**CALENDAR EFFECTS ON THE REAL ESTATE MARKET**

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# Abstract

Social and economic phenomena that rely on "soft" factors to explain the market reality supply highly valuable observations. Behavioral elements should not be omitted in analyses of the real estate market because the latest developments in behavioral sciences significantly contribute to our understanding of that market.

The popularity of behavioral research in social and economic sciences provokes an examination of the significance of behavioral analyses on the real estate market. As an object of social and economic inquiry, the property market can benefit from recent achievements in behavioral sciences which expand the explanatory potential of studies based on the neoclassical model.

This paper analyzes calendar anomalies, generally referred to as calendar effects, on the real estate market. This phenomenon has been observed on the capital market, and it has been investigated and described by behavioral finance. The research hypothesis tested in this study is that calendar effects are present on the real estate market.

This paper aims to:

* review calendar effects as model phenomena on the real estate market,
* determine whether calendar effects occur on the real estate market and, if so, identify those anomalies,
* determine whether and to what extent the real estate market is governed by seasonal diversity,
* explain the significance of calendar effects for the real estate market.

Research goals were pursued based on analyses of real estate transactions conducted in Olsztyn between 2004 and 2011.

**Key words**: calendar effects, behavioral finance, real estate market.

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# 1. Introduction

More than fifty years ago, it became evident that capital markets do not explain empirical evidence based on classical economic models. Those observations laid the foundations for the development of   
a new research field: "behavioral finance has combined the classical study of finance with psychology and sociology to expand our understanding of investor decision-making on the capital market" (Czerwonka & Gorlewski, 2012, p. 38) and "its effects on prices, return rates and capital investments" (Koppel, 2012).

The real estate market is a type of a capital market, and the effectiveness of behavioral research in explaining real estate market phenomena should be investigated. This paper will attempt to answer the following questions: is the real estate market governed by the principles applicable to the capital market and can behavioral finance explain investor decisions on the real estate market?

# 2. Literature review - calendar effects on the capital market as explained by behavioral finance

A series of anomalies, known as calendar effects, have been identified and described by behavioral finance based on the observation that selected seasons of the year bring higher rates of return on investments. "Calendar anomalies reveal the presence of regularities in stock returns over time" (Szyszka, 2009). The repeatability of the observed phenomena is of essence for our investigation.

The presence of calendar effects on capital markets has been confirmed by numerous studies of the Warsaw Stock Market (Grotowski, 2008; Ordak & Sekuła, 2000; Sekuła, 2003; Siwek, 2000) and stock markets in Asian (Holden et al., 2005), Arab (Al-Hajieh et al., 2011) and European countries (Sar, 2003).

A brief overview of calendar effects observed on capital markets is presented in Table 1.

**Table 1**

Calendar effects on capital markets – description and explanation

|  |  |  |
| --- | --- | --- |
| Effect | Description | Explanation |
| **January effect**, **month-of-the-year effect, end-of-the-year effect** | In January, average return rates are relatively high (Łon, 2006), and they often represent the highest average rates of return in the year (Czerwonka & Gorlewski, 2012). | A hypothesis postulating that depreciated stock is sold at the end of the year to produce tax-deductible losses (Szyszka, 2009). Decreasing transaction costs, window dressing (funds push up share prices to improve their annual performance reports), synchronicity with business cycles, lower real rates of return at the beginning of the year (Gu, 2003). |
| **Weekday effect, weekend effect** | "Stock prices increase on Friday and decrease on Monday more than on any other day of the week" (Zielonka, 2011, p. 40). | The highest variability in stock prices is observed around the weekend – on Thursdays, Fridays and Mondays (Kiymaz & Berument, 2003). |
| **Turn-of-the-month effect** | Return rates are higher directly before and after the turn of the month. | Search for correlations between a high market and the payment of wages in the middle of the month in some countries, such as Singapore (Czerwonka & Gorlewski, 2012). |
| **Sell in May and go away** | Assets are sold in early May before the summer holidays and are typically repurchased around Halloween (Chudzyńska-Stępień, 2012). | Investors have a low interest in the stock market during the summer. |
| **Mark Twain effect** | Stock returns are lowest in October. | The name is based loosely on a quote by Mark Twain: "October. This is one of the peculiarly dangerous months to speculate in stocks. The others are July, January, September, April, November, May, March, June, December, August, and February" (Chudzyńska-Stępień, 2012). |

*Source*: own study.

**3. Data and Methods**

To the authors' best knowledge, the presence of calendar effects on the real estate market has not been investigated to date. The following procedure was adopted to investigate calendar effects:

Data was analyzed statistically, and the search for calendar effects was performed with the use of two methods:

1. trial and error (Stages I-III) to identify the calendar effect,
2. expert method (Stage IV) to determine whether the calendar effect has a behavioral explanation.

Behavioral factors are rooted in psychology and, to a smaller extent, also sociology, and they include emotions, temptations, inability to gather and process information, cognitive ability, impaired cognitive ability due to risk and/or uncertainty (Autor 1 & Autor 2, 2013a).

We are dealing with behavioral factors when the behavior of an individual or a market cannot be explained by market principles. Market principles include market trends, cyclic phenomena, "changes in market procedures (legal procedures, recommendations for institutions financing investments), processes (changes in demand, liquidity, higher investment risk, inflation) and structures (new supervisory and financial authorities)" (Autor 1 & Autor 2, 2013b). Calendar effects that can and cannot be explained by behavioral tendencies are identified based on observable market trends and market knowledge.

**4. Empirical results**

**4.1. Basic research premises**

Calendar effects on the real estate market were investigated based on data relating to property transactions concluded in Olsztyn in 2004-2011. The analyzed data consisted of transaction prices of real property quoted in the Register of Real Estate Prices and Values kept by the Olsztyn City Office. This study was based on the following basic premises:

1. Subjective scope: the parties to a standard transaction are individuals, legal entities or local government units. In a standard transaction, the prices of traded property were set based on that property's fair market value. Transactions with the State Treasury were not analyzed.
2. Objective scope: ownership of real estate (co-ownership, perpetual usufruct and share of perpetual usufruct were excluded).
3. Type of real estate: transactions involving the sale and purchase of undeveloped land intended for non-agricultural purposes (agricultural land was excluded).
4. Terms of transaction: transactions conducted in line with free market principles (transactions concluded as part of an open bid or a no-bid procedure and non-market transactions were excluded).
5. Transactions with incomplete data and transactions where the price of property significantly diverged from fair market value were excluded.

**4.2. Calendar effects on the real estate market**

Unlike on the capital market, calendar effects on the real estate market cannot be investigated based on return rates (excluding rental returns). The above results from the specific nature of the real estate market (permanence of location, permanence over time, long-term investments, capital intensity) and the objective of real estate transactions (real estate is traded mainly to satisfy housing needs rather than for speculative reasons). For this reason, the character of calendar effects had to be adapted to the specific nature of the real estate market. The search for calendar effects was conducted with the use of two methods:

1. method I (qualitative analysis) – calendar effects were determined based on transaction prices in each of the analyzed periods,
2. method II (quantitative analysis) – calendar effects were determined based on the volume of transactions concluded in each of the analyzed periods.

Three calendar effects on the real estate market have been identified, described and interpreted in this study:

1. July effect – qualitative analysis,
2. Intramonth effect – qualitative and quantitative analysis,
3. April 2004 effect – quantitative analysis.

The analyzed effects do not represent a complete list of calendar effects on the real estate market.

**4.2.1. July effect (qualitative analysis)**

In structural terms, the July effect is a month-of-the-year effect. The month-of-the-year effect (qualitative analysis) was investigated based on market prices regardless of current market trends. Market trends do not affect the month-of-the-year effect. The objective of this study was to examine seasonal trends on the real estate market which do not require property valuation. This research method was adopted as most conducive to observing seasonal trends on the real estate market. Data was sorted based on the described premises, and it covered the period from 2004 to 2010. Data for 2011 was incomplete (insufficient number of transactions, unreliable data, no registered transactions in February – May and December), and it was not included in the analysis.

Average monthly prices determined based on the arithmetic mean were used to identify the month effect (in qualitative analysis – price fluctuations in each month). Based on an evaluation of average market prices in each month and descriptive price statistics, data relating to transactions concluded in 2004-2007 and 2009 was qualified for the analysis. Data for 2008 and 2010 was incomplete (no registered transactions in selected months).

An analysis of market prices produced results which could not be used for comparative purposes. For this reason, the concept of a "relative price" was introduced as the ratio of an average price in   
a given month of the year to the average price in that year (average annual price = 100%). The average annual price was defined as the arithmetic mean of all qualified transactions concluded in that year. Relative prices in the analyzed years are presented in Table 2. Descriptive statistics for relative prices are given in Table 3.

**Fig. 1**. July effect in 2004-2006 and 2009. *Source*: own study.

The above-average number of transactions in April 2004 could be attributed to Poland's accession to the European Union on 1 May 2004. This causal relationship cannot be rationally justified by market principles because in the analyzed period, the demand for real estate was not driven by the availability of direct subsidies. The analyzed property were undeveloped land plots, but pursuant to the provisions of Act of 26 January 2007 on agricultural and sugar subsidies, this form of financial aid was available only for agricultural land which was not analyzed in this study (Act of … 2007). Poland had negotiated a derogation on the acquisition of real estate by non-citizens (Art. 8, point 2 of the Act of …1920) to protect the market from a shock that could arise from a difference in land prices between Poland and the "old" EU countries. The fear that property prices would steeply increase was unjustified because the conclusion of a real estate transaction implies that one party disposes of property while the other party acquires it.

Attempts were made to explain the April 2004 effect and the behavior of real market participants based on behavioral factors. The fear that land prices would increase substantially after Poland's accession to the EU (manifested by a higher number of concluded transactions) could be explained by herd behavior, panic, speculation, heuristic decision making due to lack of knowledge and emotions, which is why the highest number of transactions were concluded in the last days of April (fig. 4). Behavioral research suggests that people are apt to act irrationally in problematic decision-making situations (Autor 1 & Autor 2, 2013b). A qualitative analysis indicates that market prices (and relative prices) in April 2004 were higher than in March and May and that a speculative micro-bubble was created on the local property market (refer to fig. 5 and 6).

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**5. Discussion and conclusions**

The results of both qualitative and quantitative analyses demonstrate the presence of calendar effects on the real estate market. This implies that the decisions made by market participants are less random than expected. Our findings can be used to formulate several conclusions.

Firstly, calendar effects exist on the real estate market and they have a dual nature. Some effects (July effect) can be explained by the fundamental principles that govern the market and its environment (low trading volume in summer months), whereas others have behavioral explanations (April 2004 effect).

Secondly, we identified the presence of intramonth effects on the real estate market. Fluctuations in property prices and transaction volumes were also noted during the month, and this effect has never been observed before.

Thirdly, the presence of calendar effects has various consequences for the real property market. Individual and institutional investors can gather market data and analyze market anomalies to plan optimal transactions. Real estate agents, administrators and experts can effectively use their knowledge of the laws governing the prices and/or the volume of transactions in different seasons of the year.

Fourthly, our findings indicate that in addition to strictly economic factors, the real estate market is also governed by behavioral elements which are determined by complex human nature, cognitive abilities, emotions and preferences. Similarly to the capital market, the real estate market can also be modeled based on a behavioral approach. Our observations thus justify the significance of earlier research that analyzed the behavioral aspects of market activity (Autor 1 & Autor 2, 2012, 2013a, 2013c).

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