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## EVALUATION OF THE MONTH-OF-THE-YEAR EFFECT ON THE SECURITIES MARKETS OF THE BRICS NATIONS



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### Abstract

**Importance** This article considers and discusses the issues related to the determination of the month-of-the-year effect on the securities markets of the BRICS nations. For it is known that temporal effects indicate a stock market's low efficiency.

**Objectives** The article aims to obtain results of a cross-country analysis of the month-of-the-year effect on the stock markets of the BRICS countries and determine the efficiency of the markets under consideration.

**Methods** For the study, I used the regression and econometric analyses approaches applying the Microsoft Excel and Gretl software.

**Results** I examined the stock exchanges of the BRICS countries and determined the stability of the month-of-the-year effect. The latter is defined only for the IBOV, RTS, and TOP40 indexes, which are the major market ones in the Brazilian Stock Exchange (BM&FBOVESPA), Moscow Exchange, and the Johannesburg Stock Exchange Limited, respectively. Based on the findings, I present the estimated degree of information efficiency of each of the analyzed markets. The obtained results may also be used to develop a trading strategy to increase the profitability of multinational investment portfolio.

**Conclusions and Relevance** The article concludes that the month-of-the-year effect is individual concerning only several indexes under consideration. This contradicts the efficient-market hypothesis, according to which the financial asset quotes get formed independently.

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### Introduction

The leading hypothesis of pricing on stock markets is the *Efficient-Market Hypothesis* by Eugene F. Fama [1]. According to this hypothesis, there are three forms of market efficiency.

1. *Weak Form Efficiency*. The value of the asset reflects all past information regarding the asset.

2. *Semi-Strong Form Efficiency*. The value of the asset reflects past information plus all available public information.

3. *Strong Form Efficiency*. The value of the asset reflects all the information: past, public, and the insider one.

Considering the given classification, it is clear that it is not possible to build a trading strategy with profitability surpassing the market profitability on the strong form securities market, as all information is already reflected in prices.

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However, in practice, repeated quote movements were found, depending on a certain period of time, which were later called *Temporal effects*. Their existence testifies to the weak form of the stock market efficiency, and it potentially allows to derive excess return.

This article discusses the *Month-of-the-year effect*, which refers to the unequal distribution of profitability depending on the month of the year. The most common type is the *January effect*, which suggests an abnormally high yield in this month compared to others.

The article aims to obtain certain results of a cross-country analysis of the Month-of-the-year effect on the stock markets of the BRICS countries, as well as determine their effectiveness.

### The Month-of-the-Year Effect Study Coverage

The basic provisions of the random-walk theory of stock market prices on the securities markets were formulated by L. Bachelier in 1900 [2]. This formed the basis for the definition of the mentioned three forms of efficiency of E.F. Fama.

The first observations of unequal distribution of prices were made in the U.S. market back in the 1930s. For example, F.C. Kelly noted that *Monday* was the worst day for securities purchases [3]. Around that time, M.J. Fields presented the results showing that the best day for investment was *Saturday*, the week-end day (at that time, the U.S. stock markets were open and trading six days a week) [4].

Later, the researchers began studying the relationship between the *January effect* and the *Monday effect*. R.J. Rogalski was one of the first to consider simultaneously the *Company size*, *Monday effect*, and the *January effect* [5]. He found that in January, the average yield for all sizes of companies was positive, and in other months, it was negative.

R.A. Ariel says that the hypothesis of the relationship between the *January effect* and the *Holiday effect* has not been confirmed and the increased profitability of January can not be explained by the Holiday effect [6]. The relationship between the *Day-of-the-week effect* and *Small companies*, and the *Holiday effect* was not found, either.

Chan-Wung Kim and Jinwoo Park say about the independence of the *January effect* from the *Holiday effect* in the UK, Japan, and the USA [7]. Therefore, we can say that there is no relationship between the formation of the *Month-of-the-year effect* and other *Calendar anomalies*.

At the same time, A. Agrawal and K. Tandon conducted one of the most significant studies in terms of the coverage of countries and temporal effects studied [8]. They covered five temporal effects (*Holiday effect*, *Turn-of-the-month effect*, *Month-of-the-year effect*, *Friday the 13th effect*, *End-December effect*) for 18 countries, including ten European countries (Luxembourg, Denmark, France, Germany, Belgium, Italy, Sweden, Netherlands, Switzerland and the United Kingdom), three Asian countries (Japan, Hong Kong and Singapore), and two Latin American countries (Mexico and Brazil), as well as Australia, Canada and New Zealand. Together with the USA, these countries make 95 percent of the world exchange capital. The researchers determined a high yield in January in most countries and significant seasonality by month in nine countries.

E. Balaban found the January effect in Turkey [9].

At the same time, the considered temporal effect is defined not only for stock markets. For instance, S.D. Jordan and B.D. Jordan were studying the *Month-of-the-year effect* on the basis of Dow Jones Composite Bond Average [10]. They showed that the yield of bonds had seasonality different from the securities market's one, and thus confirmed the existence of the January effect for corporate bonds.

A.L. Redman, H. Manakyan and K. Liano consider the January effect of real estate market indexes through the study of Real Estate Investment Trusts (REIT) and Center for Research in Security Prices Value-Weighted and Equal-Weighted indexes – CRSP-VW index and CRSP-EW index [11]. The researchers find that the January effect is characteristic for CRSP EW and REIT.

The impact of news can be called one of the main explanations of temporal effects, including the January effect. If the temporal effects really depend on the news, the market where firms report their profits,

must be more seasonal than the index, where they do not.

D.R. Peterson checked this hypothesis concerning the January effect [12]. As a result, the index with no news, shows a greater seasonality compared to the index with the news. Therefore, it is unlikely that seasonality in yield is caused by the news about returns.

Zainudin Arsad and J.A. Coutts published an article that dealt with the UK stock market, namely the FTO index of the London Stock Exchange (LSE) over a 60-year period [13]. They aimed to confirm the existence of the January effect, as well as determine the possibility of gaining additional profits through temporal effects. The January effect was confirmed, but it turned out that given the persistence of temporal effects, it is impossible to gain excess return because of transaction costs.

W.S. Compton and R.A. Kunkel studied the feasibility of profit making from the *Weekend effect*, *January effect*, and the *Turn-of-the-month effect*, using individual pension accounts [14]. They reviewed the data of the Teachers Insurance and Annuity Association – College Retirement Equities Fund (TIAA-CREF) and used six strategies. The first two *Buy-and-Hold* strategies are used for two pension funds of the stock and bond market. The other four ones use a strategy based on the transfer of money between the equity account and the money account, and between the money account and the equity or bond account. The researchers show that investors can win through the strategy of switching pension accounts. The Turn-of-the-month effect strategy surpasses the strategy based on the Weekend effect. However, there are several problems. First, there is a *free-rider problem*. The strategy gets funded through the buy-and-hold strategy. Second, managed funds, which are to sell and buy, face the various challenges.

Chin-Chen Chien, Cheng-few Lee and A.M.L. Wang argue that the use of a dummy variable model leads to incorrect conclusions [15]. As a rule, the null hypothesis of equality of returns in all months is incorrectly rejected, as soon as the yields of shares show greater volatility for the period under review. The detection of the January effect can be associated with the use of a wrong statistical technique, which is proved when considering the CRSP-VW index.

## The Investigated Data

As the data for study, we take the values of the indexes of IBOV, MICEX, RTS, SENSEX, NIFTY, HSI, SHCOMP, and TOP40, which are the major market ones for the Brazilian Stock Exchange (BM & FBOVESPA), the Russian Exchange (PAO Moskovskaya Birzha – Moscow Exchange), Bombay Stock Exchange Ltd. (BSE), National Stock Exchange of India Limited (NSE), Hong Kong Exchanges and Clearing Limited (HKEx), Shanghai Stock Exchange (SSE), and the Johannesburg Stock Exchange Limited (JSE Limited). Thus, all the stock markets of the BRICS nations are under consideration.

Simultaneous considering of several trading floors helps diversify risk, and also take into account the peculiarities of formation of the Turn-of-the-month effect for each particular country.

In order to determine the stability of the considered temporal effect for each country, the total sample is divided into five-year sub-periods. All the data taken cover the period from the beginning of data publication till June 30, 2015. *Fig. 1* shows the periods of study of each particular index as a time axis.

## The Research Methodology

The GARCH (1,1) model (which stands for *Generalized Autoregressive Conditional Heteroscedasticity*), first developed by T. Bollerslev (1986) [16], is used as the principal one. Its distinctive feature is that it takes into account the heteroscedasticity, revealed by the results of testing time series of stock indexes.

Using the other two models with conditional heteroscedasticity GRJ-GARCH (or TGARCH) developed by L.R. Glosten, R. Jagannathan and D.E. Runkle [17], and EGARCH developed by D.B. Nelson [18] is inexpedient, as it was confirmed by E.A. Fedorova and E.V. Gilenko [19], because the factors that are responsible for the effect of negative values of the previous series are insignificant.

The index yield is a dependent variable, which gets calculated by the following formula

$$R_t = \ln\left(\frac{I_t}{I_{t-1}}\right) \cdot 100,$$

where  $R_t$  is the index yield on day  $t$ , calculated as a yield in logarithmic form from the previous trading day closing to the current trading day closing;

$I_t$  is the  $I$ -index value at-the-close of day  $t$ ;

$I_{t-1}$  is the  $I$ -index value at-the-close of day  $t-1$ .

When considering the Month-of-the-year effect, the values of the daily yields in one of the months of the year are used as independent variables.

The GARCH model for determining the Month-of-the-year effect is as follows:

$$R_t = D_{Jan} R_{Jan} + D_{Feb} R_{Feb} + D_{Mar} R_{Mar} + D_{Apr} R_{Apr} + D_{May} R_{May} + D_{June} R_{June} + D_{Aug} R_{Aug} + D_{Sept} R_{Sept} + D_{Oct} R_{Oct} + D_{Nov} R_{Nov} + D_{Dec} R_{Dec} + \varepsilon_t,$$

where  $D_{Jan} \dots D_{Dec}$  is the dummy variable equal to 1, if the yield on the studied day falls on a certain month of the year, and 0, if otherwise;

$R_{Jan} \dots R_{Dec}$  are the regression coefficients.

In the model, the smoothing is as follows:

$$\varepsilon_t \sim N(0, \sigma_t^2),$$

where  $\sigma_t^2 = \omega + \alpha \varepsilon_{t-1}^2 + \beta \sigma_{t-1}^2$ ,  $\omega$  is the constant;  $\alpha$  is the short-term shock incidence;  $\beta$  is the long-term shock incidence.

Because the conditional variance must be non-negative, the following conditions are applied to the model:

$$\omega > 0, \alpha \geq 0 \text{ и } \beta \geq 0.$$

Also, the model removes the constant in order to avoid full multicollinearity, for if maintaining it, the sum of the dummy variables would be equal to the constant.

The hypothesis on equality of coefficients is tested (constant return is independent from the month of the year):

$$H_0: R_{Jan} = R_{Feb} = R_{Mar} = R_{Apr} = R_{May} = R_{June} = R_{July} = R_{Aug} = R_{Sept} = R_{Oct} = R_{Nov} = R_{Dec};$$

$H_1:$

$$R_{Jan} \neq R_{Feb} \neq R_{Mar} \neq R_{Apr} \neq R_{May} \neq R_{June} \neq R_{July} \neq R_{Aug} \neq R_{Sept} \neq R_{Oct} \neq R_{Nov} \neq R_{Dec}.$$

If the null hypothesis is rejected, then the yield distribution in each of the months of the year is unequal, which indicates the existence of the Month-of-the-year effect.

## The Research Findings and the Interpretation

The descriptive statistics of the Month-of-the-year effect on the stock markets of the BRICS countries are presented in *Table 1*.

When considering the IBOV index of the Brazilian Stock Exchange, it should be noted that two significant negative coefficients are found in May from 2010 to 2015 and in October from 1970 to 1974. All other significant coefficients are positive.

Concerning the general period, we can see that in January, the significant coefficient has the greatest value, which confirms the January effect. Moreover, in most sub-periods, there is also a significant positive coefficient. This indicates the stability of the January temporal effect for the Brazilian Stock Exchange.

When considering the results of the RTS index of the Russian market, the hypothesis of the existence of the January effect is not confirmed, even in spite of the significant positive coefficient for the whole period, because no significant positive coefficient has been found for any of the sub-periods. This indicates the volatility of the temporal effect. However, the February effect is clearly observable, as in this month, there are significant positive coefficients in all periods except 1995–2000.

The Moscow Exchange MICEX index does not confirm the January effect either, as unstable results have been obtained. However, significant and positive coefficients in January and February are typical for the general period and the last time segment.

If we consider the results of the SENSEX index of the Bombay Stock Exchange, we can say that the significant coefficients are distributed fairly equally, and it is not possible to reveal any pattern. For this

reason, it is impossible to talk about the existence of a certain Month-of-the-year effect.

The NIFTY index of the National Stock Exchange of India Limited has been considered also. It is evident that the positive coefficients are significant at the end of the year, mainly, but the stability of their formation does not support this or that temporal effect of the month.

Quite a number of positive and significant coefficients are characteristic of the Hong Kong Exchanges and Clearing Limited HSI index. However, they depend heavily on the time period under review. Therefore, it is impossible to declare the existence of the temporal effect of any month, although in January, only positive coefficients are significant.

A large number of positive and several negative significant coefficients are also observed on the Shanghai Stock Exchange SHCOMP index. However, they depend heavily on the time period under consideration, so it is not possible to speak of a month's temporal effect.

The Johannesburg Stock Exchange Limited TOP40 index is the final one in the list to consider. Only positive coefficients are significant here. All of them belong to the second half of the year. So we can talk about the existence of the second half of the year effect, or more strictly, the December effect.

Thus, the January effect is confirmed only for the IBOV index of the Brazilian Stock Exchange. In addition, the February effect for the RTS index and the December effect for TOP40 index were found. For all the rest indexes, there is an equal distribution of positive coefficients during the year, which does not allow to state the effect of any month.

## Conclusion

The article achieved the main objective in the form of the results of the cross-country analysis of the Month-of-the-year effect on the stock markets of the BRICS countries. As well, it determines the estimated form of information efficiency of the markets under consideration.

The objects of the study were the Russian Exchange (PAO Moskovskaya Birzha – Moscow Exchange), Brazilian Stock Exchange (BM & FBOVESPA), Bombay Stock Exchange Ltd. (BSE), National Stock Exchange of India Limited (NSE), Hong Kong Exchanges and Clearing Limited (HKEx), Shanghai Stock Exchange (SSE), and the Johannesburg Stock Exchange Limited (JSE Limited).

To achieve the goal, the previous results in the field of the Month-of-the-year effect research were summarized. A unique econometric model was built. It helps get the most relevant results.

*Table 2* presents the main conclusions about the existence and stability of the Month-of-the-year effect.

**Table 1****Evaluation of the Month-of-the-year effect on stock indexes of the BRICS countries**

Month	All-time Period	Till 1970	1970– 1974	1975– 1979	1980– 1984	1985– 1989	1990– 1994	1995– 1999	2000– 2004	2005– 2009	2010– 2015
<b>Brazil / BM&amp;FBOVESPA / IBOV</b>											
January	0.28 <sup>***</sup>	0.42 <sup>**</sup>	–0.04	0.36 <sup>***</sup>	1.19 <sup>***</sup>	0.12	2.37 <sup>***</sup>	0.56 <sup>***</sup>	0.02	0.14	–0.09
February	0.25 <sup>***</sup>	0.92 <sup>***</sup>	0.21	0.09	0.39 <sup>***</sup>	1.34 <sup>***</sup>	2.55 <sup>***</sup>	0.31	–0.01	0.12	0.04
March	0.15 <sup>***</sup>	0.21	0.35 <sup>**</sup>	0.02	0.09	1.52 <sup>***</sup>	0.77 <sup>*</sup>	0.41 <sup>***</sup>	–0.03	–0.02	0.09
April	0.22 <sup>***</sup>	0.55 <sup>*</sup>	0.31 <sup>*</sup>	0.02	0.48 <sup>***</sup>	1.04 <sup>***</sup>	0.89 <sup>**</sup>	0.31 <sup>*</sup>	–0.04	0.31 <sup>*</sup>	–0.02
May	0.22 <sup>***</sup>	1.01 <sup>**</sup>	–0.08	0.27 <sup>**</sup>	0.56 <sup>***</sup>	0.61 <sup>*</sup>	1.51 <sup>***</sup>	0.29	0.002	0.23	–0.2 <sup>*</sup>
June	0.05	–0.29	–0.18	0.04	0.28 <sup>***</sup>	0.45	1.25 <sup>***</sup>	0.3	–0.009	–0.04	–0.09
July	0.15 <sup>***</sup>	0.19	0.54 <sup>***</sup>	0.14	–0.14	0.81 <sup>**</sup>	1.27 <sup>***</sup>	0.06	–0.04	0.1	0.19
August	0.2 <sup>***</sup>	0.23	0.25	0.19 <sup>**</sup>	0.24 <sup>*</sup>	0.54 <sup>*</sup>	0.93 <sup>***</sup>	–0.07	0.2	0.04	0.09
September	0.22 <sup>***</sup>	0.48 <sup>**</sup>	–0.003	0.23 <sup>*</sup>	0.28 <sup>*</sup>	1.26 <sup>***</sup>	0.84 <sup>**</sup>	0.23	–0.17	0.32 <sup>**</sup>	0.03
October	0.04	–0.11	–0.37 <sup>**</sup>	–0.18	0.72 <sup>***</sup>	1.12 <sup>***</sup>	–0.13	0.03	0.21	0.16	0.09
November	0.03	–0.21	–0.19	–0.19	0.02	–0.03	0.65 <sup>*</sup>	0.34 <sup>**</sup>	0.33 <sup>*</sup>	0.23	–0.08
December	0.17 <sup>***</sup>	–0.02	0.16	0.05	0.45	0.48	1.15 <sup>***</sup>	0.37 <sup>*</sup>	0.35 <sup>**</sup>	0.19	0.04
<b>Russia / Moscow Exchange / RTS</b>											
January	0.16 <sup>*</sup>	–	–	–	–	–	–	0.14	0.18	–0.01	0.21
February	0.34 <sup>***</sup>	–	–	–	–	–	–	0.23	0.32 <sup>*</sup>	0.38 <sup>**</sup>	0.3 <sup>*</sup>
March	0.03	–	–	–	–	–	–	–0.15	0.27	0.004	–0.08
April	0.1	–	–	–	–	–	–	–0.06	0.27	0.19	–0.06
May	0.01	–	–	–	–	–	–	0.3	0.23	0.2	–0.34 <sup>*</sup>
June	0.15	–	–	–	–	–	–	0.92 <sup>***</sup>	0.11	0.11	0.05
July	0.08	–	–	–	–	–	–	0.27	–0.14	0.19	0.07
August	0.15 <sup>*</sup>	–	–	–	–	–	–	–0.17	0.49 <sup>***</sup>	0.17	–0.11
September	0.1	–	–	–	–	–	–	–0.37 <sup>*</sup>	0.1	0.28	0.21
October	0.2 <sup>**</sup>	–	–	–	–	–	–	0.27	0.3	0.15	0.13
November	0.07	–	–	–	–	–	–	0.15	–0.04	0.29 <sup>**</sup>	–0.12
December	0.16 <sup>*</sup>	–	–	–	–	–	–	0.08	0.13	0.28	0.22
<b>Russia / Moscow Exchange / MICEX</b>											
January	0.19 <sup>**</sup>	–	–	–	–	–	–	–0.45	0.26	0.17	0.22 <sup>**</sup>
February	0.37 <sup>***</sup>	–	–	–	–	–	–	0.66	0.24	0.27	0.37 <sup>***</sup>
March	0.01	–	–	–	–	–	–	0.58	0.32 <sup>*</sup>	0.01	–0.16
April	0.06	–	–	–	–	–	–	–0.08	0.32 <sup>*</sup>	0.15	–0.09
May	0.03	–	–	–	–	–	–	–0.79	0.29	0.19	–0.14
June	0.1	–	–	–	–	–	–	0.8	0.03	0.09	0.1
July	0.04	–	–	–	–	–	–	–0.64	–0.25	0.19	0.06
August	0.11	–	–	–	–	–	–	–0.51	0.35 <sup>**</sup>	0.16	–0.04
September	0.11	–	–	–	–	–	–	–0.32	–0.04	0.18	0.18
October	0.24 <sup>***</sup>	–	–	–	–	–	–	1.56 <sup>***</sup>	0.25	0.18	0.16
November	0.07	–	–	–	–	–	–	0.64	–0.08	0.25 <sup>*</sup>	–0.004
December	0.16	–	–	–	–	–	–	0.22	0.07	0.26	0.12
<b>India / BSE Ltd / SENSEX</b>											
January	0.02	–	–	–	–	0.24	0.29	–0.23	0.01	0.13	–0.01
February	0.02	–	–	–	–	–0.08	0.16	0.33 <sup>**</sup>	0.19	0.09	–0.03
March	0.02	–	–	–	–	–0.06	0.02	0.02	–0.29 <sup>*</sup>	0.04	0.13
April	0.04	–	–	–	–	0.36 <sup>*</sup>	–0.02	0.32 <sup>*</sup>	–0.32 <sup>**</sup>	0.15	0.002
May	0.08	–	–	–	–	–0.09	0.13	0.05	0.17	0.23 <sup>*</sup>	0.02
June	0.15 <sup>***</sup>	–	–	–	–	0.15	0.12	0.18	0.16	0.09	0.15 <sup>*</sup>
July	0.05	–	–	–	–	–0.04	0.33 <sup>**</sup>	0.04	0.05	0.21	0.001
August	0.08	–	–	–	–	–0.08	0.59 <sup>***</sup>	–0.08	0.11	0.14	–0.01

September	0.15 <sup>***</sup>	–	–	–	–	0.17	–0.03	0.04	0.06	0.35 <sup>***</sup>	0.26 <sup>***</sup>
October	0.04	–	–	–	–	0.02	–0.09	–0.19	0.07	0.03	0.16
November	0.11 <sup>**</sup>	–	–	–	–	–0.29	–0.0005	–0.27 <sup>*</sup>	0.42 <sup>***</sup>	0.26 <sup>**</sup>	0.06
December	0.12 <sup>**</sup>	–	–	–	–	0.21	–0.16	0.32 <sup>**</sup>	0.26 <sup>***</sup>	0.21	–0.01
<b>India / NSE / NIFTY</b>											
January	0.01	–	–	–	–	–	–	–0.12	0.02	0.17	–0.003
February	0.06	–	–	–	–	–	–	0.37 <sup>*</sup>	0.17	0.04	–0.03
March	0.06	–	–	–	–	–	–	0.02	–0.28 <sup>*</sup>	0.1	0.14
April	0.01	–	–	–	–	–	–	0.38 <sup>*</sup>	–0.29 <sup>**</sup>	0.08	0.01
May	0.1	–	–	–	–	–	–	–0.01	0.18	0.24 <sup>*</sup>	0.03
June	0.15 <sup>***</sup>	–	–	–	–	–	–	0.23	0.17	0.07	0.14
July	0.01	–	–	–	–	–	–	0.05	–0.005	0.16	–0.005
August	0.06	–	–	–	–	–	–	–0.13	0.13	0.16	–0.02
September	0.16 <sup>**</sup>	–	–	–	–	–	–	–0.02	0.03	0.32 <sup>**</sup>	0.27 <sup>***</sup>
October	0.09	–	–	–	–	–	–	–0.24	0.07	0.03	0.16
November	0.17 <sup>***</sup>	–	–	–	–	–	–	–0.25	0.41 <sup>***</sup>	0.27 <sup>**</sup>	0.06
December	0.16 <sup>***</sup>	–	–	–	–	–	–	0.35 <sup>**</sup>	0.26 <sup>***</sup>	0.22	–0.005
<b>China / HKEx / HSI</b>											
January	0.14 <sup>***</sup>	–	0.23 <sup>**</sup>	0.017	0.41 <sup>**</sup>	0.25 <sup>**</sup>	0.14	0.15	0.01	0.08	0.08
February	0.09 <sup>**</sup>	–	0.003	0.067	–0.09	0.21	0.5 <sup>**</sup>	0.23	0.004	0.09	0.05
March	–0.05	–	0.02	0.162	–0.3	0.01	0.09	–0.09	–0.22 <sup>*</sup>	–0.14	–0.09
April	0.16 <sup>**</sup>	–	0.25 <sup>**</sup>	0.147	0.4 <sup>**</sup>	0.25 <sup>**</sup>	0.01	0.02	0.02	0.22 <sup>**</sup>	0.12
May	0.09 <sup>**</sup>	–	0.21	0.053	0.1	0.12	0.34 <sup>***</sup>	0.21 <sup>*</sup>	0.08	0.0005	–0.1
June	0.04	–	0.21	–0.004	0.15	0.18	–0.08	0.02	–0.03	0.1	–0.09
July	0.16 <sup>***</sup>	–	0.26 <sup>*</sup>	–0.044	0.12	0.31 <sup>***</sup>	0.19 <sup>*</sup>	–0.0006	0.04	0.25 <sup>**</sup>	0.2 <sup>**</sup>
August	–0.01	–	0.05	0.033	–0.12	–0.09	0.34	0.003	0.15	0.02	–0.08
September	0.04	–	–0.07	–0.052	–0.52 <sup>**</sup>	0.18 <sup>*</sup>	–0.15	0.22 <sup>*</sup>	–0.06	0.16	0.14
October	0.2 <sup>***</sup>	–	0.01	0.033	0.34 <sup>*</sup>	0.76 <sup>***</sup>	0.5 <sup>**</sup>	0.19	0.08	0.05	0.18 <sup>*</sup>
November	0.11 <sup>***</sup>	–	–0.04	0.066	0.28 <sup>*</sup>	0.02	–0.03	0.27 <sup>**</sup>	0.23 <sup>**</sup>	0.1	0.02
December	0.11 <sup>***</sup>	–	0.28 <sup>***</sup>	0.261 <sup>**</sup>	0.11	0.16	0.16	0.11	–0.02	0.04	–0.007
<b>China / SSE / SHCOMP</b>											
January	0.09	–	–	–	–	–	0.25 <sup>***</sup>	–0.13	–0.07	0.19	–0.06
February	0.15 <sup>**</sup>	–	–	–	–	–	0.31 <sup>***</sup>	–0.71 <sup>***</sup>	0.09	0.23	0.15
March	–0.001	–	–	–	–	–	0.08	0.26 <sup>*</sup>	0.18 <sup>*</sup>	–0.05	–0.06
April	0.05	–	–	–	–	–	–0.38 <sup>***</sup>	0.2	–0.04	0.5 <sup>*</sup>	0.02
May	0.09	–	–	–	–	–	0.05	2.64 <sup>***</sup>	0.11	0.14	–0.08
June	0.01	–	–	–	–	–	0.66 <sup>***</sup>	0.08	–0.08	0.19	–0.21 <sup>**</sup>
July	0.01	–	–	–	–	–	–0.08	0.03	–0.02	0.12	0.07
August	0.06	–	–	–	–	–	0.95 <sup>***</sup>	0.08	–0.05	0.08	–0.01
September	–0.02	–	–	–	–	–	0.19	0.1	–0.18 <sup>*</sup>	0.14	0.11
October	0.11 <sup>*</sup>	–	–	–	–	–	0.85 <sup>***</sup>	0.01	–0.02	0.01	0.13
November	0.13 <sup>**</sup>	–	–	–	–	–	0.79 <sup>***</sup>	–0.22 <sup>*</sup>	0.09	0.13	–0.04
December	0.14 <sup>**</sup>	–	–	–	–	–	0.59 <sup>***</sup>	–0.2	–0.06	0.29 <sup>**</sup>	0.08
<b>SAR / JSE Limited / TOP40</b>											
January	0.07	–	–	–	–	–	–	–	0.03	0.08	0.08
February	0.08	–	–	–	–	–	–	–	–0.07	0.08	0.08
March	0.01	–	–	–	–	–	–	–	–0.19	–0.001	–0.001
April	0.01	–	–	–	–	–	–	–	–0.13	0.05	0.05
May	0.08	–	–	–	–	–	–	–	0.28	–0.01	–0.01
June	–0.01	–	–	–	–	–	–	–	–0.17	0.01	0.01
July	0.12 <sup>**</sup>	–	–	–	–	–	–	–	–0.03	0.11	0.11
August	0.09	–	–	–	–	–	–	–	0.32 <sup>**</sup>	0.002	0.002

September	0.12 <sup>*</sup>	–	–	–	–	–	–	–	0.04	0.12	0.12
October	0.12 <sup>**</sup>	–	–	–	–	–	–	–	0.06	0.17 <sup>**</sup>	0.17 <sup>**</sup>
November	0.07	–	–	–	–	–	–	–	0.15	0.05	0.05
December	0.16 <sup>**</sup>	–	–	–	–	–	–	–	0.12	0.16 <sup>*</sup>	0.16 <sup>*</sup>

<sup>\*</sup>, <sup>\*\*</sup>, <sup>\*\*\*</sup> – Significance level: 10%, 5%, and 1%, respectively.

Source: Authoring

**Table 2**

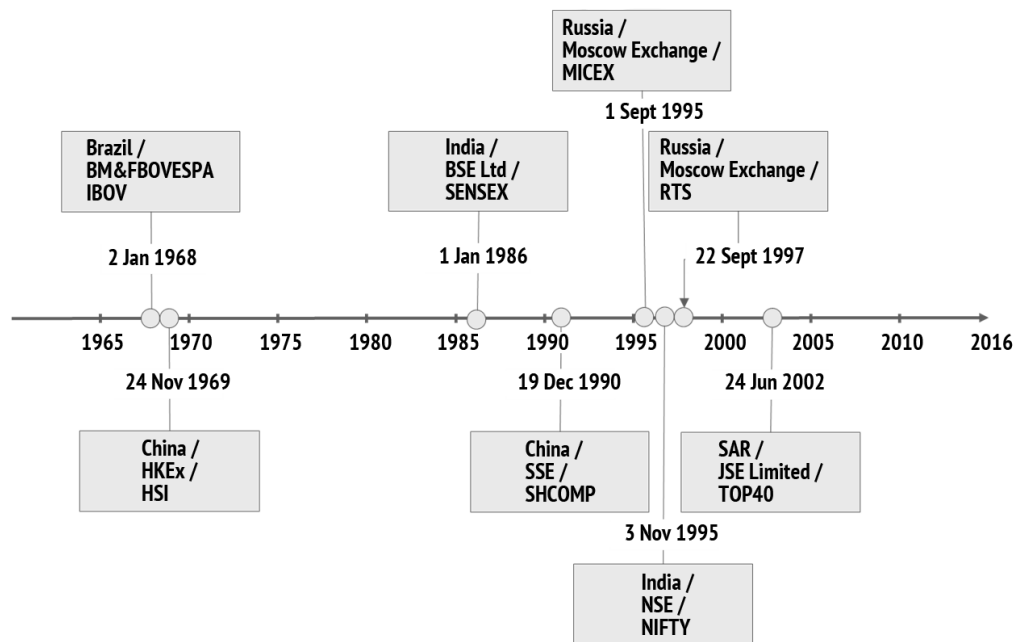
**The Month-of-the-year effect for the BRICS countries**

The Market under Consideration (Country / Exchange / Index)	The Result
Brazil / BM&FBOVESPA / IBOV	January effect
Russia / Moscow Exchange / RTS	February effect
Russia / Moscow Exchange / MICEX	Not observed
India / BSE Ltd / SENSEX	Not observed
India / NSE / NIFTY	Not observed
China / HKEx / HSI	Not observed
China / SSE / SHCOMP	Not observed
SAR / JSE Limited / TOP40	December effect

Source: Authoring

**Figure 1**

**The periods of consideration of the BRICS countries' indexes in 1965–2016**



Source: Authoring



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### **Conflict-of-interest notification**

I, the author of this article, bindingly and explicitly declare of the partial and total lack of actual or potential conflict of interest with any other third party whatsoever, which may arise as a result of the publication of this article. This statement relates to the study, data collection and interpretation, writing and preparation of the article, and the decision to submit the manuscript for publication.