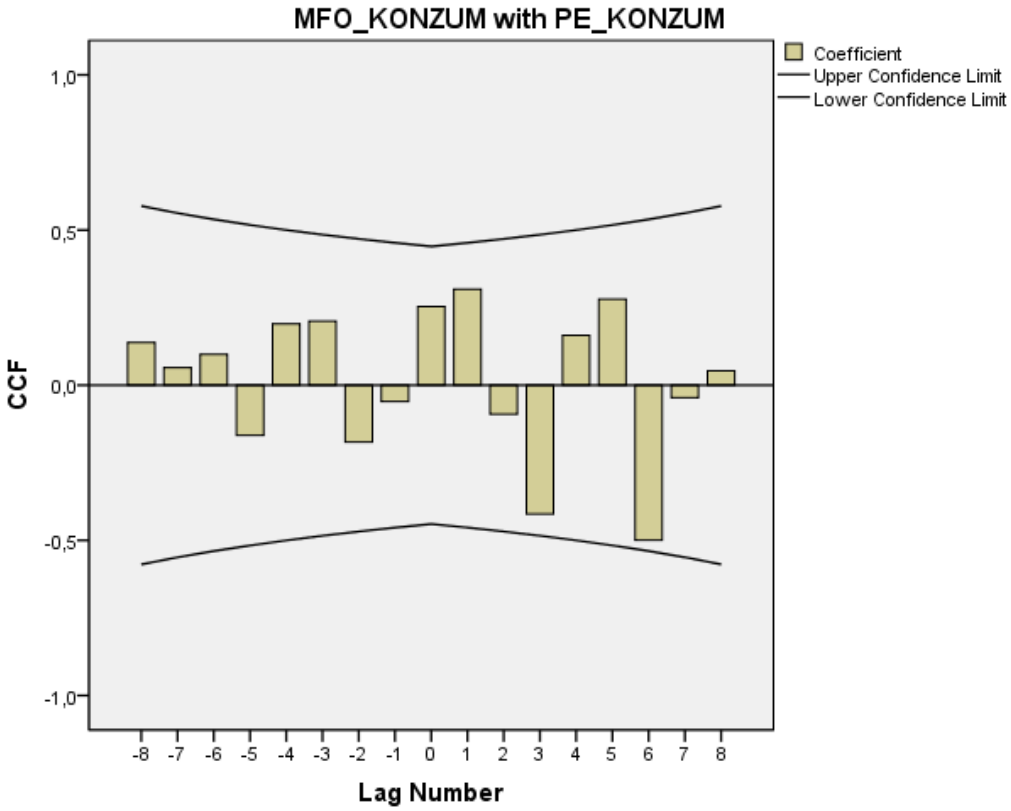
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_KONZUM with PE_KONZUM
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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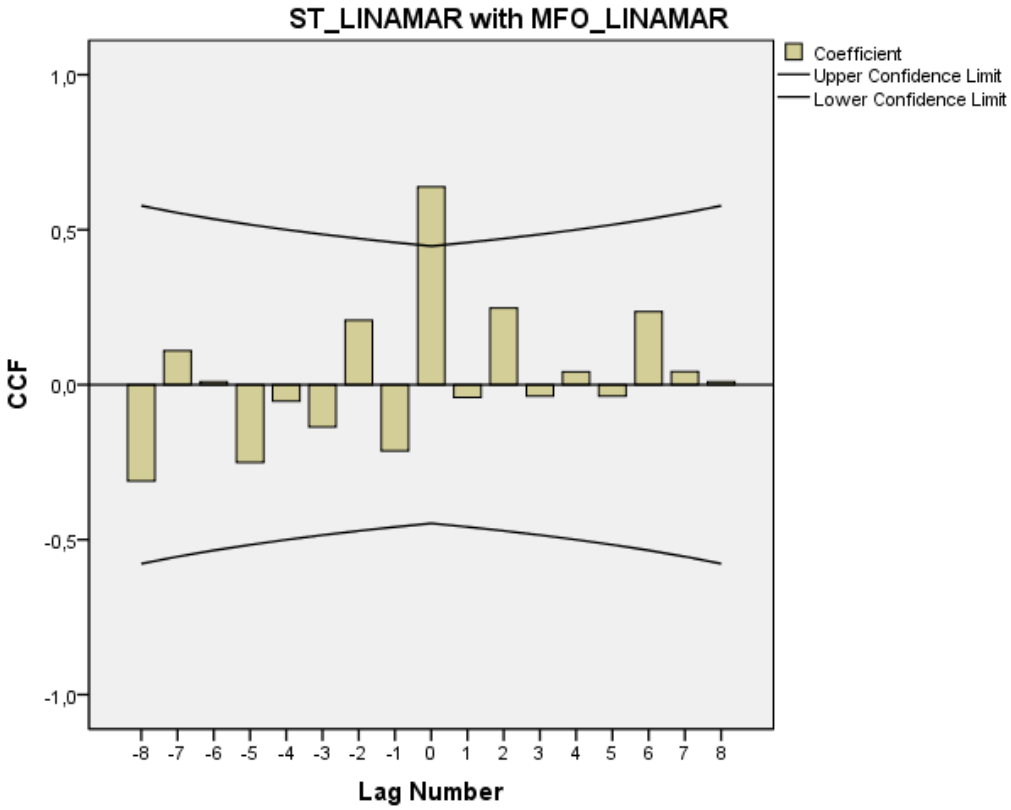
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_LINAMAR with MFO_LINAMAR
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
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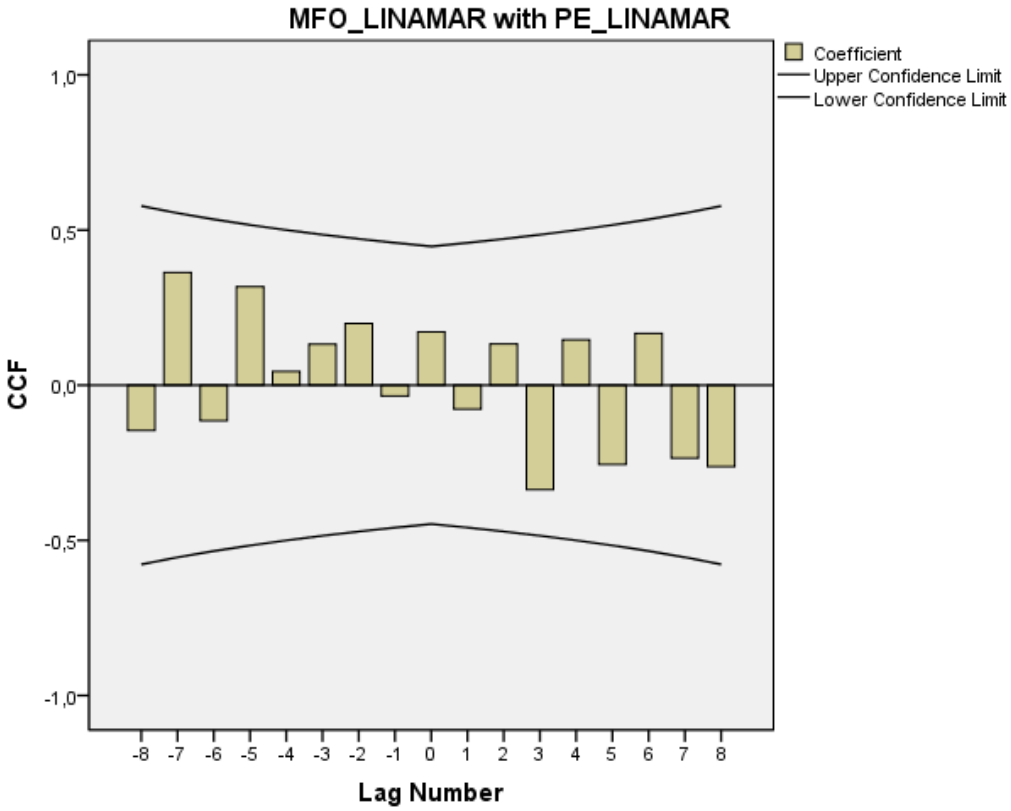
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_LINAMAR with PE_LINAMAR
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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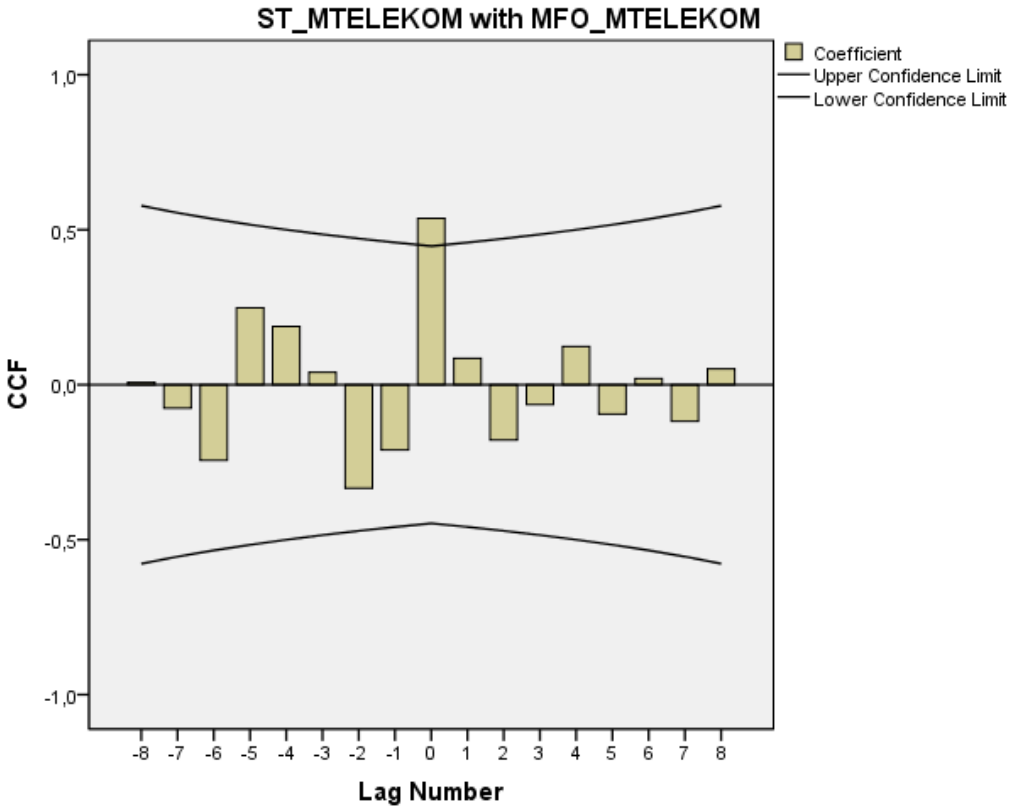
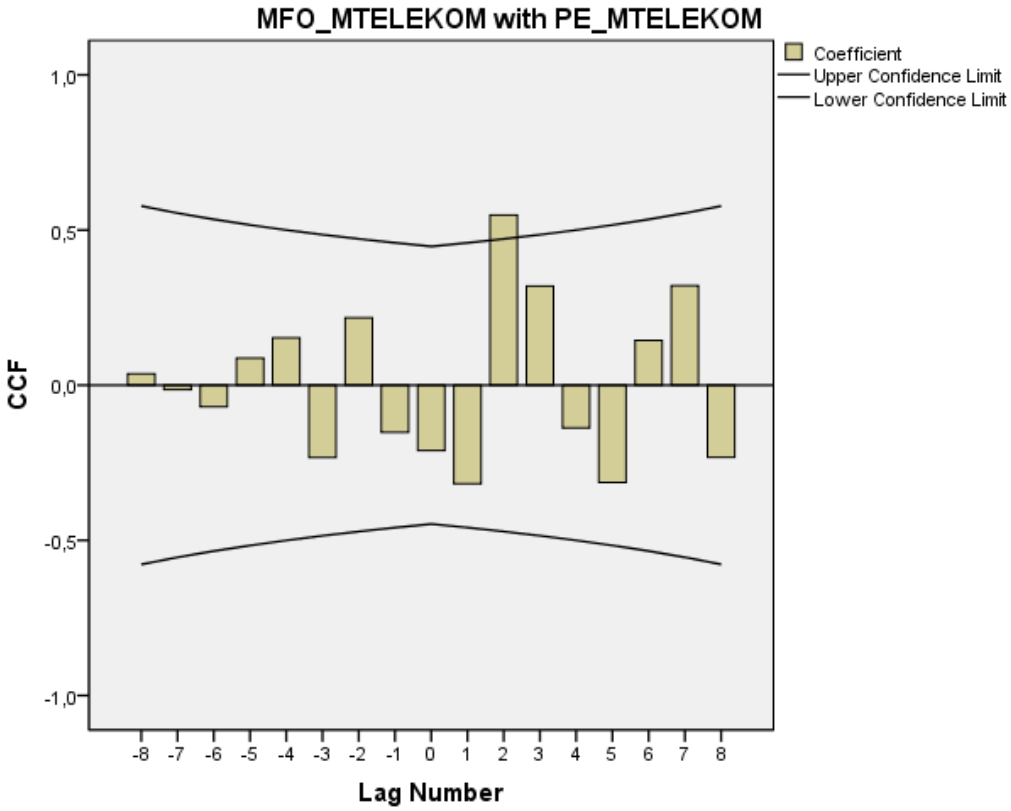
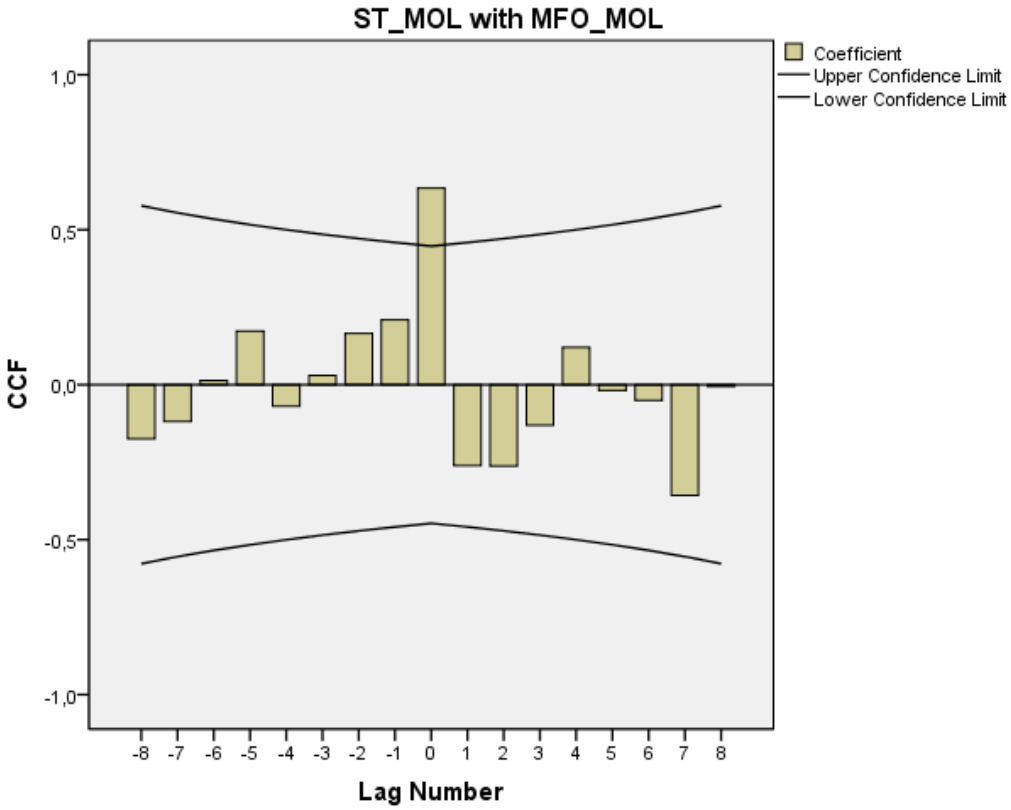
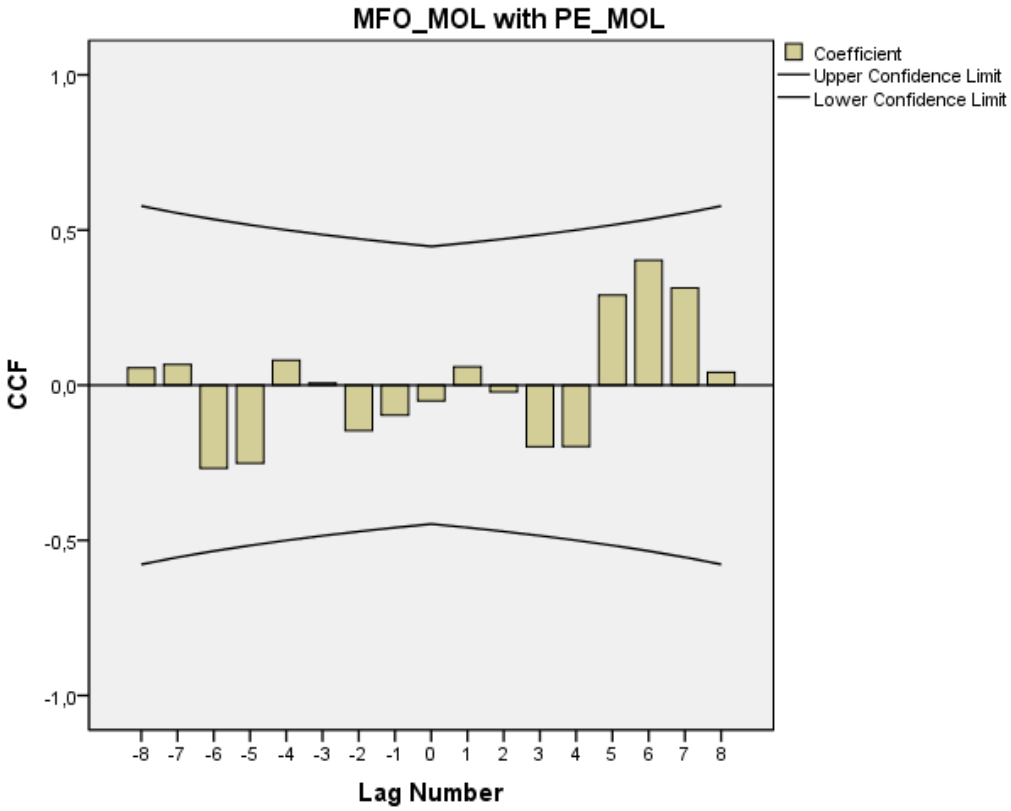
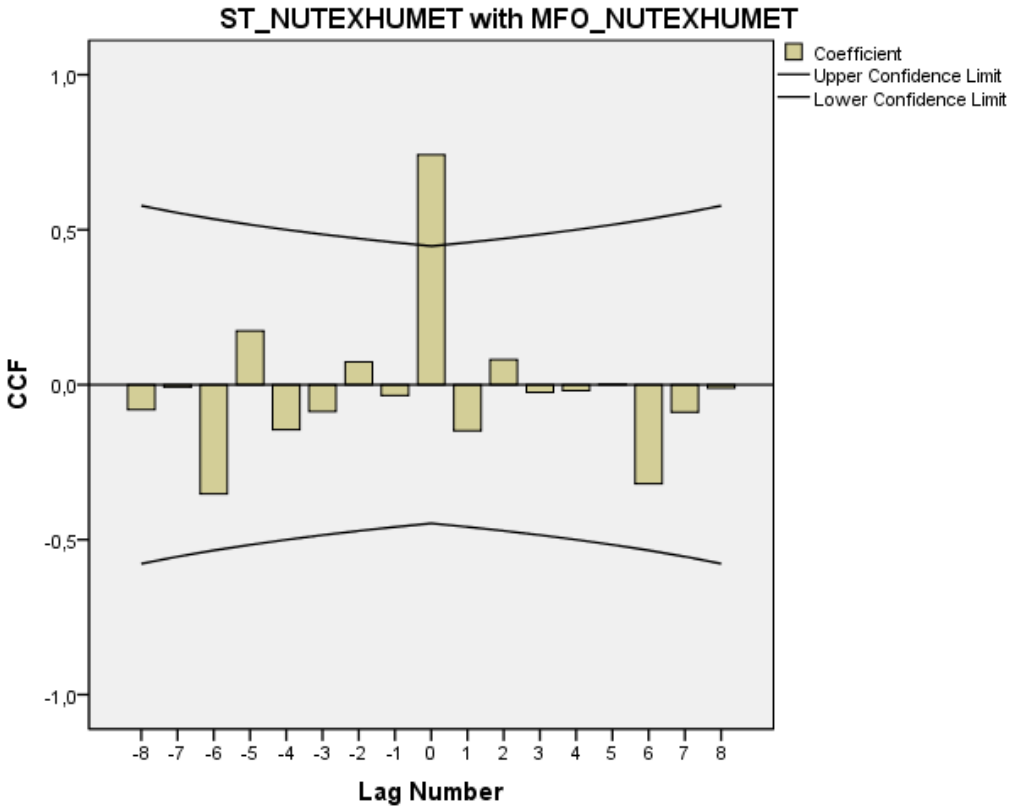
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_MTELEKOM with MFO_MTELEKOM
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_MTELEKOM with PE_MTELEKOM
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_MOL with MFO_MOL
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_MOL with PE_MOL
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_NUTEXHUMET with MFO_NUTEXHUMET
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
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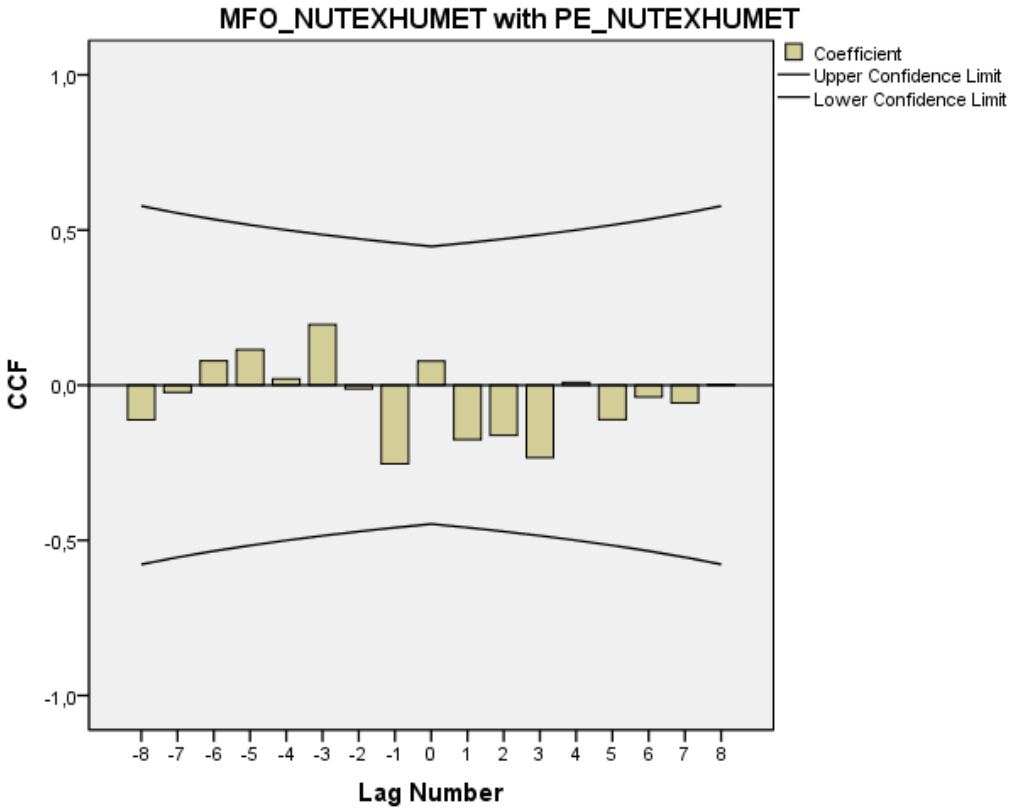
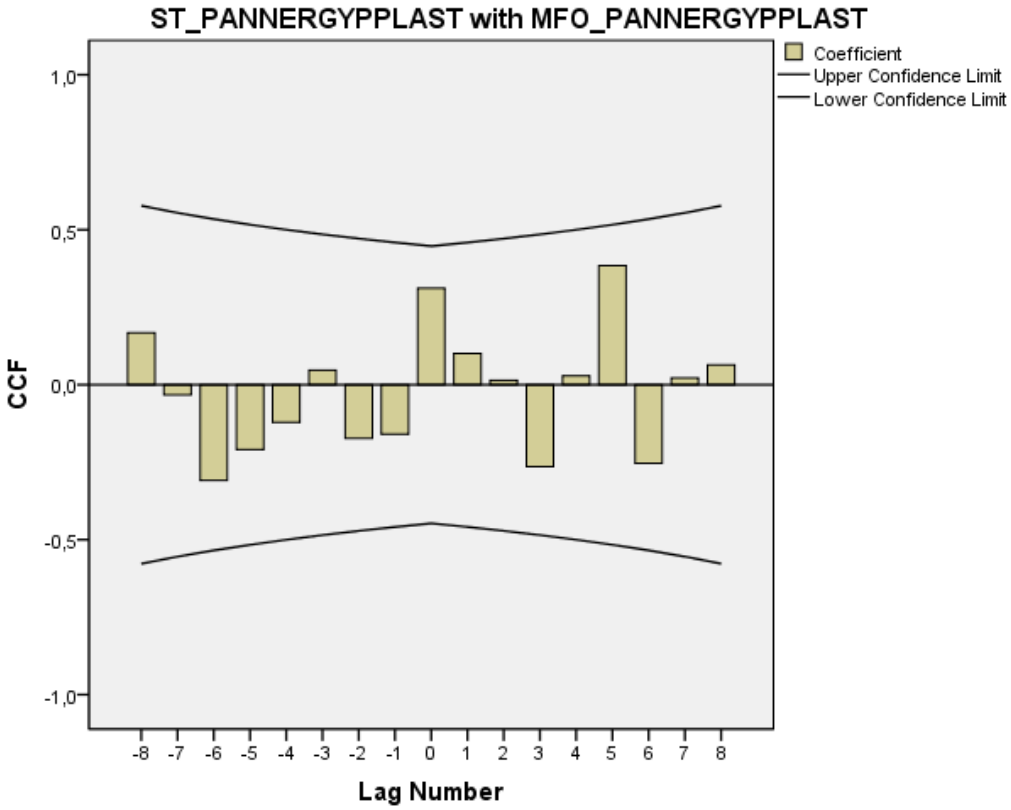
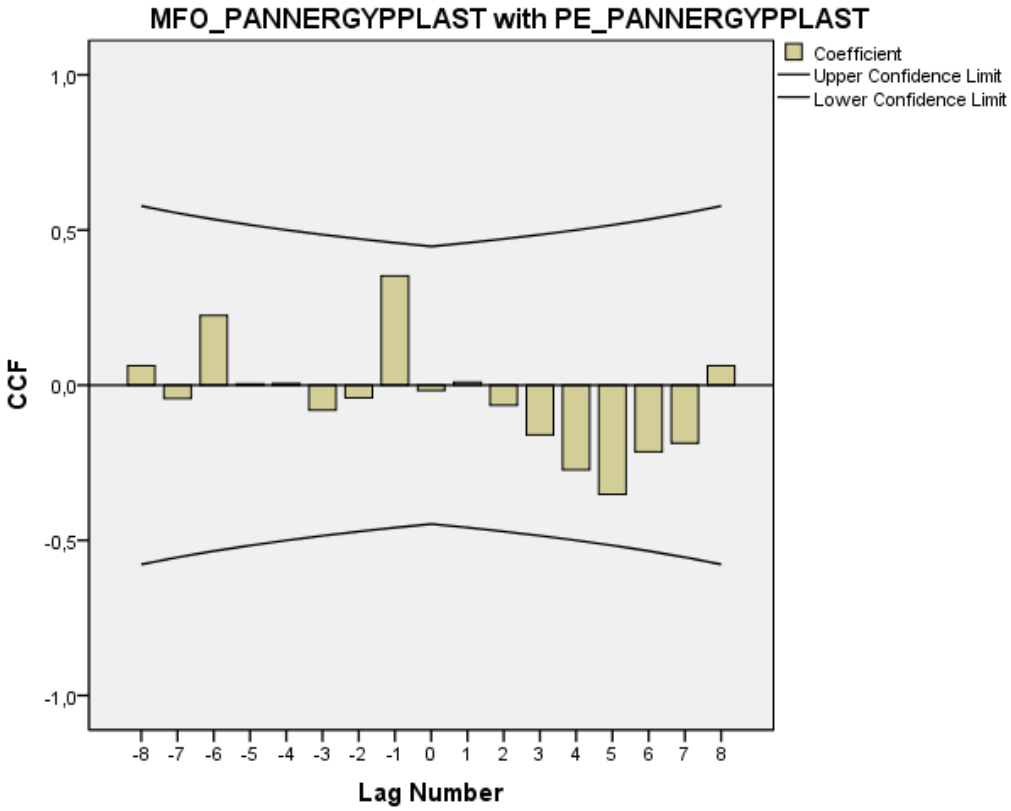
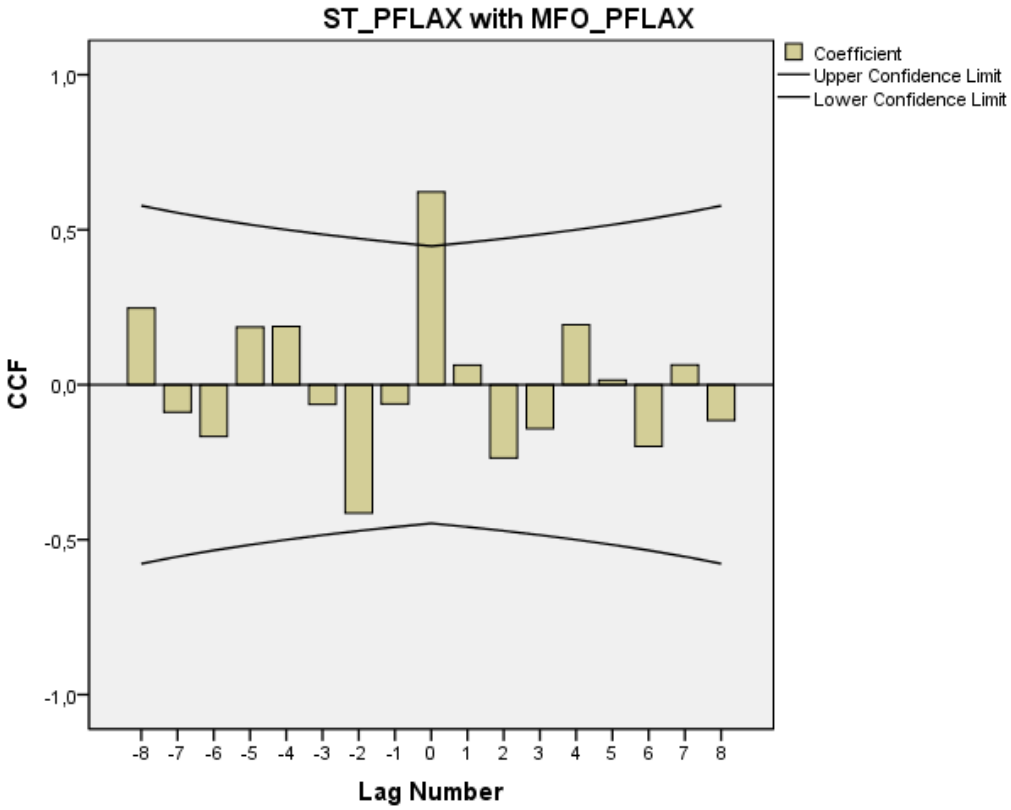
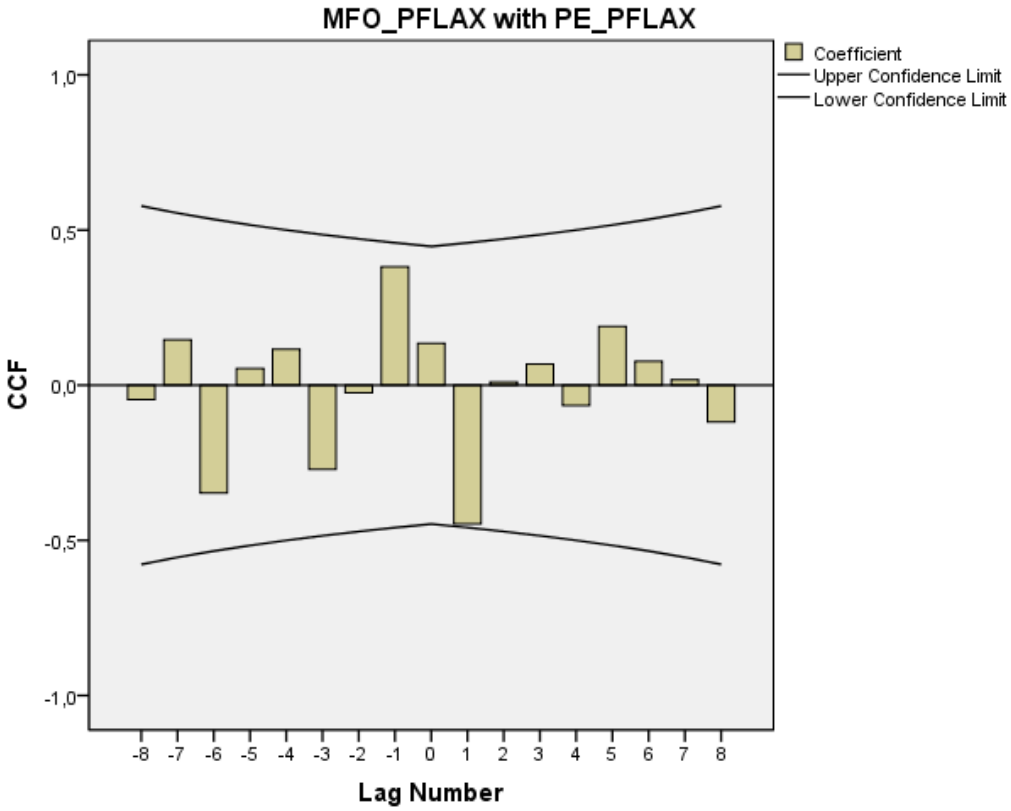
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

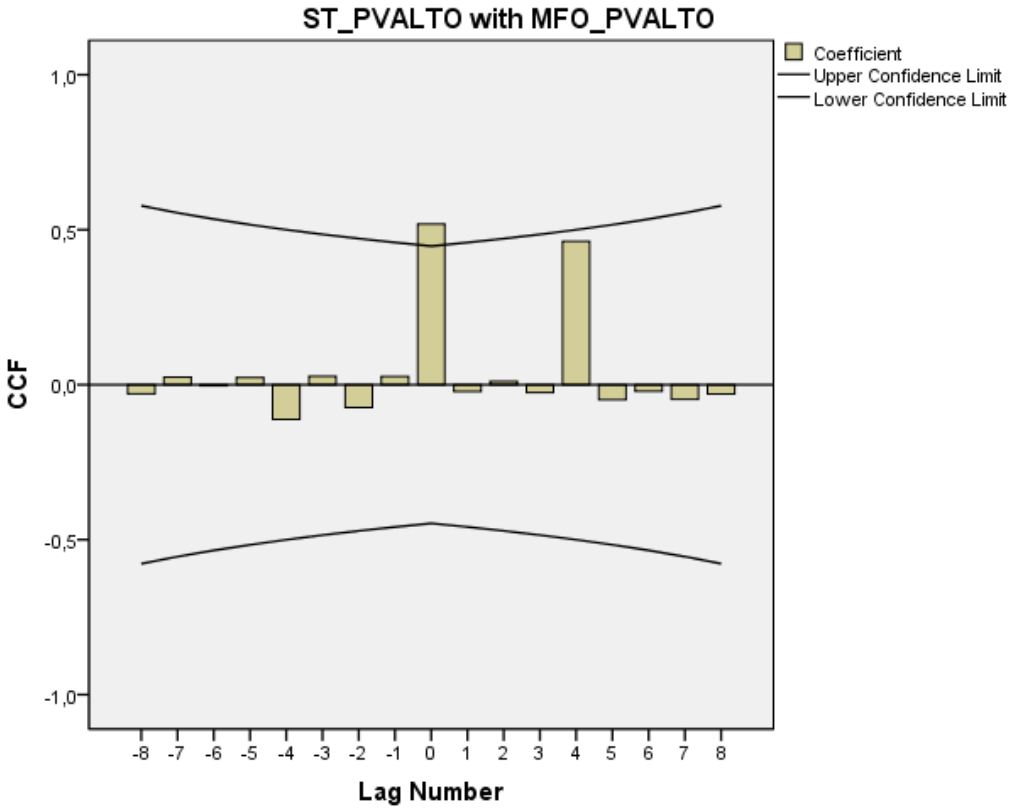

MFO_NUTEXHUMET with PE_NUTEXHUMET
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

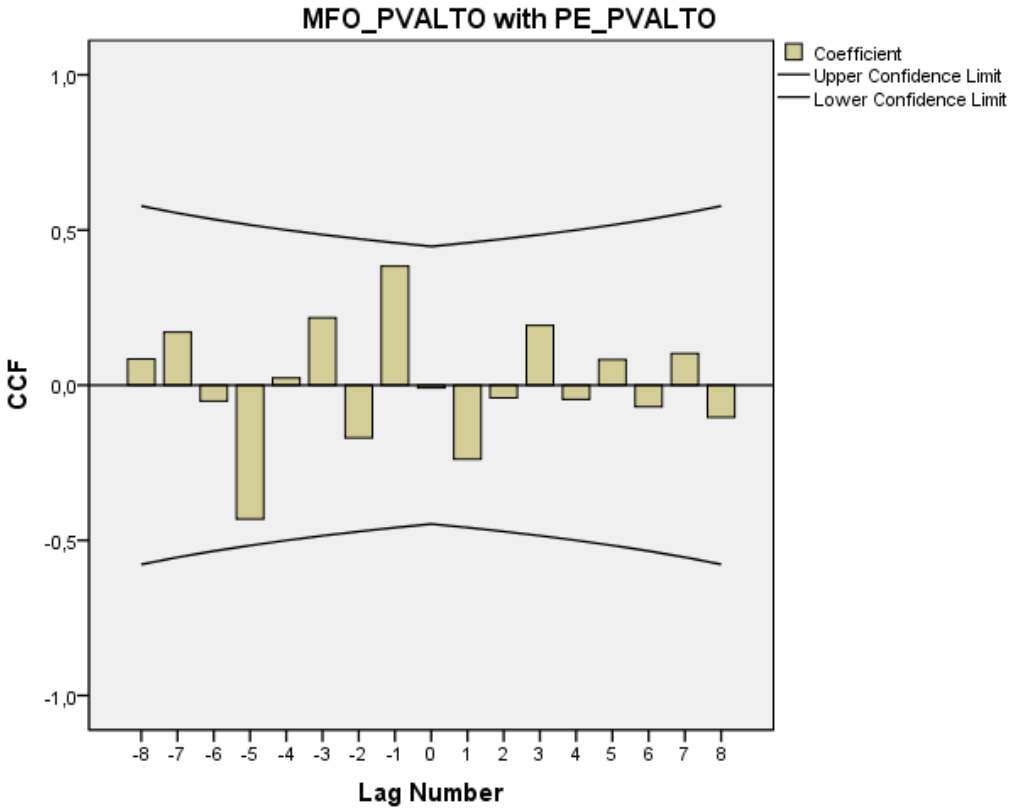

ST_PANNERGYPPLAST with MFO_PANNERGYPPLAST
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

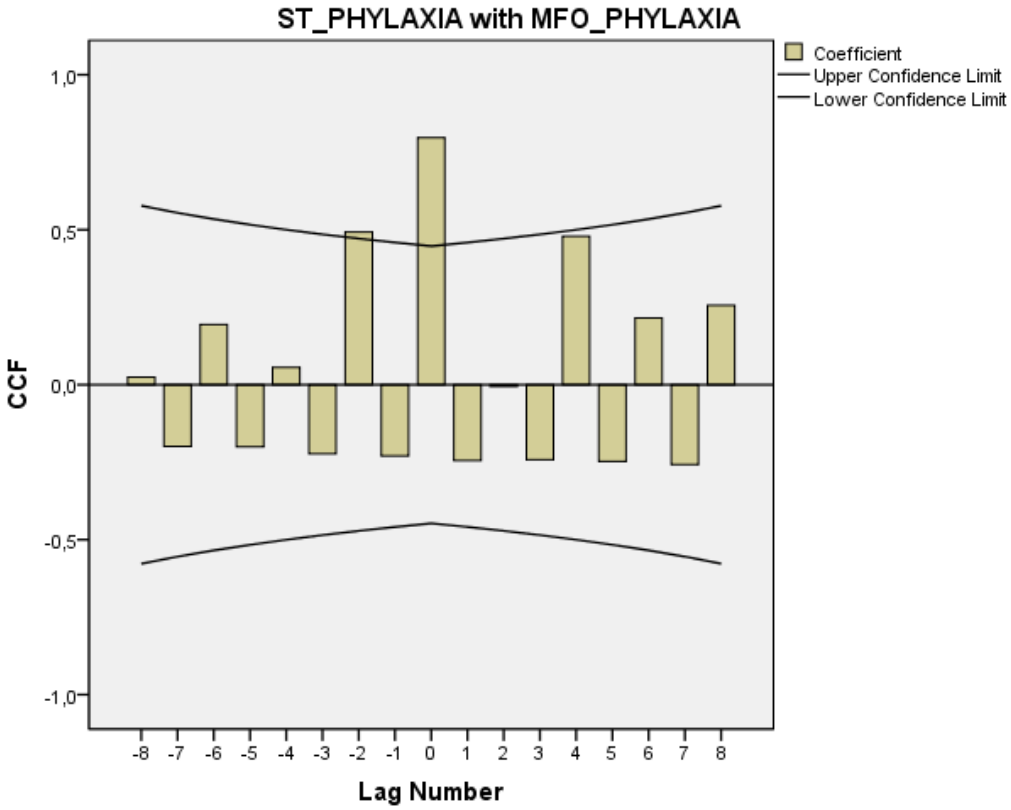

MFO_PANNERGYPPLAST with PE_PANNERGYPPLAST
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

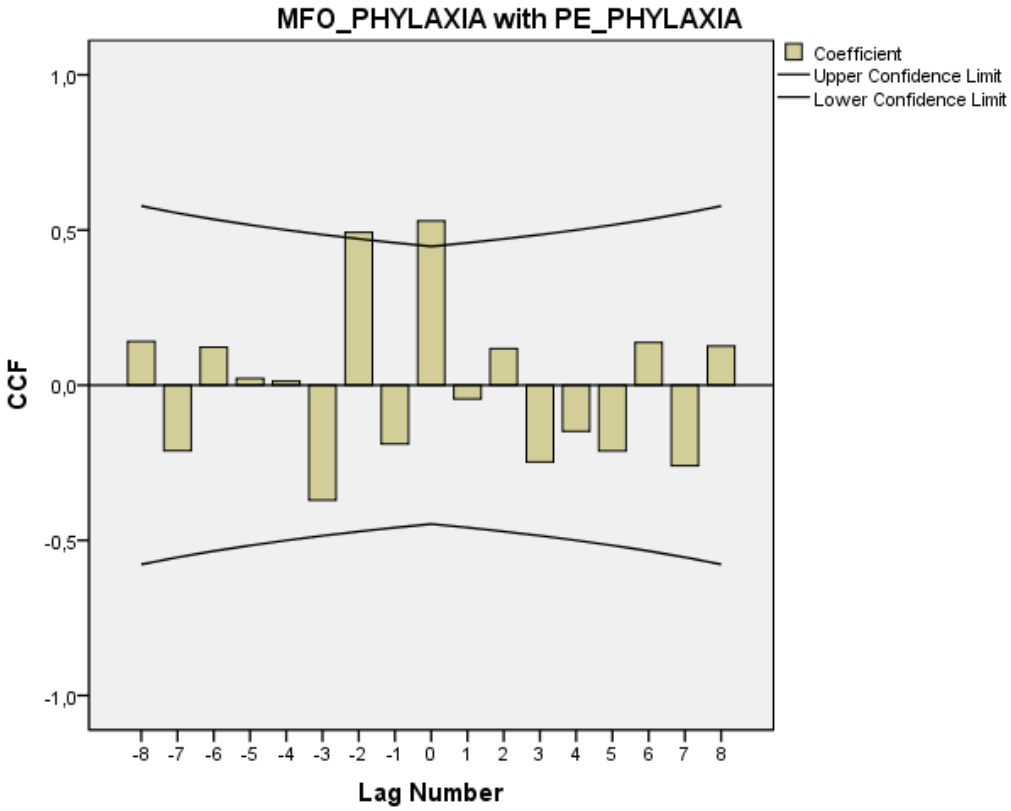

ST_PFLAX with MFO_PFLAX
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

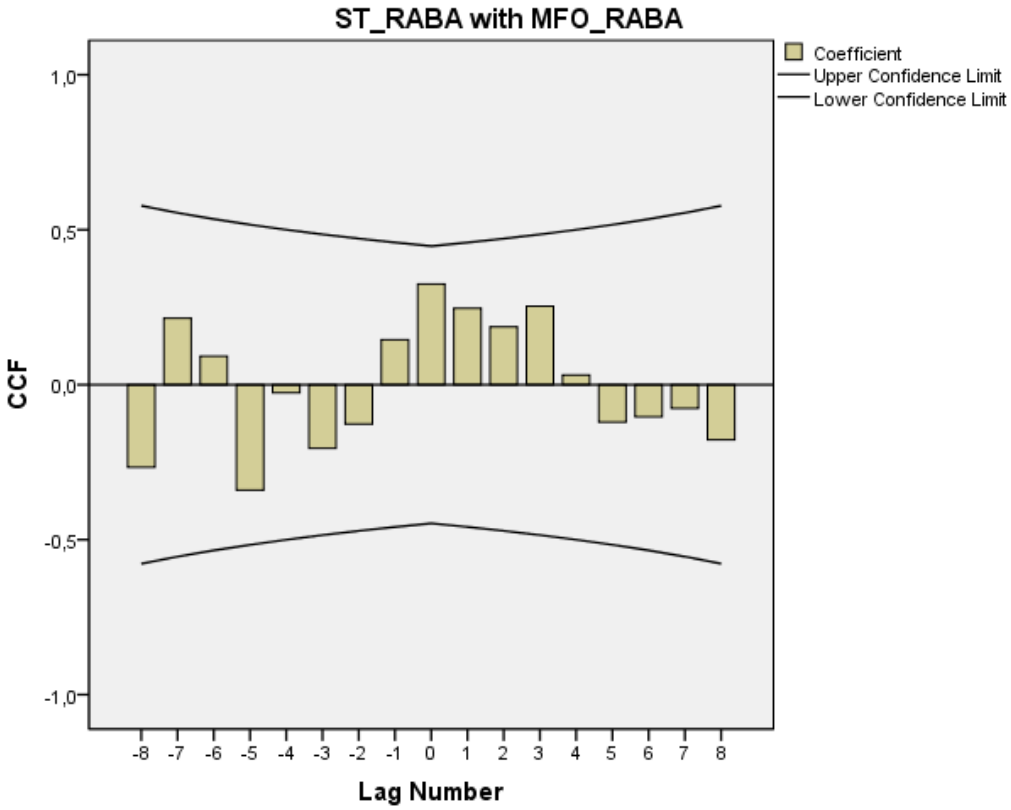

MFO_PFLAX with PE_PFLAX
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

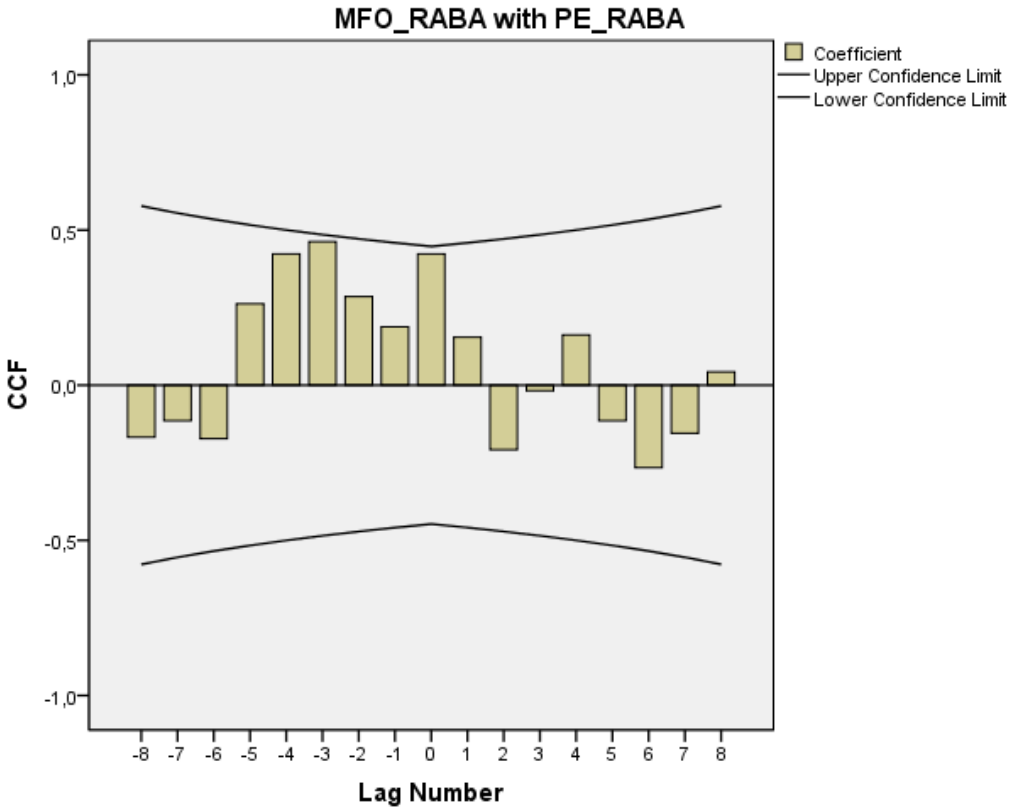

ST_PVALTO with MFO_PVALTO
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

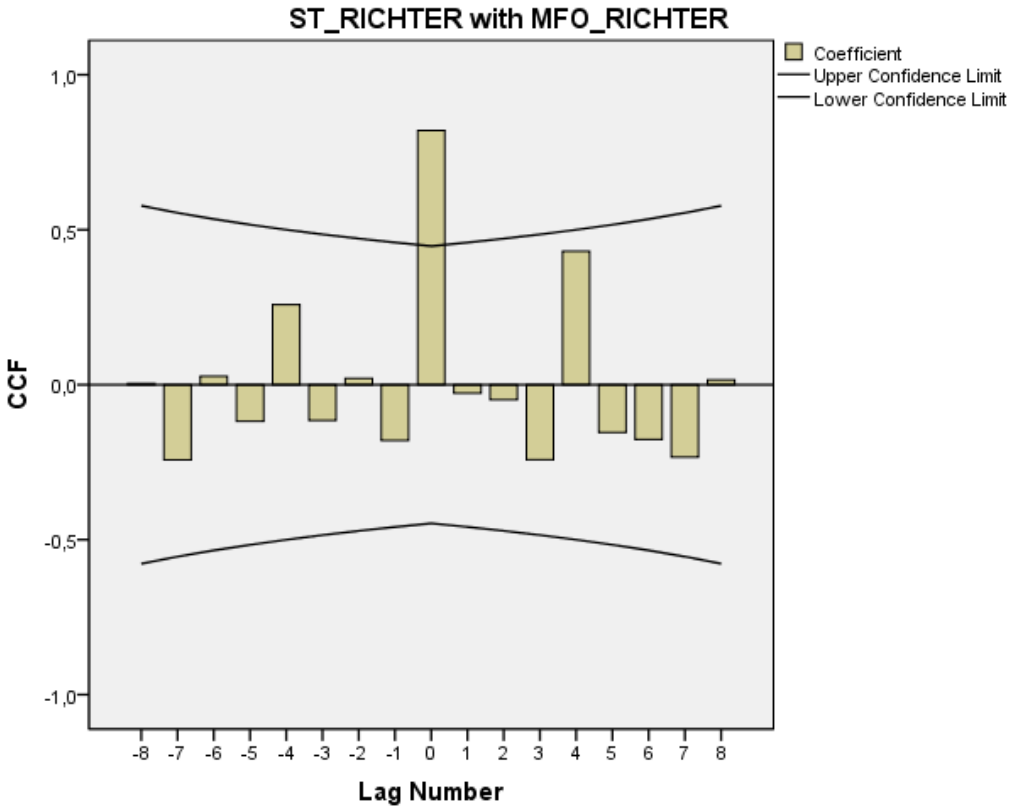

MFO_PVALTO with PE_PVALTO
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

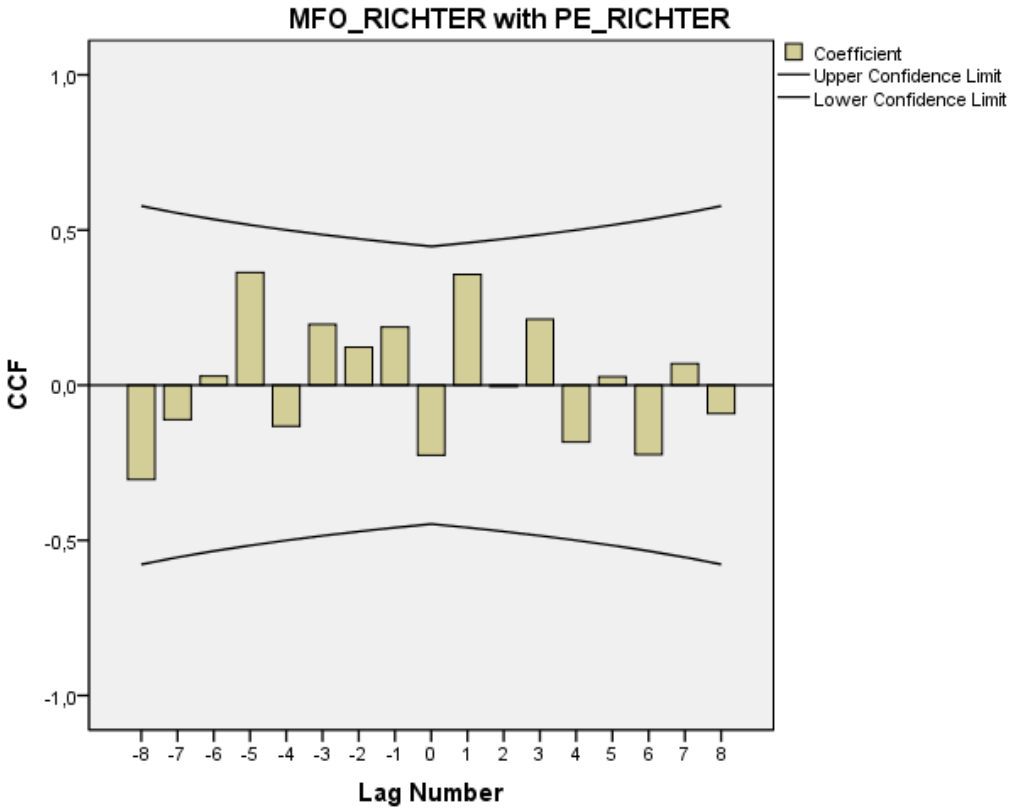

ST_PHYLAXIA with MFO_PHYLAXIA
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

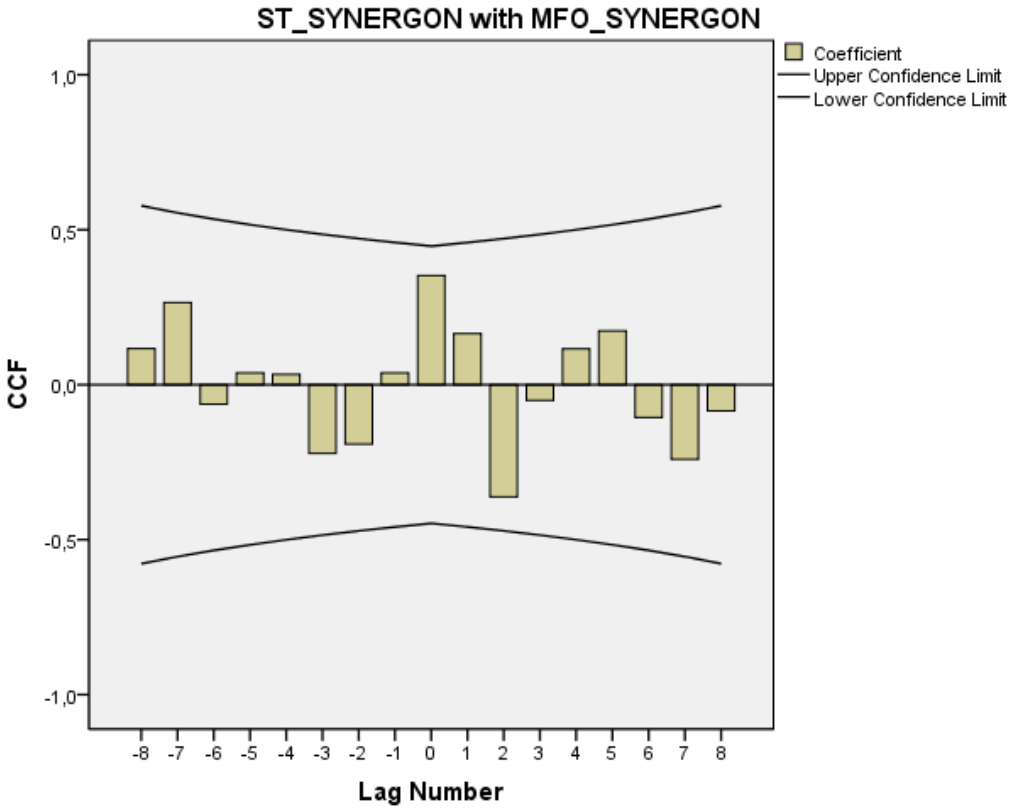

MFO_PHYLAXIA with PE_PHYLAXIA
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

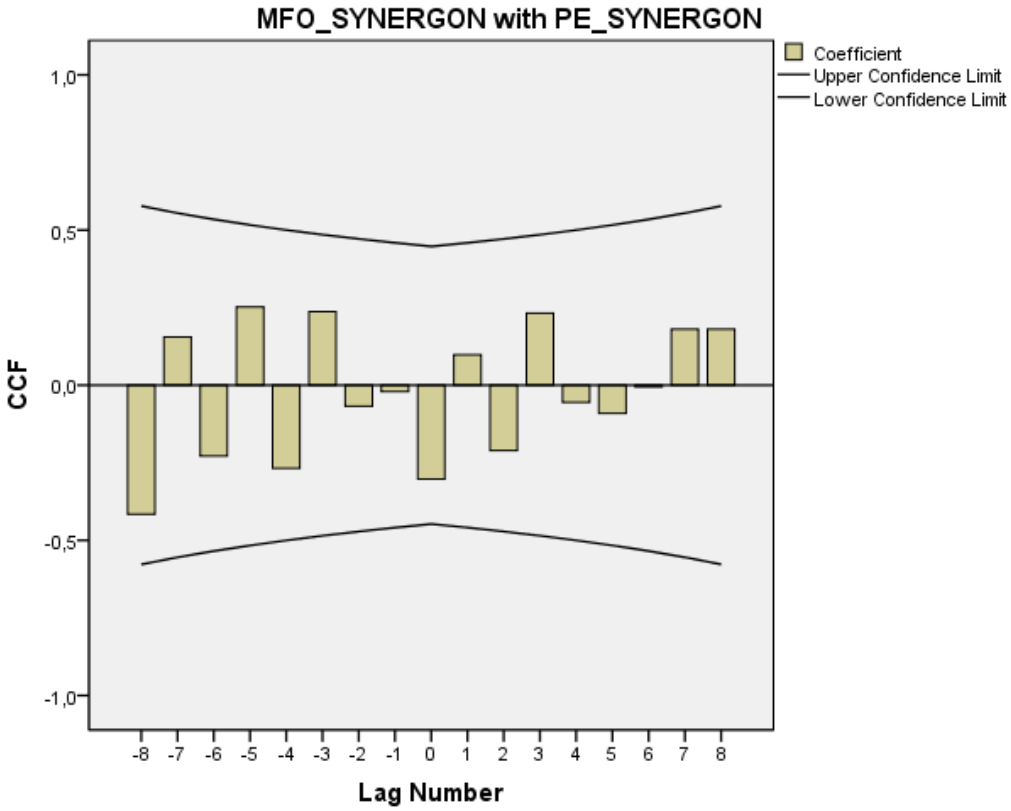

ST_RABA with MFO_RABA
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

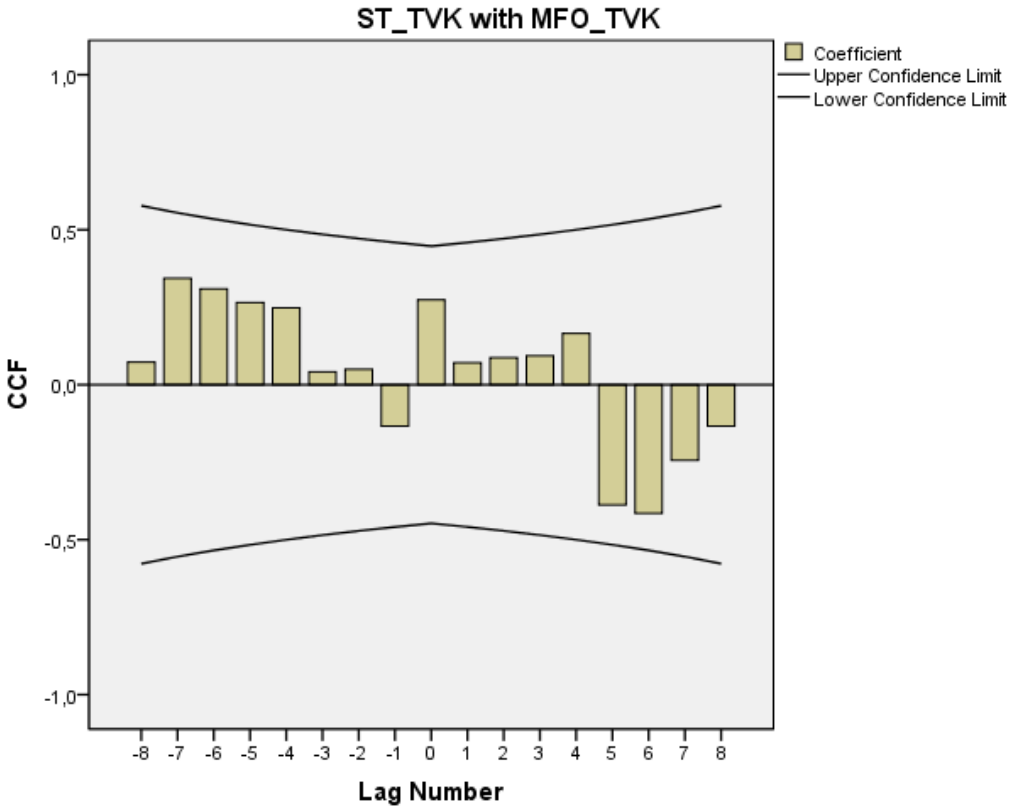

MFO_RABA with PE_RABA
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

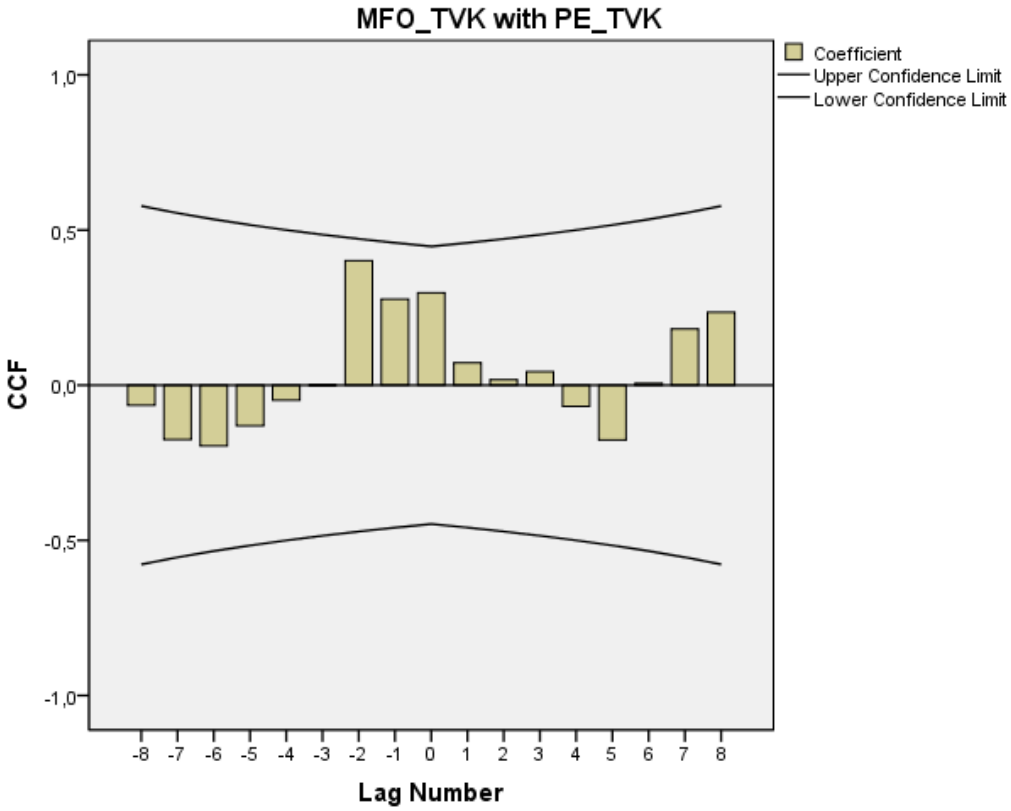

ST_RICHTER with MFO_RICHTER
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

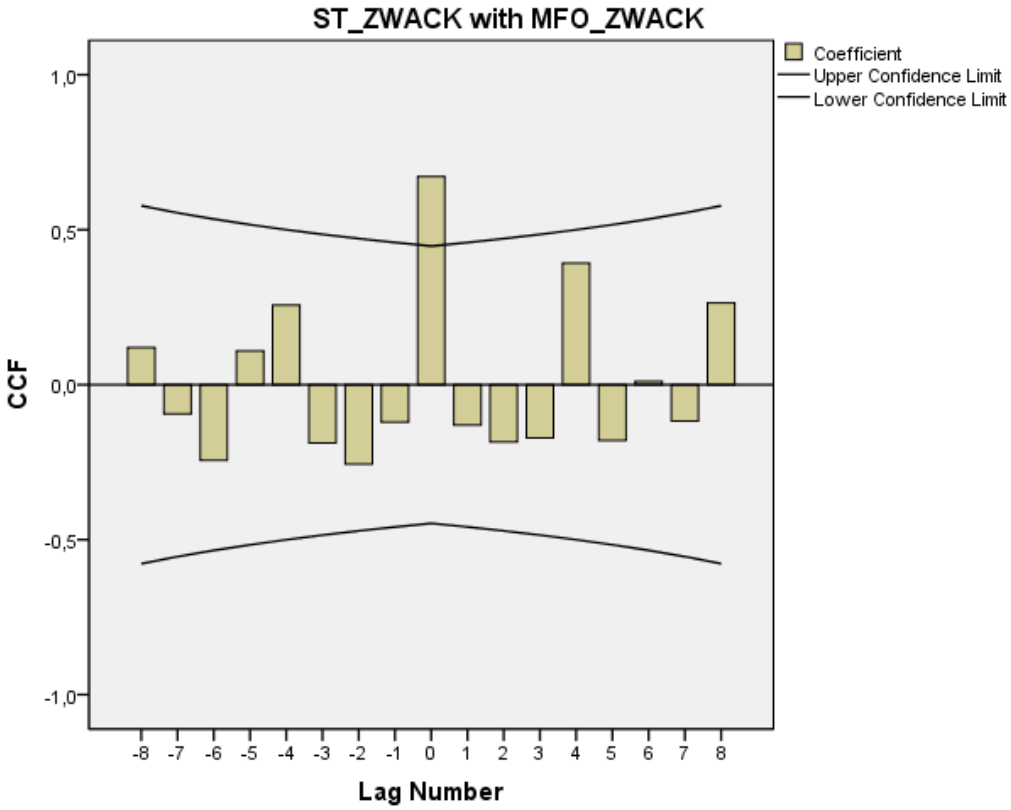

MFO_RICHTER with PE_RICHTER
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_SYNERGON with MFO_SYNERGON
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_SYNERGON with PE_SYNERGON
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_TVK with MFO_TVK
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


MFO_TVK with PE_TVK
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number


ST_ZWACK with MFO_ZWACK
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
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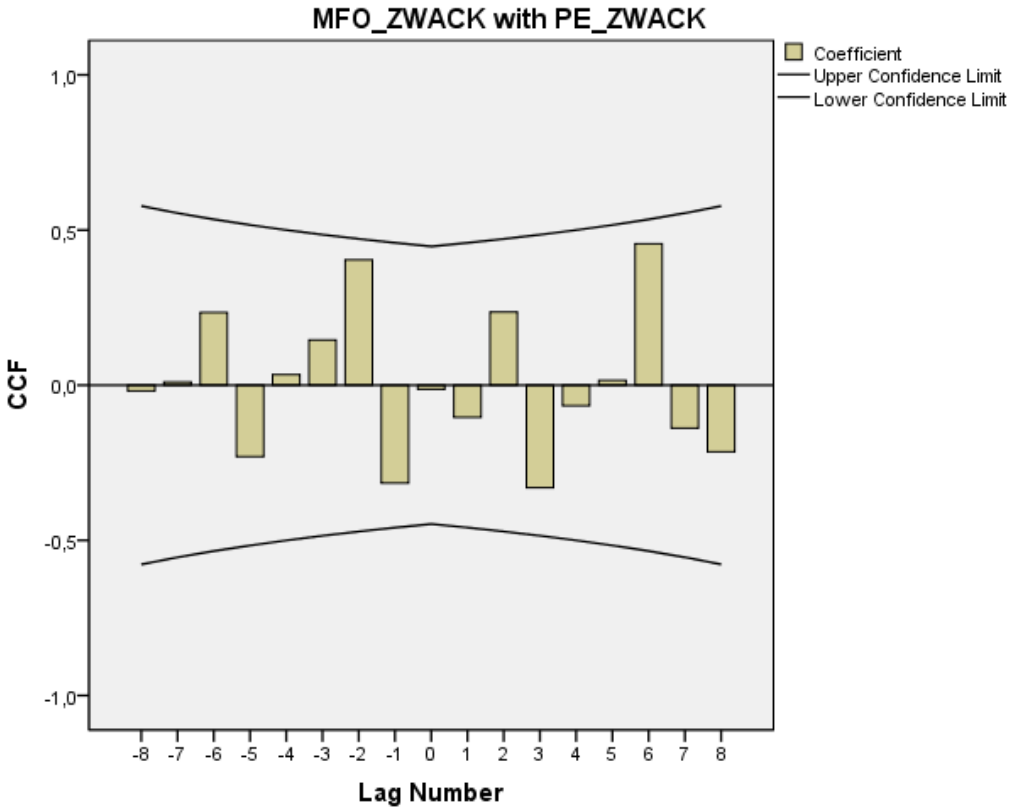
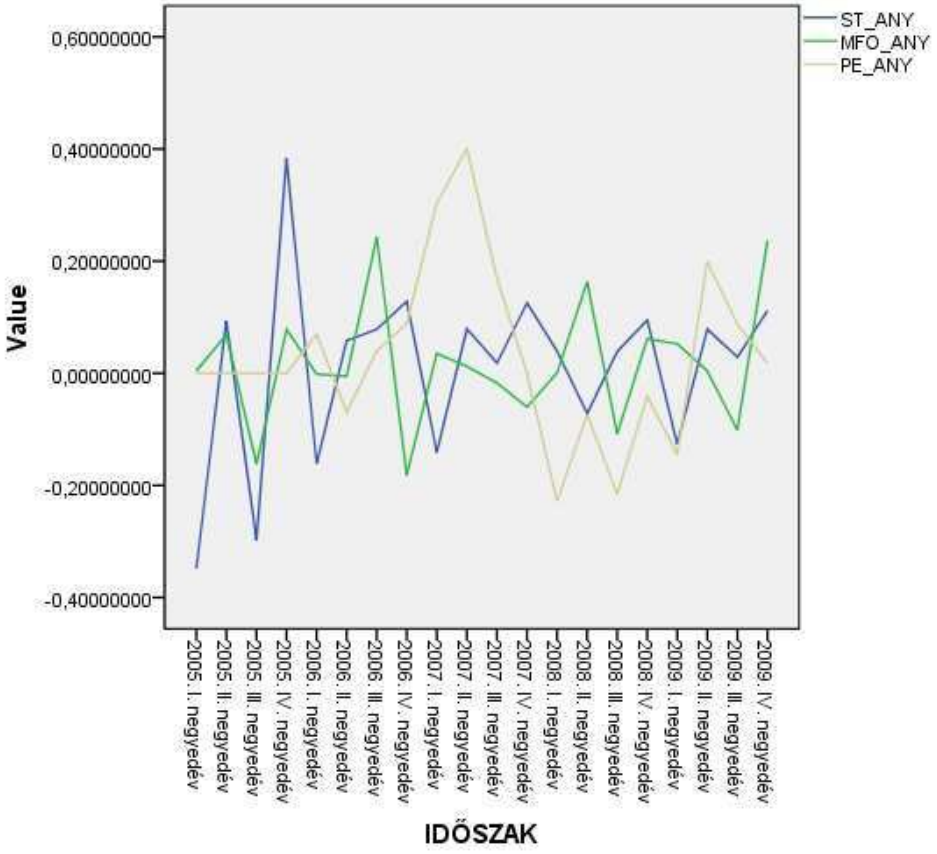
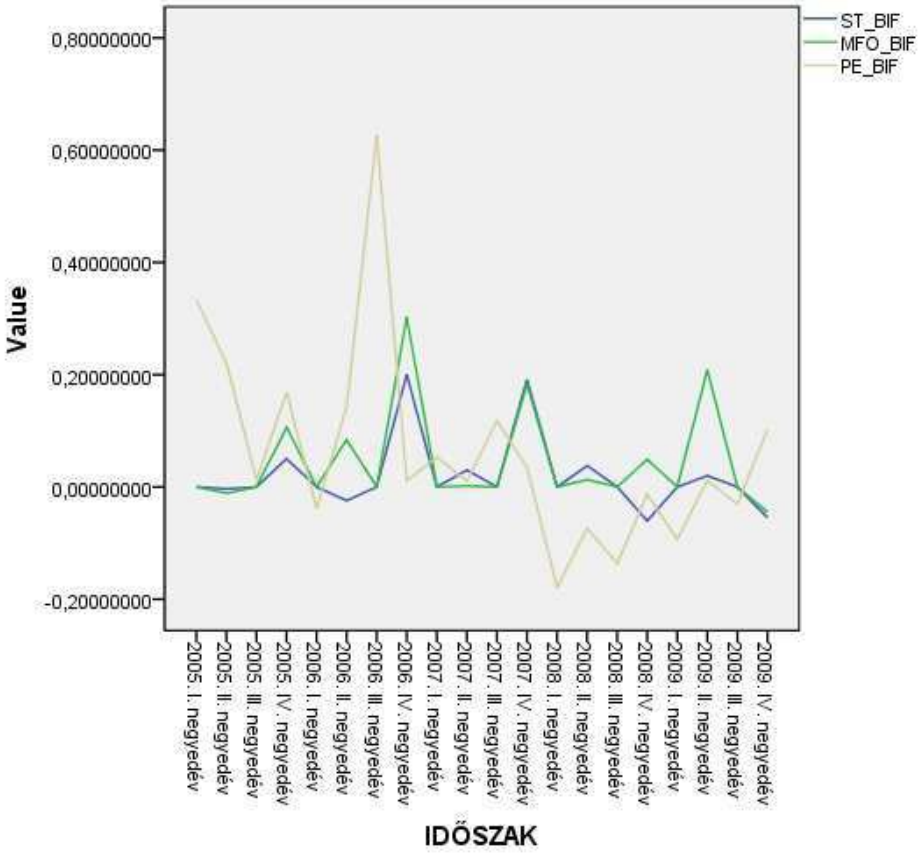
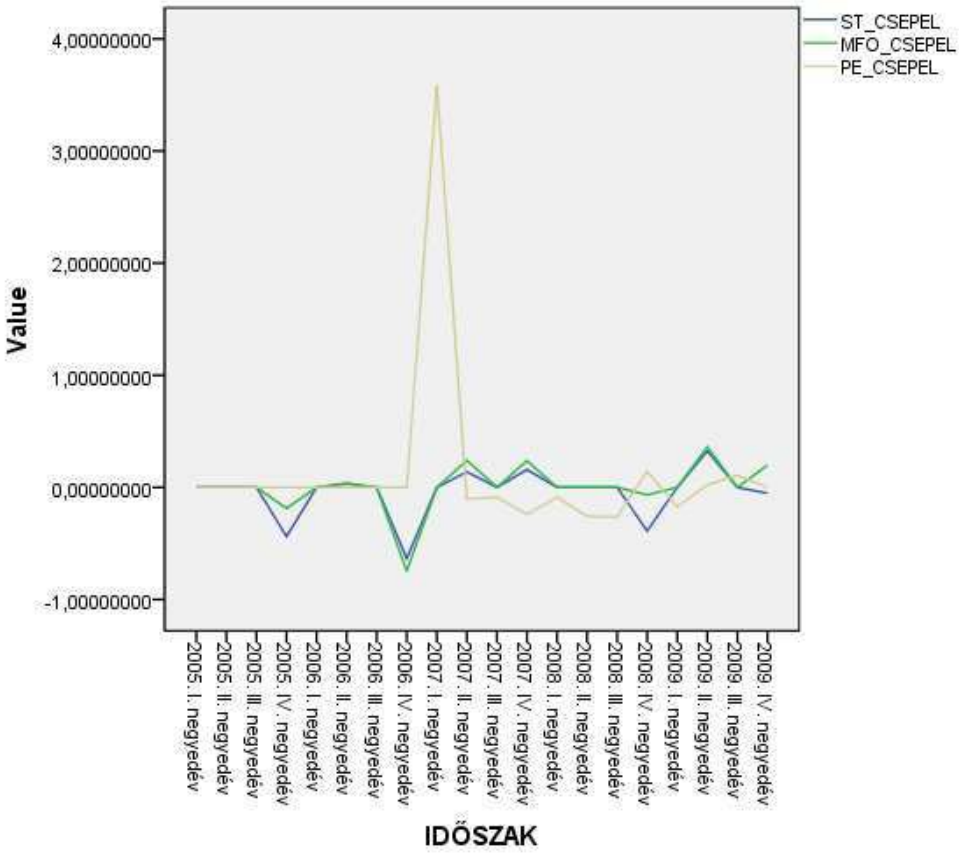
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

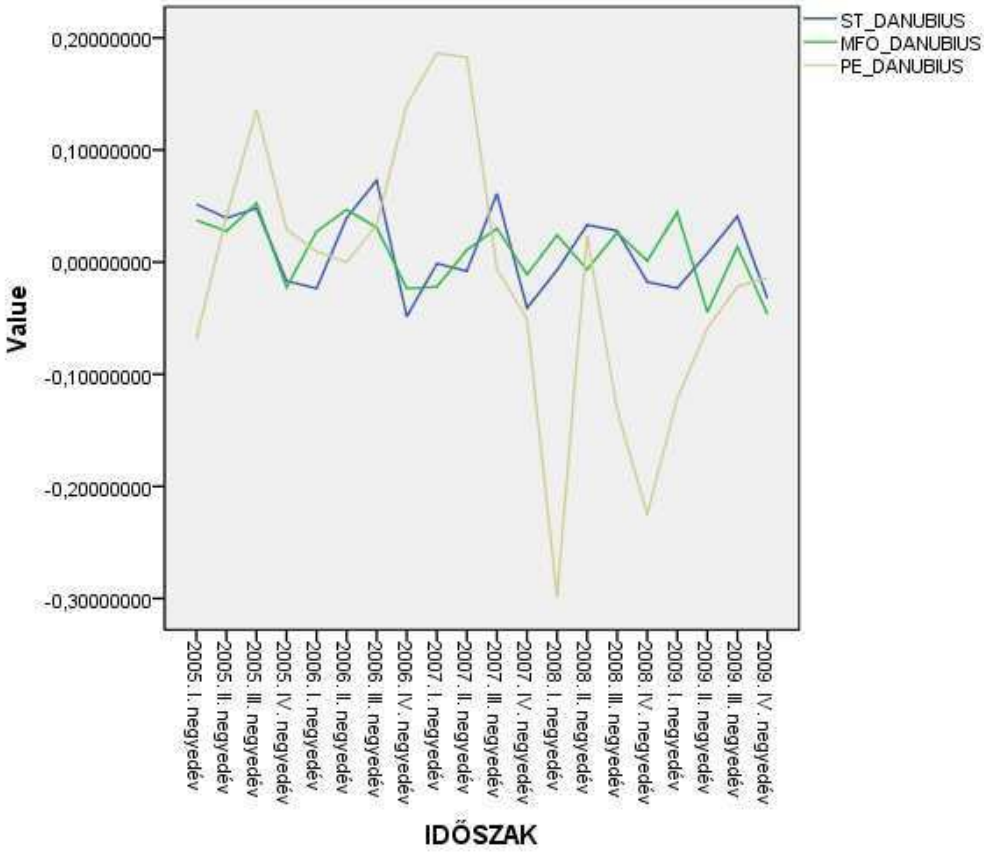

MFO_ZWACK with PE_ZWACK
Coefficient
Upper Confidence Limit
Lower Confidence Limit
CCF
1,0
0,5
0,0
-0,5
-1,0
-8 -7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8
Lag Number

ANNEX 4: VARIATIONS IN MARKET VALUE AND BOOK VALUE






ST_CSEPEL
MFO_CSEPEL
PE_CSEPEL
Value
4,00000000
3,00000000
2,00000000
1,00000000
0,00000000
-1,00000000
2005. I. negyedév
2005. II. negyedév
2005. III. negyedév
2005. IV. negyedév
2006. I. negyedév
2006. II. negyedév
2006. III. negyedév
2006. IV. negyedév
2007. I. negyedév
2007. II. negyedév
2007. III. negyedév
2007. IV. negyedév
2008. I. negyedév
2008. II. negyedév
2008. III. negyedév
2008. IV. negyedév
2009. I. negyedév
2009. II. negyedév
2009. III. negyedév
2009. IV. negyedév
IDŐSZAK


ST_DANUBIUS
MFO_DANUBIUS
PE_DANUBIUS
Value
0,20000000
0,10000000
0,00000000
-0,10000000
-0,20000000
-0,30000000
2005. I. negyedév
2005. II. negyedév
2005. III. negyedév
2005. IV. negyedév
2006. I. negyedév
2006. II. negyedév
2006. III. negyedév
2006. IV. negyedév
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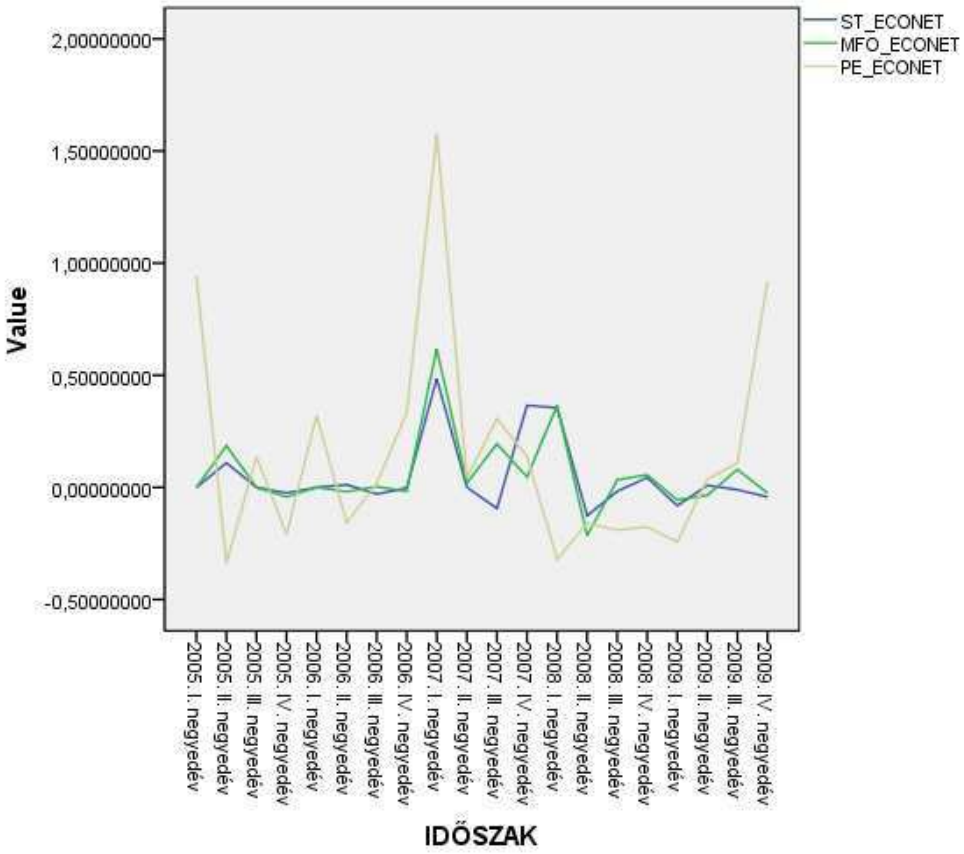
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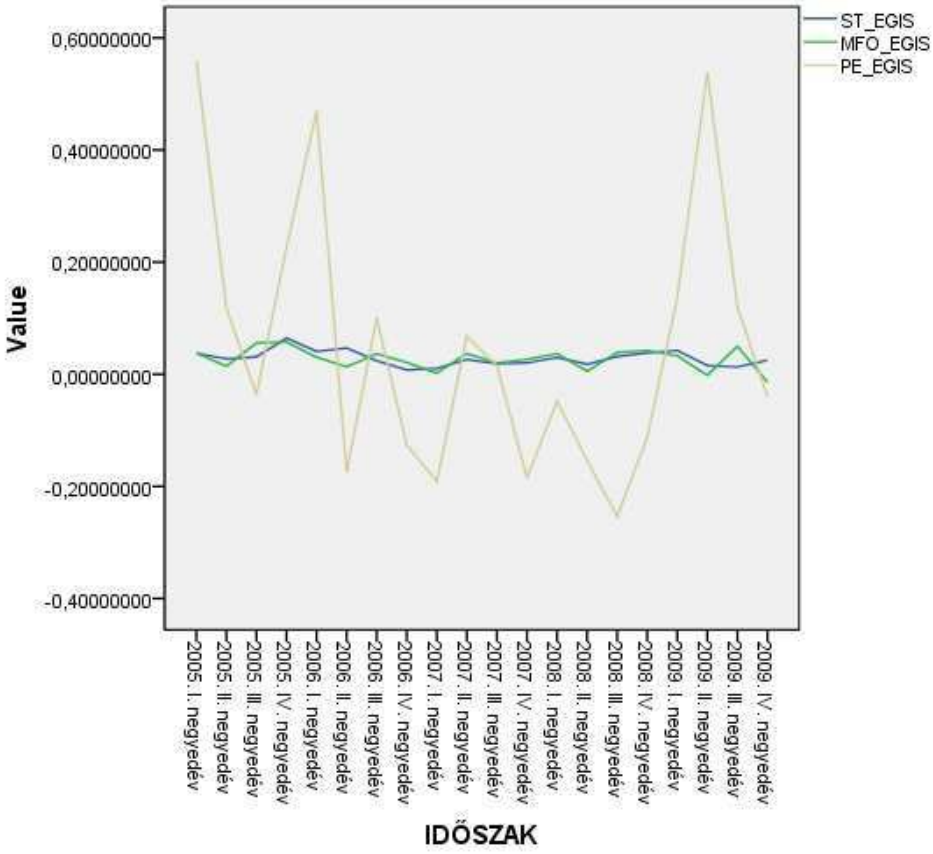
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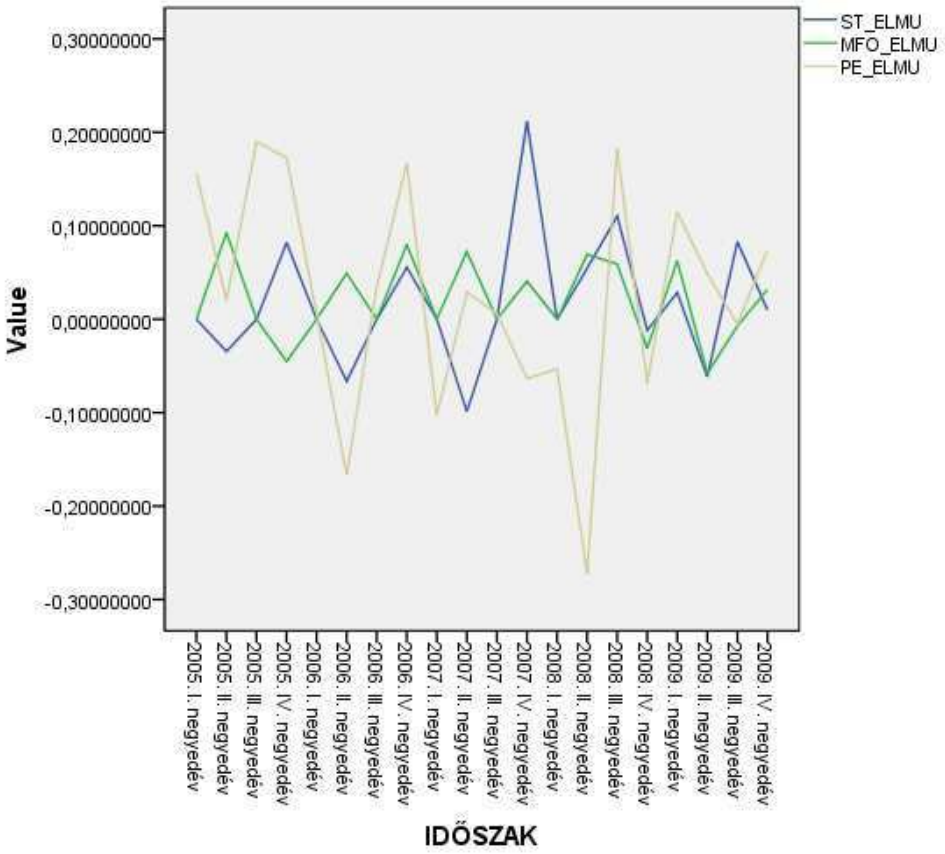
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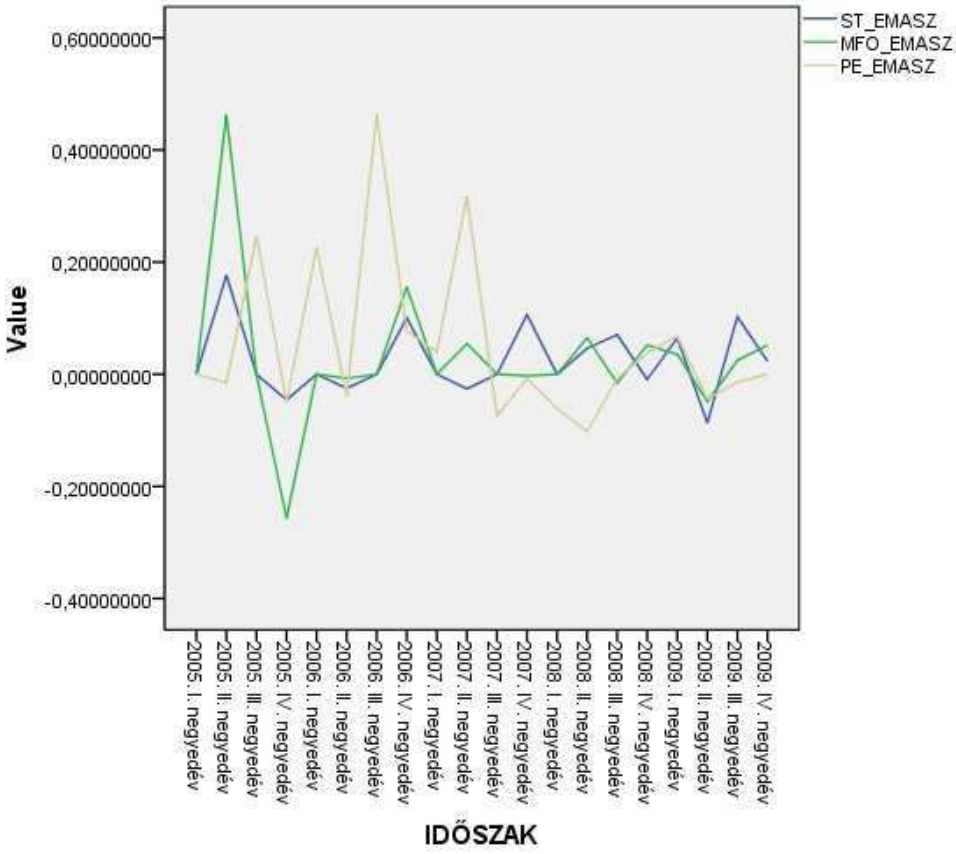
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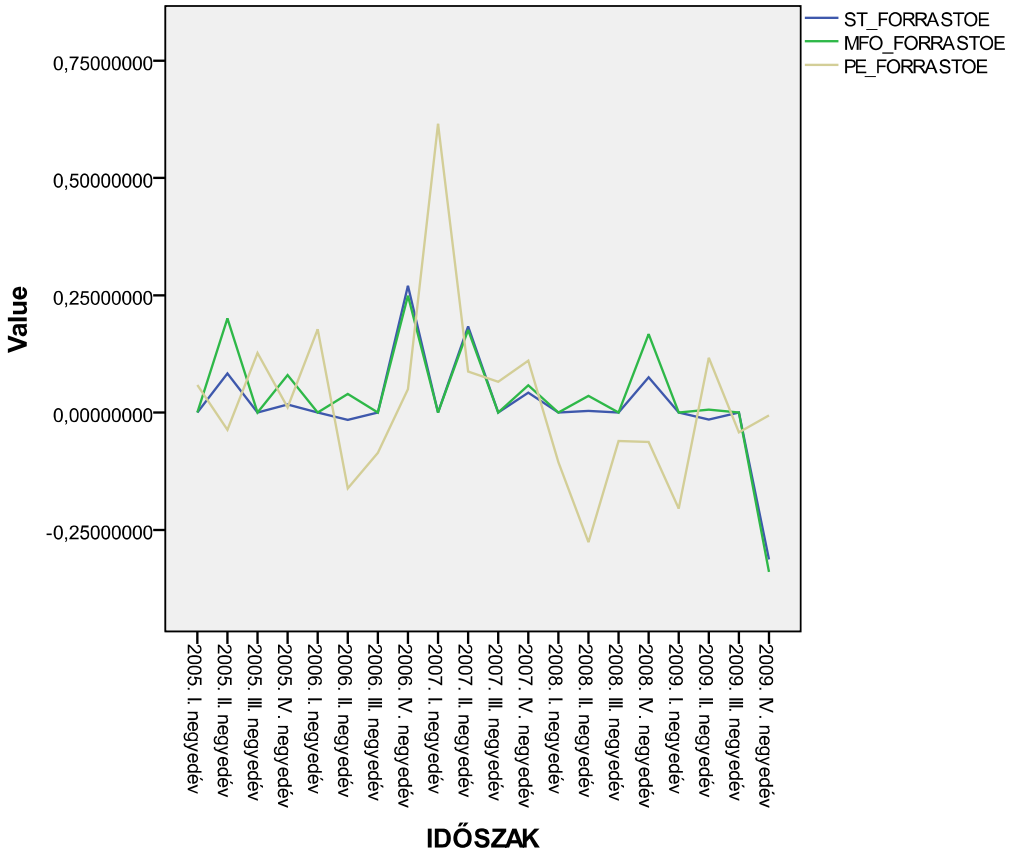
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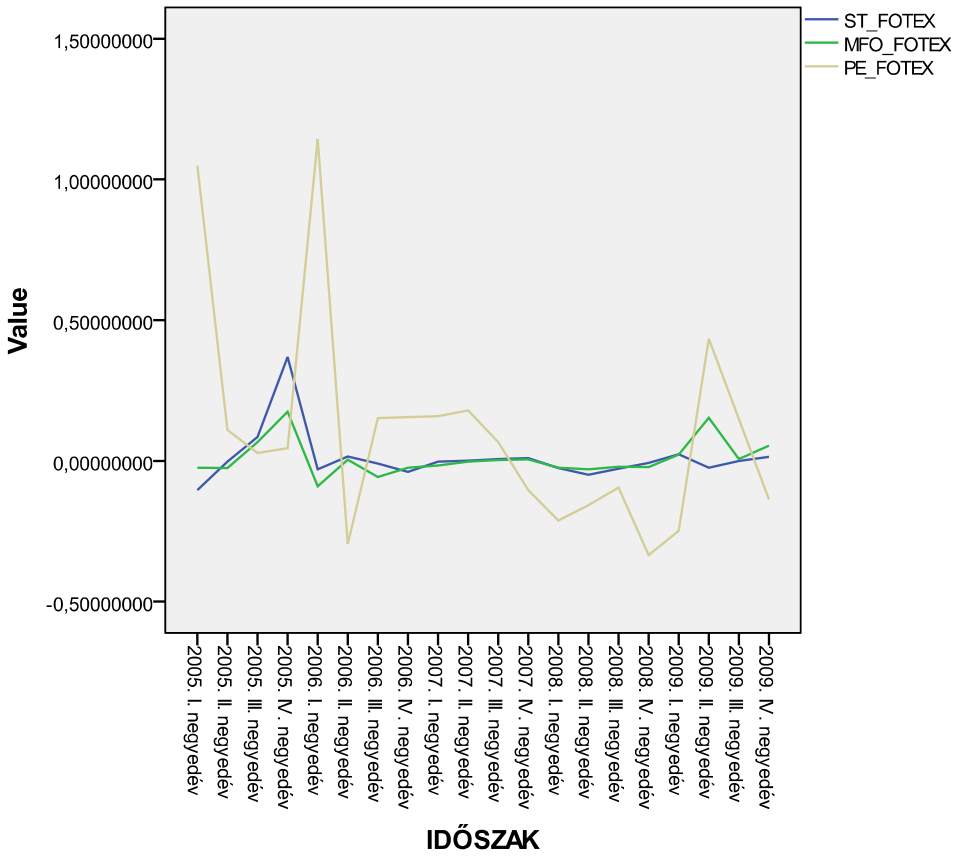
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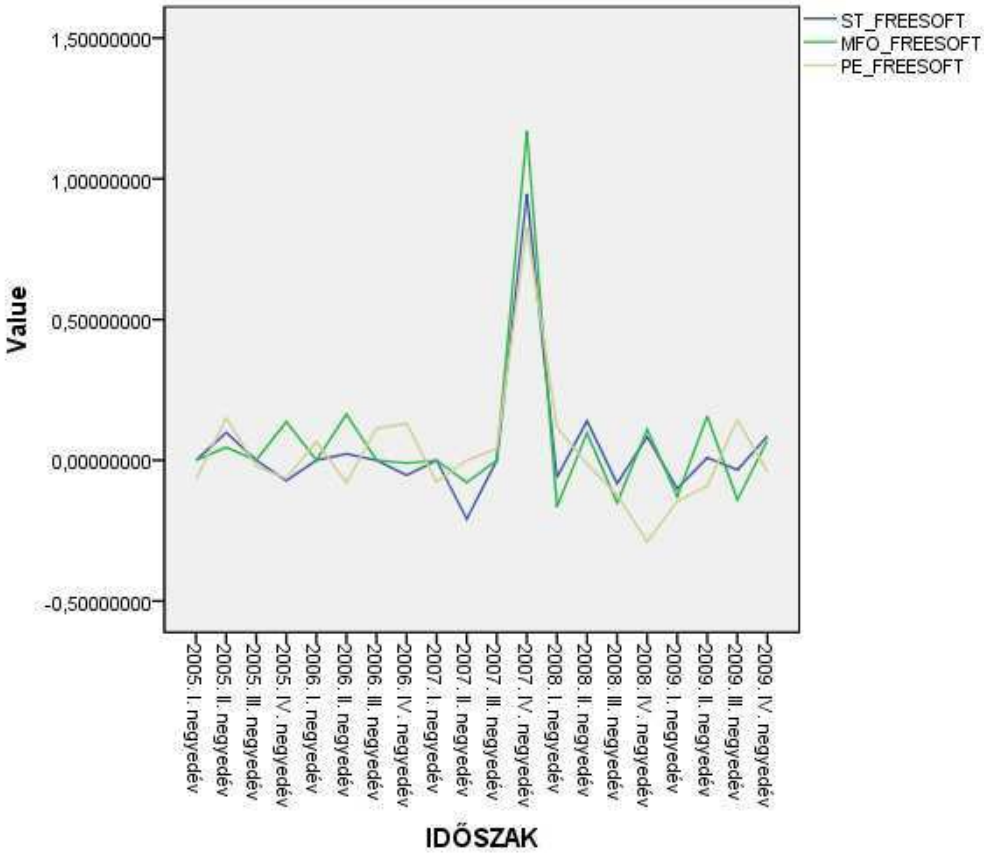
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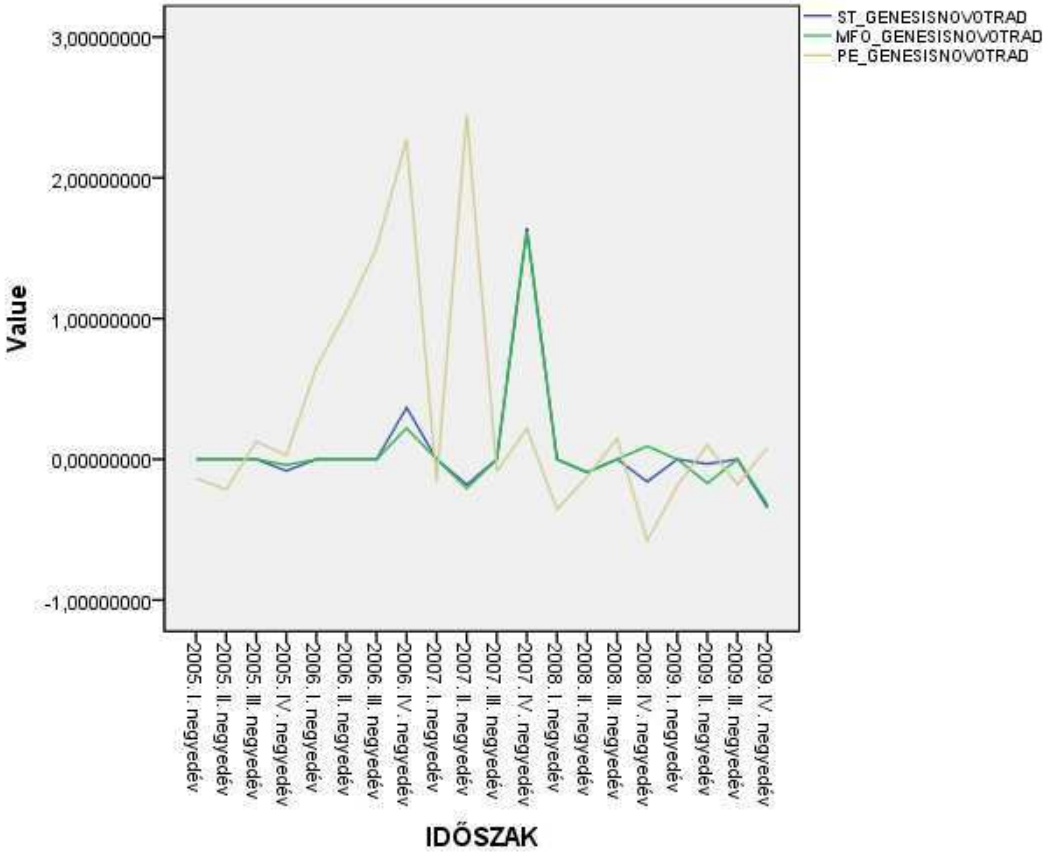
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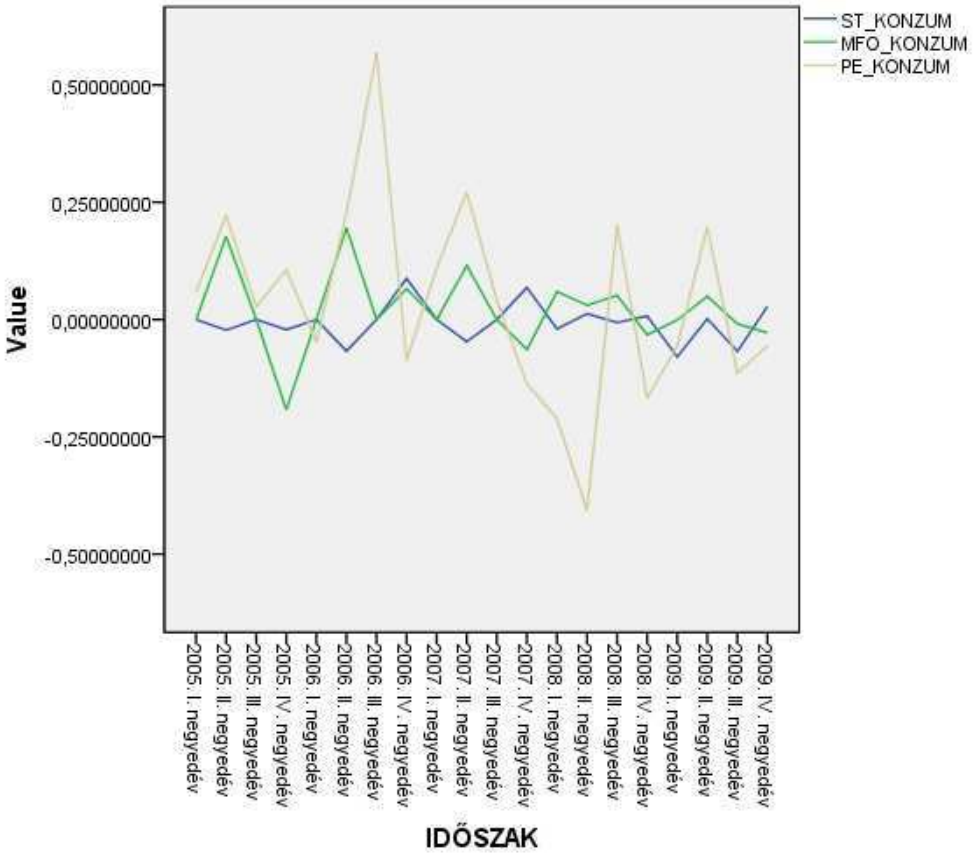
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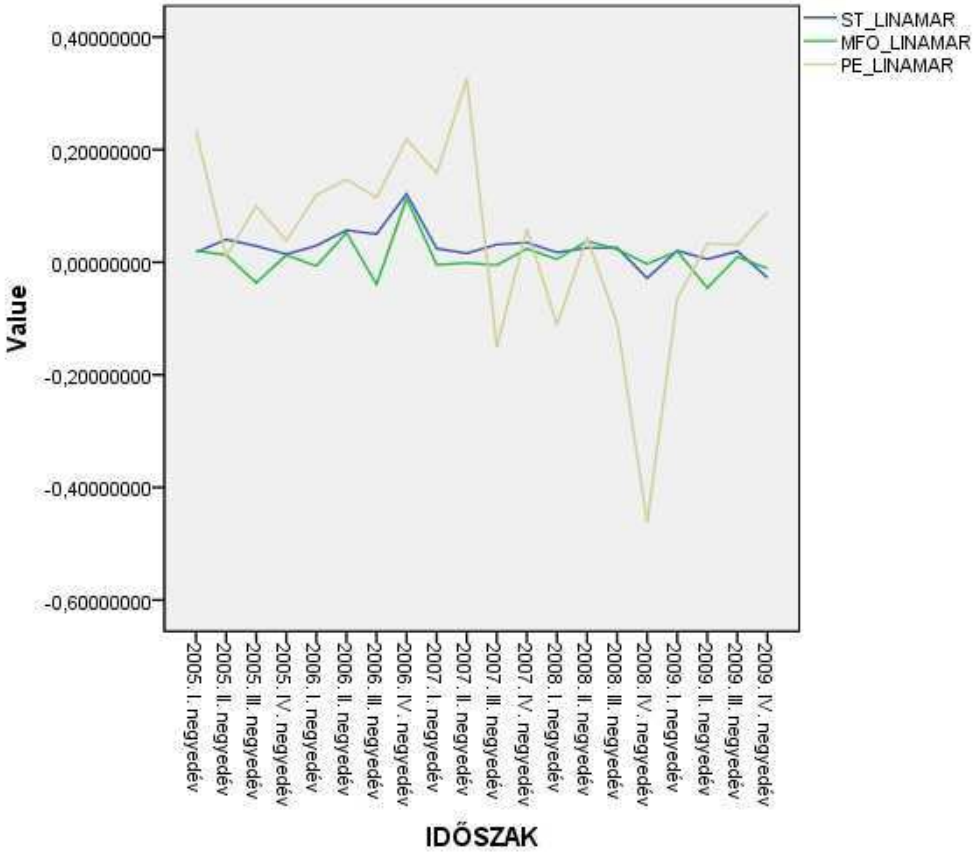
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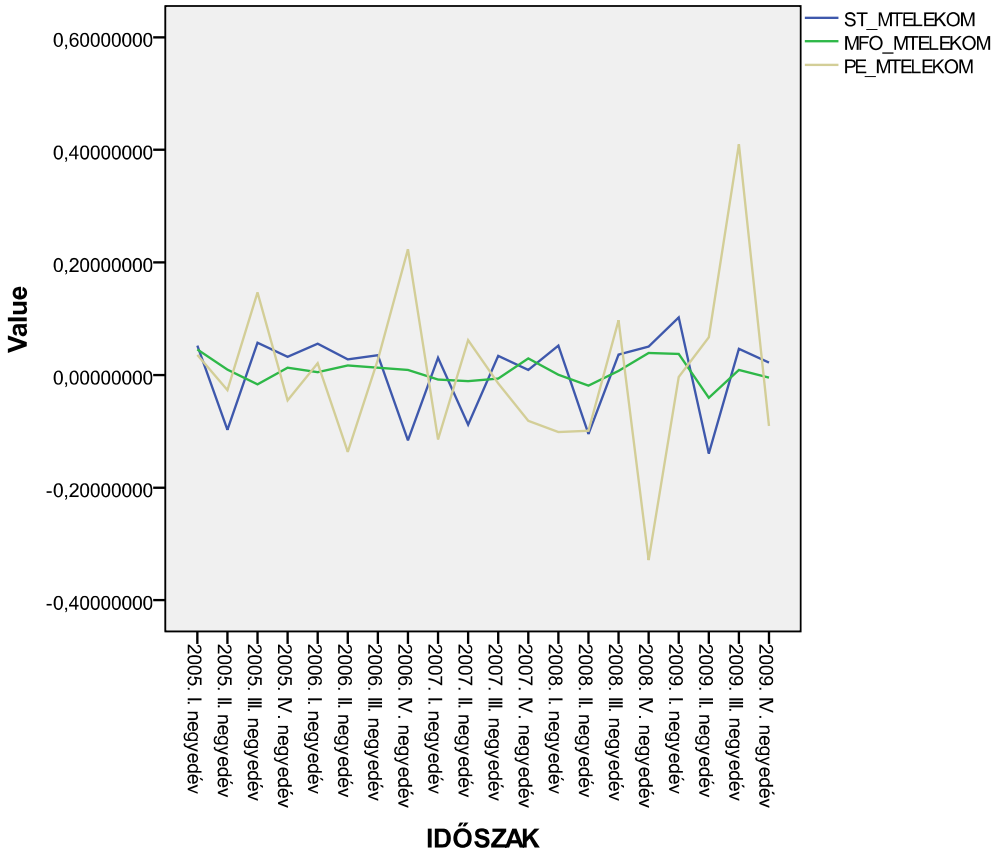
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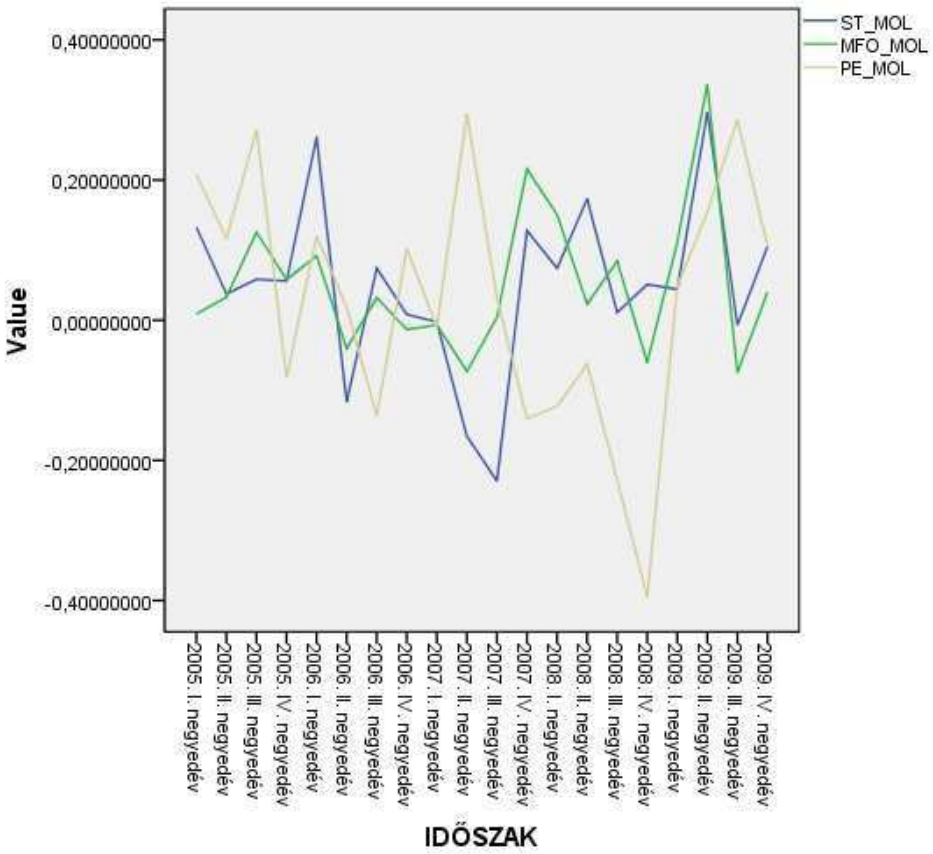
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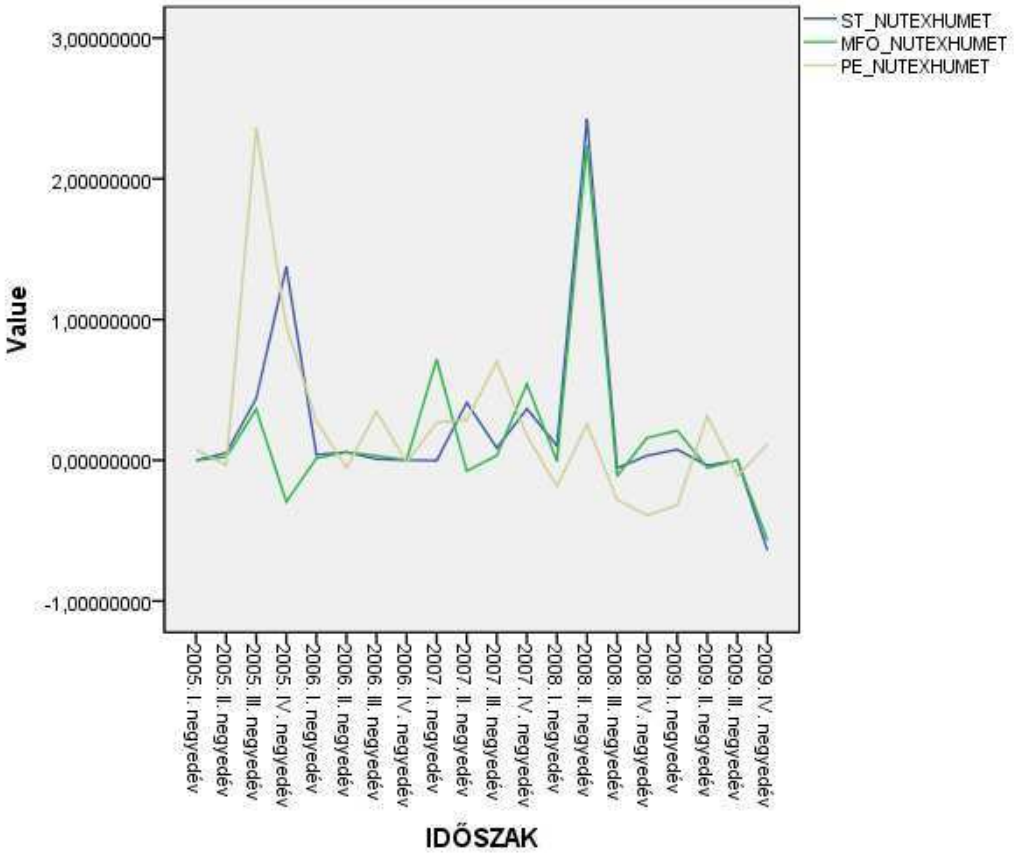
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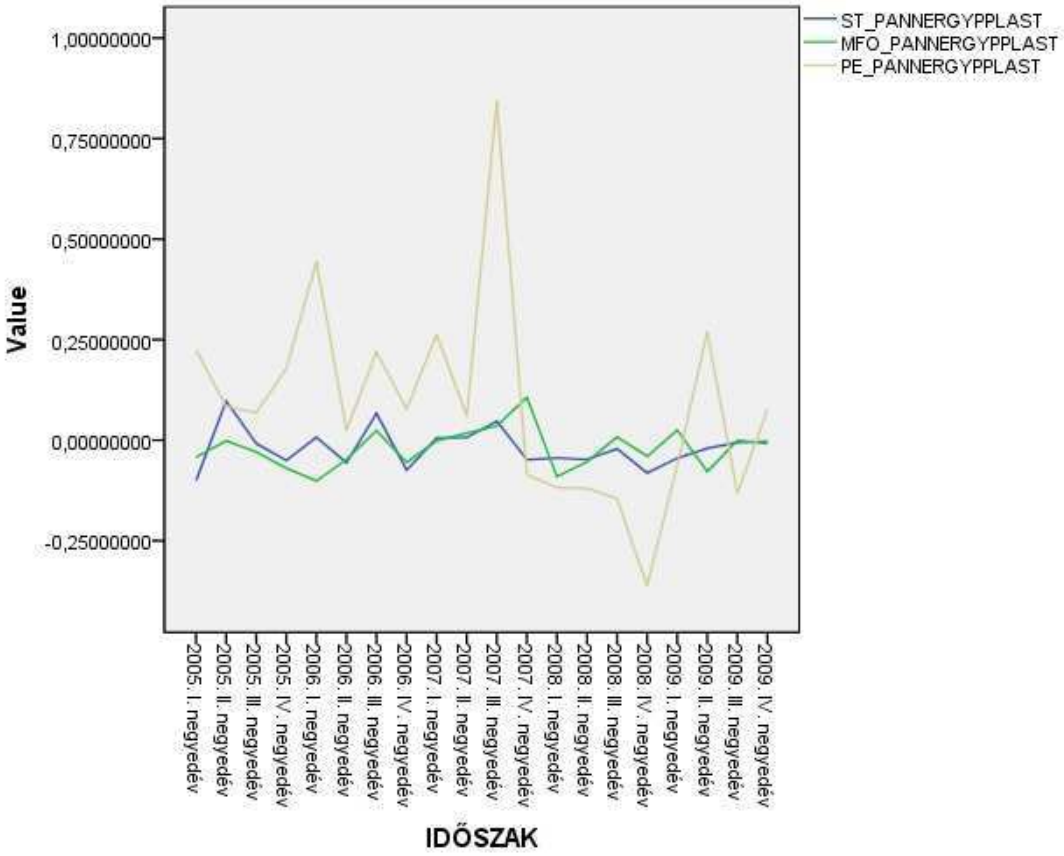
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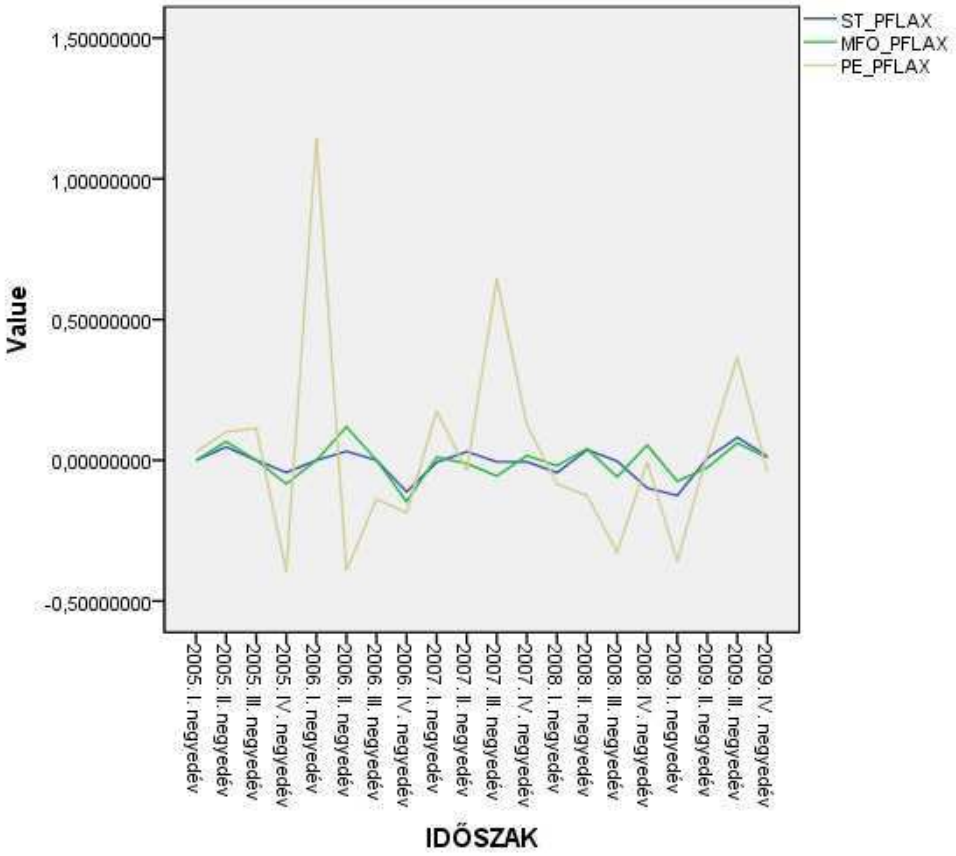
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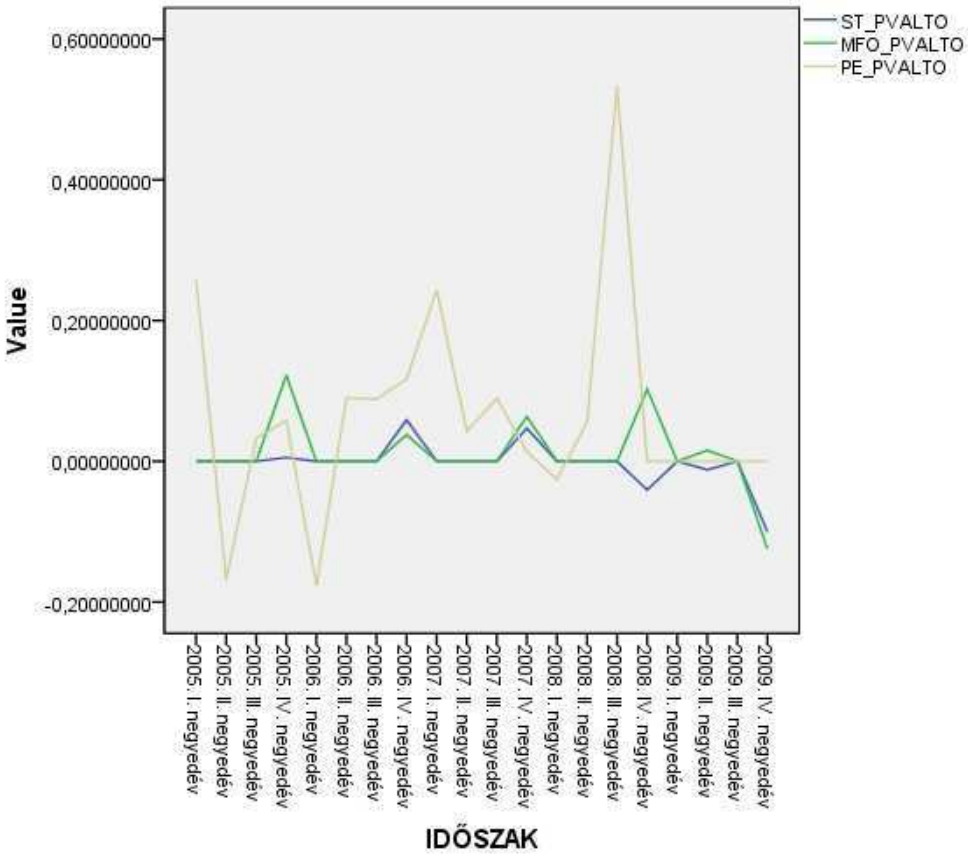
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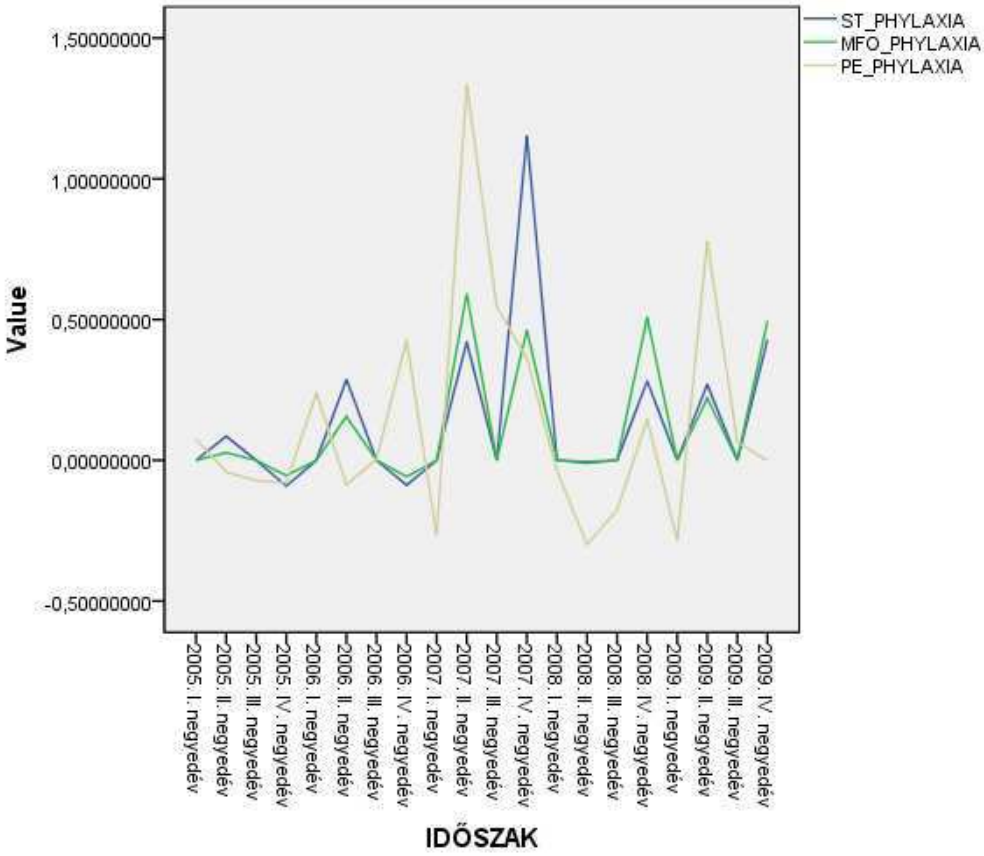
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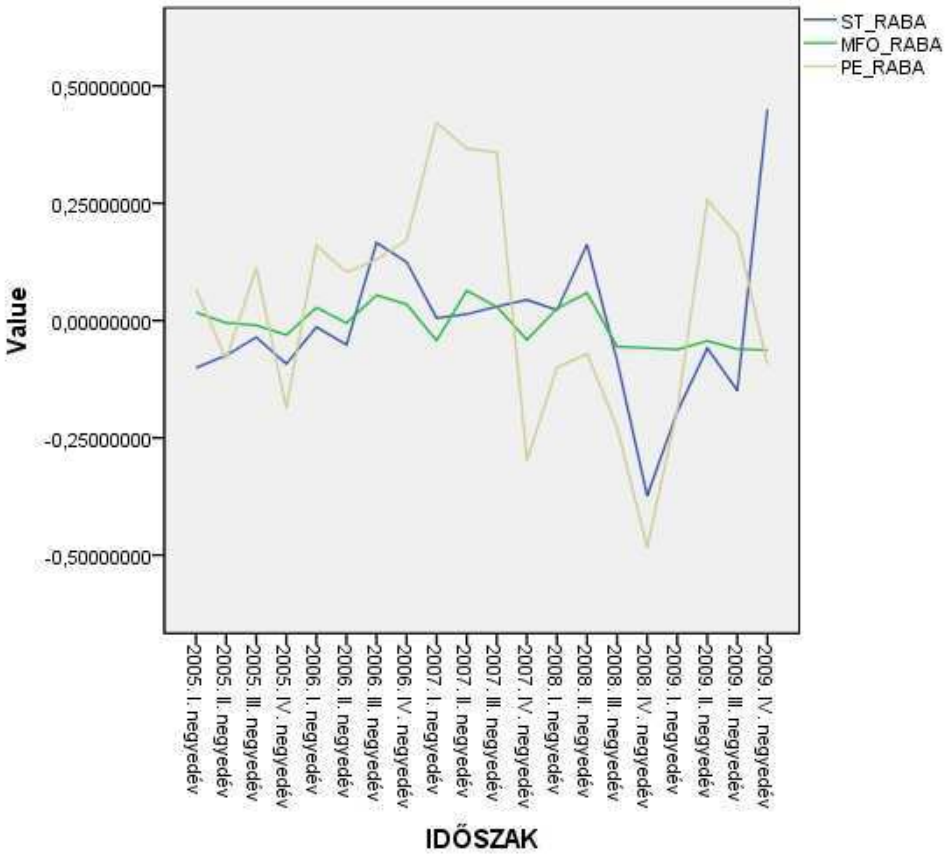
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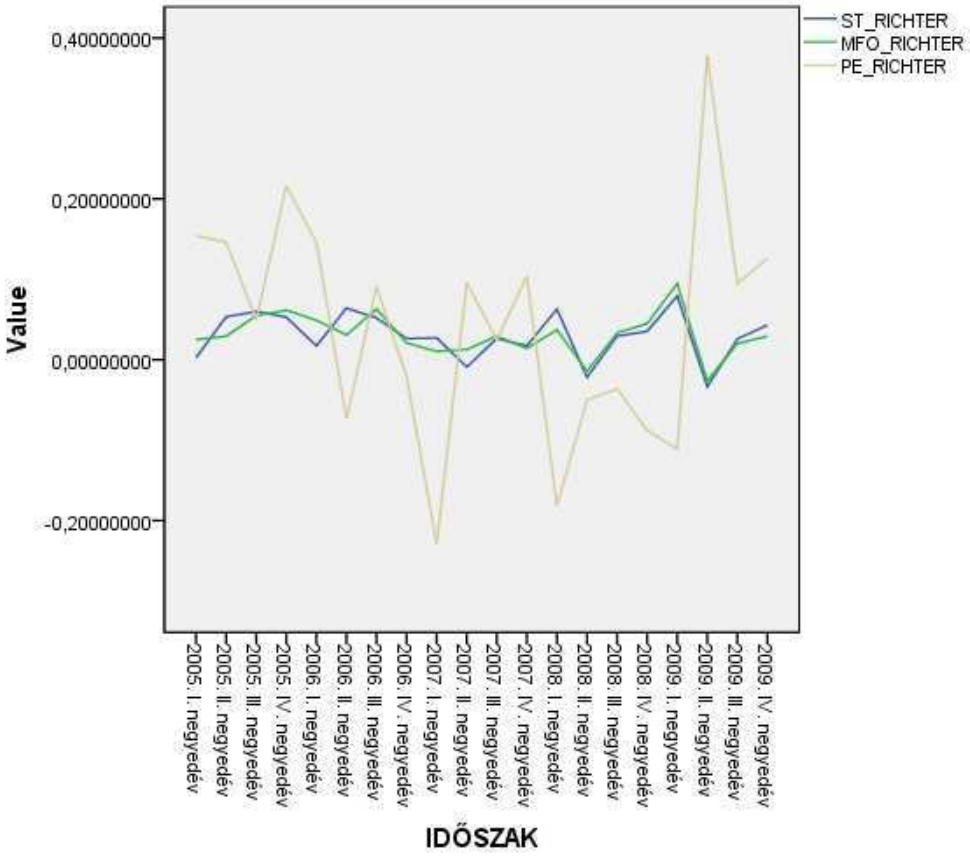
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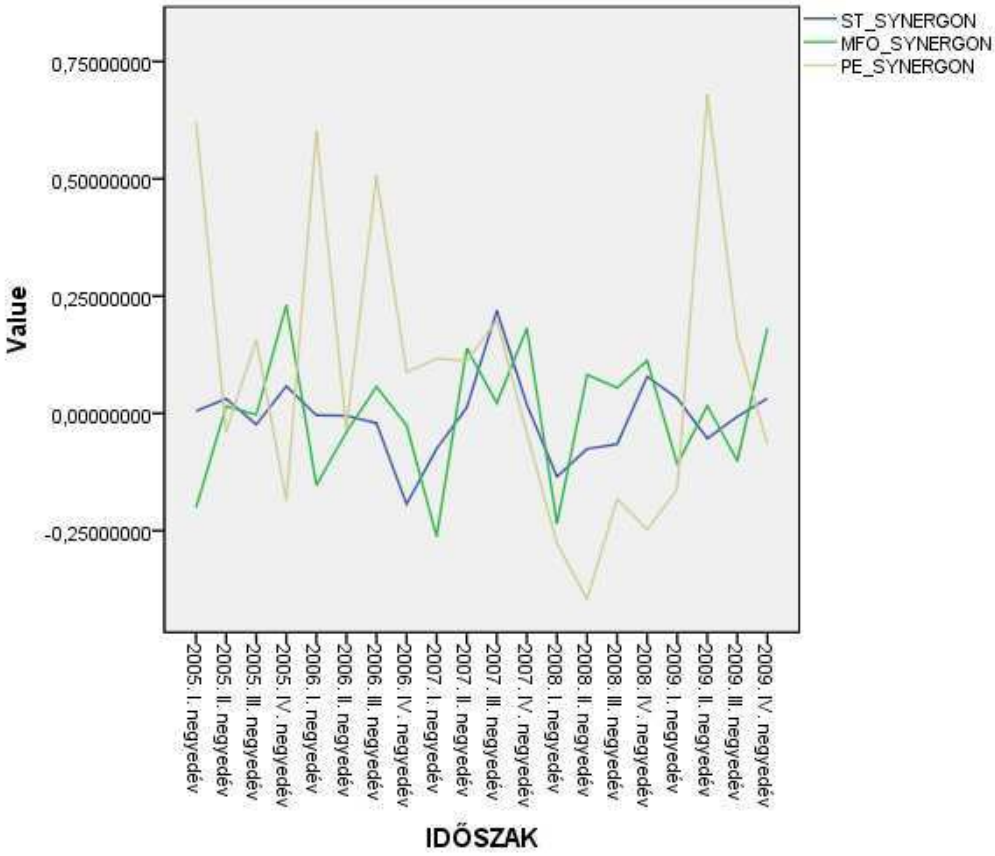
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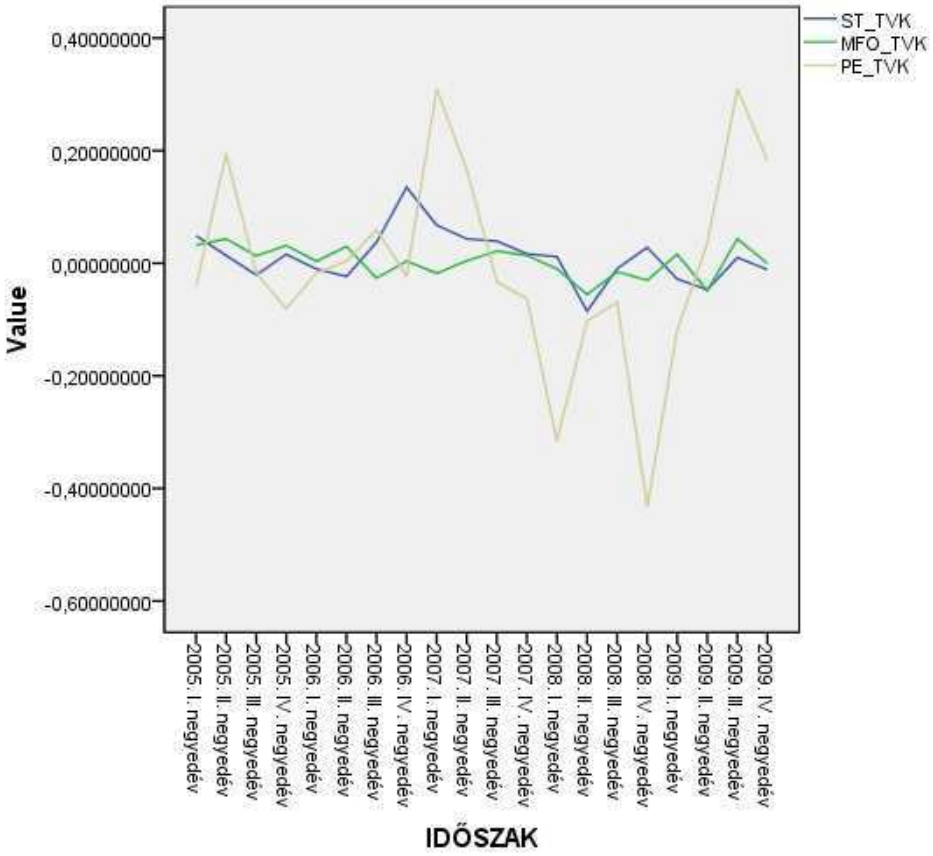
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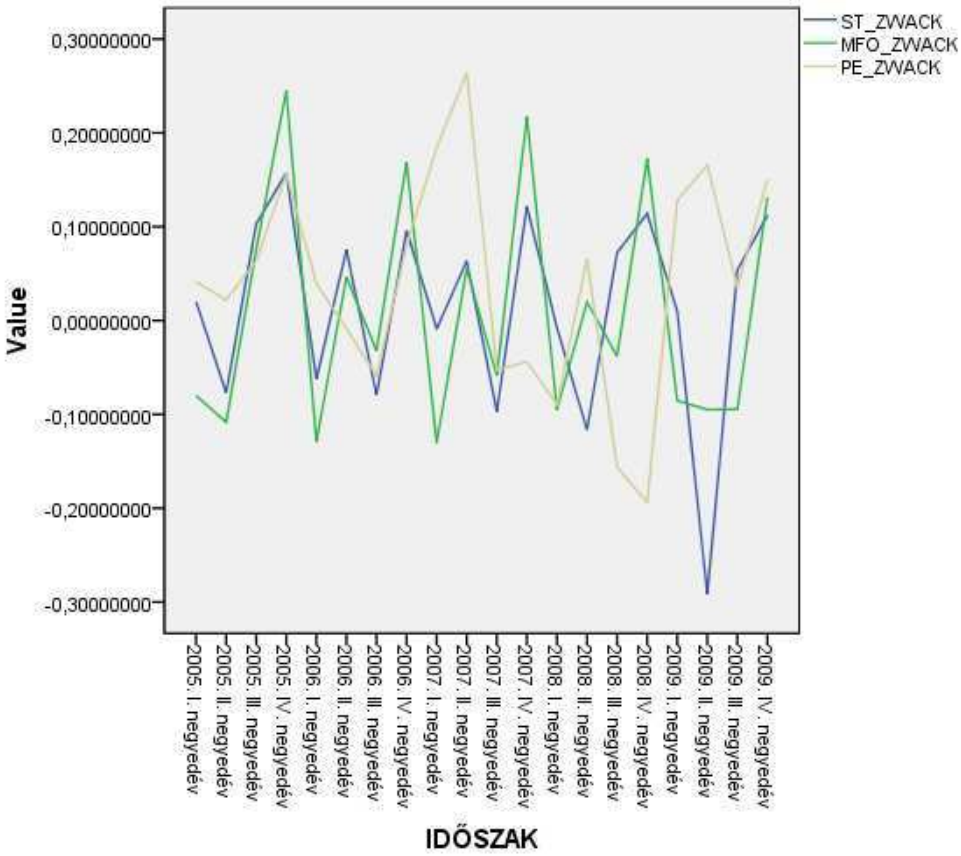
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ANNEX 5: RESULTS OF THE CROSS CORRELATION ANALYSES OF MARKET VALUE AND INDICATORS[65]

	ARF_ANY		ARF_BIF		ARF_CSEPEL		ARF_DANUBIUS	
Fogyasztói árindex	10	0,318	-		4	0,334	4	0,348
	-		-		-		-	
Munkanélküliségi ráta	3	0,279	-		-		0	-0,329
	-		-		-		-	
Állampapírpiaci referenciahozam, 3 hó	-		-		-		-	
	-		-		-		-	
Brent-olaj	-		-		-		0	0,265
	-		-		-		-	
Arany	-		-		-		-	
	-		-		-		-	
W1DOW	0	0,346	-		-		0	0,338
	-		-		-		2	0,397
W5DOW	0	0,353	-		-		0	0,357
	-		-		-		2	0,419
W5BSC	0	0,365	-		-		0	0,355
	-		-		-		2	0,375
W5UTI	0	0,282	-		-		0	0,372
	-		-		-		2	0,469
W5FIN	0	0,286	-		-		0	0,347
	-		-		-		2	0,417
W5CYC	0	0,263	-		-		0	0,346
	1	0,276	-		-		2	0,44
W5NCY	0	0,321	-		-		0	0,317
	-		-		-		2	0,373
W5ENE	0	0,399	-		-		0	0,389
	-		-		-		2	0,256
W5HCR	0	0,317	-		-		0	0,363
	-		-		-		2	0,362
W5IDU	0	0,33	-		-		0	0,342
	-		-		-		2	0,471
W5TEC	0	0,326	-		-		2	0,332
	-		-		-		-	
W5TLS	0	0,284	-		-		0	0,311
	1	0,251	-		-		2	0,427
GDAXI	0	0,274	-		-		0	0,365
	1	0,269	-		-		2	0,383
CETOP20	-		-		-		0	0,329
	-		-		-		2	0,384

[65] Fogyasztói árindex = consumer price index; Munkanélküliségi ráta = unemployment rate; Állampapírpiaci referenciahozam, 3 hó = 3-month reference yield of government securities; Brent-olaj = Brent oil price; Arany = gold price.

	ARF_ECONET		ARF_EGIS		ARF_ELMU		ARF_EMASZ	
Fogyasztói árindex	6	0,315	-		3	0,28	-	
	-		-		-		-	
Munkanélküliségi ráta	-		4	0,307	-		-	
	-		-		-		-	
Állampapírpiaci referenciahozam, 3 hó	-		0	-0,284	-		-	
	-		-		-		-	
Brent-olaj	0	0,269	0	0,255	-		-	
	-		-		-		-	
Arany	-		-		-		0	0,322
	-		-		-		-	
W1DOW	0	0,317	0	0,357	-		-	
	-		-		-		-	
W5DOW	0	0,306	0	0,405	-		-	
	-		-		-		-	
W5BSC	0	0,381	0	0,348	-		-	
	-		-		-		-	
W5UTI	0	0,257	0	0,442	-		0	0,343
	-		-		-		-	
W5FIN	0	0,321	0	0,424	-		-	
	-		-		-		-	
W5CYC	0	0,328	0	0,384	0	0,293	-	
	4	0,263	-		-		-	
W5NCY	0	0,282	0	0,431	0	0,262	-	
	-		-		-		-	
W5ENE	0	0,267	0	0,291	-		-	
	-		-		-		-	
W5HCR	0	0,279	0	0,488	-		0	0,294
	-		-		-		-	
W5IDU	0	0,275	0	0,361	0	0,258	-	
	-		-		-		-	
W5TEC	-		0	0,359	-		-	
	-		3	0,276	-		-	
W5TLS	4	0,276	0	0,394	-		0	0,275
	-		-		-		-	
GDAXI	0	0,279	0	0,322	-		-	
	-		-		-		-	
CETOP20	0	0,282	0	0,454	-		-	
	4	0,263	-		-		-	

	ARF_FORRAS/T		ARF_FOTEX		ARF_FREESOFT	
Fogyasztói árindex	4	0,304	-		-	
	-		-		-	
Munkanélküliségi ráta	-		-		-	
	-		-		-	
Állampapírpiaci referenciahozam, 3 hó	-		-		0	-0,283
	-		-		-	
Brent-olaj	-		0	0,345	-	
	-		-		-	
Arany	-		-		0	0,291
	-		-		-	
W1DOW	0	0,293	0	0,32	0	0,264
	5	0,334	-		-	
W5DOW	0	0,269	0	0,307	0	0,282
	5	0,344	-		-	
W5BSC	5	0,334	0	0,26	-	
	-		-		-	
W5UTI	5	0,323	0	0,273	0	0,295
	-		-		6	0,282
W5FIN	0	0,298	0	0,346	0	0,304
	5	0,324	-		-	
W5CYC	0	0,312	0	0,302	0	0,301
	5	0,314	-		-	
W5NCY	5	0,369	0	0,328	-	
	-		-		-	
W5ENE	-		-		0	0,345
	-		-		-	
W5HCR	5	0,315	0	0,371	0	0,259
	-		-		-	
W5IDU	0	0,303	0	0,301	6	0,288
	5	0,438	-		-	
W5TEC	5	0,295	-		-	
	-		-		-	
W5TLS	0	0,278	0	0,297	0	0,309
	5	0,29	-		6	0,295
GDAXI	0	0,265	0	0,34	9	0,354
	5	0,403	1	0,261	-	
CETOP20	5	0,325	0	0,329	6	0,263
	-		-		-	

	ARF_GENESIS= NOVOTRAD		ARF_KONZUM		ARF_LINAMAR	
Fogyasztói árindex	-		-		0	0,389
	-		-		-	
Munkanélküliségi ráta	-		-		-	
	-		-		-	
Állampapírpiaci referenciahozam, 3 hó	-		-		2	-0,327
	-		-		-	
Brent-olaj	-		2	0,258	0	0,551
	-		-		2	0,255
Arany	-		0	-0,287	0	0,253
	-		-		1	-0,339
W1DOW	0	0,252	-		0	0,303
	-		-		2	0,424
W5DOW	-		-		0	0,312
	-		-		2	0,424
W5BSC	-		-		0	0,348
	-		-		2	0,36
W5UTI	-		-		0	0,325
	-		-		2	0,37
W5FIN	-		-		0	0,316
	-		-		2	0,408
W5CYC	-		-		0	0,264
	-		-		2	0,42
W5NCY	-		-		0	0,265
	-		-		2	0,419
W5ENE	-		-		0	0,397
	-		-		2	0,277
W5HCR	-		-		2	0,412
	-		-		-	
W5IDU	0	0,264	-		0	0,252
	-		-		2	0,473
W5TEC	-		-		1	0,279
	-		-		2	0,353
W5TLS	-		-		0	0,261
	-		-		2	0,475
GDAXI	0	0,313	-		1	0,461
	-		-		2	0,307
CETOP20	-		-		0	0,262
	-		-		2	0,399

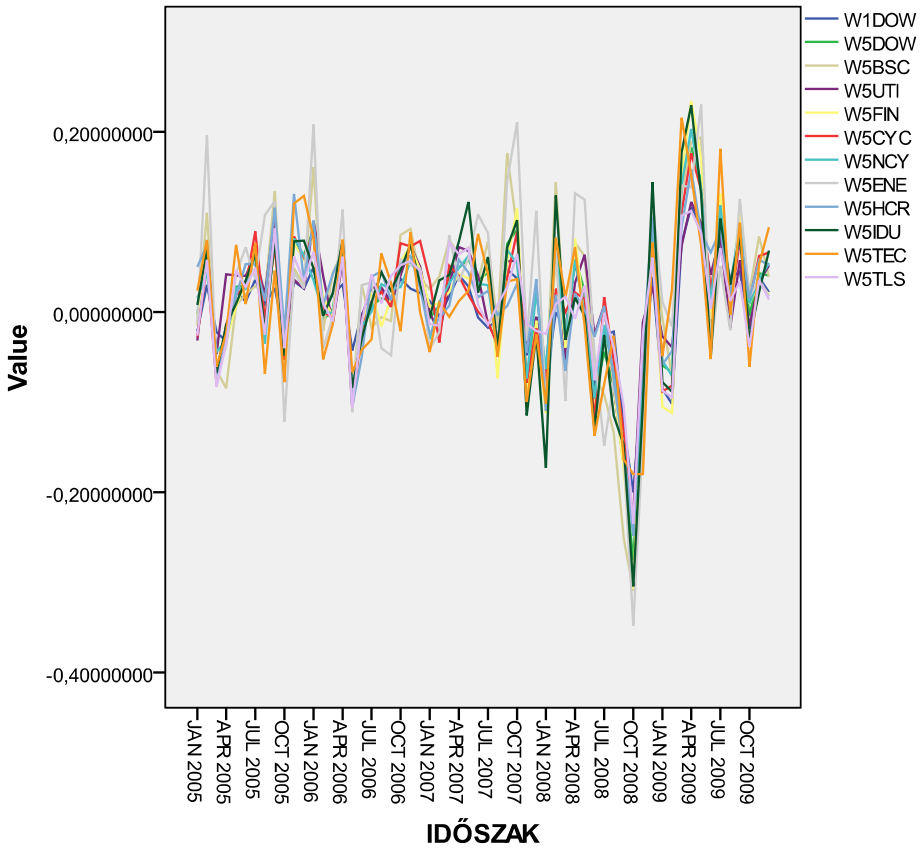
	ARF_MTELEKOM		ARF_MOL		ARF_NUTEX=HUMET	
Fogyasztói árindex	2	0,375	2	0,258	-	
	-		-		-	
Munkanélküliségi ráta	6	0,369	6	0,354	-	
	5	0,346	4	0,325	-	
Állampapírpiaci referenciahozam, 3 hó	0	-0,375	0	-0,526	-	
	-		-		-	
Brent-olaj	0	0,331	0	0,581	-	
	2	0,275	-		-	
Arany	-		0	0,264	-	
	-		-		-	
W1DOW	0	0,439	0	0,656	0	0,275
	2	0,277	-		-	
W5DOW	0	0,411	0	0,722	0	0,29
	2	0,309	2	0,334	-	
W5BSC	0	0,402	0	0,698	-	
	2	0,284	2	0,293	-	
W5UTI	0	0,441	0	0,73	0	0,251
	2	0,379	2	0,349	-	
W5FIN	0	0,441	0	0,712	0	0,283
	2	0,315	2	0,286	-	
W5CYC	0	0,433	0	0,671	0	0,291
	2	0,286	2	0,309	-	
W5NCY	0	0,414	0	0,686	0	0,271
	2	0,308	2	0,341	-	
W5ENE	0	0,401	0	0,708	-	
	-		-		-	
W5HCR	0	0,422	0	0,662	0	0,288
	2	0,308	2	0,281	-	
W5IDU	0	0,348	0	0,663	0	0,288
	2	0,311	2	0,355	-	
W5TEC	0	0,281	0	0,6	0	0,32
	-		2	0,336	1	0,28
W5TLS	0	0,386	0	0,648	0	0,298
	1	0,275	2	0,299	-	
GDAXI	0	0,373	0	0,534	0	0,284
	-		-		-	
CETOP20	0	0,547	0	0,722	0	0,26
	1	0,3	-		-	

	ARF_PANNERGY =PPLAST		ARF_PFLAX		ARF_PVALTO	
Fogyasztói árindex	-		-		-	
	-		-		-	
Munkanélküliségi ráta	-		-		-	
	-		-		-	
Állampapírpiaci referenciahozam, 3 hó	-		-		-	
	-		-		-	
Brent-olaj	0	0,279	-		-	
	-		-		-	
Arany	-		-		-	
	-		-		-	
W1DOW	0	0,375	-		-	
	-		-		-	
W5DOW	0	0,423	-		-	
	-		-		-	
W5BSC	0	0,414	5	0,312	-	
	-		-		-	
W5UTI	0	0,354	5	0,348	-	
	-		-		-	
W5FIN	0	0,415	-		-	
	-		-		-	
W5CYC	0	0,382	-		-	
	-		-		-	
W5NCY	0	0,423	5	0,301	-	
	-		-		-	
W5ENE	0	0,322	-		-	
	-		-		-	
W5HCR	0	0,4	5	0,327	-	
	-		-		-	
W5IDU	0	0,452	5	0,283	-	
	-		-		-	
W5TEC	0	0,375	2	0,326	-	
	-		-		-	
W5TLS	0	0,28	5	0,297	-	
	-		-		-	
GDAXI	0	0,339	5	0,272	-	
	-		-		-	
CETOP20	0	0,351	5	0,281	-	
	-		-		-	

	ARF_PHYLAXIA		ARF_RABA		ARF_RICHTER	
Fogyasztói árindex	3	0,517	4	0,396	-	
	4	-0,349	-		-	
Munkanélküliségi ráta	6	0,435	-		4	0,321
	5	0,367	-		-	
Állampapírpiaci referenciahozam, 3 hó	10	0,615	0	-0,336	0	-0,36
	8	-0,327	-		-	
Brent-olaj	3	0,394	0	0,324	1	0,314
	-		-		-	
Arany	-		-		-	
	-		-		-	
W1DOW	-		0	0,535	0	0,488
	-		1	0,351	-	
W5DOW	4	0,283	0	0,519	0	0,504
	-		1	0,283	-	
W5BSC	-		0	0,542	0	0,421
	-		1	0,268	-	
W5UTI	-		0	0,49	0	0,553
	-		2	0,258	-	
W5FIN	4	0,33	0	0,527	0	0,511
	-		1	0,278		
W5CYC	4	0,305	0	0,472	0	0,532
	-		1	0,298	-	
W5NCY	4	0,339	0	0,507	0	0,531
	-		1	0,297	-	
W5ENE	3	0,276	0	0,428	0	0,46
	-		-		-	
W5HCR	4	0,268	0	0,47	0	0,686
	-		-		-	
W5IDU	4	0,31	0	0,517	0	0,456
	-		1	0,302	-	
W5TEC	1	0,291	0	0,363	0	0,388
	5	0,321	-		4	0,273
W5TLS	-		0	0,438	0	0,549
	-		1	0,355	-	
GDAXI	1	0,258	0	0,503	0	0,537
	4	0,351	1	0,32	-	
CETOP20	1	0,293	0	0,465	0	0,628
	4	0,303	1	0,261	-	

	ARF_TVK		ARF_ZWACK		ARF_SYNERGON	
Fogyasztói árindex	4	0,276	0	0,273	-	
	-		-		-	
Munkanélküliségi ráta	6	0,335	-		-	
	5	0,268	-		-	
Állampapírpiaci referenciahozam, 3 hó	0	-0,25	0	-0,302	-	
	1	-0,261	1	-0,276	-	
Brent-olaj	2	0,439	0	0,417	0	0,277
	-		-		-	
Arany	-		-		-	
	-		-		-	
W1DOW	0	0,453	0	0,362	0	0,413
	1	0,386	1	0,363	-	
W5DOW	0	0,362	0	0,461	0	0,406
	3	0,398	1	0,297	2	0,306
W5BSC	0	0,317	0	0,489	0	0,383
	3	0,425	1	0,344	-	
W5UTI	0	0,392	0	0,53	0	0,403
	2	0,409	1	0,289	2	0,287
W5FIN	0	0,382	0	0,438	0	0,456
	3	0,377	1	0,29	2	0,261
W5CYC	0	0,399	0	0,389	0	0,41
	3	0,364	1	0,289	2	0,292
W5NCY	0	0,354	0	0,446	0	0,406
	3	0,4	1	0,309	2	0,256
W5ENE	3	0,303	0	0,445	0	0,306
	2	0,276	-		2	0,289
W5HCR	0	0,358	0	0,453	0	0,404
	3	0,371	1	0,294	2	0,294
W5IDU	0	0,378	0	0,485	0	0,385
	3	0,377	1	0,292	2	0,329
W5TEC	0	0,297	0	0,285	0	0,306
	3	0,402	-		2	0,322
W5TLS	0	0,302	0	0,368	0	0,359
	1	0,321	-		2	0,309
GDAXI	0	0,469	0	0,297	0	0,399
	1	0,297	1	0,328	-	
CETOP20	0	0,47	0	0,289	0	0,479
	2	0,313	-		-	

ANNEX 6: DIAGRAM SHOWING THE COVARIANCE OF THE INDIVIDUAL INDICATORS



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