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The position of NewConnect against the Alternative Markets of European countries. The impact of GDP on volatility in the indices and turnover value

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Abstract

Aim/purpose – The aim of the paper is to compare and create a ranking of alternative trading systems and to investigate if there is a relationship between Gross Domestic Product (GDP) and stock indices of those markets and correlation between GDP and turnover value.

Design/methodology/approach – The paper presents a comparative analysis of 13 European trading systems in such categories as: capitalisation, value of share trading, number of listed companies, number of new companies and companies removed from the market between the years 2016 and 2018. In addition, the paper includes a ranking of alternative trading systems in Europe which was created on the basis of the variables mentioned. The paper examines the correlation between GDP and indices of alternative trading systems and also between GDP and turnover value. Pearson's correlation coefficient was used to examine the correlation.

Findings – The ranking shows that the 1st place was taken by the British AIM market, which turned out to be the best in all categories under the comparison, the next two positions were occupied by the markets whose characteristic feature is that they cover several countries of the western Europe; these are the markets of First North and Alternext. The Polish market was at a fairly high 5th position among the 13 compared markets. The Greek and Russian markets came last. The relationship between the impact of GDP and index value as well as GDP and turnover value has also been examined. The research regarding the first aspect of the study confirmed the hypothesis about the correlation of GDP with the index. However, in the second case of the GDP and turnover value there is a very weak correlation.

Research implications/limitations – The limitation in the correlation study was the difficulty in obtaining data for all 13 alternative trading systems taken for the study, thus comparing four markets in the GDP correlation and the value of the index and three markets in the relation GDP and turnover value.

Originality/value/contribution – The added value of the paper is the ranking of alternative trading systems and study of correlations between Gross Domestic Product and stock indices of Alternative Trading Systems and turnover value of these markets.

Keywords: financial markets, capital markets, alternative trading systems, comparative analysis, GDP.

JEL Classification: G15, G23.

1. Introduction

Traditional exchanges face enormous challenges. Technology, deregulation and investor needs are driving forces reshaping the trading landscape throughout the world. Technological progress not only allows direct access to traditional exchanges. It also enables creating new market places, called Alternative Trading Systems (ATS). A general definition of ATS is a trading mechanism developed independently from the established market places and designed to match buyers and sellers on an agency basis (Degryse & Van Achter, 2001). According to MiFID title 1, art. 4, Multilateral Trading Facility (MTF) is defined as multilateral system, operated by an investment firm or a market operator which brings together multiple third-party buying and selling interest in financial instruments – in the system and in accordance with non-discretionary rules – in a way that results in a contract in accordance with Title II of this Directive¹.

Such trading systems cannot be organised by any entity but only by entities already operating on regulated markets or by investment companies (operating as brokerage) and therefore entities supervised by the supervisory authority. They are organised markets but beyond a certain formula for statutorily regulated market (Thiel, 2010).

The dynamic development of alternative markets in Europe, including the Polish market, is largely connected with the Directive 2004/39/EC issued by the European Parliament and the Council, which allowed the implementation of multilateral trading platforms. The European Union (EU) regulations have significantly liberalised the existing model of stock exchange markets in Europe, enabling them to run trading platforms in front of business entities. These regu-

¹ Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments and amending Directive 2002/92/EC and Directive 2011/61/EU.

lations were one of the factors that encouraged traditional stock exchanges to expand the scope of activities and create an offer for smaller entities and companies that are just starting their operations. Therefore, thanks to the emergence of alternative markets, it became possible to raise capital by numerous enterprises that did not yet meet the requirements of entering the regulated market (Pietrzyk & Knichnicki, 2010).

The degree of development of securities markets and its competitiveness are assessed on the basis of specific quality criteria, such as capitalisation, liquidity and investment risk (Kordela, 2013). The degree of exchange development is also reflected in the number of issuers (the number of listed companies and the number of debuts), the value of turnover and the turnover rate, and the activity of financial intermediaries on the market (Subrahmanyam & Titman, 1999).

One of the factors causing the development of the financial sector, and therefore alternative trading systems is the economic growth. Researchers of this issue indicate that the development of the financial system is a consequence of economic growth. They argue that with the sustained economic growth there is a growing demand for financial services and new financial instruments for business entities. The financial system thus adapts to the financial needs of the real sector, spontaneously developing itself (Zygmanowski, 2017). This approach to the development of the financial system, which plays a role in the economic growth, is presented, among others, by Gurley & Shaw (1967) and Goldsmith (1969).

Although in the literature there are many references to the comparison of alternative trading systems and the impact of GDP on changes in the value of the indices or other variable capital markets, despite many studies on the comparison of alternative trading systems (Feder-Sempach, 2010; Granier, Revest, & Sapio, 2019; Mikołajczyk & Kurczewska, 2010; Panfil, 2013; Pastusiak, 2011; Pietrzyk & Knichnicki, 2010) in such categories as the number of debuts, the number of companies, capitalisation, turnover value, there is a ranking created in order to carry out a comprehensive compilation in all categories. If there are already comparisons of alternative trading venues, they cover a small number of markets, and the author compares 13 alternative trading systems.

The aim of the paper is to compare and create a ranking of alternative stock markets in Europe and to examine the impact of the change in GDP on stock indices and turnover value. In the paper, the author puts forward the following hypothesis: there is a correlation between GDP and stock indices and also between GDP and turnover value. Pearson's correlation coefficient was used to examine the correlation.

In the second section of the paper author presents characteristics of alternative trading systems and a list of alternative trading systems operating in Europe. Previous studies on the comparison of alternative trading systems in Europe and studies on the impact of GDP on the value of stock indices and rates of return have been shown and discussed. Section 3 presents the methods and sources of the data used in the research. Section 4 is a research focused mainly on comparing alternative trading systems, ranking these systems and examining the impact of changes in GDP on the index value and turnover value. The last section presents conclusions of the paper, which are compared with earlier studies. The implications of results for scientists and practitioners as well as further research directions are described.

2. Literature review

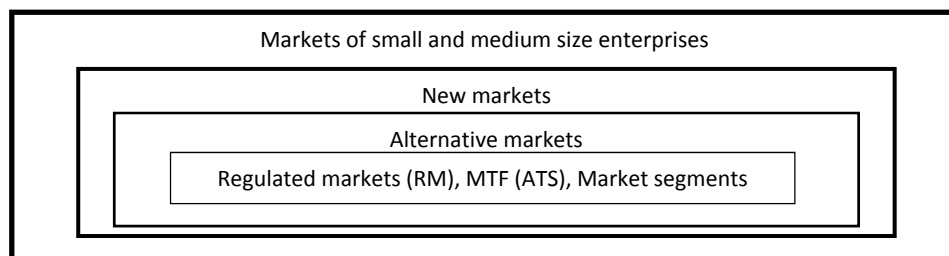
There are a number of markets in Europe that are characterised by less stringent criteria for marketing and a more liberal catalogue of information obligations (Zygmanowski, 2017).

We can distinguish three models of alternative markets (Kordela, 2013; Zygmanowski, 2017):

- segment model – created as a main market segment, which may take the form of a regulated market or an MTF;
- regulated market model – an additional regulated market created parallel to the main market characterised by less stringent marketing admission regulations and the presence on it;
- MTF model (also called a model of a multilateral trading platform or an alternative trading system) – recognised as a typical alternative trading system, created by an investment company or enterprise that manages a regulated market for issuers with low equity and with significant growth potential.

The structure of these concepts is shown in Figure 1.

Figure 1. Systematics of concepts related to the creation of alternative markets



Source: Kordela (2013).

Based on the systematics adopted by FESE, three types of markets functioning in the MTF model can be distinguished, also called the Alternative Trading System model (ATS) markets (Kordela, 2013; Zygmanski, 2017):

- full ATS – a market operating in the form of an MTF organised by an investment firm (although it may be an entity operating the main market, investment bank or other entity);
- a partial ATS – a market operating as an MTF, being a segment of the regulated market, organised by a company operating the main market;
- functional ATS – a market that is its segment, which does not function as an MTF, but has more diversified requirements for debuting and new issuers, created by a company operating the main market.

In Europe, there are many stock markets for small and medium-sized enterprises that operate in the form of the above-mentioned types of alternative trading system organised by the companies, which lead the major markets in the country. These markets are presented in Table 1.

Table 1. Alternative markets according to World Federation of Exchanges

Country	Exchange	Name of the market	Established in year
Belgium, France, the Netherlands, Portugal	Euronext	Euronext Growth	2005
Cyprus	Cyprus Stock Exchange	Emerging Companies Market – Cyprus	2009
Denmark, Finland, Iceland, Sweden	Nasdaq Nordic Exchanges	First North	2007
Germany	Deutsche Börse AG	Entry Standard	2005
Great Britain	LSE Group	AIM (later MTF\)	1995 (as MTF 2004)
Greece	Athens Stock Exchange	ATHEX Alternative Market (EN.A)	2008
Ireland	Irish Stock Exchange	Enterprise Securities Market	2005
Luxembourg	Luxembourg Stock Exchange	Euro MTF	2005
Norway	Oslo Stock Exchange	Oslo Axess	2007
Poland	Warsaw Stock Exchange	NewConnect	2007
Russia	Moscow Exchange	Innovations and Investments Market	2009
Spain	BME Spanish Exchanges	MAB Expansion	2008
Turkey	Borsa Istanbul	BIST Emerging Companies	2009

Source: Based on: World Federation of Exchanges (2019).

In 2010, Feder-Sempach (2010) compared three alternative markets, such as AIM, Alternext and NewConnect. The comparison concerned such features as capitalisation, the number of companies, the number of debuts or the obligation to cooperate with the supervision authority in 2009. The author's conclusions show that the AIM market belongs to the largest alternative markets in the European Union in comparison with Alternext and NewConnect. The number of listed companies and debuts in 2009 was also the largest. As far as the level of capitalisation is concerned, the difference between AIM and Alternext is significant – AIM has capitalisation over fifteen times greater than Alternext and is a leader in Europe. The difference in the capitalisation of Alternext and NewConnect is smaller, Alternext has capitalisation less than seven times higher. When it comes to the number of listed companies, the largest number of issuers is attracted by AIM, but the difference between Alternext and NewConnect is very small. The largest number of debuts in 2009 also fell to the London market, but the Warsaw NewConnect was not significantly worse, and Alternext acquired the least issuers. When it comes to the obligation to cooperate with the supervision authority, it was required in all markets.

A similar comparative analysis was carried out in 2010 by Pietrzyk & Knichnicki (2010), in addition to the number of companies, capitalisation and the number of debuts, they also compared the average capitalisation of turnover, turnover, changes in indices and capital obtained at the debut. Their comparison comprised markets such as Entry Standard (Deutsche Börse), Alternext (Euronext), AIM (London Stock Exchange), First North, Alternative Market (Nasdaq OMX Nordic Exchange) and NewConnect (Stock Exchange in Warsaw) in the years 2007-2009. The following conclusions arise from the comparison.

Regarding the number of listed companies and capitalisation, among the markets analysed the strong leader in terms of both the number of listed companies and their capitalisation is the London AIM market (according to data as of 31/08/2009, there were 1365 companies listed on the market with a total capitalisation of 58.7 billion euros). NewConnect, both in terms of the number of listed companies and capitalisation, ranks as the 5th out of the five analysed alternative markets. However, in terms of the number of companies, it does not stand out too much - apart from AIM market (as at 31st August, 2009, 97 companies were listed on NewConnect, while on Entry Standard – 113, Alternext – 125, and on First North – 131), in terms of capitalisation, there is a significant disproportion. The NewConnect capitalisation as of 31st August, 2009 was 471 million Euros, while the remaining markets from 1815 million euros (First North) to 8312 mil-

lion euros (Entry Standard) – excluding AIM. At the same time, this translates into the lowest average capitalisation of the companies listed. As at 31st August, 2009, for NewConnect, it amounted to only 5 million euros, while for other markets from 14 million euros (First North) to as much as 74 million euros (Entry Standard). Moreover, turnover value is very similar to the capitalisation turnover. AIM is again the main leader (annual turnover for 2009 amounted to as much as 32.6 billion euros), and NewConnect clearly stands out from other markets and takes the last place (annual turnover for 2009 – 99 million euros) (Pietrzyk & Knichnicki, 2010).

However, a better picture emerges when analysing the turnover ratio. It informs about the percentage of shares that have been traded in a given year in relation to all shares placed on the market. The Polish market with 21% share, occupies the third place in this respect and only AIM (55%) and First North (45%) disappear. Change in stock market indices: In terms of stock exchange situation, the situation on alternative markets in Europe is analogous to the situation on traditional markets. The entire year 2008 was distinguished by falls, while in 2009 there was a rebound. However, individual markets reacted differently. In 2008, among the analysed alternative trading systems, Alternext (decrease by 50.0%) behaved the best, and – NewConnect the worst (decrease by 73.5%). However, when there was an increase in 2009, the Polish market reacted extremely poorly (an increase of only 25.4% until the end of August 2009). The best moods in 2009 prevailed in the other two markets deeply affected by the bear market in 2008 – AIM (increase by 50.4% until the end of August 2009) and First North (increase by 40.3% until the end of August 2009) (Pietrzyk & Knichnicki, 2010).

The comparison of the number of debuts shows that despite the bad situation on the financial markets in 2008, the Polish alternative market was able to attract as many as 61 new companies at that time, the highest number among all European competitors, surpassing even many times higher AIM (in total, 58 debuts in 2008). However, the value of offers of companies debuting on NewConnect in 2008 amounted to 47 million euros (on average 0.8 million euros per company) and was significantly lower than on AIM – 1423 million euros (on average 24.5 million euros per company). The year 2009 brought even greater deceleration of debuts. By the middle of 2009, only eight new companies emerged on NewConnect, while considering AIM, First North and Entry Standard there were three on each market and at Alternext none. Interestingly, the average size of capital obtained by companies on AIM increased (up to 76 mil-

lion euros per company), while on NewConnect it practically remained unchanged (0.8 million euros) (Pietrzyk & Knichnicki, 2010).

Mikołajczyk & Kurczewska (2010) also compared alternative markets but based on a different feature than other authors because of the entry costs. Their comparison shows that comparing the costs of entering AIM or Alternext, one can see that the Polish offer seems attractive. It is difficult to predict, however, that foreign companies will start to choose NewConnect. This is determined by non-financial arguments. The marketing effect of AIM and Alternext is too strong. In favour of these markets are also such factors as: their reputation, internationalisation, longer period of functioning, greater experience of advisers, availability of a wide range of thriving investors. Companies from Western Europe, especially from the Eurozone, will be more likely to choose the market with higher AIM liquidity or the lack of exchange differences as in the case of Alternext. However, in Central and Eastern Europe, definitely NewConnect may try to become a leader.

The analysis conducted by Pastusiak (2011) shows that in 2010, the AIM market was the largest alternative market in Europe, considering the number of listed companies and their capitalisation. The Polish alternative market NewConnect in 2010 was a leader in the Central and Eastern European region in terms of the number of listed companies and the dynamics of new debuts.

In 2013, Panfil (2013) and the Association of Individual Investors also conducted comparisons. The comparison made by Panfil included the markets of ENA, MAB, AIM Italiana, EC Cyprus, Entry Standard, Enterprise Security Market, Euro MTF, AIM, First North, Alternext, Oslo Axess, Ditermarkt, NewConnect in 1995-2012. It shows that an example to follow for all ASO markets has become the London Alternative Investment Market, which has been in operation for seventeen years and successfully survived the first wave of creating 'new markets' based on NASDAQ solutions. At the end of July 2012, 1115 issuers were listed on the 'London small trading floor', which accounted for 54% of all companies on the London Stock Exchange.

The second significant 'small stock exchange', considering the number of companies, became the Polish NewConnect, in which as of July 31, 2012, shares of as many as 406 companies were listed. Comparing the first five years of operation of AIM and Alternext, shares of 312 companies were listed at AIM (at the end of 1998), while at Alternext (a group of four markets), 125 companies (at the end of 2009). The third market is Luxembourg MTF with 232 companies, and the fourth is Alternext with 183 companies. The most important market

within Alternext is Paris. Of the 183 companies listed on Alternext at the end of July 2012, 168 were listed in Paris. The fifth market of ASO is a segment of the German stock exchange in Frankfurt, or Entry Standard with the number of 177 companies at the end of July 2012. In terms of the number of ASO companies in the total number of all companies on 'small' and 'large' stock exchanges, the order of the five largest as at 31 July, 2012 was: MTF euro in Luxembourg: 79%, AIM: 54%, NewConnect: 48% (which makes it similar to AIM), Enterprise Market Securities in Dublin: 45%, Entry Standard: 23% (Panfil, 2013).

In the period of 2007 – 31 July 2011, the share of foreign issuers at AIM was approximately 20%, and at the end of July 2012 their number was 223 companies (from 1115), which means that both the London and AIM stock exchanges are highly internationalised and attractive for foreign issuers, due to their history and importance. At Alternext, the share of foreign companies in the total number of all issuers accounted for about 7% (12 companies out of 183), however, it should be remembered that these are four markets, including mainly the ASO market in Paris. At the end of July 2012, this ratio at the NewConnect was only around 2% (7 companies out of 406) (Panfil, 2013).

In terms of market capitalisation at the end of July 2012, the largest 'Small exchanges' are: AIM: 76.0 billion euros; Enterprise Securities Market in Dublin: 29.8 billion euros; Entry Standard: 9.4 billion euros; Alternext: 6.5 billion euros; First North: 3.5 billion euros, against this background NewConnect's capitalisation was low and amounted to only 2.1 billion euros. Taking into account the share of capitalisation of the 'small stock exchange' in the total capitalisation of 'small' and 'large' stock exchange, we can state that the first five markets are: Emerging Companies Cyprus: 37.0%; Enterprise Securities Market in Dublin: 35.9%; AIM: 2.7%; NewConnect: 1.8%; Oslo Axess: 1.1%. Then, the average capitalisation of companies from the 'small' stock exchange and from the 'large' stock exchange was calculated. The top five among the European Dealerships are: AIM: 68 million euros; Oslo Axess: 53 million euros; Emerging Companies Cyprus: 44 million euros; Alternext: 35 million euros; First North: 28 million Euros, compared to NewConnect: only 5 million euros. Among the 'large stock exchanges', the average capitalisation of companies at the end of July 2012: 2933 million euros on the London Stock Exchange; 1829 million euros for NYSE Euronext; 1626 million euros on the Dublin stock exchange; 1308 million euros at the Frankfurt Stock Exchange; 1003 million euros on the Milan Stock Exchange. For comparison, the average capitalisation of the company on the Warsaw Stock Exchange is only 140 million euros (Panfil, 2013).

During the entire 17-year period of AIM operation, the value of share issue amounted to almost 79 billion euros (including approximately 35 billion euros under the IPO), and the average IPO value amounted to 11.6 million euros. In the period January – July 2012 the average IPO amount was 7.5 million euros. At Alternext in eight years of operation, the value of the issue amounted to 2.8 billion euros (no data on the IPO value), while in 2012 one company had an issue of 1.48 billion euros, which slightly distorts the market statistics. Without this company, the average IPO value in the period January – July 2012 amounted to 4.7 million euros. However, during the six-year operation of the NewConnect, the value of the issue was only 340 million euros (including 292 million euros under the IPO), which gives a low average of 0.7 million euros for one IPO in the first seven months of 2012 (Panfil, 2013).

The second comparison from 2013 was carried out by Association of Individual Investors. It included such markets as: AIM, Alternext, NewConnect, ENA, MAB, Dritter Market, Entry Standard, First North, Alternext, Oslo Axess in 2011-2013, they compared the number of companies and capitalisation. The conclusions that arise from the comparison are the following: among the selected markets, the one with the highest number of listed companies is the London AIM market. The second is our domestic NewConnect, which, unlike its English brother, maintains a growing trend. More information on the Polish market is provided by the NewConnect Pigment. They were followed by, Alternext, the Scandinavian First North and the German Entry Standard. A small number of listed companies are characteristic, i.e., for the following markets: Norwegian, Austrian, Spanish and Greek.

By classifying the markets in terms of capitalisation, London AIM is in the first place. Interestingly, although NewConnect won second place in Europe due to the number of listed companies, this does not translate into their value. The Polish trading floor brings together many small companies, which puts it in the capitalisation classification out of the first four. In 2013, a very large (almost threefold) increase in value was recorded on the German Entry Standard. However the Greek and Spanish markets are of marginal importance (Association of Individual Investors, 2013).

The latest survey comparing alternative European and Japanese markets is the study of Granier et al. (2019). The conclusions that flow from their research are that the AIM is the largest junior market in terms of market capitalisation and the number of companies listed. In 2017, 960 firms were listed on the AIM with a market capitalisation above 170 billion euros. However, taken together,

the Japanese markets include 1017 firms and account for 65% of the AIM market capitalisation. First North Stockholm is the second most important junior market in Europe, before Alternext. AIM Italia and TPM, i.e. the most recent junior market, are the smallest.

A research on the correlation between GDP and the value of stock indices is widely discussed in the literature.

Liu & Sinclair (2008) examined the causal links between stock prices and economic growth in Greater China within the VECM framework. The results from the causality tests indicate that a unidirectional causal link running from GDP to the stock prices exists in the long run in the China, Hong Kong and Taiwan, suggesting that movements in stock prices are determined by economic growth or economic fundamentals. However, there is only a uni-directional cause and effect relationship between the stock prices and GDP growth in the short run in these economies, indicating that the stock markets act as a leading indicator of economic growth regardless of the level of stock market development. No reversal cause and effect relationship between GDP growth and stock prices exists, implying that economic growth plays a limited role in affecting the stock prices in the short run. The authors also concluded that the level of development of equity markets differs in Greater China, the findings from the study reveal that the links between stock markets and economic growth exhibit a similar pattern in which stock prices are a leading indicator of economic growth in the short run and economic growth is the main determinant of the stock markets in the long run.

Oskooe (2010) examined the relationships between share prices quoted on the Iranian stock exchange and Iran's economic growth. The author concluded that the results of his research indicate a causal relationship between economic growth and long-term stock price fluctuations, as well as bilateral causal relations between stock prices economic growth in the short term.

Boubakari & Jin (2010) investigated the causal relationship between the stock exchange and economic growth based on time series data compiled from five Euronext countries (Belgium, France, Portugal, the Netherlands and the United Kingdom) for this period of 1995: Q1 to 2008: Q4. They used Granger's causality test to find a causal link between stock market agents such as market capitalization, total trade value, turnover ratio and economic growth (GDP and FDI). Causal relationships have been investigated for each country. The survey results suggest positive links between the stock market and the stock market of economic growth in some countries for which the stock market is liquid and highly active. However, causality relationships are rejected in countries where the stock market is small and less liquid.

According to research carried out by Gajdka & Pietraszewski (2014), in the initial period of development of the capital market in the Central and Eastern European region, the relationship between the rate of return on shares and the rate of GDP growth was a positive correlation. The authors of the study formulated the hypothesis that in countries where the capital market is in the phase of initial development, the relationship between the real economy and the capital market is positive and stronger than in countries with much more developed capital markets, in which a negative correlation occurs in the long term, between the results obtained in the real economy and the results on the capital market.

In her study Widz (2016) analysed the correlation dependencies between the rates of return of major stock exchange indices of the Warsaw Stock Exchange and the economic situation in Poland as measured by the growth rate of GDP and the answer to the question whether changes in indices on the stock market are ahead of GDP changes. The analysis covered the years 2003-2014. The bases for the research were quarterly indicators of the dynamics of changes in stock exchange indices and GDP. The research showed that the correlation between the dynamics of changes in the main Warsaw Stock Exchange (WSE) stock indices and the dynamics of GDP changes in Poland is positive but moderate. Changes in indices are ahead of changes in GDP, but in the case of large changes in GDP, a stronger correlation occurred with simultaneous changes in indices.

The above-mentioned studies show that GDP has an impact on changing various variables describing stock markets.

3. Research methodology

Comparison of alternative systems in Europe will cover such markets as AIM, NewConnect and CE Enter Market, ATHEX Alternative Market (EN.A), MAB Expansion, Second National Market, Watch List, Emerging Companies Market, Entry Standard, Alternext, Enterprise Stock Market, Euro MTF, list of alternative companies, innovation and investment market, First North, Oslo Axess in 2016-2018 based on variables such as capitalisation of the domestic market, number of companies with shares, companies from the new stock exchange, Deloft companies, turnover value. Data for comparison were taken from the World Federation of Exchange website.

A ranking was created on the basis of five separate categories listed above and divided into years. The position in the ranking is the average of the positions occupied in individual years for each category.

The correlation between GDP and index value, as well as the correlation between GDP and turnover value, for the years 2010-2017 was calculated on the basis of data from Internet users such as:

- World Federation of Exchanges, *Annual Statistics Guide 2017-2018*,
- <https://pl.tradingeconomics.com>,
- GPW, *Rocznik giełdowy 2019*,
- Oslo Børs, *Annual statistics 2019*,
- <https://www.boerse.de/>,
- <https://www.londonstockexchange.com/home/homepage.htm>.

The Pearson correlation coefficient in the Gretl programme was used to calculate the correlation. Pearson's correlation coefficient was chosen because it describes two quantitative features and relationships that are close to linear.

4. Research findings

The author divided the research part into three parts. The first concerns the comparison of alternative trading systems in Europe, the second part concerns formation of the ranking of alternative markets in Europe and the third part concerns the correlation between GDP and stock index, GDP and turnover value.

4.1. Domestic market capitalisation

In this subsection, the author compared selected alternative trading systems in terms of their capitalisation in 2016-2018, as presented in Table 2.

It is not difficult to see the biggest capitalisation of AIM and that it is higher than the NewConnect capitalisation from 46 times in 2016 to 63 times in 2018, which proves a noticeable decrease in the Polish market capitalisation. However, the distance to the second market in terms of capitalisation is significantly lower and amounts to eight times less in individual years.

Table 2. Domestic market capitalisation (USD millions)

Name of the market	Exchange	2016	2017	2018
AIM	LSE Group	109,557.47	142,157.32	124,109.46
Alternative Companies List	Malta Stock Exchange	5.54	6.69	2.75
Alternext	Euronext	13,739.27	15,279.55	11,696.23
ATHEX Alternative Market (EN.A)	Athens Stock Exchange	110.35	125.55	123.31
CE Enter Market	Zagreb Stock Exchange	583.52	596.83	16.50
Emerging Companies Market	Cyprus Stock Exchange	894.59	1,172.09	1,104.04
Enterprise Securities Market	Irish Stock Exchange	18,381.36	6,661.83	5,991.99
Entry Standard	Deutsche Börse AG	11,611.70	8,086.97	7,641.12
Euro MTF	Luxembourg Stock Exchange	1,913.06	2,539.94	1,735.49
First North	Nasdaq Nordic Exchanges	12,270.91	16,898.37	17,826.49
Innovations and Investments Market	Moscow Exchange	3,668.86	5,973.29	5,196.87
MAB Expansion	BME Spanish Exchanges	5,758.42	11,565.60	13,403.11
NewConnect	Warsaw Stock Exchange	2,344.82	2,759.93	1,968.66
Oslo Axess	Oslo Børs	1,111.27	1,867.68	631.29
Second National Market	Borsa Istanbul	241.92	1,125.79	188.76
Watchlist	Borsa Istanbul	216.69	300.14	152.82

Source: Based on: World Federation of Exchanges (2018, 2019).

The markets with the lowest capitalisation are in Greece and Malta. In comparison with the alternative market from Malta, the capital of the Polish alternative market is 423 times higher in 2016 and 716 times higher in 2018, while the NewConnect, alternative market in Greece has a larger market capitalisation in 2016, 21 times, and in 2018, 16 times higher.

4.2. Value of share trading

In this subsection, the author compares selected alternative trading systems in terms of value of share trading in 2016-2018, as presented in Table 3.

The turnover on the undisputed leader market as London AIM is around 70 times greater than in NewConnect in individual years, the difference between the second market in terms of turnover is already lower and is on average around 18 times.

Table 3. Value of share trading (USD millions)

Name of the market	Exchange	2016	2017	2018
AIM	LSE Group	NA	24,278.13	30,771.42
Alternext	Euronext	3,992.44	5,141.76	6,044.41
ATHEX Alternative Market (EN.A)	Athens Stock Exchange	2.11	1.60	2.12
Emerging Companies Market	Cyprus Stock Exchange	1.66	1.42	1.34
Entry Standard	Deutsche Börse AG	3,942.64	1,857.25	2,050.83
Euro MTF	Luxembourg Stock Exchange	5.05	3.72	9.68
First North	Nasdaq Nordic Exchanges	5,799.94	5,912.06	7,639.00
Innovations and Investments Market	Moscow Exchange	103.47	92.30	60.81
MAB Expansion	BME Spanish Exchanges	290.38	241.49	266.35
NewConnect	Warsaw Stock Exchange	303.85	350.47	434.89
Oslo Axess	Oslo Børs	471.43	49.15	310.81
Second National Market	Borsa Istanbul	348.18	652.45	1,353.09
Watchlist	Borsa Istanbul	374.05	423.47	3,990.40

Source: Based on: World Federation of Exchanges (2018, 2019).

The smallest shares trading occurs in Cyprus and Greece. NewConnect compared to the Greek market has a turnover 144 times higher in 2016, and almost 205 times in 2018. However, in comparison with the Cyprus Stock Exchange, NewConnect has a stock turnover 183 times higher in 2016 and in 324 times higher in 2018.

4.3. Number of listed companies

In this subsection, the author compares selected alternative trading systems in terms of the number of companies listed in 2016-2018, as presented in Table 4.

Table 4. Number of companies listed in 2016-2018

Name of the market	Exchange	2016	2017	2018
1	2	3	4	5
AIM	LSE Group	982	1,055	1,036
Alternative Companies List	Malta Stock Exchange	1	1	1
Alternext	Euronext	197	196	206
ATHEX Alternative Market (EN.A)	Athens Stock Exchange	14	12	12
CE Enter Market	Zagreb Stock Exchange	22	21	1
Emerging Companies Market	Cyprus Stock Exchange	18	35	34
Enterprise Securities Market	Irish Stock Exchange	25	22	24
Entry Standard	Deutsche Börse AG	138	63	64

Table 4 cont.

1	2	3	4	5
Euro MTF	Luxembourg Stock Exchange	128	126	125
First North	Nasdaq Nordic Exchanges	258	260	348
Innovations and Investments Market	Moscow Exchange	12	10	10
MAB Expansion	BME Spanish Exchanges	67	88	105
NewConnect	Warsaw Stock Exchange	406	408	387
Oslo Axess	Oslo Børs	31	24	17
Second National Market	Borsa Istanbul	18	17	17
Watchlist	Borsa Istanbul	36	31	27

Source: Based on: World Federation of Exchanges (2018, 2019).

As it was not difficult to predict, AIM is also a leader in terms of companies listed, which in the analysed period is more than 2.5 times higher than NewConnect, but here is a nice surprise that the Polish market among all the markets included in the list, ranks as high as on the 2nd position.

4.4. Newly listed companies, removed listed companies

In this subsection, the author compares selected alternative trading systems in terms of the number of new listed companies and removed listed companies in 2016-2018, as presented in Table 5.

Table 5. Number of new listed companies and removed listed companies in 2016-2018

Name of the market	Exchange	Newly listed companies			Removed listed companies		
		2016	2017	2018	2016	2017	2018
AIM	LSE Group	64	105	90	126	89	102
Alternext	Euronext	11	7	14	13	12	7
ATHEX Alternative Market (EN.A)	Athens Stock Exchange	0	0	0	0	2	0
CE Enter Market	Zagreb Stock Exchange	1	3	0	NA	4	20
Emerging Companies Market	Cyprus Stock Exchange	0	5	4	0	3	5
Entry Standard	Deutsche Börse AG	6	10	18	24	17	12
Euro MTF	Luxembourg Stock Exchange	3	4	3	13	13	5
First North	Nasdaq Nordic Exchanges	61	61	51	10	61	13
Innovations and Investments Market	Moscow Exchange	0	0	0	0	0	0
MAB Expansion	BME Spanish Exchanges	23	22	23	1	1	6
NewConnect	Warsaw Stock Exchange	16	19	15	22	7	36
Oslo Axess	Oslo Børs	2	3	0	2	3	
Second National Market	Borsa Istanbul	1	0	1	4	1	0
Watchlist	Borsa Istanbul	9	1	3	7	4	6

Source: Based on: World Federation of Exchanges (2018, 2019).

Table 5 shows the number of debuts and the number of companies leaving the market. The leader in both categories is also here the London AIM. Basically, it can be said that on NewConnect debuts from four times in 2016 to six times in 2018 fewer companies, which nevertheless gives a high position on the background of alternative markets, while the number of companies leaving the market is subject to strong fluctuations; in 2017, 13 times less than in the leading AIM market, but in 2018 only about three times less.

4.5. Ranking of European alternative markets

The ranking was compiled on the basis of the ranking in individual variable categories in the years 2016-2018. Table 6 presents the ranking of selected alternative trading systems in individual categories and years as well as the position in the ranking.

Table 6. Ranking of alternative systems in Europe

Exchange	Market capitalisation			Number of companies			Newly listed companies			Delisted companies			Value of share trading			Position
	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	2016	2017	2018	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
AIM	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
First North	3	2	2	3	3	3	2	2	2	6	2	3	2	2	2	2
Alternext	2	3	4	4	4	4	5	6	6	4	5	5	3	3	3	3
Entry Standard	4	5	5	5	7	7	7	5	4	2	3	4	4	4	5	4
New Connect	7	7	7	2	2	2	4	4	5	3	6	2	8	7	7	5
MAB Expansion	5	4	3	7	6	6	3	3	3	10	11	6	9	8	9	6
Euro MTF	8	8	8	6	5	5	8	8	8	4	4	8	11	11	11	7

Table 6 cont.

<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>13</i>	<i>14</i>	<i>15</i>	<i>16</i>	<i>17</i>
Watchlist	12	12	12	8	9	9	6	10	9	7	7	6	6	6	6	8
Oslo Axess	9	9	10	9	10	10	9	9	11	9	8	10	5	10	8	9
Second National Market	11	11	11	11	11	11	10	11	10	8	11	10	7	5	4	10
Emerging Companies Market	10	10	9	10	8	8	11	7	7	11	8	8	13	13	13	11
Innovations and Investments Market	6	6	6	13	13	13	11	11	11	11	13	10	10	9	10	12
ATHEX Alternative Market (EN.A)	13	13	13	12	12	12	11	11	11	11	10	10	12	12	12	13

As can be seen from Table 6, the highest ranking belongs to London AIM, the next two are Alternext and First North, NewConnect takes the 5th place. The worst performers were alternative markets in Greece and Russia. A good example for other markets can be Alternext and First North. In the author's opinion, their high position is related to the fact that both these markets do not belong to one country, but they include many countries. This can be an example for smaller markets that they can achieve a better position in the stock market by combining their activities.

4.6. Correlation between GDP and stock indices

In this subsection, the author examined the relationship between the change in GDP and the change in the index. The survey was conducted on four alternative European markets, such as the Polish market (NewConnct), the German market (Entry Standard), the United Kingdom market (AIM) and the Norwegian market (Oslo Axess) in 2010-2017 using the Pearson correlation coefficient. The results of these tests are presented in Table 7.

Table 7. Correlation between GDP and the stock exchange index

Exchange (index)/GDP	Correlation	t	p
NewConnct (NCIndex)/Poland	0.07	0.19	0.86
AIM (FTSE AIM All-Share Index)/Great Britan	0.31	0.80	0.46
Oslo Axess (Oslo Axess All-share index)/Norway	-0.31	-0.86	0.42
Entry Standard (Entry Standard Index)/Germany	-0.53	-1.51	0.18

Source: Based on: London Stock Exchange (2020); Oslo Børs (2019);Trading Economics (s.a.); Warsaw Stock Exchange (2019).

As it results from Table 7, changes in the AIM market index have a weak correlation with the change in GDP. The NewConnect index of the Polish alternative market does not show any relation to the change in GDP. The reverse situation of AIM and GDP appears in the alternative markets of Oslo Axess and Entry Standard, where we can observe the inverse weak and average correlation between the change in the index and GDP.

4.7. Correlation between GDP and turnover value

In this subsection, the author examines whether GDP affects turnover value. The author conducted the research on three alternative markets such as NewConnect, AIM and Oslo Axcess in 2010-2018 using the Pearson correlation coefficient. Table 8 presents the results obtained.

Table 8. Correlation between GDP and turnover value

Exchange/GDP	Correlation	t	p
NewConnect/ Poland	-0.29	-0.81	0.45
AIM/ Great Britain	0.07	0.17	0.87
Oslo Axess/ Norway	0.32	0.90	0.40

Source: Own study based on Warsaw Stock Exchange (2019), Oslo Børs (2019), London Stock Exchange, Trading Economics.

As can be seen from the results presented above, there is a very weak correlation between turnover value and GDP on the Oslo Axcess market and a weak reverse correlation on the NewConnect market. There was no correlation between GDP and turnover value in the analysed period on the AIM market.

5. Conclusions

We can draw the following conclusions from the analysis of alternative markets, the largest market is the AIM. The next positions in the ranking occupy such markets as First North and Alternext. NewConnect occupies the 5th position in the ranking of alternative trading systems. On the basis of the above-said, the author of the paper states that a good move to increase the competitiveness of smaller alternative trading systems would be as for markets such as Alternext, First North, merging and creating one large alternative trading system.

An unexpected outcome of the ranking is a very low position of the Russian alternative trading system, which occupies the penultimate 12th place in the ranking, given the fact that the Russian state is considered one of the economic powers, the reason for this may be found in the political and economic conditions. The second surprising conclusion is that the alternative Spanish market was below the Polish market. This may be caused by the collapse of the Spanish economy, and thus an increase in unemployment, which has an impact on the condition of the stock markets.

The hypothesis about the correlation of GDP and index value presented in the paper was confirmed in three out of four cases. However, it is worth noting that in two cases there was an inverse correlation, that is, along with GDP growth, the indices fell. In one case, however, the correlation was positive, which means that GDP growth resulted in an increase in the index. In the case of the Polish NewConnect market, no correlation was observed between the GDP and the market index, i.e. the change in Poland's GDP does not change the value of the NewConnect market index.

In the previous studies presented in the paper, the authors came to various conclusions. The author's research largely overlaps with the research carried out by Gajdka & Pietraszewski (2014), who concluded that there is a negative correlation between GDP and index value in the developed markets. There is a weak positive correlation on the less developed markets (NewConnect), which gives similar results to the research of Gajdka & Pietraszewski (2014) and Widz (2016).

For practitioners, the fact that there is a correlation in the developed countries, which has been confirmed by research, may be an indication that they may use a change in GDP in investment processes.

The second hypothesis put forward by the author was the hypothesis about the correlation between GDP and Turnover Value. The conducted research shows that there is a very weak correlation between these variables. In one case

there is a weak appreciation correlation, while in the other two cases there is a weak positive correlation. In the case of the correlation between GDP and turnover value, there was a weak negative correlation, i.e. a change in Poland's GDP affects the change in turnover value in the opposite direction.

At the same time, it should be remembered that stock markets, apart from GDP, are influenced by many other factors, not only fundamental but also behavioural. The factors that have a positive impact on capital markets are, for example, peace in conflict zones, reduction the role of trade unions, elimination of social rights in the country, implementation of market reforms.

At the same time, it should be noted that only four or three alternative markets were taken for the correlation study due to the lack of available data at the moment. After obtaining the data, our research could be extended to a larger number of alternative markets.

Further research may look in-depth into the impact on alternative markets of other macroeconomic variables, such as unemployment rate, inflation, interest rates, positive foreign trade balance, reduction of budget deficit or behavioural factors. Further investigation may consider whether the behaviour of alternative trading systems is correlated with the behaviour of regulated markets in the same countries.

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