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QUANTITATIVE ANALYSIS OF THE TRADER'S OUTPERFORMING CAPACITY IN A SOCIAL TRADING PLATFORM

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TITLE, SUMMARY, AND KEY WORDS

ENGLISH

Title: Quantitative analysis of the trader's outperforming capacity in a social trading platform

Summary:

This final thesis analyses the performance of 30 top signalers recommended by a leading social trading platform, eToro. By doing a quantitative analysis, it aims to study each trader's outperforming capacity and its correlation with the independent variable of the number of copiers.

The research methodology is based on a manual compiling of each signalers annual stocks trading activity and, the application of OLS regression by using Gretl Software.

The eToro signaler, according to the findings, tends to underperform the stock market and the S&P 500 index. Additionally,our results showed the existence of a negative correlation between each signaler's number of copiers and its abnormal result. The justification of such results is supported by mainly two commonly identified financial behaviors: overconfidence and hindsight biases.

The results obtained enable us to conclude certain casuistries. Social trading users should be more aware of certain variables when choosing a signaler whose trades to follow. eToro's users tend to think that the top traders with the highest number of copiers tend to perform better. And consequently, decide to follow them. The result of this behavior creates an overconfident bias, which is afterwards reflected by investments in riskier stocks, which leads to an underperforming portfolio.

Key words: outperforming capacity, social-trading, financial behavior

CATALAN

Títol: Anàlisi quantitativa de la capacitat de superar els resultats del mercat en una xarxa de *trading* social

Resum:

Aquest treball de fi de carrera analitza el rendiment dels 30 millors inversors recomanats per una de les principals plataformes de *trading social*, eToro. Mitjançant una anàlisi quantitativa, es pretén estudiar la capacitat de superar els rendiments del mercat de cada *trader* i la seva correlació amb la variable independent del nombre de copiadors.

La metodologia de la recerca es basa en una recopilació manual de les inversions en accions realitzades pels millors inversors al llarg de l'últim any, així com l'aplicació de la regressió OLS mitjançant l'ús del programari Gretl.

Segons els resultats obtinguts, s'ha observat com els millors inversors tenen un rendiment inferior al del mercat de valors i al de l'índex S&P 500. A més, han mostrat l'existència d'una correlació negativa entre el nombre de copiadors de cada inversor i el seu corresponent resultat anormal. La justificació d'aquests resultats es recolza principalment en dos comportaments financers comunament identificats: l'excés de confiança i els biaixos retrospectius.

Els resultats obtinguts ens permeten concloure certes casuístiques. Els usuaris de *trading* social haurien de ser més conscients d'algunes variables a l'hora de triar a l'inversor les operacions del qual copiaran. Els usuaris de eToro tendeixen a pensar que els *traders* amb major nombre de copiadors solen tenir millors resultats. En conseqüència, decideixen seguir-los. El resultat d'aquest comportament crea un biaix d'excés de confiança, que després es reflecteix en inversions en valors més arriscats, la qual cosa porta al fet que la cartera de l'inversor tingui un rendiment inferior.

Paraules clau: capacitat de rendiment superior, *trading social*, biaix financer

SPANISH

Título: Análisis cuantitativo de la capacidad de superar los resultados del mercado en una plataforma de *trading* social

Resumen:

Este trabajo de fin de carrera analiza el rendimiento de los 30 mejores inversores recomendados por una de las principales plataformas de trading social, eToro. Mediante un análisis cuantitativo, se pretende estudiar la capacidad de superar los rendimientos del mercado de cada *trader* y su correlación con la variable independiente del número de copiadores.

La metodología de la investigación se basa en una recopilación manual de las inversiones en acciones realizadas por los mejores inversores a lo largo del último año, así como la aplicación de la regresión OLS mediante el uso del software Gretl.

Según los resultados obtenidos, se ha observado como los mejores inversores tienen un rendimiento inferior al del mercado de valores y al del índice S&P 500. Además, han mostrado la existencia de una correlación negativa entre el número de copiadores de cada inversor y su correspondiente resultado anormal. La justificación de estos resultados se apoya principalmente en dos comportamientos financieros comúnmente identificados: el exceso de confianza y los sesgos retrospectivos.

Los resultados obtenidos nos permiten concluir ciertas casuísticas. Los usuarios de *trading* social deberían ser más conscientes de algunas variables a la hora de elegir al inversor cuyas operaciones van a copiar. Los usuarios de eToro tienden a pensar que los traders con mayor número de copiadores suelen tener mejores resultados. Y, en consecuencia, deciden seguirlos. El resultado de este comportamiento crea un sesgo de exceso de confianza, que luego se refleja en inversiones en valores más arriesgados, lo que lleva a que la cartera del inversor tenga un rendimiento inferior.

Palabras clave: capacidad de rendimiento superior, *trading social*, sesgo financiero

CONTENTS

1. PRESENTATION

Four years full of knowledge and new experiences were needed to define my interests more clearly. Two of the seeds have been the financial and behavioral fields.

The investment and financial asset courses assisted me in becoming acquainted with the financial field. They helped me to discover different investment methods and how this sector has been shaped during the last few years. Having knowledge of the newest innovations in this field, and analyzing their impact on financial services has also caught my interest.

Additionally, thanks to my exchange program abroad, in one of the courses I had the opportunity to learn about the importance of financial behavior. This study field helps us understand how financial decisions around things like risk and investment, are significantly influenced by biases, human emotions, and other cognitive limitations.

Consequently, I considered that there could not be a better opportunity than now to do a research project about two topics that interest me most. For this reason, I have decided to do an analytical research on one leading social trading platform. These platforms are one of the latest innovations in the financial sector. They offer a simple investment method for beginners who do not have a broad financial knowledge base.

The social trading platforms are currently in their most growing period. They are something new for beginner users interested in the investment field. This platform's novelty makes me question the real outperforming capacity of the platforms and if they really stand for what they promise to their users.

By applying the acquired knowledge of investment strategies, the market's efficiency, and financial behavior, I intend to do this research project. My main proposal is to first understand the functioning of the social trading platforms, know how to behave with their users, and be able to detect any behavior that restrains investors' ability to outperform the market.

Last but not least, doing this project in a foreign language, such as English, has an important meaning to me. Challenging myself to step out of my comfort zone means growing in both personal and professional aspects.

2. INTRODUCTION

The financial sector has been always in a constant transformation process. Therefore, one of the latest innovations has been the emergence of online social networks, also known as social trading platforms. These kinds of platforms, let potential investors make investment decisions based on information shared by top traders in online shared communities (Wohlgemuth, Berger et al. 2016).

Until today, the social trading market has not been a potential field of study. For this reason, it can be rewarding to increase the research about this market, as it is gaining an important role in the financial sector. Moreover, the fast technological innovations are helping customers to make investment activities in an easier way, which does not require as much effort or knowledge as many years ago.

The fact that social trading is gaining such an important role in the financial sector, motivates us to study some relevant points of this field. That may be worthily for understanding the functioning of these platforms.

The top traders have the main role in these platforms, as they are the leaders that are followed by the followers. Hence, the way how they act has an important influence on the users of this network. For this reason, it could be rewarding to analyze quantitatively, the influence of any possible bias that may affect their investment strategy.

Knowing how the trader's performance can be influenced by different factors that incur certain reactions, may help us justify the investor's return, and prevent taking any wrong investment decision. Consequently, the main purpose of this research is to analyze the behavior of the top traders by doing a quantitative analysis. Hence, the questions that are aimed to be answered are the following:

Question 1: Does the copier amount negatively affect the trader's performance?

Question 2: Do signalers with fewer copiers perform better than the ones with more copiers?

The research project is focused on one of the top social trading platforms, called eToro[1]. A famous network known for being the first platform on establishing forex, commodities, and indices trading for their users.

To answer the proposed questions, a data tape has been extracted from the platform. The methodology to be applied in order to answer the proposed questions, uses different financial and statistical methods, including the use of the Gretl software.

The main contribution of this research is to help to understand eToro's top trader's performance. Moreover, it contributes to show how certain variable can affect the trader's investment decisions and, to its capacity of outperforming the market.

The remainder of this thesis is organized as follows. In Section 3 the current situation of the social trading platform's market is analyzed. Section 4 describes the eToro platform by outlying its main characteristics. Next the Section 5 explains the project's theoretical background. Continuously Section 6, presents the methodology to be used at the research. It is followed by the Section 7 in which an empirical analysis and finding discussion is done. Finally, Section 8 sum ups the main findings and provides possible future research directions.

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[1] www.etoro.com

3. INSIGHTS INTO THE SOCIAL TRADING PLATFORMS

This section is focused on presenting the key points of the social trading platforms and its market's main players.

3.1. SOCIAL TRADING

Social Trading platforms are defined as one of the biggest innovations of the last years in the market of internet-based financial services and technologies. After the global financial crisis hinted at the world in 2008, an important number of social trading platforms entered the financial sector. This service, enabled its users to connect with different top traders, follow their strategies, and gain a better performance (Dorfleitner et al. (2022)).

Before the Social Trading platforms, we could find the called Mirror Trading and Copy Trading strategies, about which we will talk later.

Some many years ago, the first incorporation of social investment has been by using e-mail. Thus, we can say that the e-mail and the newsletters have created the conditions that initiated the beginning of the evolution of social trading, up to its current form.

In its beginning, the top traders have been communicating through the newsletter, to their followers, their intentions to open or close certain trades at certain levels. When these traders wanted to open a trade, an e-mail was sent to their followers and, all members of that service opened the same trade but, on their own. Then, the same procedure was performed for closing the trade. A message was sent to the mailing list and all followers needed to decide rather close or not their positions. Then, the first trading rooms started to appear.

The main purpose and philosophy of the trading rooms were almost the same that trading via e-mail. The trader would communicate the execution of a trade to the other traders in the room, but instead of using e-mail, they would write the trade in a virtual room where the followers could read and replicate it. Later, with the evolution of chat rooms, followers could also comment or ask questions live. This all implied a constant presence in front of the computer and, in most cases, the payment of a fee for the use of the service.

At that point, some brokers and entrepreneurs began to realize the potential that would give to the financial sector if they would be able to create a replication system, but at this time, an automatic one. In this platform, a single entity would be able to generate the trading signals, and all other parties linked to this platform, would be able to replicate these operations automatically in their trading accounts, without having to constantly follow or monitor the email or the trading room. Considering it as a potential opportunity, some companies decided to go ahead with this idea and, jump in deep to this innovative chance.

Consequently, the merit for starting the real history of what is currently known as Social Trading, goes to the company called Tradency. In 2005, they proposed the first autotrading system known as Mirror Trader. Through this platform, any trader could post their own trading strategy on their Tradency systems, just with the condition that they provide a sufficiently extensive record with the performance of their strategy. At that point, if the strategy was accepted, Tradency's clients could analyze the trader's performance and strategy and, if they were interested, they could decide to duplicate automatically all the trades generated from that trader by their own. Today, the system has continued to be successful and is used by many investors to trade on Forex and other financial markets. As a result, nowadays is considered as a pioneering financial provider that enables copying in an automated way the operations of trading systems developed by expert traders, with a wider knowledge that a beginner investor.

Another crucial step in the history of social trading was made by companies such as Zulutrade[2] and eToro. With these platforms, traders no longer had to submit their strategies for approval and use. For example, in Zultrade, since its beginning, it was enough for traders to connect their personal trading account to the platform and from that moment, each of their trading activity was started to be registered and let to other users (investors) for checking any of their activities. As for eToro, thanks to the new analysis tools, their innovative system allowed investors to view the performance and history of traders, check the trader's portfolio strategies and analyze their performance evolution. In instance, in case they were interested in one of these signal-providing traders, the investor could automatically copy the trades made by the selected trader by their own (Dorfleitner et al. (2018)). Reason for which it has been started to be called as Copy Trading.

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[2] https://www.zulutrade.com

The previous development was an important step, because in this way was born the first real and direct interaction between the trader who provides the trading signal and the investor who replicates it. The last step in this field came soon after by asking: Why not allow investors who perform copy trading operations through the same platform to interact with each other, exchange opinions, leave comments on a trader's actions and even vote and rate that trader? Why not also allow the use of social networks, connected, and integrated to the platforms and to the copy trading business in general?

This is where social trading as we know it today, was born. A form of social trading that combines the interaction between traders as in investment networks with forms of automated trading also focused on the social aspect, such as mirror trading and copy trading.

Social trading is constantly improving and innovating. Companies are expanding and new ones are emerging, there are more new and more innovative services each time, which means that it will help to improve the quality of service, which will be reflected in a constant improvement.

3.2. THE MAIN SOCIAL TRADING PLATFORMS AND THEIR ACTUAL MARKET

During the last years, the Social Trading has gained and important role in the financial market. Therefore, the global social trading market is anticipated to grow considerably at a CAGR of 15,6% during the forecast period (2021-2027)[3].

Social trading may be one of the hallmarks of the latest millennials and early centennials, those 'young adults' who, until the last few days, spent their money into leisure time, fashion, music or sports. The fact is that an activity that is on the rise in all age groups, proves how the culture of profitability (which increased due to the COVID-19 pandemic) has embraced each social category and how much interest there is in learning about the financial world.

Such a huge variety of different external factors will contribute to this platform's growth. The governments are on their way to accept different cohesive policies. Moreover, since the beginning of the social trading platforms, the investors performance has been constantly improving. Noteworthy, the interest for the trading market it has been increasing for the

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[3] According to Global Social trading Market Size, Share & Trends Analysis Report by Type (Single Trade, Copy Trade, Mirror Trade), by End-User (Individual, Enterprise) Forecast Period 2021-2027.

couple of last years. In instance, a survey done last year by Fidelity[4], found that the Gen Z, which represents the 41% of all the generations, it is the most likely to say that they may use social platforms to be informed about trading.

The social trading transparency is being extended beyond family or even friends, which can follow the trading activity between each other just by using certain social trading platforms. In consequence, as indicates the Iris co-founder Christopher Josephs "Retail investing, we're called dumb money, but we're becoming much, much smarter with how we go about investing", which shows that this kind of platforms can be a potential tool for this kind for users.

The current market's situation of social trading platforms can be defined as very competitive since, during the few last years, the number of platforms that provide this service has increased drastically. This important increase did not contribute users to find easier a platform that best fit their needs.

When a learner user that does not have too much knowledge about the trading field, decides to trade in one of the social trading platforms, the process of choosing the best platform for him, can be confusing. Hence, the luck of knowledge may lead him to take wrong decisions. Nevertheless, despite of the huge amount of social trading platforms existing in the market, we can find certain platforms that are currently leading this market and that have an important role in it. For this reason, the social trading platform chosen, may differ from one user to other because of their trading knowledge, investing preferences and any other variable that may influence to their choice preferences. Nevertheless, I have chosen four of the most leading social trading platforms in the current international market, in order to compare them and, understand their key points.

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[4] Study done by Fidelity, which can be found in: https://s2.q4cdn.com/997146844/files/doc_downloads/2021/Fidelity_GenZ-Investors-Survey_Final.pdf

NAGA

Naga[5], a Fintech (financial technology) company, was founded in 2015 by Yasin Qureshi and Benjamin Bilski, headquartered in Cyprus.

The platform has been recognized by major companies such as Financial Times, Bloomberg or The Telegraph.

Naga Markets is a market making CFD broker that creates its own internal market. It is listed in Germany and specializes in trading cryptocurrencies, both CFDs and real stocks, including its own cryptocurrency, the Naga Coin.

Naga can be used by any type of trader, it has a wide range of markets, exclusive assets and copy trading and social trading services. Since the platform's main objective is to be able to compete with the traditional financial institutions represented by banks and intermediaries, they use modern technologies and the most innovative tools for their users.

The Naga's platform includes a large amount of assets information, as well as recent trades of other users and their corresponding gains and losses. In instance, they have incorporated an Artificial Intelligence based robo-advisor (CYBO), designed to invest automatically instead of oneself.

Another two of their incorporations at their platform were, the tool of pre-building a portfolio to automatically invest on it according to certain risk and, their trading charts, which enable users to compare the investment evolution between different traders.

Naga is subject to regulation by the Cyprus Securities and Exchange Commission (CySEC). It also operates under MiFID II, whose main objectives are to increase efficiency and transparency.

It is worth to highlight that they did a partnership between Naga and 11 other brokers (Axitrade, BDSwiss, Hanseatic Brokerhouse, BlackBull Markets, FP Markets, FXCM, GKFX, IKON Finance, One Financial Markets, Portex and ThinkMarkets). Which allows to their beginner users to follow the investment strategies of top traders.

Their investors can trade with the following products:

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[5] https://naga.com

∵ Assets

∵ Exchange-Traded Funds (ETFs)

∵ Foreign exchange market (Forex)

∵ Futures

∵ Indexes

∵ Row materials

In conclusion, as the platform has more than 800 instruments to trade with, we can say that Naga platform can be useful for all type of users that are looking to invest in different type of assets. Moreover, the fact that they have partnerships with 11 other brokers, enables to the users of those brokers to use the Naga's social trading function, which can be useful for the traders.

FXTM (FOREX TIME)-BEST SOCIAL TRADING PLATFORM FOR MT4

FXTM is mainly an online social trading platform that specializes in forex and CFDs. Is one of the companies that has a shorter trajectory in the online trading market since it began its operations in 2012. Despite this, during the few last years they have been growing progressively to become a big part of the trading market.

Until the day of today, they have won different awards in the industry such as the Best New Broker of the year 2013 as well as the Best Forex MT5 Broker of the year 2021.

DUPLITRADE

DupliTrade can be defined as a European-based copy trading and social trading platform established in 2017.

The DupliTrade's platform is well known for its strict selection criteria on the process of selecting their strategy providers. The platform carefully selects from among all providers, the most experienced ones, which enables their users to have access to the best traders.

Compared with other social trading platforms, DupliTrade does not have many functions to communicate with other top traders neither other users. For this reason, we can say that its main function is to provide access to copying trades of the 12 strictly chosen strategy

providers. These, means that the main purpose of the platform's user will be to choose one or more of the 12 providers and, start copying their trading activity.

The platform has a main section called "strategy providers", where users can choose the trader that they will follow. In this section the amount of providers strategies is not big, the reason for which is that because their traders need to pass through a strict verification, interviews, and strategy testing for a long time.

Another useful tool that can be found at the platform, is the trading simulator, which show users the evolution of any possible trade that they could have done.

The subscription to the platform is completely free but, their brokers charge an execution commission following their own trading terms.

Moreover, DupliTrade is a regulated platform by the Cyprus Securities and Exchange Commission (CySEC). In instance, the brokers with which the platform works, are registered in countries that have a strict legal control such as the EU countries or Australia.

In conclusion, we can say that DupliTrade can be differentiated from other top social trading platforms. Their strict selection criteria, brings them to offer a high-quality top traders list in order to copy their investment strategies. Hence, we can say that this platform can be the best choice for an experienced investor that has already some knowledge about social trading and, that wants to follow the investment strategies of other top investors strictly selected.

ZULUTRADE

ZuluTrade is a financial services company that is currently operating as one of the largest copy trading platforms in the world. It was created in 2007 from an idea of Leon Yohai, a Greek entrepreneur born in 1974, that worked previously in several successful online and mobile companies.

ZuluTrade's parent company, Triple A Experts SA, is regulated in Greece by the Hellenic Capital Market Commission (HCMC). In addition, each broker that partners with ZuluTrade and with which any user can connect to its account, is highly regulated within their respective jurisdictions.

As a copy trading broker, ZuluTrade has a very strict criteria as to which traders can be presented as "copy traders" and to which traders can be the top traders in their rankings.

Each user that decides to learn and trade by using Zulutrade, needs to choose which type of account fits better for him:

∴ Demo account

∴ Classic account

∴ Proportional sharing account

∴ Trader account

ZuluTrade has grown and expanded its trading network so much that it currently supports approximately 40 brokers worldwide.

The minimum deposit amount to maintain in the trader's account is $100 no matter with which broker the user decides to trade. Despite this, each broker has the freedom to choose the minimum deposit for their traders, which need to be greater than $100.

Their users can trade with a wide range of assets, including forex, stocks, commodities, etc. The platform has also a dedicated space for cryptoasset copy trading. This means that followers can also follow any cryptoasset signaler and copy its position in the major markets. This includes Bitcoin, Ethereum, Ripple, Litecoin and Bitcoin Cash, which any user can engage in automated trading.

ZuluTrade has its own algorithm called ZuluRank. By applying an advanced intelligence technology, the platform is capable to rank their top traders by analyzing deeply important variables of their trading operations.

4. ANALYSIS OF A TOP SOCIAL TRADING PLATFORM: ETORO

As previously mentioned, eToro is one of the veteran platforms in the social trading market. It was founded in 2006 by two Israeli brothers, Jonathan, and Ronen Assia, and it currently has 23 million users in more than 100 countries. Their platform is nowadays running in 20 different languages and, it has an active and growing user base, with an average of 34 years

old (Chamizo, H., 2021. Interview with Yoni Assia, co-CEO, and co-Owner of eToro for the journal of Forbes).

4.1. PLATFORMS FUNCTIONING

eToro offers all its users an advanced platform, both in its web version and in the mobile trading app. With its search engine the trader can find the instruments to invest in and, make the investment in an easy and fast way. The platform is open almost to everyone. The only requirement for Spanish users is to do a minimum initial investment of 50$ to start trading. Undoubtedly, this is one of the elements that has helped them to stand out, making them grow at a dizzying pace.

The eToro system, includes three main features: eToro's Copyportfolio, Copyfund and TopTrader.

eToro's users have two options to trade at the platform, manually or automatically. It is recommended to trade manually if the user has a minimum knowledge and base about investing and is confident enough to take decisions on his own. Instead, if the user is considered as a beginner, he should start its activity at the platform by following other users trading strategies. Consequently, when one eToro's user decides to follow the trading movements of another user, he allocates a certain amount of money and mirrors automatically the investments of that user. (P.M. Krafft et al. (2021)).

The platform's users have a wide variety of instruments that may help them to understand and analyze different markets. Moreover, they have a section in which they can interact and share their opinions, doubts, and different posts with other worldwide top traders.

The most used tools offered by the platform are the ProCharts (Figure 1) and the one-click investment tool.

In order to choose the best trader to copy, eToro's users can sort all the users by different criteria. At this way, they can match at the best point to their financial interests and expectations as a trader.

FIGURE 1 Example screenshot of the ProChart tool at eToro's platform. SOURCE: eToro

ETORO POPULAR INVESTOR PROGRAM

One of the famous eToro's lemmas is the one which says "Get Copied. Get Paid" [6]. The eToro's popular investor program, recommends the best traders that a user can copy from.

In order to join to this program, there are certain requirements. Amongst them, the investor needs to obtain profits from its investments by depositing a minimum amount of $1000.

Once an investor is accepted to the program, he can be classified between 4 popular investor levels: Cadet, Champion, Elite and Elite Pro. To be upgraded from one level to another, one of the main requirements for the investor, is to meet a minimum amount of assets under management (AUM).

Table 1 shows the requirement details.

Requirements	Cadet	Champion	Elite	Elite Pro
Minimum copiers	1	10	10	10
Minimum AUM	$500	$50 000	$500 000	$10 000 000
Minimum equity	$1 000	$5 000	$25 000	$50 000
Minimum time on level	2 months	4 months	4 months	N/A

TABLE 1 Summary of upgrading category requirements

Each eToro's popular investors earns depend on different variables. The cadet investor does not receive any platform's compensation but, champion category pays $500 monthly, the

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elite group receives the 1,5% - 2% of its AUM per year and, the last category, receives between the 2% - 2,5% of the AUM yearly.

The top traders list is one of the most used tools at the platform. As their users do not have a wide knowledge neither trading experience, they use to rely on this tool, without understanding deeply the classification criteria applied by the platform.

PLATFORM'S TRADING PAIRS

eToro offers a total amount of 2.000 assets to trade with. Which can be classified as

follows:

- ∴ Investment in assets

- ∴ Foreign exchange market (Forex)

- ∴ Cryptocurrencies

- ∴ Row materials

- ∴ Indexes

- ∴ Exchange-Traded Funds (ETFs)

- ∴ Contract for Differences (CFDs)

4.2. PLATFORMS COMMISSIONS

As for the commissions that eToro charges to its clients, it should be noted that opening an account is free of charge and depositing on the platform is completely free, as the broker does not charge anything for these activities. eToro's commissions are applied when the user withdraws money and transfers it to his bank account.

4.3. PLATFORM REGULATIONS

 eToro is an authorized broker and its activity is regulated by the Cyprus Securities and Exchange Commission (CySEC) and the Financial Conduct Authority (FCA). It is also authorized by the Australian Securities and Investments Commission (ASIC) and licensed by the Seychelles Financial Services Authority (FSA).

In addition, it should not be forgotten that it is also registered with the National Securities Market Commission (CNMV), which means that the company complies with the local regulatory framework. Therefore, eToro is a regulated broker in Europe, which can be interpreted as a sign of transparency. The regulations applied, mean that the platform's activity is in a constant exhaustive supervision with the aim to ensure that the deposited funds are safe.

4.4. PLATFORMS OPINIONS

Despite of being the best worldwide trading platform, eToro has received an important number of critics. By overall, most of their users are losing money with their investments. Therefore, as the platform offers both short and long investing methods, many users can still obtain profits by applying short and neutral market strategies, Pan, W. et al. (2012).

4.5. RESEARCH QUESTIONS

As previously mentioned, the eToro platform incentivizes their users with the "Popular Investor Program". Therefore, the top trader's profits depend mainly on two variables, their trader's classification at the platform and their own investment decisions. The fact that the trader's profit depend in these variables, can affect on the traders' investing behavior.

In the social trading platforms, the good performance of a trader is normally reflected in an increase of his popularity and consequently, with a higher number of copiers. The trader's popularity increases and, the implemented feature of social interaction at the platform, can conduct to a trader's overconfidence bias. At the Pentland's research (2013), it is shown as the confidence of individuals increases when they realize that other users are trying to reflect their investment decisions. Consequently, the overconfident traders, tend to overestimate their expected profits and this can be reflected by increasing their trading activity. By increasing the trading activity, the trader's returns are directly diminished compared with their benchmarks (Bond and Tahler, (1995)). Considering these factors, enables us to think that they all contribute to observe an overconfident behavior at the trader's activity, and consequently, a decrease of his returns. Which motivates us to ask:

Question 1:   Does the copier amount negatively affect the trader's performance?

Considering that the main users of social trading platforms do not have an extensive knowledge neither experience in trading, it can bring them to focus not on the best variables while choosing the trader that they will copy.

Wei Pan, Altshuler, et al. (2012) research, proved that eToro platform does not always make the best decisions in selecting experts when they can see others' choices. Additionally, Glaser et al. (2018) paper showed as Human investors tend to reap the benefits of their winning positions too soon, while allowing unfavorable positions to amass losses for an extended period of time. The authors also shown as most of social-trading platform's users, tend to be motivated to follow a trader because of his high number of followers, as they consider that it may be a good signal of a qualitative trading strategy. Nevertheless, the high signaler's number of followers does not always mean his strategy is successful or the best.

Based on prior research, we may predict that inexperienced traders are more drawn to traders with many followers. They may consider that their investment strategies are better that from the traders with less popularity. This, brings us to ask:

Question 2:   Do signalers with more copiers perform worse than the ones with less copiers?

5. THEORETICAL BACKGROUND

This section explains the theoretical concepts that will be applied later to analyze the investor's performance and investment behavior.

5.1. THE MODERN PORTFOLIO THEORY (MPT)

Because most traders invest in portfolios, it is critical to comprehend the portfolio theory of social trading. The Modern Portfolio Theory (MPT) can be used as a tool that assists an investor in classifying, estimating, and controlling both the type and amount of expected risk and return, Alka Rani. (2012).

The MPT, also known as the Markowitz Model, has its origins in a paper published in 1952 by the American Harry Markowitz. This economist was a specialist in investment analysis,

and he focused the development of a theory aimed at finding a possible optimal composition in a portfolio of securities (Elton and Graber, 1997).

The main purpose of this model is to represent the relationship between the risk and the expected return of different portfolios (Zimao Liu and Qiang Ma, (2020)). In order to show the correlation between the two variables, the economist defined as a portfolio problem as the choice between the variance and mean of the portfolio's assets. The economist also proved the fundamental theory of the mean-variance portfolio, showing that by holding the variance constant, the investor will maximize his expected return, and conversely, by holding the expected return constant, the variance decreases (Elton and Graber, 1997). By considering these two assumptions, Markowitz shown that an investor can formulate its efficient frontier from which he can choose his preferred portfolio depending on his return and risk preferences.

The Markowitz's paper considers as an efficient portfolio the one that provides the highest possible return for a given risk, or equivalently, if it presents the lowest possible risk for a given level of return.

MODEL SETTING

The set of the model's efficient portfolios can be calculated by solving the following formulas:

Minimize: $\sigma^2(R_p) = \sum_{i=1}^{n} \sum_{i=1}^{n} x_i \cdot x_j \sigma_{ij}$

Subjected to: $E(R_p) = \sum_{i=1}^{n} x_i \cdot E(R_i) = V^*$

$$\sum_{i=1}^{n} x_i = 1$$

$$x_i \geq 0 \ (i = 1, \dots, n)$$

In the previous formulas, x_i represents the proportion of the investor's budget allocated to the asset i. The $\sigma^2(R_p)$ is the variance of the portfolio p, and σ_{ij}, shows the covariance between the returns of assets i and j. The expected return or yield of the portfolio i, is expressed as $E(R_p)$. After applying the model, by modifying the parameter V^* we will obtain different values of x_i that minimize the portfolio's risk and its corresponding profit. Consequently, the different combinations between $\sigma^2(R_p)$ and $E(R_p)$, will show the

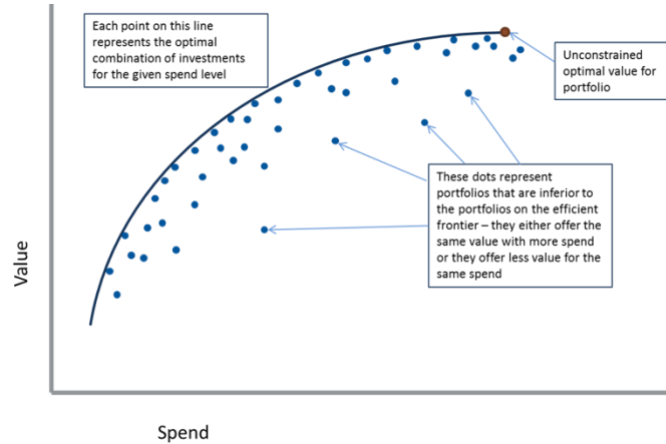investor's efficient frontier (Zubia Zubiaurre, Miera Zabalza, L. M., & Mendizábal Zubeldia, A., 2002) ([Figure 2](#)).

FIGURE 2 Efficient frontier representation. source: investing answers

Despite that some authors as Villalba (1998) and Mendizábal (2002) consider that the MPT model is not the best for applying when choosing the best portfolio, an important number of empirical studies rely on applying this model. The main reason for which the previous authors recommend not use the model, is because they indicate that the Markovitz model, like the CAPM model, does not consider the existence of various types of systematic risk (Álvarez, et al. 2004). Nevertheless, this main disadvantage can be solved by considering its systematical risks when applying the model.

5.2. THE CAPITAL ASSET PRICING MODEL (CAPM)

The capital asset pricing model (CAPM) was developed by William Sharpe (1964) and John Lintner (1965). This model was the first that showed how certain investment risks can affect to its expected performance (Perold, 2004).

The main purpose of the model is to offer an easily predictable way of measuring the risk and its relationship with the expected return. It has been deployed by using the previously mentioned Markowitz model (MPT), in which an investor chooses a certain portfolio to invest at $t-1$ obtaining a future performance at t. Markowitz's model considered that investors are risk averse, which means that they only act being impulsed by the mean and variance of their one period investment. Conversely, by using an algebraic condition, the CAPM is capable to quantify the investment's risk and show, the behavior of the financial markets (Fama and French, 2004).

In order to calculate the expected return of an asset by considering its risk, it is needed to apply the following formula:

$$E(R_i) = R_f + \beta_{iM}\big(E(R_M) - R_f\big)$$

Where:

$E(R_i) = capital\ asset\ expected\ return$

$R_f = risk\ free\ rate\ of\ interest$

$\beta_i = sensitivity$

$E(R_M) = expected\ return\ of\ the\ market$

$E(R_M) - R_f = risk\ free\ premium$

The β_i can be calculated by applying the following formula:

$$\beta_{iM} = \frac{Cov(Ri, RM)}{\sigma^2\ (RM)}$$

$Cov\ (Ri, Rm) = covariance\ of\ the\ asset\ return\ and\ market\ return$

$\sigma^2\ (Rm) = variance\ of\ the\ market\ return$

The β_{iM} can be interpreted in two different ways. Firstly, it can be used to measure the sensitivity of the asset's return to variation in the market return. Secondly, it can be interpreted as the covariance risk of an asset i in M, calculated relatively to the average covariance risk of assets. Therefore, we can say that an asset with a $\beta = 1$, is strongly correlated with the market and, it will fall and rise at the same coefficient as the global market index such as the DOW Jones Index or S&P 500. Consequently, we can say that:

$If\ \beta_i > 1: means\ that\ the\ securities\ price\ is\ more\ volatile\ than\ the\ market's$

$If\ \beta_i < 1: indicates\ that\ the\ securities\ price\ is\ less\ volatile\ than\ the\ market's$

$If\ \beta_i = 1: shows\ that\ the\ securities\ price\ is\ strongly\ correlated\ with\ the\ market$

In the scope of this model, a rational investor should not take any risk that is diversifiable, as only non-diversifiable risk is rewarded with a higher return. Consequently, the required rate of return for a given asset is linked to the contribution that asset makes to the overall risk of a given portfolio (Antonio Moreno, 2010).

5.3. THE JENSEN'S ALPHA

The Jensen's Alpha (α) has been introduced by Jensen (1972). It can be defined as a ratio that measures the ability of an investment portfolio manager, to outperform the benchmark stock index, on a risk-adjusted basis determined by applying the previously mentioned Capital Asset Pricing Model (Phuoc, 2018).

Each investor aspires to obtain a higher alpha, as it would show their good performance of security or asset, by earning more than expected the CAPM. Therefore, this ratio has become one of the main risk metrics used in the MPT as stated in Association for Investment Management and Research (AIMR) performance presentation standards handbook (1996).

In other words, Jensen's Alpha also quantifies the difference between the expected return of the asset or security and its average return. Which means that a positive ratio would mean that the portfolio gives a greeter average return than the expected return. Thus, alfas formula will be:

$$\alpha_i = R_i - [E(R_i)] = R_i - [R_f + \beta_{iM}(E(R_M) - R_f)].$$

Despite that the Jensen's alpha also known as the excess return is one beyond the most used approaches by different investors, yet Jensen (1972) has criticized its own model. Indicating that even an investor who perfectly knows the market, can obtain a significant negative Jensen's Alpha. Nevertheless, there is no evidence of this significant market-bias (Bunnenber et al. 2018).

6. METHODOLOGY

The main purpose of this section is to present the research methodology, including the process used for the data scraping, and the technique applied to answer the research's questions.

6.1. DATA SAMPLE SELECTION

To analyze the trader's performance, a sample of 30 top trader's portfolio trading transactions were collected by hand from etoro.com. The time series of the data compresses the maximum period of daily trading activity shown by eToro, which is one year. Thus, the data scraped comprised the trading activity from the 5th of May 2021 until 5th of May 2022.

To achieve the most realistic and detailed analysis, the trading activity of each investor has been filtered by choosing only their investments on the stocks market. At this way, we were able to compare the data with the considered benchmark.

By choosing the main top traders showed at the platform as the most leading ones in the stock's market, enabled us to analyze the performance of the traders that are most likely to be selected by other users. Pan, W. et al. (2012) shown that investors tend to act by being influenced by platform's variables such as the number of followers, and do not choose traders rationally by their performance data.

All the trading data collected was exported to an Excel file, in which each trader would have one assigned sheet. Furthermore, all the calculations have been done separately in each trader's sheet.

6.2. RESEARCH QUESTIONS VALIDATION

The following are the research questions that need to be answered:

Question 1: Does the copier amount negatively affect the trader's performance?

Question 2: Do signalers with more copiers perform worse than the ones with less copiers?

To validate and answer the proposed questions, a quantitative analysis to the data extracted was required to apply. By using the previously explained theorical models, enabled us to analyze each trader's activity, its performance and detect any possible inconsistency.

CAPITAL ASSET PRICING MODEL (CAPM)
The main motivation for applying this model, comes for its simplicity and because it enables to observe a clearer relationship between the portfolio's return and its risk factors (Dorfleitner et al. 2018).

The four-factor capital asset model's market benchmark considered was the S&P index. The incentive for using S&P comes from its wide number of large-cap companies included in the index. Moreover, in terms of capitalization, it represents the three-quarters of the stock market (Frankel, 2021). Hence, the daily performance of this index was exported from the website of finance.yahoo.com to each trader's spreadsheet and afterwards, the expected return of the market (R_M) has been calculated for each portfolio.

To know the risk-free rate (R_f) of the period analyzed, the daily Treasury Bill yield has been extracted from the U.S. Department of the Treasury webpage. The main reason of using this yield as the risk-free yield, comes because the Treasury Bills are considered nearly free of default as they are fully backed by the U.S. government.

VALIDATION OF QUESTIONS USING ECONOMETRIC SOFTWARE

Applying an econometric Software each signalers data, enables to validate the research questions.

By using the compiled Excel Spreadsheet, we conducted a simple ordinary least squares (OLS) estimation by using the Gnu Regression, Econometrics and Time-series Library (GRETL).

When using this software, we have utilized the OLS regression by applying the following regression function:

$$E(R_i) - R_F = \alpha_i + \beta_{iM}(E(R_M) - R_F) \tag{1}.$$

The function's variables could be interpreted as follows:

∴ **DEPENDENT VARIABLE** $= E(R_i) - R_F$: represents the portfolio risk-free premium.

∴ **CONSTANT** $= \alpha_i$: if the CAPM applies, and both parts of the equation are equal, the values of this constant should be equal to zero. Nevertheless, if the previous condition is not applied: $\alpha_i \neq 0$.

∴ **EXPLANATORY VARIABLE** $= \beta_{iM}(E(R_M) - R_F)$: represents the market risk-free premium times each portfolio sensitivity.

By applying the model, enabled us to observe certain casuistries. If the CAPM states, in our case, the return of each signaler's portfolio, would be equal to the return of the risk-free rate

portfolio plus the market risk-free premium times the systematic risk of each portfolio. If this condition was met, each portfolio's alpha value, would be equal to zero. Nevertheless, if the equality condition was not meet, alpha would not be equal to zero. In other words, α_i can be interpreted as the excess return of each portfolio to a given level of systematic risk.

If a portfolio's $\alpha_i \neq 0$ and its value is $statistically\ significative\ negative$, it would mean that the signaler's portfolio is underperforming our benchmark (S&P index). By contrast, if the α_i value obtained is $statistically\ significative\ positive$, it would mean that the investor is outperforming the market. To verify the α_i significance, we have followed the p-values condition. Which states that if the variable's $p - value < 0,05$ the variable is $statistically\ significant$, and the null hypotheses should be rejected. By contrast, if the $p - value > 0,05$ the $variable\ is\ not\ statistically\ significant$, and the null hypotheses is not rejected.

After applying the OLS regression, to satisfy the model's results and to be able to trust them, we have checked the heteroskedasticity of the data. By applying the Breusch-Pagan-Godfrey test, we were able to verify the existence of relevant error correlation error terms.

Finally, in order to answer our research questions, we checked the correlation between two variables: the signalers abnormal returns (α) and its number of copiers (NC). To do so, we applied the OLS regression by considering the following function:

$$\alpha_i = \beta_0 + \beta_1\ NC_i \tag{2},$$

where

$i = 1,2,3, \ldots, 30.$

$\alpha_i = abnormal\ return.$

$NC_i = signaler\ number\ of\ copiers.$

$\beta_0 = constant, intercept.$

$\beta_1 = slope, coefficient.$

In order to verify the two variables correlation, we considered α_i as the dependent variable, which is represented by each trader's Jensen's Alpha or in other words, its abnormal returns. The number of copiers NC_i has been extracted by hand for each signaler. To do so, we

entered to each trader's profile at the website of www.etoro.com, and consequently, annotated its total number of copiers existing on the 5th of May 2022.

Alf the coefficient of the independent variable was negative, and its $p - value < 0,05$, we would proof the negative correlation between these variables being *statistically significative negative*. And consequently, we would be able to state and answer the research question.

7. EMPIRICAL ANALYSIS

The purpose of this section is to firstly, show the obtained results and secondly, analyze them and answer the proposed research questions.

7.1. RESULTS

The application of the CAPM and the obtention of the Jensen's alpha by applying the formula (1) per each trader's portfolio, enables the analysis and comparison between the 30 sampled signalers. Table 2 shows the results obtained for each portfolio, and the most relevant trader's information compiled from the eToro platform.

Any of portfolio's regression models, shown a positive Heteroskedasticity result, showing that the model is not prone to econometric problems.

The obtained Jensen's alpha values, shown a negative sign for the 56,67% (17 traders) of the total sample. Seven of which, had a $p - value < 0,05$, being a *statistically significant variable*. Which means that their investment strategy is not giving greater return than the market. Nevertheless, the 43,33% (13 traders) shown an outperforming portfolio compared with the market, and 4 of them had a *statistically significant variable*.

When considering the portfolios that are not outperforming the benchmark, it is worth to remark that most of them have the highest number of copiers and trading frequency.

Another value that should be remarked, is each portfolio than shown a greater β than 1. These portfolios represent the 26,67% (8 signalers) from the total sample and, indicate that

they are more volatile and riskier than the market, which could be a signal of an overconfident trader bias.

Correlation test by using the formula (2) is shown in Table 3. The OLS regression result enables us to confirm the correlation between the number of copiers and the trader's alpha. The independent variable of number of copiers shown a $p-value < 0,05$, and a negative coefficient of $-3,80146$, being a $statistically\ significant\ variable$. Such results let us confirm that the higher number of copiers will lead to a lower portfolio alpha.

TABLE 2. SOURCE: Data obtained from OLS Regression and from eToro platform compiled by author.

Trader	β	α	P-value	Significant	N° of copiers	Trades per week
1	1,5498656	(0,0472575)	0,3317	No	4.432	105,25
2	0,9468421	(0,0076327)	0,4248	No	4.220	39,64
3	(0,1066461)	0,0090042	0,4224	No	4.065	33,23
4	0,2406046	(0,0312864)	1,46e-48	Yes	1.741	25,2
5	0,9027934	0,1296850	1,83e-05	Yes	1.175	15,08
6	1,6514222	0,0432419	0,0001	Yes	1.245	12,69
7	(0,6266951)	0,0461980	0,1863	No	1.311	10,84
8	3,3980106	(0,1389860)	0,2310	No	24.730	10,31
9	0,3863264	0,0222321	0,4125	No	3.093	9,82
10	0,3835714	0,1411050	0,0850	No	2.963	9,62
11	0,1941865	0,0040878	0,8416	No	1.032	8,65
12	0,5634324	(0,0004808)	0,8868	No	145	6,78
13	0,1941865	0,0040878	0,8416	No	1.040	6,04
14	(0,2575622)	(0,1232100)	0,0016	Yes	390	5,45
15	1,3344940	0,0013452	0,7450	No	794	4,71
16	1,0402503	(0,0256960)	1,96e-06	Yes	1.023	4,15
17	0,5698816	(0,1866640)	0,0152	Yes	773	3,93
18	0,9864514	(0,0360063)	6,46e-11	Yes	2.055	3,85
19	0,3445046	(0,0339126)	0,0578	No	1.843	3,8
20	(0,1600097)	(0,0565671)	1,65e-08	Yes	1.750	3,42
21	1,5290971	0,1408810	0,0028	Yes	2.104	3,31
22	(0,1752138)	(0,0821233)	3,13e-09	Yes	18.455	2,98
23	0,7924873	0,5116180	0,0001	Yes	2.055	2,98
24	0,1472444	0,0270613	0,5483	No	1.564	2,89
25	0,0075971	0,0366572	0,5764	No	1.320	2,4
26	0,6311993	(0,0258396)	0,1242	No	515	2,29
27	2,2373013	(0,02367269)	0,3010	No	3.458	2,25
28	0,9375330	(0,0319616)	0,2951	No	7.281	2,15
29	1,0836156	(0,0296396)	0,5716	No	11.912	1,22
30	0,6945886	(0,0100294)	0,3263	No	894	1,07

The abnormal traders return, could be also correlated with other investor's variables, such as its trading frequency, its investment experience, or its trading knowledge. Nevertheless, due to this research aims to poof the relationship between the copiers amount and investor's abnormal return, we have only applied the regression model to these variables.

TABLE 3 OLS model application by using GRETL Software. SOURCE: Compiled by author

```
Model 1: OLS, using observations 1–30
Dependent variable: Alpha

                    coefficient    std. error    t-ratio    p-value
  ---------------------------------------------------------------------
  const             0.0370518      0.0241223      1.536      0.1358
  Numberofcopiers  −3.80146e−06    1.66902e−06   −2.278      0.0306   **

Mean dependent var   0.007541    S.D. dependent var   0.119222
Sum squared resid    0.347771    S.E. of regression   0.111447
R-squared            0.156316    Adjusted R-squared   0.126184
F(1, 28)             5.187771    P-value(F)           0.030581
Log-likelihood      24.29296     Akaike criterion    −44.58593
Schwarz criterion  −41.78353     Hannan-Quinn        −43.68942
```

Our correlation results also stand for other research findings. G. Dorfleitner, et al. (2018) study, analyzed the factors that motivate the irrational part of trading of leading traders and, their found a negative relationship between the traders returns and the number of total copiers. In addition, by using different data samples, Grinblatt et al. (2009) also found that the high trading frequency is a result of an overconfident trader and consequently, is negatively correlated with its performance. Hence, the results obtained from our study clearly show the relationship between these variables. We can confirm that they reflect an overconfident behavior, that results in a bias with negative effect to the signaler's portfolio performance.

At eToro, the signaler trader does not have direct power over his number of copiers nor over the total capital invested in his trading strategy. Therefore, the trader's success can be partly measured by its ability to attract new followers (Doering, P., S. Neumann, and S. Paul (2015)). To attract those new followers, the signalers use to increase their trading frequency, which does not mean that they will obtain a higher return, as shown in the traders 4,12 and 18 (see Table 2) trading data.

The traders with a $\beta > 1$, are investing in volatile stocks, which reflect a higher investment risk. Such result could be justified by the presence of the hindsight bias. This bias explains the investor's ability believing of outperforming (Dorfleitner et al. 2018). The Biais and Weber

(2009) research, showed that investors tend to be negatively affected by their learning behavior, and tend to overestimate their investment's risk level reflecting the hindsight bias.

7.2. EMPIRICAL RESULTS

Table 3 shows the empirical model validation with Gretl software. Overall, the results confirm the research assumptions by showing as statistically significant the variable of the number of copiers. This means that the metric has a relevant effect on the trader's outperforming capacity.

Regarding the research's Q1, the result confirms our proposal, as higher will be the number of copiers, the greater will be the possibility for the signaler to not outperform the market. This effect can be explained because of the presence of behaviors such as overconfidence and hindsight biases. Traders use to act biased in this kind of platforms and, consequently, underperform the market.

Considering the correlation between the previous variables, the Q2 can be partially validated as true. From the sample extracted, the 40% (12 traders) of the traders have a positive α and are followed by a number of copiers greater than 1.000. Nevertheless, when analyzing the signalers with a negative α, 5 out of 17 have the highest value of copiers from the total sample, and the rest have less than 1.000 copiers. These data contrast can be justified for two reasons.

Firstly, the fact that the trader with less than 1.000 copiers show a negative performance, may be justified by his lack of trading experience at eToro and consequently, he takes wrong investment decisions.

Secondly, between the underperforming traders, we can identify some signalers with the highest number of copiers. Their negative α may be a result of an overconfident portfolio strategy, which brings them to invest in highly risky stocks.

7.3. FINDINGS DISCUSSION

The goal of research was to analyze the outperforming capacity of the top traders in a leading social trading platform: eToro. For this purpose, we have exported and analyzed 30 stocks top traders' portfolios and their trading activity over the last year period.

The results obtained from our analysis, reflect two main findings. Firstly, we show as signalers do not always obtain abnormal returns, which means that their portfolio's strategies, do not outperform the market. Secondly, we prove a negative correlation between the variable of number of copiers and, the trader's performance.

Our findings are consistent with previous research studies results. Dorfleitner et al. (2018) literature, by analyzing the returns of traders on social trading platforms, shown as high losses are experienced by traders with the largest aggregated returns. Additionally, they have found that extremely active trading behavior is inversely connected to returns.

Doering et al. (2015) research, studied a unique dataset comprising transactions from the four biggest social trading platforms. By analyzing the traders returns generated, they found that signal providers prefer active trading over buy-and-hold strategies, resulting in non-normal return distributions. The authors also identified that signal providers frequently use directional tactics and hence, may be exposed to significant market risk at any time.

Lastly, Jin et al. (2019) also studied an extracted dataset from a popular social trading platform in China. Over time, they seen an increase in signal followers' trading frequency and a preference for high-volatility equities in the network. Furthermore, they discovered that leading trades outperform lagging transactions, implying that social learning in a social trading network is not associated with portfolio performance.

Until date, there have not been many quantitative research studies on social trading platforms. Nonetheless, the few studies that have been conducted have yielded results that are sufficiently compatible with our principal conclusions.

The three research papers findings, match by identifying a signaler risk loving behavior. This result has been also partially observed in our findings. The 17 traders that showed a negative abnormal value, took riskier investments than the market, which reflected obtaining an underperforming portfolio. Additionally, we have identified 8 signalers with a negative β value, showing an investment strategy more volatile than the market.

Nevertheless, any of the previous studies has analyzed the correlation between the number of copiers and, the signaler's performance.

Our results showed that traders with a higher number of copiers tend to underperform the benchmark market (S&P index). Their investment strategy tends to be biased, affecting

negatively to their performance. In addition, the fact that this platform's main users are followers without extensive financial knowledge, they tend to be attracted by the top signalers.

Due to the research findings, we can affirm that the platform's top traders list does not always show signalers with the best performing strategy. Nevertheless, due to that our research has been focused only in one social trading platform, it may be the case that the findings will not stand for other social trading platforms.

8. CONCLUSION AND IMPLICATION

The emergence of new financial services has helped to bridge the digital divide of financial services, concretely in terms of accessing to wealth management services and financial advising (M. Yang et al. (2020)). Among them we can find the social trading platform through which a retail investor can manage her wealth (Eldridge, 2017). The main user of these platforms does not have a wide financial knowledge, which motivates him to focus on the wrong variables when choosing the signaler.

This research aimed to study quantitatively the relevance and correlation between the variable of the number of copiers, and the signalers outperforming capacity. In order to do so, we have applied the OLS regression with the Gretl Software. The results from which confirmed the correlation between the two variables.

More than the half of our sample's traders, shown having an underperforming portfolio. Which could be justified for the presence of several biases such as overconfidence and hindsight behaviors.

The conclusions obtained, answer both of our questions with a veritable answer. Moreover, they enable us to conclude certain casuistries. Social trading users should be more aware of certain variables when choosing a signaler whose trades to follow. Due that eToro platform mainly ranks its top traders by their number of copiers and trading frequency, it has an important impact in the copiers decision-making process. Their users use to think that the top traders with the highest number of copiers, tend to perform better. And consequently,

decide to follow them. The result of this behavior creates an overconfident bias, which afterwards is reflected by investments in riskier stocks, which conducts to an underperforming signaler's portfolio.

We briefly point out some caveats of this study which may provide interesting directions for future research. The 30 sampled portfolios and the S&P index benchmark considered do not let us state with certainty that the scenarios observed will be always fulfilled. Nevertheless, it helped us to identify and confirm the presence of several irrational behavior strategies that were also found in studies of this field. Consequently, we would recommend for further studies, to increment the sampled number of portfolios and, to analyze their investing outperforming evolution since the beginning of their trading activity at the platform. Additionally, future studies could compare the trading data between different social trading platforms, in order to identify possible variables that may affect their performance.

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