A STUDY OF SEASONAL ANOMALIES ON THE STOCK MARKET

Abstract: Seasonal anomalies play an important role in the global economic system. One of the most frequently empirically observed anomalies is the Halloween effect. Halloween effect describes the anomaly in the financial markets, which is that the returns of different assets in the summer period generally are lower than the returns in the winter period. This study tests the hypothesis of the existence of the Halloween effect on the energy markets over the period from 1990 to 2010. The sample includes series of prices for various energy resources. The econometric estimation showed that for a range of energy markets, returns during the summer period are higher than the returns in winter ones. The difference in returns is statistically significant, which speaks in favor the Halloween effect.

Key words: Halloween effect, financial market, energy market, bounded rationality, investor sentiment

Аннотация: Сезонные аномалии играют важную роль в глобальной экономической системе. Одной из наиболее часто наблюдаемых эмпирически аномалий является эффект Хэллоуина. Эффект Хэллоуина описывает
аномалию на финансовых рынках, которая заключается в том, что доходность различных активов в летний период обычно ниже, чем доходность в зимний период. Данное исследование проверяет гипотезу о существовании эффекта Хэллоуина на энергетических рынках в период с 1990 по 2010 год. Выборка включает ряд цен на различные энергоресурсы. Эконометрическая оценка показала, что для ряда энергетических рынков доходность в летний период выше, чем доходность в зимний период. Разница в доходности статистически значима, что говорит в пользу эффекта Хэллоуина.

**Ключевые слова**: эффект Хэллоуина, финансовый рынок, энергетический рынок, ограниченная рациональность, настроение инвесторов

**Introduction**

Halloween effect was first identified on the securities market. The basis of this seasonal anomaly is the assumption, according to which stock returns in the May-October period are significantly lower than in the second half of the year. For example, a study by Bouman et al. (2002) has shown that the Halloween effect is present in the securities markets of 36 developed and developing countries. [1] Other studies confirmed the results of Bouman et al. (2002) and have shown that the Halloween effect exists for various stocks and for various segments of the market. For example, a study of Lean (2011) showed the presence of the Halloween effect in the stock markets of several Asian countries (Malaysia, China, India, Japan, Singapore). [4] Jacobsen and Nuttawat (2009) found that 48 out of 49 U.S. sectors of the stock market showed better result in the winter period rather than in the summer period. For 2/3 of the sectors, the difference was statistically significant. The study is based on time series sample from 1926 to 2006. [3] Andrade et. al (2013) came to the conclusion that the Halloween effect not only affects the value of assets, but also on the credit risk premium and volatility. [1] Zhang and Jacobson (2013) examined data on the securities market of Great Britain for a period of more
than 300 years. As a result, the authors came to conclusion that calendar and seasonal effects took place, although their scope and importance has changed significantly. The Halloween effect was present constantly regardless of the applied methods. [5]

The purpose of this paper is to investigate the presence of the Halloween effect in energy markets. In the case of confirmation of the hypothesis, the results obtained can be useful both to professional market players and regulators. Also, in case of confirmation of the hypothesis, we get additional confirmation of the weakness of the neoclassical efficient markets hypothesis.

**Materials and Methods**

In this paper we investigate the presence of the Halloween effect in different markets for energy resources for the period from 1990 to 2010. For the study we use monthly closing prices for crude oil, coal, hydrocarbons and uranium. Data were provided by the International Monetary Fund (IMF) database. To study the Halloween effect, following Arendas (2017), we divide each calendar year consisting of 12 months into two periods - winter and summer. [2] In case of presence of the Halloween effect, the returns of the winter period should be significantly higher in comparison with the returns of the summer period. The end of summer and the beginning of the winter period will be around Halloween. In this study, a turning point from one period to another is the closing price of the last trading day in October.

Thus, definition of the turning point from the winter period to the summer period is ambivalent. In professional circles it is believed that it is necessary to "sell in May and go away". So, in most papers studying the Halloween effect, the turning point is determined as the last trading day April. In this paper we use two alternative turning points: closing price of the last trading day in April and the closing price of the last trading day in May. This allows us to study several variations of the Halloween effect.

Such formulation of the problem allows us to propose and test the following hypotheses:
H1: The Halloween effect is present in the energy market.

**Results and Discussion**

The results of the study showed that the differences in returns in winter and summer periods in selected markets vary significantly. The same is true for the minimum and maximum returns on the markets. If we turn to the percent of the presence of the Halloween effect, we could see that depending on the turning point and on the particular market, the percentage of its presence also varies significantly.

For the sample, where the summer period lasts from May to October and winter period - from November to April, most markets showed returns in winter period significantly higher than in the summer period (Table 1).

The largest difference in returns in the first alternative, are recorded on the coal market in Australia and crude oil in Dubai: difference in returns is more than 20%. The market for uranium and natural gas (Indonesia) show higher returns during the summer than in winter period.

As we have pointed out before, the level of presence of the Halloween effect varies significantly from one energy market to another. Mostly the Halloween effect is present on the market of crude oil (Dubai), natural gas (Russia) - more than 60% of cases. More than in the half of the years of observation, the Halloween effect is observed on the coal market (Australia), crude oil markets for Brent and West Texas.
# Table 1.

**Halloween effect statistics**

<table>
<thead>
<tr>
<th>Market</th>
<th>Summer returns (May-October)</th>
<th>Winter returns (November-April)</th>
<th>Resulting statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>min. %</td>
<td>max. %</td>
<td>average, %</td>
</tr>
<tr>
<td>Fuel (Energy) Index</td>
<td>-21,9</td>
<td>41,4</td>
<td>-1,5</td>
</tr>
<tr>
<td>Crude Oil (petroleum)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>: Brent, West Texas,</td>
<td>-17,4</td>
<td>35,1</td>
<td>-5,25</td>
</tr>
<tr>
<td>Dubai Fateh</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Coal (Australian thermal coal)</td>
<td>-18,8</td>
<td>65,2</td>
<td>-2,5</td>
</tr>
<tr>
<td>Natural Gas (Russia)</td>
<td>-29,9</td>
<td>76,1</td>
<td>1,7</td>
</tr>
</tbody>
</table>
Conclusion

Analysis of prices for key energy markets for the last 20 years has shown that the Halloween effect is present on energy markets. In five out of seven energy markets with a statistically significant result, we found the presence of the Halloween effect when the average returns of the winter periods of higher than average returns year periods. This result is typical for a number of markets crude oil, natural gas and thermal coal.

References:

