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THE ANALYSIS OF FINTECH ECOSYSTEM IN TURKEY

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ABSTRACT

Purpose – The purpose of this study is to analyze the dynamics of creating a wealthy FinTech Ecosystem. The state of the Turkish FinTech Ecosystem will be used as a case to determine the components of a healthy FinTech Ecosystem.
Methodology – This paper is designed on a self-reflection methodology. The author is the co-founder of FinTech Istanbul Platform, which is acting as a FinTech Hub to gather all the building blocks of the Ecosystem in Turkey since 2016. The reflections are based on the experience of the author gained both from Turkey and international hubs.
Findings – The main components of a FinTech Ecosystem consist of 8 elements: New technologies and tools that enable innovations; telecom and technology companies that create infrastructure for distribution; startups that create innovative business models; government and regulators that define the rules of the game; financial institutions that cooperate with startups; customers and users who benefit from innovations; investors, incubation centers and accelerators that enable both financial aid and space for innovators.
Conclusion – To create a wealthy FinTech Ecosystem, all players and stakeholders must work together and try to create synergy in order to sustain competitive advantage.

Keywords: FinTech, financial technologies, ecosystem, Turkey, ecosystem evaluation.
JEL Codes: G21, O16

1. INTRODUCTION

Although we have met with FinTech (Financial Technology) concept within the last 10 years, it is possible to say that FinTech is highly sought after for investors, users and governments. In particular, the concepts such as digitalization and sharing economy brought about by the new economy have enabled the development and acceptance of financial technologies. Today, many countries consider FinTech startups and the environment they create as a potential for capturing foreign investments and know-how transfer, and make their best efforts to improve the ecosystem for the development of this field.

FinTech (Financial Technologies) is a dynamic field between the financial services industry and technology sectors where technology-focused startups innovate products and services currently provided by the traditional financial services firms. FinTech is reshaping the financial experience of millions of people and businesses around the world today, and has the potential to dramatically change our understanding of financial services tomorrow. On the other hand, FinTech innovation is an important component of economic development, where you can attract foreign direct investment and know-how, especially for emerging economies. FinTech startups have attracted more than USD 100 billions of investment within the last five years. It is vital for any country to create a dynamic, well-functioning ecosystem to flourish its companies and attract investments.
In this study, the importance of the concept of ecosystem, which defines the necessary infrastructure elements for the development of the FinTech area in a country, and the characteristics of the environment for the development of the ecosystem will be examined. The current situation of the FinTech ecosystem in Turkey will be used as an example. In this examination, firstly, the elements that make up a FinTech ecosystem within the framework of generally accepted approaches will be identified and then the current situation will be examined in terms of key factors such as demand, regulation, capital and human resources which are the drivers of this ecosystem.

2. FINTECH: DESCRIPTION AND EVOLUTION

The term FinTech refers to innovation in financial services through the use of technology or the use of technology to make financial services more efficient in areas, such as banking, insurance, or capital markets (Chishti, Barberis, 2016; Schueffel, 2016). This definition actually refers to digital transformation and restructuring for financial institutions. Delivering faster, flexible and personalized products to customers through innovation is the core of the FinTech. The financial services sector is one of the largest sectors and the user experience in financial services is changing with FinTech, while mobile technologies bring many opportunities for innovation and growth in the FinTech field (Wilson, 2017).

To understand the concept of FinTech, the development of financial technologies must first be understood. The first acquaintance with financial technologies can be traced back to the 1950s when Frank McNamara created a Diners Club card, which later emerged as a business model for card payment systems (many FinTech initiatives today build business models on payment systems) (Skinner, 2016). The development of ATMs in the 1960s has led to a greater sense of technology in the banking sector, perhaps for the first time the contact between customers and banks realized through technology. Later, the expansion of credit cards, the development of electronic fund transfers (EFT), the expansion of telephone and internet banking, the use of mobile phones and mobile devices and their unique technological innovations (sensors, cameras and smart features) have changed the lives of financial service users significantly. In particular, the expansion of the mobile phone has enabled people to make transactions independently of time and location. When the development of FinTech is examined, it is seen that, as one of the first places of use, African countries that use SMS technology first come to the forefront in contrast to the countries where smartphones are common. Vodafone's M-Pesa, a mobile phone based money transfer service by SMS, launched in Kenya and Tanzania in 2007, is the most significant part of the history of FinTech. It allows users with a national ID card to deposit, withdraw, and transfer money easily with a mobile device. M-Pesa has expanded to Afghanistan, South Africa, India, and Eastern Europe (Blakstad, 2018).

It is possible to evaluate the effects of the 2008 Financial Crisis in many different dimensions. Some see it as a major destruction and others see it in terms of new opportunities. Undoubtedly, the economic and social impacts have had a profound impact on both the welfare of countries and the way of life of the societies. The most important feature of the 2008 crisis in terms of financial services sector was the focus on the risk policies and capital adequacy of banks' attention with the penalties and heavy regulations imposed on the banks. This naturally led banks to allocate more time and resources to internal processes, risk management and compliance, but less time to customers who expect more and more services (Arner, Barberis, Buckley, 2015). One of the important consequences of the 2008 Financial Crisis was the shaking of the trust of bank customers to banks. The environment created by many factors such as the decrease in the lending of banks due to the risk policies that changed after the crisis, the development of the internet and sharing economy and the use of smart devices in financial activities in the same period led to the emergence of FinTech startups.

With the support of technological innovations, FinTech startups, aimed at facilitating the lives of users in financial transactions, have been invested more than USD 100 billion globally between 2014-2018 according to CB Insights data. Until 2018, 39 FinTech startups worldwide have been rated as "Unicorn", by exceeding USD 1 billion in valuation (CB Insights, 2019). These and similar figures show the value given to FinTech startups in the economy on a global scale. However, in order to better evaluate the added value created by financial technologies, firstly, it is necessary to understand the ecosystem created in the financial technology field.

3. FINTECH ECOSYSTEM

The concept of ecosystem, as similar to biological systems, has been gaining interest in the management literature within the scope of the "system approach" for many years. Ecosystem refers to the environment in which living organisms survive and the systems that maintain continuity, namely the "natural environment", which expresses the interrelationships between living and non-living environments surrounding these organisms. This system is based on various balances and continues to operate and maintain as a result of close and mutual interactions with each other. The negativity experienced in any element of this natural balance affects all the elements of the system as required by the systems approach (Micklin, Poston, 1998). Disruption of natural balance is the biggest threat to the ecosystems. Life in ecosystems continues with energy flow and nutrient cycles. Management scientists, inspired by biological systems, described businesses as living organisms and their environments as ecosystems and tried to explain businesses in economic order in this way.

Based on this approach, understanding the FinTech ecosystem is important for the development of mechanisms to ensure the survival and growth of the ecosystem. Therefore, in the continuation of the study; the importance of the FinTech ecosystem, players of ecosystem, relationships between them, growth and competition strategies will be examined.

4. COMPONENTS OF A FINTECH ECOSYSTEM

There are elements in an ecosystem, each of which works independently, but cannot survive without the interactions between them. Without interaction, the ecosystem loses its power and competitiveness falls. Therefore, the power of the ecosystem is dependent on the nature of the interactions and synergies between the elements but not only the sum of the powers of each element. To understand the dynamics of an ecosystem, it is necessary to examine the FinTech ecosystem players, their roles and their interdependencies first. The first question that comes to mind here is whether this ecosystem will change from country to country. Research shows that the structure of the ecosystems are very similar in every country. What distinguishes is the "climate" in which this structure is located. The power and competitiveness of this ecosystem changes as the climate changes. There are many studies attempting to identify FinTech ecosystem players and their roles in a country (Chishti, Barberis, 2016; Nicoletti, 2017; Arjunwadkar, 2018; Blakstad, Allen, 2018; Gupta, Tham, 2019). Based on these studies, it is possible to group the factors that make up the FinTech ecosystem in a country under eight main headings:

4.1. New Technologies and Tools

In the emergence of the FinTech ecosystem, new technologies, new economic approaches and new tools come to the fore. In particular, the development of mobile and wearable technologies and the emergence of business models that facilitate their adaptation to the financial field through changing socio-economic approaches (such as Behavioral Finance and Sharing Economy) have had an important role in the emergence and development of the ecosystem. Today, many softwares such as machine learning, artificial intelligence, chatbot, robot consultants (Sironi, 2016) and blockchain increase the variety of products and services offered in the field of financial technology (Thompson, 2017).

4.2. Telecom and Technology Companies, Social Media and Internet Platforms

The most important facilitators for understanding and using new technologies were, of course, telecom and technology companies that created an infrastructure for the use of these technologies through mobile devices. The facilitating and supporting effect here is provided by the internet platforms or social media tools with their assets. Today, companies such as Google, Apple, Facebook, Amazon are called "GAFA Bank" (inspired by the initials of the companies' names) with the opportunities and technologies they have, and by reversing the FinTech concept, they can cause the concept to evolve as "TechFin" with the introduction of technology companies into the financial field (Gupta, 2019).

4.3. Startups

These are the firms that provide solutions to the users with their innovative business models and by adapting the opportunities offered by technology, digitalization and mobile technologies to the financial field. One of the key players in the field of financial technology is the startups, whose basic features can be explained by the "LASIC Principles" (Low Margin, Asset Light, Scalable, Innovative, Compliance Easy), their ability to be established with a small capital, agile structures, innovative and rapid solutions, and with their high growth potentials (Chuen, Teo, 2015). Important factors in the emergence of startups are: entrepreneurs' knowledge of the sector, understanding the needs and pains correctly, providing a good business idea appropriate to the needs, having qualified human resources in teams, thinking globally (thinking of a global product), financial information, good understanding of the regulations and an adequate business model (Gimpel, Rau, Maximilian, 2018).

4.4. Government and Regulators

Perhaps the most important player in the ecosystem is the government. It is the government that constitutes the bodies providing the financial infrastructure, the structure that determines the rules of the game and determines the conditions of competition by enacting regulations. The most important role of the government arises in the stage of climate formation. Policy-making and the understanding of the FinTech concept by the relevant institutions of the state can make it a window of opportunity (Arner, Barberis, Buckley, 2017).

As discussed earlier, FinTech area is one of the largest investment areas in the world. Therefore, prioritizing this issue in a country's development plan and creating policies and strategies accordingly, create new opportunities for countries to directly attract foreign capital. Today, many developed and developing countries have taken FinTech as one of their priority areas among their development policies, and have managed to attract startups and investors to their countries by creating an appropriate investment climate with their approaches and regulations.

4.5. Financial Infrastructure Providers

They are the institutions that are established by the government for the effective operation of the financial system. At the same time, they are the policymakers, regulators, supervisors that are maintaining the infrastructure of the financial system (Engel, 2015).

4.6. Financial Institutions

Banks, insurance companies, and capital market intermediary institutions are the major actors of the financial system. These institutions refer to the old, known and trusted institutional structures that have historically created the financial system, which are large, slow-moving in nature, working within the framework of certain principles. Many of these counted up to the 2008 Financial Crisis. However, with the 2008 Financial Crisis, the loss of confidence in the financial system caused some of these structures to disappear and some of them caused serious restructuring. These organizations act as the key players in the FinTech ecosystem by collaborating or partnering with startups (Alt, Beck, Smits, 2018).

4.7. Customers and Users

When the concept of customer is mentioned, more “business to business (B2B)” customers are perceived on the corporate scale. Today, however, the government can become an important FinTech user due to the services it offers and can be among the customers of startups. Today it is possible to see startups that develop cooperation with the government in many countries. Individual users (B2C) are perhaps the most important actors in the emergence of the FinTech field with their desire, need and behavior models (Chishti, Barberis, 2016). Here, the correct determination of users' wishes, needs and behavior models, form the essence of the innovative business model to be created. But, this requires a sociological perspective and understanding.

4.8. Investors, Incubation Centers and Accelerators

The importance of financial resources for the emergence and growth of an enterprise cannot be denied. Investors come to the forefront in obtaining financial resources. Today, it is possible to see different types of investors for every stage of the startups. While angel investors can be a significant investor, venture capital (VC) investors and corporate investors (CVC) can be used to provide the funds needed by enterprises at different stages.

In addition to investors, there are incubation centers and acceleration programs that make startups ready to attract investment starting from the idea stage (seed investment) (Brooks, 1986). Especially in the FinTech vertical, it is possible to come across many acceleration programs around the world. In such structures, the idea in the entrepreneur's mind is matured, tested and structured within a business model in a systematic way. In this way, enterprises that are able to do business are brought together with investors and investments are made in line with the wishes and needs of both parties. These structures can be established within the framework of a business model as well as with the support of the government can be established in Technoparks, Technology Transfer Offices of Universities (Jamil, Ismail, Mahmood, 2015). Today, it is possible to see the incubation centers established by financial institutions (such as banks) for their own purposes as well.

It seems possible to consider each of the ecosystem components mentioned above as independent components. However, given the interactions and synergies between them, it is possible to see that they are an integral part of a whole and the added value they will create for the country.

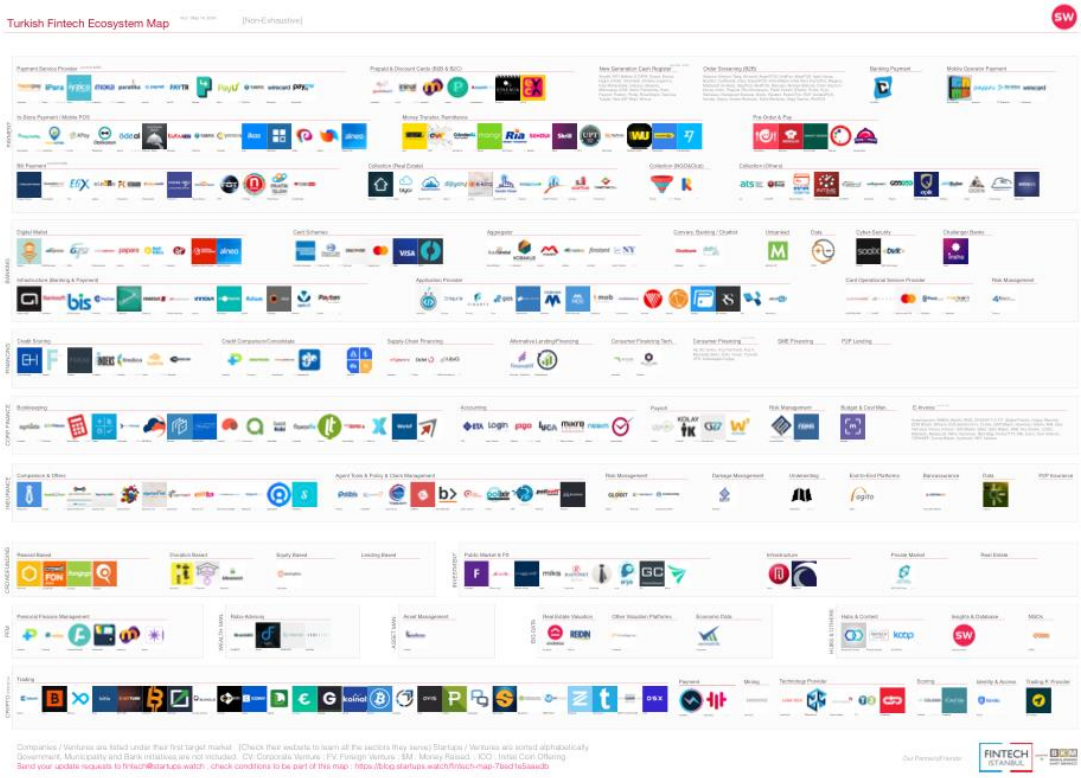
5. GENERAL EVALUATION OF FINTECH ECOSYSTEM IN TURKEY

In addition to developed countries, countries such as India, Singapore, Bahrain, Abu Dhabi, Dubai, Kazakhstan and Malaysia have started to make serious investments to attract FinTech startups to their countries. These countries have positioned themselves as “Financial Technology Centers”, aiming to capture the attention of both FinTech startups, innovations and investors. Nowadays, attracting investment and ensuring its continuity is a strategic issue for every country. The current situation of foreign direct investments in the world economy is clear. Investments in traditional industries are now being replaced by high-growth technology investments. Therefore, among the competitive strategies of countries, FinTech occupy a priority position.

There are many studies evaluating whether countries are attractive in terms of financial technology investments. In a survey conducted by the Global FinTech Hubs Federation (GFHF) and Deloitte (Deloitte, 2017), 44 financial technology centers (Hubs) around the world were evaluated and scored with a system based on objective criteria for each Hub. Turkey was also evaluated for the first time in this report and achieved a low score.

According to the Startups.Watch (Startups.Watch data, there are over 250 startups operating in 13 different verticals in the FinTech field in Turkey as of October 2019 (Figure 1).

Figure 1: Turkish FinTech Ecosystem Map (2019)



This paper is based on self-reflection research methodology. The author is the co-founder of FinTech Istanbul, a platform launched in 2016, acting as a Hub, aiming to bring together all the players in Turkish FinTech space and try to link them to global developments. With the experience and knowledge gained from FinTech Istanbul experience, the evaluation will be made in terms of both the ecosystem components and by using objective criteria. A Hub's strengths and weaknesses are heavily dependent on the issues such as regulation, customer proximity, expert human resources, the potential for attracting foreign startups, innovation culture, and government support. It is possible to say that they are the key elements that support the building blocks of a healthy ecosystem. Consequently, the effects of these elements will be taken into consideration when making the following assessment.

5.1. Technological Developments, New Tools and Methods

New technologies and tools are spread all over the world with globalization thanks to the inventions and technological developments in the world. What is important here is the use and development of these in line with the needs in the country. The most important technology in the field of FinTech is “mobile” technologies. Especially through smartphones, all financial transactions are carried out through the online channels of financial institutions, making it easier for users to make transactions by taking advantage of time and space without going to the bank. Apart from these, the development of card payment systems, wearable technologies, Internet of Things (IoT), Personal Assistants (such as Alexa, Siri, Bixby), Chatbots, Artificial Intelligence and Robotics Process Automation (RPA) software and applications are developed and used by startups in Turkey. One of the important elements here is to combine these new technologies and tools with the innovation culture in the country and turn them into commercial products. The closer the entrepreneurs are to the customers, the more they can analyze their wishes, needs and experiences from a sociologist’s point of view, the more they produce products and services with high added value and increase their profitability.

5.2. Infrastructure Providers and New Players in the Industry (TechFin)

Telecom Operators provide the most important infrastructure enabling the use of mobile technologies. Apart from these, social media, internet platform companies, e-commerce companies and technology producing companies (such as Google, Facebook, Apple, Amazon) have started to focus on their financial needs by using the digital power of their customers. The point that gains importance here is the companies that produce solutions in order to facilitate the purchasing experience of the customer by entering between the customer and the shopping point.

The companies operating in this field in Turkey try to facilitate online payments and offer payment options (such as credit offering, installment, installment skipping) thanks to their cooperation with banks. In Turkey, telecom operators and e-commerce companies have seen the gap in the payment field and have started to offer online payment opportunities to a high number of customers. Therefore, such structures have begun to become "platform companies" by offering different combinations and to create their own ecosystems. In this way, these structures that enter the sector as new and powerful players are defined as "TechFin", that is, the entry of technology companies into the financial world (Skinner, 2016). Alibaba, Amazon and Apple are the most important examples of this globally.

5.3. Status of FinTech Startups

As shown in Figure 1, FinTech startups in Turkey operate in 13 different verticals. These are areas such as payments, banking, finance, corporate finance, insurance, crowdfunding, investment, personal finance management, asset management, big data, hubs, blockchain and crypto coins. Thanks to their innovative business models, they are able to offer products and services that are more flexible, faster, more cost-effective and more suitable to customer expectations than the corporate structures.

These startups should be considered together with the competencies of the entrepreneurs, their innovative approaches to the business model and the competencies of the teams they work with. In other words, the intellectual capacity of startups should be evaluated in terms of human resources. Generally, when human resources are mentioned, quality, quantity and costs emerge. The universities and other educational institutions play a key role in the development of this human resource.

The vast majority of startups today are software-oriented technology startups. More specifically, the FinTech field refers to a combination of technology, software and finance knowledge in a very specific field, such as financial technologies. Therefore, it is becoming increasingly difficult and costly to find human resources specifically trained in this field. Universities in Turkey have not yet established specialized programs in a field such as Financial Technology. Platforms such as "FinTech Istanbul" aim to close this gap with the programs they create in the sector. Therefore, Hub structures in the country play an important role in raising human resources as well as financial institutions.

Many financial institutions in Turkey support the entrepreneurship and creativity skills of their employees and support their efforts in developing new products through corporate entrepreneurship programs. In this sense, considering the quality, quantity and cost criteria of human resources, it should be considered that the country will become a center of attraction in terms of attracting FinTech startups. One of the best examples of this is the annual "Startup Istanbul" event held in Turkey. Every year, many startups in our region and close geographies apply to this event and look for opportunities to expand on a global scale thanks to the business models they develop. In this sense, especially Istanbul has started to become an attraction center for those startups.

5.4. The Attitude of Financial Institutions

Financial institutions are important players in the FinTech ecosystem. The "win-win" environment created especially by the cooperation with FinTech startups play an important role in the growth of the sector. However, as seen in every country, FinTech startups were seen as a competitor to banks at the beginning in Turkey. While banks did not want to give their shares, FinTech startups were trying to enter to market with their customer-oriented, innovative approaches. Nicols (2016) expresses this approach with the "Banker's FinTech Grief Cycle" (Figure 2).

Figure 2: The Banker's FinTech Grief Cycle

In his article published in 2016, J.P Nicols stated that the banks underwent a five-stage griefing process against FinTech startups. In the first stage, the process started by "denying" the existence of FinTech startups and their contributions to the sector and then turned into "anger" and tried to take more aggressive measures; after the "bargaining" between banks and FinTech startups to work around the problem with temporary solutions. In the "depression" stage, the idea that the sector is no longer profitable and that the deal is meaningless takes the banks and, in the end, the banks "accept" the situation and inevitably set sail for partnerships that will benefit both themselves and the sector (Nicols, 2016).

The situation has progressed in a similar way to Nicols' cycle in Turkey. FinTech-Bank relations in Turkey can be dated back to 2013. Initially, big banks provided superiority in the sector with their technology companies and the digital channels they developed thanks to them. Starting from online payment systems and virtual POS areas, FinTech startups have entered the fields that banks cannot realize, cannot enter or are not willing to enter with fast, innovative methods and customer experience. Nowadays, we see that even though the level is low, FinTech startups in Turkey have entered into a process of cooperation with banks.

5.5. Government Perspective and Infrastructure of Financial System

Here, the government's approach is very important. FinTech has entered into the financial policies and economic development models of many countries. UK, USA, Canada, Switzerland, Germany, the United Arab Emirates, Bahrain, Singapore, Malaysia and China have developed their state policies on FinTech, integrated them with laws and regulations, and show themselves as a center of attraction for attracting all startups in this field. Therefore, these countries have entered into a competition. It is known that FinTech has attracted more than 100 billion dollars in the world between 2014-2018. Therefore, it can be considered as a Foreign Direct Investment. Government needs to show the investors that there is a friendly environment in which to invest. For a long time, FinTech investments flowed to UK. What the fate of these investments will be after Brexit remains as a discussion topic. Many European counties are trying to get a share of this pie by trying to create an attractive environment of trust both by the regulations and the economic and political conditions of their countries.

When evaluating an area where finance and technology meet, such as FinTech, it is not enough to consider only the relationships between banks and enterprises. In this field of play, it is necessary to evaluate the infrastructure players of the financial system and their relations with the sector. In the financial sector, the infrastructure of the Banking Regulation and Supervision Agency (BRSA), The Central Bank of Turkey (CBRT), the Capital Markets Board (CMB), the Ministry of Treasury and Finance, the Revenue Administration (GIB) and the Financial Crimes Investigation Board (MASAK) regulate the institutions and organizations that constitute the infrastructure of the financial services sector in Turkey. Therefore, it is necessary to understand their working principles and reflexes while operating in this field. In short, it is not possible to operate in this field without knowing and understanding the rules of the game (regulation).

The priority of government institutions in this field is the security of the system and consumers. It is possible to address trust in two dimensions: Financial Trust and Information Security. Users of FinTech services first want to be sure that FinTech companies they are entrusting money with or FinTech companies with whom they are partnering are financially secure. Thus, they believe that they can easily benefit from their services. On the other hand, consumers, in particular, attach great importance to the security of personal data that FinTech companies hold. These two issues are regulated by Law No. 6493 and its sub-regulations for payment services, e-money services and system operation in Turkey. Law No. 6493 obliges payment and e-money institutions and system operators to obtain operating licenses. This requirement also necessitated the compliance with certain financial, process and technological criteria.

The amendments introduced by Law No. 6493 increased confidence in the sector and created an obstacle for the relatively small institutions that wanted to provide payment and e-money services. It is clear that the right height of the barriers

created by the Law is critical for the size and reliability of the sector. In many countries, FinTech works with many different regulations. For example, in the area of Activity Permit (Licensing), which is a critical issue, countries (such as England, Lithuania, Estonia) issue different types of licenses for different fields of activity. This makes these countries more attractive for companies to carry their operations.

With the initiatives of BRSA, Central Bank, CMB, Treasury and Finance Ministry and Presidency Finance Office in the last two years, developments in the field of FinTech have been brought to the agenda of Turkey. The results of these efforts are included in the 11th. Development Plan. This shows that FinTech has entered the agenda of the government.

5.6. Customers and Demand

Customers and users, namely the size of the demand in Turkey, with a population of over 80 million and widespread use of smartphones are becoming attractive for many sectors. Considering the fact that a significant portion of the population is unbanked or under-banked and that citizens need easily accessible financial instruments and solutions, the importance of the services offered by FinTech startups that make life easier becomes evident for the sector. With the products developed by FinTech startups, it is aimed to include the masses who do not have access to financial products; it is clear that it will create satisfaction in terms of financial inclusion and fiscal policy in Turkey (as seen in other examples in the world such as India) in terms of both the growth of the market and the registered economy.

On the other hand, corporations that make up another dimension of demand (SME's) use the products and services offered by FinTech startups. Here; market structure in the country, competition, consumer behavior, customer experience, opportunities, threats and new markets that may occur in the financial services sector should be evaluated. The intensity of smartphone penetration in our country, the increase in the amount of online shopping and the development of e-commerce have led to the intensification of the use of virtual POS and the development of payment systems for FinTech startups that produce solutions that fit the country's payment habits. As shown in Figure 1, most of the FinTech startups in Turkey operate in payment systems.

5.7. Capital and Investments

In the capital dimension; investors, government support and public funds are the most important issues for FinTech startups that have the potential to grow rapidly. In the field of FinTech, TUBITAK and EU funds become prominent as government and publicly funded support; however, FinTech companies in Turkey are more timid about these issues and are directed towards angel investors, venture capital and bank incentives.

The investment level is not as high as the sector deserves. According to Startups.Watch data, in 2018, approximately 12 million USD was invested in FinTech startups in Turkey. The first factor that makes it difficult to get investments for FinTech startups is the lack of adequate data about the FinTech sector and the second factor is cautious foreign investors about the current conjuncture of Turkey.

Lack of the number of investors in Turkey is another important problem. Banks play an important role especially in cooperation with FinTech startups. Therefore, banks have the resources to invest in startups. Banks can provide the capital needed by FinTech startups, while FinTech startups can support banks with innovative ideas and methods, opening up new markets and offering them new opportunities. Nowadays, corporations investing by establishing their own venture capital funds is called Corporate Venture Capital (CVC). In Turkey, banks such as Akbank, Is Bank and Fibabanka are able to develop cooperation models by investing in FinTech startups with their own corporate funds.

5.8. Other Complementary Supports

Incubation centers, acceleration programs, thematic techno-cities and Sandbox environments are of great importance for the development of the FinTech area. In the UK, the Financial Conduct Authority (FCA) initiated the "Project Innovate" and invited all institutions in the country to take a supportive approach. Similarly, the National Money Authority of Singapore (MAS) established the national Sandbox platform and identified the scope and conditions of operation. In both approaches, the aim is to increase the participation in the financial system by testing new technologies in an effective and safe environment for innovation. The Sandbox environment should be created in a way to support innovation in the FinTech field, to follow technological new practices, and to ensure that regulations are strengthened by the industry (Arlanian, Fischer, 2019).

Even though the Sandbox environment has not yet been implemented in Turkey, it is possible to see the launch of the Thematic Technopark initiatives through universities. It is possible to see the first example of this with the joint venture of Bogazici University and Borsa Istanbul. The establishment of thematic Technopark areas on FinTech in cooperation with universities and the private sector will contribute greatly to the training of human resources with sector knowledge and

experience, to the cooperation of universities and industry, to the implementation of new projects in FinTech and to support entrepreneurs and entrepreneurship.

6. CONCLUSION

When academic studies and ecosystems in different countries in the literature were evaluated, it is observed that the weights or functions of the players in the ecosystem may vary according to the cultural and economic characteristics of the countries, but the thing that does not change is the linked functioning of all those players. The power of the ecosystem is created by the synergy between them.

In this study, the financial technology field which attracts a high amount of investments all over the world and the importance of FinTech startups in this field have been evaluated especially in terms of today's strategic elements such as national economy, attracting investment and know-how transfer. In this way, an analysis tried to be made in Turkey. In this evaluation, first of all, the components of the ecosystem are presented and then the current situation is evaluated in terms of key factors such as demand, regulation, capital and human resources which are the drivers of this ecosystem.

Today, in the financial world, the concept of FinTech changes the rules of the game. Increasing financial access on a national basis, increasing productivity through collaboration with startups, improving financial innovation and providing better service and user experience to customers, preventing informality in the economy, increasing financial inclusiveness, attracting global investment and know-how transfer can be considered as the most important opportunities that a country can gain by investing on FinTech. It is important to note that the most important role here depends on the FinTech ecosystem players and the synergy between them. Therefore, it makes more sense to see the power of the FinTech ecosystem in a country as the sum of the impact of the relationship (synergy) between them rather than the sum of the power of the individual players.

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ANALYZING TECHNOLOGY ACCEPTANCE FOR INTERNET OF THINGS (IoT) AMONG ACCOUNTING AND FINANCE STUDENTS

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ABSTRACT

Purpose- The purpose of this study is to test technology acceptance model for internet of things (IoT) among accounting and finance students. Internet of things refers the interconnection between devices via internet including mechanical and digital objects. The advancements in internet technology, wireless communication, microelectromechanical systems (MEMS) and radio frequency identification (RFID) created a world of interconnected devices. The term IoT is used in conjunction with all the devices that send data to each other, including appliances which are used in our daily lives. Since IoT has a wide range of use in Finance and Accounting, its acceptance among accounting and finance students is important.
Methodology- In this study, a quantitative research has been conducted by using survey method. In this research, following a literature review, technology acceptance of IoT among Accounting and Finance students have been tested by using appropriate statistical techniques.
Findings- Findings of the study imply that there is positive correlation between research variables. This result shows that participants are ready to accept technological developments in IoT.
Conclusion- As a result of the study, it is tested technology acceptance among accounting and finance students for Internet of Things (IoT). The technological advancements in IoT increase the level of automation and have a wide range of usage in accounting and finance, primarily in banking. Therefore, its level of acceptance between accountants and finance managers is important.

Keywords: Technology acceptance model, internet of things (IoT), finance, accounting
JEL Codes: L68, G10, M41

1. INTRODUCTION

With the recent advancements, a new technology called Internet of Things (IoT) which is simply an interconnected network of many different types of devices gained great importance with its wide range of use. This network covers from huge computerized production machines in factories to everyday use home devices like refrigerators. By using this intercommunication-based technology between devices, many novelties and conveniences come to human and work life. By using IoT everyday devices may collect usage data at home and can share it with their counterparts. Refrigerators may check their stock levels and automatically order products. Beds may use MEMS sensors and may ask you to use new clean sheets because of bacteria level. Wide spreading broadband internet, faster wireless connections, RFID enabled devices, more useful MEMS chips and many other technological advancements support IoT technology. The Internet of Things simplifies the management of workflow in production areas, reduces costs during storage, material tracking and distribution, and increases efficiency by saving time. Internet of things provides data to be collected in a pool to provide more accurate results in the analysis of data. The Internet of Things is not only used in supply chain and production management, but also in finance, banking, payments and accounting issues.

Similarly, with other sectors, product diversity, customer satisfaction and customer-specific products in the finance sector will prevent the customer from choosing another bank, especially in the banking sector. Banking transaction security, accurate information flow and speed are important in financial services. With the rapid development of technology, the use of mobile devices in the banking sector, the use of face recognition systems that are safer than the PIN code used in ATM transactions, and the creation of wearable credit card systems contributed to the speed and security of the banking system. Technology Acceptance Model (TAM) is created by (Davis, 1989) to be able to predict users' level of acceptance for computers. In this study, it is examined technology acceptance level of accounting and finance students for Internet of Things. It is perceived that the use of this new technology is gaining importance day by day for both disciplines. This study is based on the preliminary proceeding of Komsuoglu Yilmaz & Boydas Hazar (2019) titled "The Rise of Internet of Things (IoT) and Its Applications in Finance and Accounting" presented in 9th Istanbul Finance Congress, and its purpose is to test technology acceptance model for internet of things (IoT) among accounting and finance students.

2. LITERATURE REVIEW

2.1. Internet of Things (IoT)

Internet of Things (IoT) is a relatively new concept. Two decades have passed since British technology pioneer Kevin Ashton used the words "Internet of Things-IoT" as a concept in a conference in Procter&Gamble in 1999 (Ashton, 2009). In these 20 years, the concept has found huge area of interest both research and development side. Internet of Things (IoT) is transforming main communication form on the Internet: human to human (Tan & Wang, 2010) to object to object form by providing interconnection between devices. As a new technology, the Internet of Things (IoT) creates a way to link objects and transfer data between them (Kumar & Raza, 2017). This interconnection may have a huge impact on humans' lives. Internet of things provides new connection alternatives between "human to human", "human to object" and "object to object". These connection alternatives provide good opportunities not only for businesses but also everyday life. Refrigerators may understand that egg stock is low and order it from grocery store or automobiles may understand that they need maintenance and may take an appointment or coffeemakers may get a signal from your smartphones location services and understand that you headed to home and begin to prepare your coffee. It is expected that these changes will have a facilitating effect for everyday life of humans by providing them more spare time. In his study, (Stankovic, 2014) listed main research needs for Internet of Things as seen on Table 1.

Table 1: Research Needs on Internet of Things

Research Problem	Explanation
Massive Scaling	Since the number of devices increase, data usage and the need for wireless networks will also increase. The management of the network formed by these devices will pose a problem.
Architecture and Dependencies	Over connection to internet by millions of IoT devices forces companies to build better architectures. And with this architecture, connecting, controlling, communicating and usage of the technology will be facilitated.
Creating Knowledge and Big Data	There is a continuous data collection with the technology. New data mining techniques should be developed to deal with meaningful information.
Robustness	IoT devices will locate other devices, will be in sync and cooperate with others to do their daily routines.
Openness	Data collection, data analysis and data use should work with openness.
Security	Wireless connection, RFID stickers, MEMS chips, GPS devices and software used in IoT makes security an issue to be concerned. Companies should create new procedures to deal with security issues.
Privacy	The communication abilities of IoT will have numerous benefits in aiding people. However, security will be disregarded in many instances. Privacy policies should be specified to prevent this.
Humans in the Loop	As IoT applications proliferate they will become more complicated.

Resource: Stankovic J. A. (2014). Research Directions for The Internet of Things. IEEE Internet of Things Journal.

On the table above, main concerns on Internet of Things can be seen. But these concerns are directly related to technology itself and not its area of use. With a general classification, IoT has two main users: Consumers and Businesses. Consumers are using the technology to facilitate their daily lives and companies may use it for the same reason: facilitating their procedures.

Balakarthiga (2018) listed top seven applications of IoT for business as follows:

- Revenue management
- Data management
- Inventory and maintenance management
- Customer services management
- Logistics management
- Enhancing customer experience
- Security management

Almost all business functions may be adapted with internet of things and create new business opportunities. By interconnecting devices and sensors, businesses may find the opportunity to conduct more efficient operations. Buyya & Dastjerdi (2016) analyzed main principles and paradigms for internet of things. While Samaila, Neto, Fernandes, Freire, & Inácio (2017) discussed security challenges, Weinberg, Milne, Andonova, & Hajjat (2015) analyzed the subject with a privacy, secrecy and convenience window. Since the security is a primary issue on Internet of things Dorey (2017); Jing, Vasilakos, Wan, Lu, & Qiu (2014); Riahi Sfar, Natalizio, Challal, & Chtourou (2018); Sicari, Rizzardi, Grieco, & Coen-Porisini (2015); Suo, Wan, Zou, & Liu (2012); Weber (2010); Zhao & Ge (2013) also conducted studies on this subject. In their study Caro & Sadr (2019) examined the usage of IoT in balancing supply and demand. Mathaba, Adigun, Oladosu, & Oki (2017) analyzed the synergy created by using two different technologies in inventory management: IoT and Web 2.0. In their study, Xu & Chen (2016) examined the effect of solutions based on internet of things to improve just-in-time effectiveness. In the literature there are also many studies on IoT and logistics including Barreto, Amaral, & Pereira (2017); Macaulay, Buckalew, & Chung (2015); Sun (2012) and supply chain management including Ben-Daya, Hassini, & Bahroun (2017); Haddud, DeSouza, Khare, & Lee (2017); Tjahjono, Esplugues, Ares, & Pelaez (2017); Verdouw, Wolfert, Beulens, & Rialland (2016); Zhou, Chong, & Ngai (2015). Bi, Xu, & Wang (2014) examined the usage of IoT on enterprise systems of modern manufacturing. Löffler & Tschiesner (2013) discuss the future of manufacturing systems in the light of IoT technologies. Shariatzadeh, Lundholm, Lindberg, & Sivard (2016) discussed the transition period from digital factory to smart factory with IoT. Hasselblatt, Huikkola, Kohtamäki, & Nickell (2018) have been modeled manufacturer's capabilities for the internet of things. Willner, (2018) made an analysis on the industrial usage of IoT. Storey (2014) also made a research on industrial IoT. Lee & Lee (2015) investigated IoT investment opportunities and challenges for companies. In their study Haller, Karnouskos, & Schroth (2009) analyzed internet of things with an industrial perspective and provided its business value as an investment alternative. Perera, Liu, Jayawardena, & Chen (2015) conducted a survey to see IoT with an industrial market perspective.

2.2. Importance of IoT for Accounting and Finance

Industry 4.0 is a revolution in the industry by using technology and artificial intelligence together and reflecting it into our lives, especially in the production process. Almost all business functions may be adapted with internet of things and create new business opportunities. As a revolution, Industry 4.0 transformed all devices from their shape to their hardware (Gürün, 2019). By interconnecting devices and sensors, businesses may find the opportunity to conduct more efficient operations. Technology, artificial intelligence and the Internet of things are main advancements related to Industry 4.0. With the use of these innovations, information can be gathered in a pool to be analyzed. Thus, defective production can be reduced, and time and cost savings obtained. Industry 4.0 is envisaged to increase productivity and efficiency. High technology applications related concepts not only concern the production process, but also enable efficient work in finance and accounting issues.

Uses of IoT in Banking may provide the attributes seen in Table 2 below.

Table 2: IoT and Banking

Wealth management personalization	It is related to the accurate and fast data collection, which creates better insights.
Improved payment security	By using internet of things, new forms of payment tools-including smart cards, biometric tokens, and more can be created.
Transaction automation	Ensures that security and control of transactions can be done from a single place.
Improved transparency	In the future, for banks, IoT means that credit providers will be provided with detailed customer data: credit debt and history, asset details and value, as well as commodity yields produced by the client.
Optimized capacity management	Considering the customer numbers visiting the bank, the number of workers per customer optimization is made.
Voice assistants	IoT will facilitate banks embrace voice-driven communications. Operations can be performed by the customer himself without the need for an intermediary.

Resource: Created by using the information on https://www.digiteum.com/internet-of-things-banking-finances

Another challenge is to create new accounting models which can incorporate information coming from sensors of billions of devices. IoT has changed the way business is done today. IoT led to advancements in the accounting discipline as well. Internet of things may help the accounting professionals in the following areas:

Table 3: IoT Technology for Accountants

Providing Data for Business Models	The IoT can provide an abundant amount of past and present data. This provides data to business models for decision making. Past data is needed to form models and to correct them.
Asset Management	IoT always allows businesses to know the whereabouts of their assets. The information system may alert when maintenance is needed on any of the assets. This enables better planning and resource allocation.
Inventory Management	Smart storage allows businesses to know where the inventory is stored at all times. Moreover, it gives a correct count of the inventory. Instead of manually counting inventory at certain times, it is possible to know its quantity precisely at a given time. When an inventory is below a certain level, the accounting software can automatically reorder it directly from a supplier. This helps inventory management and enables to use resources more efficiently. IoT does not only help to track inventory in the warehouse but makes it possible to track the shipments worldwide. RFID chips can be integrated to products to keep tabs of the current status and other information about the shipment (Rathore, 2019). The cost of materials is a fundamental component of the product cost. IoT can assist businesses to get better price quotes on materials. Moreover, information on inventory transportation, time needed to supply the materials and other relevant information help to calculate the cost more accurately.
Billing Services	Since IoT connects devices on a global scale, it is suitable to automate invoicing and billing services. Accounting systems of customers and suppliers can be connected to automate the billing services.
Auditing	Audits are time consuming for the accounting team. Accountants are expected to gather all the related documents and compile them in an order so that the financial information is ready for the auditors to check. Since all ledgers are connected in IoT, sorting transactions will not take too much effort and time (Rathore, 2019). This would decrease the stress on the accounting team. When IoT technology is used in accounting, it is expected that high volumes of data and transactions are processed. It is imperative that this data is audited. The classical auditing method of sampling leaves out large quantities of transactions unaudited. This increases the possibility of not finding anomalies in the data during audits. Moreover, most of the data captured by IoT

	is in real time. Computer aided audit tools and techniques can be used to audit the full audit domain. Continuous auditing technique can be implemented to make audits in real time.
Budgeting	IoT technology improves the budgeting process. The information received from many networks helps the planning and forecasting stages of budgeting (Chandi, 2017). The forecasting models can be tested and refined using the versatile and generous amount of data. This increases the predictive ability of the forecasting model.
Providing Advice to Clients	The accountant's role has shifted from providing manual services to providing advice in financial matters (Tucker, 2017). Tax planning and financial analysis have been the top priority areas in which businesses seek advice. Since gathering information from different ledgers, or even from different networks, is easy with IoT technology, accountants can provide timely financial advice to their clients.

Resource: Created by using the Proceeding by Komsuoglu Yilmaz & Boydas Hazar (2019) The Rise of Internet of Things (Iot) and its Applications in Finance and accounting, Istanbul Finance Congress, November 1, 2019.

2.3. Technology Acceptance Model (TAM)

Technology Acceptance Model (TAM) is created by (Davis, 1989) to be able to predict users' level of acceptance for computers. In his study he added new scales for two variables as fundamental determinants of acceptance: (1) Perceived usefulness, (2) Perceived ease of use. Individuals decide to use or not to use a new technology by understanding the level of help comes from the new technology for their current job. This is called perceived usefulness. To be able to use a technology its features should also be easy to use. This variable is called perceived ease of use. In the literature many studies have been made about TAM. Some researchers (Lee, Kozar, & Larsen, 2003) analyzed the model with an historical perspective. The others (Surendran, 2012) analyzed the model's use in the related literature. There are researchers (King & He, 2006) who conducted a meta-analysis on the subject. In his study, Pavlou, (2003) analyzed technology acceptance for electronic commerce; in a very similar study Ha & Stoel, (2009) examined technology acceptance of consumer on e-shopping. Lu, Yu, Liu, & Yao, (2003) have been researched on the acceptance of wireless internet by using TAM. Lin, Shih, & Sher, (2007) added a new variable -technology readiness- to the model in their study. Walczuch, Lemmink, & Streukens, (2007) have been tested employees' technology readiness on technology acceptance.

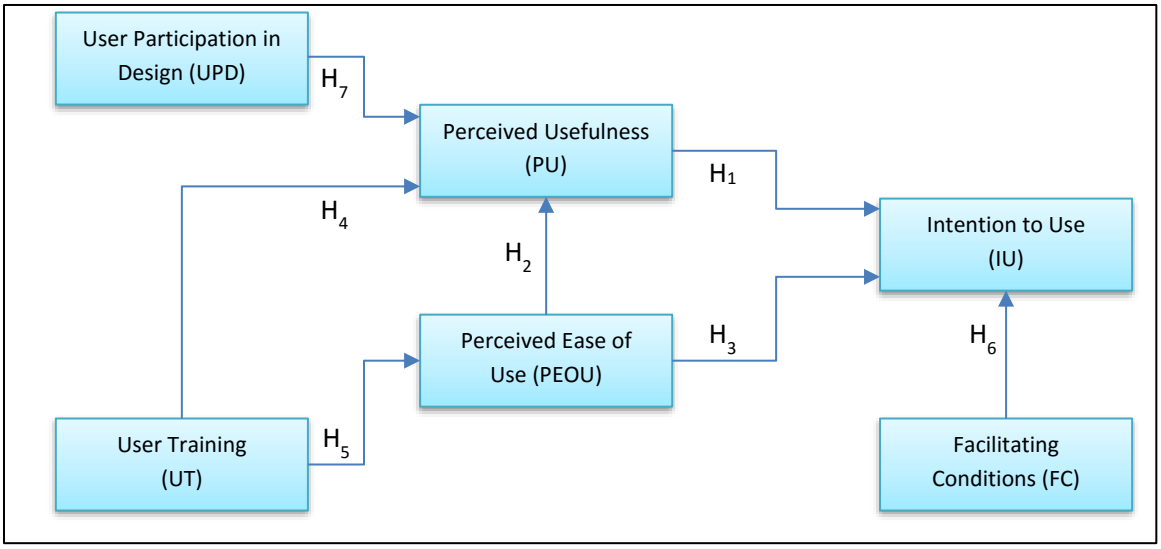
In some recent studies, Herrenkind, Brendel, Nastjuk, Greve, & Kolbe, (2019) investigated end-user acceptance of autonomous electric buses to accelerate diffusion. Hamdani (2019) analyzed technology acceptance in the use of social networks by teachers and employees of education offices in Ahwaz. Rafiee & Abbasian-Naghneh, (2019) have tested technology acceptance of e-learners in language learning.

Gao & Bai, (2014) conducted a study on the factors influencing consumer acceptance of internet of things technology. Park, Cho, Han, & Kwon, (2017) tested the acceptance level of smart home products. In a similar study, Kim, Park, & Choi, (2017) analyzed technology acceptance of smart home products by using value-based adoption model.

3. RESEARCH MODEL AND HYPOTHESES

In the literature both Internet of Things (IoT) and Technology Acceptance Model (TAM) have a huge interest from many different disciplines. In this study, the research model proposed by Morienyane and Marnewick (2019) has been used and can be seen in Figure 1 below:

Figure 1: Research Model



Source: Developed from Morienyane and Marnewick, (2019)

The model depicted in Figure 1 hypothesizes that when people are involved in the design of products of the related technology (UPD), they are inclined to think that these products are useful to them (PU), and thus they intend to use them (IU). Moreover, this model assumes that when people are trained to use them (UT), they tend to think that these products are useful (PU) and easy to use (PEOU), increasing the intention to use (IU). The model also states that the chance that people will use these products vastly increase if there exits facilitating conditions (FC) to use them.

According to the research model, hypotheses of the research are listed below:

H_1: There is a positive correlation between PU and IU among accounting and finance students for IoT.

H_2: There is a positive correlation between PEOU and PU among accounting and finance students for IoT.

H_3: There is a positive correlation between PEOU and IU among accounting and finance students for IoT.

H_4: There is a positive correlation between UT and PU among accounting and finance students for IoT.

H_5: There is a positive correlation between UT and PEOU among accounting and finance students for IoT.

H_6: There is a positive correlation between FC and IU among accounting and finance students for IoT.

H_7: There is a positive correlation between UPD and PU among accounting and finance students for IoT.

4. METHODOLOGY AND FINDINGS

4.1. Research Method

In this research, a quantitative research approach has been followed by using survey method. The quintessence of survey strategy can be clarified as "addressing appropriate people on a point or subjects and afterward depicting their reactions" (Jackson, 2011).

4.2. Sampling

For this study, research universe can be accepted as all university students who are enrolled in accounting and finance programs in İstanbul, Turkey. This number is approximately 100.000 (23.773 seats per year). Sample size with 90% confidence interval can be calculated as 270. Considering time as a limitation for the study, convenience sampling method has been applied to reach this number.

4.3. Data Collection

A two-part questionnaire form was created for data collection. There are six demographic questions in the first part. The second part covers modified version of the questions used by Morienyane and Marnewick (2019) in their study for six scales (PU, PEOU, UT, UPD, IU, FC). 400 questionnaire forms were prepared by researchers. These forms were distributed to the students in class and collected immediately after they were filled. By this controlled approach, researchers reached 286 valid forms. SPSS program has been used to analyze the data collected via questionnaires.

4.4. Demographical Findings

Demographic composition of the participants is analyzed by conducting descriptive statistical analysis. Age, gender, university degree, marital status, nationality and work experience distribution of the participants can be seen in Table 4 below:

Table 4: Demographic Distribution of the Participants

Variable	Options	Number	Percentage	Variable	Options	Number	Percentage
Gender	Male	181	63.3	Marital Status	Single	250	87.4
	Female	103	36.0		Married	30	10.5
	Undisclosed	2	0.7		Undisclosed	4	1.4
Age	0-17 years old	2	0.7	Nationality	Turkey	80	28.0
	18-24 years old	184	64.3		European Countries	10	3.5
	25-34 years old	84	29.4		Middle East	89	31.1
	35-44 years old	13	4.5		Asia	47	16.4
	45-54 years old	1	0.3		North & South Amerika	53	18.5
	55-64 years old	2	0		Australia & New Zealand	80	28.0
	65-74 years old	0	0		Africa	10	3.5
	75 and more	0	0	Work Experience	0 – 1 years	135	47.2
Enrolled Program	Undergraduate	134	46.9		1 – 5 years	113	39.5
	Masters	145	50.7		5 – 10 years	22	7.7
	PhD.	1	0.3		Over 10 years	13	4.5

Demographical findings of the study indicate that 2 out of 3 participants are male and most of them are single. Most of them are undergraduate and master's degree students. 28% of the participants are from Turkey and 72 % of them are distributed to other countries. This demographic distribution of the participants adds an international point of view to the study.

4.5. Reliability Tests and Factor Analysis

For the reliability of scales in the data collected an internal measurement method (Cronbach Alpha) has been used. Cronbach Alpha (CA) is a function of the number of test items and the average inter-correlation among the items. CA value of each scale in the study can be seen in Table 5 below:

Table 5: Reliability Analysis

Scale	Cronbach Alpha	N of Items
PU	0.936	7
PEOU	0.845	5
UT	0.833	3
UPD	0.610	2
IU	0.899	4
FC	0.857	4

For 5 out of 6 scales Cronbach alpha is more than 0.8 and only for scale UPD it is 0.61. Since reliability values between 0.6 to 0.7 are acceptable in exploratory research (Nunnally & Bernstein, 1994), all scales of the study can be accepted as reliable.

4.6. Hypotheses Testing

To test the hypotheses, same statistical path is followed as the study of Morienyane and Marnewick, (2019). To test the hypotheses, Pearson's correlation coefficient test has been conducted. Results of the test can be seen in Table 6:

Table 6: Pearson's Correlation Coefficient

		PUORT	IUORT	PEOUORT	FCORT	UTORT	UPDORT
PUORT	Pearson Correlation	1	.765**	.729**	.694**	.689**	.604**
	Sig. (2-tailed)		.000	.000	.000	.000	.000
	N	286	286	286	286	286	286
IUORT	Pearson Correlation	.765**	1	.698**	.770**	.766**	.638**
	Sig. (2-tailed)	.000		.000	.000	.000	.000
	N	286	286	286	286	286	286
PEOUORT	Pearson Correlation	.729**	.698**	1	.675**	.651**	.580**
	Sig. (2-tailed)	.000	.000		.000	.000	.000
	N	286	286	286	286	286	286
FCORT	Pearson Correlation	.694**	.770**	.675**	1	.760**	.650**
	Sig. (2-tailed)	.000	.000	.000		.000	.000
	N	286	286	286	286	286	286
UTORT	Pearson Correlation	.689**	.766**	.651**	.760**	1	.673**
	Sig. (2-tailed)	.000	.000	.000	.000		.000
	N	286	286	286	286	286	286
UPDORT	Pearson Correlation	.604**	.638**	.580**	.650**	.673**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
	N	286	286	286	286	286	286

**. Correlation is significant at the 0.01 level (2-tailed).

Pearson's Correlation Test results indicate that there is a positive correlation between PU and IU. This means that if accounting and finance students perceive IoT as useful (PU), they probably intend to use it (IU). Perceived ease of use (PEOU) will also positively affect perceived usefulness (PU) and intention to use (IU). User training (UT) will provide more knowledge on the subject and facilitate both perceived ease of use (PEOU) and perceived usefulness (PU). If conditions will be facilitated (FC) it will also create a positive effect on the intention (IU). Finally, if users can participate in the design of the IoT enabled products (UPD), it will create a positive impact on perceived usefulness (PU).

In Table 7 below, a summary of hypotheses tested in the study can be seen.

Table 7: Summary of the Hypotheses Tests

H_N	Hypothesis	Accepted/Rejected
H_1	There is a positive correlation between PU and IU among accounting and finance students for IoT.	ACCEPTED
H_2	There is a positive correlation between PEOU and PU among accounting and finance students for IoT.	ACCEPTED
H_3	There is a positive correlation between PEOU and IU among accounting and finance students for IoT.	ACCEPTED
H_4	There is a positive correlation between UT and PU among accounting and finance students for IoT.	ACCEPTED
H_5	There is a positive correlation between UT and PEOU among accounting and finance students for IoT.	ACCEPTED
H_6	There is a positive correlation between FC and IU among accounting and finance students for IoT.	ACCEPTED
H_7	There is a positive correlation between UPD and PU among accounting and finance students for IoT.	ACCEPTED

5. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

The purpose of this study was to test technology acceptance model for internet of things (IoT) among accounting and finance students. Since IoT has a wide area of use in Finance and Accounting, its acceptance level is important between accounting and finance students.

Internet of things refers the interconnection between devices via internet including mechanical and digital objects. The advancements including internet, wireless communication, microelectromechanical systems (MEMS) and radio frequency identification (RFID) created a world of interconnected devices; with IoT this interconnection covers everyday objects. In this study it is examined the areas where IoT can be used to facilitate finance and accounting. User training both facilitates the ease of use and usefulness perception and indirectly affects the intention. At the same time, if conditions can be facilitated, this will also make a positive effect on the intention. These results indicate that accounting and finance students are ready to accept the new technological advancements in IoT and implement it to their prospective jobs.

Internet of things (IoT) technology has a wide range of use within industrial practitioners and academic researchers. Today, the importance of internet of things is increasing day by day. Each day new types of IoT enabled devices take their place in the market.

Results of this study indicate that between accounting and finance students, perception on ease of use and usefulness have a positive impact on their intention to use the technology. Cooperation in the design of the technology positively affects its usefulness perception. Ease of use perception has also a positive effect of the usefulness perception.

Financial technologies, IoT and AI integration and collaboration in many disciplines will create more accurate and faster jobs and reduce all types of costs by controlling production, maintenance, logistics and many other business functions. The customer satisfaction and loyalty will be positively affected by these advancements. Finance and accounting, which are the two main functions of businesses, will be changed forever with the help of IoT. Therefore, understanding the readiness level of the future users and managers is very important. Analyzing their technology acceptance in IoT gives this study a high level of importance.

Primary limitation of the study is its coverage of only two business disciplines: accounting and finance. Second limitation of the study is its research universe and sample. The study only covers future potential corporate IoT users and managers: accounting and finance students.

In the future researches and studies, researchers and professionals may study different business functions or different areas of IoT use. Also for further researches, different variables like Artificial Intelligence can be added. Both researchers and practitioners in accounting and finance disciplines should give greater importance to IoT to be able to benefit from its unexplored opportunities.

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THE IMPACT OF DIGITALIZATION ON THE AUDIT PROFESSION: A REVIEW OF TURKISH INDEPENDENT AUDIT FIRMS

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ABSTRACT

Purpose - The aim of exploratory study is to increase the understanding of the effects digitalization has on the tools and working methods of the audit profession.

Methodology - Websites of 235 audit firms authorized by POA (Public Oversight, Accounting and Auditing Standards Authority) were examined. In addition, transparency reports of 64 companies authorized for Public Interest Entity (PIE) Audit were investigated as well. The status of the services provided by the audit companies after the technological developments were analyzed. In addition, infrastructure and continuous education investments of audit firms related to digitalization have been determined.

Findings- It has been found that almost all audit companies provide services for independent audit and tax audit. (Respectively 95% and 85%). These are followed by financial services and internal audit issues. (Respectively 61% and 45%). Only Big Four invest the necessary infrastructure and human resources in addition to providing services in these matters. In spite of all these technological developments, only 24 companies provide education to their employees for IT / IT audits. Only Big Four provide education for digital technologies to their employees.

Conclusion- As a result, with the effect of digitalization, Information technologies have gained importance. But the audit firms have not yet made the necessary investment in these areas. 90% of audit firms do not provide services in these areas and do not make infrastructure and human resources investments.

Keywords: Digitalization, information technologies, accounting, audit, auditing firms.
JEL Codes: M40, M41, M42

1. INTRODUCTION

An independent audit is an examination of the financial records, accounts, business transactions, accounting practices by an "independent" auditor. According to Flint (1988) the original purpose of auditing was to find out if certain duties were met honestly, with properness and in accordance with regulations and specific instructions. Companies prepare their financial statements in accordance with a framework of generally accepted accounting principles (GAAP) relevant to their country, also referred as accounting standards or financial reporting standards. Auditing can be seen as a special kind of examination that is a part of securing accountability, performed by a person other than the parties involved.

For as long as humans have existed, there has been technological development. During the recent years, the development of technology and digitalization have led to the globalization of business world especially accounting profession. It is important to realize how the accounting and audit profession is affected by technology and digitalization.

What impact digitalization will have on the audit profession is unknown, in that it is still a growing event. However, in the report prepared by FAR (2016), they anticipate that the automation and digitization of the accounting field will bring about structural

changes that will have a profound impact on the entire audit profession. FAR (2016) insists that further development is necessary, but "One thing we know for certain is that our time is not close to what the future will be" (FAR, 2016).

In recent years, digitization has been seen as one of the most important events that will have a major impact on the audit profession and will lead to changes. In this study, current status of the audit profession in Turkey will be examined. In addition, the effect of digitalization on the audit profession will be determined.

1.1. Digitalization

As companies move towards digital business models, more and more data are being exchanged between organizations, partners and customers. Digital information, the source of life for today's interconnected ecosystems, is becoming increasingly valuable for companies. In today's golden age of digitalization; data, data review and data audit are important challenges to accounting and audit profession. Developments in digitalization and information technologies will lead to changes in the accounting and auditing profession. In particular, the services and professional practices provided by audit firms will reshape with the effect of these changes.

This part of the study, artificial intelligence, big data, blockchain and cyber security issues which are very important in digitalization and information technologies are discussed. These issues are explained conceptually and their effects on the accounting and auditing profession are summarized.

1.1.1 Artificial intelligence

Artificial intelligence (AI) is defined as: intelligence exhibited by machines. In computer science, an ideal ''intelligent'' machine is a flexible rational agent that perceives its environment and takes actions that maximize its chance of success at some goal. Generally, the term ''artificial intelligence'' is applied when a machine mimics ''cognitive'' functions that humans associate with other human minds, such as ''learning'' and ''problem solving.'' (Issa, H. et. al, 2016).

AI is currently being implemented in a variety of areas, including vehicle-free, home energy systems and investment portfolio management. Accounting and auditing will also be affected. The effects of artificial intelligence on the audit profession can be summarized as follows: (E&Y, 2018)

- Machine learning can be used to automatically record accounting transactions.
- Creating models based on advanced machine learning auditors can also improve fraud detection.
- AI can analyze unstructured data such as emails, social media broadcasts, and conference call audio files.
- AI will help auditors optimize their time, enabling them to use their human judgment to analyze a broader and deeper set of data and documents.

1.1.2. Big Data and Data Analytics

Big data refers to datasets whose size is beyond the ability of typical database software tools to capture, store, manage, and analyze. (McKinsey, 2011). More importantly, for auditors, data in big data means the collection of multiple types of data that may include a mix of traditional structured financial and non-financial data, logistics data, sensor data, emails, phone calls, and social media data, blogs, as well as other internal and external data. The traditional focus of auditors on transactional data, and therefore a particularly relevant content definition of big data in the audit context, is taken by Connolly (2012) as the starting point for transactions: (Alles et. al, 2015)

Big Data = Transactions + Interactions + Observations

Big data provides higher quality audit evidence and more relevant business insights. Big data and analytics enable auditors to better identify financial reporting, fraud and operational business risks, and adapt their approach to providing a more relevant audit. The automatic acquisition of data via sensors, RFID (Radio Frequency recognition) and GPS data streams allows the addition of large number of sources of audit evidence. For example, instead of using methods such as LIFO and FIFO to determine inventory costs, the use of data from RFID or barcode systems, one of the big data sources, facilitates real-time monitoring of inventory costs. One of the big data elements is the capital markets files, e-mails, web pages, social media and media news. These data are tools that contribute to the evaluation and improvement of processing performance. (Aslan and Özerhan, 2017).

1.1.3. Blockchain

A block chain or blockchain is a distributed database that maintains a continuously growing list of data records that are hardened against tampering and revision, even by operators of the data store's nodes. (Fanning and Center, 2016). The

blockchain, which started to spread since 2008, is developing rapidly in a structure that has the opportunity to transform and destroy many sectors. Especially in recent years, blockchain technology has gone beyond Bitcoin and has become a controversial concept in many business areas. However, since blockchain technology is a continuously developing field, it is known that it is not yet possible to fully demonstrate its effects at the business level. (Uçma and Kurt, 2018)

Blockchain technology offers users advantages at various points. The blockchain records the transactions performed by all participants in a single book and enables this service to be performed without centralized transaction processes. Since each blockchain stores copies of previous operations within the chain, it is also possible to reach each one retrospectively. (Deloitte, 2017). In particular, the absence of a central authority or administration control ensures that all changes are viewed, approved and recorded by all users. The transparency of the system becomes even more important as it does not allow the elimination / deletion or modification of the transactions performed. (Ovenden, 2017). The blockchain allows to record actual transactions in almost real time. However, it eliminates the risk of payment or collection made by a user. A blockchain comprises a verifiable record of each process performed on the chain. This also prevents repetitive recording of the traceable element by the blockchain. Furthermore, the fact that transactions cannot be altered or intervened after recording has increased the fair presentation of the data produced by the system. (Deloitte, 2017).

1.1.4. Cybersecurity

The concept of cybersecurity refers to measures taken to protect company data held on computer-based systems from the risks of loss, damage, unauthorized access and misuse of unauthorized persons. As explained in IIA's manual called '2016 Global Perspectives and Understanding: Internal Audit as a Trusted Cyber Advisor' "Cybersecurity should be addressed in a holistic manner and systematically in all institutions because the inability of an institution to provide cybersecurity can lead to inadequacy to carry out its most basic activities, loss of intellectual property rights, and even great damage to its reputation." (IIA, 2016). Governments across the globe have come to realize that cybersecurity is increasingly important not only for public sector institutions, military institutions and critical national substructure organizations, but also for private sector companies. Besides that, cybersecurity is a technology related and business related risk. Cyber-attacks for both the private and public companies in many different sectors are the most common and greatest risks that these companies face today. Cybersecurity violations may affect;

• financial systems and assets through misuse, theft and extortion

• intellectual property rights and business secrets through spying

• the brand and internet assets through defamation, accusation and disclosure of secrets

• business continuity through sabotage and interruption of operations.

Digital transformation requires the business world to make significant investments in cybersecurity. In addition, the specialization of internal auditors in the field of cybersecurity will contribute significantly to the objectives of internal audit in terms of adding value to the enterprises and protecting the business assets against all kinds of damages. The challenge of keeping up with the rapid evolution of digital technologies and the need for expertise raise awareness about cybersecurity and make creation of necessary substructure vital in developing countries which have sensitive economic balance like Turkey.

1.1.5. Cloud Computing

Essentially, cloud computing is a kind of outsourcing of computer programs. Cloud computing is rooted in search engine platform design. There are 5 major technical characteristics of cloud computing: (1) large scale computing resources (2) high scalability & elastic (3) shared resource pool (virtualized and physical resource) (4) dynamic resource scheduling and (5) general purpose. (Qian et al., 2009).

As in many other fields, it is seen that cloud computing is increasingly used in accounting and auditing. Cloud computing has many effects and contributions to the accounting and auditing profession.

With the use of cloud-based accounting software, especially professionals can work independently from time and space and can access all kinds of information over the internet to serve customers faster and reach more customers. Customer or user can be defined to the system without paying additional license fee. also, there is no additional charge for software updates. This significantly reduces costs. Since the accounting data entered in the cloud systems are continuously recorded as multiple copies in the headquarters of the service provider and in the backup units outside the center, the company also protects against data loss caused by a negative event (natural disaster or malicious initiatives). Costs for backup are also prevented. Legal documents that need to be sent to public institutions are easily sent over the cloud system. (Öz, 2016)

2. LITERATURE REVIEW

Kiesow et al. (2014) developed Continuous Auditing (CA) approach to cover the requirements to AIS in Big Data Computing Environments in their study. Since, the implementation of CA is a recognized challenge among researchers and practitioners, and traditional audit tools and techniques neglect the potential of Big Data Analytics, they strived for the development of appropriate computer-assisted audit tools and techniques (CAATTs). Therefore, they analyzed established CAATTs considering the dimensions of the Big Data paradigm in their research. To do so, they analyzed relevant literature and viewpoints of occupational organizations. They proposed a model for the integrated audit approach.

Alles and Gray (2015) aim to provide a balanced discussion of both the pros and the cons regarding incorporating Big Data into financial statement audits; and present a research agenda to identify specific aspects of Big Data that could benefit auditors.

Issa et al. (2016) propose various areas of AI-related research to examine where this emerging technology is most promising. Moreover, the paper raises a series of methodological and evolutionary research questions aiming to study the AI-driven transformation of today's world of audit into the assurance of the future.

Aslan and Özerhan (2017) reveal definition of Big Data, opportunities, challenges, accounting practices and its effects on accounting profession. According to the demographic factors, the perspectives of professional accountants operating in Turkey have been determined through a questionnaire about the impact of Big Data on accounting profession in next 10 years. The questionnaire was applied to 790 professional accountants and 740 valid questionnaires were taken into consideration. According to the results, accounting profession have different views about the effects of the BIG DATA on accounting profession over the next 10 years according to the demographic variables such as generation, gender, professional experience, place of residence, graduated faculty and working styles.

Karlsen and Wallberg (2017) aim to increase the understanding of the effects digitalization has on the tools and working methods of the audit profession. This is achieved through 14 semi-structured interviews with practicing auditors, where emphasis is put on interpretation. Conclusions drawn are that the effect on the auditors' working methods are more prominent than on the tools, due to paperless working methods and increased flexibility. Unlike previous research, this study also discovers an increasing effect – education. Thereby, education is underlined as important among auditors, where institutions also have to develop available education to the new competence needed.

Turker (2018) explains the developments and studies on shaping the global accounting profession to meet the expectations of the global business world according to the digital world.

Sabillon, R et al. (2017) examined the best practices and methodologies of global leaders in the cybersecurity assurance and audit arena. The article presents an original and comprehensive cybersecurity audit model as a proposal to be utilized for conducting cybersecurity audits in organizations and Nation States. The Cybersecurity Audit Model (CSAM) evaluates and validates audit, preventive, forensic and detective controls for all organizational functional areas. They tested, implemented and validated CSAM along with the Cybersecurity Awareness Training Model (CATRAM) in a Canadian higher education institution.

Uçma and Kurt (2018) discuss innovations brought by block-chain technology into the field of accounting and control. Then the study addresses the necessity of preparing professional members' future record keeping system on the basis of block-chain technology. Thus, the study draws attention to block-chain-based accounting and auditing practices and explains the professional qualification requirements that each member of the profession shapes in response to this innovation.

3. DATA AND METHODOLOGY

The aim of exploratory study is to increase the understanding of the effects digitalization has on the tools and working methods of the audit profession. For this purpose, websites of 235 audit firms authorized by POA (Public Oversight, Accounting and Auditing Standards Authority) were examined. In addition, transparency reports of 64 companies authorized for Public Interest Entity (PIE) Audit were investigated as well.

The status of the services provided by the audit companies after the technological developments were analyzed. In addition, infrastructure and continuous education investments of audit firms related to digitalization have been determined.

The sample we used consists of the 235 of the 273 audit firms (38 firms' web sites could not be reached) which are listed in POA's web site. The distribution of 235 companies by cities and authorization information of the firms are shown:

Table 1: Distribution of Audit Companies by Cities

Cities	# Of Audit Firm	Cities	# Of Audit Firm
İstanbul	132	Adana	1
Ankara	38	Denizli	1
İzmir	18	Elazığ	1
Bursa	13	Eskişehir	1
Antalya	8	Kocaeli	1
Gaziantep	7	Kütahya	1
Kayseri	3	Malatya	1
Samsun	3	Manisa	1
Şanlıurfa	2	Mersin	1
Sakarya	1	Tekirdağ	1

According to Table 1, There are 20 different cities where audit firms locate. Most of the audit firms operate in Istanbul (132 firms). Istanbul is followed by Ankara and Izmir (respectively 38, 18 firms).

Table 2: Authorizations of Audit Companies

Authorization	# of Audit firm
Basic Audit Power	115
Audit Power on PIE's Additionally Excluding Insurance Etc.	64
Audit Power on PIE's Additionally	56
Total	**235**

As shown in Table 2, 115 audit firms have only basic audit power. 64 of the other 120 companies have Audit Power on PIE's Additionally Excluding Insurance Etc. and rest of the firms have Audit Power on PIE's Additionally.

4. FINDINGS AND DISCUSSIONS

Initially, to analyze the effects of digitalization on audit profession and services 235 companies' website disclosure were examined and services provided by firms detected.

Table 3: Services Provided by Audit Firms

Services	# of Audit Firms
Independent Audit	227
Tax Audit	202
Corporate Finance/Financial Services	145
Internal Audit/Internal Control	106
Risk Management	42
Digitalization/Information Technologies	24
Other	67

As shown in the table above, unsurprisingly almost all of the firms provide independent audit and tax audit. At the same time, more than half of the companies perform advisory services in corporate finance and internal audit issues. Only 24 firms have services about Digitalization/Information Technologies. Approximately 90 percent of the sample have no disclosure about Digitalization/Information Technologies services.

Table 4: Digitalization/ Information Technology Services Provided by Firms

Services	# of Audit Firms
IT Audit	20
Cyber Security	13

Big data/Data Analytics	8
Digitalization	7
Artificial Intelligence	5
Blockhain	5
Cloud Computing	5
ERP	5
IoT	1
Robotic Process Automation	1
Social Media Audit	1

When the disclosures of the companies providing services on digitalization issues are examined, it is seen that IT audit and cyber security are the leading services. Big four provide services about promising and developing digitalization issues which are big data, AI, Blockchain, Cloud Computing and ERP. And also they disclose infrastructure investments about these topics.

In order to find out the effect of digitalization on the continuing education of audit professionals, the disclosures and transparency reports of firms were examined. The results of the examination of the transparency reports of 64 companies authorized for Public Administration (PIE) Audit are presented in table 5.

Table 5: Continuing Education Topics

Continuing Education	# of Audit Firms
Accounting/Financial Statements	58
IFRS	42
Tax	42
Auditing Standards	35
IT/IT Audit	24
Communication	21
Ethics	19
Money & Banking	19
Corporate Governance	18
Risk Management	17
Financial Law	11
Digitalization	4
Team Work	2
Other	21

Most audit firms preferred to provide education to their employees on accounting/financial statements, IFRS and tax issues. 24 firms provide education about IT/IT audit topics. Only big four provides education about digitalization topics which are big data/data analytics, artificial intelligence, blockhain, cloud computing, cyber security.

5. CONCLUSION

In this study websites of 235 audit firms authorized by POA and transparency reports of 64 companies authorized for PIE audit were investigated to determine current situation of effects digitalization has on the tools and working methods of the audit profession.

It has been concluded that almost all audit companies provide services for independent audit and tax audit. (Respectively 95% and 85%). These are followed by financial services and internal audit issues. (Respectively 61% and 45%).

Only Big Four invest the necessary infrastructure and human resources in addition to providing services in these matters. In spite of all these technological developments, only 24 companies provide education to their employees for IT / IT audits. Only Big Four provide education for digital technologies to their employees.

As a result, with the effect of digitalization, Information technologies have gained importance. But the audit firms have not yet made the necessary investment in these areas. 90% of audit firms do not provide services in these areas and do not make infrastructure and human resources investments. These audit firms are mainly focused on tax audit. The majority of customers are SMEs. It is quite natural that Big Four, which audit larger companies, make investments and services in these areas.

For further part of the study, the survey will be conducted to auditors to determine the effect of Digitalization on the audit profession.

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IT GOVERNANCE IN THE REAL ESTATE INDUSTRY: A FRAMEWORK SUGGESTION

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ABSTRACT

Purpose - Information technology is the core issue that all the companies need to re-evaluate and re-organize to adapt themselves to the digital world. This study investigates the critical IT governance factors for effective and sustainable success and the growth of real estate investment companies and developing a new IT governance framework.

Methodology - The common literature about IT governance is searched and by taking into consideration of the dynamics of the industry, the conceptual framework is developed for specifically real estate industry.

Findings- The model developed is suggesting the corporate cultures, organizational structures and industry culture as critical IT governance (ITG) existence factors for the real estate industry. Effective IT tool selection and effective data flow and integration are also recommended as IT governance effectiveness parameters. Sustainable growth, asset utilization, cost-effectiveness, and business flexibility are evaluated as the positive and successful business outcomes of ITG effectiveness in the real estate industry.

Conclusion- Based on the researches made in past studies, this research seems to be the first in the literature that develops an IT governance framework for real estate investment companies in emerging economies.

Keywords: Real estate IT governance, corporate governance, sustainability, corporate culture.
JEL Codes: O16, O33, L85

1. INTRODUCTION

Real estate and construction are important sectors in the economy, employing large amounts of capital and significant proportions of the workforce (Kummerow and Chan Lun, 2005). Since real estate investment decisions are closely related to external factors such as political stability, economic development and legal regulations, the developments of the real estate companies in developing countries such as Turkey, Russia, Indonesia seem cyclical and fragile due to the unstable political situation the countries face and negative effects on the emerging economies and the lack of sufficient legal laws and regulations currently effective. In addition to external factors, internal dynamics such as the corporate cultures, organizational structures, financial situations and the decision-making processes of the companies are important for the sustainable growth of real estate companies.

In this context, in order to carry their businesses to the next generations, the real estate investment companies in emerging economies need to take important steps such as understanding the changing market dynamics and needs, utilizing their assets efficiently, managing their resources effectively, reducing and managing their costs, increasing their flexibility to react to rapidly changing conditions, and making the right decisions to grow sustainably.

Real estate decisions depend upon the land use regulations, financial institutions, legal contracts, and cultural preferences. Most of the industry, however, still think in terms of getting insider advantages and profiting from cycles. Nevertheless, transparency and market efficiency would reduce risks and therefore reduce costs of capital and thus allow for stronger long-term growth—more projects, steadier employment, fewer bankruptcies, and milder recessions. Information technology provides the required tools for implementing such changes. Meanwhile, various applications of ICT are changing the way firms do business in various branches of the real estate industry and delivering substantial productivity gains (Kummerow and Chan Lun, 2005).

IT governance, which is defined as a subset discipline of corporate governance, focuses on information technology (IT) and its performance and risk management. The interest in IT governance is focusing on value creation efforts for an organization's strategic objectives and managing the performance of those who are responsible for creating the value of all stakeholders better.

In this research, the major factors that verify the existence of IT governance in companies are analyzed, and by taking into consideration the nature and dynamics of the sector new determinants for both ITG existence and factors for effective, sustainable success and growth of the real estate investment companies (REICs) are suggested.

2. LITERATURE REVIEW

2.1. Corporate Governance vs IT Governance

Information Technology Governance (ITG) is commonly referred to as a subset of Corporate Governance (CG). Information Technology (IT) has been used in large organizations since the 1950s or 1960s, for internal and for external purposes. This pervasive use of technology has created a critical dependency on IT that calls for a specific focus on IT Governance. (Almeida, 2013). The term ITG was first used in academic literature in the early 1990s, although similar phenomena had been studied for some time. Since then, research has produced various definitions of ITG, leading to a lack of clarity concerning the meaning of the term. (Buchwald and Urbach, 2013). Before I go through the details of ITG, I will briefly define corporate governance in order to clearly draw the line between CG and ITG.

Corporate governance is the set of processes, customs, policies, laws, management practices and institutions affecting the way an entity is controlled and managed. It incorporates all the relationships among the many stakeholders involved and aims to organize them to meet the goals of the organization in the most effective and efficient manner possible. An effective corporate governance strategy allows an organization to manage all aspects of its business in order to meet its objectives.

On the other hand, Weill and Ross (2004) define IT governance as specifying the decision rights and accountability framework to encourage desirable behavior in the use of IT. They identify three questions that must be addressed to achieve effective IT governance: 1. What decisions must be made to ensure effective management and use of IT? 2. Who should make these decisions? 3. How will these decisions be made and monitored? (Diamond, 2005)

While corporate governance is concerned with board roles, board composition, board characteristics, board, and organizational structure and processes in order to develop, implement and monitor corporate strategy, similarly, but at one level below, IT governance concentrates on the structure of relationship and processes to develop, direct and control IT resources in order to achieve enterprise's goals through value-adding contributions, which account for balancing risk versus return over IT resources and its processes. (Diamond, 2005).

In literature, there are some studies that focus on the corporate governance of real estate companies. According to Bauer et. Al (2010), since the real estate investment trusts (REITs) reduce agency problems by leaving little free cash flow management, they have a good corporate governance mechanism which results in a better performance. Hartzell et.al (2006) investigated the relation between firms' investment choices and various governance mechanisms of real estate investment trusts (REITs), and they found a link between the corporate governance structures of those companies and their investment expenditures. Kohl and Schaefers (2012) investigated the effects of corporate governance mechanisms on the market valuation of publicly traded real estate companies in the UK, France, the Netherlands and Germany and the results of their analysis exhibited that corporate governance is affecting the strategic decisions of the top managers as well as investors. Hartzell et. All (2008) analyzed the impact of corporate governance structures on the public offering (IPO) date and their study showed that higher IPO valuations and better long-term performance come with stronger governance structures. Another interesting study was conducted by Piecholtz et al (2011) which analyzed the relation between corporate governance and the performance of listed property companies in the U.S. by evaluating the before and after global economic crisis, and their results exhibited that while the performance of REITs was affected from the structure of the corporate governance after the crisis, the firm-level corporate governance did not affect the performance of equity real estate investments before the crisis.

2.2. Need for IT Governance

Focusing on avoiding any type of risk and uncertain situations is critical for the real estate industry. Thus, implementing IT governance is vital for organizations in order to manage and mitigate risks (Saetang and Haider, 2014). Weill and Ross (2004) exhibited at least a 20 percent better return on IT investment when effective IT governance is in place. Companies need ITG in order to, reduce the cost of day-to-day operations, improve overall operational efficiency and consistency, free more resources

for strategic initiatives that improve competitiveness, choose those initiatives far more wisely, working on the right things, not the wrong things, bring those initiatives to market faster with less risk and bring IT into close alignment with business priorities

A company needs and IT governance for the reasons mentioned above, but what should IT governance cover to be more effective? National Computer Center published IT Governance, Developing a Successful Governing Strategy-Best Practice Guide for Decision Makers in IT in 2005. According to this guide, IT Governance is defined as an evolving process that is not just an IT issue or only of interest to the IT function. In its broadest sense, it is a part of the overall governance of an entity, but with a specific focus on improving the management and control of Information Technology for the benefit of the primary stakeholders. Ultimately it is the responsibility of the Board of Directors to ensure that IT along with other critical activities are adequately governed. Although the principles are not new, actual implementation requires new thinking because of the special nature of IT.

IT Governance spans the culture, organization, policy, and practices that provide for IT management and control across five key areas:

Strategic Alignment – Provide for the strategic direction of IT and the alignment of IT and the business with respect to services and projects. ***Value Delivery*** – Confirm that the IT/Business organization is designed to drive maximum business value from IT. Oversee the delivery of value by IT to the business and assess ROI. ***Risk Management*** – Ascertain that processes are in place to ensure that risks have been adequately managed. Include an assessment of the risk aspects of IT investments. ***Resource Management*** – Provide high-level direction for sourcing and use of IT resources. Oversee the aggregate funding of IT at the enterprise level. Ensure there is adequate IT capability and infrastructure to support current and expected future business requirements. ***Performance Measurement*** – Verify strategic compliance, i.e. achievement of strategic IT objectives. Review the measurement of IT performance and the contribution of IT to the business (i.e. delivery of promised business value).

IT Governance is not a one-time exercise or something achieved by a mandate or setting of rules. It requires a commitment from the top of the organization to instill a better way of dealing with the management and control of IT. IT Governance is an ongoing activity that requires a continuous improvement mentality and responsiveness to the fast-changing IT environment. IT Governance can be integrated within a wider Enterprise Governance approach which supports the increasing legal and regulatory requirements of Corporate Governance.

The National Computer Center Guide (2005) focuses on 12 key topics selected by the group because of their importance to effective IT governance:

The business case – because the organization needs to understand the value proposition,

- Performance measurement – to answer the question “Is the ship “on course”?”,
- Implementation roadmap – to draw the path to follow,
- Communications – to explain the objectives and change the culture,
- Capability assessment – to find out the true current state of IT governance,
- Risk management – to find out the existing risks and to make sure they are dealt with,
- Supplier governance – to include the external parties which play a big role,
- IT and audit working together – to co-operate for a common goal,
- Information security – use it as a key topic in today’s networked environment,
- Legal and regulatory aspects –because compliance is a global concern,
- Architectures – for effective technical solutions
- Managing investments – to ensure that value is delivered and benefits realized.

Those key topics or their derivatives were evaluated in different studies. On the basis of conceptual considerations, Guldentops (2004) presents five key success factors for IT control and governance focused on establishing appropriate IT structures and processes, as well as aligning business and IT in strategy and operations. Weill (2004) suggested eight critical success factors when assessing and implementing ITG. Transparency of the IT decisions, the simplicity of the governance arrangements and whether the incentive and reward systems are aligned are some of those factors. According to Ali and Green (2005), the significant positive relationships between ITG effectiveness and ITG mechanisms are; the IT strategy committee, senior management involvement, a culture of compliance and the corporate communication systems. Nfuka and Rusu (2010) analyzed the critical success factors for effective ITG in Tanzanian public sector organizations and found 11 factors and tested them in 2011. Some of those factors are; IT leadership, senior management support, IT/Business communication partnership, key stakeholder engagement, alignment of IT and corporate strategy, consolidation of IT structures, well-communicated IT strategies and policies, defining and tracking of benefits. They classified these factors under 4 main categories: Strategic

Alignment, Value Delivery/Risk Management, Resource Management, and Performance Management, as categorized in the Best Practice Guide for Decision Makers published by National Computer Center.

Buchwald and Urbach (2013), categorized comprehensibility and adequateness of regulations, persuasive of communication, top management commitment, financial and HR support, integration of business and IT perspectives and IT staff's business orientation as IT governance success determinants, increase in transparency and business/IT alignment as impact factors and increase in efficiency as the goal factor.

2.3. The Framework Developed

The size, the focus area and the location of the company are the major factors that shape the organizational structures of real estate investment companies. Some small companies may not need some of the departments, yet in some companies, some departments may be merged or even separated. A real estate company organization should be structured by including the following departments; a strategic planning department where long-terms strategies are set and the road map is prepared, a real estate development department where the projects to invest are selected and the feasibility studies are conducted, a project development department where detailed designs are developed, a construction project management department where the projects are professionally managed in accordance with the international project management standards, a projects control department where the progress of the projects together with the comparison of the planned and actual works are monitored, an asset management department, where all the assets are managed by following standard company rules and procedures. Accounting and finance, sales and marketing, leasing, corporate communication, risk management and internal audit, investor relations, human resources, legal affairs, administrative affairs and information technology are the other major departments a large size real estate investment company needs to have.

Among those departments, there are important decisions that are directly or indirectly related to IT governance and processes. Land selections, alternative feasibility studies, go/no-do decisions, bidding strategies, procurement strategies, contracts and document management, buy-rent decisions, stock and asset management, planning, time and cost control, progress payment control, payment audit, risk analysis, payment tracking, invoicing, cost-income analysis, customer relations, occupancy and vacancy rates, investor relations, annual reports, investor presentations, press relations and internal communications are the main issues that IT governance and processes affect.

The internal and multidisciplinary relations of those departments are very important success factors of real estate investment companies. The more data is transferred among departments on time and accurately, the more companies have control over business issues as well as have strong decision-making processes.

The major IT success and effectiveness factors for IT governance studied in previous researches were evaluated as IT governance existence factors in REIC's, because there is not any previous study that has tested those factors yet in the real estate industry. In addition to those factors, three new factors added by taking into consideration the specific conditions of the industry and classified below:

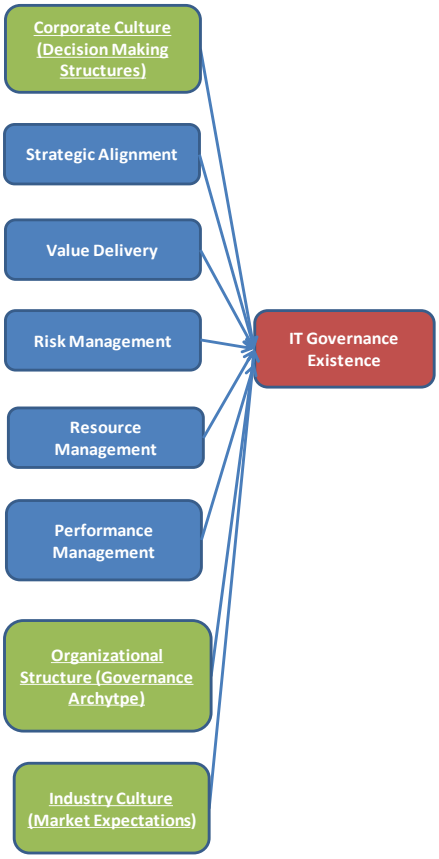
- Strategic Alignment
- Value Delivery
- Risk Management
- Resource Management
- Performance Measurement
- **Industry Culture (Market Expectations) – newly suggested**
- **Corporate Culture (Decision-Making Processes) – newly suggested**
- **Organizational Structure (Governance Archetypes) – newly suggested**

Figure 1 shows the parameters of the IT governance existence, together with the newly suggested factors in the model proposed. The real estate industry is different from manufacturing industries because of the uniqueness of each project and it is affected by many external conditions such as politics, economic conditions, legal regulations, environmental and soil conditions and even the historical background of the cities. These conditions push REIC's to shape their corporate governance as well as their IT governance. The rules, regulations, and laws related to the industry can be classified under this factor.

Corporate culture is another important parameter that affects IT governance in a real estate company because the institutionalization level of the sector is far behind the other industries and the decision-making processes are mostly dependent on the owner-boss of the company which directly affects the IT governance processes and procedures. Top management participation, commitment, support, and contribution can be listed under this parameter.

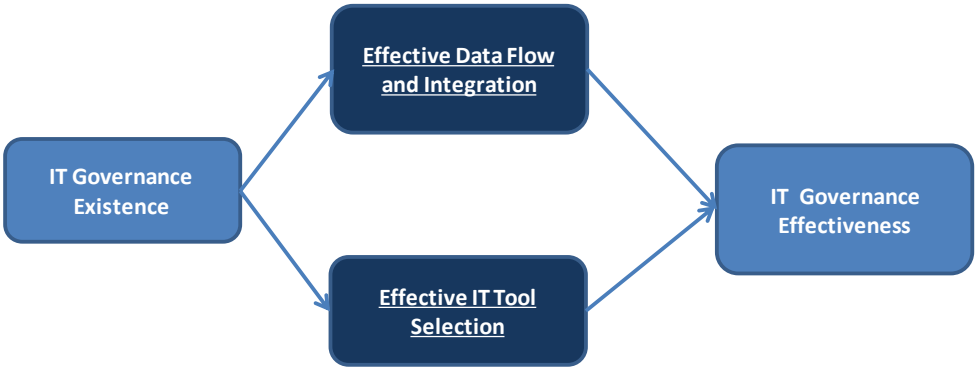
The third newly suggested factor for IT governance existence is organizational structure, which is focused on the governance archetypes defined by Weill and Ross (2004). The existence of the IT steering committee, the HR support, and employee fit, financial support can be categorized under this factor.

Figure 1: The IT Governance Existence Parameters (The National Computer Center Guide (2005), 3 Newly Parameters Suggested



After discussing the parameters of IT governance existence, it is critical to find the way how to reach ITG effectiveness. In that context, effective data flow and integration and effective tool selection are suggested as shown in Figure 2. Even though the companies have all the required IT governance processes and procedures, ITG won't be effective if they do not select the appropriate IT tools that allow the departments mentioned above to have a smooth and effective data flow and integration, because the success of real estate companies is directly linked to having the right data in the right time to make the right decision. The question is how can we measure the ITG effectiveness in the real estate industry? What are the outcomes of effective IT governance? The selection of effective IT tools and effective data flow and integration should have positive consequences. Sustainable growth helps companies to survive, make profits and carry themselves to future generations successfully. Asset utilization helps companies to use the right asset at the right time and in the right area. Cost-Effectiveness helps them to manage and control their costs and as a result their profits. Business flexibility which enables them to react positively against the changing market and industry conditions can be listed as the main consequences. (Weill and Ross (2004))

Figure 2: IT Governance Effectiveness Parameters



4. DISCUSSIONS

4.1. IT Governance Existence

In this study, the corporate culture is considered as decision-making structure and evaluated as an important indicator for ITG existence, but because of the nature of the industry which is far from making decisions through IT steering committees, the company owner based corporate culture of the RIEC's may negatively affect the ITG existence. The more professional the companies become, the more corporate culture may affect the ITG positively.

The organizational structure is discussed as governance archetypes and was considered as an important parameter for ITG existence but since the institutional level of the industry is far below the other industries, as in the corporate culture case, the ITG existence may negatively be affected from the organizational structure.

The culture of the real estate industry which is one of the largest industries in emerging countries is taken as a market expectation in the study and its current and future perspective seems to have a positive effect on ITG existence in the real estate industry.

Strategic alignment, value delivery, risk management, resource management, performance measurement parameters where the National Computer Center Guide (2005) suggests for the ITG existence are accepted as the having a positive outcome for real estate industry, yet the real effects of these factors are also be needed to be tested together with the newly introduced factors.

4.2. IT Governance Effectiveness

Effective IS/IT governance needs to provide a mechanism that enables IS/IT managers and suppliers to develop integrated business and IS/IT plans. (Kakabedse and Kakabedse, 2001). There are many phases in the real estate industry that include land selection, design development, construction, and post-construction. In each phase, there is important data to be transferred from one department to another one. The more companies have accurate and integrated data, the more they have effectiveness in their governance and decision processes.

4.3. Business Outcomes

All the IT governance existence and effectiveness have one purpose: Successful business outcomes. These outcomes are categorized as sustainable growth, asset utilization, cost-effectiveness and business flexibility by Weill and Ross (2004).

There is a hard competition in the real estate markets in developing countries, and there are many companies that fail due to wrong investment decisions, lack of cost control and management, inefficient resource and asset management. IT effectiveness helps the companies to track their assets and resources more effective, through efficient data flow and integration, the

companies may shape their policies and reactions to the dynamic conditions of the market and will be one step further compared to other companies which do not have such effective IT governances.

5. CONCLUSION

For many organizations, Information Technology (IT) enabled business initiatives and IT infrastructures constitute major investments that, if not managed properly, may impair rather than enhance the organization's competitive position. (Bowen et al. 2007)

In the past literature, there are many studies that focused on generally on IT governance success and effectiveness. There are also some researches on ITG in developing countries such as the Nfuku and Rusu made in 2010 and 2011, but unfortunately, there are very few studies that examine the information systems in real estate industry, yet there are no published researches that study the IT Governance effectiveness of real estate investment companies in developing countries.

For this reason, in this study, the IT governance existence and effectiveness factors which may lead the REIC's in emerging economies to successful business operations are studied and IT governance as a subset discipline of corporate governance is evaluated and the main parameters that test the existence of IT governance in companies were investigated. By taking into consideration the nature and dynamics of the sector, new determinants for effective, sustainable success and growth of the real estate investment companies (REIC's) were suggested.

In this study, strategic alignment, value delivery, risk management, resource management and performance measurement which was evaluated as ITG success factors in previous studies are considered as ITG existence parameters, because their successes have not been tested for the real estate investment companies yet. Even though they are not tested in any previous studies these first five factors were accepted as verified IT governance existence factors in the real estate industry, so these five factors should also be tested in further studies whether they verify the ITG existence or not. Moreover, the two-parameter that is suggested for ITG effectiveness; effective IT tool selection and effective data flow and integration, should be examined in detail, and the possible tools and programs may be suggested. The organizational structures of the real estate companies and their background before being established as REIC's should also be examined and the size of the companies should also be taken into consideration as a factor while studying the ITG effectiveness.

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RISK MANAGEMENT IMPROVEMENT DRIVERS FOR EFFECTIVE RISK-BASED DECISION-MAKING

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ABSTRACT

Purpose - Most managers are not satisfied with the operations risk management tools they have got in their companies. This article addresses risk management enhancement within integrated risk informed decision-making.
Methodology - Three distinct and independent methods were used to analyze current practices and to find a solution: A) literature review, B) brainstorming, and C) structured interviews, achieving three lists of parameters that are integrated by using semantic technics and concept theory.
Findings - The result is a list of 66 risk assessment requirements which are going to be the success key for any new risk management system trying to fill the current gap. A new Risk Management solution is proposed fitting those requirements: The Visibility Factor method (Fv) and its risk summary method.
Conclusion - Risks should be managed in a better way and a list of key success factors and a concrete solution are provided to do it.

Keywords: Risk analysis, risk management, overall risk, methodology, risk system requirements.
JEL Codes: C63, D81, D83

1. INTRODUCTION

New articles arise every year proposing new methods, algorithms, and studies related to risk management; and new articles also talking about the lack of academic research, risk management models and systematization (Sanchez-Cazorla et al.; Rodney et al.; Zio; Mantovani et al.). Companies are reluctant to accept innovations and typically continue to use their old methods which frequently rely on intuition and subjective evaluations, sometimes biased because of short-term approaches (Serpella et al.; Bello and Odusami). The lack of quantitative methodologies that are easy-to-use, universally applicable, and yield a quantitative value for the overall risk could be the root of this problem.

Risk management is frequently intended for compliance and, for that reason, operations managers do not have efficient risk systems to make risk-based decisions. Current international projects are highly complex (Mishra and Mishra; Meulbroek; Institution of Civil Engineers and Institute and Faculty of Actuaries) and it makes it necessary to prioritize risks and seek the most effective way to inform boards of directors (AMRAE; ANRA; CEB Risk Management Leadership Council; EcoDa/IFC; EY; Hoyt and Liebenberg; International Organization for Standardization (ISO), "Risk Management - Risk Assessment Techniques"; Zurich Insurance Group). Project risk reports are usually very long, and they lack a simple summary showing what the project overall risk is. The information about risks has to be simple (Cretu et al.; International Organization for Standardization (ISO), "Risk Management - Guidelines."; Tsiga et al.) and it should be possible to express the overall risk of a scenario with its overall impact and likelihood and with its overall risk rate to help decision-makers to understand the overall risk situation (Tarantino-Curseri; Okan et al.).

2. LITERATURE REVIEW

When studying the articles published, several sources were considered (Web of Science, Scopus, Science Direct, Research Gate ASCE, Willey, and Google Scholar), reviewing more than 1,700 articles, theses, and books, of which 272 were used.

The articles studied stress the need to use risk indicators (Hamid and Kehinde; Renault and Agumba; Tanner and Hingorani; Tóth and Sebestyén) and overall ratings for decision-making (Murakami et al.). Many works present overall risk indicators devised for very specific scenarios (Orojloo et al.; Samantra et al., "Fuzzy Based Risk Assessment Module for Metropolitan Construction Project: An Empirical Study"; Shen et al.; West et al.); whereas others present methodologies that are probabilistic, fuzzy and multivariable (Cheng and Lu; Jung et al.); others apply neuronal networks (ANN) and multiple regression (Lam and Siwingwa; Lhee). Other works bring to light a lack of literature in complex scenarios and the difficulty that firms have when it comes to applying the sophisticated methods of scientific literature (Bromiley et al.; Deng and Smyth; Serpella et al.).

The most frequently used methodologies identify the risks and assess their impact and probability (or any other additional indicator) using Likert Scales (Likert). This qualitative assessment often turns into a semi-quantitative assessment, considering the product of the impact by its probability, hereinafter Risk Factor Fr (Alcocer-Yamanaka et al.). The value Fr makes it possible the comparison of a variety of risks among themselves. However, it is not very intuitive and has drawbacks owing to its lack of linearity and to the fact that it is the mean of a probabilistic distribution (Vegas-Fernández and Rodríguez-López). The sum total of the values of Fr for all the events analyzed (hereinafter, sum of products of probability times impact, SPTI) is considered the expected value of the project risk (Raftery), and it can either be regarded as an absolute value that measures the overall risk level, or it can be divided by the number of risk events to obtain the average Fr.

This practice is widespread (Zou et al.; Van Niekerk and Bekker; Rodney et al.; Carpio de los Pinos and González García) but it corresponds to the average value expected for a supposed Normal distribution of the overall risk value, which would require the applicability of the Central Limit Theorem (Raftery; Diekmann; Amade et al.); However, this theorem is not applicable to current projects because they do not fulfill the basic premises required by the theorem: a large number of independent (not correlated) risk events (>500) with no one component which contributes significantly (no Pareto effect) to the sum (Schuyler). As a result, the SPTI value is not suitable for estimating overall project risk or project risk cost (Vegas-Fernández and Rodríguez-López).

3. DATA AND METHODOLOGY

The aim of this study is to define the basic parameters to improve risk management within the integrated risk informed decision-making process. The result, a list with 66 ranked parameters, will help new risk management system definition to be successful.

A new indicator and a new method for estimating overall risk are presented as a possible response to the improvement parameters identified. This new system is simple and effective and it is intended to remove the traditional barriers that separate academic publications from customary practice (Taroun).

To make it consistent with the approaches of Aven (Aven) the research undertaken gives precedence to professional experience with international projects and the studying and reviewing of methods, theories, principles, and frameworks of application. With a view to this, 3 different techniques have been chosen among the techniques ISO 31010 proposes to identify risks and to assess solutions (International Organization for Standardization (ISO), "Risk Management - Risk Assessment Techniques"). In this study, they were used to obtain ranked lists of improvement ideas, which are integrated later on into a single ranked list. Integrating these techniques allows a final, reliable conclusion to be obtained (Fernández Sánchez; Hruškovič; Leceta Ostolaza; Pérez Soriano). These techniques are:

1, reviewing the available scientific literature. ISO 31010 and most authors use this information source to obtain qualitative information, but this study makes a deep study applying a method to obtain a quantitative outcome.

2, brainstorming. A means of collecting a broad set of ideas and evaluation, ranking them by a team. Brainstorming involves stimulating and encouraging free-flowing conversation amongst a group of knowledgeable people.

3, structured interviews. Individual interviewees are asked a set of prepared questions from a prompting sheet which encourages the interviewee to view a situation from a different perspective.

ISO 31010 proposes these techniques among others to identify risks and to assess solutions. In this study, they are used to obtain a ranked list of improvement ideas, which are integrated later on into a single ranked list.

4. EMPIRICAL FINDINGS

4.1. Literature Review

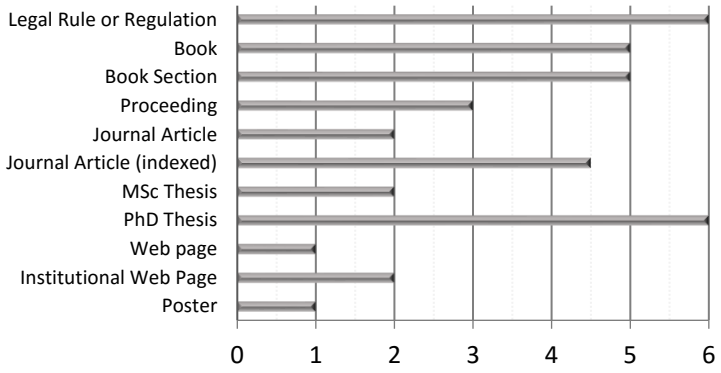
In the study conducted into the 272 references selected, the analysis of syntagmas (clauses or words) is used to identify the concepts sought, and their appearance is weighted using weights that consider the document type (standard or regulation, doctoral thesis, book, indexed journal, lecture source, unindexed journal, master thesis, website run by a renowned

organization and standard website). The date and their scope have also been considered by adding +0.5 in documents after 2009 and by subtracting 0.5 when they are intended for a specific activity or a particular country.

By adding for each concept the number of references that contains it times the reference weight, the outcome is a value that indicates the relevance of that concept in the references selected. The maximum value is 857 and corresponds to "decision-making". In order to check a possible Pareto behavior, an accumulated percentage is also obtained for each concept by dividing the sum of the accumulated values in a ranked list by the sum of all the values.

Figure 1 displays the distinct weights assigned to each type of document.

Figure 1: Publication Weights



The structured list of the characteristics studied is shown next, with their punctuation (Table 1). It is ranked according to the values, and the accumulated percentage is the sum of the own and previous concept values divided by the sum of values.

Table 1: Summary of Concepts Analyzed When Reviewing the Literature

Concept	Value	% accumulated
Decision-making	857	8%
Importance	665	14%
Uncertainty	556	20%
Subjectivity	549	25%
Quantify	533	30%
System	430	38%
Impact + Probability	420	42%
Key Risk Indicator (KRI)	415	46%
Final rating	379	50%
Overrun	356	53%
Bias	352	56%
ERM deficiencies	329	59%
Probabilistic	322	62%
Compare	288	65%
Contingency	279	68%
Correlation	278	70%
Strategy (integration)	259	73%
Overall risk	226	75%
Mitigation	219	77%
Attitude	199	79%
Fr	179	81%
Expected Value	169	82%
I / P Map	153	84%
Fuzzy	143	85%
Conf. level	136	86%
Simplicity	134	88%
Clear reports	134	89%
Evolution	131	90%
Risk maps	130	91%

Risk appetite	112	92%
Linear / non-linear scale	109	93%
SPTI	104	94%
Monte Carlo	91	95%
Pareto	78	96%
Operations (integration)	78	97%
More indicators	73	97%
PERT	72	98%
ANN	64	99%
Multiple regression	58	99%
Silos	46	100%
Red lines	32	100%
3 lines of defense	17	100%

4.2. Brainstorm

The brainstorm session was held in Madrid at the Escuela Técnica Superior de Ingenieros de Caminos, Canales y Puertos, and the subject dealt with was "Difficulties experienced in the everyday practice of project risk assessment and when informing about the overall risk situation, aimed at effective decision-making". The conclusions were that risk management had to be aligned with the company´s strategy, that a systematic and objective method is required in order to quantify the risks, backed up by a system that collects information from the operational units, that simple and easy-to-understand indicators are needed that make it possible to compare risks and scenarios with each other and with the risk appetite and red lines, and that the system has to be automatic and cannot be manipulated.

Each idea was given a score considering the number of attendees supporting that idea and the number of times that concept was repeated. The higher score was 36, assigned to "Objectivity".

The analysis of the ideas, homogenized and rated according to the number of participants in agreement, is summarized in **Error! Reference source not found.**. In order to check a possible Pareto behavior, an accumulated percentage is also obtained for each concept by dividing the sum of the accumulated values in the ranked list by the sum of all the values.

Table 2: Summary of the Concepts Put Forward in the Brainstorm

Concept	Value	% accumulated
Objectivity	36	11%
Decision-making	36	21%
Uniformity	32	31%
Analytical system	24	38%
Risk indicator (KRI)	24	45%
Non-quantifiable risks	23	52%
Comparisons	16	56%
Clarify	16	61%
Evolution	16	66%
Risk appetite	15	70%
Cost	15	75%
Integration with strategy	14	79%
Simplicity	14	83%
Alternative qualification	14	87%
Structured system	12	91%
Qualitative impact and probability	12	94%
Limit scope	7	96%
Not making mistakes	4	97%
Uncertainty	4	99%
Operational personnel	2	99%
Forecasting	1	99%
Reports	1	100%
Multiple variables	1	100%

4.3. Structured Interviews

The interviews were held separately with 21 professionals from different industries (most of them from the construction sector), using a complex questionnaire structured. The findings indicated the need to obtain a numerical result for the

overall risk for a scenario and for each risk matrix, the allocation of impact and probability using a Likert scale, and the use of linear scales to assess the interpretation.

A list of 41 concepts was proposed to the interviewees, asking them to rate each concept from 0 to 3, being 3 the higher relevance. The first interviews revealed the need to enlarge the list of concepts, and the result was a final list with 50 concepts.

The maximum obtained value was 63 and corresponds to "Qualitative rating of the overall risk level for the project". In order to check a possible Pareto behavior, an accumulated percentage is also obtained for each concept by dividing the sum of the accumulated values in a ranked list by the sum of all the values.

The structured list of the concepts rated is shown below (**Error! Reference source not found.**).

Table 3: Summary of Concepts Analyzed at the Interviews Conducted

Concept	Value	% accumulated
Qualitative rating of the overall risk level for the project	63	3%
Definition of red lines	63	5%
Use of a computerized system	63	8%
Impact and probability values expressed by scales	63	10%
A number must be obtained to express the result of the project risk	63	13%
Qualitative rating for each risk	62	15%
Allocation of the impact and probability for each risk	62	18%
Quantitative rating of the overall risk level for the project	62	20%
Possibility of adding specific risks for each project	61	23%
Defining the risk appetite	60	25%
Indicating the risk type (cost, deadline, quality, reputation, safety, etc.)	60	27%
A number must be obtained for each matrix	60	30%
Linear scales to rate and interpret risks	60	32%
Quantitative rating for each risk (risk level)	59	35%
The effects of the actions of reducing or mitigating proposed must be rated	59	37%
Monitoring risk evolution	58	39%
A number must be obtained for each risk assessed	58	42%
A distinction must be made between the possible, probable and mitigated cost	58	44%
The total cost envisaged is the sum of the products of cost x probability	58	46%
The red line concept (exclusive risk condition) has to be considered	58	49%
Organizing the risks into chapters in the matrices	57	51%
A separate rating for each type of risk	57	53%
The cost associated with the risk must be calculated	57	55%
Use of a template to assess risks	56	58%
Structuring the risks identified (by matrices or similar)	56	60%
Need for greater objectivity in the ratings	56	62%
Use of matrices to organize risks	55	64%
Use of weighting to distinguish between the importance of the various risks	55	67%
The mitigation effect must be estimated separately for the impact and probability	55	69%
Breakdown structure of the risks	54	71%
Vision of development in time	53	73%
Decision-making integration	53	75%
A number result must be obtained for each risk group (chapters)	49	77%
Consistency between cost mitigation and the estimated effect of the mitigating measures	49	79%
The weighting of the risks must refer to the organizing unit where the risk is	47	81%
Use of one single risk questionnaire for all the projects	46	83%
Quantitative rating of the overall risk for each matrix (risk level)	45	85%
Rating the overall impact and probability on the project	45	87%
The cost of the mitigating measure must be broken down	45	88%
Each organizing unit must have its own weight	44	90%
Quantitative rating of the risk level of groups of projects	42	92%
Qualitative rating of the overall risk for each matrix	37	93%
Potential for adding risks not included on the template	34	95%
Rating the impact and overall probability of each matrix	34	96%
Use of graphs (heat maps)	31	97%
Use of a questionnaire with predetermined questions and answers to be selected	30	98%

Use of probabilistic methods, such as Monte Carlo, to calculate the total cost	13	99%
Use of other indicators (speed, vulnerability, etc.,)	10	99%
Use of an objective system (closed)	9	100%
Use of Monte Carlo	6	100%

4.4. Integration

The analysis of the previous results shows that the Pareto effect is not present. So the idea of selecting just the top 20% concepts of each list is not suitable and all of them have been considered initially.

In order to integrate the findings, they were given a weight of 1.1 for the literature review, a weight of 1.0 for the brainstorm and a weight of 1.2 for the interview results. Priority is given to the interviews because the respondents were all practitioners, and much more time was devoted to this than to the brainstorm. An intermediate weight was given to the literature despite its great academic value, because of the distance between the publications and customary practice (Thamhain; Taroun; Deng and Smyth).

The different way the concepts were formulated for each one of these three study sources, a consequence of their different origin, makes it necessary to conduct a semantic analysis of the concepts announced in each one, with a view to establishing the equivalences that enable the findings to be integrated.

One single list of homogenized semantic concepts was then obtained, whose rating is the sum total, for each concept, of the scores for the semantically similar concepts in each source, using the previously defined weights. The list contains 66 results or basic improvement parameters, and it is displayed in **Error! Reference source not found.**. The accumulated percentage is showed one more time to confirm that the Pareto effect is not present even in the integrated results.

Table 4: Basic Improvement Parameters

No	Parameter	Value	% accumulated
1	Decision-making	351	4%
2	Quantitative project rating	336	8%
3	Need to be objective	307	11%
4	Need to quantify (risks, groups, and matrices)	297	15%
5	Use of a risk indicator (KRI)	293	18%
6	Computerized system	285	21%
7	Qualitative project rating	270	24%
8	Uniformity	269	27%
9	Use of templates for risk assessment	267	30%
10	Importance of the risk analysis	267	33%
11	Qualitative rating for each risk	256	36%
12	One single risk questionnaire for all the projects	252	39%
13	Global impact and probability of the project	246	42%
14	Comparisons	237	44%
15	Allocation of the impact and probability for each risk	231	47%
16	Potential, probable and mitigated cost	227	49%
17	Calculating the cost of the risks	227	52%
18	Quantifying risk for a group of projects	220	54%
19	Integration with strategy	217	57%
20	Consideration given to different risk types	203	59%
21	Risk appetite and red lines	192	61%
22	Use of linear scales for Impact and Probability	187	63%
23	Structured risk system	182	65%
24	Cost - Risk as summed up SPTI	181	67%
25	Simplicity	180	69%
26	Risk evolution	180	71%
27	Rating for mitigation effects	154	73%
28	Use of graphs (heat maps)	151	75%
29	Expected value of I x P	143	76%
30	Uncertainty	125	78%
31	Cost overrun	120	79%
32	System open to new risks	118	81%
33	A separate rating for each type of risk	113	82%
34	Use of weighting for risks	112	83%

35	Independent mitigation for impact and probability	108	84%
36	Mitigated cost consistent with mitigation	107	86%
37	Weight of risks relative to their organizing unit	94	87%
38	Breakdown of mitigation cost	91	88%
39	Each organizing unit must have its own weight	88	89%
40	Considering probabilistic methods	84	90%
41	Not making mistakes	82	90%
42	Clarification	81	91%
43	Qualitative rating of the overall risk for each matrix	81	92%
44	Rating the impact and overall probability of each matrix	75	93%
45	Non-quantifiable risks	70	94%
46	Questionnaire assessment with predetermined questions and answers	67	95%
47	ERM deficiencies	60	95%
48	Alternative qualification	45	96%
49	Use of an objective system (closed)	37	96%
50	Correlation between risks	36	97%
51	Use of additional indicators	33	97%
52	Influence of overall risks	30	97%
53	Attitude	30	98%
54	Use of Monte Carlo	29	98%
55	Clear reports	27	98%
56	Limit the scope	25	99%
57	Forecasting	21	99%
58	Fuzzy methods	21	99%
59	Confidence level	20	99%
60	Integration with operations	17	99%
61	PERT	10	100%
62	Pareto	10	100%
63	Neural networks (ANN)	9	100%
64	Multiple regression	8	100%
65	Presence of silos	6	100%
66	3 lines of defense	3	100%

4.5. Discussing the Findings

The findings have been presented for the proposals for improvement of the risk management function in complex projects, both individually for each one of the study methods followed, but also for the view resulting from their integration. These findings are not consistent with the forecast of the Pareto rule, according to which 20% of the proposals (13) would attain 80% of the desired satisfaction (Leceta Ostolaza; Pérez Soriano), but 50% of them would make up 80% of the rating made.

An analysis of the 10 most important improvement parameters is significant when it comes to understanding the scope of the findings and showing that they are consistent with each other.

The best-rated aspect is “decision-making” and it reveals the importance of the risk management role in companies.

The second best-rated aspect, “Quantitative project rating”, is a demand that has stood out in each of the three study sources, and it comes from lack of knowledge about the overall risk level of the projects when, for the analysis, a large number of risk events have been pinpointed (Institution of Civil Engineers and Institute and Faculty of Actuaries).

The “Need for objectivity” underlines the aforementioned parameters and demands a system that makes it possible to reduce subjectivity, pre-judgments and, even, decisions based only on experience.

The “Need to quantify (risks, groups, and matrices)” requires an analytical quantitative system to be able to conduct a detailed study of the risk situation affecting the project.

The fifth requirement, “Use of a risk indicator (KRI)”, calls for a general indicator applicable to any type of risk and project, and demonstrates the lack of a general indicator applicable to all cases, essential for the analytical studies and the comparisons required by a decision-making system.

A “Computerized system” is a basic requirement for achieving uniformity, reliability and an analytical view of risk management.

The seventh improvement parameter is "Qualitative project rating", and its presence among the most important is explained by the difficulties involved in quantifying many of the risks when using current methods and by the need to have a vision, even if it is only qualitative, of the risk level for the project as a whole.

The eighth and ninth requirements ask for "Uniformity" to standardize and compare situations, and for "Use of templates for risk assessment" to make it easier to work in a standardized way.

The tenth parameter "Importance of the risk analysis", rather than being interpreted as a guideline, has to be regarded as a call to attention with respect to the role that risk assessment ought to play in companies.

These 10 requirements, together with the remaining ones, are the improvement parameters that would make it possible to define a risk system to fulfill the needs explained, providing solutions to the current deficiencies.

The study concerning the parameters at the tail end showed that the proposals put forward for using the Fuzzy methods, the Neural Networks (ANN), multiple regression and forecasting were not generally accepted. It is also important to note that the concept of the 3 lines of defense (The Institute of Internal Auditors) received the poorest rating and is not associated with the strategy or the importance of risk management.

The fact that little importance is attached to using the Monte Carlo simulation (position 50) and considering the correlation between risk events (Position 51) also stands out. These parameters are interrelated, given that good modeling of the correlation is essential if the Monte Carlo method is to yield valid results (Rezaie et al.; Touran and Wiser).

SPTI is ranked 26th in spite of yielding misleading values, mainly because the respondents to the questions in the interviews were not aware of the problems its use implies (see section "Current situation"). The use of Fr stands out too, in 29th position, for the same reasons.

Mantovani et al., 2014 was talking about the need to innovate rating methodologies. Many other authors claim for risk management improvements within integrated risk informed decision-making (Venkatraman and Ramasamy; Samantra et al., "A Risk-Based Decision Support Framework for Selection of Appropriate Safety Measure System for Underground Coal Mines"; Bouayed; Hamid and Kehinde). This article defines key improvement factors that will ensure that practitioners will have the risk management system they need.

4.6. The Visibility Factor

An example of the application of these findings is the Visibility Factor method (Vegas-Fernández, "Sistema de Información de Riesgos: Factor de Visibilidad."; Vegas-Fernández and Rodríguez-López). Its design is the consequence of considering the proposed improvement parameters; it is an innovative solution that is easy to implement and provides a new risk indicator (Fv) and a method for summarizing risk events that allow for the quantitative and analytical processing of the basic impact and probability data (Vegas-Fernández, "Factor de Visibilidad. Nuevo Indicador Para La Evaluación Cuantitativa de Riesgos").

The Visibility Factor (Fv) is a linear indicator from 0 to 100 that uses the existing impact and probability definitions made using Likert scales to obtain an automatic value for the risk level. The method incorporates a risk summary system that enables the user to obtain a significant summary for any set of risks of any type expressed in terms of its impact, probability, and Fv; this calculation can be recursive, which makes it possible to obtain summaries at a higher level such as matrices, projects, countries, divisions or companies.

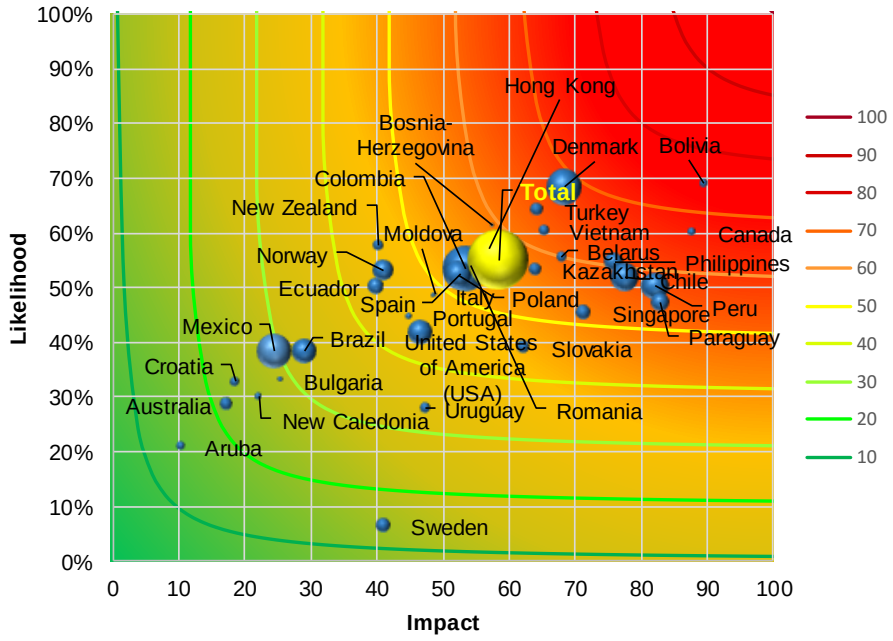
The suitability of the Fv method has been checked by being actually implemented in a construction company where it has been proved its applicability, versatility, and effectiveness when compared to traditional systems. It enables its users to control the risk involved in all the projects at the tendering phase, to define the risk appetite, and to incorporate the red lines definition into the system. It also makes possible to break down the risks as much as is thought necessary (Institution of Civil Engineers and Institute and Faculty of Actuaries) and to obtain a homogenized system that can be applied to all the projects, and that is more objective and enlargeable, with analytical capacities.

This system was presented as a project at the Project Management Institute Conference held in Valencia in 2015 (Vegas-Fernández, "Gestión de Riesgos.") and has been successfully implemented in a multinational construction company with headquarters in Spain. This implementation enabled its users to control the risk involved in all the projects at the tendering phase, to define the risk appetite, and to incorporate the red lines definition into the system (Vegas-Fernández, "Sistema de Información de Riesgos: Factor de Visibilidad."). Its simplicity also enables it to be easily programmed on spreadsheets so it can be incorporated into risk assessment templates at a very low cost.

Adopting this solution enables the user to break down the risks as much as is thought necessary (Institution of Civil Engineers and Institute and Faculty of Actuaries) to obtain a homogenized system that can be applied to all the projects, and this system is more objective and enlargeable, with analytical capacities.

The summarizing capability and the compliance with parameter #13 "Global impact and probability of the project" makes it possible to build risk maps such as figure 2, where the project risk is summarized by countries and the overall ("Total") risk is identified with its own impact and likelihood (Figure 2).

Figure 2. Example Showing How the Fv Method is Applied



5. CONCLUSION

This article provides highly significant guidelines for improving risk management, based upon thorough research that has taken into account the academic literature and the work of risk managers, and proposes a specific solution that meets the needs considered.

Three independent lines of research were used yielding a single rated list with 66 basic improvement parameters.

The 10 main parameters have been analyzed in detail because these are representative of the whole to understand the main guidelines for taking action. This information is important when it comes to devising any new indicator or system aimed at achieving the desired improvement.

A practical example has been given showing a new risk management system that has been designed by following the main parameters of the list and it is being used in a construction company.

Literature and practitioners claim for better and more useful tools for risk management daily practice. Companies are frequently not up-to-date with the latest methodologies and do not possess the skills necessary to apply them. For that reason, practitioners ask for simple and effective solutions. This article presents improvement drivers to succeed in developing new risk management solutions that meet practitioners' needs.

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ANALYSIS OF FINANCIAL IMPLICATIONS DUE TO THE ABSENCE OF INDIGENOUS AIRCRAFT LEASING ENTERPRISE IN TURKEY

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ABSTRACT

Purpose- To determine the volume of outflows of foreign exchange due to aircraft leases of the Turkish airline companies and to examine the necessity of an indigenous company to prevent this outflow.
Methodology- Collecting data on current aircraft fleets of operating Turkish airline companies, classifying those airplanes by Type/ Model/Determination of lease rates of the similar aircraft from aircraft lease finance market sources (Data Collection). Verification of data on lease rates on a selected mathematical model.
Findings- Estimation of annual volume of economics and outflows of foreign exchange due to aircraft leases of Turkish airline companies.
Conclusion- indigenous aircraft leasing enterprise in Turkey would avoid the flow of finance annually of around $ 2,555,272,000 to out of country economies and would be one of major Lessor's in the top ten ranking which would provide lease services in the region and obtain additional income to Turkish Economy.

Keywords: Leasing, aircraft (airliner/airplanes) leasing, aircraft leasing company, aircraft lessors, aircraft leasing enterprise.
JEL Codes: R42

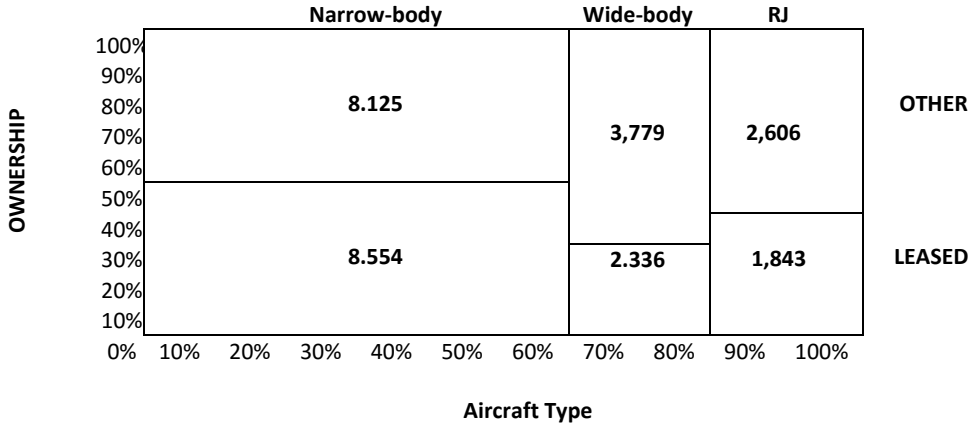
1. INTRODUCTION

In order to perform a healthy analysis of financial implications due to the absence of indigenous aircraft leasing enterprise in Turkey, a good understanding is required of the current global requirement and trend of the aircraft lease finance industry and subsequently have clear vision of the market growth forecast for the future. This overview will assist to analyze the position of Turkish Aviation/Finance market, to frame out the financial implications and provide a resolution of the matter.

Obviously, the main equipment and one of the largest costs to an Airline Operator is commercial Aircraft itself. Choosing whether to purchase or lease Aircraft is a major economic decision for both the academic and business world. As a method of financing, Leasing seems to be the more favorable option Operating lease of the aircraft gives the airlines flexibility in capacity management when demand for air transportation service is uncertain and cyclic (Oum, 1999). Especially as airline industry leasing appears to be increasing according to article published by (Scholnick, 2018) at Airline Economics Finance & Leasing Guide 2018 data, globally airlines operate a fleet of more than 27,000 commercial jet aircrafts with a valued worth of $696 billion (active and inactive (parked aircraft).

By the last quarter of 2017, over 13,300 commercial jet aircraft valued at almost $331 billion were airline operated worldwide on lease contracts, representing more than 49% of the fleet by value as shown below (Table 1).

Table 1: Value Distribution of Global Jet Fleet by Aircraft Type and Ownership (# of Aircraft)



Source: Scholnick, M. (2018, May) Airline Economics Finance & Leasing Guide 2018

As we can see in below trend, we can observe the rapid increase in demand of leased aircraft over the years where it forecasts 50% of the operating aircraft expected to be sourced on lease-based solutions (Table 2).

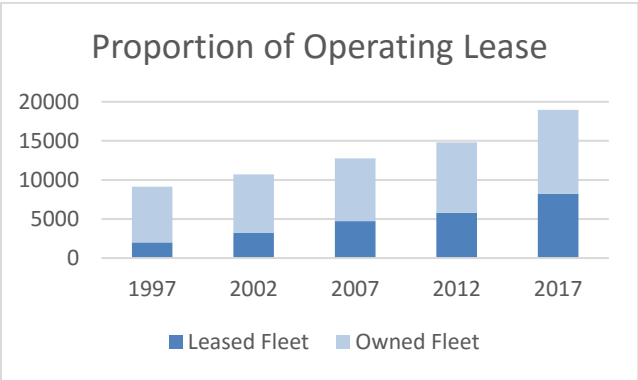
Table 2: Evolution of Operating Lease Penetration between 1970 and Forecast by 2020

YEAR	1970	1980	1990	2000	2014	2020
Market Fleet	3722	6037	9160	15032	20726	Forecast
Leased Aircraft	17	100	1343	3715	8440	Forecast
Market Share	0.5%	1.7%	14.7%	24.7%	40.7%	Over %50

Source: Scholnick, M. (2018, May) Airline Economics Finance & Leasing Guide 2018

Another similar forecast presented by Aercap Leasing Company CIO Edward, Ted O'Byrne (2017), where almost identical figures were forecast), (Table-3). Over the past 20 years the world fleet doubled while the operating lease fleet quadrupled.

Table 3: Proportion of Global Fleet on Operating Lease



Source: O'Byrne E. (2017, September). Aercap Leasing Company CIO presentation World Financial Symposium 27 – 28 September 2017 Convention Center Dublin (CCD), 7.

The decision to lease is based primarily on financial considerations rather than on strictly operational factors. Leasing is thus considered as alternative source of capital by management says (Gritta and Lynagh, 1973)

if we have a quick look into main reasons of why airlines are preferring the leasing option rather than purchasing the aircraft, we can easily see the below benefits for airline operations;

1. **Lesser startup costs:** Better utilization of startup investment capital on airplane fleet since number of airplane sourcing via leasing is more than purchase quantity
2. **Flexibility of possession:** Pay a fixed monthly 'rental' for the term of the lease and hand the aircraft back at the end of the term which provides clear accounting visibility to airline where it represents a healthy figure for business planning
3. **No residual value risk:** With an operating lease we take on all the risk associated with the residual value of the aircraft at the end of the lease.
4. **No balloon payment:** Under the terms of debt financing there is often a large 'balloon payment' at the end of the loan. With leasing there is no balloon payment. The lease payments just stop at the end of the lease term.
5. **Flexible use of assets:** Further reducing the risk profile of your financing strategy. The lease rates payable depend on the equipment chosen and the length of the lease.
6. **Access to the latest technology:** Having the airplane in the fleet only limited time with lease term, provides opportunity for renewal of fleet with newer equipment where newest technology provides plus values in market competition
7. **Availability:** Aircraft Manufacturers primarily focused on bulky orders and such orders are mainly raised by Aircraft Lease Finance companies in large numbers hence airline purchases generally is not the priority for the main aircraft manufacturers hence due to limited production slots, typical waiting time for a lease company would be 2 years where that would be longer for an airline depending on quantity and volume of their purchases

Note: Depending on the existing financial capacity and structure airlines may have additional benefits other than above depending on also where airline is based and operating conditions.

Major Stake Holders of Global Aircraft Lease Stakeholders

Major stake holders of global aircraft lease industry are generally operating as sub corporations of existing major finance organizations [see below Table 4 which are already been established in terms of capital and financial infrastructure which provides them major financial advantage during their procurement of equipment from major Aircraft OEM's (Shamshad, 2013).

Table 4: Financial Alliances of Aircraft Lease Finance Companies

	Lessor	Fleet$	Unit	Key Backers
1	GECAS	34.6	1755	GENERAL ELECTRIC
2	ILFC	27.8	1031	AIG
3	AerCap	8.4	326	NYSE listed, backed by CERBERUS CAPITAL
4	BBAM	7.8	327	BBAM Mgmt and FLY Leasing
5	CIT Aerospace	7.5	263	CIT Group, USA
6	BOC Aviation	6.7	179	Bank of China
7	RBS Aviation Capital	6.7	246	Sumitomo Corporation, Japan
8	AWAS	5.2	224	Terra Firma, CPPIB and others
9	Aviation Capital	4.8	245	Pacific Life Insurance, USA
10	Aircastle Advisor	3.7	140	NYSE listed, backed by FORTRESS
11	Macquarie Air Finance	3.6	156	Macquarie Group, Australia
12	Air Lease Corporation	3.5	97	NYSE listed, backed by PE houses and Banks S
12	Doric Asset Finance	3	27	Focusing on A380S via LSE Listed Investment Companies
14	China Development Bank Leasing	2.9	70	China Dev, Bank, HNA Group, Xi'an Aircraft Industry Group

Source: Shamshad, A. Hampson N. (2013, January) PwC Aviation Finance Report 2013

Note: Intend of this table as to demonstrate the connections between major aircraft lessors and finance organizations due to dynamic industry movements, content and figures may slightly differ as of today's actual data.

As the passenger numbers continue to rise globally, airlines have demanded more lift from aircraft leasing companies, which have grown in scale and number). According to article published by (Woods, 201) in Economics the Aviation Industry Leaders Report only in 2018 the leased aircraft portfolio increased by 629 aircraft to 8,109 aircraft and same report informs that 100 new names have entered the commercial operating lease sector over the past decade. Especially China and famous Chinese banks started to show up in aircraft leasing industry with strong liquidity and financial funds. To understand global volume of current leasing market Table 5 demonstrates the latest current ranking of the top 6 aircraft leasing companies as end of 2018.

Table 5: Top 6 Leasing Companies (Ranked by Number of Aircraft)

LESSOR	TOTAL PORTFOLIO	ON ORDER	EST.PORTFOLIO VALUE	CURRENT RANK
GECAS	1.229	369	23,602	1
AerCap	1.056	362	32,975	2
Avolon	521	400	18,725	3
BBAM	498	0	20,499	4
Nordic Aviation Capital	471	48	6,285	5
SMBC Aviation Capital	422	196	15,723	6

Source: Woods, T. (2019, October) Airline Economics the Aviation Industry Leaders Report 2019

Note: Aircraft portfolio count includes all in service & stored jets and more than 50 seat turboprops managed by operating lessors, all roles (owner/asset manager). On order aircraft excluded from estimated portfolio value.

2. LITERATURE REVIEW

As it is shown in introduction section, aviation industry has rapidly grown globally over the last decades. This growth is also observed within Turkish aviation market and the facts and figures report published by Turkish DGCA. Also, such growth, which is a significant case to analyze to have an idea on financial volume and financial implications due to absence of indigenous aircraft leasing abstract enterprise in Turkey.

Due to insufficiency of academic publications or analysis of the aviation lease facts for Turkish airline industry and aircraft operators, the review of literature was more from global publications in areas of Financial Leasing Management, Asset Management, Airline Revenue Management and Aircraft Specific Leasing Sources. Collected data from domestic sources are classified and optimized as be able to use during analysis based on academically accepted methodologies in this study.

Selection criteria for use of references and publications were based on ease of use and understanding without going into deep sophisticated theoretical approaches, as to clarify the criteria with and example. It is possible to find various mathematical formulas on aircraft lease calculation methods published in different times and in different academic papers. It has been noticed that some of those mathematical models would be too complicated to test with actual available figures of the market parameters hence mathematical formulas provided by Timothy R. Mayes (Ph.D.Professor of Finance at Metropolitan State University of Denver) seem be most suitable for sake of simplicity (www.tvmcalcs.com/index.php/calculators/apps/lease_payments).

Some of the market data and financial figures were collected from web site databases which are often used by aircraft lease and finance industry role players. The website *www.airfleets.net* provides the production date of each aircraft based on manufacturer serial numbers and shows the current operator / country of registration. That web data base was used to analyze Turkish Aviation Fleet and it was possible to verify the accuracy of the provided data by comparing Turkish aviation market and facts and figures report published by Turkish DGCA. Additionally www.speednews.com and http://www.airfax.aero were another useful sites where major role players of aircraft lease industry advertises and offers their available aircraft for both sale and lease transactions with airline companies.

Brand new Aircraft List Prices are announced by aircraft manufacturers in different sources however we know that those listed prices do not reflect the actual prices which are paid by aircraft lease finance Companies when they acquire the aircraft. As to be able to increase the profitability and have competitive offers, leasing companies are generally purchasing aircraft~~s~~ in large numbers with significant discounts which are generally kept as corporate secret. The one of the ways to have a good estimate on discount rates would be scanning of financial newspapers and web sites to catch some news on aircraft lessors' purchases where total volume of purchase, type of aircraft, number of aircraft and delivery dates would be available. With those figures we would be able to calculate the unit prices of the aircraft~~s~~ and compare with the applicable manufacturer list price which would expose the discount rate. The Analysis published by Bhaskara (2014) at www.airwaysnews.com on Delta Airlines Purchase Order for Airbus A350 & A330 widebody aircraft had enough details to be able to have obtain a good estimate on actual acquisition price; Other good sources were as follows;

Ryanairs Boeing 737-800 purchase which was published by David, M. E. (2013) in Forbes.

Aercaps 2016 purchases published at https://www.aerotime.aero (2017).

https://www.bloomberg.com (2018) on HNA's Avolon purchase from Airbus.

All the aforementioned articles show us that depending on the volume of purchases. It is possible to obtain significant discount~~s~~ from the published list prices which may vary from 45% to 60%.

Asset depreciation along the lease term and the useful life of the asset is dependent on the operational environment and it may show significant variation between operating geographies, cultures and utilization characteristics which are driven by many unpredictable parameters. Therefore, the best data on regional depreciation of aircraft would be statistical data used by Leasing companies, or domestic airlines. Documents published by IATA (IATA Airline Disclosure Guide Aircraft acquisition cost and depreciation 2016) provides the basic statistical information on Depreciation Rate, Aircraft/Fleet Type Useful life (UL), Residual Value (RV) from the different Airlines of the world, one being Turkish Airlines. Since more than half of passenger aircraft operated in Turkey are in operation with Turkish Airlines, these figures could be used as an average for the whole industry.

3. DATA AND METHODOLOGY

3.1. The Data

In order to perform analysis on financial volume of the Fleet of Turkish Passenger Aircraft Operators it is highly important to have a good snapshot of the equipment used. In terms of the following data such as, Manufacturers, Types / Models, Age of Fleet, Quantities of the Aircraft based on Models and Type of Leasing preferred by Turkish Passenger Aircraft Operators. All the required data was collected from reliable aviation sources such Turkish Directorate of General Civil Aviation Activity Report (2018) based on last 15 years figures.

Numbers contained within collected data may vary over time due to financial fluctuations, political changes and market supply and demand balances. However, if we consider the number of aircraft as an indicator parameter, increasing trend provided, shows that the outcome of this report is expected to be valid for next decade. According to Turkish DGCA Activity Report 2018, Turkish Aviation market consist of 11 Airline companies, operating ~~in~~ a total of 515 Passenger aircraft, 485 of them are passenger class airplanes with more than 50 seat capacity (see Table 6), the same report provides the details of the aircraft type and trend of fleet growth over the years. Unfortunately, the subject report issued by Turkish DGCA does not indicate the exact number of aircraft which are own assets of Turkish Operators, however we know the market fact that Turkish operators prefer~~s~~ to import their aircraft through a third-party leasing company due to vehicle taxation system of Turkey. Therefore, it would be wrong to consider the subject fleet as a leased fleet for calculation assumptions of forthcoming sections of this paper.

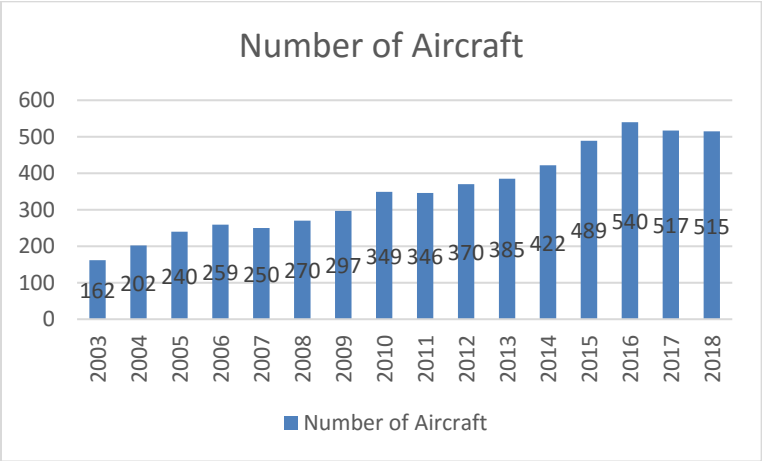
Table 6: Types and Quantities of the Passenger Aircraft Types Operated in Fleets of Turkish Airline Companies 2018

	Make	Aircraft Model/Type	Unit		Make	Aircraft Model/Type	Unit
Narrow Body Fleet	Airbus	A319	7	Wide Body Fleet	Airbus	A330	67
	Airbus	A320	72		Airbus	A340	4
	Airbus	A321	88		Boeing	B777-300ER	33
	Boeing	B737-400	5				
	Boeing	B737-800	185				
	Boeing	B737-8 Max	8				
	Boeing	B737-700	1				
	Boeing	B737-900ER	15				
	Total Narrow Body		381		Total Wide Body		104
TOTAL UNIT IN TURKISH AIRLINE INDUSTRY: 485 AIRCRAFT							

Source: Turkish DGCA Activity Report (2018)
Note: Aircraft Types and quantities above showing the passenger aircraft fleet, excluding Freighter type aircraft and distribution to body classification shows that Turkish Airline companies Operates 381 Narrow Body (single aisle) and 104 Wide Body Aircraft (double aisle).

Above listed 4 each B737-400 narrow body airplanes are operated by Tailwind Airlines and 4 each A340 wide body airplanes operated by Turkish Airlines shall be excluded from forthcoming analysis due to their age and ownership to airline.

Table 7: Trend of Fleet Growth over the Years in Turkish Airline Industry



Source: Turkish DGCA Activity Report 2018
Note: Aircraft types and quantities above includes freighter aircrafts.

Based on analysis out of Original Equipment Manufacturer (OEM) production data published in www.airfleets.net, age factors can be obtained for manufacturer Serial Numbers operated by the Turkish Airline Industry as follows, for Wide Body Boeings 4.86 years old, Wide Body Airbuses 5.35 years old, Narrow Body Boeings 5.34 years old and Narrow Body Airbuses 6.22 years old (as of 2019).

3.2. Types of Leasing Preferred by Turkish Passenger Aircraft Operators

There are many lease finance methods and options available for operators offered by aircraft lease finance industry which can be also tailored for specific needs of the lessee however most common type of the leasing are Operating Lease, Finance Lease and Lease Purchase.

Operating Lease: The Commercial Aircraft Finance Handbook defines the Operating Lease as a "financial structure where the owner of the equipment (the operating lessor), rather than the lessee, retains most of the benefits and risks of asset ownership. Operating Leases do not usually provide the lessee with an option to terminate the lease prior to its scheduled termination date". In other words, it is a right to possess and use an asset for an agreed period conveyed for consideration by the operating lessor to the operating lessee. Which is commonly used by Limited budget airlines and operators, typical Lease Term is generally five years with contractual extension options as agreed between lessee and lessor (Scheinberg, 2017).

Finance lease: A type of lease that transfers substantially all risks and rewards incident to the ownership of an asset. Title may or may not eventually be transferred.

Lease Purchase: Type of Lease where all the payments, terms and conditions structured under purchase agreement and title ownership passes to lessee once all contractual obligations are fulfilled.

The Turkish Airline industry is known to be very sensitive to financial fluctuations and geopolitical factors due to country's location and overall financial strength; therefore it is very crucial for Turkish airline companies to be flexible in terms of fleet size which enables them to control the costs and expenditures, hence long term planning can be highly risk and lease purchase options structured financial commitments may end up with serious financial difficulties. Especially for private owned airlines which are at higher risk, since their passenger transportation activities mainly depend on country's tourism and seasonal traffics. Therefore, majority of aircraft operated in Turkey are temporarily imported aircrafts operating with lease contracts of typically 5 years; therefore, we will build our analysis on Operating Lease concept.

3.3. Manufacturer List Prices for Aircraft and Discount Factor

Classification of Invested Capitals are market value and book value (Damodaran, 2017) is a realistic definition for Aircraft investments and financing

Aircraft Manufacturers issues average list prices for their products on type and model basis however those listed numbers are intended to be more indicative numbers for one time buyers, it was not a secret that those numbers would be dramatically

discounted (up to 60%) for aircraft lease finance companies bulk orders, however the discount rates were always kept as commercial secret between aircraft manufacturers and aircraft lease finance companies; The only reliable sources for healthy estimations would be from press releases on purchases, a typical example of that kind of news would be the analysis published by *Vinay Bhaskara at www.airwaysnews.com (2014)* on Delta Airlines Purchase Order for Airbus A350 & A330 and Ryanairs Boeing 737-800 purchase published by *David,* 2013.

Both press analysis already indicating that Aircraft Manufacturers are able to make discounts between 40% to 60% depending on deal size and it was just that secret revealed by the Financial Express based on Reuters news February 14, 2019 where airbus announcement on up to 50% discount off the list prices

Therefore, in this study as a Lease Amount (Asset Value) we shall use that official discount rate which is already officially publicized as 50% by Airbus, below Table 8 compiled out of 2018 List prices announced by major aircraft manufacturers mainly operated by Turkish Airline Companies, the data in this table shall be our basis in our lease calculations

Table 8: 2018 List Prices Announced by Major Aircraft Manufacturers

BOEING		AIRBUS	
Airplane Families	in millions average	Airplane Families	$ in millions average
737-700	89.1	A220-100	81
737-800	106.1	A220-300	91.5
737-900ER	112.6	A318	77.4
737 MAX 7	99.7	A319	92.3
737 MAX 8	121.6	A320	101
737 MAX 200	124.8	A321	118.3
737 MAX 9	128.9	A319neo	101.5
737 MAX 10	134.9	A320neo	110.6
747-8	418.4	A321neo	129.5
747-8 Freighter	419.2	A330-200	238.5
767-300ER	217.9	A330-800 (neo)	259.9
767-300 Freighter	220.3	A330-200 Freighter	241.7
777-200ER	306.6	A330-300	264.2
777-200LR	346.9	A330-900 (neo)	296.4
777-300ER	375.5	A350-800	280.6
777 Freighter	352.3	A350-900	317.4
777-8	410.2	A350-1000	366.5
777-9	442.2	A380	445.6
787-8	248.3		
787-9	292.5		
787-10	338.4		

Figures are based on OEM official Press Releases for 2018
Source: OEM (Airbus/Boeing) official Press Releases for 2018

3.4. Residual Value and Depreciation

As like any other asset, aircraft~~s~~ are subject to depreciation to their values over the time due to wear and tear of the equipment and enhanced technologies of supplied later versions of the equipment.

Typical residual value and depreciation in Aircraft leasing industry is based on discounted net cash flow principles (DCF) which is reasonably explained by (Żelazowski, 2014) where principles of RV are based on long term cash flow and the physical depreciation and functional obsolescence of tangible assets

Residual value would be defined as the value of the aircraft at the end of lease term after depreciation of its value. A paper issued by (Riaz,2016) "Valuation of Lease Contracts in Continuous Time with Stochastic Asset Values" provides almost linear depreciation in lease value, however we shall use a fully linear depreciation for 20 years of ultimate life of the Aircraft.

When it comes down to understanding the depreciation calculation of an airplane operating in Turkey, we can use the data from IATA Airline Disclosure Guide Aircraft Acquisition 2016 for Turkish Airlines (THY) Aircraft Residual Value After Depreciation of 20 Years is 10%-30%

Reflection of this data to the whole Turkish Airline Operator Fleet shows a healthy assumption that data which we can use below of Residual Rates and figures show on average 15% End of useful lifeline;

Airbus Narrow Body: 74% residual rate for based on average age of 6.22

Boeing Narrow Body: 76% residual rate for based on average age of 5.34

Airbus Wide Body: 77% residual rate for based on average age of 5.35

Boeing Wide Body: 79% residual rate for based on average age of 4.86

3.5. APR-Annual Percentage Rate/ Interest Rate

Interest Rate is the Annual Percentage Rate where a simply cost of money reflects all the costs of the loan during a one year time period, in other terms it is simply the value of money versus other investment tools at the defined period.

At the time of lease agreement executions lease payments are specified in US Dollars and the interest rate implicit in the lease is not readily determinable hence this is where most of the risk taken by Aircraft Lease Finance Companies. The annual percentage rate is determined by lessors in different ways depending on their financial environment and financial instruments they refer to such FED interest rates, Government Bonds and other financial factors.

Numerical determination of APR for an aircraft lease agreement is generally one of the major negotiation factors between Lessor and Lessee.

During this study we shall consider the APR / Interest rate is equal to average of United States Fed Funds Rate for last 10 years due to average age of the fleet operated by Turkish Airline companies and available statistical data

Considering the highest FED annual interest rates during our study would give a fair approach for the sake of coverage on lessor risks, hence our calculational rate will be 2.60% during this study based on Federal Funds Rate - 62 Year Historical Chart, (2019, June).

3.6. Calculation Method of Lease Payments

As it is been explained in section 2 of this study, it is possible to find many mathematical models on matter of determination of lease payments which are generally expressed with sophisticated formulas. It is chosen the proposed formula by Financial Analysis with Microsoft Excel by *Mayes 2014,* which enabled this study to use excel to test the figures and obtain quick and realistic results,

$$Pmt = \frac{PV - \frac{FV}{(1+i)^N}}{\left[\frac{1 - \frac{1}{(1+i)^N}}{i}\right]}$$

Where;
Pmt: Monthly Lease Payment
PV: Lease Amount (which is value asset and in this study that will represent the Aircraft Value which shall be extracted out of Manufacturer List Prices
FV: Residual Value
İ: Monthly interest Rate (1/12 of yearly average interest rate)
N: Lease Term (duration of Lease)

Lease Term is the duration of operational lease which is typically applied as 5 year per lease contract with airlines and if we consider the useful life of a passenger airplane as 20 years that would mean in ideal circumstances an aircraft shall be subject to 4 Lease term since its birth as follows as commonly classified in aviation;

1st Run: 0 to 5th Years 2nd Run: 5th to 10th Years

3rd Run: 10th to 15th Years 4th Run: 15th to 20th Years

4. ANALYSIS OF THE LEASE VOLUME OF TURKISH AIRLINE INDUSTRY

After setting all numerical assumptions based of statistical data and mathematical model, we may use spreadsheets where mathematical method and assumption data operated

Our aim is to have a good and realistic calculational values which we can compare with actual market lease values for the sake of secondary verification; we shall use the data published on Trends and Market Analysis of Aircraft Values report [25 Jan 2016] by www.aircraftvaluenews.com of Access Intelligence, LLC and IBA ISTAT LEASE RATES 2017 data as published at airliners.net which were readily available; deviations between the calculated values and market sampling is expected to be due to aircraft configuration and technical options, daily marketing and actual competition conditions at the time of lease.

4.1. Fleet Monthly Lease Rate and Total Volume Analysis

Mathematical Correlations between Capital leases for aircraft, Operating leases for aircraft and Aircraft purchases based on Asset Value are modelled in detail by Chen et.all (2018) and using the provided concepts, we can analyze the relation between unit cost and lease rate.

Below in Table 9 where monthly lease rates are calculated based on assumptions and method in chapter 3 of this study and also testing parameter from the market values (MPR) shows that all calculations are well in market range except A319 and B737-8 Max types, Airbus A319 type aircraft are the lowest passenger capacity type of narrow body airliners therefor A319 type market is highly affected with Regional jet aircraft types such Embraer, Bombardiers (which are typically 70 to 100 seat segment of aircraft). Other failure observed on Boeing 737-8 Max family is simply due to unsettled marked of that type in Aircraft Lease world after taking into consideration that type was introduced to market just in May 2017.

If we check the differences between calculated monthly leases vs Test numbers (MPR) in failed calculations, we can still consider this delta within market competition range and are possible numbers in daily market competition and supply demand variations

Table 9: Narrow Body Fleet Monthly Lease Rate and Total Volume Analysis

		AIRBUS AIRCRAFT			BOEING AIRCRAFT			
		A319	*A320*	*A321*	*B737-700*	*B737-800*	*B737-900ER*	*B737 8 MAX*
	OEM List Price (Millions USD)	*90,5*	*99*	*166*	*80,6*	*96*	*101*	*110*
	Discount Factor (45% - 60%)	*50*	*50*	*50*	*50*	*50*	*50*	*50*
PV	*Lease Amount (Asset Value) (Millions USD)*	*42,25*	*49,5*	*58.00*	*40,3*	*48.00*	*50,5*	*55.00*
RV	*Residual Rate (Rate %)*	*74.00*	*74.00*	*74.00*	*76.00*	*76.00*	*76.00*	*76.00*
FV	*Residual Value (Millions USD)*	*33.4*	*36.63*	*42.92*	*30.628*	*36.480*	*38.38*	*41.8*
N	*Lease Term (in Months)*	*60*	*60*	*60*	*60*	*60*	*60*	*60*
Yi	*Annual Percentage Rate (Yearly İnterest Rate %)*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*	*2.6*
Pmt	Monthly Payment (USD) '000s	***282***	***308***	***361***	***238***	***283***	***299***	***325***
Test Data	MPR (USD) '000s	70-260	40-335	165-390	125-245	170-350	265-365	385
	COMPARISON	**HIGHER (FAIL)**	***IN RANGE (PASSED)***	***IN RANGE (PASSED)***	***IN RANGE (PASSED)***	***IN RANGE (PASSED)***	***IN RANGE (PASSED)***	***IN RANGE (PASSED)***
	Total Unit in Turkish Aviation	7	72	88	7	185	15	8
	Monthly Finance Out (Millions USD)	***1,973***	***22,2***	***32***	***1,66***	***52,539***	***4,481***	***2,6***

Monthly Finance of Narrow Body Fleet in Turkey (Millions USD): *117,2*

Yearly Finance of Narrow Body Fleet in Turkey (Millions USD): *1407*

Note: A340 Fleet operating in Turkish Aviation are excluded from this table since they are owned by operating Airline

MPR: Monthly Payment Range iaw Market Data: Based on Trends and Market Analysis of Aircraft Values report [25Jan 2016] by www.aircraftvaluenews.com of Access Intelligence, LLC and IBA ISTAT data issued at www.airliners.net

When we apply same assumption data method for the wide body fleet of Turkish Airline operators, we obtain the numbers as it is shown in Table 10 where calculated monthly lease rates have passes the test vs (MPR)

Table 10: Wide Body Fleet Monthly Lease Rate and Total Volume Analysis

		AIRBUS AIRCRAFT	BOEING AIRCRAFT
		A319	***B737-700***
	OEM List Price (Millions USD)	*260*	*375.50*
	Discount Factor (45% - 60%)	*50*	*50*
PV	*Lease Amount (Asset Value) (Millions USD)*	*130*	*188*
RV	*Residual Rate (Rate %)*	*74*	*76*
FV	*Residual Value (USD)*	*96.200*	*148.322*
N	*Lease Term (in Months)*	*60*	*60*
Yi	*Annual Percentage Rate (Yearly İnterest Rate %)*	*2.6*	*2.6*
Pmt	Monthly Payment (USD) '000s	***810***	***1022***
Test Data	MPR (USD) '000s	330-875	850-1990
	COMPARISON	**IN RANGE (PASSED)**	***IN RANGE (PASSED)***
	Total Unit in Turkish Aviation	7	88
	Monthly Finance Out (Millions USD)	***5.668***	***90.009***

Monthly Finance of Narrow Body Fleet in Turkey (Millions USD):	*117.20*
Yearly Finance of Narrow Body Fleet in Turkey (Millions USD):	*1407*

Note: A340 Fleet operating in Turkish Aviation are excluded from this table since they are owned by operating Airline

MPR: Monthly Payment Range iaw Market Data: Based on Trends and Market Analysis of Aircraft Values report [25Jan 2016] by www.aircraftvaluenews.com of Access Intelligence, LLC and IBA ISTAT data issued at www.airliners.net

4.2. Return of Investment

Measurement of the fundamental return on the investment, assuming the project is financed using the firm's overall capital resources are classified on two parametric approach as Real option analysis (ROA) and net present value (NPV) in a paper published by Gibson, Morrell (2004), our Return of investment model shall be based on net present value (NPV) as to obtain health indicative numbers for the sake of simplicity

To see the return of investment out of collected funds based on Table 9 and Table 10 for Turkish Airline Operators with Fleet Residual Value Rate vs Average Aircraft Age with average of 15% end of aircraft life residual value that will give following return of investment figures for Narrow and Wide Body respectively in Table 11.

Table 11: Return of Investment Figures - Narrow Body over its useful life wide bodies

		NARROW BODY							WIDE BODY	
		AIRBUS			BOEING				AIRBUS	BOEING
		A319	***A320***	***A321***	***B737-700***	***B737-800***	***B737-900ER***	***B737 8 MAX***	***A330***	***B777-300ER***
	Aircraft Manufacturer List Price (Millions USD)	*90,5*	*99*	*166*	*80,6*	*96*	*101*	*110*	*260.00*	*375.50*
PV	*Lease Amount (Asset Value) (Millions USD)*	***42.25***	***49.50***	***58.00***	***40.30***	***48.00***	***50.50***	***55.00***	***130.00***	***187.50***
Pmt	Monthly Payment (USD) in average	*282*	*308*	*361*	*238*	*283*	*299*	*325*	*633*	*914*
	Collected amount out of lease during useful life (Millions USD)	*53*	*58*	*68*	*47*	*56*	*59*	*64*	*152*	*219*
	Residual Value of asset at the end of Useful life (Millions USD)	*6.70*	*7.40*	*8.70*	*6.00*	*7.20*	*7.50*	*8.25*	*19.50*	*28.16*
	Total income (Millions USD)	59.60	65.20	76.50	53.10	63.31	66.60	72.50	171.46	247.63
	Profit (Millions USD)	14.40	15.80	18.50	12.85	15.31	16.10	17.54	41.47	59.88

5. CONCLUSION

Aviation and Airline industry's main equipment Aircraft require~~s~~ more financials in terms procurement and operation comparing the other industries which is generally beyond of capacity of airline investors in developing countries. Most of the major developing countries recognized that volume of capital leak due to aircraft leasing needs of domestic airlines reaching significant levels, therefore we observe more and more developing countries are establishing their indigenous aircraft leasing enterprises,

China with BOC (Bank of China) in 2006 bought existing Singapore based Leasing company which used to be US owned Boullioun Aviation Services, Inc., Russian state established largest leasing company in Russia VEB-leasing in 2003 and other banks of Russia such Sberbank opened their aircraft leasing branches in last decade since Aircraft leasing is the only major segment that demonstrated growth in 2017 comparing to other equipment leasing activities within Russian economy (Gerasimova, 2017). India also looking for a place in the market according to news in Bloomberg analyst "Finance Minister Nirmala Sitharaman said in her maiden budget speech. "This is critical to the development of a self-reliant aviation industry, creating aspirational jobs in aviation finance, besides leveraging the business opportunities available in India's financial Special Economic Zones" (Kotoky, 2019).

This study is trying to reach out the numerical indicators for need of indigenous aircraft lessor enterprise out of existing volume of Turkish Airline industry. According to this analysis we can conclude total asset value operating by Turkish Airline Companies has fleet value of 36.77 Billion USD and Annual Volume of Exchange Paid out to foreign economies for leased Aircrafts is 2.55 Billion USD which could be avoided by an indigenous aircraft leasing enterprise in Turkey. And such an enterprise with a portfolio of 477 units of aircraft that would have 5th place by Aircraft Number, and 1st Place by and estimated portfolio value in world ranking as published in Airline Economics, The Aviation Industry Leaders Report 2019, the final conclusions shows it should be well worth to consider the opportunities in Aircraft Leasing Market for Turkish Financial investors and Banks.

The ability to fund purchases and lease aircraft locally would be a boom for local carriers as it will significantly insulate them from foreign exchange fluctuations and provide better fleet planning for airlines and their operational needs which is a significant contribution to Turkish Economy.

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THE FINANCIAL AND NON-FINANCIAL CONTRIBUTION OF BANKING SECTOR ON FOREIGN TRADE OF COUNTRIES: COINTEGRATION ANALYSIS AND TEB BUSINESS CASE

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ABSTRACT

Purpose- Turkey, along with the economic decisions of January 24 in 1980, has begun to apply liberal trade policies. After 1980s foreign trade volumes and capital movements has begun to experience severe accelerations. The banking system has become the major mediator of this period. The banks have very important roles, such as brokering foreign trade transactions, following export commitments, allocating loans to exporters, opening letters of credit, informing companies of the legislative point of view as well as providing consultancy services; in other words, they continue to fulfill the functions that do not generate income by non-financial means. The aim of this research is to analyze the contribution of the banking system on foreign trade of the countries with the help of taking Türk Ekonomi Bankası (TEB) as a business case and search the cointegration between Eximbank loans (exports supporting product) and letter of credit and bank acceptance (imports supporting product) and volume of foreign trade for Turkey

Methodology- ARDL, FMOLS and DOLS methods for the period 2001-2018 are used for the empirical analysis, before cointegration analysis Zivot Adrews, ADF (Augmented Dickey Fuller), PP (Phillip Perron), KPSS are used as unit root tests, CUSUM and CUSUM square tests are used for determining the stability of the coefficients and taking Türk Ekonomi Bankası a business case for analyzing the non-financial contribution of the sector on foreign trade

Findings- It was concluded that a 1% increase in the credit volume in the long term caused an increase in the foreign trade volume between 0.88% and 95%.

Conclusion- It was concluded that a 1% increase in the credit volume in the long term caused an increase in the foreign trade volume between 0.88% and 95%. Especially result gained on empirical part of the paper shows us once again how important it is for banks, one of the most important actors in the financial systems of the countries, to continue their activities effectively.

Keywords: International trade, foreign trade, banking sector**,** cointegration, ARDL, FMOLS, DOLS
JEL Codes: E02, F10, 039

1. INTRODUCTION

The concept of International trade took place for the first time in the book of Adam Smith, Wealth of Nations, published in 1776. Adam Smith, one of the representatives of classical economics, argues with the Theory of Absolute Advantages in his book that the foreign trade should be free, and that a country to import a product that can be produced by using less production factor in another country and export a product that can be produced by using less production factors in itself will support the labor division and specialization and thus increase the welfare level of the World along with increasing efficiency. (Karluk, 2013, s: 28). The development and acceleration of foreign trade coincides with the aftermath of World War II. In 1820, the share of world exports in the world gross national product was 1%, while it was 5.5% in 1950, this ratio increased to 35% as of 2017 as a result of the developments after world war II. (World Bank, 2018) Today even though intense trade wars are being experienced, it is

difficult to even imagine a world without international trade. On the other hand, as the main actors of the financial system, banks offer short-term export credit facilities for the growth and development of the real sector and export credit facilities to support long-term foreign trade for investment financing. It is natural that banks obtain interest and commission income from these activities and the said product and service group have the same structure and characteristics in almost all deposit banks. On the one hand, banks are similar to other commercial enterprises in terms of being profit-making organizations yet on the other hand they differ with their undeniable and large-scale effects on the real sector.

In this paper the effects of banking sector on foreign trade will be investigated in the separation od two parts; financial affects and non-financial effects. On the non-financial effect section Türk Ekonomi Bankası activities on foreign trade will be analyzed. Türk Ekonomi Bankası has been chosen out of other commercial banks because of its unique partnership with TİM- Turkish Exporters Assembly.

What was aimed at the financial aspect; empirical part of the study was to search for the presence of cointegration between the cash and non-cash loans disbursed by commercial banks and Eximbank in order to support foreign trade in Turkey and total volume of foreign trade. In the study, in addition to the cash export loans extended through the banking sector, non-cash ones; letters of credit and acceptance loans, which allow the sector to guarantee the import transactions, are considered as independent variables as total loans. As of the independent variable total foreign trade volume was based on.

2. LITERATURE REVIEW

In the literature, rather than researches on the effects of the banking sector on foreign trade, heavily on the effects of foreign capital inflows on the banking sector were observed. In the research of Acar, performed by survey method in 2009 it was emphasized that, the fact that after the 2008 America Mortgage crisis the financing taps were narrowed for foreign trade and operation costs of foreign trade were raised, caused a contraction in foreign trade for them mentioned period in Turkey. According to this study, pre-export financing creation was considered as an obstacle in terms of export growth for 32,5% of the survey participants. In the study by Ozturk et al in 2007 aimed to measure the contribution of Eximbank to Turkish export by calculating the share in exports of the total loans granted by Eximbank over the years, it was concluded that Eximbank did not provide a significant contribution to the Country's export. In 2016, Alpdündar repeated the same study with the same method and found that the contribution rate determined at similar rates was high. Küçükaksoy et al in their study carried out in 2015, have targeted to test genuineness of export-based growth hypothesis within the particular scope of Turkey. In this study, it has been concluded by using FMOLS, CCR, DOLS methods that 1% growth in exports caused an increase of 1.3% and 1.55% on gross domestic product.

No study has been found in which the contributions of the banking sector to the foreign trade of the country have been analyzed as case study within a scope of a particular bank. For this reason, the literature review was directed to the studies carried out to determine the success factors in foreign trade and whether the success factors identified were presented to the customers by the Turkish Economy Bank, which was analyzed as a case study, was planned to be included in the study.

Critical elements of being successful in international trade have attracted the attention of various researchers from different countries and analyzes have been attempted to be conducted mostly by using questionnaire and interview methods. Madsen (1989) in the study conducted within the particular scope of Denmark, with 82 exporters operating in the SME segment among the 9000 producer exporters in the country, using the survey method prepared in scale of 7-point Likert and Stapel, aimed at measuring the effects of the variables determined 'Company characteristics', Export Marketing Policy' and 'Market Characteristic' on the export success of firms. As a result of the study: • making full use of the existing export markets rather than opening to new markets • establishing good personal contacts with contact persons in the exporting countries and getting ideas on of how he/she works • providing a strong and quality product • approaching cautiously to low price strategy • internalizing the export strategy • giving the decision-making authority to people who know and understand the market • selecting nearby markets instead of remote, exotic markets • selecting markets with high growth and low local competitiveness are determined to be critical success factors for success in exports.

Yücel stated in a study conducted in 2018 that export marketing strategies and firm performance are closely related; that it is essential to find new markets for companies to take place permanently in the international arena, to modify their products in accordance with the market needs and / or to design new products, to perform market segmentation and to make market selection after performing target market analyzes.

Dhliwayo (2017) in his study; identified three titles as the main success factor in cross-border trade which are, the ability to identify potential customers, the ability to find the necessary resources and credit support, and to manage the process, import and export legislation, tariffs and customs practices.

Goldberg and Pallini (2008), on the other hand, considered education, use of technology and business connections as the most important success factors.

3. DATA AND METHODOLOGY

Eximbank loans intended to support exports and non-cash letters of credit and acceptance loans used to support imports and which is the financial institutions are the guarantor of the importer assigned as independent variables. All of these data were obtained from the Statistical Reports Section of the Banks Association for the period 2001-2018.

Table 1: Dependent and Independent Variables

(Milyon USD)	Independent Variable				Dependent Variable		
Period	**Eximbank Loans**	**Letter of Credit**	**Acceptance Credits**	**Total Credit**	**Imports**	**Exports**	**Total Foreign Trade Volume**
2001	4.434	6.499	1.710	12.643	41.399	31.334	72.733
2002	2.789	5.663	1.310	9.763	51.554	36.059	87.613
2003	2.480	6.766	1.741	10.987	69.340	47.253	116.593
2004	2.442	8.023	2.122	12.587	97.540	63.167	160.707
2005	2.225	9.073	1.894	13.191	116.774	73.476	190.251
2006	2.384	10.667	1.777	14.828	139.576	85.535	225.111
2007	2.486	12.811	1.930	17.226	170.063	107.272	277.334
2008	3.156	16.694	2.468	22.318	201.964	132.027	333.991
2009	2.529	13.287	1.906	17.722	140.928	102.143	243.071
2010	2.775	18.484	2.314	23.572	185.544	113.883	299.428
2011	4.827	22.480	3.837	31.144	240.842	134.907	375.749
2012	7.450	21.016	4.705	33.170	236.545	152.462	389.007
2013	12.103	26.437	6.618	45.158	251.661	151.803	403.464
2014	14.584	24.743	6.677	46.005	242.177	157.610	399.787
2015	15.873	23.591	5.520	44.984	207.234	143.839	351.073
2016	20.413	23.951	6.350	50.714	198.618	142.530	341.148
2017	22.025	24.997	6.825	53.846	233.800	156.993	390.793
2018	26.810	19.161	7.170	53.142	223.039	168.023	391.062

Source: The Statistical Reports Section of the Banks Association

3.1. Theoretical Model

The analysis was aimed at the existence of the cointegration relationship of the foreign trade volume with the cash and non-cash loans for import and export, 'exchange rate' variable, whose impact on foreign trade volume has come up with many studies, is also included in the model. Model:

$$\ln TotalForeignTrade = \alpha + \beta lnCred. + \delta lnExchangerate + \upsilon t \quad (1)$$

*InForeign Trade: The volume of foreign trade consisting of the total of import and export logarithms.

*InCred: Logarithms of total of Eximbank cash loans, letters of credit and acceptance credits

*InExchangerate: The logarithm of the CBRT exchange buying rate average of the year.

It is expected that the increase in Eximbank loans used to support exports or the letters of credit and acceptance loans extended to support imports will lead to an increase in foreign trade volumes in the same year.

3.2. Methodology

ARDL (Autoregressive Distributed Lag Model) cointegration approach was used to determine the existence of long-term relation with the foreign trade volume of the support provided by the banking sector by providing cash financing and non-cash guarantees. In addition to ARDL, FMOLS (Fully Modified Least Squares) and DOLS (Dynamic Least Squares) methods have been used to examine the long-term presence of the relationship between variables. ARDL method is preferred because the data set covers the years 2001-2018 due to the fact that non-cash loans data are available since 2001. Having to work with 18 annual data led to the selection of the ARDL model which is suitable for obtaining the most effective result with less data in cointegration analysis. The rationale for using FMOLS and DOLS methods is that they provide reliable results in small data sets sample amount of which is small such as ARDL. (Erdoğan et al; 2018:47) However, even if there is no significant and real relationship between the variables in the model $yt = \alpha + \beta x_1 + \upsilon t$, in cases that they have a common trend, as a result of the model estimate high R^2; the counterfeit regression result may be faced (Favero, 1999:46). In order to avoid such problem, ADF-Augmented Dickey Fuller, PP-Philip Perron, KPSS-Kwiatkowski-Philipps-Schmidt-Shin stationarity tests were applied for dependent and independent variables. In addition, although it is possible to ignore structural changes reduce the power of stationary tests. the Zivot Andrews test, which considers structural breaks, is also included in the study,

Another point that makes ARDL method necessary is that variables have become static at different levels. None of the cointegration methods proposed by Engle and Granger (1987), Johansen (1988), Johansen and Juselius (1999) provide the opportunity to analyze the sets of data that become inert at different levels. The ARDL (Autoregressive Distributed Lag) approach developped by Pesaran et al. (1996) Pesaran and Shin (1995) Pesaran et al. (2001), has overcome the aforementioned problem and allows cointegration analysis with data sets with different levels of inertia (Altıntaş, 2008: 30). The ARDL model is used to model the relationship between variables in a single equation time series setup (Kripfganz ve Schneider, 2016: 2). Distributed autoregressive models - ARDL are models with lagged series of dependent variables as well as independent variables (Johnston ve Dinardo, 1997:246). The ARDL boundary test is performed in three steps. The first stage is the determination of the existence of the long-term relationship between the variables in the model. At this stage, F statistics are applied to the first level delays of the variables. The results of the F statistic are compared with the table in which the lower and upper critical values in the 2001 analysis of Pesaran et al. If the result is greater than the upper and lower values in the mentioned table, it means that the existence of a long-term relationship between the variables. The second stage is the estimation stage of the cointegration relationship after the determination of the long-term relationship. As for the final step, its is the realization of the short-term prediction including the delay of the error term in the cointegration model. (Çetin et al., 2014: 255). DOLS-Dynamic Least Squares Method and FMOLS-Fully Modified Least Squares Method and CCR-Canotic Cointegration Recession Method are two other methods used to estimate long-term coefficients after the determination of the existence of long-term relationship. All three methods are advised by Philip and Hansen (1990); In order to avoid the problem of causing hypothesis tests to be invalid of the estimation of the model by ordinary least-squares method, in case the variables are static at first degree and there is a co-integrated vector between the variables. (Küçükaksoy et al, 2015: 706).

4. FINDINGS AND DISCUSSIONS

4.1. ADF-PP-KPSS-ZA Unit Root Test Results

In all tests carried out to search for the presence of unit root, it was concluded that the data series were not static at the level, structural breaks were involved, and they were static at first degree.

Table 2: ADF-KPSS-PP Unit Root Test Results

	ADF			KPSS			PP		
Variables	Level Fixed and Trend	First Difference Fixed and Trend	Decision	Level Fixed and Trend	First Difference Fixed and Trend	Decision	Level Fixed and Trend	First Difference Fixed and Trend	Decision

LogForeign Trade.	-1,692 (-3,710)*	-3,954 -(3,759)*	(I)	0,1776 (0,1460)	0,500 (0,1460)	(0)	-2,490 (-3,710)	-6,629 (-3,733)	(I)
LogCredit	-3,880 (-3,710)*	-5,425 (-3,733)*	(I)	0,1050 (0,1460)	0,1785 (0,1460)	(1)	-3,880* (-3,710)	-6,490 -3,733	(0)
Logexchange rate	1,087 (-3,759)*	-4,748 (-3,759)*	(I)	0,1831 (0,1460)	0,1480 (0,1460)	(0)	2,316 (-3,710)	-9,358* (-3,733)	(I)

* The table is organized according to 5% significance level and Schwarz criteria.

Table 3: Zivot-Andrews Unit Root Test Results

	Zivot Andrews	
Variables	**Model C**	**Breaking year**
LogForeign Trade	-2,998 (-5,08)*	2007
LogCredit	-5,69 (-5,08)*	2013
Logexchange rate	-0,588 (-4,859)*	2004

* The table is organized according to 5% significance level and Schwarz criteria.

4.2. ARDL Results

ARDL was analyzed separately for the presence of both short- and long-term relationship. According to ARDL Boundary test results F statistics; 5.95 has a value higher than the lower and upper limit values at all levels of significance (Table 3). Therefore, it can be said that there is a long-term cointegration relationship between the variables. After determining the existence of cointegration relationship, short and long term relation analysis was started.

Table 4: ARDL Boundary Test Results

Model	Optimal Delay	F Statistics*	Boundary Test Critical Values	
			Lower	Upper
f(logTrade; logCredit, logexchange rate)	1,0,3	5,947681	3,1	3,87

* Analysis is tabulated according to 5% significance level.

CUSUM in Graph 4 and CUSUMQ tests in Graph 5 (Brown, Durbin and Evans, 1975) are used to determine the stability of the coefficients of the long-term model. CUSUM is used to determine whether the error terms are within the 95% confidence interval and CUSUMQ used to determine if the squares of the cumulative error terms are within the desired limits. (Çetin et al., 2014: 257) According to both tests, there is no break in the model.

Figure 4: CUSUM

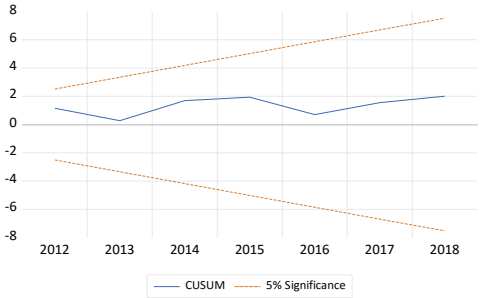
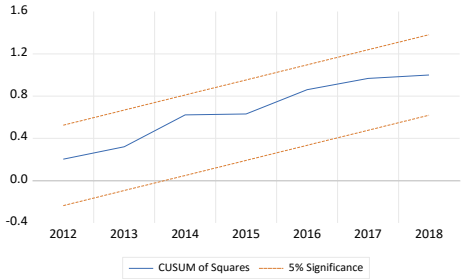


Figure 5: CUSUM of Squares



When short-term error correction model is taken into consideration, 37% of shocks arising from total foreign trade volume, exchange rate and total credit volume normalize in a period and the cycle comes to long-term balance again. (Table 4)

Table 5: Short Term Relationship Analysis

Variables	Coefficient	Standard Error	t-statistics	Probability Values
D(LOGTRADE(-1))	-0.617670	0.217816	-2.835743	0.0252
D(LOGCREDIT)	1.078902	0.083656	12.89687	0.0000
D(LOGCREDIT(-1))	1.274665	0.312882	4.073950	0.0047
ECM(-1)*	-0.369571	0.067540	-5.471906	0.0009

* Analysis is tabulated according to 5% significance level via ARDL Panel Method

4.3. Long Term Relationship Analysis: FMOLS and DOLS Results

In the model, the coefficient of exchange rate τ and the coefficient of credit volume β represent the flexibility of the foreign trade volume to these variables. With this viewpoint, when FMOLS and DOLS results are evaluated, it is seen that credit volume has positive effect on total foreign trade volume according to both test outputs.

An 1% increase in credit volume leads to 0,88% increase in foreign trade volume according to DOLS results (Table 6) and 0,95% increase according to FMOLS results (Table 7).

Table 6: DOLS Results

Variables	Coefficient	Standard Error	t-statistics	Probability Values	R^2
LOGCREDIT	0.877280	0.223727	3.921213	0.0078	0,976
LOGEXCHANGE RATE	-0.480463	0.237061	-2.026750	0.0891	
C	3.886972	2.059545	1.887297	0.1081	

Table 7: FMOLS Results

Variables	Coefficient	Standard Error	t-statistics	Probability Values	R^2
LOGCREDIT	0.954731	0.137664	6.935250	0.0000	0,88
LOGEXCHANGERATE	-0.446175	0.212052	-2.104087	0.0539	
C	3.098141	1.290803	2.400166	0.0309	

5. BUSINESS CASE EVALUATION OF TURKISH ECONOMY BANK

After the economic liberalization in the banking sector after 1980, especially with decision no: 32 on the Law on the Protection of the Turkish Currency (TPKK) issued in 1989, the banking sector was installed important missions in foreign trade intermediation. With this decision, banks have been given the authority to hold foreign exchange positions, open foreign currency deposit accounts, act as intermediaries in import-export transactions and undertake the obligation to follow the export commitment.

Türk Ekonomi Bankası was established in 1927 and in 2005, established a strategic partnership with the French Bank Paribas by selling 50% of the Bank's stocks open to public and thus joined BNP Paribas' network of 100 commercial centers in 60 countries (trade center). In Turkey, with trade centers established in Istanbul, Izmir and Adana Bank is providing consultancy services to companies in foreign trade and provide support for banking.

The services other than the products and services offered by the Bank through branches in foreign trade are; TEB Foreign Trade-Foreign trade portal, TEB Enterprise House, TEB-TIM cooperation, TEB SME TV, Trade Center and TEB Legislation Unit. The services mentioned will be evaluated in detail in this study.

In particular, by analysing this case study, students of International Trade, Banking and Insurance, Economics Departments, academicians, bankers and company executives engaged in foreign trade activities will be able to;

- Compare Turkey's foreign trade structure the before and after 1980
- Comprehend the structural changes in Turkish banking system after 1980.
- Analyze the non-financial support of the banking system other than main financial activities such as allocating loans for the foreign trade of the country in a multi-faceted way within the particular scope of Turkish Economy Bank

5.1. TEB-Turkey Exporters Assembly Cooperation Protocol

Turkey Export Assembly (TIM) within the scope of Turkey Export Strategy and Action Plan adopted for the year 2023 realized a protocol. for cooperation with the Turkish Economy Bank

The advantages of the protocol to TIM member companies are related to foreign trade transactions are as follows;

- Special definition for import-export, arbitrage, spot foreign exchange transactions in order to benefit from exchange rate advantage in intern et branch usage
- Special interest rate
- Application of maximum commission of 1% for letters of guarantee issued as collateral for short-term export credits
- Providing free foreign trade seminars, consultancy and training opportunities
- Discounted tariff document preparation service
- Discount on insurance products
- Special pricing from TEB Factoring in export factoring transactions and,
- Free of charge cash flow for six months. (Annex: 1)

The most remarkable points in the cooperation protocol with TİM are that the Bank's training, consultancy and seminar services are provided free of charge for an unlimited period of time, Foreign Trade portal, which provides important contributions to companies for opening up new foreign markets is provided free of charge for one year. On the other hand, providing the opportunity to optimize the matters such as additional transportation costs, market research costs, intelligence costs which may be considered as disadvantages of foreign trade compared to local trade through provided privilages and supports is considered as an issue of importance.

5.2. Trade Center Structure

Standard customer segmentation of banks-segmentation structure for corporate customers is predominantly carried out by taking into account the annual net sales figures of customers. Most banks' corporate customer segmentation is made as; corporate, commercial, SME, business, micro, product diversity, organizational structuring and localization are differentiated in accordance with the said segmentation. Turkish Economy Bank went beyond the standard segmentation and became involved in the structure of the trade center of its shareholder, BNP Baribas.

During the meeting with TEB top management, it was stated that it would be possible that its trade centers would be able to offer global, not local, solutions through the use of BNP Paribas' 100 trade center networks in 80 countries; It is stated that end-to-end solutions can be offered in the relationship established by domestic companies with foreign trade partners, and consultancy can be given to the market research process of domestic companies with a team specialized in foreign trade.

5.3. TIM TEB Enterprise House

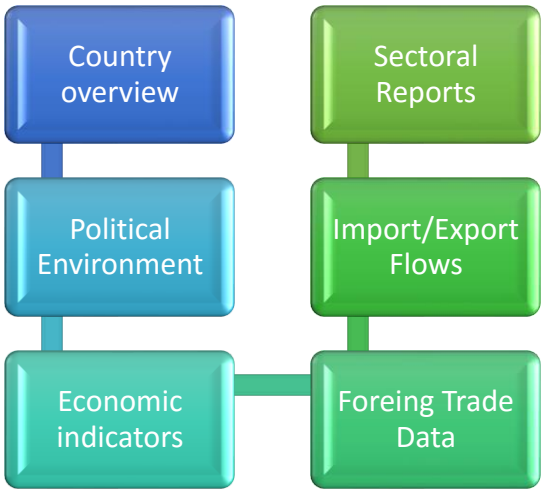
TEB Enterprise House was established to provide support to those who want to start a business in order to produce and sell value-added products in three main subjects: ‘Business Management Consultancy’, ‘Entrepreneurship Trainings’ and ‘Incubation Center. Currently TEB Enterprise House is providing logistic support to entrepreneurs such as meeting room, wireless internet connection, printer, scanner, fax as well as training support in nine points as -West Ataşehir, ITU Teknokent Maslak, and as e-office, Yesilkoy, Bakirkoy, Gayrettepe, Maslak, Istiklal Street, Kadikoy and Atasehir, office, As the main purpose supporting foreign trade and as the particular purpose is to provide the opportunity to benefit from the TİM-TEB Growth Circuit San Francisco-America office, which provides the opportunity to meet with the global investors and introduce the developed technologies abroad to the two customers identified as having the potential to open to the foreign market. Aslı Semerci, who

met TİM-TE Intervention House after her participation in TÜBİTAK's Individual Young Intervention Program, is one of the examples that stepped into entrepreneurship to work on a test that will highlight the current diagnostic process of Alzheimer's disease. Under the umbrella of the company Semerci Genecare Tekonoloji, TİM-TEB Enterprise House is still in preparation for production of a few products which are currently consumed in our country but not produced and therefore have to be imported.

5.4. Foreign Trade Portal (www.tebledisticaret.com)

The portal which was launched in 2016 is the first and unique in the sector. In case Turkish companies decide to export or import, it contains all the data on to which countries and to which companies they can sell the products they want to export by using the portal, The main functions of the portal can be summarized under the headings of the country overview, political environment, economic indicators, sectoral reports, import / export flows and foreign trade data.

Figure 2: **Foreign Trade Portal Main Sections with TEB**



In order to analyze in detail the information and support provided to the companies that want to open foreign markets and / or foreign trade in the portal the results of one by one examination of the sections are given in the following sub-sections.

5.4.1. Market Research Reports

One of the most important issues for companies either will start foreign trade for the first time or that need to expand and diversify their existing foreign market is the methods and analyzes to be chosen in the determination of new market. Especially the companies that will open to the foreign market for the first time do not know the level of international competition of the product range they produce or sell locally, even if they estimate the level of competition abroad, they cannot control the dynamics of the market in which they can be competitive. The weakness in market control causes problems in terms of sustainability even if the opportunity to open to the foreign markets was seized.

Foreign trade portal offered to customers by Türk Ekonomi Bankası in case that importer or exporter Turkish companies wish to conduct market research regarding the country and / or industry they want to trade in, allows them to access market research reports prepared for the country or industry where information is requested from the database which is updated weekly by entering keywords in the 'Market researches' tab.

5.4.2. Determination of the most appropriate country for the product to foreign trade

Firms that obtain information about the market of the product produced, by examining the market research reports can identify the five most suitable countries for the sale of the product from the data warehouse prepared on the basis of Comtrade data by entering the HS code (Harmonized Product Definition and Coding System) of the product that they produce or plan to sell

abroad by providing from the domestic market. If the HS code of the product is not known, the code can be provided by entering the name of the product in the search section. In the same way, by entering the HS code of my product, which is desired to be imported from abroad, the five most suitable importing countries can be displayed.

5.4.3. Obtaining Information about the Identified Country

In case the exporter or importer Turkish company needs to collect and compare information about the 5 countries listed as suitable for foreign trade, about these countries information below are provided:

In the overview section: Information on the population of the country, population growth rate, percentage of urban population, large city densities, face measurement, ethnic origin, official language, local time, exchange rate information, telephone code, internet extension, in which currency the invoice is made

In the Political Environment section: Information on the main political parties and their characteristics, including information on executive and legislative powers.

In the economic data section: gross domestic product (GDP), GDP per capita, share of Public Budget Balance in GDP, share of Public Debt in GDP, inflation rate, unemployment rate, current balance, data on the share of current balance in GDP in the last 5 years, sectoral distribution of the economic activities of the year and information on main industrial sectors.

5.4.4. Customs Duty Calculation

As a result of the comparative country analyzes performed for the group of goods subject to foreign trade, in order to calculate the customs duty applicable in the country it has decided, the local company enters into the relevant tab, the country of export, the country of import and manufacture, the mode of transport and the HS code.

5.4.5. Identification of Required Shipping Documents

After the country, product, taxes are cleared, the information on the country of export, the country of importation, the country of manufacture, the date of shipment, the mode of transport and whether the documents will be arranged by country or product and by selecting the HS code information in the relevant tab information about the required shipping documents can be obtained.

5.4.6. Fair Chasing

Fairs are the entities that allow buyers and sellers to come together to present and recognize products and services in detail. Fairs are also important in terms of being the platforms where technical development and changes are shared by bringing together many buyers and sellers in a certain period of time. TEB Foreign Trade portal allows foreign trade companies to obtain detailed information by using the country, city and sub-sector tabs of the related department in order to follow the fairs related to the sector in which they operate.

Fairs are a publicity event organized at regular intervals, usually at the same places, depending on a specific schedule for the promotion of goods or services, technological developments, information and innovations, the availability and purchase of market, technical cooperation, and the establishment and development of future commercial relations. At fairs buyers and sellers come together to realize various business agreements. At fairs, which are time-limited events, many exhibitors exhibit important products of one or more economic branches and exhibit sample products mainly to industrial wholesalers, industrial consumers and large purchasers (http://www.tobb.org.tr/fuar/2011).

5.5. TEB - SME TV

TEB - SME TV which is the first banking television channel established to support SMEs in the banking sector is broadcasting seven days and twenty-four hours in the categories of Entrepreneurship, Marketing and Sales, Tax and Law, Foreign Trade, Business life, Sectors, Management, Finance, SME Support and Production.

Under Foreign Trade Category it broadcasts under ten sub-categories as;

- Import-Export
- Foreign Investment

- Supports
- Business Opportunities
- Opportunities and Suggestions
- European Union
- Customs and Free Zone
- Foreign Language
- Trade Center
- Recommendations

When the details of the broadcast were examined, it was observed that the experts had provided practical information on any subject that may be needed in addition to the legislation support to the newly started or the present foreign trade companies.

6. CONCLUSION

After economic liberalization, especially with Turkish Currency Protection Law No. 32 decision, the role of the banks in Turkey's economy opened outward has been moved to a more critical point. The banks along with acting as intermediaries for foreign trade transactions, they support firms engaged in foreign trade by providing cash loans, guaranteeing them through non-cash loans, offering derivative products and protecting them against currency risks. All said products are provided by all banks operating under deposit bank status. As for the Turkish Economy Bank, which was examined as a case study, is understood that it provides support for meeting all the criteria for being educated on foreign trade legislation, customs procedures which is considered as a critical success factor, mastering the dynamics of foreign markets to be traded and establishing strong business connections. The fact that the said bank contributes to foreign trade by means of different tools such as private television, incubation centers for SMEs, loan provision with special opportunities in cooperation with TIM, business development centers abroad, and web site that provides versatile macro and micro market analysis opportunities, separates it from a standard deposit bank.

It is understood that not-for-profit applications of the bank which are the subject of the case study, provided to support the foreign trade of the country, which require a significant knowledge and labor and technology infrastructure, go beyond the standard functions of the banking sector and contribute to the economy of the country. It is expected that this study to be considered as a guiding tool for students and academicians aiming to produce projects aimed at contributing to foreign trade and for firms dealing with foreign trade activities, especially SMEs in terms of meeting their consultancy needs.

In the empirical study, as a result of the cointegration analyzes conducted with the help of ARDL, FMOLS and DOLS methods, between the total volume of guarantee and volume of import and export made by the Eximbank loans used by banks in order to support the export and the volume of guarantees and letters of credit with the aim of supporting the imports. It was concluded that a 1% increase in the credit volume in the long term caused an increase in the foreign trade volume between 0.88% and 95%. This result shows us once again how important it is for banks, one of the most important actors in the financial systems of the countries, to continue their activities effectively.

*All information used for TEB business case has been gathered through www.teb.com.tr and www.tebledisticaret.com.tr web sites which public has full access.

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ANNEX: 1

TIM-TEB Cooperation Product and Service Fees Table

ww.tebledisticaret.com Platform (for1 year)	Free
SWIFT MT103 Messages (Incoming / Outgoing) E-Mail Notification Service	Free
Confirmed / Unconfirmed Export Letter of Credit Notification Service by E-Mail	Free
Internet Banking Export File Observation Service	Free
Document Delivery Tracking Service from Internet Banking	Free
Global Account Management Service Fee	Free
Check Collection (TEB Checks)	Free
Check Collection (Other Bank Checks - TL)	5 TL
Check Collection (Other Bank Checks - FC)	50 TL
Foreign FC Collection Check Commission	25 USD
Blocked Check Commission	20 TL
Virtual Account Usage Fee (TL)	50 TL
Virtual Account Usage Fee (FC)	10 USD
Automatic Pool Account Usage Fee	30 TL

Source: Turkey Exporters Assembly

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CAPITAL STRUCTURE AND PERFORMANCE: EVIDENCE FROM EUROPEAN LISTED COMPANIES

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ABSTRACT

Purpose - The paper aims to investigate the existence of a relationship between financial structure and performance for European listed companies.

Methodology - The reference period of the study is three years (2015-2017). In line with Modigliani and Miller' Theory we assume that independent variable (debt/equity ratio) does not influence performance (measured by ROE and ROA). We use correlation and linear regression analysis.

Findings - Results show the existence of a weak relationship between capital structure expressed as debt/equity ratio and performance measures. However, the R^2 of the model has a limited explanatory capacity, so only an insignificant part of the variability of performance measures can be explained by changes in capital structure. The remaining part depends on factors not included in the linear models formulated.

Conclusion- The study shows that the financial structure does not condition the economic and financial performance of European listed companies.

Keywords: Capital structure, performance, value, corporate finance
JEL Codes: G00, G32, G39

1. INTRODUCTION

Financial structure refers to the mix of financing sources available to companies. The most common sources are represented by debt and equity. The way companies choose to finance their activities can reflect on their performance and value creation. This concept is explained in the leverage mechanism that links the return on equity (ROE) to the return on investment (ROI), the return on debt (ROD) and the financial structure.

Several theories have been developed over time with a focus on the capital structure: the reference is to the Classical Theory of Modigliani and Miller (according to which the choice of the financial structure does not affect the creation of value by the companies), to the Trade Off Theory (according to which a company chooses the debt and equity by balancing the related costs and benefits) and to the Pecking Order Theory. The latter states that companies follow an order of preference in the choice of financial resources, preferring firstly internal resources and, only where these resources are insufficient, companies would resort to the banking channel or to the issue of shares. Companies can affect their choices of financial structure using different tools. Among these are the shareholders' agreements, the pyramidal groups and the dual class models that allow the separation between ownership and control.

Since 1958 the search for the relationship between capital structure and performance has always been discussed in the literature. Many Authors treated this theme investigating how the choice of financing methods by companies can affect their economic and financial performance and the value creation process. The studies developed on this field came to the identification of controversial results: some of them highlighted the existence of a positive relationship, others determine a negative relationship. In other cases, Authors found a relationship not statistically significant. This work intends to contribute to the literature trying to estimate the impact that financial structure has on profitability of the European listed companies.

2. LITERATURE REVIEW

Miller (1977) concluded on the existence of a positive correlation between the financial leverage and the value of the company.

Some authors have not found a connection between debt and company profitability. Long and Maliz (1986), as well as Fama and French (1998) concluded that there is no link between the financial structure and profitability of the companies.

Other Authors identified the existence of a negative relationship between financial structure and performance. In particular, a negative effect of the debt on profitability was confirmed by Majumdar and Chhibber (1999), Eriotis and al. (2002), Ngobo and Capiez (2004), Goddard and al. (2005), Rao and al. (2007), Zeitun and Tian (2007).

Majumdar and Chhibber (1999) examine for a sample composed of Indian companies the link between debt levels in the financial structure and their performance: this relationship for Indian companies was found significantly negative.

Eriotis and al. (2002) investigate the relationship between leverage, calculated as the ratio between debt capital and equity, and the profitability of the company. The study was based on panel data for various sectors, referring to the 1995-1996 period. Authors showed that companies which finance their investment activities through self-financing are more profitable than companies that adopt a more debt-oriented financial structure.

Sarkar and Zapatero (2003) find a positive relationship between financial leverage and profitability.

Ngobo and Capiez (2004) based their analysis on listed companies of different countries. Data collected concerned the period from 1992 to 2002. They analyzed 166,320 data. Three performance measures were taken into consideration: company performance, financial performance and market value. The commercial performance was measured by the sales growth rate. The financial performance was measured by the Return on Assets (ROA) while the value of the company was measured by the ratio between market value and value accounting (market to book value). The analysis showed that global debt was negatively correlated with performance.

Goddard and al. (2005) wanted to identify the determinants of profitability for the manufacturing and services sectors in Belgium, France, Italy and the United Kingdom. The analysis was developed for the period 1993-2001 finding a negative relationship between the debt ratio of a company and its profitability.

Joshua Abor (2005) identified in his study the presence of a significantly positive relationship between leverage and ROE. Leverage was calculated as short-term debt to total assets ratio. At the same time a negative relationship was found between another configuration of leverage, calculated in this case by relating long-term financing to total assets, and ROE. Analysis showed a significantly positive association between the "total debt / total assets" ratio and the return on equity.

Mollik (2005) discovered the existence of a positive association between financial leverage and performance.

Baum and al. (2006) using the Compustat and Bundesbank databases analyzed the impact of financial structure on performance for companies located in Germany and in the United States. The US sample consists of a panel of about 15,000 manufacturing companies for the period 1984-2004. The Bundesbank database takes on average 125,000 annual company data in the period from 1988 to 2000. Authors used in their analysis variables as net profit, total assets, cash flows, ROA and the turnover to total assets ratio. The independent variable was the short-term debt (calculated as current liabilities to total liabilities ratio). Authors hypothesized that the profitability of the companies varies according to the expiry of the funding sources. Sensitivity to the duration of funding was statistically significant in Germany, but not in the United States.

Pornsit and Yixin (2007) analyzed the relationship between capital structure and business value. The results did not demonstrate any significant negative impact on the value of the company due to excess financial leverage.

Walaa (2007) investigated the impact of the financial structure on business value. The empirical results show that the debt/equity ratio had no impact on the value of the company.

Zeitun (2007) analyzed the Jordanian companies in the period 1989-2003 showing that the capital structure of a company had a statistically significant negative impact on the performance measures of the company. Furthermore, the level of short-term debt relative to total assets has a positive effect on the measurement of market performance (Tobin's Q). The panel consists of 167 companies of 16 economic sectors. Financial companies, such as banks, insurance companies, were excluded from the analysis. Which company performance measures were used asset return (ROA), return on equity (ROE), earnings before interest and taxes plus amortization on total assets (variable named PROF), market value of equity plus book value of the debt in relation to the book value of the assets (Tobin's Q), market value of the equity in relation to the related book value (MBVR), price to earnings (P/E) and market value of the equity and book value of the liabilities in relation to the book value of the own capital (MBVE). Capital structure of a company had a significant and negative impact on performance measures expressed in both accounting and market terms. The relationship between short-term debt and total assets had a positive and significant effect on Tobin's Q.

Arulvel and Ajanthan (2013) in their study investigated the ability of the financial structure to influence business performance. The analysis involved companies listed on the Colombian Stock Exchange and was based on the period 2007-2011. The financial structure was expressed by the debt/equity ratio and the debt ratio. Performance variables were instead represented by ROE, EPS (Earning per share), pre-tax result and net result. The study revealed a negative relationship between financial structure and performance.

Mujahid and Akhtar (2014) evaluated the impact of capital structure on financial performance of companies in the textile sector in Pakistan. 155 textile companies were analyzed for the period 2006-2011. ROA, ROE and the EPS ratio (Earning per share) were used as measurement of profitability. The results showed that capital structure had positive impact on the financial performance of companies.

Mashavave and Tsaurai (2015) analyzed the impact of financial structure on performance measures. The sample was composed of companies listed on the Johannesburg Stock Exchange in South Africa. Authors used the debt/equity ratio as independent variable; the profit margin was used as a dependent variable. The analysis showed the absence of relationship between the two variables.

Rahimian (2016) investigated the existence of a relationship between financial structure and value (measured through ROE, ROA and Profit on sales variables). Authors based their analysis on n. 157 companies listed on the Tehran Stock Exchange and for the period 2004-2012. Results showed a negative relationship between capital structure and ROA. On the other side, no significant relationship was found between financial structure and ROE. With reference to the variable Profit on sales, the analysis showed a negative relationship with capital structure.

Filipovic and Demirovic in a 2016 paper tested the correlation between financial structure (debt capital) and profitability (measured by ROA and ROE ratios). For the research, Authors used the simple linear regression methodology. The panel consists of listed companies in Montenegro. Authors concluded that a relationship exists between these variable in the case of companies listed on the Montenegro Stock Exchange. Research showed a negative impact of debt (financial leverage) on the profitability measured by ROA and ROE: an increase in debt is reflected in the decrease in return on equity due to the increase in financing costs.

3. DATA AND METHODOLOGY

The empirical analysis is based on European listed companies extracted using the Amadeus database of Bureau van Dijk. At the beginning of April 2019, n. 9,625 companies with annual operating revenue exceeding 1 million euros were listed in the States of the Europe 28 area.

For the construction of the sample, we excluded from the reference population n. 1,565 companies listed on the English market because we want to compare companies of homogeneous financial markets and n. 3,527 companies whose activity is identified by the Nace codes Rev. 2 n. 64 and n. 66 relates to the provision of financial services and auxiliary activities of financial and insurance services because of the different legislation concerning the preparation of the financial statements in these sectors.

So, the initial sample consists of n. 4,533 listed companies.

After we eliminated companies with negative shareholders' equity and that with anomalous values. For their individuation we computed a lower limit (also called lower inner fence) and an upper limit (the so-called upper inner fence) on the basis of the following formulas:

lower inner fence = Q1 - 1.5*IQ

upper inner fence = Q3 + 1.5*IQ

The sample size will not be constant, but will vary due to the different years on which the study is developed.

The correlation and regression analysis was used to identify the relationship between the dependent and independent variable. To interpret the strength of the relationship between the variables, we referred to the guide of Evans which report the value indicated in Table 1:

Table 1: Strength of the Correlation

ρ	Relationship
-1,00<ρ<-0,80	very strong
-0,79<ρ<-0,60	strong
-0,59<ρ<-0,40	moderate
-0,39<ρ<-0,20	weak
-0,19<ρ<0,00	vey weak
0,00<ρ<0,19	very weak
0,20<ρ<0,39	weak
0,40<ρ<0,59	moderate
0,60<ρ<0,79	strong
0,80<ρ<1,00	very strong

We used as dependent variable ROE and ROA calculated as follow:

$$ROE = \frac{NET\ INCOME}{SHAREHOLDERS\ EQUITY}$$

$$ROA = \frac{NET\ INCOME}{TOTAL\ ASSETS}$$

The independent variable is capital structure expressed through the debt/equity ratio.

Simple linear regression was used to estimate the relationship between financial structure and performance. In particular, the following models have been formulated:

$$ROE = {}_1\beta_0 + {}_1\beta_1 \times \frac{D}{E} + {}_1\varepsilon \qquad (1)$$

$$ROA = {}_2\beta_0 + {}_2\beta_1 \times \frac{D}{E} + {}_2\varepsilon \qquad (2)$$

where:

- ${}_i\beta_0$ is the intercept of the regression line relative to the model *i* (i = 1, 2);
- ${}_i\beta_1$ is the angular coefficient of the regression line *i* and indicates the marginal effect of the independent variable on the dependent variable;
- ${}_i\varepsilon$ is the error term.

The null hypothesis is the absence of a relationship between capital structure and the measures of performance:

$$\mathrm{H}_0 : \ {}_i\beta_1 = 0$$

The alternative hypothesis concerns, instead, the existence of a relationship between the independent variable and the dependent variable:

$$H_1 : \ _i\beta_1 \neq 0$$

4. FINDINGS AND DISCUSSIONS

4.1 FINANCIAL STRUCTURE AND ROE

For the year 2015 we used a sample composed of n. 2,681 companies after eliminating the outliers.

There is a weak positive relationship: the Pearson coefficient reported in Table 2, with a value of 0.041, is in the range of 0.00 <ρ<0.19 on the Evans scale. The p-value is lower than the α=0.05 threshold and therefore the correlation coefficient can be considered significant at a level of 5%.

Table 2: Correlation Matrix (year 2015)

		ROE	*D/E*
ROE	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.041*	—
	p-value	0.032	—

* p < .05, ** p < .01, *** p < .001

Table 3 refers to the coefficient of determination R^2 of the corresponding regression model; its value was 0.002: so, only 0.2% of variance in ROE is accounted by debt/equity ratio. The remaining 99.8% is due to factors not considered in the model.

Table 3: Coefficient of Determination (year 2015)

Model	R	R^2
1	0.041	0.002

Although significant at a level of 0.05, the regression coefficient is close to zero as it is understood from Table 4: so, we can affirm that there is a weak positive relationship between the ROE and the debt/equity ratio.

Table 4: Regression Analysis Results (year 2015)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.055	0.002		23.925	< .001
	D/E	0.008	0.004	0.041	2.148	0.032

In 2016 the sample is composed of n. 2,668 companies. According to the results in Table 5, Pearson coefficient define a weak positive relationship between variables. As for 2015, the p-value assumes a value lower than the significance threshold α = 0.001: the correlation coefficient is significant.

Table 5: Correlation Matrix (year2016)

		ROE	*D/E*
ROE	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.068***	—
	p-value	<0.001	—

* p < .05, ** p < .01, *** p < .001

As reported in Table 6, the coefficient of determination R^2 was 0.005 that is only 0.5% of variance in ROE is accounted by debt/equity ratio.

Table 6: Coefficient of determination (year 2016)

Model	R	R^2
1	0.068	0.005

As for 2015, the results in Table 7 showed a weak positive relationship between ROE and debt/equity ratio.

Table 7: Regression Analysis Results (year 2016)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.058	0.002		25.104	< .001
	D/E	0.013	0.004	0.068	3.496	<.001

For the analysis conducted in 2017 we used a sample of n. 2,601 companies without outliers. We found a weak positive relationship between debt/equity ratio and ROE. As reported in Table 8, correlation coefficient is significant given the p-value below the level α = 0.01, so the correlation between financial structure and ROE is different from zero.

Table 8: Correlation Matrix (year2017)

		ROE	*D/E*
ROE	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.059**	—
	p-value	0.002	—

* p < .05, ** p < .01, *** p < .001

The coefficient of determination R^2 for 2017' analysis is reported in Table 9; it was 0.004 that is only 0.4% of variance in ROE is accounted by debt/equity ratio. The remaining 99.6% is due to factors not considered in the model.

Table 9: Coefficient of d-Determination (year 2017)

Model	R	R^2
1	0.059	0.004

The regression coefficient, with a significance level of 0.05, is close to zero as we can observe from Table 10: so, we can confirm the existence of a weak positive relationship between capital structure and firm performance.

Table 10: Regression Analysis Results (year 2017)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.062	0.002		25.738	< .001
	D/E	0.012	0.004	0.059	3.027	0.002

4.2 FINANCIAL STRUCTURE AND ROA

For the year 2015, the analysis about the relationship between ROA and capital structure consists of n. 2,761 companies remaining after eliminating the outliers. Table 11 reports the results for correlation with evidence of a weak positive relationship between the independent variable and the measure of performance. In this case, p-value is higher than the level of significance so the correlation coefficient is not significant.

Table 11: Correlation Matrix (year2015)

		ROA	*D/E*
ROA	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.011	—
	p-value	0.567	—

* p < .05, ** p < .01, *** p < .001The linear determination coefficient R^2 reported in Table 12 (which value is 0.000) of the corresponding regression model suggests that the linear model cannot explain the variability of the ROA respect to the debt/equity ratio. The 100% of the variance in firm performance is due to factors not included in the model.

Table 12: Coefficient of determination (year 2015)

Model	R	R^2
1	0.011	0.000

The coefficient of the linear regression is positive as it can be noted from Table 13, but its value is close to zero with a p-value of 0.567. This is higher than the significance threshold of 5% so we accepted the hypothesis of a coefficient equal to zero.

Table 13: Regression analysis results (year 2015)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.037	0.001		26.639	< .001
	D/E	0.001	0.002	0.011	0.573	0.567

Sample for 2016 is composed of n. 2,761 companies; correlation coefficient is statistically significant. The p-value (0.021) is lower than the level α=0.05 thus we can conclude that correlation is different from zero. Looking at Table 14, the value of the Pearson coefficient identifies the existence of a very weak positive link between the financial structure and the ROA.

Table 14: Correlation Matrix (year2016)

		ROA	*D/E*
ROA	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.044*	—
	p-value	0.021	—

* p < .05, ** p < .01, *** p < .001

According to the results reported in Table 15, R^2 of the corresponding regression model resulting from the regression statistics is 0.002; thus, the linear model has a limited explanatory capacity.

Table 15: Coefficient of Determination (year 2016)

Model	R	R^2
1	0.044	0.002

The regression coefficient is close to zero with a significance level of 0.05: as it can be understood from Table 16, for 2016 results showed a weak positive relationship between the ROA and the debt/equity ratio.

Table 16: Regression Analysis Results (year 2016)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.036	0.001		25.732	< .001
	D/E	0.005	0.002	0.044	2.310	0.021

Analysis conducted for 2017 is based on a sample of n. 2,689 companies. The correlation analysis evidence a p-value higher than the α thresholds. Pearson coefficient, whose value (0.007) close to zero indicates no relation between the variables, is not significant as shown by the values in Table 17.

Table 17: Correlation Matrix (year2017)

		ROA	*D/E*
ROA	Pearson's r	—	
	p-value	—	
D/E	Pearson's r	0.007	—
	p-value	0.724	—

* p < .05, ** p < .01, *** p < .001

As showed in Table 18, the value of the coefficient R^2 (0.000) suggests that 0% of the variability of the ROA is caused by financial structure; it is possible to state that 100% of it is attributable to factors that the linear model does not consider.

Table 18. Coefficient of Determination (year 2017)

Model	R	R^2
1	0.007	0.000

P-value of the coefficient resultant from the analysis for this year is reported in Table 19: it is higher than the significance threshold of 5%; therefore, we accept the hypothesis of nullity of the coefficient of the linear regression.

Table 19: Regression Analysis Results (year 2017)

Model		Unstandardized	Standard Error	Standardized	t	p
1	(Intercept)	0.040	0.002		26.739	< .001
	D/E	0.865	0.002	0.007	0.353	0.724

5. CONCLUSION

This paper wanted to test the assumption of the Modigliani and Miller Theory about the irrelevance of the financial structure and, thus, the absence of a relationship between capital structure and performance. The study covered the universe of European listed companies, surveyed through Bureau van Dijk's Amadeus database, in the period 2015 - 2017.

For the construction of the sample, from the reference population of n. 9,625 listed companies, n. 1,565 companies listed on the English market and n. 3,527 companies engaged in the provision of financial services and auxiliary activities of financial and insurance services were excluded. Their exclusion derived from the need to compare companies with homogeneous characteristics; in this regard, it should be noted that the English market is considered a liquid and efficient market unlike the other financial markets. On the other hand, with reference to financial companies, the exclusion derived from the different legal provision about financial statements in this sector respect to other economic sectors. In addition, companies with negative equity were excluded. Based on the literature review, ROE (return on equity) and ROA (return on assets) have been selected as dependent variables

Research showed the existence of a weak relationship between the debt/equity ratio and the measures of performance given the linear regression coefficient always close to zero. However, R^2 suggests a very limited explanatory capacity of the various models developed: thus, only a small part of the variability in performance measurements can be explained by changes in the explanatory variable of the financial structure. The remaining part is to be attributed to factors not included in the linear models formulated. In conclusion, financial structure expressed by the debt/equity ratio does not influence performance of European listed companies. This result is in line with the literature and in particular with the assertion of Modigliani and Miller (1958) and the studies of Long and Maliz (1986), of Fama and French (1998) and of Walaa Wahid ElKelish (2007).

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