

How Financial Analysts Perceive Macroeconomic, Political News And Technical Analysis Signals

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The paper describes how Polish financial analysts associate various kinds of measures with future stock prices. Forty financial analysts participated in a questionnaire with items including macroeconomic, political news and technical analysis signals derived from commentaries in Polish economic newspapers. The analysts were asked what market movement they would expect if certain political events, macroeconomic or technical signal occurred. The financial analysts assessed most of the questionnaire items as strongly affecting future stock prices. These findings are interpreted in terms of cognitive psychological biases.

Keywords: *Investments, Stocks, Cognitive psychology*

Introduction

Dawes, Faust and Meehl (1989) distinguished two approaches in making predictions: actuarial and clinical. In the actuarial approach, a decision is made on the basis of empirical relations between predictor variables and an outcome variable. In the clinical approach, decisions are based on mental processes of the human judge. The advantage of actuarial models over human judges has been replicated in many domains. While making clinical judgments, humans do not make decisions the same way every time. They can make different predictions from the same set of data. In addition, humans have difficulty distinguishing valid predictor variables from invalid ones. False beliefs about the predictive value of variables can develop. One reason is that feedback is often not provided. Therefore, "lacking sufficient or clear information about judgmental accuracy, it is problematic to determine the actual validity, if any, of the variables on which one relies" (Dawes et al., 1989, p. 1671). False beliefs about the validity of a variable can also form through self-fulfilling prophecies. Similarly, hindsight bias makes people believe that certain outcomes are more predictable than they actually are (Kahneman, Slovic & Tversky, 1982).

Financial analysts rely on clinical judgments rather than on actuarial ones. There is no obvious algorithm which allows for assigning macroeconomic, political or other signals to market movements. So, financial analysts usually make clinical judgments on what can move stock prices and their clients seem to rely on their judgments.

Many investors have only a limited understanding of the

workings of the stock market and rely on the financial pages of their preferred newspapers for advice. Commentators do not explain that stock prices generally follow a random walk pattern, although most of the modern financial theories suggest that stock prices approximately follow this pattern (Roberts, 1959; Alexander, 1961, Cootner, 1964; Samuelson, 1965; Malkiel, 1996). There is some important evidence that stock prices' movements deviate from randomness (Lo & MacKinlay, 1999, Lo, Mamaysky & Wang, 2000; Shleifer, 2000) but this has a limited meaning for the practice of forecasting (Dimson & Mussavian, 2000; Shafer & Vovk, 2001). Some macroeconomic variables are meaningful for predicting stock prices (Lorie, Dodd & Kimpton, 1985). For an accurate prediction of future stock prices, an identification of the factors leading the stock market is needed. However, previous research shows that only a small fraction of return variation can be explained by publicly known news (Fama, 1981; Pearce & Roley, 1985; Summers, 1985; Cutler, Poterba & Summers, 1989). The level of real dividend payments, industrial production, real money supply, interest rates, inflation rate, and market volatility can explain only a small fraction of share price movements. The effect of political news seems to be even less significant.

Most of the variation in returns cannot be explained using readily available measures of new information. Stock movements might be randomly but correlated with some (also randomly occurring) macroeconomic or political news. A precise market prediction based on public news is much more difficult than a post hoc linking of major market movements to the release of

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economic or other information.

The *Wall Street Journal* defines technical analysis as “research of a security or market sector that uses trading data, such as volume and price trends, to make predictions” (*Wall Street Journal*, 2002). Technical analysis, as previous research shows, is more an art than an objective analytical tool and its efficiency has not been proven (Fama & Blume, 1966; Jensen & Bennington, 1970). Even if stock prices fully followed a random walk, people would convince themselves that there are patterns having a predictive value. In laboratory experiments, subjects are reported to have been searching for patterns in purely random sequences of stock prices (Warneryd, 2001). In spite of a substantial amount of research showing that market movement is random or at least very difficult to predict, a lot of effort has been made in forecasting future prices (Bernstein, 1992). Analysts who write commentaries for financial magazines strive to precisely predict the future market movement according to measures of a different quality (Tyszka & Zielonka, 2002). Motivational issues are of great importance here. The stock exchange tempts with big gains. When browsing popular financial journals one can notice that commentaries on the future stock prices are based on a great number of measures: macroeconomic, political, and related to technical analysis.

The main purpose of this research was to discover how financial analysts rate all these measures as predictors of stock prices movements. Are their ratings differentiated individually (presumably due to the different individual experience) or rather unified (presumably due to the same psychological strategies applied)? Do they make a distinction between macroeconomic, political, and technical analysis measures or treat them as having the same predictive value?

As already stated, there is no evidence that any particular factors have an impact on stock prices significant enough to lead the index in a predictable way, so there is no rational explanation to regard any of the measures as a good predictor. A great majority of "causes" listed in the financial newspapers have absolutely no predictive value. Why then are they so popular? One can speculate that a reason for this is the correspondence of these factors with some basic cognitive principles of the human mind (Dawes et al., 1989; Arrow, 1982). If so, in a situation of lacking any meaningful measures for predicting the future stock prices, we can hypothesize the following:

Hypothesis 1. Financial analysts will rate highly almost all available signals as appropriate for predicting the future stock prices.

If the hypothesis is supported by this research it can be stated that when making clinical judgments about future stock price movements analysts are generally unaware of which factors can really affect these prices and they find almost all these factors useful.

Financial analysts, like most people, are subject to well-known cognitive biases (Kahneman et al., 1982). By these we mean simple heuristic principles which reduce the complexity of a task but sometimes lead to such systematic errors as the law of small numbers, anchoring effect, gambler's fallacy and misperception of regression to the mean and fictitious correlations.

1. The law of small numbers is the false exaggeration of how closely a small sample will resemble the parent population, regardless of the results of statistical methods of inference (Tversky & Kahneman, 1971; Rabin, 2000).
2. The anchoring effect shows that most people tend to base their estimations or assessment of information initially on a first source of reference value (anchor) and subsequently to adapt this to the real value. Empirical research shows that the adjustment process is regularly cut short and is incomplete. The original value (anchor) is afforded too much weight (Slovic & Lichtenstein, 1971; Tversky & Kahneman, 1971; Goldberg & Nitzsch, 2001). For example decision makers (investors) overestimate the importance of a recently quoted or otherwise significant stock price. This price may then serve as an anchor for further probability assessments.
3. The gambler's fallacy is observed in a casino where after a long run of red, the roulette player is inclined to believe that black will be next. In financial markets the gambler's fallacy manifests itself in predicting a trend reversal. If a trend continuation is predicted then the behavior is called antiregressive (Wagenaar, 1988).
4. Misperception of regression to the mean disregards the statistical fact that in a long series of a chance process extreme values are likely to be followed by less extreme values (Tversky, 1974).
5. Fictitious correlations are intuitive correlations between various events unconfirmed by the calculations of statistically significant coefficients (Goldberg & Nitzsch, 2001).

When people face situations in which information is unstructured and conflicting, with no probabilities given, they frequently simplify the process of decision making by using the heuristics-and-biases approach. Political events and macroeconomic signals can be intuitively bound to the future market rise or drop. Most of the political and macroeconomic events cited in the questionnaire have no proven effects on stock market behavior, and it was expected that the analysts surveyed would fall into a false correlations trap. In addition, technical analysis is not a scientific tool of acknowledged predictive power, and many technical signals seem to represent some cognitive biases. Consequently, the questionnaire respondents falling in various types of psychological traps will be almost unanimous regarding the positive or negative impact of particular items on the future stock index behavior. Hence the second hypothesis is:

Hypothesis 2. A majority of financial analysts will agree on the impact of particular signals for the future stock prices.

If the hypothesis is supported by the results of this research it can be inferred that the analysts are subject to some psychological biases since they agree on a predictive value of unproven measures.

There are three types of factors regarded as potential predictors of the future market movements: macroeconomic indicators, political events and technical analysis signals. Assuming that none of these measures explains stock price changes well enough, but that they are so popular mainly because they correspond with some basic cognitive principles of the human mind, we can hypothesize that:

Hypothesis 3. When rating the importance of various kinds of signals financial analysts will not discriminate between macroeconomic, political, and technical analysis.

If the hypothesis is confirmed it can be concluded that the psychological biases are so significant that the analysts do not pay strong attention to the nature of the "predictive" factors.

Method

The study was carried out in Warsaw, Poland in June 1999 during a financial analysts' meeting. The respondents were financial analysts or dealers employed by banks and capital market institutions, who were

preparing themselves for the investment advisor license exam. The sample was not random. However, the information about the meeting was sent to most financial institutions in Poland, so every person who was interested in the lectures might attend the meeting, and there were no additional conditions limiting participation. Each participant responded to the questionnaire without consulting others. The procedure took approximately 45 minutes.

The material was presented as a 56-item questionnaire (Appendix). The cover page of the questionnaire stated that the survey was designed to better understand the opinions of experts in order to prepare a new questionnaire examining the financial knowledge of Poles. This remark allowed the respondents to feel more like experts whose opinion is needed for some further research rather than merely the persons to be examined. Respondents were assured of confidentiality. Demographic information was collected on the respondents' age, educational level, sex, and employment status.

The items of the questionnaire were derived from commentaries in Polish economic newspapers, especially the financial newspaper *Parkiet*. Only those commentaries which occurred in the newspapers most frequently were chosen as items for the questionnaire. Journalists had used the items as explanations of past stock price changes as well as for predictions of near future market movements, so all items listed in the questionnaire represented real events. No items were created by the author.

Three kinds of items were included: macroeconomic, political and technical. The respondents of the questionnaire were asked to assign a score of -3, -2, -1, 0, +1, +2 or +3 to each item, depending on how they estimated the impact of the item for the future (within a few weeks) behavior of stock prices (the WIG index). WIG is the main Polish stock exchange index; a total-return index encompassing all shares listed on the main market, calculated since 1991.

The analysts were asked about what market movement they would expect if certain political events, macroeconomic or technical signal occurred, with a higher score indicating a stronger positive impact of the item, resulting in a stock price rise. Thus -3 meant that the item was expected to evoke a strong stock price drop, while +3, a strong rise. Zero meant that the item was

regarded by the participant as a neutral measure, having no effect on stock price changes.

All 40 respondents filled out the questionnaires. On average less than 5% of the questionnaire items remained unscored. No regularity was noticed among unscored items. Statistical analysis of the questionnaire was done with the use of the StatSoft computer program *Statistica*.

Cluster L consists of 31 items, rated as highly important predictors of a stock price drop. This group includes all three types of measures: macroeconomic, political as well as some technical signals.

Cluster M consists of only seven items (drop in oil prices, rise in coal prices, street demonstrations, big stock offerings, post-communist and socialist forces win parliamentary election, WIG breaks its main rising trend line, a rise in the total numbers of orders on a bullish market) which according to respondents' opinion have little or no impact on future stock prices.

As seen above, the respondents marked 49 items as strongly affecting future stock prices (positively in cluster H, negatively in cluster L) regardless of whether their nature was economic, political or technical.

Results

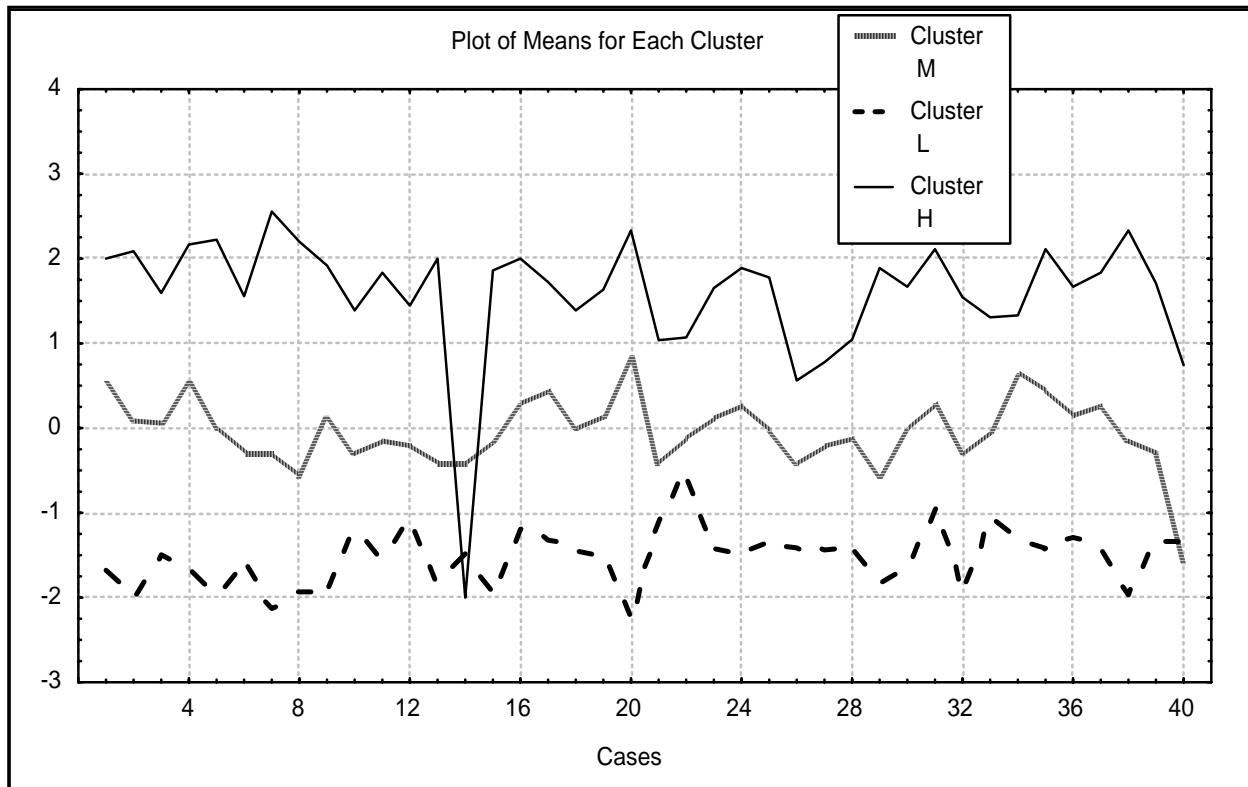
Which Questionnaire Items Were Perceived as Strongly Influencing Market Movements?

In order to examine which of the 56 items received the highest, lowest and median marks, indicating respondents' opinions on their power to affect stock prices, a cluster analysis was carried out (Hartigan, 1975). The cluster analysis was conducted in two stages. A horizontal hierarchical tree plot and a graph of amalgamation schedule (Ward's method amalgamation rule, Euclidean distances) indicated three main clusters. K-means clustering (constant intervals) divided all 56 items into three clusters. The clusters are presented in Figure 1.

Cluster H consists of 18 items, rated by questionnaire respondents as highly important predictors of stock price increase. This group consists of all three types of measures: macroeconomic, political as well as some technical signals.

Figure 1.

The Plot of the Means for Each of Three Clusters. Cases Represent the Questionnaire Respondents



Thus, in accordance with the Hypothesis 1, the opinion of questionnaire respondents is that a great majority of items demonstrate a strong impact on future market movements.

Inter-judge Agreement

An example of histograms showing the distribution of scores is presented in Figure 2. This is a typical distribution of responses.

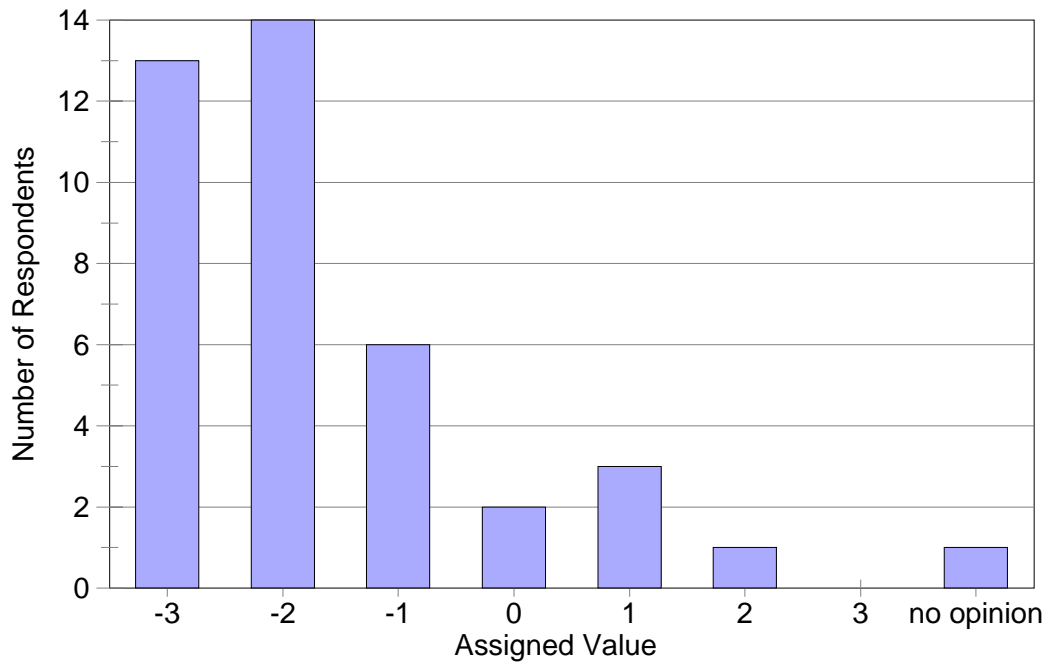
The great majority of the respondents were in agreement about what impact a particular measure has on the future movement of stock prices. Indeed, the mean standard deviation of the responses was only about 1.4. These results support Hypothesis 2. The demographic features of the respondents did not correlate in any way with their responses.

Which Measures Are Grouped Together in Financial Analysts' Minds?

In order to determine which of the 56 questionnaire measures go together in respondents' minds a factor analysis on scores showing the predictive value of particular items was conducted (Stevens, 1986). Due to the small number of respondents in relation to the number of items, a correlation matrix was used for further analysis. The principal axis method of varimax normalized rotation factor analysis yielded four factors explaining as much as 45% of total variance. The results of the factor analysis are presented in Table 1.

Figure 2.

Histograms of the Values Assigned to One of the Questionnaire Items: "Falling WIG index breaks strong psychological barriers".



The participants were asked to mark a score -3, -2, -1, 0, +1, +2 or +3 to each item, depending on how they estimated an impact of the item on the future behavior of stock prices (WIG index).

Table 1.
Varimax normalized factor loadings.

Highest loadings questionnaire measures assigned to Factor 1.

Measure	Factor 1	Factor 2	Factor 3	Factor 4
Dramatic rise in the maximum value of a buy order	0.88	0.13	0.11	0.01
High volume in blue chips after a long, horizontal trend	0.84	-0.29	0.17	0.04
Reduction of interest rates	0.82	-0.04	-0.02	0.02
After an index fall, a big overbalance of demand	0.81	-0.03	-0.03	0.04
Dramatic WIG index rise after a horizontal trend	0.80	-0.22	0.05	0.02
The beginning of an index rise accompanied with high volume after a long horizontal trend	0.80	-0.04	0.04	0.03
Bullish situation on the world stock market	0.77	0.15	-0.06	0.23
Continuous overdemand	0.75	-0.18	0.13	0.19
The rise of foreign investment in Polish economy	0.67	0.16	-0.16	0.16
New foreign investors joining Polish market	0.63	-0.10	-0.23	0.12
Diminishing inflation	0.61	0.19	0.22	0.23

Highest loadings questionnaire measures assigned to Factor 2.

	Factor 1	Factor 2	Factor 3	Factor 4
After a big rise, WIG index creates a "head and shoulders" formation	0.08	0.73	0.10	0.22
After a stock price rise, a big overbalance of supply	-0.09	0.69	0.03	0.05
Moving averages trajectory (13 and 55 weeks) characteristic for bearish market	-0.03	0.62	0.04	-0.10
WIG index fails to surpass former peaks	-0.14	0.58	-0.09	-0.24
Observable selling of large amounts of stocks	0.19	0.52	-0.03	-0.16

Highest loadings questionnaire measures assigned to Factor 3.

	Factor 1	Factor 2	Factor 3	Factor 4
Unstable economic situation in Russia	-0.07	0.09	0.63	-0.06
Important domestic political affairs	0.30	-0.38	0.60	0.00
Important foreign political affairs	-0.45	-0.30	0.53	-0.14
Unstable political situation in Russia	0.21	-0.07	0.48	-0.03
Post-communist and socialist forces win parliamentary election	0.00	0.05	0.47	-0.06

Highest loadings questionnaire measures assigned to Factor 4.

Measure	Factor 1	Factor 2	Factor 3	Factor 4
Increase in dynamics of the indebtedness of the national state sector	-0.29	-0.23	-0.07	0.75
Increase in balance-of-payment	-0.10	0.01	0.28	0.72
Increase in income tax	0.03	-0.02	0.25	0.65
Increase in budget deficit	-0.13	0.12	0.11	0.60
Increase in corporate tax	-0.25	0.05	-0.02	0.59
Increase in the dynamics of privatization	0.30	0.03	-0.35	-0.56
Industrial production decline	0.08	0.23	0.27	0.45

As can be seen, Factor 1 consists of pertinent to the growth of investments in the stock market. Reliability results for the 10 highest loadings (absolute values) of items belonging to the factor measured as Cronbach's Alpha were 0.93.

Factor 2 consists of technical measures, pertinent to the selling of stocks. The Cronbach's alpha for the reliability results for the 10 highest loadings of items belonging to the factor measured was 0.75.

Factor 3 can be interpreted as unfavorable political signals. Reliability results for the five highest loadings of items belonging to the factor expressed as Cronbach's alpha were 0.57

Factor 4 can be interpreted as positive macroeconomic and financial signals. Reliability results for the 5 highest loadings of items belonging to the factor measured as Cronbach's alpha were 0.79.

A high Cronbach's alpha coefficient indicates high reliability of the factor structure.

Thus, contrary to the Hypothesis 3, when rating the importance of various kinds of items the financial analysts discriminated between macroeconomic, political, and technical analysis.

Discussion

According to what Hypothesis 1 proposed, financial analysts rated almost all indices as highly significant signals of either increase or decrease of future stock prices. This is in apparent contrast with the actual direct impact of only a very few measures on stock prices behavior.

An important question arises as to why the financial analysts almost unanimously regard so many unproven measures as having strong influences on stock price changes. This can be explained by one or both of the following two reasons:

- 1) They were taught to take these items as important.
- 2) They are subject to some psychological biases.

Regarding Reason 1, there are many financial handbooks presenting without any empirical supporting evidence many signals allegedly determining future market movements (Murphy, 1999; Pring, 1998). Some people, including financial analysts, take these statements as proven and believe them.

Regarding Reason 2, there are dozens of inclinations discovered by cognitive psychologists which have large impacts on people's judgements and decisions (Kahneman et al., 1982; Rabin, 1998). Only the items which were commonly listed in financial newspapers as influencing future stock market behavior were selected for the questionnaire. Their popularity may derive from the psychological inclinations or traps which they represent (Zielonka, 2002). Particularly interesting from this perspective is the phenomenon that almost all the technical measures received very high absolute scores both in cluster "H" and "L". There are a few examples below:

1. Assigning a high predictive value to such items as: important domestic political affairs, or unstable political situation in Russia, or the threat of break up of the present Polish coalition government, seems to be associated with so called law of small numbers.
2. Assigning a high predictive value to the item such as "WIG index fails to surpass former peaks" seems to be based on the anchoring effect.
3. Assigning a high predictive value to such items as "after a big rise, WIG index creates a *head and shoulders* formation" looks like the gambler's fallacy which shows itself in predicting an imminent trend reversal.
4. Assigning a high predictive value to such items as: moving averages trajectory (13 and 55 weeks) characteristic for bearish market, moving averages

trajectory (13 and 55 weeks) characteristic for bullish market, or "WIG index breaks its main rising trend line" seems to be based on the heuristics of ignoring the principle of regression to the mean.

5. Assigning a high predictive value to such items as unstable economic situation in Russia represents a trap of fictitious correlations.
6. Assigning a high predictive value to such items as rising WIG index breaks strong psychological barriers, the beginning of an index rise accompanied with high volume after a long horizontal trend, or dramatic rise in the value of a buy order, seems to be connected with the group thinking and group behavior effect. Due to this tendency people overestimate views shared by others and thus are strongly inclined to panic and euphoria (Goldberg & Nitzsch, 2001).

Hypothesis 2 stated that the financial analysts would tend to be unanimous about the positive or negative impact of each questionnaire item on the future market behavior. As the results of inter-judge consistency show, generally the financial analysts strongly agreed regarding the impact of various measures on the stock market. This supports a thesis that the questionnaire respondents fall in various cognitive traps. Shanteau (1995) described a generally low consensus among stock brokers on market forecasting. The results of the present research can be helpful in understanding Shanteau's findings. Having dozens of measures, each of them regarded as having a big predictive value, a financial analyst is not able to consider all of them. So, an analyst takes into consideration only a few arbitrarily chosen measures. As there is no obligation for a financial analyst to choose the same group of measures at any time, this can lead to contradictory predictions among analysts.

As far as Hypothesis 3 is concerned, we found that despite assigning a high predictive value to a majority of the items, the financial analysts do discriminate among macroeconomic, political, and technical analysis. It means that these "learned" types of measures are present in the financial analysts' minds. It is likely that the respondents experienced a similar education, leading to some consistency in responses.

The confirmation of the Hypothesis 1 and 2 indicates that the analysts' judgments on a high predictive value of a majority of questionnaire items derive from some cognitive biases. The lack of confirmation of the Hypothesis 3 points out that the analysts may additionally be taught (schools, handbooks) how to

perceive certain macroeconomic, political or technical signals and this also influences their behavior.

Appendix Questionnaire Items

1. Dramatic rise in the value of a buy order.
2. High volume in blue chips after a long, horizontal trend.
3. Reduction of interest rates.
4. After an index fall, a big overbalance of demand.
5. Dramatic WIG index rise after a horizontal trend.
6. The beginning of an index rise accompanied with high volume after a long horizontal trend.
7. Bullish situation on the world stock market.
8. Continuous overdemand.
9. The rise of foreign investment in Polish economy.
10. New foreign investors joining Polish market.
11. Diminishing inflation.
12. New domestic institutional investors on the market.
13. Diminishing in amplitude of fluctuations after a long horizontal trend.
14. Right wing nationalist political parties win parliamentary election.
15. Dramatic WIG index drop after a horizontal trend.
16. Rising WIG index breaks strong psychological barriers.
17. After a big rise, WIG index creates a "head and shoulders" formation.
18. After a stock price rise, a big overbalance of supply.
19. Moving averages trajectory (13 and 55 weeks) characteristic for bearish market.
20. WIG index fails to surpass former peaks.
21. Observable selling of large amounts of stocks.
22. Drop in oil prices.
23. White candle (a kind of Japanese technical analysis).
24. Moving averages trajectory (13 and 55 weeks) characteristic for bullish market.
25. Continuous oversupply.
26. Positive reports of Polish market by foreign rating agencies.
27. Populist political forces win parliamentary election.
28. Dramatic rise in the value of a sell order.
29. A rise in the total numbers of orders on a bullish market.
30. The threat of break up of the present Polish coalition government.
31. Diminishing dynamics of a rise in blue chips.
32. Street demonstrations.
33. Falling WIG breaks strong psychological barriers.
34. Unstable financial situation on emerging markets.
35. Unstable economic situation in Russia.
36. Important domestic political affairs.
37. Important foreign political affairs.
38. Unstable political situation in Russia.
39. Post-communist and socialist forces win parliamentary election.
40. Big stock emissions.
41. Drop in the dynamics of economic growth.
42. WIG breaks its main rising trend line.
43. Diminishing unemployment.
44. Drop in zloty to US dollar rate.
45. The beginning of recession.
46. Increase in dynamics of the indebtedness of the national state sector.
47. Increase in balance-of-payment.
48. Increase in income tax.
49. Increase in budget deficit.
50. Increase in corporate tax .

51. Increase in the dynamics of privatization.
52. Industrial production decline.
53. Increase in dividend tax.
54. Rise in coal prices.
55. Diminishing foreign currencies reserves.
56. Drop in blue-chips prices.

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