SILESIAN UNIVERSITY OF TECHNOLOGY PUBLISHING HOUSE

SCIENTIFIC PAPERS OF SILESIAN UNIVERSITY OF TECHNOLOGY 2025
ORGANISATION AND MANAGEMENT SERIES NO. 237

RETURNS ON IPOS IN THE POLISH CAPITAL MARKET: SHORT AND LONG TERM PERSPECTIVE

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Purpose: The purpose of the study was to assess the development of short- and long-term stock returns from initial public offerings (IPOs) on the Warsaw Stock Exchange. The in-house study aimed to verify the hypothesis assuming the existence of anomalies on the WSE's main market in relation to IPO companies, consisting in the undervaluation of share prices in the short term and their overvaluation in the medium and long term.
Design/methodology/approach: The main research method was the analysis of historical stock returns from initial public offerings. The existence of undervaluation in the prices of shares participating in IPOs was verified using the initial return (IR) and the adjusted initial return (AIR). On the other hand, the measurement of overvaluation in the long term was made using simple rates of return (BHR) and abnormal rates of return (BHAR).
Findings: The study confirmed the phenomenon of undervaluation of share prices in IPOs on the Polish capital market between 2010 and 2024, where the average initial return (IR) was 9.73%. The highest average returns in the short term were recorded in 2020. (over 40%), mainly due to gaming companies and ALLEGRO. On the other hand, in the longer term, the worst performance, with negative average returns (BHAR) in all the time intervals analysed, occurred in the period 2019-2024, due to post-pandemic economic problems and the dominance of companies generating negative returns.
Research limitations/implications: Our own research partially fills the information gap regarding the Polish capital market after 2016, thanks to the analysis of data from 2010-2024. Taking into account a longer time horizon allows for a more comprehensive assessment of investment effectiveness, which is rare in previous Polish studies. The use of an approach that takes into account economic cycles makes it possible to compare the results of IPOs in different phases of the economy.
Practical implications: the analysis provides valuable insights for market participants. The results on undervaluation in the short term and volatility of returns in the long term are of direct relevance to investors (e.g. in the context of 'buy and hold' investment strategies, issuers (e.g. in the context of IPO pricing) and financial intermediaries.
Originality/value: The value and originality of the study stems from the analysis of current data for the Polish WSE main market (2010-2024), which fills the information gap after 2016. The study is comprehensive, covering both short and long periods and considering different

investment horizons, which is rare in Polish studies to date. The analysis takes into account different time frames reflecting business cycles.
Keywords: undervaluation, overvaluation, IPO, public offering.
Category of the paper: Research paper.

1. Introduction

The term 'initial public offering' is defined in general terms in the literature and has various interpretations (Sobotnik, 2009, pp. 268-269). It usually refers to the public offering of shares of a company, which is equivalent to its debut on the stock market (Siwek, 2005, pp. 12-13). An initial public offering may include the issuance of shares on the public market for the first time (first subscription) and the sale of existing shares by existing shareholders but for the first time on the public market (first sale) (Siwek, 2005, p. 13; *Act of 29 July 2005..., art. 4(5)*). According to Polish and European law, "a public offer of securities means a communication addressed to the public in any form and by any means, presenting sufficient information on the terms and conditions of the offer and the securities offered, in order to enable an investor to take a decision to purchase or subscribe to those securities (*Regulation of the European Parliament and of the Council of the EU 2017/1129..., art. 2(d)*). As of 21.07.2019, a communication with the above content addressed to at least two persons (previously it was 150 persons) is considered a public offer (FSC, 2025).

Initial public offerings (IPOs) are often associated with the phenomenon of rising share prices in the short term, particularly during the IPO, which is referred to as *underpricing*. On the other hand, in the longer term, a phenomenon of falling share values, known as *underperformance*, is usually observed (Lizinska, 2014, p. 384). IPO underpricing is common on stock exchanges around the world, but its intensity varies by market, period of analysis and business cycle (Ibbotson et al., 1995, pp. 994-996). The phenomenon of *underperformance* means that long-term stock returns are lower than those of the broad market, as measured by the WIG index, or relative to companies with a similar profile that have not conducted an IPO in the same period (Wieczorek, 2020, p. 359).

Taking up this research topic is justified by the identified gaps in the existing scientific literature and the specificity of the Polish capital market. There is a distinct lack of up-to-date and detailed analyses of the phenomenon of undervaluation and overvaluation on the Warsaw Stock Exchange (WSE). The existing studies for the Polish market are characterised by a limited time horizon, usually focusing on two- or three-year ranges, which is a significant departure from the comprehensive analyses of several years conducted on developed markets, as exemplified by J.R. Ritter's studies for the US market. Furthermore, most of the available work is based on data prior to 2016, resulting in an information gap with regard to current market dynamics and the behaviour of returns.

Despite the fact that the WSE's main market plays a key role in raising financing for companies, research to date has mainly focused on the long-term effectiveness of IPOs on large capital markets in a homogenous geographic space, such as the US, Germany or China. Comprehensive analyses for the Polish market are lacking. Previous studies on emerging markets have often been limited to companies in specific industries, such as gaming, which prevents a full understanding of the overall trends.

In the context of the above shortcomings, a detailed study of the Polish IPO market is essential. This market requires constant monitoring and analysis of phenomena due to its importance for capital raising. Thus, a comprehensive analysis of the long-term effectiveness of IPOs on the WSE, going beyond the current methodological and time constraints, is fully justified and will fill important gaps in the academic literature and provide valuable insights for capital market participants.

The aim of the study was to assess the development of short- and long-term returns on initial public offerings (IPOs) on the Warsaw Stock Exchange. A research hypothesis was formulated as follows: anomalies are assumed to exist on the WSE's main market in relation to IPO companies, consisting in the undervaluation of share prices in the short term and their overvaluation in the medium and long term.

The study formulates the following research questions:

1. What were the short-term rates of return on shares (IR and AIR) of companies debuting on the main market of the Warsaw Stock Exchange in 2010–2024, in particular on the day of their debut, and was there any undervaluation of share prices during this period?
2. What were the medium- and long-term rates of return on shares (BHR and BHAR) of companies debuting on the main market of the WSE in 2010–2024, depending on the investment horizon (from 1 month to 72 months after debut), and was there any underperformance (worse results compared to the broad market) during this period? compared to the broad market)?

2. A review of the literature research on returns on first issue shares

2.1. Short-term stock returns according to foreign and domestic studies to date

In the short term, especially on the day of the debut, *underpricing* is common. This means that the closing share price on the day of the debut is higher than the issue price (Wieczorek, p. 359). Miller and Reilly (1987) argue that market valuation on the day of the debut is often inappropriate. Paleari and Vismara (2007) noted that issuers and analysts often 'overvalue' new companies, which is beneficial as it increases investor confidence and builds a positive image of the issuer.

Empirical studies confirm the occurrence of the phenomenon of undervaluation both on foreign markets and in Poland. Ibbotson, Sindelar and Ritter's (1994) research on US stock exchanges between 1960 and 1992 showed that the average undervaluation of shares of debuting companies varied depending on the decade, e.g. amounting to 21.3 per cent in the 1960s and 10.9 per cent in the 1990s. Loughran, Ritter and Rydqvist (2020), analysing data from 54 countries, proved that the average returns on the first day of the debut were in the range of a few to several per cent. Examples of return values are: USA - 16.9 per cent (1960-2019), Germany - 23 per cent (1978-2014) and the UK - 15.8 per cent (1959-2016). Perz's (2025) compilation of data for emerging and mature markets showed that the phenomenon of undervaluation was stronger in emerging markets than in mature markets. For example, China had an average return of 388.0% between 1989 and 1996, while mature markets, such as the US, had a return of 15.8% between 1960 and 1996.

The most recent survey results for the US market, conducted by Ritter (2025) for the period 1980-2023, show that the highest average initial rate of return was recorded between 2019 and 2023 at 158.0%. A high rate of return also occurred between 1998 and 2000 (149.40%).

Lyn and Zychowicz (2003), analysing IPOs on the Polish and Hungarian markets between 1991 and 1998, found that the average first-day return in Poland, adjusted for the WIG index, was 15.1%. A study by Czapiewski et al. (2014) on the WSE between 1991 and 2011 showed that the magnitude of IPO undervaluation decreased as the capital market developed. The average adjusted initial return for total offerings was 34.1% in 1991-2000, while it was 13.6% for the period 2001-2011. Pomykalski and Domagalski's (2015) study found that the average undervaluation for the period 2005-2013 was 11.89%.

Trąpczyński (2017) found that the average undervaluation for 200 IPOs on the WSE between 2007 and 2016 was 7.89%, which was significantly lower compared to the results of previous studies on the Polish market, where the average undervaluation between 1991 and 1997 was 19.8%. Lizińska and Czapiewski (2014), analysing IPOs on the WSE between 2004 and 2009, reported an average first-day return of 10.98%. They also found that higher pre-issue company profitability correlated with higher levels of undervaluation.

Sukacz (2005), studying 185 IPOs between 1991 and 2002, found an average undervaluation of 26%. He also observed that industries such as construction, media, publishing, electrical machinery and IT achieved the highest returns on the first day of listing. Podedworna-Tarnowska's (2024) research on IPOs between 2017 and 2021 showed that among the largest listings, the average first-day return was 13.68%, while for the smallest listings it was 22.90%. Among the smallest listings, high returns were recorded in the gaming industry.

Aziewicz and Dobrowolski (2014) showed a high volatility of returns on debut day between 2005 and 2013, implying no clear regularity for a long-term investment strategy. Nearly 64% of the companies provided returns above the average return of the WIG index on the debut date. Frydrych (2022) analysed the years 2007-2020 and found, that 60.22% of companies had

a higher price at the end of the first day of trading than the issue price, and that debuts of penny companies (below PLN 1) played a dominant role.

In summary, undervaluation in the short term is a common phenomenon, globally stronger in emerging markets. Polish research confirms its occurrence, indicating a potential tendency to reduce its magnitude as the capital market develops.

2.2. Long-term stock returns according to foreign and domestic studies to date

Over the long term, the share price reaction of IPO companies on the main market is often negative. This phenomenon is referred to as *long-run underperformance*, meaning that investors tend to lose out on their investment in the shares of such companies compared to the market index or other companies.

The occurrence of abnormal returns over the long term was pointed out by Ritter (2025). His study for the US market between 1980 and 2023 showed that average 3-year adjusted returns (BHAR) were typically negative, e.g. -20.20% for the entire period 1980-2023. For the period 2019-2023, the average BHAR was – 296.40%**.** This suggests that there was no systematic positive overvaluation of equities in the US market among the group of debut companies. Similar negative 3-year returns were observed in Spain, Sweden and Switzerland, ranging from -12% to -42% (Schuster, 2003).

International studies tended to confirm that buying shares in IPOs and holding them for up to three years was not a profitable strategy, with company prices below their benchmark indices. The exceptions were Sweden (+1.20%) and Korea (+2.0%), where relative returns over the long term turned positive (Sehgal, Singh, 2007). Goergen et al (2007) found that the more profitable the company prior to the IPO and the greater the ownership dilution following the IPO, the more negative the long-run returns. On the other hand, they noted that more favourable long-term returns occurred for larger companies.

Polish empirical studies have shown that returns on investments in shares of IPO companies in the medium and long term were significantly lower than on the day of the debut. Their values were similar to the results for developed countries. Sieradzki (2013) pointed out that holding shares one year after the IPO yielded, after adjusting for the change in the WIG index, an average negative abnormal return of -4.2%. Zielinski (2013), analysing the WSE between 1994 and 2016, found that the adjusted BHAR 36M return ranged from -14% to -28.6% depending on the target group. Rzewuska and Wrzesinski (2016) proved that investments in companies from IPOs conducted in 2006 yielded an average return 9% lower than the stock market index over a two-year period, while over a three-year period it was as high as 26%.

Kwit (2006) estimated that if one decided to buy shares of companies debuting during the first trading session and kept them in one's portfolio for three years, one could gain 17% less compared to the shares of other companies listed on the Warsaw Stock Exchange.

A study by Kochalski and Ratajczak (2025) showed that the average stock return of companies with IPOs from 2009-2011 showed a downward trend until the 370th day of trading. The average return (BHR) over the first 370 days was -19.35%. Aziewicz and Dobrowolski (2014) confirmed that the phenomenon of companies being overvalued 12 months after listing with above-average returns was not sustained between 2006 and 2014, with a more pronounced trend of negative returns emerging three years after listing. Some studies, such as the one by Wieczorek (2020) on 29 gaming companies, cast doubt on the long-term underperformance by showing positive average BHAR levels for this group.

In summary, studies on capital markets, including the WSE, over the long term indicate that investors holding shares of debut companies perform statistically worse compared to the market. Although most studies confirm the *underperformance* phenomenon, not all have shown the existence of systematic overvaluation in the medium term, and returns have been variable from year to year.

3. Survey methodology

Verification of the existence of undervaluation in the prices of shares participating in the IPO was carried out using the *initial return* (IR) and the *adjusted initial return* (AIR).

The formula for calculating the instantaneous rate of return is as follows (Wieczorek, 2020, pp. 367-368; Trąpczyński, 2017, p. 150; Wieczorek, 2019, p. 88):

$$IR_i = \frac{(P_i - E_i)}{E_i} * 100\%, \quad (1)$$

where:

IR_i – the initial return on investment in the company's shares *and* offered in the IPO on the first day of trading,

P_i – the closing price of the company's shares (or rights to shares) *and* at the close of trading on the day of the IPO,

E_i – the price of the shares offered by the company *i* (issue price or reference price).

The main advantage of the simple rate of return is that it is the only such rate whose use in portfolio theory is mathematically justified (Piasecki, Tomasik, 2013, p. 31). Calculating the rate of return on the basis of the presented formula allows us to assess the profitability of investing in the shares of a given company at the time of the IPO.

In order to infer for the groups of companies debuting on the WSE that are separated within the research sample, the rates of return determined on specific listing days of individual companies can be aggregated and divided by the number of companies in the group, which allows the average adjusted initial rate of return to be calculated. The formula for the average initial rate of return on the day of listing is as follows (Siwek, 2005, p. 146):

$$\overline{IR} = \frac{1}{N}\sum_{i=1}^{N} IR_i \ , \tag{2}$$

where:

$\overline{IR}$ - average initial rate of return,

N – total number of companies surveyed.

Research papers also use the adjusted initial rate of return for the relative change in the stock market index (AIR). This rate takes into account the change in the broad market, which allows an analysis of the profitability of the investment relative to the overall market. In the empirical part, the WIG index was taken as the benchmark for stock returns reflecting the efficiency of investments in the broad stock market due to the fact that it is considered the primary barometer of the Polish stock market (Zimny, 2017, p. 114). The formula for the initial adjusted rate of return was as follows (Wieczorek, 2020, p. 368; Podedworna-Tarnowska, Kiełpsz, 2024, p. 56; Wieczorek, 2019, p. 88):

$$AIR_i = \frac{(P_i - E_i)}{E_i} - \frac{(M_i - M_0)}{M_0} * 100\%, \tag{3}$$

where:

AIR_i – the initial return on investment in the company's shares *and* IPO offerings adjusted for the relative change in the stock market index,

P_i – the closing price of the company's shares *and* on the first day of trading,

E_i – the price of the shares offered by the company (issue price or reference price),

M_i – value of the stock exchange index on the first day of trading of the company *i*,

M_0 – value of the stock market index at the date of allotment of the company's shares *i*.

The following formula (Siwek, 2005, p. 155) was used to calculate the average adjusted initial stock return of all companies for a given time interval:

$$\overline{AIR} = \frac{1}{N}\sum_{i=1}^{N} AIR_i \ . \tag{4}$$

The average adjusted initial return indicates what the abnormal return was in each of the consecutive quotations considered.

With regard to the initial adjusted stock return in the empirical part, a verification of statistical significance was also carried out. Accordingly, two research hypotheses were formulated:

$$H_0: AIR_i = 0$$
$$H_1: .AIR_i > 0 \tag{5}$$

A parametric test t_{stat} for the sample mean value with a one-sided rejection area, based on the Student's t-statistic, which is determined according to the following formula, was used to verify the hypotheses:

$$t_{stat} = \frac{AIR_i}{\hat{S}(\overline{AIR_i})}\sqrt{n} \tag{6}$$

where $\hat{S}(\overline{AIR_i})$ - The standard deviation of the adjusted stock return on the first day of trading.

Assuming a normal distribution of instantaneous rates of return and the truth of the statistical hypothesisH_0 the test statistic t_{stat} has a Student's t-distribution with n-1 degrees of freedom. If the decision is made to reject the null hypothesis, the instantaneous rate of return will differ from zero and the result obtained will be statistically significant. For the determined rates of return, the value of the test statistic t_{stat} was calculated together with the critical probability (Sosnowski, 2014, p. 201).

In order to calculate returns over longer time intervals, the BHR '*buy-and-hold*' (BHR) approach is used in the literature to verify the occurrence of overvaluation of share prices over the longer term. This assumption is based on the fact that the investor will hold the purchased shares in the portfolio at the time of the IPO until the exit (Wieczorek, 2020, p. 368). The timing of the sale in the empirical part was denoted as 1M/3M/6M/12M/24M/48M/60M/72M, respectively, where *M* refers to the number of months since the IPO for each time interval *t*. The return on BHR shares was calculated as follows (Wieczorek, 2020, p. 368; Podedworna-Tarnowska, Kiełpsz, 2024, p. 56):

$$BHR_{i,T}^{IPO} = \frac{P_{it} - P_{i1,}}{P_{i1}} * 100\%, \tag{7}$$

where:

$BHR_{i,T}^{IPO}$ – simple rate of return on investment in company *i* shares at date *t*,

P_{it} – the closing price of *i*'s shares on the day of quotation *t*,

P_{i1} – the allotment price of the company's *i* shares on the allotment date *t=1*.

The following formula was used to calculate the average stock return of all companies (BHR) for a given time interval:

$$\overline{BHR_{i,T}^{IPO}} = \frac{1}{N}\sum_{n=1}^{N} BHR_{i,T}^{IPO}, \tag{8}$$

where N – total number of companies surveyed.

On the other hand, if the rate of return on specific financial instruments is compared to the returns on the benchmark portfolio, then the so-called *abnormal* rate of return, BHAR (*buy and hold abnormal return*), is determined. In order to calculate the BHAR, the simple rate of return on shares of the company i for the quotation t ($BHR_{i,T}^{IPO}$) should be adjusted by the hypothetical rate of return on the WIG income index, which is calculated according to the following formula (Kochalski, Ratajczak, p. 137):

$$BHR_{i,T}^{WIG} = \frac{I_{it} - I_{i1,}}{I_{i1}} * 100\% \tag{9}$$

where:

$I_{n,t}$ – the closing price of the WIG index corresponding to quotation *t* for company *i*,

$I_{i,1}$ – the closing price of the WIG index on the day of allotment *t=1* share of company *i*.

The abnormal rate of return for each company on successive trading days was determined according to the following formula (Kochalski, Ratajczak, p. 369):

$$BHAR_T^i = BHR_{i,T}^{IPO} - BHR_{i,T}^{WIG}. \quad (10)$$

In order to calculate the abnormal return of all companies considered under the time criterion, the equation for the average abnormal return was used (Podedworna-Tarnowska, Kiełpsz, 2024, p. 56):

$$\overline{BHAR_T} = \frac{1}{N}\sum_{i=1}^{N} BHAR_T^i. \quad (11)$$

As for instantaneous returns, two statistical hypotheses were also formulated for returns resulting from the implementation of a buy-and-hold strategy (Sosnowski, 2014, p. 224):

$$H_0: BHAR_T = 0$$
$$H_1: BAHR_T < 0\ . \quad (12)$$

A parametric test t_{stat} with a one-sided rejection area was used to verify the hypotheses, whose Student's t-statistic was determined according to the following formula (Sosnowski, 2014, p. 224):

$$t_{stat} = \frac{BHAR_T}{\hat{S}(\overline{BHAR_T})}\sqrt{n}, \quad (13)$$

where $\hat{S}(\overline{BHAR_T})$ - standard deviation of the BHAR return.

Assuming a normal distribution for BHAR returns and the truth of the statistical hypothesisH_0 , the test statistict_{stat} has a Student's t-distribution with n-1 degrees of freedom. Rejecting the null hypothesis will mean that the BHAR return rate is significantly different from zero and the result obtained is statistically significant.

Below is a Diagram 1 illustrating the analytical steps of the WSE's own study on IPO returns.

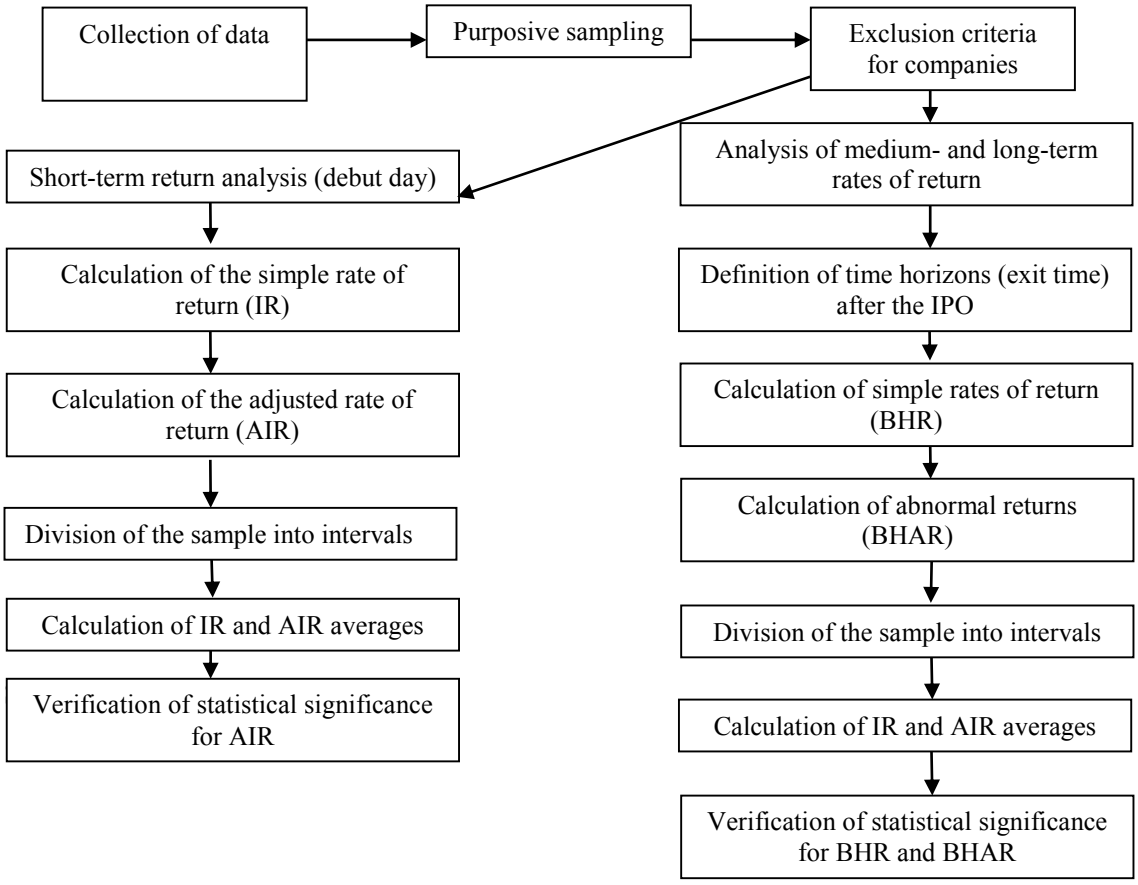

Diagram 1. Stages of own research.

4. Short- and long-term stock returns in the light of own research

4.1. Research assumptions and sampling

The data used in the study to calculate returns on shares of companies debuting on the main market were secondary data obtained from the WSE's official website (issue price), as well as the website https://stooq.pl/ (closing price of shares and WIG stock index quotations). The advantage of the data provided on this website is that they take into account the following operations (Stooq.pl):

- dividends,
- subscription rights,
- acquisition rights,
- allotment rights,
- stock splits,
- denominations or redenominations.

All the events mentioned have been taken into account in the historical share prices of the companies by converting them with the appropriate divisor value, so that they did not distort the rates of return for the periods in which they occurred.

The sampling for the study was purposive and based on the following criteria:

1. Companies that made an initial public offering (IPO) on the Warsaw Stock Exchange between 2010 and 2024 and at the same time were listed on 31.12.2024 were included, which means that entities debuting on the alternative market - NewConnect - were excluded from the research sample.
2. The study excludes IPOs which, although they took place on the main market, had the character of a transition from the NewConnect market, as well as those of a so-called *cross-listing* nature, i.e. those which took place simultaneously on several stock exchange floors.
3. Companies for which there was no classic IPO on the WSE, i.e. the offering was a dual listing, were excluded from the analysis; the excluded companies are: Sopharma AD, Eurohold Bulgaria, Tatry Mountain Resorts, AB Inter Rao, City Service or debut was the result of a spin-off: Marvipol Development.
4. Shares of the company for which the initial price (issue price, offer price) was known at the time of the IPO on the Warsaw Stock Exchange were included.
5. Shares of the company on the first day of trading on the Warsaw Stock Exchange for which the closing price of the shares was known were included.

In addition, it should be emphasised that, as in T. Sosnowski's study, if the company used rights shares (rights issue shares) in its IPO, then in the empirical study the price of rights shares was treated equivalently to the price of shares. In contrast, if both types of securities were listed on the day of the IPO, then the closing price of the shares was taken into account (Sosnowski, 2014, pp. 197-198).

Based on the aforementioned criteria, the total sample under study comprised 90 companies. For the research sample, stock returns were analysed due to the criterion concerning the investment horizon since the IPO.

In calculating long-term returns, it was assumed that the investor follows a passive investment strategy, which is characterised by the fact that the shares purchased are held by the investor for a certain period of time, regardless of the economic situation in the country and market fluctuations.

Taking into account the investment horizon, an initial return (IR) and adjusted initial return (AIR) were calculated for each company in the sample, while simple stock returns (BHR) and relative returns, i.e. adjusted for the WIG index (BHAR), were calculated for longer periods, assuming an appropriate number of trading sessions:

a) one-month returns - 1M, taking quotes from the 21st trading session,
b) three-month returns - 3M, taking quotes from the 63rd trading session,
c) six-month returns - 6M, taking quotes from the 126th trading session,

d) twelve-month returns - 12M, taking quotes from the 252nd trading session,
e) twenty-four-month returns - 24 M (2-year), taking 504 quotes from the trading session,
f) thirty-six-month returns - 36 M (3-year), taking the 756th quotation of the trading session,
g) forty-eight month returns - 48M (4-year), taking the 1008th quotation of the trading session,
h) sixty-month returns - 60 M (5-year), taking the 1260th quotation of the trading session,
i) seventy-two month returns - 72M (6-year), taking 1512 quotations from the trading session.

Returns were calculated for each company participating in the IPO during the analysis period, and average returns were then determined for the following time periods:

- 2010-2012,
- 2013-2015,
- 2016-2018,
- 2019-2024.

The division of the research period into five time periods was dictated, inter alia, by the fact that the sample included a similar and sufficient number of companies, which is important for the reliability of statistical analyses. In addition, the intention was to capture in the selected time periods the different phases of the business cycle and market conditions prevailing in Poland and Europe at the time under analysis, as well as to group the years with similar macroeconomic and market characteristics, which facilitates the comparison of rates of return of debuting companies in different periods. For the indicated time periods, in addition to the averages for the stock returns of the companies included in the study, the median and standard deviation were also calculated.

4.2. Characteristics of the research sample

The number of companies debuting on the WSE main market (excluding NewConnect) between 2010 and 2024, as well as the number of companies that were active on the WSE as of 31 December 2024 and included in the research sample and the percentage of active companies in the total number of debuts in a given year are presented in Table 1.

Table 1.
Number of companies on the WSE included in the sample and the share of the sample companies in the number of IPOs on the WSE between 2010 and 2024

Year of the company's debut	Number of companies newly listed on the WSE (excluding NewConnect)	Number of companies in the research sample (companies active on the WSE as at 31.12.2024)	Share of companies in the sample in the total number of companies newly listed on the WSE
1	**2**	**3**	**4=(col. 3/col. 2) x 100**
2010	27	14	52%
2011	32	13	41%
2012	17	6	35%
2013	16	9	56%
2014	18	7	39%
2015	17	9	53%
2016	12	6	50%
2017	8	3	38%
2018	5	4	80%
2019	1	1	100%
2020	5	5	100%
2021	12	11	92%
2022	0	0	-
2023	1	1	100%
2024	1	1	100%
Total	**172**	**90**	**52%**

Source: own calculations.

Table 1 shows that 52% of the companies that debuted on the WSE between 2010 and 2024 were still listed on the market at the end of 2024. On the other hand, it should be emphasised that 82 companies out of 172 that debuted on the WSE in the analysed period were not included in the research sample for various reasons, e.g. mergers, acquisitions, bankruptcy, delisting. Between 2010 and 2016, the share of companies included in the survey ranged from 35% to 56%. In years with a very low number of IPOs (2018-2021, 2023-2024), the share of companies in the sample was very high (often reaching 100%). The year 2017 was characterised by a low number of IPOs (8) and at the same time a relatively low share of companies included in the sample (38%).

In the next step, basic statistics were calculated: arithmetic mean, standard deviation and coefficient of variation for the number of IPOs included in the sample. Due to the significant range of observations in the sample, these statistics referred to aggregated data for the period 2010-2024. The calculated values of the mentioned statistics are included in Table 2.

Table 2.
Selected descriptive statistics on the number of IPOs included in the sample for the period 2010 to 2024

Statistics	Average	Standard deviation	Coefficient of variation
Value	6,00	4,49	74,80%

Source: own calculations.

Table 2 shows that, on average, there were six IPOs on the WSE in a given year. The standard deviation related to the dispersion around the average and amounted to 4.49 debuts. This value confirms that in some of the years covered by the analysis, the number of debuts varied, which could be due to economic, political and other external factors. The value of the coefficient of variation around 75% indicates a high variability in the number of debuts with respect to the average. Such a high result suggests that the number of IPOs was not stable and may imply difficulties in forecasting its value for the future.

4.3. Results of own research

4.3.1. Short-term stock returns in the light of own research

Table 3 summarises the companies, in each year of the study period from 2010 to 2024, with an increase in the IPO price, a decrease in the IPO price and no change in the closing price from the issue price.

Table 3.
Number of companies with upside, downside and no volatility in closing price relative to issue price between 2010 and 2024

Year	N	Price increase on debut		Price drop on debut		Issue price = closing price on debut	
		n	%	n	%	n	%
2010	14	11	78,57	3	21,43	0	-
2011	13	8	61,54	4	30,77	1	7,69
2012	6	5	83,33	1	16,67	0	-
2013	9	6	66,67	2	22,22	1	11,11
2014	7	6	85,71	0	0,00	1	14,29
2015	9	3	33,33	5	55,56	1	11,11
2016	6	3	50,00	2	33,33	1	16,67
2017	3	2	66,67	1	33,33	0	-
2018	4	4	100,00	0	0,00	0	-
2019	1	1	100,00	0	0,00	0	-
2020	5	4	80,00	0	0,00	1	20,00
2021	11	5	45,45	6	54,55	0	-
2022	0	0	-	0	-	0	-
2023	1	1	100,00	0	0,00	0	0,00
2024	1	0	0,00	0	0,00	1	100,00
Total	90	59	-	24	-	7	-

Source: own calculations.

An analysis of the annual data shows that a greater proportion of companies that proceeded with an IPO recorded an increase in their IPO price. It is worth noting that in 2015, only 33.33% of companies recorded an increase, indicating a slightly weaker performance that year compared to other years. In 2018-2019, all companies that participated in the IPO achieved an increase in the closing price relative to the issue price. 2015 saw the highest percentage of companies with a decrease in closing share price (55.56%), which may suggest that market conditions were difficult for new companies. Over the period under review, there were seven years of IPOs in which the issue price and the closing price on debut were equal. It is worth

noting that no IPOs were registered in 2022, which may suggest a decline in interest in IPOs. In recent years (2023-2024), there has been little activity in the capital market.

First, Table 4 presents the results of the analysis with initial returns (IR) and returns adjusted for the change in the broad market, as expressed by the WIG index (AIR).

Table 4.
Immediate unadjusted (IR) and adjusted (AIR) returns from 2010 to 2024

Year	N	Average	Median	Standard deviation	Average	Median	Standard deviation	*t-statistics* for AIR	The *p-value*
		Initial rate of return (IR)			Adjusted initial rate of return (AIR)				
2010	14	8,48%	7,07%	8,81%	7,06%	5,17%	8,33%	3,17	0,36%
2011	13	2,32%	1,52%	11,73%	5,94%	5,00%	12,21%	1,75	9,94%
2012	6	17,42%	7,68%	25,48%	16,89%	6,02%	23,16%	1,79	6,67%
2013	9	10,56%	18,59%	13,20%	9,44%	14,91%	14,91%	1,90	4,70%
2014	7	1,44%	1,72%	0,85%	2,33%	2,09%	1,59%	3,88	0,41%
2015	9	0,62%	-1,29%	4,70%	2,90%	2,90%	5,09%	1,71	6,28%
2016	6	4,32%	2,39%	7,75%	5,03%	2,89%	9,34%	1,32	12,20%
2017	3	2,83%	1,82%	7,06%	2,19%	2,05%	7,35%	0,52	32,74%
2018	4	10,83%	3,53%	13,86%	9,60%	4,61%	15,92%	1,21	15,65%
2019	1	14,74%	14,74%	-	17,57%	17,57%	-	-	-
2020	5	43,88%	49,96%	41,40%	40,92%	46,95%	35,51%	2,58	3,07%
2021	11	4,84%	-0,01%	12,04%	3,98%	0,34%	11,15%	1,19	13,08%
2022	0	-	-	-	-	-	-	n.a.	n.a.
2023	1	13,94%	13,94%	-	8,97%	8,97%	-	-	-
2024	1	0,00%	0,00%	-	1,62%	1,62%	-	-	-
average	90	9,73%	8,69%	13,35%	9,60%	8,65%	13,14%	-	-

Source: own calculations.

The average initial return (IR) for the period 2010-2024 was 9.73% (with a median of 8.69%), while the adjusted return (AIR) was slightly lower at 9.60% (with a median of 8.65%). As in other empirical studies, the differences between unadjusted and adjusted values were insignificant. The highest IR and AIR were reached in 2020 at 43.88% and 40.92% respectively, mainly due to two gaming companies, i.e. GAMES OPERATORS and PCF GROUP, where IR and AIR were 100% (90.80%) and 49.96% (46.95%) for both companies, as well as ALLEGRO, for which IR was equal to 62.79% and AIR was 64.94%. The lowest average returns were recorded for 2015. - 0.62% (IR) and 2.90% (AIR) mainly due to 4 companies that showed negative values, i.e. ATAL, DEKPOL, KORPORACJA KGL, KRYNICA VITAMIN. This means that the phenomenon of the occurrence of share price undervaluation in IPOs has been confirmed for the studied sample.

As the average adjusted rates of return calculated separately for each year covered by the analysis turned out to be statistically insignificant for the most part, the amounts of these rates after the first day of the debut were determined in time intervals selected in such a way as to include a comparable number of companies. These intervals were calculated by grouping companies into three groups, for which: the issue price turned out to be lower than the closing price, the issue price was higher than the closing price and those for which the closing price at the end of the debut day corresponded to the price on the issue day. The results of the calculations are shown in Table 5.

Table 5.
Initial unadjusted (IR) and adjusted (AIR) returns over several year intervals for the period 2010-2024

Year	N	Average	Median	Standard deviation	Average	Median	Standard deviation	*t-statistics* for AIR	The p-value
		IR			AIR				
2010-2012									
Total	33	7,68%	3,86%	14,42%	8,41%	5,00%	14,14%	3,42	0,09%
issue price< closing price	24	12,07%	7,14%	13,95%	11,97%	7,10%	13,91%	**4,22**	**0,02%**
issue price>closing price	8	-4,52%	-1,49%	7,69%	-1,30%	-0,13%	10,21%	-0,36	63,53%
issue price=closing price	1	0,00%	0,00%	0,00%	0,58%	0,58%	-	-	-
2013-2015									
Total	25	4,43%	1,72%	9,42%	5,09%	2,90%	8,97%	2,84	0,45%
issue price< closing price	15	9,46%	6,82%	8,47%	10,00%	8,48%	7,69%	**5,03**	**0,00%**
issue price>closing price	7	-4,44%	-4,11%	3,26%	-3,13%	-2,92%	5,07%	-1,64	92,39%
issue price=closing price	3	0,00%	0,00%	0,00%	-0,23%	0,21%	2,75%	-0,14	54,93%
2016-2018									
Total	13	5,98%	2,94%	10,45%	5,78%	3,79%	10,59%	1,97	3,62%
issue price< closing price	9	9,90%	4,78%	10,30%	9,87%	6,23%	25,78%	1,15	14,17%
issue price>closing price	3	-3,78%	-3,85%	1,24%	-3,65%	-3,74%	2,57%	-2,46	93,35%
issue price=closing price	1	0,00%	0,00%	0,00%	-2,82%	-2,82%	-	-	-
2019-2024									
Total	19	15,86%	8,00%	27,11%	14,56%	14,56%	14,56%	**4,36**	**0,02%**
issue price< closing price	11	29,69%	14,74%	12,38%	27,78%	27,78%	27,78%	3,32	0,39%
issue price>closing price	6	-4,21%	-1,21%	6,15%	-4,94%	-4,94%	-4,94%	2,45	2,90%
issue price=closing price	2	0,00%	0,00%	0,00%	0,32%	0,32%	1,30%	0,35	39,28%

Source: own calculations.

Table 5 shows that the highest average IR returns were recorded between 2019 and 2024 (15.86%). The AIR over this period was 14.56%. In the different groups of companies studied (issue price < closing price, issue price > closing price, issue price = closing price), a variation in performance is observed. In the group of companies where the issue price was lower than the closing price, between 2019 and 2024, the average IR was 29.69%, while AIR was slightly lower at 27.78%. In the group of companies where the issue price turned out to be higher than the closing price on the debut day, the IR and AIR return values were negative, suggesting that the investments closed at the end of the debut day were loss-making. The average values of adjusted returns proved to be statistically significant for companies whose shares turned out to be undervalued in 2010-2012, 2013-2015 and for all companies in the sample, included in the period 2019-2024. The last sub-period studied was a time when the stock market experienced dynamic growth, which favoured higher stock returns. Expansionary monetary policy and economic recovery from the pandemic crisis (in 2019-2021) had a positive impact on the valuation of IPO stocks.

4.3.2. Medium - long term stock returns - findings from own research

Considering post-IPO time frames of 3 years (for the period 2010-2018) and 5 years for the period 2019 to 2024, the levels of unadjusted and adjusted stock returns over a longer period than one day from the IPO date are included in Table 6. Exit time frames after a period of 1/3/6/12/24/36/48/60/72 months are included.

Table 6.
Unadjusted (BHR) and adjusted returns (BHAR) on first issue shares by investment horizon from the date of listing (in months) over the period 2010 to 2024

Year	N	Average	Median	Standard deviation	Average	Median	Standard deviation	*t-statistics* for BHAR	The *p-value*
		BHR 1M			**BHAR 1M**				
2010-2012	33	2,78%	0,38%	15,42%	2,03%	1,17%	15,67%	0,74	23,23%
2013-2015	25	2,16%	0,23%	8,12%	2,85%	3,07%	7,17%	1,99	**2,90%**
2016-2018	13	5,00%	0,00%	11,65%	3,79%	-0,72%	13,42%	1,02	16,39%
2019-2024	19	-1,20%	-3,15%	11,96%	-3,20%	-2,62%	11,65%	-1,20	87,72%
Return on shares		**BHR 3M**			**BHAR 3M**				
2010-2012	33	7,75%	0,94%	39,33%	7,46%	3,07%	38,29%	1,12	13,55%
2013-2015	25	5,11%	4,34%	13,78%	4,49%	5,93%	13,43%	1,67	5,40%
2016-2018	13	11,48%	-2,86%	24,91%	8,46%	4,46%	26,48%	1,15	13,63%
2019-2024	19	-1,23%	2,43%	16,85%	-4,79%	-1,74%	15,00%	-1,39	90,93%
Return on shares		**BHR 6M**			**BHAR 6M**				
2010-2012	33	1,68%	-5,06%	35,71%	0,97%	-4,30%	34,04%	0,16	43,69%
2013-2015	25	19,64%	13,77%	36,20%	19,17%	17,07%	31,70%	3,02	**0,30%**
2016-2018	13	13,55%	1,10%	46,33%	7,10%	-2,82%	46,16%	0,55	29,62%
2019-2024	19	-10,52%	-7,70%	24,05%	-18,87%	-15,40%	26,52%	-3,10	99,69%
Return on shares		**BHR 12M**			**BHAR 12M**				
2010-2012	33	-3,25%	-10,32%	66,01%	0,01%	-3,71%	63,42%	0,00	50,00%
2013-2015	25	19,33%	14,12%	34,80%	18,71%	11,53%	32,84%	2,85	**0,44%**
2016-2018	13	16,45%	-18,69%	69,04%	2,79%	-17,02%	68,05%	0,15	44,16%
2019-2024	18	-23,98%	-16,47%	23,20%	-25,83%	-20,27%	34,50%	-3,18	99,73%
Return on shares		**BHR 24M**			**BHAR 24M**				
2010-2012	33	-2,45%	-27,60%	81,96%	-5,19%	-21,94%	79,09%	-0,38	64,68%
2013-2015	25	30,44%	23,99%	43,90%	23,13%	21,52%	47,72%	2,42	**1,17%**
2016-2018	13	54,17%	18,98%	149,83%	48,03%	-11,11%	154,14%	1,12	14,23%
2019-2024	17	-29,04%	-26,68%	28,43%	-32,01%	-21,01%	33,61%	-3,93	99,94%
Return on shares		**BHR 36M**			**BHAR 36M**				
2010-2012	33	11,31%	-10,99%	92,32%	-2,17%	-25,47%	91,43%	-0,14	55,52%
2013-2015	25	38,68%	26,98%	62,42%	29,38%	27,54%	60,68%	2,42	**1,17%**
2016-2018	13	123,86%	61,11%	238,26%	117,18%	71,42%	241,16%	1,75	5,28%
2019-2024	17	-28,56%	-39,18%	42,87%	-53,08%	-66,09%	45,25%	-4,84	99,99%
Return on shares		**BHR 48M**			**BHAR 48M**				
2010-2012	33	5,28%	-15,17%	86,15%	-11,40%	-31,72%	85,78%	-0,76	77,36%
2013-2015	25	48,34%	7,10%	91,59%	29,57%	-10,27%	92,04%	1,61	6,02%
2016-2018	13	144,21%	69,65%	287,80%	140,45%	51,98%	287,07%	1,76	5,19%
2019-2024	11	-16,26%	0,00%	46,76%	-43,86%	-27,34%	58,38%	-2,49	98,40%
Return on shares		**BHR 60M**			**BHAR 60M**				
2010-2012	33	29,96%	-21,01%	130,38%	13,74%	-28,26%	135,76%	0,58	28,30%
2013-2015	25	40,83%	1,52%	95,10%	30,00%	15,26%	96,45%	1,56	6,59%
2016-2018	13	171,87%	111,05%	300,38%	155,00%	65,46%	292,18%	1,91	**4,02%**
2019-2024	2	-5,30%	0,00%	15,70%	-13,09%	0,00%	40,02%	-0,46	63,72%
Return on shares		**BHR 72M**			**BHAR 72M**				
2010-2012	33	43,74%	-21,61%	176,12%	23,48%	-28,20%	177,39%	0,76	22,64%
2013-2015	25	37,05%	15,40%	84,79%	20,89%	21,93%	79,88%	1,31	10,13%
2016-2018	13	165,58%	50,13%	318,73%	140,47%	-0,63%	321,67%	1,57	7,12%
2019-2024	1	-2,89%	0,00%	12,28%	-6,28%	0,00%	26,65%	-	-

Source: own calculations.

The results obtained indicated the volatility of unadjusted returns and WIG index-adjusted returns depending on the time horizon adopted from the date of debut. Between 2010 and 2012, stock returns (BHARs) were generally positive, with the exception of the 24M, 36M and 48M time intervals. It is worth noting that the overstatement of average returns from the third month to three years after the debut was influenced by the high stock returns (even more than 200% increase relative to the issue price) of PCC EXOL. From one year after the debut to five years, significant returns (100-200%) were also achieved by the company ZAMET INDUSTRY. Good results in this period, especially two years after the debut, were recorded for the companies: EUROPEJSKIE CENTRUM ODSZKODOWAŃ, BENEFIT SYSTEMS, KRUK and AC.

Optimistic results were observed between 2013 and 2015, where BHR and BHAR returns took on positive values and were statistically significant for the time intervals: 1M, 6M, 12M, 24M, 36M. Particularly good results - not infrequently returns exceeding 100% 3 years after listing - were recorded for companies: MFO, ATAL, ENTER AIR. In 2016-2018, the average returns of BHR and BHAR were higher especially 3 years after the debut, mainly due to the good performance of the companies: AUTO PARTNER, DINO POLSKA, TEN SQUARE GAMES, ML SYSTEM. A statistically significant rate of return of BHAR was recorded for 60 months after the debut. The lack of statistical significance for returns with longer time intervals is due to a decrease in the number of companies included in the formula for the arithmetic average.

Across all time intervals, the worst performing, negative returns for BHR and BHAR occurred between 2019 and 2024, which can be explained by the post-pandemic economic problems that translated into negative investment performance. For the period described, the median for returns also remained negative.

To better illustrate the number of companies with positive and negative adjusted returns over the analysed period, the results of the analysis are summarised in Table 7.

Table 7.
Number of companies with negative and positive average BHAR returns sampled in 1M to 72M post-IPO intervals over the period 2010-2024

Period	Description	BHAR 1M	BHAR 3M	BHAR 6M	BHAR 12M	BHAR 24M	BHAR 36M	BHAR 48M	BHAR 60M	BHAR 72 M
2010-2012	Negative	14	13	19	19	22	21	22	21	23
	Positive	19	20	14	14	11	12	11	12	10
2013-2015	Negative	8	10	5	6	7	9	14	12	11
	Positive	17	15	20	19	18	16	11	13	14
2016-2018	Negative	7	5	7	8	7	6	6	5	7
	positive	6	8	6	5	6	7	7	8	6
2019-2024	negative	12	11	16	13	16	16	10	2	1
	positive	7	8	3	5	1	1	1	0	0

Source: own calculations.

Analysis of the data in Table 7 shows changes in the number of companies with negative and positive average BHAR returns over different investment periods from 2010 to 2024. Between 2010 and 2012, holding shares of companies debuting for up to 3 months generated the addition of returns, but during this period the number of companies whose shares were in investors' portfolios for at least 6 months and yielded negative returns increased significantly. In favour of investors, the situation changed between 2013 and 2015, when the number of companies debuting with positive stock returns - BHAR - was significantly higher compared to companies with negative returns. This situation suggests that the market was favourable to debut companies during this period. Over time, the number of companies with shares initially with positive returns in the years (2016-2018, 2019-2024) showed a downward trend. For the period 2019-2024, companies with shares generating negative abnormal returns dominated in all time intervals.

5. Discussion

With regard to short-term rates of return, our own research confirmed the phenomenon of undervaluation of IPO share prices on the Polish capital market in the analysed period. The average immediate rate of return (IR) for 2010-2024 was 9.73%, while the adjusted immediate rate of return (AIR) was slightly lower, at 9.60%. These results are within the range of values obtained by other researchers for the Polish market in similar periods, suggesting a continuation of the trend of a decrease in the scale of the phenomenon of undervaluation compared to the 1990s and the beginning of the 21st century. For example, research by Czapiewski et al. (2014) on the WSE in 1991–2011 showed an average adjusted IR of 34.1% in 1991-2000 and 13.6% in 2001-2011. Trąpczyński (2017) found an average undervaluation of 7.89% for 2007-2016, which was lower than 19.8% in 1991-1997. Lizińska and Czapiewski (2014) recorded an average return on the first day of 10.98% for 2004-2009. Pomykalski and Domagalski (2015) showed an average undervaluation of 11.89% in 2005-2013. Research by Podedworna-Tarnowska (2024) on IPOs in 2017-2021 showed an average IR of 13.68% for the largest offers and 22.90% for the smallest ones. Sukacz's research (2005) from 1991-2002 showed an average undervaluation of 26%.

Comparing the results of our own research with foreign literature, the phenomenon of undervaluation is common on stock exchanges around the world, but its intensity varies depending on the market, the period of analysis and the economic cycle. A compilation of data by Perza (2025) shows that undervaluation was stronger in emerging markets than in mature markets. For example, in China, the average IR in 1989-1996 was 388.0%, while in mature markets, such as the US, it was 15.8% in 1960-1996. The latest results for the US market (Ritter, 2025) for the period 1980-2023 show the highest average IR at 158.0% in 2019-2023. Average IRs on the Polish market, both in our own study (9.73% for 2010-2024) and in other Polish studies, are noticeably lower than these extreme values from emerging markets or certain periods on the US market, but are within the typical range for mature or more developed emerging markets (several to several dozen percent).

An analysis of annual data in our own research showed that the majority of companies recorded an increase in price on their debut, although there were differences between individual years. The highest average rates of return (IR and AIR) were achieved in 2020 (43.88% and 40.92%), mainly due to companies from the gaming industry and ALLEGRO. Aziewicz and Dobrowolski (2014) also showed high volatility of returns on the debut date in 2005-2013. Our own study showed that average adjusted rates of return (AIR) were statistically significant for undervalued companies in 2010-2012, 2013-2015 and for all companies in the sample in 2019-2024. These results confirm the first part of the hypothesis of short-term undervaluation.

With regard to long-term rates of return, our own research only partially confirmed the underperformance phenomenon (a decline in share value over a longer horizon) observed in the literature. This phenomenon means that investors usually lose money on investments in newly listed companies compared to the market index or other companies. Ritter (2025) in his study for the US market (1980-2023) showed that average 3-year adjusted rates of return (BHAR) were usually negative, e.g. -20.20% for the entire period and -296.40% for 2019-2023. Polish empirical research also indicated lower IPO returns in the medium and long term compared to the IPO date or the market index. Sieradzki (2013) indicated an average negative abnormal return of -4.2% one year after debut. Zieliński (2013) found that the BHAR 36M adjusted return on the WSE in 1994-2016 ranged from -14% to -28.6%. Rzewuska and Wrzesiński (2016) proved that investments in IPO companies in 2006 yielded an average rate of return 9% lower than the index over a two-year period and 26% lower over a three-year period. Kwit (2006) estimated that after three years, it was possible to earn 17% less compared to the assets of other companies listed on the WSE. Kochalski and Ratajczak (2025) showed a downward trend in the average rate of return (BHR) on shares of companies with IPOs from 2009 to 2011 up to 370 days of trading, reaching an average of -19.35%. Aziewicz and Dobrowolski (2014) confirmed that the phenomenon of overvaluation after 12 months was not permanent, and a clearer trend of negative returns appeared three years after the IPO.

The results of our own research for the period 2019-2024 are consistent with these observations, showing negative average BHR and BHAR rates in all analysed time intervals. However, our own research also identified periods in which the average BHAR rates were positive, suggesting that underperformance is not a systematic phenomenon in all the time intervals analysed. In 2010-2012, BHAR rates were generally positive, with the exception of the 24M, 36M and 48M intervals. The results for 2013-2015 were optimistic, with BHR and BHAR rates positive and statistically significant for the 1M, 6M, 12M, 24M and 36M intervals. In 2016-2018, average BHR and BHAR rates of return were higher after 3 years following the IPO, and a statistically significant BHAR rate of return was recorded for 60 months after the IPO. This volatility corresponds to the observation by Aziewicz and Dobrowolski (2014) that the phenomenon of overvaluation after 12 months was not permanent.

An analysis of the number of companies with positive and negative BHAR rates also indicates volatility over time. While in 2010-2012 and 2013-2015, companies with positive BHARs prevailed in the short and medium horizons, in 2019-2024, companies generating negative abnormal returns dominated in all time intervals.

In summary, the results of our own research confirm the occurrence of short-term stock undervaluation on the main market of the WSE. However, in the medium and long term, the results are variable and do not indicate systematic overvaluation (negative rates of return) in all the time intervals analysed, although the phenomenon of underperformance was evident in some periods, particularly in 2019-2024. This is consistent with the second part of the

research hypothesis for 2019-2024, but not for the entire medium- and long-term period under review.

6. Conclusion

The aim of this study was to assess the short- and long-term returns on initial public offerings (IPOs) on the Warsaw Stock Exchange. The author's own research aimed to verify the hypothesis that there are anomalies on the main market of the WSE, consisting in the undervaluation of share prices in the short term and their overvaluation in the medium and long term. The main research method was an analysis of historical rates of return on shares from IPOs in 2010-2024.

The study confirmed the phenomenon of undervaluation of IPO share prices on the Polish capital market in the analysed period. The average immediate rate of return (IR) for 2010-2024 was 9.73%, and the adjusted immediate rate of return (AIR) reached 9.60%. These results confirmed the first part of the research hypothesis regarding short-term undervaluation.

With regard to medium- and long-term rates of return, our own research only partially confirmed the underperformance observed in the literature, which means that investors usually lose on investments in the shares of debuting companies compared to the market index or other companies. Although negative average abnormal rates of return (BHAR) occurred for some periods, and the underperformance phenomenon was particularly pronounced in 2019-2024, where negative average BHARs were recorded in all analysed time intervals, the results in other periods (e.g. 2013-2015, 2016-2018 in some intervals) showed positive average BHARs. This means that the own study does not indicate systematic overvaluation (negative rates of return) in all analysed time intervals. This is consistent with the second part of the research hypothesis for 2019-2024, but not for the entire medium- and long-term period under review.

This study is valuable and original due to its analysis of current data for the main Polish market of the WSE from 2010 to 2024, which fills an information gap after 2016. The study is comprehensive, covering both the short and long term, considering different investment horizons, which is rare in previous Polish studies. In addition, the analysis takes into account different time intervals reflecting economic cycles.

One of the limitations of the study is the lack of statistical significance for longer-term rates of return due to the decline in the number of companies included in the analysis. Of the 172 companies that debuted during this period, 82 were not included in the sample for various reasons, such as mergers, acquisitions, bankruptcies or delisting. This means that the long-term analysis only covers companies that survived on the market until the end of 2024, which may affect the picture of long-term rates of return (potential bias due to the survival effect).

The research sample was deliberately selected based on specific criteria. The analysis excludes companies debuting on the NewConnect alternative market, those that have moved from NewConnect to the main market, as well as those with cross-listing (listed simultaneously on several trading floors) or dual listing. Companies for which there was no data on the issue price or closing price on the debut date were also excluded. These criteria limit the scope of the study to classic IPOs on the main market of the WSE carried out by companies meeting specific conditions of data availability and market presence, which may affect the possibility of generalising the results to all types of debuts or all companies that have ever debuted.

The information obtained in the study can be further used as a database and reference point for future analyses, for example, comparing the effectiveness of IPOs on the WSE with other markets (especially emerging markets), examining the determinants of short- and long-term rates of return for the Polish market, or analysing the impact of specific market and macroeconomic factors on the performance of IPOs in specific periods.

The results obtained provide valuable insights for market participants. Information on short-term undervaluation and long-term volatility of rates of return is of direct relevance to investors (e.g. in the context of investment strategies), issuers (e.g. in the context of IPO pricing policy) and intermediaries.

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