Studia Sieci Uniwersytetów Pogranicza | 2025 | 9
DOI: 10.15290/sup.2025.09.24

Anna Wierzbicka
- University of Bialystok
- e-mail: a.wierzbicka@uwb.edu.pl
- ORCID: 0000-0002-1154-7082

THE WARSAW STOCK EXCHANGE COMPARED TO OTHER EUROPEAN STOCK EXCHANGES

Abstract

- *Goal* – The purpose of the article is to analyse the position of the Warsaw Stock Exchange in relation to the market position of other European stock exchanges.
- *Research methodology* – The verification hypothesis was formulated as a statement that the Warsaw Stock Exchange is the capital center of Central and Eastern Europe. The basis of the study was secondary data published in the reports of both the Warsaw Stock Exchange and the Federation of European Securities Exchanges (FESE). The comparative analysis of European stock exchanges covered the years 2014–2018.
- *Score/results* – The comparative analysis determining the position of the WSE compared to other European stock exchanges enabled a positive verification of the research hypothesis confirming that the Warsaw Stock Exchange is the capital center of Central and Eastern Europe.
- *Originality/value* – The analysis of the research results confirmed that the Stock Exchange is the capital center of Central and Eastern Europe. Nevertheless, the Warsaw Stock Exchange faces many challenges, including: the low value of public offers, low liquidity ratio, competing for both issuers and investors with other European stock exchanges, etc. This justifies conducting regular surveys verifying the position of the Warsaw Stock Exchange in relation to other global stock exchanges, especially the European ones, undertaking both spatial and temporal analysis.

Keywords: stock exchange, capital market, capitalisation, investment, economic system

1. Introduction

The literature on the subject suggests that "[...] without stock exchanges, the civilisational leap of the last century, associated with the development of new information and telecommunications technologies, among other things, would not have been possible, and no public authority is capable of allocating capital as effectively." [Rydzewska, 2017: 157] Therefore, one of the basic segments of the financial market is the capital market, which, owing to the entities, mechanisms, and devices operating on it, facilitates meetings between capital providers and capital recipients and the execution of transactions between them. This allows one party to raise capital for future investments, while the other party can invest their savings and diversify their sources of income. The stock exchange is considered the heart of the capital market, as its mechanisms improve and increase the flexibility of this segment of the financial market.

The aim of this paper is to analyse the position of the Warsaw Stock Exchange SA in relation to the market position of other European stock exchanges, measured by basic indicators. The paper was prepared using a hypothetical-deductive approach. The hypothesis was formulated as a statement that the Warsaw Stock Exchange is the capital center of Central and Eastern Europe.

Literature studies, descriptive analysis, and comparative analysis were used to achieve the intended goal. The study was based on secondary data published in reports by both the Warsaw Stock Exchange and the Federation of European Securities Exchanges (FESE).

2. The functions of the stock exchange as the center of the capital market

The stock exchange is treated as the center of the capital market, enabling the optimisation of the distribution of funds between users and providers of capital [Szymański, Wojtalik, 2022: 290]. The stock exchange is a meeting place for capital seekers, i.e., entrepreneurs looking for capital for further development of their entities, and capital providers looking for investment areas that allow them to multiply their savings [Gorban, Buga, Puscas, 2024: 15–19].

Due to several factors, the stock market is associated with the model concept of a perfect market, including its characteristic large number of participants, full transparency of operations, homogeneity of objects – in this case: securities, and the relative ease of entry and exit [Aluchna, 2007: 236]. Moreover, according to

W. Tarczyński's analysis, the stock market is considered an example of an efficient market due to the factors mentioned above [Tarczyński, 1997: 521–538].

The efficient operation of the stock exchange allows it to perform functions that are crucial both from the point of view of the financial market as well as the economy as a whole, including [Dziawgo, 2012: 229]:

- Capital mobilisation – savings resulting from foregoing current consumption can be converted into investments. In return, investors gain opportunities to multiply their capital, which is a reward for their current self-sacrifice and the risk they take. "Investor engagement depends on the attractiveness of the financial instrument (expected financial results), the ease of its acquisition and disposal (market organisation), and the risk associated with the issuer's operations" [Banaszczak-Soroka, 2019: 17–18]. At the same time, billions of dollars are mobilised to support economic and state initiatives [Dobosiewicz, 2013: 36].
- Capital allocation – which entails the transfer of free financial resources from entities with a surplus to entities that need them. "Through the institutionalised securities market, institutional and individual investors finance the development activities of the entities that issue these instruments by purchasing shares and bonds" [Rydzewska, 2017: 158]. At the same time, this solution allows investors to diversify their investment forms on the one hand, and on the other hand, it gives issuers access to financial resources [Granier, Revest, Sapio, 2019: 43–67]. The free flow of funds allows for the injection of capital into those sectors of the economy which, in the opinion of investors, are able to multiply the entrusted funds by offering effective use of the entrusted capital.
- Capital transformation – it emphasises the role of the stock exchange in transforming the capital derived from savings into investment capital, which is useful from the point of view of both the economy and the state. The renunciation of current consumption or unproductive saving enables the investment of capital resources in equity or debt securities offered by stock exchange issuers [Dobosiewicz, 2011: 101–105].
- Appraisal of the capital value and risk – owing to the exchange quotations, it is possible to determine the market value of the enterprise, as well as the value of the issued shares [Banaszak-Soroka, 2019: 17–18]. Financial investment is accompanied by the risk linked to the uncertain results of the undertaken investment. The valuation of the issued securities, which is carried out on an ongoing basis and reflected in the published indicators, is often treated by the investors as one of the possible assessments of the investment results, as well as the accompanying risk [Adamska, 2019: 7].

- Money circulation – owing to the financial market institutions and financial instruments, it is possible to transfer capital between different locations safely, efficiently, and cheaply [Harwood, Konidaris, 2015; Wiśniewski, Wyrzykowska-Antkiewicz, 2014: 49].
- Economic barometer – "it is widely accepted that changes in the stock market signal changes in the economic situation in advance, if the economy is adequately represented on the stock exchange. This is because changes in stock prices and stock market indices are the result of decisions made by stock market investors who, on the basis of their predictions about the future, determine the most effective investment directions" [Widz, 2016: 157–158]. Investors' predictions of an improving economic situation have a positive impact on stock market indices, which is the result of the increased financial investments that are positively reflected in real investments [Gorban, Buga, Puscas, 2024: 16]. Conversely, a negative assessment of economic development prospects results in a decline in stock market indices, hampering real investments. This confirms the view that the value of stock market indices precedes the economic situation [Eberhart, Eesley, 2018: 2644; Switzer, Picard, 2016: 106; Galariotis, Giouvris, 2015: 44].

The functions listed above demonstrate the significant role of the stock exchange in the economic system [Czaja, 2020: 19]. This can be seen both at the microeconomic level – through the valuation of companies and their shares, the activation of accumulated savings, and their secure transfer between entities operating within its structures – as well as at the macroeconomic level – by reflecting the economic situation and its forecasts, or by assessing the effectiveness of the use of entrusted capital by individual sectors.

3. Characteristics of the Warsaw Stock Exchange

The history of the stock exchange in Poland dates back to 1817. The current Warsaw Stock Exchange (Giełda Papierów Wartościowych w Warszawie SA) began operating on April 12, 1991. The rules governing the functioning of the stock exchange are set out in legal acts, including [www 1]:

- Act of July 29, 2005, on Trading in Financial Instruments [Journal of Laws of 2005, No. 183, item 1538],
- Act of July 29, 2005, on Public Offering, Conditions Governing the Introduction of Financial Instruments to Organized Trading, and Public Companies [Journal of Laws of 2005, No. 184, item 1539];

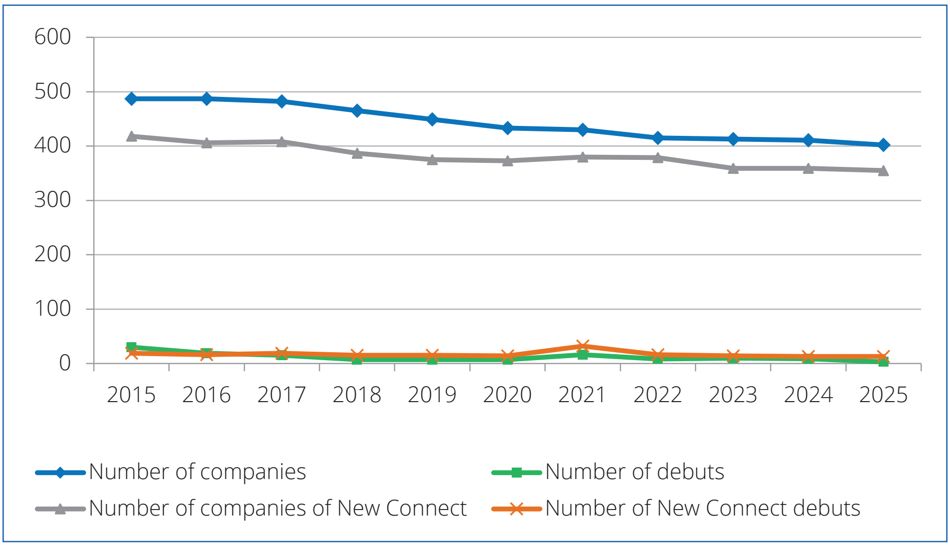
- Act of July 21, 2006, on Financial Market Supervision [Journal of Laws of 2006, No. 157, item 1119];
- Act of July 29, 2005, on Capital Market Supervision [Journal of Laws of 2005, No. 183, item 1537].

On this basis, a stock exchange is defined as an enterprise operating in the form of a joint-stock company whose business consists of trading in financial instruments [www 2].

Almost thirty years of operation have led to the development of the Warsaw Stock Exchange, as evidenced by the indicators it has achieved, including: the number of companies listed on the stock exchange, the market capitalisation of domestic companies, and the volume of trading on the stock exchange. Starting with five companies whose shares could be purchased during the first session in 1991, in 2015–2016 the Warsaw Stock Exchange had already 487 issuers offering their shares on the main market and 418 on the New Connect market in 2015.

However, an analysis of the number of companies listed on the Warsaw Stock Exchange in 2015–2025 shows a worrying trend of a decrease in the number of issuers (Figure 1).

Figure 1. Number of companies listed on the Main Market of the Warsaw Stock Exchange in 2015–2025



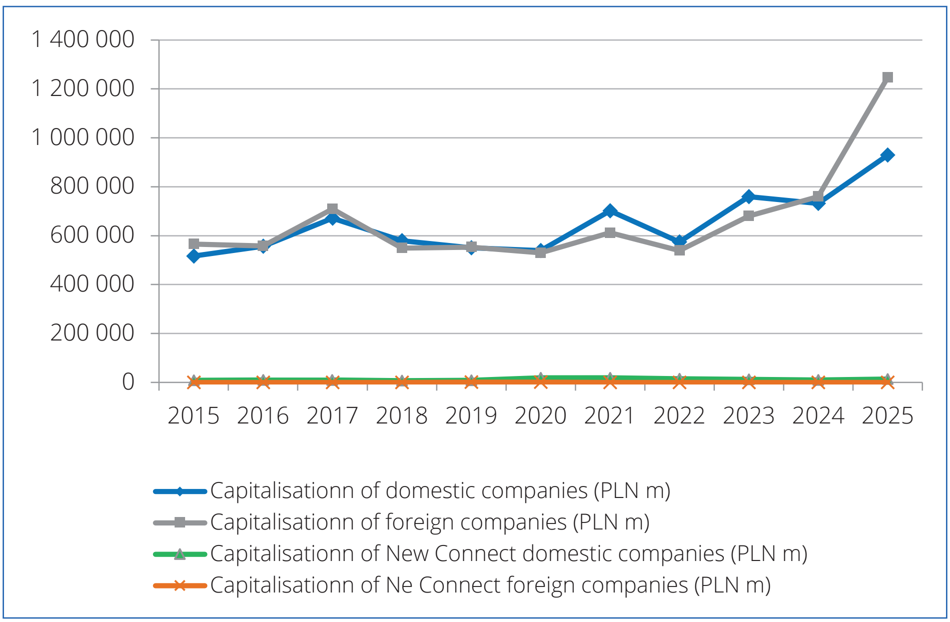
Source: the author’s own study based on [www 3; www 5].

In 2025, there were 402 of them on the main market and 335 on the New Connect market, which indicated a decrease by 85 entities on the Main Market and 6 on the New Connect market compared to 2015.

The observed trend highlights one of the challenges faced by the Warsaw Stock Exchange – the declining value of the IPO index. In 2025, there were only three IPOs on the WSE, compared to 30 in 2015, and 13 on the New Connect market, compared to 19 in 2015.

Another area that enables the assessment of the level of development of the Warsaw Stock Exchange is capitalisation, which determines the market value of the companies listed on the WSE (Figure 2). The highest value was achieved in 2025. The capitalisation of domestic companies listed on the main market amounted to PLN 929 277 million, while the capitalisation of foreign companies reached PLN 1 246.707 million. In the case of the New Connect market, the capitalisation in 2025 amounted to PLN 14 278 million for domestic companies and PLN 34 million for foreign companies. There is a clear increase in interest in the Warsaw Stock Exchange on the part of foreign entities operating on both the main market and the New Connect market [Doukas, Hoque, 2016: 378].

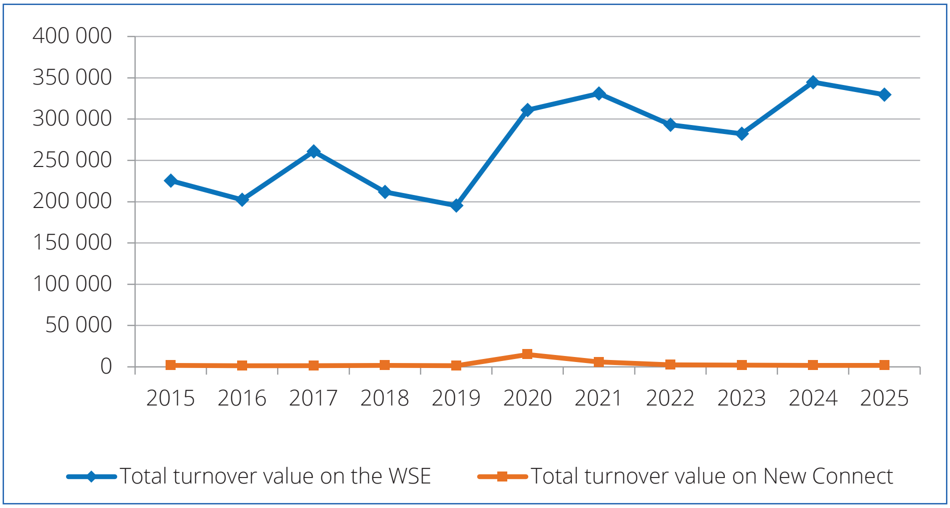
Figure 2. Capitalisation of companies listed on the Warsaw Stock Exchange in 2015–2025 (PLN million)



Source: the author's own study based on [www 3; www 5].

The value of the total turnover is also important for assessing the development of the Warsaw Stock Exchange (Figure 3). The highest level was reached in 2024, which meant an increase of 153% compared to 2015. The highest turnover on the WSE was generated by shares, classified together with bonds in the first category, and those belonging to the second category – futures contracts – i.e. instruments whose price depends on other primary instruments. According to A. Zaremba, "[...] this segment of the market is the fastest growing one in the world" [Zaremba, 2013: 66].

Figure 3. Total turnover on the Warsaw Stock Exchange in 2015–2025 (PLN million)



Source: the author's own study based on [www 3; www 5].

The basic data characterising the Warsaw Stock Exchange confirm, on the one hand, its dynamic development over the analysed period, and on the other hand, signal the challenges it faces, including the desire to increase the number of issuers, striving to increase the value of trading in individual financial instruments, the increasing interest in the capital market among a wide range of investors, and the competition for investor capital. The Warsaw Stock Exchange must also cope with growing competition from both other forms of investment and other European stock exchanges.

4. The Warsaw Stock Exchange compared to European and global stock exchanges

The basis for further assessment of the development of the Warsaw Stock Exchange, as well as its position in relation to other European stock exchanges, was secondary data published by the Federation of European Securities Exchanges (FESE), taking into account the following issues: the number of employees working on European stock exchanges, the number of companies listed on stock exchanges, capitalisation, and the value of share trading. In addition, for the purposes of the study, the stock exchange liquidity index was used, calculated as the quotient of trading and capitalisation. The analysis covered the years 2020–2024, which enabled to carry out a comparative analysis (Table 1).

The Warsaw Stock Exchange is the fifth largest stock exchange in Europe in terms of the number of employees. This position remained unchanged in 2024 compared to 2020, although there was a change of one of the leaders in this area. In 2020, Deutsche Börse, Euronext, and SIX were the leaders. In 2024, however, the leaders in terms of employment were BME, Deutsche Börse, and SIX. When comparing the number of employees to the number of companies listed on the stock exchange, it can be seen that in 2024, there were 1.4 companies per WSE employee. In 2020 there were 1.8 companies per WSE employee.

Table 1. Number of employees on European stock exchanges in 2020–2025

STOCKS	2020	2021	2022	2023	2024
Athens Stock Exchange	230	228	236	254	254
Bme	798	809	938	946	×
Börse Stuttgart	350	348	258	233	233
Bratislava Stock Exchange	×	×	×	×	16
Bucharest Stock Exchange	101	105	100	106	114
Budapest Stock Exchange	62	61	63	62	61
Bulgarian Stock Exchange	51	50	54	58	65
Cyprus Stock Exchange	63	63	63	60	60
Deutsche Börse	7238	10200	11078	14502	15495

STOCKS	2020	2021	2022	2023	2024
Euronext	1138	2126	2203	2324	2518
Ice Futures Europe	202	201	203	×	204
Luxembourg Stock Exchange	197	206	140	139	146
Malta Stock Exchange	52	51	51	47	52
Nasdaq Nordic	475	505	502	467	440
Prague Stock Exchange	81	78	78	77	78
Six	111	132	136	140	4431
Vienna Stock Exchange	81	87	88	87	89
Warsaw Stock Exchange	**454**	**475**	**493**	**598**	**583**
Zagreb Stock Exchange	36	39	39	36	36

× – no data

Source: the author’s own study based on [www 4].

What determines the attractiveness of a stock exchange from the point of view of both investors and issuers is the number of companies listed on it. Their presence determines the market capitalisation, trading value, and liquidity of trading. An analysis of the number of companies listed on European stock exchanges shows that the vast majority recorded a decline in the number of issuers compared to 2020. In the case of the Warsaw Stock Exchange, the number of issuers decreased by 6 entities. The highest percentage loss in the number of issuers in the period under review was recorded by the Cyprus Stock Exchange (-59.85%), the Prague Stock Exchange (-45.45%) and the Zagreb Stock Exchange (-25.24%). In the case of the WSE, the decline amounted to only 0.62%. Nevertheless, some European stock exchanges achieved higher results in this area, e.g. the Malta Stock Exchange (+762.96%), SIX (+106.4%), and the Budapest Stock Exchange (+53.33%), indicating growing competition in the region.

Table 2. Total listings on European stock exchanges in 2020–2025

STOCKS	2020	2021	2022	2023	2024
Athens Stock Exchange	176	160	159	156	149
Bme	2,961	2585	1498	284	×
Börse Stuttgart	×	×	×	×	×
Bratislava Stock Exchange	×	×	×	×	31
Bucharest Stock Exchange	83	82	83	85	86
Budapest Stock Exchange	45	50	63	67	69
Bulgarian Stock Exchange	259	440	252	253	253
Cyprus Stock Exchange	259	108	108	107	104
Deutsche Börse	485	493	481	433	477
Euronext	1,493	1995	1966	1924	1812
Ice Futures Europe	×	×	×	×	×
Luxembourg Stock Exchange	173	130	127	119	115
Malta Stock Exchange	27	30	33	34	233
Nasdaq Nordic	1071	1236	1251	1221	1178
Prague Stock Exchange	55	55	59	30	30
Six	250	232	227	855	516
Vienna Stock Exchange	809	873	864	222	872
Warsaw Stock Exchange	**806**	**810**	**799**	**788**	**801**
Zagreb Stock Exchange	103	97	91	86	77

× – no data

Source: the author's own study based on [www 4].

Attracting new issuers is also crucial to the development of European stock exchanges [Vismara, Paleari, Ritter, 2012: 352–388]. The Polish stock exchange ranked 6th in 2024, compared to the 4th place in 2022 in this respect. In 2024, the Malta Stock Exchange was the most effective in terms of the number of new obtained companies, attracting 124 new entities (Table 3).

Table 3. New listings on European stock exchanges in 2020–2025

STOCKS	2020	2021	2022	2023	2024
Athens Stock Exchange	×	×	4	6	4
Bme	×	×	34	26	×
Börse Stuttgart	×	×	2	0	8
Bratislava Stock Exchange	×	×	×	×	2
Bucharest Stock Exchange	×	×	1	3	3
Budapest Stock Exchange	×	×	14	7	3
Bulgarian Stock Exchange	×	×	6	6	7
Cyprus Stock Exchange	×	×	0	0	×
Deutsche Börse	×	×	10	6	8
Euronext	×	×	83	64	53
Ice Futures Europe	×	×	×	×	×
Luxembourg Stock Exchange	×	×	5	3	7
Malta Stock Exchange	×	×	3	1	124
Nasdaq Nordic	×	×	63	29	32
Prague Stock Exchange	×	×	5	1	0
Six	×	×	5	2	28
Vienna Stock Exchange	×	×	5	15	39
Warsaw Stock Exchange	**×**	**×**	**29**	**24**	**22**
Zagreb Stock Exchange	×	×	2	0	0

× – no data

Source: the author's own study based on [www 4].

One of the key factors influencing the development of the stock exchange, apart from the number of companies, is the closely related market capitalisation value, which determines the total capitalisation of all companies listed on the stock exchange. Thus, its value depends, on the one hand, on the number of issuers, the number of the issued securities and their market price expressed in share price.

Table 4. Market capitalisation on European stock exchanges in 2020–2025 (EUR m)

STOCKS	2020	2021	2022	2023	2024
Athens Stock Exchange	41 758	52 311	55 139	73 673	82 508
Bme	621 764	684 899	621 575	697 235	x
Börse Stuttgart	x	x	x	x	x
Bratislava Stock Exchange	x	x	x	x	2 236
Bucharest Stock Exchange	20 847	28 514	27 042	43 327	45 495
Budapest Stock Exchange	22 787	27 798	22 253	35 242	39 894
Bulgarian Stock Exchange	14 497	15 738	15 429	7 926	8 932
Cyprus Stock Exchange	14 497	4 991	6 102	9 404	11 398
Deutsche Börse	1 870 685	2 210 189	1 764 946	1 973 316	2 132 151
Euronext	4 458 593	6 475 616	5 664 213	6 241 462	6 052 738
Ice Futures Europe	x	x	x	x	x
Luxembourg Stock Exchange	42 234	54 034	47 538	48 764	43 662
Malta Stock Exchange	4 161	4 254	4 071	4 669	4 472
Nasdaq Nordic	1 728 450	2 258 163	1 734 186	1 920 369	1 868 797
Prague Stock Exchange	21 767	33 048	26 949	31 335	33 179
Six	1 637 776	2 043 339	1 714 030	1 822 604	2 692 121
Vienna Stock Exchange	108 176	143 831	114 927	125 602	125 975
Warsaw Stock Exchange	**146 368**	**174 282**	**137 837**	**191 453**	**189 064**
Zagreb Stock Exchange	18 362	18 599	18 057	22 971	29 013

× – no data

Source: the author's own study based on [www 4].

In this case, the highest positions were consistently held by Euronext, Deutsche Borse AG, Nasdaq Nordic, Six, and BME during the analysed period. The Warsaw Stock Exchange ranked sixth, ahead of the other stock exchanges of Central and Eastern European countries, which proves its leading position in the region.

Undoubtedly, the Warsaw Stock Exchange is an important center of the Central and Eastern European financial market, which may be due to several factors. Firstly, its competitive advantage over the leaders is cost-related, which means that both Polish and foreign companies can operate on the capital market at a relatively lower cost compared to other European stock exchanges. The demand potential of the Polish market is also significant. "[...] foreign companies place their assets on the Warsaw Stock Exchange either to raise capital for development in Central and Eastern Europe, or to be able to develop on the Polish market [Przybylska-Kapuścińska, 2008: 128]. In addition, foreign companies practice dual listing, which means issuing securities on several stock exchanges, thereby improving their statistical data.

At the same time, it should be kept in mind that the last decade of the WSE's operation proves the challenges faced by the Polish stock exchange, as also pointed out by K. Kowalke [Kowalke 2017: 273–286]. These include: growing competition from other European stock exchanges, a decreasing number of issuers, and low liquidity.

5. Summary

According to the prevailing paradigm, the development of the financial sector through the more efficient use of resources demonstrates a high level of economic maturity [Karagiannis, Kvedaras, 2016; Breitenlechner, Gächter, Sindermann, 2015: 31–33; Apergis, Artikis, Kyriazis, 2015: 42–64; Panizza, 2014: 35–65; Balta, Nikolov, 2013: 7–18; Beck, Levine, Loayza, 2000: 261–300]. "From relatively simple intermediaries of capital transfer, they have become institutions conducting diversified activities. Stock exchanges open up new trading markets, e.g. for innovative small and medium-sized enterprises, create new products, and take over functions within the value chain that were previously performed by separate institutions" [Rydzewska, 2017: 159]. Owing to modern technologies, stock exchanges are going beyond the domestic market, competing for foreign investors and their capital, as well as for foreign issuers [Gorczyńska, 2012: 33–35]. Thus, the stock exchange has become a key institution of the financial market, creating opportunities for trading securities.

Over the course of nearly thirty years, the Warsaw Stock Exchange has established itself as the leader in the region. An analysis of the condition of the Warsaw Stock Exchange, based on indicators determining the number of companies listed on the exchange, its turnover, as well as the capitalisation of domestic companies, allows to recognise the maturity of the Polish stock exchange. Similar conclusions were reached on the basis of a comparative analysis determining the position of the WSE in relation to other European stock exchanges. Thus, the research hypothesis was verified positively.

Nevertheless, the Warsaw Stock Exchange faces many challenges, including: low value of public offerings, low liquidity ratio, opportunism of issuers in terms of transitioning from the New Connect market to the Main Market, as well as competition for both issuers and investors from other European stock exchanges. This justifies conducting regular studies verifying the position of the Warsaw Stock Exchange in relation to other global stock exchanges, especially European ones, undertaking both spatial and temporal analysis.

References

Adamska A., 2019, *Modele rozwoju rynku kapitałowego w Państwach Europy Środkowo-Wschodniej*, "Zeszyty Naukowe SGGW, Polityki Europejskie, Finanse i Marketing" No. 21(70), pp. 7–21, DOI: 10.22630/PEFIM.2019.21.70.1.

Aluchna M., 2007, *Mechanizmy corporate governance w spółkach giełdowych*, Warszawa.

Apergis N., Artikis P.G., Kyriazis D., 2015, *Does Stock Market Liquidity Explain Real Economic Activity? New Evidence from Two Large European Stock Markets*, "Journal of International Financial Markets, Institutions & Money", No. 38, pp. 42–64, DOI: 10.1016/j.intfin.2015.05.002.

Balta N., Nikolov P., 2013, *Financial Dependence and Growth since the Crisis*, Quarterly Report on the Euro Area (QREA), "Directorate General Economic and Financial Affairs (DG ECFIN)", European Commission, Vol. 12(3), October, pp. 7–18.

Banaszczak-Soroka U., 2019, *Rynki finansowe. Organizacja, instytucje, uczestnicy*, Warszawa,

Beck T., Levine R., Loayza N., 2000, *Finance and the Sources of Growth*, "Journal of Financial Economics", Vol. 58(1–2), pp. 261–300, DOI: 10.1016/S0304-405X(00)00072-6.

Breitenlechner M., Gächter M., Sindermann F., 2015, *The Finance-growth Nebdus in Crisis*, "Economics Letters", Vol. 132, Issue C, pp. 31–33, DOI: 10.1016/j.econlet.2015.04.014.

Czaja S., 2020, *Zarządzanie papierami wartościowymi*, Głogów.

Dobosiewicz Z., 2011, *Bankowość*, Warszawa.

Dobosiewicz Z., 2013, *Giełda. Zasady Działania. Inwestorzy. Rynki giełdowe*, Warszawa.

Doukas J.A., Hoque H., 2016, *Why Firms Favour the AIM when They Can List on Main Market?*, "Journal of International Money and Finance", No. 60, pp. 378–404, DOI: 10.1016/j.jimonfin.2015.10.001.

Dziawgo D., 2012, *Rynek finansowy: istota – instrumenty – funkcjonowanie*, Warszawa.
Eberhart R., Eesley C., 2018, *The Dark Side of Institutional Intermediaries: Junior Stock Exchanges and Entrepreneurship*, "Strategic Management Journal", Vol. 39, Issue 10, pp. 2643–2665, DOI: 10.1002/smj.2934.
Galariotis E., Giouvris E., 2015, *On the Stock Market Liquidity and the Business Cycle: A Multi Country Approach*, "International Review of Financial Analysis", Vol. 38, March 2015, pp. 44–69, DOI: 10.1016/j.irfa.2015.01.009.
Gorban I., Buga D., Puscas, V., 2024, *The Stock Exchange and Its Role in the* Economic System: The Impact of the Stock Exchange on the Country's Economy, "American Journal of Innovation in Science Research and Development", Vol. 1, No. 10, pp. 15–19.
Gorczyńska A., 2012, *Organizacja giełdy papierów wartościowych jako przedsiębiorstwa*, "Przegląd Organizacji", No. 8(871), pp. 32–35.
Granier C., Revest V., Sapio A., 2019, *SMEs and Junior Stock Markets: A Comparison between European and Japanese Markets*, "Journal of Innovation Economics & Management", Vol. 2(29), pp. 43–67.
Harwood A., Konidaris T., 2015, *SME Exchanges in Emerging Markets Economies*, "Policy Research working paper", No. WPS 7160 Washington.
Karagiannis S., Kvedaras V., 2016, *Financial Development and Economic Growth: A European Perspective*, Luxembourg.
Kowalke K., 2017, *Płynność obrotu Giełdy Papierów Wartościowych w Warszawie na tle płynności giełd europejskich*, "Zeszyty Naukowe Uniwersytetu Szczecińskiego Finanse Rynki Finansowe Ubezpieczenia", No. 2, pp. 273–286, DOI: 10.18276/frfu.2017.86-23.
Panizza U., 2014, *Financial Development and Economic Growth: Known Knowns, Known Unknowns, and Unknown Unknowns*, "November 2014, Revue D Économie du Développement 22(HS02)", DOI: 10.3917/edd.hs02.0035.
Rydzewska A., 2017, *Finansjalizacja a klasyczne funkcje giełdy papierów wartościowych*, "Studia i Prace Kolegium Zarządzania i Finansów. Zeszyty Naukowe", No. 154, pp. 155–172.
Switzer L.N., Picard A., 2016, *Stock Market Liquidity and Economic Cycles: A Non-linear Approach*, "Economic Modelling" Elsevier, Vol. 57(C), pp. 106–119, DOI: 10.1016/j.econmod.2016.04.006.
Szymański M., Wojtalik G., 2022, *Wpływ wyborów politycznych na ceny akcji na Giełdzie Papierów Wartościowych w Warszawie*, "Ekonomista", No. 3, pp. 290–306.
Tarczyński W., 1997, *Efektywność działania Giełdy Papierów Wartościowych w Warszawie*, "Ekonomista", No. 4, pp. 521–538.
Vismara S., Paleari S., Ritter J., 2012, *Europe's Second Markets for Small Companies*, "European Financial Management", Vol. 18, Issue 3, pp. 352–388, DOI: 10.1111/j.1468-036X.2012.00641.x.
Widz E., 2016, *Wahania indeksów giełdowych a wahania koniunktury gospodarczej w Polsce*, "Acta Universitatis Lodziensis Folia Oeconomica", No. 4(323), pp. 155–158, DOI: 10.18778/0208-6018.323.11.

Wiśniewski J., Wyrzykowska-Antkiewicz M. (eds), 2014, *Rynki finansowe w dobie kryzysu*, Vol. 29, Gdańsk.
Zaremba A., 2013, *Giełda.Podstawy inwestowania*, Gliwice.

www 1, https://www.gpw.pl/o-spolce#historia [date of access: 2.09.2025].
www 2, https://www.gpw.pl/pub/GPW/files/PDF/Statut_GPW_17.06.2019.pdf [date of access: 2.09.2025].
www 3, www.gpw.pl/podstawowe-statystyki-gpw [date of access: 2.09.2025].
www 4, https://www.fese.eu/statistics/european-exchange-report [date of access: 2.09.2025].
www 5, https://newconnect.pl/o-rynku [date of access: 2.09.2025].