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ALGORITHMIC TRADING VERSUS HUMAN TRADERS AT DIFFERENT INFORMATION LEVELS

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ABSTRACT

In this study, it was investigated whether different levels of information create advantages or disadvantages in the stock market. For this purpose, net profit rates at the end of the period were calculated for two different investors. Investors are separated in terms of access to information differences. The fundamental investor is evaluated under the assumption of asymmetric information whereas the chartist investor is done under the assumption of perfect information. In the current study, the fundamental investor makes only one transaction, while the chartist investor acts according to the indicator The moving average convergence-divergence indicator (MACD) since it makes algorithmic transactions. The transactions were made based on trend periods. At the end of the trend, the net profit rates have been calculated to find out to see whether the information differences create commercial inequality.
In this context, two companies known as high in volume and worldwide known in Borsa Istanbul, where algorithms are also used, are discussed. Transactions for two different investors are started and completed on the same trend dates. When the transactions made in 20 different trend periods are compared, it is concluded that the chartist investor is more advantageous than the fundamental investor. As a result, a chartist investor who has perfect information is more advantageous for financial markets, as expected.
Keywords: Algorithmic Trade, Investment, Asymmetric Information, Perfect Information, Stocks.

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Introduction

Technological developments are happening almost every day at a shocking speed. So much so that this process has brought the first room-sized computer to a size that is now lost in our pockets. This innovation affects new fields every day and reached the financial markets in a very short time. Today, trading on stocks has also been heavily affected by this development. From the periods when buying and selling transactions were made directly on the stock market or via banks over the phone and followed via Teletext; now we are in the era of mobile phones and algorithms (AT) and even the biggest investors high-frequency trading (HFT) methods for. The fact that the fundamental investor lags behind in speed and does not give up his/her investment on time by thinking emotionally can negatively affect his/her portfolio. Thanks to the speed provided by the information age, algorithmic robots are trading in the market in the blink of an eye. The fact that the algorithm behaves emotionally and follows the developments much faster than the human while performing the transaction suggests that it is advantageous in terms of theory. An algorithm is a very effective tool to avoid losses by both acting quickly and not being emotional.

To access information is of great importance when performing all business transactions. It is an issue that should be investigated whether there is a higher rate of profit than normal with only indicator operations without examining the current information. Algorithmic robots can access information using various tools (indicators, news, trends, etc.). There are even indicators that allow you to buy and sell just by reading the news. When the investor does not get the information from the right sources, or if the information is not reliable, the investor can make an adverse selection[1] and asymmetric information[2] can lead to portfolio loss.

Two different investor strategies have been designed for analysis in the study. These can be basically divided into algorithmic and non-algorithmic. Based on this, the first of the investment strategies was named as a fundamental investor. The fundamental investor determines the buy-sell strategy with his/her own means. It decides by looking at various tables known as fundamental analysis. S/he has insufficient information on the market. S/he acts according to his/her own feelings and predictions while performing transactions. S/he does not know whether the information in the market is correct or not. It has asymmetric information of the market as we call it and invests with a more traditional view. The second investor uses more chartist methods. It acts with various technical analysis methods using algorithms. It interprets the information in the market through indicators. The decisions made by the algorithm are more callous and modern. It can make better sense of the market. That's why we define our chartist investor as having perfect information of the market. In addition, it can react much faster to the action in the market because it uses an algorithm. S/he does not hesitate to make a decision as his predictions are better and there is no room for emotions. While thinking about the fundamental investor strategy decision, the chartist investor strategy, namely the algorithm, has already been decided and applied. The main difference between them stems from making quick decisions, determination not to give up on strategy, and whether the decision is affected by emotions. Here we place several restrictions on these two investor strategies for the health of the study. The algorithm of the chartist investor moves very fast and the transaction with the signals of the indicator reaches the result. Although the algorithms work systematically, it cannot be said that they get positive results in every process. In this study, the chartist investor using this algorithm is defined by the perfect information assumption, the trader trading in the traditional channel with the assumption of asymmetric information. The fundamental investor is the investor who analyses the companies on a balance sheet and profitability basis and selects them according to criteria such as dividend service. Chartist investor is the investor who manages his/her commercial transactions using algorithms.

The article investigates the effects of algorithm strategies used in the financial market. Algorithms commonly used in this area can make a big difference for investors once they choose an investment strategy. Algorithms are like a consultant working for the investor in terms of their structure. As it increases profitability, it also creates free time for its investors as it undertakes transactions and responsibilities and realizes decisions through pre-given commands. They are also very useful in terms of fast management and market monitoring. In this context, algorithms also affect daily life by reducing the stress level experienced by the investor.

In the study, the transactions performed were limited for clarity. The time limit was created by trading stocks during trend periods. Therefore, it does not matter which years are selected in the study. Trend periods are

[1] For more information; George Akerlof (1970), “The Market for Lemons: Quality, Uncertainty, and the Market Mechanism”
[2] In this study, we use the names of agents from Paddick et al.(2012). For more information; Paddrik, M. et al. “An agent-based model of the E-Mini S&P 500 applied to Flash Crash analysis”.

seen as good times to reanalyze. From this point of view, the fundamental investor is on the side that makes only one buy-sell transaction, and does not use stop-loss and indicators in any way. The chartist investor, on the other hand, is the investor who can make short buying and selling as well as buy-sell transactions, and carry out his/her transactions through the algorithm using one indicator. Algorithms can be encoded in a very diverse and complex way today. Here we have designed the algorithm to be more minimal and simple in accordance with our desire to do. One of the reasons why we keep the algorithm we use in the study especially simple and minimal is that the ratio between the investors is not decayed. We think that the analysis carried out in this section allows for a better comparison. It should be remembered that with HFTs, which are high-level algorithms, a large number of operations can be performed in seconds, and a person cannot be expected to compete with them. For the simplicity of the study, it is limited to a single indicator. Analysis results are interpreted within these limitations. More work must be done to achieve more general and definitive results. The article is estimated that the results of the study will come true over time. It does not guarantee that the results will be successful for all periods and overall. These results may have been realized only with the specified constraints and methods.

The study was conducted in two different sectors in Turkey and selected firms in two different markets. In recent years, Turkey offers high investment opportunities for investors. Borsa Istanbul (BIST)[3], which attracts the attention of foreign capital in particular, has an appearance of a constantly rising and developing market in the long term both in terms of volume and pricing. In this context, two of the companies in BIST30 and BIST100 were selected for the current study.

The article is organized into five parts. Section 1 links technological developments to developments in the financial world. Section 2 contains the results of various studies found in the selected literature. Section 3 describes the data and method used in the study. Section 4 expresses the profitability achieved by the investors as a result of the analysis. Section 5 is the conclusion.

Literature Review

The current literature on asymmetric information and algorithmic trading consists of many theoretical and empirical studies. Literature on algorithmic trading (AT) and high-frequency trading (HFT) is constantly evolving. However, to date, no analysis was performed on the investment behaviours of different information levels at an algorithmic level in Turkey. Therefore, our study will be the first empirical study to shed light upon the potential difference in investors with difference information levels.

Freund, Larrain and Pagano (1997) investigated market efficiency in the Canadian market using Toronto Stock Exchange data between 1975–1995 and concluded that AT has no significant effect on the stock market transactions.

Tse and Zabotina (2001) found that a market with an open outcry mechanism has a higher market quality and pricing efficiency than one with a computer auction trading system, especially during volatile periods.

Oehmke (2009) and Kondor (2009) argue that as the number of investors applying algorithm strategies increases, more affordable prices for trading emerge. On the contrary, Kozhan and Tham (2009) argue that competition increases the price efficiency and that computers entering the same trade at the same time can cause a misleading effect that takes prices away from their core values to take advantage of the arbitrage opportunity.

Biais, Foucault and Moinas (2011) and Martinez & Rosu (2013) argued that the speed advantage of algorithmic trading on people should have a positive effect on the price prediction. In their theoretical model, algorithmic trading informs the investor better and applies market orders to use the information they have. Given these assumptions, the authors show that trading in the market by algorithmic traders makes asset prices more affordable, but more importantly, their trading is a negative source of choice for liquidity providers. In the study, it is claimed that in the cases in which the price is not at the desired level for trading, the investors who make algorithmic trading contributes to the price discovery, that is, due to the rapid elimination of inefficiency that occurs with continuous transactions.

Carrion (2013) found that HFT transactions provided efficiency in terms of timing by using the 2008–2009 Forex and Nasdaq OMX data in the USA in their study on market timing.

Chaboud et al. (2014) have examined whether algorithmic trading affects the price efficiency of the foreign exchange market. They analyzed the data, from 2003-2007, in the three most traded currency pairs on Electronic

[3] For more information; https://www.kap.org.tr; https://www.borsaistanbul.com

Broking Services, euro-dollar, dollar-yen, and euro-yen. They found that AT's two price efficiencies led to an improvement: the frequency of triple arbitrage opportunities and the autocorrelation of high-frequency returns. This result is another thing where the AT increases information yield by accelerating price discovery, but we can also bring higher adverse choices together to slower investors. Also, this correlation does not seem to cause a deterioration in market quality, at least not on average.

Brogaard, Hendershott and Riordan (2014) in their study on pricing efficiency concluded that HFT increased price efficiency as a result of performing HFT transactions in Forex and Nasdaq OMX by using USA 2008–2009 data. Similarly, Hirschey (2013) investigated the liquidity demand by using the USA 2009 Nasdaq OMX data and concluded that HFT increased the liquidity demand.

Syamala and Wadhwa (2020) analyzed the National Stock Exchange in India, using 208 days of data between 2012-2013 and they have reached the conclusion that investors engaged in algorithmic trading are maximizing their profits while providing liquidity in all situations during the day. Using the volume-weighted average price disaggregation analysis, they concluded that the trader making algorithmic trade at five-minute and one-minute intervals made a profit through market timing performance during the day, and this profit was higher than the short-term market timing performance from other groups of investors. In addition, they have shown that the instability of orders and the delay in price significantly increase the price efficiency of algorithmic trading.

In their study on asymmetric information and Islamic finance, Benamraoui and Alwardat (2019) showed that Islamic finance providers should prefer more secure financing, especially with small borrowers.

Foucault, Hombert and Roshu (2013) argue that, contrary to the most positive opinions about algorithmic trading and the suitability of price to take risks, in a world without asymmetric information, the speed advantage of algorithmic investors will not increase the awareness of prices, but still increase adverse selection costs.

In the studies of Ramos and Perlin (2020), it was concluded that AT in the Brazilian B3 stock market reduces liquidity. Contrary to the results with the most positive relationships between AT and liquidity, a negative relationship was found. For 26 stocks on the B3 stock exchange, they found evidence that the AT increased spreads between 2017-2018 using high-frequency data, both in fixed effects and in VAR estimates.

Garcia and Schweitzer (2015) analyzed the effects of social signals on AT by using 2011-2014 Bitcoin Tweets in the Swiss market and concluded that it provides a positive return on investment.

Groß-Klußmann and Hautsch (2013) investigated the news-based change using London Stock Exchange data between 2007-2008 in the UK and found that HFT has significant effects on yield, volatility, and transaction volumes.

Hagströmer and Nordên (2013) examined marketing and momentum strategies using Nasdaq-OMX Stockholm Exchange data USA 2011-2012 and concluded that HFT reduces intraday price volatility.

Ito et al. (2012) investigated the arbitrage between USD/JPN/EBS using Forex data between 1999-2010 and it was observed that triple arbitrage disappeared as the transaction speed increased.

Ito and Yamada (2015) investigated the widespread use of HFT in the market through Forex, and Nasdaq OMX, using the data of 2008-2009 in the US market, and reached that HFT increased its effectiveness in times of global crisis.

Papachristou, Papadamou, and Spyromitros (2018) investigated asymmetric price formations for adding and removing shares to the Athens Stock Exchange Index. Findings show that excluding a company from the index has a significant negative effect on stock returns. In particular, it was concluded that such a stock would take more than 15 days to recover. However, the authors observe short-lived positive responses on stock returns for a company to be included in the index.

Ravi and Hong (2015) in their study examining the effects of asymmetric information using the data of the changes in the S&P 500 between 2001-2010 showed that algorithms reduce the investor's adverse selection costs in the presence of asymmetric information and increase it in the opposite case.

Seo and Chai (2013) investigated the profitability of algorithmic trading in the stock market in Korea and concluded that AT can reduce information asymmetry.

Riordan et al. (2013) investigated the effect of newsletter messages on prices using Canada 2005-2008 Toronto Stock Exchange data and concluded that investors using AT react more to negative messages.

Zhang (2012) in his study investigating access to information using 2008–2009 NASDAQ data in the US market, found that HFT accessed difficult information faster.

In his study, Hoffmann (2014) claims that algorithmic investors, who are specialized in liquidity and are better informed, send offers that reflect new information quickly, making prices more suitable for trading, and thus preventing arbitrage opportunities from occurring.

Hendershott and Riordan (2011) investigating the liquidity in the financial market, using the data of USA 2001-2005 The New York Stock Exchange, concluded that liquidity, information, and the price increased and transaction costs decreased with AT.

In the study of Frino et al. (2017) about the liquidity in the financial market, it was concluded that the AT increased the liquidity and supported the market depth by using Borsa Italiana data between 2008-2012 in the Italian market.

Kulkarnı and More (2014), in their paper, analyzed the profit or loss generated on the application of this indicator MACD on selected five stocks from the Bombay Stock Exchange. It has been observed after application daily for over a year that all the decisions based on MACD have generated a profit. Certain precautionary measures have also been suggested for the successful implementation of the indicator.

Data And Methodology

Ravi and Hong (2015) investigated the S&P 500 index within the framework of asymmetric information. Carrion (2013), on the other hand, investigated the algorithmic transactions in the market (there was HFT but we used it as AT) on NASDAQ. In our study, based on these two studies, we gave a new direction to the study by combining information asymmetries and algorithmic operations. In this context, we have shown whether algorithmic transactions in the market are a better strategy than traditional investment strategy through asymmetric information. Findings are given in the last section.

The effect of working algorithms on profitability in the stock market has been investigated in this study. It explores the difference between the profits earned by the chartist investor who makes algorithmic trading with the assumption of perfect information and the fundamental investor who makes buying and selling transactions with an asymmetric information assumption. The expected result is that perfect information will lead to superiority in the financial field. That is, algorithm profitability will outweigh traditional profitability. Here it was investigated how the investments have resulted during the trend periods in Turkey.

MACD was chosen as the indicator because it is thought to follow the trend periods well. To make a better judgment, the US dollar ($), which is accepted as the international currency, was used in the study. The first investor traded through the traditional channel under the assumption of asymmetric information is an investor who traditionally examines the balance sheets of companies and develops his/her strategy while buying and selling shares. The said investor makes a purchase when the trend starts and a sale at the end of the trend and is limited to a single buy-sell. Here, the fundamental investor is evaluated under the assumption of asymmetric information. However, the second investor is evaluated under the perfect information assumption. It leaves the trading transactions completely to the algorithm and is limited by an indicator. MATRIX software was used for the algorithmic trading. In addition, short selling, where the algorithm is advantageous, is also allowed. There is no transaction limitation and commissions are not taken into account.

The moving average convergence-divergence indicator (MACD)

The moving average convergence-divergence indicator (MACD) was invented by Gerald Appel in the 1970s. It has recently become one of the most popular technical tools for investors. The MACD is obtained by subtracting the longer-term exponential moving average from the shorter-term exponential moving average (EMA) prices or from other measures of the followed instrument. It is obtained by subtracting the 26-day exponential moving average from the 12-day exponential moving average. The signal line showing the buy-sell signals in the MACD is used for trading (Appel, 2005).

The values of 12, 26, and 9 are the typical settings used with the MACD, though other values can be substituted depending on your trading style and goal.

MACD Line: (12-day EMA - 26-day EMA) (1)

When talking about MACD, the zero signal line should also be mentioned. This line is important for tracking buy-sell signals. On the line, lines intersect, diverge, or may rise abnormally. The zero line is interpreted as follows (Appel, 2005):

Intersections: If the MACD indicator falls below the zero line, that is, the signal line, this creates a downward trend signal and signals a sell for investors. Conversely, if the indicator rises above the zero line, this creates an upward trend signal and signals the investor that the level of purchase has been reached. In general, investors know that false signals may be detected and they wait for the intersection level to be exceeded to prevent this.

Divergences: If the price moves away from the MACD signal line, that is, if the difference rises enough to diverge, it is understood that the trend is now over.

Abnormal Rises: If the MACD indicator makes an abnormal rise, the short-term average suppresses the long-term average upwards, the product is in the overbought territory and will soon return to its original state. If the MACD indicator is above the zero line, it indicates that the upward pressure can continue. If MACD indicator is below the zero line, it expresses the opposite of this situation.

Signal Line: 9-day EMA of MACD Line (2)

MACD Histogram: MACD Line - Signal Line (3)

In the study, two different stocks in two different indices- one in BIST30 and the other in BIST100- in Borsa Istanbul (BIST) were compared. While choosing the stocks, the brand value, volume, and worldwide recognition of the company were taken into consideration. The first of the stocks[4] has been selected from the BIST30 index. The second stock is not included in BIST30 and BIST50, but was selected from BIST100, paying attention to its high volume. It is also known that robots are currently trading on stocks. In the analysis, uptrend and downtrend periods were selected to create time constraints. Trends are chosen randomly. To make the results more meaningful, a total of twenty periods between 2014–2019 were analyzed, including ten uptrend and ten downtrend periods for two stocks. It was not included in the study after 2019 due to the covid epidemic in the world and the currency crisis in Turkey.

Table 1. Transaction Amounts in Stock (per year)

	BIST30 Stock		BIST100 Stock	
	Chartist Investor	Fundamental Investor	Chartist Investor	Fundamental Investor
2014	-	-	16	1
2015	16	1	16	2
2016	4	1	6	1
2017	16	1	21	3
2018	40	6	15	2
2019	10	1	-	-

Source: Author's calculations.

Table 1 expresses the number of transactions made on an annual basis. It covers the trend periods within the year. Transactions have been made on trends over the years. In some trend periods, three transactions were made, while in some, nearly forty transactions were made.

In this article, the result has been reached by comparing the profit percentages. The aim is to enable investors to reach results without using complex methods. This quite simple approach easily reveals which type of investment and level of knowledge gained more.

Findings

Two different stocks have been selected from Borsa Istanbul, provided that they are in different indices. Uptrend and downtrend periods for stocks are determined randomly. Twenty different trend periods in total, five uptrends, and five downtrends were analyzed for each stock. The research findings are tabulated technically and presented in a summary.

It is the trend line that is at the top of the graphs and is valid for both traders. It shows whether the stock is in an upward or downward trend and the price is in an up or downtrend. The red and turquoise lines at the bottom of the graphs show the intersections where the MACD indicator gives a buy and sell signal for the investor. If the MACD baseline crosses above the signal line it is a buy signal, if the MACD crosses below the signal line it is a sell signal. While the fundamental investor only follows the trend line, s/he makes his/her decisions according to this line. The chartist investor, on the other hand, follows the signals of the MACD indicator that follows the trend line and prefers the algorithm to trade according to these signals. In this way, analyzes were performed and the results are presented.

[4] Shares are not expressed to avoid investment advice.

The first analysis is made for the stock in BIST30. Five uptrends and five downtrends graphs analysis results are summarized and shown below.

Fig. 1. Trend Periods for BIST30 Stock, Uptrends are shown in the upper part and downtrends in the lower part (Matriks Data Terminal)

Separate purchase and sale transactions were made for the five uptrends and five downtrends in Fig. 1.

The second analysis is made for the second stock not included in BIST30 and BIST50, but in BIST100. Five uptrends and five downtrends graphs analysis results are shown below.

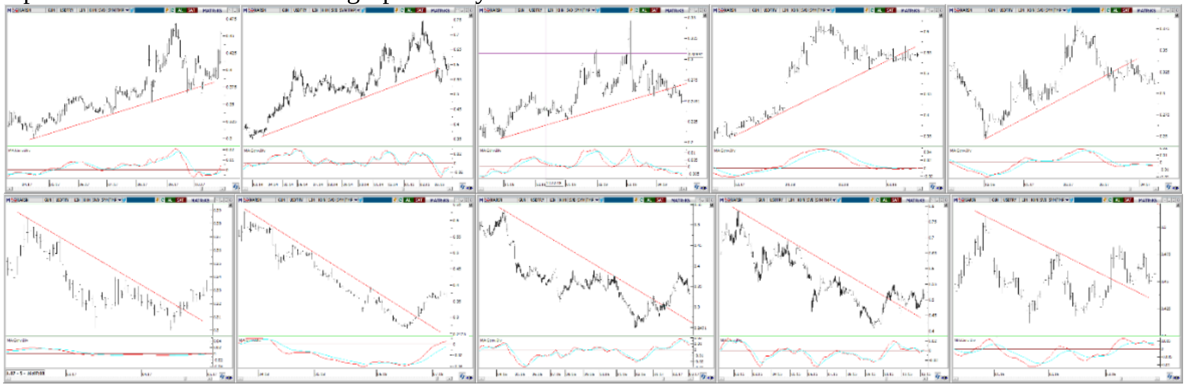

Fig. 2. Trend Periods for BIST100 Stock, Uptrends are shown in the upper part and downtrends in the lower part (Matriks Data Terminal)

Separate purchase and sale transactions were made for the five uptrends and five downtrends in Fig. 2. The transactions in Table 2 are given in percentage to facilitate the evaluation of two different investor performances. The values marked with an asterisk indicate which investor has an advantage during the current trend period.

Table 2. Transaction Performances in Trend Periods for Stocks

	BIST 30 STOCK		BIST 100 STOCK	
	FUNDAMENTALIST	CHARTIST	FUNDAMENTALIST	CHARTIST
UPTREND 1	80,95*	11,19	16,67	22,7*
UPTREND 2	16,88*	-23,98	51,43	65,37*
UPTREND 3	8,63*	-13,57	23,81*	-12,6
UPTREND 4	-1,85	29,99*	54,04*	11,5
UPTREND 5	17,46*	15,83	23,08*	19,53
DOWNTREND 1	-25,74	45,58*	-13,51	3,97*
DOWNTREND 2	-31,16	21,31*	-12	-10,22*
DOWNTREND 3	-35,4	22,02*	-29,73	45,39*
DOWNTREND 4	-12,8	14,73*	-37,25	48,03*
DOWNTREND 5	-16,39*	-32,19	-46,55	33,42*

Note: Those marked with an asterisk indicate higher profits.

As it can be understood from the results about BIST30 stock analysis in Table 2, the fundamental investor is very advantageous compared to algorithmic trading in the uptrend period. It should not be forgotten that the algorithm buys and sells, but the fundamental investor only buys at the beginning of the trend and sells at the end of the trend. This situation is theoretically an expected result. It can be said that fundamental investors will earn more in the long run if they get the opportunity to buy at the beginning of the uptrend period. The fundamental investor has made more profit than the chartist investor in four different trend periods. Only in the fourth trend period, the algorithm has an advantage.

As can be understood from the result of the BIST30 stock downtrend periods, the chartist investor is in a very advantageous position compared to the fundamental investor. It has shown its advantage by profiting through algorithmic trading in four different trend periods. Only in the fifth downtrend period, both investors suffer losses. The point to note here is that the fundamental investor makes a loss for all trend periods. The reason for the loss of the fundamental investor is to buy stocks at a high price at the beginning of the downtrend and sell them at a lower price than they bought at the end of the trend. The reason for the loss of the algorithm is thought to be that the MACD indicator does not determine the end of the trend period well.

According to the results of the BIST100 stock analysis, it is understood that the fundamental investor is advantageous in three trend periods and the chartist investor in two trend periods in the uptrend period. It is an expected result that the fundamental investor will be more advantageous in the uptrend periods, but it can be seen that the chartist investor almost catches the fundamental investor thanks to the algorithm.

As can be seen in Table 2, the chartist investor doing algorithmic trading is completely more advantageous than fundamental investors in the downtrend period. Here, it is seen that the algorithm made a profit in four different trend periods but a loss in one trend period. Even in the period of loss, the algorithm has shown its advantage to the chartist investor by making less loss than the loss of the fundamental investor.

Conclusion

There is no general understanding of the consequences of algorithmic trading. We contribute by examining algorithmic trade and its contribution to the market through unique Borsa Istanbul data. The data set is unique because; to the best of our knowledge, two different stocks selected from BIST were not previously used in other studies specifically in this dimension. In addition, BIST is an emerging exchange where algorithmic transactions are becoming widespread and their efficiency is more evident.

In the study on the profitability of fundamental trade and algorithmic trading, two different stocks were examined for a total of twenty different trend periods. The stocks were selected from Borsa Istanbul and different indices (BIST100, BIST30). Investors are separated by the assumptions of perfect information and asymmetric information. The timing constraint is determined as trend periods. For this reason, the choice of year does not matter. Analysis was completed using these constraints. In the light of the investigations made, it has been observed that profits can be made with both investor behaviors during uptrend periods. However, the difference has emerged in times of downtrend. Fundamental investors have gained an advantage mainly in uptrend periods, while chartist investors have gained an advantage in times of downtrend. In times of a downtrend, the algorithm not only prevented the loss but also closed the trading position with profit and made a profit for the chartist investor.

Based on the results, it can be said that fundamental buying and selling transactions earn more in uptrend periods. This can be explained by the widening of the difference in favor of traditional trade during uptrend periods. The findings also support the thesis that the sale will be more functional for the fundamental investor in case of an uptrend. On the contrary, algorithmic trading during periods of downtrend reduces losses and can even make a profit. In this context, when the profit behavior in the case of both up and downtrends is evaluated together, it turns out that algorithmic trading is more advantageous. The point to be considered here is that it is quite difficult to catch an uptrend period.

When the analysis is evaluated numerically; it turns out that the chartist investor is in a more advantageous position in twelve of the twenty trends. In contrast, the fundamental investor only made higher profits or less cost in eight trend periods. This is an indication that modern trade and therefore algorithmic transactions will become widespread with the assumption of perfect information. Nowadays, making transactions through algorithms is an indispensable condition for all major investors. It is of great importance for investors that algorithms can make a profit even when the markets are falling. The use of algorithms will also create results for the benefit of small investors. It is possible to predict that over time, all investors in the market, even investors with very low trading volumes, called small investors, will start using algorithms.

A limitation of this study is the stocks of two companies in Turkey which is considered necessary for completing the empirical analysis of the study. If desired, new results can be obtained by evaluating certain shares together or by evaluating the stock market with index-based transactions. As a suggestion, since it was not encountered in the study, high-frequency trade transactions can be examined on a stock index basis and the results can be compared as algorithmic trading versus high-frequency trading. Similar studies can be done for both different stock markets and various stock baskets.

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FARKLI BİLGİ DÜZEYLERİNDE İNSAN YATIRIMCILARA KARŞI ALGORİTMİK TİCARET

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ÖZ

Bu çalışmada, farklı bilgi düzeylerinin borsada avantaj yaratıp yaratmadığı araştırılmıştır. Bu amaçla iki farklı yatırımcı için dönem sonu net kâr oranları hesaplanmıştır. Yatırımcılar bilgiye erişim farklılıkları açısından ayrılmaktadır. Temel yatırımcı asimetrik bilgi varsayımı altında, teknik yatırımcı ise tam bilgi varsayımı altında değerlendirilmiştir. Çalışmada, temel yatırımcı sadece bir işlem yaparken, teknik yatırımcı algoritmik işlemler yaptığı için, MACD indikatörüne göre hareket etmektedir. İşlemler trend dönemlerine göre yapılmıştır. Trendin sonunda, bilgi farklılıklarının işlemlerde eşitsizlik yaratıp yaratmadığını görülmesi için net kâr oranları hesaplanmıştır.
Bu bağlamda algoritmaların da kullanıldığı Borsa İstanbul'da, hacmi yüksek ve dünya çapında bilinen iki şirket ele alınmaktadır. İki farklı yatırımcı için işlemler aynı trend tarihlerinde başlatılmış ve tamamlanmıştır. 20 farklı trend döneminde yapılan işlemler karşılaştırıldığında, teknik yatırımcının temel yatırımcıya göre daha avantajlı olduğu sonucuna varılmıştır. Sonuç olarak, tam bilgiye sahip olan teknik yatırımcı, beklendiği gibi finansal piyasalar için daha avantajlı konumdadır.

Anahtar Kelimeler: Algoritmik Ticaret, Yatırım, Asimetrik Bilgi, Tam Bilgi, Hisse Senetleri.