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THE JANUARY EFFECT AND FIRM SIZE: EVIDENCE FROM THE WARSAW STOCK EXCHANGE (2000-2024)

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Purpose: This paper examines the existence, differentiation, and evolution of the January effect on the Warsaw Stock Exchange over the period 2000-2024, with particular emphasis on differences between large-cap and small-cap market segments and on changes associated with market maturation.
Design/methodology/approach: The study analyses monthly logarithmic returns of the WIG20 and sWIG80 indices using descriptive statistics, data visualisation, and inferential testing. Seasonality is assessed with one-way ANOVA and the Kruskal-Wallis test, complemented by sub-period analysis for 2000-2008 and 2009-2024. The theoretical framework draws on the Efficient Market Hypothesis and the literature on calendar anomalies and firm size effects.
Findings: No statistically significant monthly seasonality is identified for either index over the full sample period, indicating the absence of a persistent January effect at the aggregate market level. Nevertheless, descriptive results show relatively higher January returns in the small-cap segment. Sub-period analysis reveals a weakening of January returns after 2008, suggesting a declining economic relevance of the anomaly as the market matures.
Research limitations/implications: The analysis is based on monthly index data and does not account for transaction costs or taxation. Future research could employ firm-level or higher-frequency data and incorporate behavioural or institutional factors.
Practical implications: The findings indicate that the January effect has limited applicability as an investment strategy on the contemporary Polish stock market, particularly after accounting for risk and market efficiency.
Originality/value: The paper provides a long-horizon, segment-based analysis of the January effect on the Warsaw Stock Exchange, highlighting its gradual weakening and structural transformation in a post-transition market.
Keywords: January effect; calendar anomalies; stock market seasonality; market efficiency; Warsaw Stock Exchange.
Category of the paper: research paper.

1. Introduction

The presence of calendar anomalies has long posed a challenge to the Efficient Market Hypothesis (EMH), according to which financial asset prices fully reflect all available information. Under this assumption, earning abnormal returns based on historical data should not be possible (Malkiel, 2003). One of the most extensively documented deviations from this premise is the January effect (Patel, 2016). This phenomenon refers to the observation that stock returns in January, particularly for small-cap firms, are significantly higher than in other months of the year (Cooper, McConnell, Ovtchinnikov, 2006).

The empirical foundations of research on the January effect were laid by Rozeff and Kinney (1976), who demonstrated, using evidence from the U.S. market, that average January returns substantially exceeded those recorded in other months. Subsequent studies, including those by Roll (1983), Gultekin and Gultekin (1983), and Thaler (1987), further refined the understanding of this anomaly by highlighting its strong association with firm size. The literature most frequently identifies tax-related motives and window dressing practices employed by investment funds as the primary mechanisms underlying the January effect (Haug, Hirschey, 2005). At the same time, more recent research increasingly emphasizes a weakening of this anomaly. The tendency toward a gradual decline in the January effect became particularly evident after the global financial crisis of 2008 (Darrat, Li, Chung, 2013).

The January effect has also been the subject of numerous studies conducted on the Polish capital market. Domestic researchers have employed a variety of methods to measure abnormal returns and have adopted different econometric approaches. Grotowski (2008), using, inter alia, GARCH-type models, identified the presence of the January effect on the Warsaw Stock Exchange (WSE), while simultaneously emphasizing its limited economic significance. In turn, Szczepańska-Przekota (2024), applying the CENSUS X12 procedure, linked the periodic disappearance of this anomaly to changes in the structure of investors. The conclusions drawn from these studies, as well as from the work of Pawlonka and Sypniewski (2023), are consistent with findings in the international literature, indicating that on the WSE the January effect primarily concerns smaller firms and exhibits varying intensity over time.

At the same time, existing studies on the WSE have generally focused on shorter time horizons or selected market segments, which hampers a clear assessment of the persistence of the January effect under conditions of a maturing capital market. In particular, there is a lack of analyses covering a long, coherent observation period and enabling a direct comparison of the behavior of different groups of firms. This article addresses this research gap by focusing on a comparative analysis of two key segments of the Warsaw Stock Exchange over the period 2000-2024. The study examines the largest companies included in the WIG20 index as well as small-cap firms represented by the sWIG80 index. The main objective of the paper is to verify the presence of the January effect on the WSE over a long, 25-year time horizon, with particular

emphasis on its differentiation by firm size. The research problem concerns an assessment of the current relevance of this anomaly in the context of a contemporary capital market and an examination of whether, in line with the classical literature, the January effect in Poland primarily pertains to low-capitalization firms.

2. Literature review

2.1. Calendar Anomalies and the January Effect

The Efficient Market Hypothesis (EMH), formulated by Fama (1970), provides a fundamental reference point for the analysis of market anomalies. According to its assumptions, stock prices should fully reflect all available information, implying that investment strategies based on historical price patterns are ineffective. As empirical research developed, however, recurrent deviations from this framework began to be identified. Thaler (1987) referred to such regularities as market anomalies, among which the January effect occupies a prominent position in the literature.

Although systematic research on calendar anomalies began in the 1970s, early observations pointing to atypical market behavior at the beginning of the year appeared much earlier. Wachtel (1942) drew attention to seasonality in stock returns on the U.S. market, while Officer (1975) identified similar patterns on the Australian stock exchange. The importance of Officer's study lies in its analysis of a market operating under a different tax cycle, with the fiscal year ending in June, which later enabled researchers to test the tax-loss hypothesis independently of the calendar year-end.

A significant stage in the development of research on the January effect was the study by Rozeff and Kinney (1976), who were among the first to apply econometric tools to the analysis of data from the New York Stock Exchange (NYSE) covering the period 1904-1974. They demonstrated that average stock returns in January were markedly higher than in other months of the year, which stimulated further investigations across different markets. Subsequent research by Gultekin and Gultekin (1983) confirmed the presence of the January effect not only in the United States but also across most developed-country markets.

For the purposes of the present study, particularly relevant is the strand of literature focusing on the relationship between calendar anomalies and firm size. Banz (1981) identified the so-called small-firm effect, showing that companies with lower market capitalization tend to achieve higher average returns. Keim (1983) subsequently demonstrated that a substantial portion of this premium is concentrated in January. Roll (1983) concluded that the January effect is closely linked to the firm size effect, a relationship that can be regarded as constitutive for further considerations of the economic mechanisms underlying this anomaly.

2.2. Mechanisms of the January Effect

The literature proposes several approaches to explain the mechanisms underlying the January effect. Most commonly, three groups of explanations are distinguished: the tax-loss selling hypothesis, institutional practices referred to as window dressing, and factors related to market microstructure.

The most widely cited explanation remains the tax-loss selling hypothesis, independently formulated by Branch (1977) and Dyl (1977). According to this approach, investors sell loss-making assets toward the end of the tax year in order to reduce their tax liabilities. The resulting selling pressure in December leads to a temporary undervaluation of stock prices, while their repurchase in January generates renewed demand and, consequently, higher returns. More recent studies, however, suggest that the economic relevance of this mechanism may be limited, particularly in emerging markets. Caporale and Zakirova (2017), analyzing the Russian market, showed that the January effect appears primarily as a statistical regularity rather than as the basis for a profitable investment strategy. Although January exhibited higher returns in raw data, the anomaly largely disappeared once transaction costs were taken into account.

A second group of explanations focuses on institutional mechanisms, particularly the practice of window dressing employed by investment funds. Lakonishok, Shleifer, Thaler, and Vishny (1991) argued that portfolio managers may adjust asset holdings at the end of the year in order to present portfolios with a lower perceived risk profile in annual reports. Such actions can generate seasonal shifts in demand for specific asset classes. More recent evidence, however, calls into question the universality of this explanation. Kaul et al. (2025) demonstrated that the January effect was already present in the United States during the period 1874-1917, when neither income taxation nor institutionalized investment funds existed. They documented that average January returns exceeded those in other months by approximately 3.1%, suggesting that neither tax optimization nor formal institutional arrangements constitute a necessary condition for the emergence of this anomaly.

Complementing the fiscal and institutional perspectives is the behavioral approach. Ciccone (2011) argues that the January effect may be linked to psychological factors influencing investor decision-making. The beginning of a new calendar year functions in financial markets as a symbolic “new start,” fostering increased optimism and a greater willingness to take risk. This phenomenon is associated with the so-called false hope syndrome, defined as an unjustified belief in improved future investment performance (Ciccone, 2011, p. 159). Elevated investor sentiment in January may translate into higher demand for assets characterized by greater uncertainty, contributing to short-term price increases and, in a longer horizon, potentially leading to overvaluation and subsequent performance deterioration.

The mechanisms outlined in the literature provide the interpretative framework for the empirical analyses conducted in this study.

2.3. The specificity of the January Effect in emerging markets: the case of the Warsaw Stock Exchange

The analysis of the January effect in the context of emerging markets constitutes an important complement to findings derived from studies of developed markets. Poland, as a market positioned between these two categories, provides an interesting setting for examining the persistence of the January effect under conditions of progressing institutionalization and increasing market efficiency. Lewandowska (2017) notes that anomalies in the distribution of stock returns, including the January effect, were observed on the Warsaw Stock Exchange (WSE) even prior to the introduction of the capital gains tax in 2004. This observation challenges the tax-loss selling hypothesis in the Polish context, suggesting that tax optimization was not the primary source of this phenomenon. At the same time, more recent studies emphasize the evolution of the January effect and its pronounced segmentation. Borowski (2019), analyzing a sample of 91 companies listed on the WSE, demonstrated that the January effect occurs more frequently among firms with low and medium market capitalization. These findings are consistent with the strand of literature linking calendar anomalies to the small-firm effect. Similar conclusions in an international setting were presented by Szymański and Wojtalik (2020), who showed that the main stock indices in Poland, the Czech Republic, and Hungary have gradually exhibited characteristics of more efficient markets, while indices composed of smaller firms continue to generate excess returns at the beginning of the year.

At the same time, some authors question the current relevance of the January effect on the WSE. Keller (2016), analyzing the WIG20, mWIG40, and WIG250 indices over the period 2000-2013, found no statistically significant evidence of this anomaly and interpreted the results as an indication of market maturation. A similar position is taken by Myśliwiec (2020), who, based on data from 2015-2020, considered the results to be inconclusive and questioned the significance of January as a month generating above-average returns. A different perspective was proposed by Lewandowska (2017), who drew attention to the presence of a so-called December effect, which in certain phases of a bull market may outweigh January gains.

Index-based analyses are complemented by sectoral and cross-market studies. Lisicki (2018) demonstrated that the January effect on the WSE is heterogeneous and varies across industries. Borowski (2018), in turn, indicated that this form of seasonality is more pronounced in the equity market than in commodity markets. An alternative perspective was offered by Pieloch-Babiarz (2020), who linked the occurrence of seasonality to dividend payment cycles.

The most recent studies also take into account the impact of extraordinary events and macroeconomic shocks. Lisicki (2025), analyzing the behavior of the WSE during the COVID-19 pandemic and the post-pandemic period, showed that heightened volatility driven by macroeconomic factors can distort or weaken traditional calendar patterns, thereby limiting the usefulness of simple historical analogies in crisis periods.

In summary, the literature suggests that the January effect is strongly dependent on firm size and the stage of market development, which justifies conducting a comparative analysis of the WIG20 and sWIG80 indices over a long-term horizon.

3. Research method

3.1. Research objectives and hypotheses

The primary objective of the study is to assess the presence and differentiation of the January effect on the Warsaw Stock Exchange (WSE) over a long-term horizon, with particular emphasis on differences between market segments representing firms with varying levels of market capitalization. The analysis aims to determine whether the calendar regularities documented in the literature persist under conditions of a maturing capital market.

Based on prior empirical and theoretical studies on calendar anomalies, firm size effects, and the time-varying nature of the January effect, particularly those documenting its concentration among small-capitalization stocks and its weakening in mature markets, the following research hypotheses are formulated:

- H1: Stock returns of companies listed on the WSE exhibit seasonal variation across individual months of the year, with January displaying behavior that differs from that observed in other months.
- H2: The magnitude and statistical significance of the January effect vary with firm size, with the phenomenon being relatively more pronounced in the small-cap segment (sWIG80) than in the large-cap segment (WIG20).
- H3: The relevance of the January effect on the WSE weakens over time, a trend that is particularly evident in the segment of the largest companies.

3.2. Data sources and sample construction

The empirical analysis is based on historical price data for the main stock market indices of the Warsaw Stock Exchange (WSE), namely WIG20 and sWIG80, obtained from the financial data service Stooq.pl. The study focuses on the seasonality of stock market returns, with particular attention paid to differences between market segments representing firms with varying levels of market capitalization.

All statistical computations and data visualizations were conducted using the R programming environment (RStudio). The research sample covers the period from January 2000 to December 2024, which enables an examination of the January effect over a long-term horizon and an assessment of its evolution across successive stages of market development.

The data preparation stage involved standardizing date formats and reducing the dimensionality of the dataset by retaining only observations containing the date and monthly closing prices of the indices. Subsequently, the data were transformed by computing logarithmic returns and constructing auxiliary variables, including calendar year, month, and a grouping variable used to assign observations to predefined subperiods.

To capture potential changes in the nature of the January effect over time, two analytical subperiods were distinguished. The first subperiod covers the years 2000-2008 and corresponds to the phase of dynamic development of an emerging market, Poland's accession to the European Union, and the period preceding the global financial crisis. The second subperiod spans the years 2009-2024 and reflects a stage of market stabilization and structural maturation, as well as deeper integration of the WSE into the global financial system.

3.3. Variables and statistical analysis methods

The primary measure used in the analysis was the logarithmic monthly rate of return of the stock market indices, calculated according to the following formula:

$$R_t = \ln \frac{P_t}{P_{t-1}} \tag{1}$$

where:

R_t – rate of return in month (t),

P_t – index closing price in month (t),

P_{t-1} – index closing price in the preceding month.

The use of logarithmic returns is a standard approach in financial market research and improves the statistical properties of the analyzed time series, particularly with respect to data aggregation and the interpretation of percentage changes (1).

For each calendar month, basic descriptive statistics were computed, including the arithmetic mean, median, standard deviation, and sample size. The distributions of monthly returns were examined visually using bar charts and boxplots, which allowed for the identification of outliers and the assessment of distributional asymmetry.

The hypothesis testing procedure was conducted in a stepwise manner. In the first step, the assumption of homogeneity of variances across monthly returns was examined using Bartlett's test. Subsequently, the normality of empirical distributions was assessed using the Shapiro-Wilk test. The results indicated violations of the normality assumption, which justified a cautious approach to the application of parametric methods.

Despite these limitations, a one-way analysis of variance (ANOVA) was performed in the next stage to provide a parametric assessment of differences among mean monthly returns. In parallel, the non-parametric Kruskal-Wallis test was applied. Due to its robustness to outliers and the absence of a normality requirement, the Kruskal-Wallis test was treated as the decisive procedure in the verification of the research hypotheses.

Hypothesis H1, concerning seasonal variation in stock returns across calendar months, was tested by comparing the distributions of monthly returns using both one-way ANOVA and the Kruskal-Wallis test. Hypothesis H2, which addresses differences in the strength of the January effect depending on firm capitalization, was verified by comparing January returns for the WIG20 and sWIG80 indices, with analyses conducted separately for each market segment. The verification of Hypothesis H3, which assumes a weakening of the January effect over time, was based on subperiod analysis and a comparison of statistical test results across the identified phases of market development.

In all statistical tests, the significance level was set at $\alpha = 0.05$.

4. Results and discussion

4.1. Seasonality of monthly returns on the WSE

In the first stage of the analysis, the suitability of one-way analysis of variance (ANOVA) for examining the seasonality of monthly returns of the WIG20 and sWIG80 indices was assessed. For this purpose, the fundamental assumptions of parametric testing were verified, including the homogeneity of variances and the normality of residual distributions.

For the WIG20 index, Bartlett's test did not provide grounds for rejecting the hypothesis of equal variances across calendar months ($K^2 = 17.807$; $p = 0.086$). At the same time, the Shapiro–Wilk test conducted on the model residuals indicated a statistically significant deviation from normality ($W = 0.98814$; $p = 0.015$). The results of the one-way ANOVA confirmed the absence of a statistically significant effect of the "month" variable on the returns of the WIG20 index ($p = 0.343$).

In the case of the sWIG80 index, violations of the parametric test assumptions were more pronounced. Bartlett's test confirmed significant heterogeneity of variances in monthly returns ($p = 0.034$), indicating that return volatility differs across calendar months. The Shapiro-Wilk test also revealed a lack of normality in the residual distribution ($p < 0.001$; specifically, 3.004×10^{-5}). Under these conditions, the result of the classical ANOVA ($p = 0.233$) was deemed unreliable.

Given the violation of the normality assumption for both indices and the lack of variance homogeneity in the case of sWIG80, further analysis of monthly return seasonality was based on the non-parametric Kruskal-Wallis test.

The results of this test for the WIG20 index did not indicate a statistically significant effect of the calendar month on the level of returns ($H = 14.031$; $df = 11$; $p = 0.2312$). This suggests that no significant monthly seasonality was observed in the segment of the largest companies listed on the Warsaw Stock Exchange during the analyzed period. Analogous results were

obtained for the sWIG80 index, for which the test statistic equaled H = 13.149 and the p-value was 0.2837. This indicates the absence of statistically significant differences between monthly returns also in the segment of small-cap companies.

4.2. Analysis of the January Effect in Subperiods

To assess the robustness of the results and to verify whether the lack of statistical significance over the entire sample period may be driven by the averaging of opposing tendencies, an additional seasonality analysis was conducted for two subperiods: 2000-2008 and 2009-2024.

For the WIG20 index, the Kruskal-Wallis test did not reveal statistically significant differences between monthly returns in either of the analyzed subperiods. In the years 2000-2008, the p-value amounted to 0.9026, while in the period 2009-2024 it equaled 0.3514. These results confirm the absence of monthly seasonality in the segment of the largest companies both before the global financial crisis and in the subsequent period.

Similarly, no statistically significant differences between calendar months were identified for the sWIG80 index in either subperiod. In the years 2000-2008, the p-value reached 0.8869. It should be noted, however, that the average January return in this period was relatively high, amounting to 4.49%. At the same time, the high volatility of monthly returns meant that the observed difference did not reach statistical significance. In the second subperiod (2009-2024), the p-value equaled 0.3929, which confirms a further weakening of seasonal effects in the small-cap segment.

4.3. Characteristics of monthly returns over the entire sample period

The inferential analysis conducted using the Kruskal-Wallis test is complemented by a descriptive examination of monthly returns based on data visualizations for the entire sample period 2000-2024. This analysis makes it possible to assess whether the lack of statistical significance identified in the nonparametric tests is reflected in the structure of mean values and in the distribution of observations.

The charts of average monthly returns (Figure 1 and Figure 2) reveal noticeable differences between the analyzed indices. In the case of the sWIG80 index, January stands out as the month with the highest average return, amounting to 3.6%. Relatively high values are also observed in February (2.1%) and April (2.4%). Such a pattern may suggest the presence of a positive seasonal effect at the beginning of the year in the small-cap segment.

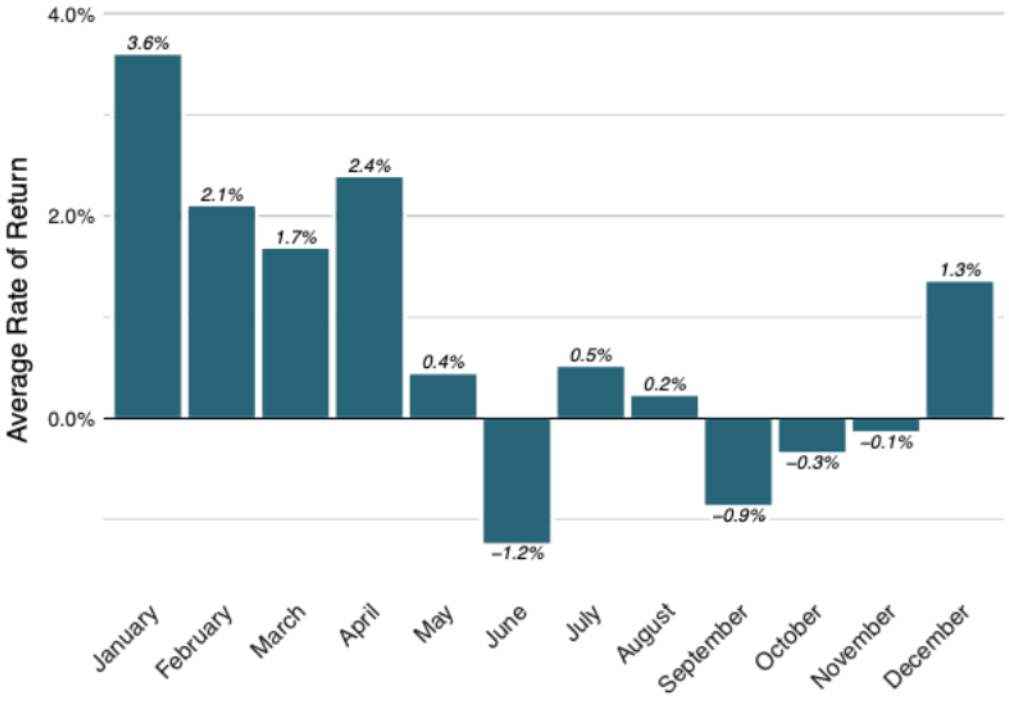

Figure 1. Average Monthly Rates of Rerun sWIG80.

Source: Own elaboration.

A different situation is observed for the WIG20 index, where January does not constitute a dominant month and its average return amounts to only 0.3%. The distribution of average monthly returns for this index is more irregular, with a particularly pronounced negative anomaly occurring in September, characterized by an average loss of –2.8%.

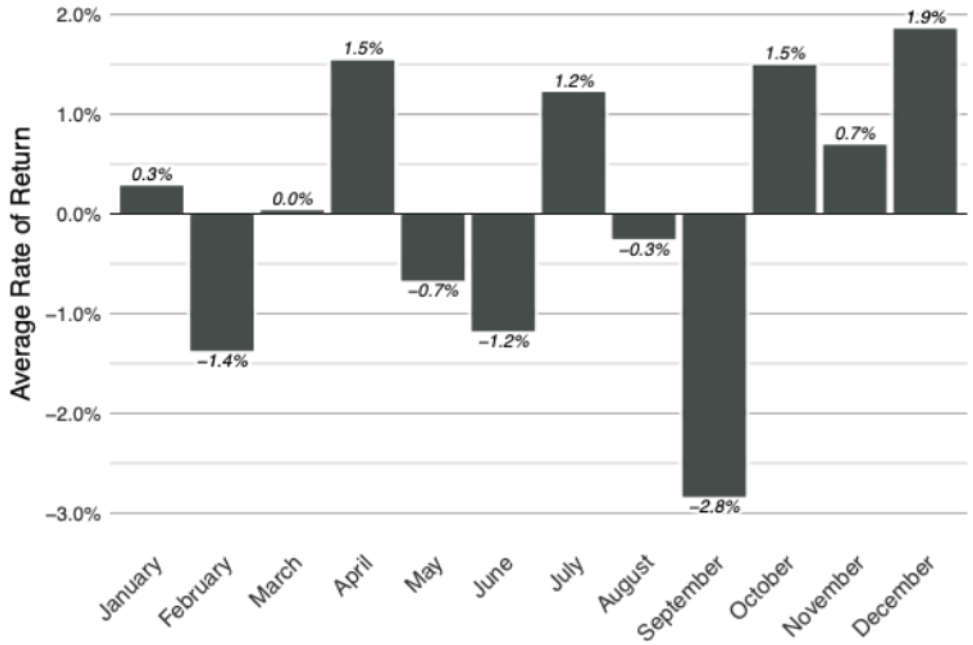

Figure 2. Average Monthly Rates of Rerun WIG20.

Source: Own elaboration.

An explanation for the lack of statistical significance of the monthly effect is provided by box plots illustrating the distribution of monthly returns (Figure 3 and Figure 4).

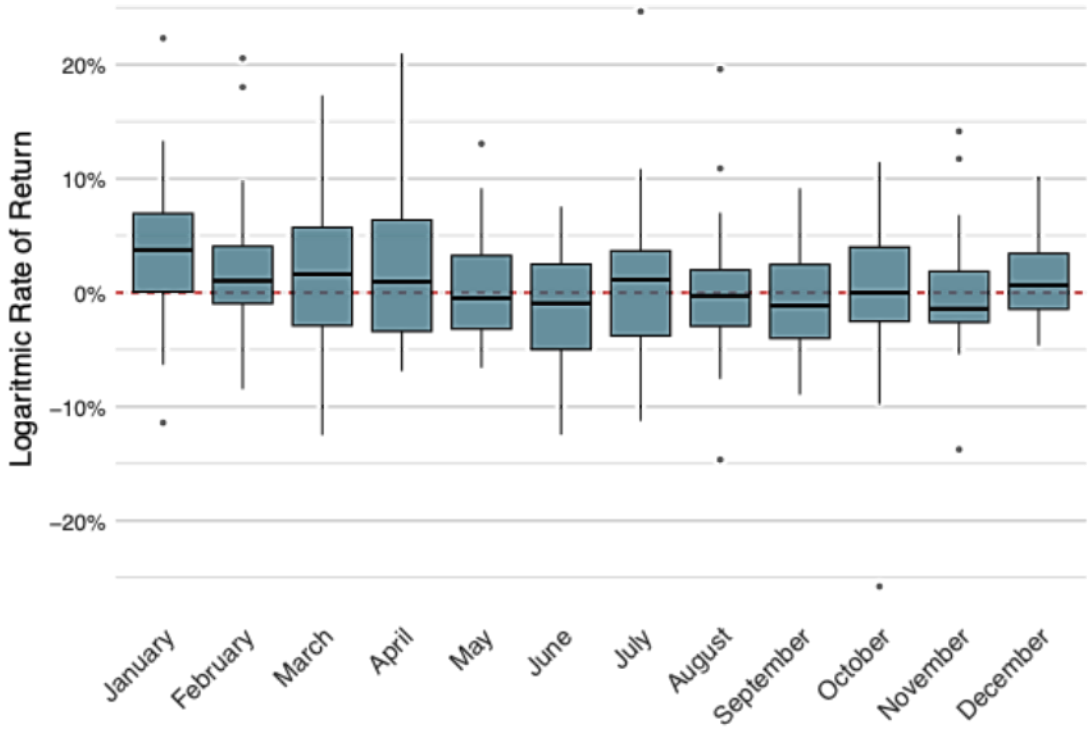

Figure 3. Distribution of sWIG80 Returns.

Source: Own elaboration.

For the sWIG80 index, despite the relatively high average return in January, a substantial interquartile range and numerous outliers can be observed. The high volatility of observations across individual months significantly affects the stability of mean values and limits the ability to identify a systematic seasonal effect at the statistical level.

A corresponding analysis for the WIG20 index does not provide evidence supporting the existence of a regular January anomaly. January is characterized by a wide range of return fluctuations, and the distribution of observations does not show a concentration of positive values. High volatility and the presence of extreme observations undermine the stability of any potential positive seasonal effects, which remains consistent with the results of the nonparametric tests.

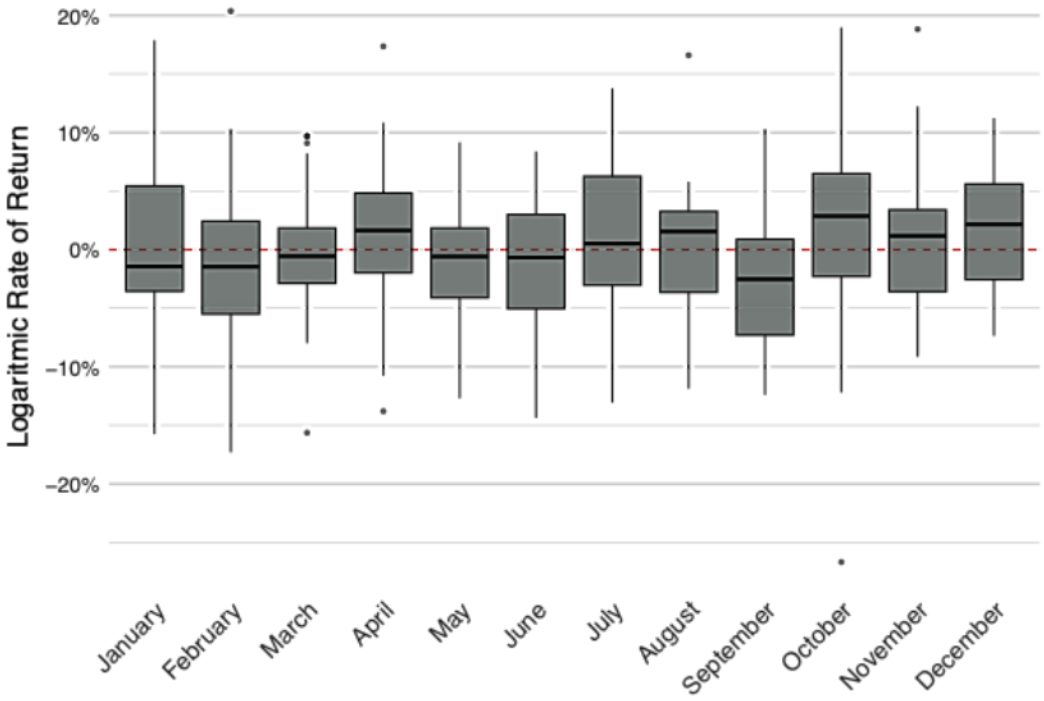

Figure 4. Distribution of WIG20 Returns.
Source: Own elaboration.

4.4. Evolution of the January Effect in the subperiods 2000-2008 and 2009-2024

The objective of this part of the analysis was to assess whether the strength of the January effect changed as the capital market matured. To this end, average monthly returns were compared for the pre-crisis period (2000-2008) and for the years 2009-2024.

Figure 5 presents a comparison of average monthly returns for the sWIG80 index across both subperiods. A weakening of returns in the early months of the year is clearly observable. In the years 2000-2008, the average returns in January and February amounted to 4.6% and 4.5%, respectively, whereas in the period 2009-2024 they declined to 3.1% and 0.7%. This indicates a reduction in the magnitude of seasonal excess returns in the small-cap segment.

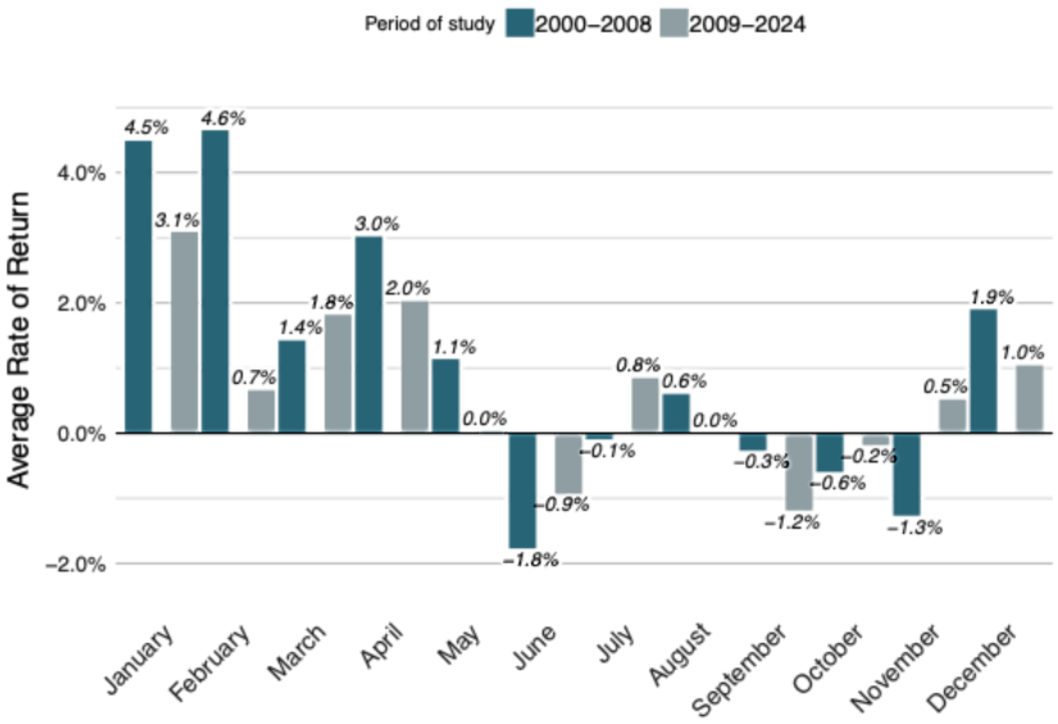

Figure 5. Comparison of Average Rates of Return sWIG80.

Source: Own elaboration.

An analogous comparison for the WIG20 index is shown in Figure 6. In both subperiods, September remains a month characterized by negative average returns; however, in the years 2009-2024 the scale of declines is markedly smaller than in the pre-crisis period.

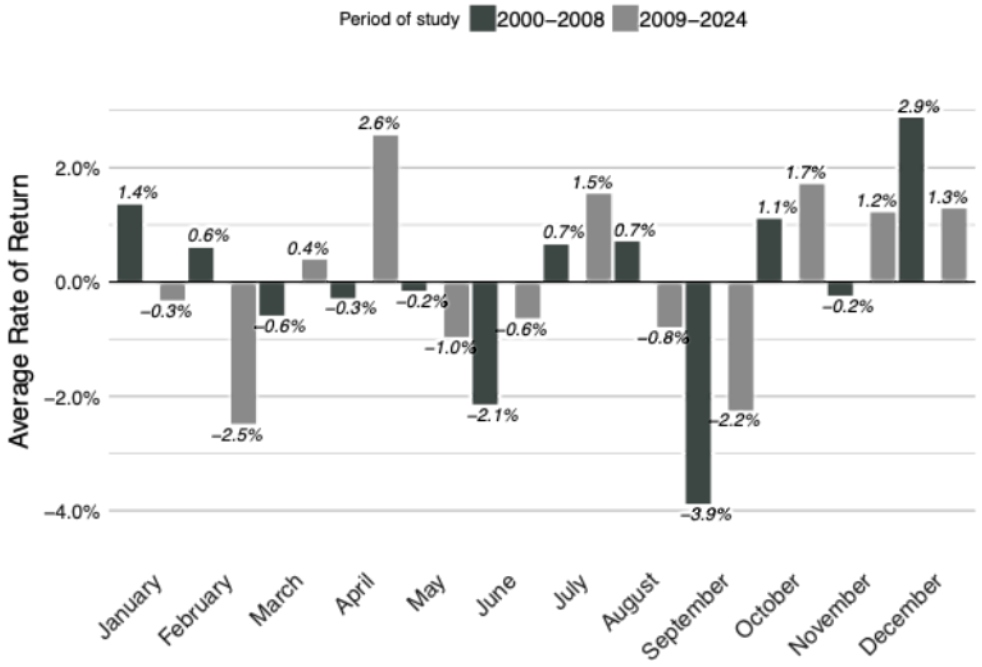

Figure 6. Comparison of Average Rates of Return WIG20.

Source: Own elaboration.

4.5. Structural changes in return volatility

Complementing the analysis of average values, the distributions of monthly returns in both subperiods were compared using box plots. This approach allows for an assessment of changes in volatility and in the structure of risk.

Figures 7 and 8 illustrate clear differences between the period 2000-2008 and the years 2009-2024. In the latter subperiod, a narrowing of the interquartile range and a shortening of the whiskers can be observed, indicating a decline in the volatility of monthly returns.

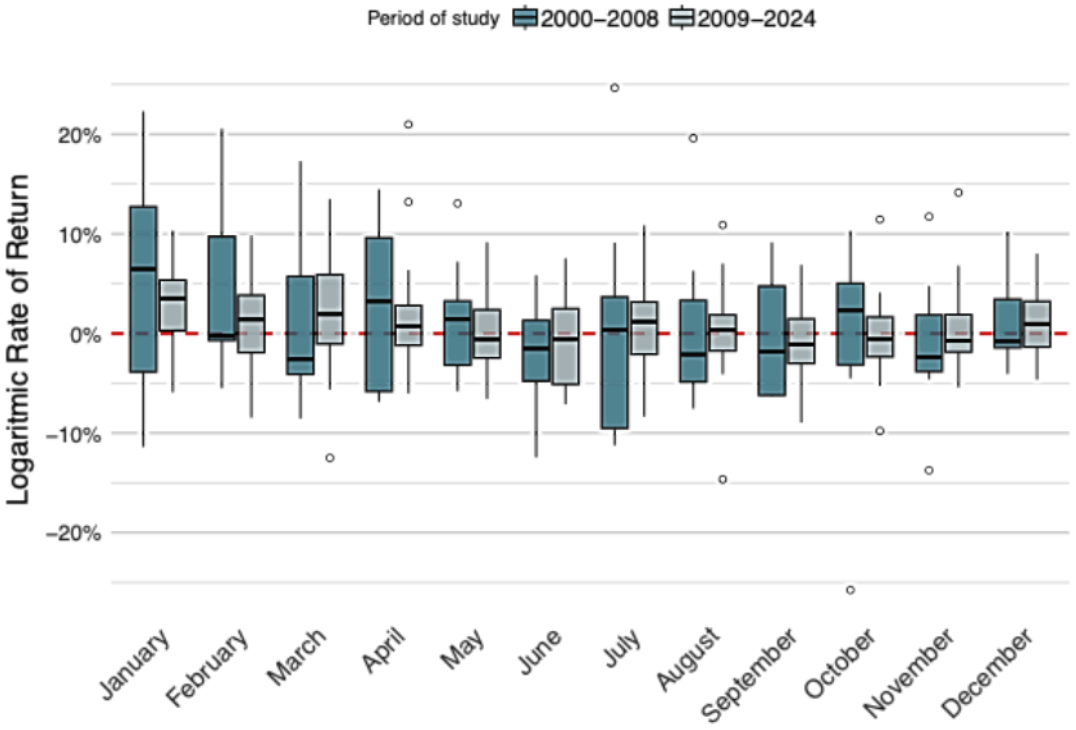

Figure 7. Diminishing Volatility: Comparison of sWIG80 Rates of Return.
Source: Own elaboration.

This pattern is evident in both the small-cap and large-cap segments, suggesting increased market stability in the later stage of its development.

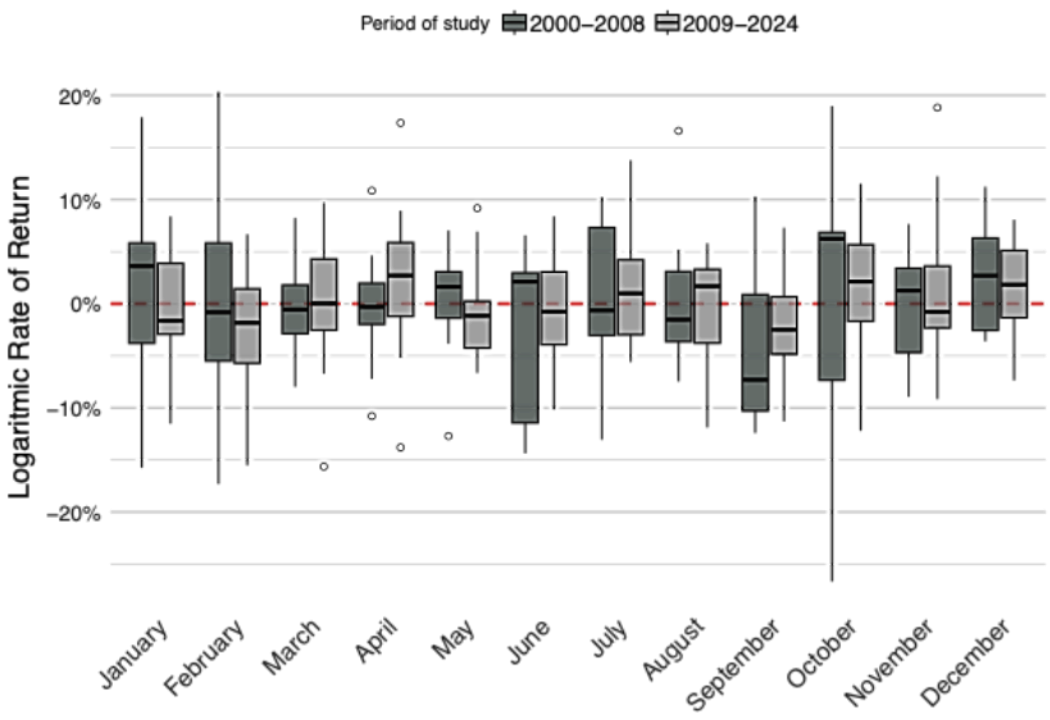

Figure 8. Diminishing Volatility: Comparison of WIG20 Rates of Return.
Source: Own elaboration.

4.6. Discussion of the research results

The results of the statistical tests did not reveal statistically significant differences between monthly returns over the entire 25-year study period, which implies a lack of empirical support for confirming hypothesis H1 in its global formulation. In particular, January does not differ from other months in a statistically significant manner, as the p-values obtained for both analysed indices exceeded the adopted significance level. These findings are consistent with the assumptions of the Efficient Market Hypothesis and suggest that, under contemporary conditions of the Warsaw Stock Exchange, simple calendar anomalies do not generate systematic excess returns. This observation is consistent with recent international evidence provided by Enow (2024), who, upon revisiting the January anomaly in global stock markets, concluded that while the effect may have been prominent in the past, it is no longer evident in modern, efficient financial systems due to arbitrage activities.

At the same time, descriptive analysis and the visualisation of average monthly returns indicate a clear differentiation between market segments. In the small-cap segment, represented by the sWIG80 index, January was characterised by a relatively higher average return compared with the WIG20 index. Although this difference did not reach statistical significance over the full time horizon, its directional character remains consistent with hypothesis H2 and with earlier findings in the literature, which point to a concentration of seasonal anomalies among firms with lower capitalisation. This specific market behavior is corroborated by the recent findings of Pawlonka and Sypniewski (2023). Their research on the WSE confirms that the

January effect persists as a statistically significant phenomenon primarily in the segment of small and medium-sized companies, whereas it has largely disappeared from the main indices representing the largest capitalisation stocks.

The analysis of the subperiods provides additional insights into the evolution of the January effect on the Polish market. In the years 2000-2008, when the Warsaw market exhibited features typical of an emerging market, January was associated with relatively high average returns, particularly in the small-cap segment. Following the global financial crisis of 2008, a clear flattening of monthly returns was observed, accompanied by changes in their dispersion, which limited the ability to identify stable seasonal patterns. These results provide empirical support for hypothesis H3, which assumes a weakening of the January effect over time as the market matures, especially in the segment of the largest companies. Such temporal variability finds theoretical and empirical backing in the work of Kołatka (2020), who tested the Adaptive Market Hypothesis on the WIG index (1994-2019) and demonstrated that market efficiency is not constant but cyclical, explaining why anomalies may exist in earlier development stages and disappear as the market evolves.

In a synthetic perspective, the obtained results indicate that the lack of statistical significance of the January effect does not necessarily imply its complete disappearance, but rather a transition from a regular anomaly to a phenomenon that is unstable and strongly dependent on market structure and the stage of market development. This instability in the most recent years is further documented by Lisicki (2025), who showed that in the post-pandemic reality of the WSE, the January effect is no longer consistent and depends heavily on unexpected market events.

5. Conclusion

The aim of the study was to empirically verify the existence of the January effect on the Warsaw Stock Exchange, taking into account differences related to firm capitalisation and changes occurring over a long time horizon. The analysis of returns for the WIG20 and sWIG80 indices over the period 2000-2024 did not provide grounds for confirming hypothesis H1 in its global formulation, as no statistically significant differentiation of monthly returns was identified over the entire sample period.

At the same time, the results of the structural and descriptive analyses indicate directional differences between market segments. Relatively higher average January returns observed for the sWIG80 index, in the absence of analogous tendencies for the WIG20 index, provide partial support for hypothesis H2, which assumes a stronger manifestation of the January effect in the small-cap segment. It should be emphasised, however, that this advantage is nominal in nature

and did not receive confirmation at the level of statistical significance across the full research horizon.

An important contribution of this study to the existing literature is the demonstration of the time-varying nature of the analysed phenomenon. Dividing the 25-year period into subperiods made it possible to show that the relatively high January returns observed prior to 2008 weakened markedly in the post-crisis period. This result confirms hypothesis H3 and points to a process of maturation of the Warsaw capital market, which is increasingly resembling developed markets where seasonal anomalies are of limited importance or tend to disappear.

When interpreting the results, several limitations of the study should be taken into account. First, the analysis is based on aggregate index-level data, which does not allow for the identification of firm-level drivers of seasonal return patterns. Second, the use of non-parametric tests, while robust to deviations from normality, limits the ability to control for additional risk factors and dynamic effects. Third, the study does not incorporate transaction costs and tax burdens, which may substantially reduce the potential investment benefits implied by the observed regularities, especially in the small-cap segment.

In view of these limitations, future research could focus on analysing the behaviour of individual investors in order to identify possible behavioural or tax-related determinants of seasonal anomalies. Further studies could also extend the analysis to real (inflation-adjusted) returns and examine seasonal effects using higher-frequency data, for example at the level of selected trading days during the year, which may reveal short-term patterns not observable in monthly data. Additionally, comparative analyses including other Central and Eastern European capital markets could provide broader insight into the regional dynamics of calendar anomalies.

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