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Perception of the Effectiveness of Stock Market Recommendations in Relation to Their Real Marketability

Abstract: The purpose of this paper is to evaluate the effectiveness of stock market recommendations as a factor supporting investment decisions, both in objective and subjective terms. The applicative objectivity of using recommendations is visualized by indicating their real impact on achieving an above-average return. Subjective utility refers to the perception of recommendations directly by their recipients, including individual investors. For this purpose, a survey was conducted on a group of 564 respondents whose structure is representative of stock market investors in Poland and the results of the survey were verified by conducting statistical analyses (logit models) on the example of selected brokerage houses indicated by investors as the most and least effective in the prediction. The analyses conducted show an ambiguous perception of stock market recommendations by investors. According to investors, the usefulness of stock recommendations issued by individual brokerage houses varies, resulting in different possibilities of generating income using these reports. The responses of respondents to the objective results of investment models using information from stock market recommendations also indicate that individual perceptions of investors' recommendations do not necessarily translate into their actual usefulness.

Keywords: capital market, investments, stock exchange recommendations, stock exchange, investment strategies, brokerage houses

JEL: G11, G12, G14

1. Introduction

Information effectiveness of the market is a broad issue and is subject to a great deal of research in both domestic and foreign literature of the subject. The investment decisions of capital investors are based on a number of variables that provide information on a selected aspect of reality. The stock market recommendations are a specific source of information, which contains a summary of the most important factors and data which may influence the development of investment decisions.

In order to phrase stock market recommendations, analysts use fundamental analysis tools and evaluate a company taking into account its situation both at the macroeconomic level and within the company itself. As a result, the analyst's final prediction is based on a wide range of processed and compensated information, leading to the formulation of a simple type message: buy/sell. Such information, coupled with the prestige and reputation of a brokerage house as a specialized trading company, can be a strong prerequisite for carrying out an investment consistent with its recommendation. The literature review of the subject, however, indicates that the valuation of the companies included in the recommendations diverges from their real value. Moreover, it is often overestimated.

The purpose of this paper is to evaluate the effectiveness of stock market recommendations as a factor supporting investment decisions, both in objective and subjective terms. The useful objectivity of using recommendations is visualized by indicating their real impact on achieving an above-average return. Subjective utility refers to the perception of recommendations directly by their recipients, including individual investors. The following research hypotheses were set out:

H1: The quality of brokerage recommendations is varies significantly between individual brokerage houses.

H2: The perception of stock market recommendations by individual investors is inconsistent with their objective utility.

In order to verify research hypotheses, a survey was conducted among 566 stock investors in Poland and a statistical analysis was conducted using logit models for selected brokerage houses to verify the effectiveness of their forecasts on changes in the values of individual listed companies.

2. Importance of stock market recommendations

The Polish capital market is a low-efficiency market due to common asymmetry of information. There is a divergence between the real value of listed companies and their valuation by individual investors. This translates into improper capital allocation. Broker recommendations significantly reduce the asymmetry of information between the company's management and stock market investors. The in-

formation contained in the recommendations supports equity investors in making investment decisions with an expected rate of return.

Research on the role of recommendations in the investment process and their effectiveness in valuing listed companies is ambiguous. The first study of the impact of recommendations on price changes revealed that most of the recommendations did not constitute a significant source of information to the advantage of its holder (Cowles, 1933), as was also confirmed by Walker and Hatfield (1996). Stickel (1995) noted that the impact of stock market recommendations on investment decisions of investors varies, which is conditioned by the fact that investors, following the reputation of a brokerage house, do not treat all recommendations in the same way. According to Stickel, the impact of recommendations on investor investment decisions varies, depending on the institution that issued them. This is confirmed by Chang and Chan (2008). Moshirian, Ng and Wu (2009) have noticed that recommendations play a particularly important role in emerging markets that are more risky and difficult to analyse. The utility of the recommendation is higher in this case compared to the markets of the developed countries. Jegadeesh and Kim (2006) came to similar conclusions by examining the US market, where the importance of stock recommendations turned out to be negligible.

It is important to evaluate the role of stock market recommendations in the investment process and in the effectiveness of the forecasts contained therein. Hall and Tacon (2010) have verified whether relying on analyses from analysts who have shown high predictability in the previous year is justified. While statistically, there is some predictability that is constant over time, it is not sufficient to assume the ability to generate effective recommendations in the future.

Krishnan and Booker (2002) have shown that stock market recommendations have a significant impact on reducing the effect of disposals (when investors are too quick to sell profitable stock and hold loss stock for too long). Taking into account the announcements contained in stock exchange recommendations allows one to reduce the effect of Forex trading on all profitable positions. For losses, this effect is weaker.

Barber et al. (1998) pointed out the differentiation of recommendations in terms of the message contained in them. In the case of positive recommendations, higher rates of return are recorded than in the case of negative recommendations. Investment strategies based on decisions in which recommendations were used as a source of fundamental information on companies, were characterized by a significantly higher rate of return. These conclusions are also confirmed by Fang and Yasuda (2014), who in their deliberations have proven the usefulness of the information derived from the recommendations and clearly greater profitability of the investments based on these reports. Ryan and Taffler (2006) have shown that the response to negative recommendations is stronger than to the positive recommendations, which justifies the aversion to investors' loss and the avoidance of transactions where these are likely to occur.

On the other hand, Azzi et al. (2006) showed low effectiveness of recommendations. He argues that the tone of the messages contained in the recommendations is tailored to the prevailing market trend. Thus, in the case of negative announcements on the upstream market, the impact of recommendations is smaller, as is the case with positive announcements on the down market. The survey conducted by Sakatih (2015) on the example of the capital market in Manado shows that investors do not attach much importance to the messages contained in these reports and believe in the effectiveness of their own prediction, especially when backed up by technical analysis.

In Poland, Mielcarz, Podgórski and Waremczuk (2007) claimed that the publication of the recommendation implies the occurrence of the abnormal returns on the day of the publication. Buzala (2012) also proved that the publication of the brokerage reports results in price changes within a 30 days' horizon. Buy recommendations brought additional returns of average 0.46%, and sell ones – the average of –0.71%. Czapiewski (2015) tested the returns in the event window between 10 days before to 10 days after the publication of the recommendation. The results obtained by the researcher indicated the impact of the recommendation on quotations of valuated assets, consistent with the announcements contained in the studies.

3. Methodology of research

This article is based on the results of own survey, conducted to evaluate individual investors' use of stock recommendations. In the second part of the paper, statistical analysis of the investment utility of brokerage houses is presented, based on which houses were marked by the respondents most often as the most reliable and the least reliable ones. This is to verify whether the subjective perception of the respondents is reflected in the statistical analysis of the effectiveness of the recommendations made on a broad research sample.

The questionnaire survey was conducted in November–December 2016, among 566 individual investors in Poland, which represents 0.023% of the total population. Sample selection was purposeful. The study was attended only by people who are investing in a stock exchange. The structure of the respondents was representative of the structure of investors statistically determined by the Polish Financial Supervision Authority. The survey was conducted using a questionnaire survey, with interviewers present during the survey. The purpose of the study was to assess the degree to which stock market recommendations were used by individual investors and their usefulness. For the measure of usefulness of a recommendation the author accepted the possibility of making an appropriate investment, based on the information contained

in it. In the first place, the author wanted to examine the subjective perception of the quality of stock market recommendations by investors, the degree of trust in their valuations and the distinction between individual brokerage houses in terms of the usefulness of their reports.

The verification of survey results was performed using econometric modelling, using logit models, where the variable is explained by the probability of the correct direction of price change indication within one year of the recommendation's publication. The model ignores the aspect of the specific return that can be obtained from a particular transaction, assuming that the investor's profit is due solely to the correctness of the behaviour and to the direction of change. The author decided to use logit modelling because the main point of interest in the study is only the occurrence of the price change implied by the publication of the recommendation and convergent with the recommendation signal (buy = positive return, sell = negative return). This kind of problem is a typical yes/no question which is often modelled with logistic functions. Also in this study the author tried to use the logit model to determine whether the publication of the recommendation from a particular brokerage house gives the investors a higher chance of making a good investment decision.

Four independent estimates of the likelihood of a successful investment decision were made for the two brokerage houses identified by the respondents as the best and the worst. Finally, a comparison was made to determine whether the models for the "best" brokerage houses give an objectively better chance of making a profitable deal than the models for the "worst" houses. Each of the models was developed on the basis of a variety of observations, which is due to the varying levels of valuation by individual brokerage houses. The time range of recommendations included in modelling is 1999–2014. Recommendations apply to companies listed on the main market and the NewConnect market. Recommendations for the alternative market, however, represent a negligible percentage of all records. Having achieved the modelling results, the final assessment of the objective effectiveness of stock market recommendations was made in relation to the subjective perception of the respondents.

4. Usefulness of stock market recommendations – survey results

When analyzing the impact of stock market recommendations on investor behavior, it is interesting to note that the degree of their use in decision-making varies significantly from one investor to another. Table 1 presents respondents' answers to the question about the frequency of use of stock recommendations.

Table 1. The frequency of broker recommendations usage

How often do you use broker recommendations	Frequency	Percentage
Always	115	20.54%
Often	126	22.50%
Sometimes	178	31.79%
Never	141	25.18%
In total	560	100.00%

Source: own elaboration

Approximately 43% of investors participating in the study use recommendations when making investment decisions always or often. On the other hand, a quarter of respondents indicated that they never used these recommendations.

Among the remaining only about one third of the respondents verify the information contained in the recommendations, while just over 21% of the respondents do not. Additionally almost half of the respondents did not answer this question. According to the author, the reason for this may be the reluctance of the respondents to admit the lack of knowledge necessary to verify the content of the recommendations, which causes the respondent's discomfort and unwillingness to answer. The author assumes that for this reason most of these non-existing answers (if given) would be negative, but because of the lack of definitive data, this thesis should be treated as speculation.

Table 2. Verification of recommendations

Do you use the recommendations of a brokerage house to verify the proposed valuation?	Frequency	Percentage
Yes	129	30.50%
No	92	21.75%
No answer	202	47.75%
In total	423	100.00%

Source: own elaboration

Afterwards the respondents were asked to refer to the merit level of recommendations from individual brokerage houses. First of all, the question was whether they consider that the recommendations of different institutions have the same informative value or not. They were then asked to provide a way of verifying the information contained in the valuations. To the first of these questions, almost 45% of the respondents replied that the brokerage houses differ in terms of the quality of their valuations. About 30% of respondents indicated that their value is the same for all brokerage houses. Approximately 25% of the respondents did not answer this question and, as above, we can identify them as respondents who do not use market recommendations in their decision-making process.

Table 3. Comparison of the usefulness of brokerage recommendations

Do you think the usefulness of the recommendations of all brokers is the same?	Frequency	Percentage
Yes	167	39.76%
No	253	60.24%
In total	420	100.00%

Source: own elaboration

The majority of respondents verified the content of brokerage recommendations in two basic steps. First, they compare them with recommendations made by other institutions (53% of respondents) or make their own calculations (20.6% of respondents). The survey shows that the advisory institution is very unpopular with individual investors, as well as making investment decisions based on their own preconceptions. Respondents pointed to the need to compare recommendations with other reports, which explicitly confirms the fact that the value of individual analyses performed by different analysts varies, and the subjective determinants of quality and final valuation may be reduced or eliminated in some way by using reports from multiple sources.

Table 4. Methods used by respondents when comparing recommendations

Do you rely on recommendations of one brokerage house or compare the recommendations of different brokerage houses?	Frequency	Percentage
I compare with recommendations of other brokerage houses	299	71.19%
I make my own calculations	116	27.62%
I use advisers	3	0.71%
I rely on my own premonitions	2	0.48%
In total	420	100.00%

Source: own elaboration

Knowing that a large group of respondents distinguishes good quality stock market recommendations from low quality ones, they were asked which brokers make the best and the worst recommendations. Less than 50% of respondents answered these two questions. In the case of the appointment of the best brokerage houses, the vote was made by 250 people, and in the case of the worst ones – 234. In addition, despite the closed brokerage list given in the question, the degree of fragmentation of the response is very high. Tables 5 and 6 show the five most frequently appearing answers to these two questions.

The reports from BOŚ and PEKAO enjoy the greatest confidence, while the ones provided by TRIGON and PKO BP are the least trusted ones. These brokerage houses were further analysed to statistically verify the differences between

the efficiency of price forecasting by each institution, to determine whether there are objective differences between the qualities of their reports.

Table 5. Brokerage houses most often indicated by respondents as the best

Brokerage house	Number of votes	Percentage
BOŚ	35	14.00%
PEKAO	26	10.40%
ING Securities	22	8.80%
PKO BP	17	6.80%
mBank	16	6.40%

Source: own elaboration

Table 6. Brokerage houses most often indicated by respondents as the worst

Brokerage house	Number of votes	Percentage
TRIGON	17	6.80%
PKO BP	16	6.40%
Millennium	15	6.00%
UniCredit	14	5.60%
Deutsche Bank	12	4.80%

Source: own elaboration

In a further study, the usefulness of brokerage recommendations issued by selected brokerage houses was analysed. Two brokerage houses with the best and two with the worst efficiency were selected for the study (according to the opinion of investors). These were accordingly BOŚ and PEKAO, and TRIGON and PKO BP.

5. Usability of stock market recommendations of selected brokerage houses – results of statistical analysis

The verification model was constructed in a very simple form, based only on a constant variable and a growth potential that was defined as the percentage change between the target price within the 250 trading session (1 calendar year) horizon and the price on the date of the recommendation. The variable is the probability of an increase in the price of a given company. The model assumes that increasing growth potential resulting from stock recommendations should strengthen the investment signal and translate into a better chance of determining the actual price change in a given direction.

The first model was made for recommendations issued by BOŚ. During the period considered, that is 1999–2014, 663 reports from this institution were collected. Based on them a model has been prepared with the specification as follows. For the variables, one to three stars have also been placed in the upper index, representing the statistical significance of the given variable: 10%, 5% or 1% respectively. No stars mean that according to the model specifications the given variable is not statistically significant. For the BOŚ recommendations model, predictive efficiency was 60.8% over the one-year horizon. In the model, both the constant factor and the growth potential are statistically significant at a minimum of 5%.

$$P(\text{bos})_i^{\wedge} = \frac{\exp(0,476525^{***} - 0,754037^{**} * \text{pot.growth})}{1 + \exp(0,476525^{***} - 0,754037^{**} * \text{pot.growth})}. \quad (1)$$

Number of ‘correct prediction’ cases = 403 (60.8%)

$f(\beta'x)$ to the average of independent variables = 0.490

The likelihood ratio Chi-square(1) = 5.18595 [0.0228]

Thereafter an estimate was made for PEKAO recommendations. The total number of observations used for this modeling was 562. The model specifications are shown below.

$$P(\text{pekao})_i^{\wedge} = \frac{\exp(0,343657^{***} + 0,614648^{**} * \text{pot.growth})}{1 + \exp(0,343657^{***} + 0,614648^{**} * \text{pot.growth})}. \quad (2)$$

Number of ‘correct prediction’ cases = 339 (60.3%)

$f(\beta'x)$ to the average of independent variables = 0.492

The likelihood ratio Chi-square(1) = 4.76344 [0.0291]

From the perspective of quality of forecasts, the model for PEKAO is very similar to that of BOŚ. The effectiveness of predicting the direction of change is 60.3%, with the materiality of both fixed and variable “growth potential” at a minimum of 5%.

Based on the above it can be assumed that the brokerage houses identified by the respondents as the most trustworthy in terms of valuing companies bring added value to individual investors looking for investment objectives. The effectiveness of forecasting changes at around 60% may seem low, but we should bear in mind the standard effectiveness of this type of forecasting models, especially based on such a simple form and narrow range of variables, and we should also take into consideration the broad spectrum of data and moods determining the changes of Stock prices. It is therefore worth noting that the indicated models allow us to move away from random inference, where we would have a 50% chance

of making the right decision. Value added in the form of more than 10% of additional predictive accuracy in making investment decisions can be discounted for multiple trading strategies.

Next, the effectiveness of the models built for Trigon and PKO BP brokerage houses, as the least trusted investors in the survey, was verified. In the case of Trigon, the number of observations collected is significantly lower and amounts to 78 recommendations. The model based on them is presented below.

$$P(\text{trigon})_i^{\wedge} = \frac{\exp(1,10033^{***} - 1,56069 * \text{pot.growth})}{1 + \exp(1,10033^{***} - 1,56069 * \text{pot.growth})}. \quad (3)$$

Number of ‘correct prediction’ cases = 53 (67.9%)

$f(\beta \cdot x)$ to the average of independent variables = 0.474

The likelihood ratio Chi-square(1) = 5.67021 [0.0173]

Prognostic efficiency of the proposed formula is almost 68%, which is significantly higher than in the previous two models. However, it should be noted that the variable “growth potential” is not statistically significant. That means that we should not draw conclusions about the effectiveness of predicting a change in price, based on the forecasts contained in the recommendations of this brokerage house. Ultimately, it should be noted that the recommendations issued by Trigon do not present usable value as high as in BOŚ and PEKAO.

The last executed model was related to the PKO BP Brokerage House. It is a very active participant on the stock market, which performs many valuations against the competition. In the analyzed period, 912 reports were included in the implementation of the econometric model, the form of which is presented below.

$$P(\text{pkobp})_i^{\wedge} = \frac{\exp(0,116148^* - 0,0531241 * \text{pot.growth})}{1 + \exp(0,116148^* - 0,0531241 * \text{pot.growth})}. \quad (4)$$

Number of ‘correct prediction’ cases = 482 (52.9%)

$f(\beta \cdot x)$ to the average of independent variables = 0.499

The likelihood ratio Chi-square(1) = 0.0593966 [0.8075]

In this case, a low level of confidence in the PKO BP recommendation is evident both in the case of a low predictive error rate of less than 53% but also in the absence of significant variability of growth potential. Finally, it should be noted that the subjective perception of the quality of brokerage reports by individual investors is confirmed by statistical analysis using a logit model.

6. Conclusions

The analyses conducted in this paper were aimed at verifying the thesis that the market is not uniform in perception and use of brokerage recommendations. The survey indicated that there were relatively equitable groups leaning on or rejecting the information contained in the recommendations. In addition, respondents' answers suggest that even when using stock market recommendations they verify them in a variety of ways, most often by comparing them to reports from other institutions, or by doing their own analyses and calculations. We can therefore conclude that the overwhelming majority of individual investors use such reports as a supplementary tool and not as a major factor in making a final investment decision.

In addition, statistical analyses show that recommendations can actually help in making a proper investment decision, but should not be the only analytical component on the basis of which they were made. Due to the appropriate regulations and expertise of people who compile such reports, we have the right to believe that they bring real added value to the decision-making process. The level of knowledge of analysts, which obviously translates into the quality of the recommendations made, is an individual element attributed to a particular analyst, which makes the quality of the employee an important determinant of the effectiveness of the analysis. This thesis was confirmed in this article, implying that the institution performing the study is an important factor influencing its marketability.

With the logit verification of the chances for the price change due to the publication of the recommendations from the different brokerage houses, author claimed that the reactions for each published report vary significantly between individuals. The study referred only to the brokerage houses indicated most often by the respondents of the survey. Despite that, analysis showed that occurrence of the reports from two most trusted institutions gave over 60% chance of the price change convergent with the signal from the report. That statement is not valid for the two houses that are considered as the least trustworthy. That difference confirms the hypothesis 1 stated by the author. Also, the shown models confirm that the brokerage houses considered the best in the surveyed group gave better investment signals for the investors (more predictable price changes). That leads to the conclusion that the hypothesis 2 was incorrect for the studied group of investors.

The conducted study follows the trend of analysis confirming the effectiveness of recommendations in predicting price changes. In further research, the author would like to broaden the spectrum of factors that may determine the prognostic quality of stock recommendations.

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Postrzeganie skuteczności rekomendacji giełdowych przez inwestorów indywidualnych w odniesieniu do ich realnej użyteczności rynkowej

Streszczenie: Celem niniejszego artykułu jest ocena skuteczności rekomendacji giełdowych jako czynnika wspomagającego podejmowanie decyzji inwestycyjnych – zarówno w ujęciu obiektywnym, jak i subiektywnym. Użyteczność obiektywna stosowania rekomendacji jest obrazowana przez wskazanie ich realnego wpływu na osiąganie ponadprzeciętnej stopy zwrotu. Użyteczność subiektywna odnosi się natomiast do postrzegania rekomendacji bezpośrednio przez ich odbiorców, m.in. inwestorów indywidualnych. W tym celu wykonano badanie ankietowe na grupie 564 respondentów, których struktura jest reprezentatywna dla inwestorów giełdowych w Polsce. Wyniki badania ankietowego zweryfikowano przez przeprowadzenie analiz statystycznych (modele logitowe) na przykładzie wybranych domów maklerskich, wskazanych przez inwestorów jako najbardziej i najmniej skuteczne w predykcji.

Wykonane analizy wskazują na niejednoznaczne postrzeganie rekomendacji giełdowych przez inwestorów. Ich zdaniem użyteczność rekomendacji giełdowych wystawianych przez poszczególne domy maklerskie jest niejednorodna, co skutkuje różnymi możliwościami generowania dochodów przy wykorzystaniu tych raportów. Zestawienie odpowiedzi respondentów z obiektywnymi wynikami modeli inwestycyjnych wykorzystujących informacje pochodzące z rekomendacji giełdowych również wskazuje, że indywidualne postrzeganie rekomendacji przez inwestorów niekoniecznie przekłada się na ich faktyczną użyteczność.

Słowa kluczowe: rynek kapitałowy, inwestycje, rekomendacje giełdowe, GPW, strategie inwestycyjne, domy maklerskie

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