

# **Basic Financial Data and Behavior of Investors with Limited Knowledge of Finance: an Experimental Study**

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This paper investigates how basic financial data available on-line affects behavior of investors with little or no knowledge of finance. It presents results of an experimental study in which undergraduate students were asked to invest in various stocks based on basic information about these stocks provided by Yahoo Finance website. We found that subjects, as a group, (1) invest more in stocks with extremely high or low short-term realized returns, (2) follow momentum strategy over short-run realized returns, and (3) follow contrarian strategy over long-run realized returns. We also found that (i) the same investor may simultaneously use momentum and contrarian strategies, (ii) investment strategies of a significant number of individual investors do not change over time, and (iii) short-term momentum investors are more likely to follow long-term contrarian strategies than investors who do not base their investment decisions on short-term realized stock returns.

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## **1. Introduction**

Introduction and growing popularity of discounted on-line financial brokers such as E-trade and Ameritrade in 1990s and 2000s led to a significant increase in the number of investors with little or no knowledge of financial markets and investment. Some of these “unsophisticated” investors understand their lack of knowledge and ability to obtain and analyze the financial data and use on-line brokers mainly to invest into exchange traded mutual funds (ETFs) that track market indices. Other investors, however, take advantage of the low commission fees set by on-line brokers to “play” on the stock market. Such investors invest in individual stocks and trade frequently based on the basic financial information that they can easily obtain on-line at a variety of investment-related websites (such as Yahoo Finance) or that is provided to them by their on-line brokers (such as E-trade or TD Ameritrade) free of charge. In this paper we investigate how such information affects the investment decisions of short-term unsophisticated investors.

The existing studies of individual investors’ behavior concentrate primarily on how past stock performance affects investors’ decisions. Investors who base their investment decisions on the past realized stock returns can be divided into two categories: momentum investors (or trend-chasers), who prefer to invest in stocks with high past realized return, and contrarian investors, who invest in stock with negative past returns.

Investors' desire to buy past winners may be based on the documented positive short-term autocorrelation of stock returns (Conrad and Kaul, 1989). For example, Jegadeesh and Titman (1993, 2001) show that a strategy of buying stock with the high realized past return over the preceding six month and selling stock with lower past realized return earns a one percent higher average profit<sup>1</sup>. Trend-chasing behavior can also be explained by adaptive expectations that inexperienced investors may have and their desire to extrapolate recent price movements, as documented by experimental studies of Smith, Suchanek, and Williams (1988) and Haruvy, Lahav, and Noussair (2006). The use of contrarian investment strategy, on the other hand, may be explained by documented long-term negative autocorrelation of returns (De Bond and Thaler, 1985, 1987, Fama and French, 1988, Poterba and Summers, 1988)

Both momentum and contrarian investors' behavior are documented by numerous empirical studies. Bange (2000) shows that portfolio holdings of small individual investors reflect momentum trading. Choi, Laibson, Madrian, and Metrick (2007) found trend-chasing behavior among passive investors who invest in an S&P 500 mutual fund. Nofsinger and Sias (1999) found that institutional investors are using momentum trading strategies as well. Goetzmann and Massa (2000) also studied the behavior of S&P 500 mutual fund investors. They found that about 12% of investors in their sample are trend chasers and about 25% of investors follow contrarian investment strategies. In addition, they found that more active investors are usually contrarian while less active investors are

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<sup>1</sup> Hong, Lim and Stein (2000) found that the profitability of this strategy is much lower for large firms.

trend chasers. Grinblatt and Keloharju (2000) study the investors' behavior in Finnish market. They found that domestic investors follow contrarian strategies while foreign investors are trend chasers.

Some researchers argue that an investor's decision to buy a stock may be influenced by different factors than his or her decision to sell a stock he/she already owns. Shefrin and Statman (1985) apply the ideas of regret theory (Kahneman and Tversky 1979, 1992) and mental accounting (Thaler 1980, 1985) to study how past stock performance affects investors' decision to sell the stock they already own. They argue that investors are reluctant to realize their losses, and, therefore, are more likely to sell a stock at a gain than at a loss. This hypothesis, known as disposition effect, was confirmed by Odean (1998), who found that investors tend to sell their winning stocks and hold on to their losers. Barber and Odean (1999), Weber and Camerer (1998), and Grinblatt and Keloharju (2001) provide additional evidence of the disposition effect. Rangelova (2001) found that disposition effect is relevant to trades involved large cap stocks only. She shows that for firms with small capitalization the reverse is true: investors realize their losses and hold to the stocks that performed well in the past. Oehler, Heilmann, Laeger, and Oberlander (2003) study both buying and selling decisions of individual investors. They found that, while investors hold to their losses, they behave as trend-chasers when they choose a new stock to buy. Dodonova and Khoroshilov (2007) conducted an experimental study of investors buying and selling behavior. Consistent with Oehler, Heilmann, Laeger, and Oberlander (2003), they found that investors buy

stock with high past return while tend to hold to stocks with low or negative past return if they have owned this stock already.

While selling decisions involve a choice over a limited number of stocks that investors already own, buying decisions can potentially involve a choice over all stocks that are trading on the market. Odean (1999) argues that when investors make their buying decisions, they are more likely to limit their decisions to stocks that recently caught their attention (e.g., the stocks that were in the news or have some unusual features such as extremely high or low past realized return). He found that investors buy stock with higher absolute price change over the preceding two years than the stocks they sell. This hypothesis was also confirmed by Seasholes and Wu (2004), who show that on the Shanghai Stock Exchange individual investors are net buyers the day after a stock hits an upper price limit. It was also confirmed by Hirshleifer, Myers, Myers, and Teoh (2007) who document that individual investors are net buyers following both positive and negative earnings surprises. Lee (1992) documented the same phenomenon for small individual traders.

Odean, Strahilevitz, and Barber (2004) study the repurchasing decisions of individual investors. They found that investors (1) tend to buy additional shares of the stock that they already own if that stock decreased in value; (2) tend to buy back the stock that they sold earlier if its price went down since then, and (3) are more likely to repurchase stocks

that they have sold earlier for a profit than if they sold them for a loss. Weber and Welfens (2007) provided an experimental evidence of the former two phenomena.

In this paper we present the results of an experimental study in which subjects (recruited from undergraduate students in various fields of specialization) were asked to buy stocks from a list of several comparable companies provided to them along with the basic financial information about these stocks. The subjects were given information provided by Yahoo Finance website about stock price, dividend yield, price to earning (P/E) ratio, and historical 52-week low and high stock prices (which can be used to get a rough estimate of volatility and long-term stock performance). In addition, to capture the information related to the short-term historical return presented by Yahoo Finance as a chart, subjects were provided with realized stock returns for the preceding two-week period. Thus, subject were able to base their decisions on short-term realized stock returns, on long-term (52 week) stock performance (by observing how the current stock price relate to its 52-week low and high values), and on some “fundamental” characteristics such as dividend yield, P/E ratio, and volatility (that can be proxies by the 52-week price range).

We use the data collected in this experimental study to analyze which factors affect the total investment of “unsophisticated” investors as a group as well as individual investment decisions. We found that, as a group, subjects (1) invest more in stocks with extremely high or low short-term realized returns, (2) invest more in stocks with higher

short-term realized returns, and (3) invest more in stocks with lower long-term realized performance. We found that “fundamental” parameters, such as risk, P/E ratio and dividend yield, have no significant effect on the investment decision neither at a group no at the individual level.

By analyzing individual investment decisions, we found that a significant number of subjects simultaneously use momentum investment strategies based on the short-term realized stock returns and contrarian strategies based on the long-term realized stock performance. In addition, we found that “short-term momentum” investors are more likely to follow contrarian strategies based on the long-term realized stock performance than investors who do not base their investment decisions on the short-term realized stock returns. By analyzing individual investment decisions in two rounds of the experiment, we found that a significant number of subjects do not change their momentum and contrarian strategies over time.

The rest of the paper is organized as follows. In part 2 we describe the design of the experiment. In part 3 we analyze the data and report our findings. In part 4 we conclude. The instructions provided to subjects are presented in the appendix.

## **2. The Design of the Experiment**

Our experimental study consisted of two rounds. In total, 85 undergraduate students from the same Canadian university but from various academic departments were recruited as subjects. In both rounds we provided subjects with a list of stocks and basic financial information about these stocks. We then asked them to invest “play money” in one or several stocks from the list of stocks provided to them. At the end of the experiment subjects were compensated based on the value of their investment portfolios relative to the value of portfolios of other subjects.

In both rounds we provide our subject with the following information about each individual stock: current stock price, realized stock return over the preceding two-week period, dividend yield, price to earning (P/E) ratio, and historical 52-week low and high stock prices. This information, with the exception of the realized stock return over the preceding two-week period, is easily available on Yahoo Finance website in a “summary statistic” of “get a quote” section. In addition, we included the information on the realized stock returns over the preceding two-week period because the Yahoo Finance website provides a chart and a list of historical stock prices. We choose the two-week period for the realized stock returns because we asked our subjects to make their investment decision for the next two-week period.

In the first round, subjects were asked to invest in one or several (up to 10) stocks from a list of 30 stocks included into the Dow Jones Industrial Average (DJIA) index. Subjects were asked to invest \$1000 experimental dollars (ED) based on the information provided

to them. They were given their instructions by e-mail on Saturday morning and they were asked to return their investment decisions by e-mail by the midnight of the following Sunday. They were told that their investment portfolios will be sold for cash in a two-week period. Appendix provides the exact wording of the subjects' instructions for each round.

In the second round, conducted four weeks after the first round, same subjects were asked to invest another \$1000 ED into one or several (up to 10) stocks from a list of 34 companies that belong to "Money Center Banks" or "Foreign Money Center Banks" industries according to the Yahoo Finance classification and have a market capitalization of at least one billion dollars. Subjects were provided with the same type of information and instructions as in the first round (see appendix for the exact wording).

At the end of the experiment subjects were paid according to the following compensation rule (all subjects were informed about this compensation rule at the beginning of the experiment):

Each subject received \$5 for participation. In addition, the price pool of  $PP = \$15 \times N$  (where  $N=85$  is the total number of subject participated in the experiment) was divided among all subjects. The value of each subject's investment portfolio was transferred into "Payment units" ( $PU$ ) according to the following formula:

$$PU_i = VP_i - \min_j(VP_j), \quad (1)$$

where  $VP_i$  is the value of the portfolio of subject  $i$  in experimental dollars at the end of the experiment, and  $\min_j(VP_j)$  is the minimum value of portfolios of all subjects. Then,

the final monetary compensation for each subject was set to

$$C_i = \$ \left( 5 + PU_i \times \frac{PP}{\sum_{j=1}^N PU_j} \right). \quad (2)$$

### 3. Data Analysis and Results

For each round we analyze how subjects' investment decisions depend on fundamental characteristics of the stocks (such as risk, P/E ratio and dividend yield), historical short-term (two weeks) realized returns, and the overall stock performance over the preceding year (measured by current and 52-week low and high stock prices). In particular, based on the 52-week low and high stock prices, we have constructed two variables that we have include into our regression model. The first variable is the “coefficient of range”, defined similarly to the coefficient of variation, i.e., as a 52-week price range (52-week maximum minus 52-week minimum price) divided by the average between 52-week maximum and 52-week maximum stock prices. We believe that subjects may use this

parameter as a proxy for the historical volatility (or “risk”) of stock returns. The second variable is the current price percentile, defined as the difference between the current stock price and the 52-week minimum stock price divided by the 52-week price range. We believe that subject may use this parameter as a proxy for the stock performance over the preceding year.

To analyze which factors affect the total investment of the entire group of “unsophisticated” investors in the first round, we estimate the OLS regression model in the form

$$\begin{aligned}
 Inv = & \beta_0 + \beta_1 \times STret + \beta_2 \times AbsSTret + \beta_3 \times LTperf + \beta_4 \times Risk + \\
 & + \beta_5 \times DivY + \beta_6 \times DivY + \beta_7 \times PE + \varepsilon
 \end{aligned}
 \tag{3a}$$

where *Inv* is the total investment in a given stock; *STret* is short-term (two weeks) realized return; *AbsSTret* is the absolute value of *STret*; *LTperf* is the measure of long-term (52 weeks) stock performance defined as the percentile of the current stock price in the interval between 52-week low and high prices, i.e., as “current stock price minus 52-week low” divided by “52 week high minus 52 week low”; *Risk* is the measure of the relative volatility of the stock return defined as “52 week high minus 52 week low” divided by the average between 52 week high and 52 week low; *DivY* is the dividend yield; and *PE* is P/E ratio. The first three explanatory variables in equation (3a) are included to measure how stock price movements affect the investors’ decisions. In

particular, the coefficients in front of  $STret$  and  $LTperf$  measure investors' reaction to short-term and long-term stock performance while the coefficient in front of  $AbsSTret$  measures “attention-driven” investment as in Odean (1999). The second three variables represent some “fundamental” qualities of the stock.

To analyze the data obtained in the second round of our experiment, we modify regression equation (3a) by including a dummy variable for well-recognized Canadian retail banks such as Bank of Montreal, Bank of Nova Scotia, Canadian Imperial Bank of Commerce, Royal Bank of Canada, and Toronto-Dominion Bank. This dummy variable was introduced to capture the home bias effect that may exist among our subjects who were students at one of the Canadian universities<sup>2</sup>. Thus, for the second round of our experiment we estimate the OLS regression model in the following form:

$$\begin{aligned}
 Inv = & \beta_0 + \beta_1 \times STret + \beta_2 \times AbsSTret + \beta_3 \times LTperf + \beta_4 \times Risk + \\
 & + \beta_5 \times DivY + \beta_6 \times DivY + \beta_7 \times PE + \beta_8 \times CanBank + \varepsilon
 \end{aligned}
 \tag{3b}$$

Table 1 presents the estimated values of the regression coefficients for regression models (3a) and (3b) with significance level presented in brackets underneath each value. It shows that, in both rounds, the coefficients in front of  $STret$  and  $AbsSTret$  are positive and significant at 1% significance level while the coefficient in front of  $LTperf$  is negative and significant at 1% significance level. At the same time, none of the

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<sup>2</sup> Indeed, the combined investment in these five Canadian banks constituted 40% of the total investment.

“fundamental” characteristics (risk, Dividend Yield, and P/E ratio) has significant effect on the total investment in either round. The following result summarizes the above findings:

Result 1:

As a group, investors with little or no knowledge of Finance:

- Follow momentum strategies based on the short-term realized stock returns, i.e., invest more in stocks which has increased in value in the preceding two-week period.
- Follow contrarian strategies based on the long-term realized stock performance, i.e, invest more in stocks with current price close to the 52-week low.
- Are attention-driven investors who invest more in stocks with extremely high or extremely low short-term realized returns.

**Table 1**  
**Total Investment**

	<b>Const.</b>	<b>STret</b>	<b>Abs STret</b>	<b>LTperf</b>	<b>Risk</b>	<b>DivY</b>	<b>PE</b>	<b>Can Bank</b>
<b>Round 1</b>	7099 (0.007)	35761 (0.008)	61479 (0.008)	-9008 (0.001)	4639 (0.420)	-2133 (0.951)	-32.81 (0.692)	
<b>Round 2</b>	3358 (0.006)	181454 (0.000)	165162 (0.000)	-3329 (0.007)	2208 (0.123)	11317 (0.550)	1.873 (0.673)	3395 (0.000)

**Table 2**  
**Individual Investment**

<b>Explanatory variable</b>	<b>Effect</b> (OLS regression with 5% significance level)	<b>Round 1</b>	<b>Significance</b>	<b>Round 2</b>	<b>Significance</b>
<b>STRet</b>	<b>positive</b>	30.59% (0.000)	<b>Yes</b>	34.12% (0.000)	<b>Yes</b>
	<b>negative</b>	7.06% (0.020)	Yes	5.88% (0.178)	No
	<b>Significantly non-zero</b>	37.65% (0.000)	<b>Yes</b>	40.00% (0.000)	<b>Yes</b>
<b>AbsSTret</b>	<b>positive</b>	5.88% (0.178)	No	32.94% (0.000)	Yes
	<b>negative</b>	0.00% (0.136)	No	3.53% (0.727)	No
	<b>Significantly non-zero</b>	5.88% (0.801)	No	36.47% (0.000)	Yes
<b>LTperf</b>	<b>positive</b>	1.18% (0.534)	No	0.00% (0.136)	No
	<b>negative</b>	25.88% (0.000)	<b>Yes</b>	14.12% (0.000)	<b>Yes</b>
	<b>Significantly non-zero</b>	27.06% (0.000)	<b>Yes</b>	14.12% (0.001)	<b>Yes</b>
<b>Risk</b>	<b>positive</b>	2.35% (1.000)	No	10.59% (0.000)	Yes
	<b>negative</b>	1.18% (0.534)	No	0.00% (0.136)	No
	<b>Significantly non-zero</b>	3.53% (0.632)	No	10.59% (0.039)	Yes
<b>DivY</b>	<b>positive</b>	3.53% (0.727)	No	4.71% (0.280)	No
	<b>negative</b>	1.18% (0.534)	No	0.00% (0.136)	No
	<b>Significantly non-zero</b>	4.71% (1.000)	No	4.71% (1.000)	No
<b>PE</b>	<b>positive</b>	5.88% (0.178)	No	7.06% (0.020)	Yes
	<b>negative</b>	3.53% (0.727)	No	0.00% (0.136)	No
	<b>Significantly non-zero</b>	9.41% (0.132)	No	7.06% (0.448)	No

To analyze the behavior of individual investors and to potentially identify a group of investors with investment strategies that are opposite to the ones described in Result 1 or to identify two groups of investors who trade based on “fundamental” characteristics but follow the opposite strategies (so that their contributions to the total investment cancel each other out), we estimate regressions (3a) and (3b) for each subject separately. For each explanatory variable in (3a) and (3b), Table 2 presents proportions of investors with significant (at 5% significance level) estimated coefficients.

Note that in the absence of any effect of a given explanatory variable on the individual investment decision, the corresponding proportion is expected to be  $\alpha/2$  for 1-sided effect (i.e., significant positive on negative estimated regression coefficients) and  $\alpha$  for 2-sided effect (i.e., estimated regression coefficient of any sign significantly different from zero), where  $\alpha$  is the significance level of a corresponding OLS regression. Such expected proportions are induced by the chosen probability of type 1 error in the OLS regression analysis. For example, even if short-term realized stock returns have had no effect on individual investment decisions, the estimated regression coefficient in front of  $STret$  will be positive and significant for approximately 2.5% subjects and it will be significantly different from zero (without the specified sign) for approximately 5% subjects. In fact, given the assumption that short-term realized returns have no effect on individual investment decision, the number of subjects with significant positive estimated regression coefficient in front of  $STret$  will be binomially distributed with the sample size of  $N=85$

(the number of subjects participated in our experiment) and the probability of success of 2.5% (half of the significance level of the OLS regression analysis). Similarly, the number of subjects with significant estimated regression coefficient of any sign in front of  $STret$  will be binomially distributed with the sample size of 85 and the probability of success of 5%. Hence, to analyze the individual investment decisions, we have conducted a set of one-sample proportion tests to test whether the observed proportions are significantly different from the probabilities induced by the significance level of the OLS regression analysis. The number in brackets underneath each proportion in Table 2 presents the significance level of the corresponding one-sample proportion test. These tests confirm our findings reported in Result 1 that some investors follow momentum strategies based on the short-term realized stock returns while some investors follow contrarian strategies based on the long-term realized stock performance. It does not provide any evidence of existence of investors with investment strategies that are opposite to the ones described in Result 1 or investors who trade based on “fundamental” characteristics<sup>3</sup>.

**Table 3**  
**Individual Investment Strategies over Time**

<b>Strategy</b>	<b>Prob(Round 2)</b>	<b>Prob(Round 2 Round 1)</b>	<b>Significance level (<math>\chi^2</math> test)</b>
<b>Momentum</b>	34.12%	53.85%	2%
<b>Contrarian</b>	14.12%	31.82%	1%

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<sup>3</sup> Note that the power of these tests was not sufficiently high to reject the null hypothesis that  $\beta_2=0$ , although it was rejected when we analyzed the total investment of all subjects.

To understand whether the investment strategy of an individual investor changes over time, we have calculated the conditional probability that an investor uses momentum trading strategies in Round 2 given that he/she has used it in Round 1 and the conditional probability that an investor uses contrarian trading strategies in Round 2 given that he/she has used it in Round 1. Table 3 reports these probabilities<sup>4</sup>. As it can be seen from Table 3, the conditional probabilities are higher than the appropriate unconditional probability of following the corresponding strategy in Round 2 for both momentum and contrarian strategies. The appropriate  $\chi^2$  contingency analysis test shows that the difference between conditional and unconditional probabilities is significant at 2% significance level for both strategies. The following result summarizes this finding:

Result 2:

A significant number of investors do not change their momentum and contrarian strategies over time.

As Tables 1 and 2 show, some investors follow momentum strategies based on the short-term realized stock returns while some investors follow contrarian strategies based on the long-term realized stock performance. To understand whether these two groups of investors are separate or whether there are a significant number of investors who follow both contrarian and momentum strategies simultaneously, we have computed the

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<sup>4</sup> We provide this analysis only for momentum and contrarian strategies because these are the only strategies that are significant at the individual level in both rounds..

proportions of “short-term contrarian” investors among “long-term momentum” investors in each round. Table 4 presents these numbers. Assuming that the two groups of investors do not intersect, the corresponding proportions, induced by type 1 error (5%) of the OLS regression analysis, should be equal to 2.5%. The corresponding one-proportion tests conducted separately for both rounds show that both proportions are significantly different from 2.5% (at 1% and 4% for Rounds 1 and 2 respectively). The following result formalizes this finding:

Result 3:

There are a significant number of subjects who simultaneously use momentum investment strategies based on the short-term realized stock returns and contrarian investment strategies based on the long-term realized stock performance.

**Table 4**  
**Simultaneous use of Contrarian and Momentum Strategies**

	Round 1			Round 2		
	Among		Significant difference	Among		Significant difference
	Momentum	Other		Momentum	Other	
<b>contrarian</b>	65.38%	8.47%	Yes (1%)	10.34	16.07%	No (44%)
<b>significance</b>	Yes (1%)			Yes (4%)		

Finally, to further investigate how investors are divided based on their use of momentum and contrarian strategies, we have computed the proportions of investors who used contrarian strategies among momentum investors and among investors who did not use

momentum strategy. To test whether the difference in proportions is significant, we have conducted 2-sample proportion tests. As it can be seen from Table 4, in Round 1 momentum investors are more likely to be contrarians than investors who do not follow momentum strategies. For Round 2, the difference is not statistically significant. Therefore, the following result follows:

Result 4:

In the first round of experiment short-term momentum investors are more likely to follow long-term contrarian strategies than investors who do not base their investment decisions on short-term realized stock returns

## **4. Conclusion**

This paper documents the results of an experimental study in which a group of undergraduate students from various academic departments was asked to invest fictional currency based in one or more stocks from a list of stocks provided to them based on the basic information about these stocks available on Yahoo Finance website. We found that investors, as a group, invest more in stocks with extremely high or low short-term realized returns, follow momentum strategy based on short-term realized stock returns, and follow contrarian strategy based on long-term realized stock performance. By analyzing investment decisions of individual investors, we found that a significant

number of investors do not change their momentum or contrarian strategies over time, that there is a significant number of investors who simultaneously use momentum strategy based on short-term realized stock returns and contrarian strategy based on long-term realized stock performance, and that “short-term momentum” investors are more likely to use “long-term contrarian” strategies than investors who do not base their investment decisions on short-run realized stock returns.

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## APPENDIX

### Instructions for Round #1:

Hello to everybody,

Thank you very much for your willingness to participate in my experimental study of investors' behavior. This is the first round of the experiment. In this round you are given \$1000 of "play money" that you must invest in some stocks from the list of stocks attached to this message. The attached file provides you a list of 30 stocks included into the DJIA index and their basic characteristics. You need to invest all of your fictional money in some of these stocks. You can invest all your money in one stock or choose several stocks (no more than 10 stocks!!!). The stocks that you will choose will be held in your portfolio for two weeks and will be sold on Friday, [date specified] (at the closing price at that day). You must submit your investment decision by e-mail no later than 11:59pm on Sunday, [date specified]. Please, use the following submission guidelines as close as possible:

- 1) put "Round 1" into the subject of your e-mail
- 2) Start your e-mail with your name and student number
- 3) For each stock you want to buy, state the name of the stock, its ticker, and the amount of money you would like to invest in this stock (not the number of shares you want to buy)
- 4) Make sure your total investment is exactly equal to \$1000
- 5) Make sure you invest in no more than 10 stocks

You should get an auto-reply message from me confirming that your submission is received. Sunday night I will send reminder to people who will not submit their investment decisions by that time yet. If you will receive such reminder from me – it meant that I did not get your e-mail.

Thank you again for your help in this research study.

## **Instructions for Round #2:**

Thank you very much for your willingness to participate in my experimental study in investors' behavior. This is the second and last round of the experiment. It is very similar to the first round that was conducted a month ago. In this round you are given another \$1000 of "play money" that you must invest in some stocks from the list of stocks attached to this message. The attached file provides you with a list of stocks that belong to "Money Center Banks" and "Foreign Money Center Banks" industries according to the Yahoo Finance classification and have a market capitalization of at least 1 billion dollars. In total, there are 34 such companies.

You need to invest all of your fictional money in some of these stocks. You can invest all you money in one stock or choose several stocks (no more than 10 stocks!!!). The stocks that you will choose will be held in your portfolio for two weeks and will be sold on Friday, [date specified] (at the closing price at that day). You must submit your investment decision by e-mail no later than 11:59pm on Sunday, [date specified]. Please, use the following submission guidelines as close as possible:

- 1) put "Round 2" into the subject of your e-mail
- 2) Start your e-mail with your name and student number
- 3) For each stock you want to buy, state the name of the stock, its ticker, and the amount of money you would like to invest in this stock (not the number of shares you want to buy)
- 4) Make sure your total investment is exactly equal to \$1000
- 5) Make sure you invest in no more than 10 stocks

You should get an auto-reply message from me confirming that your submission is received. NOTE: If you will not receive such message it means that your e-mail does not reach my mailbox, in which case you should try to send it to me again. Please, save the auto-reply message that you will get from me as a proof that you have submitted your investment decision on time!!!

I have also attached the compensation formula just in case you have deleted the enrollment e-mail

Thank you again for your help in this research study.