Investment risk in the context of price changes in the real estate and capital markets

Dr. Rafal Wolski
rwolski@uni.lodz.pl
Agenda

• The aim of the article
• Hypothesis
• A literature review
• Survey
• Conclusion
The aim of the article

Comparison of prices volatility of residential real estate and stocks
The aim of the article

Investors can choose from a variety of directions of investments. The decisions they take have an impact on possible future rate of return.
The aim of the article

To achieve the aim statistical analysis was performed. Changes in the real estate market hedonic indices and of the stock market indices were examined.
Hypothesis

Residential investment market is safer than the stock market, but not necessarily more profitable despite a tendency to form economic bubbles.
Investment motifs

• The capital market - speculative motive, capital investment

• Residential real estate market - to meet the housing needs, capital investment
Investment motifs on the residential real estate market

Investment motive do not have to be dominated by a motive to meet housing needs. The advantage of one or the other motive may be a matter of individual preference of investors and within one country, but two different regions can dominate one or the other.

As suggested by the literature, residential real estate market is susceptible to the occurrence of economic bubbles.
The causes of bubbles

- Increased access to mortgage loans, ANUNDSEN, (2014).
- The real estate market ceased to be a place where only meets housing needs, and has become a place to invest capital - an additional demand, COŞKUN, (2013, p.53), ALLEN, CARLETTI, (2013).


The real estate market vs. capital market

Both markets are subject to cyclical fluctuations, the real estate market and capital market

Trojanek, R., 2008, Determinanty wahań cen na rynku mieszkaniowym (Determinants of price fluctuations in the housing market), Studia i Materiały TNN, vol. 16, nr 4, Olsztyn, pp. 85-97.

The research problem

Which market choose as a place of capital allocation on the assumption of risk aversion?
Research

The average descriptive statistics on the capital market and the housing market were compared:
• average quarterly rate of return,
• the cumulative rate of return for the entire period of research,
• standard deviation,
• beta ratios,
• minimum and maximum quarterly rate of return on individual segments of both markets.
Methodology

- One-way ANOVA in order to determine what is the probability that the expected values of both samples are the same
- Levene tests in order to verify whether the variances are equals in both groups
- taking into account the results obtained, in order to verify null hypothesis of equality of means two tests were used: Welch and less rigorous Brown-Forsythe test
Methodology

With one-way ANOVA, and using Welch and Brown-Forsythe tests one verified the null hypothesis of equality of means, against the alternative hypothesis about the lack of equality.

With Levene test one tested the null hypothesis of a statistically significant diversity of variance, against the alternative hypothesis of homogeneity of variance.
Data

- Selected indices from Warsaw Stock Exchange
- Hedonic index of prices on a housing market from Polish National Bank.
- 16 biggest cities in Poland
- Max 31 quarterly observation from Iq 2007 to IIIq 2014 where it was possible
- Quarterly percentage rate of return were counted
## Results

Average from descriptive statistics residential real estate market and the capital market

<table>
<thead>
<tr>
<th></th>
<th>Capital market</th>
<th>Real-estate housing market</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cumulated rate of return</td>
<td>0.075</td>
<td>0.296</td>
</tr>
<tr>
<td>Beta coef.</td>
<td>1.000</td>
<td>0.070</td>
</tr>
<tr>
<td>Standard dev.</td>
<td>0.350</td>
<td>0.065</td>
</tr>
<tr>
<td>Minimum quarterly rate of return</td>
<td>-0.340</td>
<td>-0.096</td>
</tr>
<tr>
<td>Maximum quarterly rate of return</td>
<td>1.451</td>
<td>0.230</td>
</tr>
</tbody>
</table>
## Results

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>One-way ANOVA</td>
<td>0.732</td>
<td>169.015*</td>
<td>4.78*</td>
<td>93.398*</td>
<td>2.845</td>
</tr>
<tr>
<td>F-Stat</td>
<td>5.189*</td>
<td>6.134*</td>
<td>12.527*</td>
<td>7.198*</td>
<td>12.77*</td>
</tr>
<tr>
<td>Sig.</td>
<td>0.402</td>
<td>0</td>
<td>0.04</td>
<td>0.04</td>
<td>0.106</td>
</tr>
<tr>
<td>Levene’s W</td>
<td>0.331</td>
<td>88.341*</td>
<td>1.972</td>
<td>60.078*</td>
<td>1.172</td>
</tr>
<tr>
<td>F** stat.</td>
<td>0.585</td>
<td>0</td>
<td>0.21</td>
<td>0</td>
<td>0.321</td>
</tr>
<tr>
<td>Sig.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** Asymptotically distributed F.

* Significance level 0.05.
Results

In two cases, one can not demonstrate equality of means - in the case of cumulative rate of return and standard deviation. The alternative hypothesis about the lack of average equality average has also been accepted in a number of the maximum quarterly returns. In contrast to the beta coefficient and the minimum quarterly returns we have failed to reject the hypothesis of equality of means.
Results

- Mean standard deviation
  - Capital market vs. Real-estate housing market

- Mean cumulated rate of return
  - Capital market vs. Real-estate housing market

- Mean beta coefficient
  - Capital market vs. Real-estate housing market
Results

The real estate market observed a lower risk measured by standard deviation and higher cumulative rate of return.

We failed to show a significant statistical difference in beta coefficients.
Conclusion

It has been shown that the housing market and the capital market average cumulative rate of return and standard deviation are different. However the standard deviation is lower on housing market one should be aware of the uncertainty accompanying real estate market.
Thank you for your attention