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Modeling the E-Transactions Intentions of Thessaloniki Residents, Due to the COVID-19 Pandemic

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I hereby declare that the work submitted is mine and that where I have made use of another's work, I have attributed the source(s) according to the Regulations set in the Student's Handbook.

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Contents

Abstract

This dissertation was written as a part of the MSc in E-business and Digital Marketing at the International Hellenic University. The summary of the thesis consists of the following: Firstly, the terms of self-service technologies (SSTs) and e-transactions are illustrated, while in the next chapter of the literature review, follows an in-depth analysis of the multiple models concerning the triggering of intention to use e-transactions. The research focuses on residents of the city of Thessaloniki Greece, where a structured questionnaire was distributed through the internet. The results confirmed the bibliography, where the proposed theoretical model of Giovanis et al., (2019) indicated statistically significant correlation between the variables of *intention to use* and *innovativeness*, *social influence*, *perceived risk* and *perceived trust*.

In order to further elaborate on the matter, this research tried to identify the gap of satisfaction between the expected and received risk and trust of users, before and after using the e-transaction systems during the COVID-19 reality. The results indicate significant alteration for the construct of *trust*, where dissatisfaction was observed, while no significant result was found concerning the *risk* construct. As the COVID-19 pandemic creates a new transactional environment for Greece, a larger transition to e-commerce is being forced and the necessity to affect the intentions to use e-transactions is greater than ever. This research could contribute to the market by providing a context with regards to focusing on aspects that actually affect this intention.

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Keywords: self-service technologies, Covid-19, e-transactions,Thessaloniki

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Introduction

During the COVID-19 pandemic outbreak, the social distancing approach established by governments worldwide, resulted, among others, in the increase of use of electronic transaction systems in specific sectors like groceries, food delivery and retail shopping (Andersen *et al.*, 2020; Baker *et al.*, 2020; Hall *et al.*, 2020).

As electronic transaction systems have established their presence over traditional transaction systems and replace them day by day (Dahlberg *et al.*, 2008), the COVID-19 pandemic could lead to an even faster transition and adoption of electronic transactions (e-transactions). Studies and research are being carried out in order to properly identify the effects of the COVID-19 pandemic on e-transactions. According to a research carried by Baker (2020) in the United states, average household spending increased as the number of cases increased at first, before the lockdown period, which indicated stockpiling behavior.

During the lockdown period, the spending on average decreased but what needs to be mentioned is that a transition from traditional transaction systems to electronic transactions systems was observed (Baker *et al.*, 2020). A research from Andersen et. al., (2020), concerning the largest Denmark bank transaction data, indicated less decrease in e-commerce than the traditional commerce, while in the sectors that average household spending increased (e.g. groceries spending), electronic payments massively increased.

This paper aims to study the effects of the COVID-19 crisis on electronic transactions in the city of Thessaloniki in Greece. Electronic transactions belong in the greater category of self-service technologies (SSTs). Due to the enormous rise of the internet and its implementation into everyday corporate tasks, business practices and service delivery, firms tend to replace traditional person-to-person service delivery, with technology-based practices that eliminate the human factor from the service delivery procedure (Yang and Park, 2011). Many bibliographic models have been developed in order to measure the factors that drive consumers to adopt SSTs.

The more widely used models in the literature, as well as their extensions, are the "*Technology acceptance model*" (TAM) (Davis, 1985), "*Innovation diffusion*

theory" (Rogers, 1995), *"Theory of planed behavior"(TBP)* (Ajzen, 1991)*, "Unified theory of acceptance and use of technology" (UTAUT)* (Venkatesh *et al.*, 2003a). A thorough analysis of the models follows in the next chapters.

This research aims to measure the extended UTAUT model variables of *innovativeness, social influence, intention to use, perceived risk* and *perceived trust* and provide an insight concerning the effects of the COVID-19 pandemic crisis in Thessaloniki, Greece. Furthermore, the variable of *expected risk* and *expected trust* are added in the model, in order to measure whether the risk and trust perception has changed before and after the use of electronic transactions systems during the pandemic outbreak. The objectives of the research are summarized below:

Firstly, the relationship between intention to use and social influence will be measured, as well as the relation of intention to use and innovativeness. Next, the relationship between intention to use and perceived risk and perceived trust will be measured, while for further analysis, this research will study the relationship between expected and perceived risk, as well as the relationship of expected and perceived trust. This measurement will provide some evidence on the gap of satisfaction of individuals from the use of e-transactions. The element of social influence is expected to positively affect the acceptance of e-transactions. The same expectation refers to the elements of trust and innovativeness. The element of perceived risk is expected to negatively affect the acceptance of e-transactions. This study aims to contribute to the existing literature by empirically testing the effects of the variables mentioned above in the SSTs acceptance by individuals.

As the COVID-19 pandemic outbreak is very recent, no literature exists with regards to the effects of the pandemic on e-transactions in Thessaloniki. This paper will cover this gap by measuring the e-transactions acceptance during the COVID-19 outbreak crisis in the City of Thessaloniki. Furthermore, this research will try to measure the pre-COVID-19 e-transactions acceptance relationship, with the during-COVID-19 e-transactions acceptance levels.

Lastly, the level of perceived risk and perceived trust before and after accepting e-transactions will be measured in order to provide a clearer understanding of the perceived security that the e-transaction platforms provide to the users and detect possible correlations among acceptance and the level of

differences between expected and perceived security. Further, the paper is organized as explained below.

The literature review provides a better understanding of the SST acceptance factors and the various models developed based on those variables, as well as their extensions. Following, a series of research hypotheses are formed based on the proposed model constructs and the research methodology is analyzed. Next, the statistical analysis is presented as well as the results of the statistical analysis. Lastly, the limitations of the research are provided as well as a framework proposition for further research.

Literature review

SSTs and acceptance factors

Based on the existing literature, self-service technologies (SSTs) aim to help the end user receive a service without having to rely on its delivery from a service employee (Meuter et al., 2000). There are many types of self-service technologies, such as ATM machines, voice mails, blood pressure machines, electronic transaction platforms, package tracking platforms.

This paper will focus on online financial transactions, and the factors that drive people to complete e-transactions. In order to identify those factors, many studies have been carried, focusing on the development of various models, as well as their extensions, that indicate the driving forces for the use e-transactions. Among others, with regards to the SSTs and e-transactions adoption factors understanding, there is the Technology Acceptance Model (TAM), the theory of Planned Behavior, the IDT (innovation diffusion theory) and the UTAUT ((Shaikh and Karjaluoto, 2015), (Blut, Wang and Schoefer, 2016)).

A great volume of research has been conducted and the main factors identified include variables like *perceived usefulness* (Hanafizadeh *et al.*, 2014)*, resistance* (Laukkanen *et al.*, 2008; Cruz *et al.*, 2010)*, demographic characteristics* (Laukkanen, 2007; Alafeef, Singh and Ahmad, 2011; Amin *et al.*, 2012)*, facilitating conditions* (Yu, 2012)*, self-efficacy,* (Amin *et al.*, 2012)*, perceived risk* (Chitungo and Munongo, 2013)*, social influence* (Aboelmaged and Gebba, 2013)*, trust* (Hanafizadeh *et al.*, 2014)*, perceived ease of use* (Hanafizadeh *et al.*, 2014). Additionally, The factors that mostly aim to affect the dependent variable are *behavior intention* (Luo *et al.*, 2010)*, usage* (Crabbe *et al.*, 2009) and *antecedents of attitude* (Püschel, et. al., 2010). During the past years, many empirical studies have been conducted, with the vast majority of them focusing mostly on the dependent variable of either behavior intention, or adoption. (Tam and Oliveira, 2017).

A study carried from Suoranta and Mattila (2004), found that there are specific factors that drive the acceptance of e-transaction systems in the country of Finland. These factors are *demographic characteristics*, *perceived risk,* and elements of the *Diffusion of innovation* like maturity, relative advantage, and complexity.

Another empirical study carried from Ho and Ko (2008), focuses on what drives SST users to continue using the services after they first try them. They proved that more innovative people who are familiar with new technologies tend to easily accept the use of SSTs, while less familiarized users need to become aware of the relative advantages the e-transactions provide, in order to increase their satisfaction. The study also shed light on the fact that it is also very important to study not only what drives people to use SSTs, but also what makes them satisfied while using them in order to understand the elements that will increase the chance of them using them again in the future.

Moreover, more factors are proven to affect the acceptance of SSTs, for example a study conducted by Riquelme and Rios (2010) proved that the adoption of SSTs is significantly affected by the variables of *usefulness*, *social norms* and *social risk*. Female users have been proven to accept SSTs when the ease of use is perceived as "high", while male users tend to adopt SSTs more when they find a perceived relative advantage while using the service. A different approach is proposed for each gender group, as they differently perceive the ease of use, social influence levels and relative advantage.

Another empirical study completed by Zhou (2011), indicated that system quality, as well as information quality, affect both perceived usefulness and initial trust. Initial trust positively affects perceived usefulness which affects the adoption of the SSTs. Thus, initial trust is the main factor that need to be maintained in as high levels as possible, in order to achieve high adoption.

Another interesting study which was conducted from Meuter et. al., (2000) tried to identify the factors that lead to user satisfaction after use a self-service technology, as well as the elements that lead to user dissatisfaction. The results led to 3 elements that lead to satisfaction. The first element of the satisfaction category is *solved intensified need.* This refers to solving a problem immediately, such as using an ATM machine, when downtown, to withdraw money in order to complete an urgent transaction. Furthermore, the second satisfaction category, *better than the alternative*, consists of 6 subcategories. these are *easy to use, avoid service personnel, saved time, when I want, where I want, saved money.* The result led to the fact that the respondents found it more preferable to use a self-service technology system than interact with others in order to receive a service, either because they

found it more time consuming, or did not want to interact with service providers for personal reasons, or even found it more satisfying to achieve a better price online or complete the transaction when they wanted and without having to visit the service provider's physical facilities. The last category, "*did its job*" indicated that the respondents derived satisfaction from the fact that the system "did what it was intended to do".

On the other hand, 3 elements of dissatisfaction occurred. The first element of dissatisfaction category is *technology failure.* This refers to technical failure, such as losing a credit card because a broken ATM machine kept it. Moreover, the second dissatisfaction category, *process failure,* refers to completing an e-transaction, only to find out a long time later that the system did not accept it in the end although at the time of the transaction, no problem occurred. The third dissatisfaction category, *poor design,* consists of 2 subcategories. These are *technology design problem* and *service design problem* and refer to either poor design of the environment of the self-service technology system, e.g. user cannot find the log out button easily, or poor design of the processes of the self-service technology system, e.g. ATM machine not mentioning the daily cash withdrawal limit. The last category, "*customer-driven failure*" indicated that the respondents were dissatisfied from the fact that they made mistakes that they were aware of, while using the SST system, while the system worked as it was intended to. An example of this dissatisfaction factor is trying to withdraw money from an ATM machine while having forgotten the PIN code. Although the system works fine, the malfunction is caused by the customer and the system cannot be used. By taking in consideration all the factor mentioned above, as well as many more, many theoretical models have been developed.

Innovations Diffusion Theory (IDT)

The theoretical model of Innovations Diffusion Theory (IDT) was developed by Rogers, E. (1995), and combines deep-rooted already scientifically accepted theories from the scientific fields of sociology, psychology, and communications. (Wonglimpiyarat and Yuberk, 2005). The four core principles that the model includes are *innovation, channels of communication, time* and *the social system* (Rogers, 1995).

According to innovation, Rogers refers to anything that is perceived as new and different from the unit of adoption. What should be underlined is that innovation is not about creating new concepts but focuses on how much an idea is perceived and innovative, ignoring the time stamp that the object, practice or idea was first introduced or created (Wonglimpiyarat and Yuberk, 2005).

According to Rogers (2010), there are five certain factor that actually affect the adoption rate of an innovation. Firstly, the adoption of an innovation is determined by *"Relative advantage".* In order for innovation to be greatly approved and highly adopted, the individual must perceive that the advantages gained by applying the specific new idea/product are higher than following the traditional approach. If the individual perceives the innovation as advantageous in terms of prestige, economic benefits, satisfaction, or convenience, then the probability of adopting innovation it is high.

Moreover, innovation adoption is affected by "*compatibility*". Compatibility refers to the whether the innovation suits the current values system of the society in order to be adopted fast. The more it suits the social norms and values of the system of the society, the faster it will be adopted by the public.

Another factor is "*Complexity*". Complexity refers to whether the innovative idea can be easily understood and applied by the social system members. The easier an idea is to be understood and used by the members, the higher the degree of adoption is. So, it is necessary for complexity levels to be perceived as "low".

Additionally, innovation is proven to be affected by "*Trialability*". This term refers to sampling and prototyping the suggested innovative approach, in order to be more widely accepted by the social system. An idea that the individual can experiments on and learn by doing, provides less uncertainty to the individual which is proven to be possibly affected and approve the innovation in a higher rate.

Lastly, innovation is affected by the element of "*observability*". This refers to whether the results of the innovation application are visible to the social system's members. The more visible the results are among the members, the higher the degree of acceptance is.

The second core principle for innovation diffusion, according to Rogers (2010) refers to the *communication channels*. The term includes the means by which a message is being sent and received between two individuals (Rogers, 2010). The

communication channel of mass media allows innovation to reach a very large number of recipients, while the interpersonal channels that involve live interaction between two or more individuals, highly affect the acceptance of a new idea. People tend to believe in an innovative idea more when they learn about it from another individual that has already experienced it (Rogers, 2010). What needs to be underlined it is the fact that there is also the need for high homophily between the individuals that communicate the innovation. Although high homophily leads to better communication and higher diffusion of innovation, there is also the need for a little heterophily between individuals, in order to ensure that they are not identical, so information is actually exchanged (Rogers, 2010).

Furthermore, the third core principle according to Rogers (2010) is *time*. Time affects the innovation diffusion process by affecting the *innovation decision process,* the *innovativeness of an individual* and the *rate of adoption.* Innovation decision process refers to the research of information, as well as the processing of the information collected in order for the individual to accept or reject an idea as innovative (Rogers, 2010).

Moreover, concerning the innovativeness of an individual, the term describes the level at which the unit of adoption is in the relatively earlier or later stage of adoption, compared to the other members of the system. Based on innovativeness, adopters are classified into five categories, these are *innovators, early adopters, early majority, late majority, laggards* (Rogers, 2010). These categories reflect whether the individual is ahead or before the adoption stage of the social system, with regards to time.

The last dimension by which, time affects the diffusion of innovations, is *rate of adoption.* This refers to the relative speed by which the members of a society accept an idea as innovation. This element focuses on the time length that is required for the idea to be perceived as innovation by a specific number of members of a social system and does not focus on the individuals themselves (Rogers, 2010).

Furthermore, the last factor that affects the diffusion of innovations, according to Rogers (2010), is *social systems.* A social system consists of units with multiple relations among them that have common goals or problems to solve (Rogers, 2010). The factors that affect innovation diffusion inside a specific social system are *social structure,* which refers to the formation of groups of homogenous

individuals within the social system, *system norms* which refers accepted behavior patterns between various members of a specific social system *,opinion leadership* which refers to the degree that a specific unit in a specific social system is able to informally affect the attitudes of other units in a desired way and *innovation decision types* which refers to whether innovation is accepted or rejected from either units of individuals independently of the opinion of other members of the social system (optional innovation-decisions), or by a mutual concurrence between multiple members of the system (collective innovation-decisions) (Rogers, 2010).

Theory of Planned Behavior (TPB)

The theory of planned behavior is the extension of the Theory of Reasoned Action, which was developed by Ajzen and Fishbein (1980). According to this theory, the most fundamental factor that determines whether a person will execute a behavior or not, is *Intention* to execute it (Ajzen and Fishbein, 1980). The elements that determine the behavioral intention are Subjective Norm and Attitude. The term Attitude, refers to the individual's judgement of executing a specific behavior or not (Ajzen, 1985). Moreover, the term Subjective Norm, refers to whether other members of the society that are important to the individual performing the behavior, consider this behavior as acceptable or not (Ajzen, 1985).

Based on numerous empirical studies, Ajzen, (1985) reached the conclusion that the intention to execute a behavior is better at determining the *attempt* of the individual to execute this behavior than the behavior itself, as many other obstacles interfere between trying to complete a behavior and actually achieving it. This extension of the Theory of Reasoned Action was named *Theory of Planned Behavior* (Ajzen and Fishbein, 1980; Ajzen, 1985; Luarn and Lin, 2005; Pavlou and Fygenson, 2006). The dimension added was *Perceived Behavioral Control,* which refers to the degree that the individual perceives that subjectively controls the factors determining the outcome of a behavior (Pavlou and Fygenson, 2006). For example, when buying a product, perceived behavioral control refers to how easy or difficult the consumer perceives the procedure of finding information about a specific product (Pavlou and Fygenson, 2006). Based on the existing literature, social influence plays a significant role in shaping subjective norms (Khasawneh and Irshaidat, 2017). Also, perceived behavioral control and attitude have been

significantly proven to affect the behavioral intention (Cheung, Chang and Lai, 2000; Suh and Han, 2002; Khasawneh, 2012).

Furthermore, Hsu et al., (2006), proposed an even deeper extension to the theory of planned behavior, in order to determine the factors that affect the continuance of usage of self-service technologies and not only the factors that affect their acceptance. This factor was proven to be the satisfaction from prior usage (Hsu *et al.*, 2006).

Further research conducted by Pavlou, (2002), highlight the important role of two other critical factors which are *Trust* and *Perceived risk.* Trust plays a very important role on whether an individual will transact online and the absence of trust between a consumer and an e-retailer will probably lead to the cancelation of the e-transaction (Jarvenpaa, Tractinsky and Vitale, 2000). When we refer to trust in an e-retailer, we refer to how the web retailer will react in certain situations with regards to the transaction, that the consumer has no control (Jarvenpaa, Tractinsky and Vitale, 2000). As a result, the greater the trust is, the more control the consumer has on the web retailer's behavior, as the web retailer is expected to act in a certain, predefined way, which leads to greater acceptance (Jarvenpaa, Tractinsky and Vitale, 2000).

Lastly, concerning perceived risk, the term refers to the uncertainty of the outcome of a transaction, with regards to the information collected prior to the purchase of the product or service (Taylor, 1974). The less risky a possible e-transaction is perceived by the consumer, the greater the likelihood of completing the transaction is, as the chance of the web retailer to act in an opportunistic way is perceived as low (Jarvenpaa, Tractinsky and Vitale, 2000). According to (Ajzen, 1985), perceived risk influences the control on a behavior in an indirect manner.

Technology Acceptance Model (TAM)

The technology acceptance model was introduced in order to provide better insights with regards to the determination of the factors that influence the acceptance of information systems (Davis, 1985). The two core principles that it is developed upon are *Perceived usefulness* and *Perceived ease of use,* which actually consist the main determinants of the *intention* to accept IT.

The TAM model also constitutes a special case of the theory of reasoned action, but in this case attitude is determined by the factors of perceived usefulness and perceived ease of use, which excludes the element of subjective norm (Davis, 1985). Furthermore, the element of perceived usefulness is being proven to be affected by the element of perceived ease of use, as the easier a technology is, the more useful it is perceived as, which leads to greater acceptance (Venkatesh, 2000). Concerning the technology acceptance, *perceived usefulness* refers to the degree that a specific technology will help the user perform the job better (Davis, 1989), *while perceived ease of use* refers to the degree that a technology will be easy to use and despite the benefits it provides, it won't outweigh the effort needed to execute it (Davis, 1989).

The TAM model has been widely used in the literature and holds a very strong empirical confirmation, as well as plenty extensions and differentiations (McKechnie, Winklhofer and Ennew, 2006). A study carried by Püsche et al., (2010), included variables from different theoretical models in order to propose a new framework that accurately predicts innovation adoption as well as the adoption of self-service technologies and especially the adoption of m-banking services. They included variables from the innovation diffusion theory, the extended model of the theory of planned behavior called DTPB, and the technology acceptance model (Püschel, Afonso Mazzon and Mauro C. Hernandez, 2010). Among others, Püsche et al., (2010) included the variable of *Relative Advantage,* which is similar to *perceived usefulness*, but also included the *perceived ease of use* variable. The results of the study confirmed the theoretical approach and was proved to be solid and consistent.

Moreover, the TAM model has been studies under the prism of continuance of usage of self-service technologies. McKechnie et al., (2006) used the TAM model as a theoretical basis in order to examine the factors that do not lead to the adoption or no- adoption of electronic transactions but affect the extension of usage. This approach viewed the internet as a distribution channel for financial services and tried to measure the possible relation of perceived ease of use and perceived usefulness on the attitude towards using the internet for financial services and finally the effects of intentions to use on the extent of use (McKechnie, Winklhofer and Ennew, 2006). Furthermore, the results proved that TAM can also be used as a theoretical framework that predicts the extent of use of internet as a

distribution channel for financial services. What needs to be underlined is that in contrast to the original model (Davis, 1985), the study found that perceived usefulness alone, is not enough to determine whether the user will continue to use the service, but positive attitude is also necessary (Venkatesh, 2000; McKechnie, Winklhofer and Ennew, 2006). Furthermore, negative emotions (e.g. insecurity) were proved not to affect whether or the individual will continue to use the service. Lastly, experience with technology is also proven to play a major role, as people with greater experience, perceive the effort needed to use the internet as a distribution channel for finance services as '*small*' (McKechnie, Winklhofer and Ennew, 2006).

Additionally, another extension of the TAM is proposed by Kesharwani and Singh Bisht, (2012), where the role of *perceived risk* is also added in the model in order to provide an even clearer approach in predicting the e-transaction adoption. The term of perceived risk is conceptualized as mentioned in the theory of planned behavior. The development of this extension, actually merges the theory of reasoned action (Ajzen, 1985) with the components of the TAM model by incorporating the variable of *perceived risk* which is negatively affected by the variable of *trust* (Kesharwani and Singh Bisht, 2012). The results indicated that in order for the e-transactions to be greatly accepted, a high level of trust should be achieved, which leads to less perceived risk. The less the perceived risk is concerning the individual that completes an e-transaction, the greater the acceptance (Kesharwani and Singh Bisht, 2012).

Another factor that should also be taken in consideration according to (Kesharwani and Singh Bisht (2012), is the dimension of the *website design.* They proved that the better the website design is, the clearer the communication of trust can be established between the individual and the e-retailer, in order to achieve greater acceptance through decreased perceived risk. Furthermore a well-designed website will lead to greater perceived ease of use which also proven to lead to great acceptance of the e-transaction platform (Kesharwani and Singh Bisht, 2012). Another research that extended the TAM model was developed by Venkatesh and Davis (2000), which is referred at as TAM2. The specific model excludes the mediation of the element of attitude, between the attributes of perceived usefulness, perceived ease of use and the acceptance of self-service technologies.

What is further proposed is that usage intention is explained through the elements of influence processes which is composed by subjective norm, voluntariness, as well as image and cognitive instrumental processes which is composed of job relevance, output quality, result demonstrability, and perceived ease of use (Venkatesh and Davis, 2000). The TAM2 model has shed light on the factors that affect the perceived usefulness which strongly affects the intention which leads to greater acceptance. Furthermore the role of subjective norm has been proven to be the main element that drives acceptance in the context of use of mandatory systems, but not voluntarily ones (Venkatesh and Davis, 2000). Additionally, a very interesting finding is the importance of job relevance. The element of job relevance greatly interacts with the element of perceived usefulness in terms of larger acceptance when for example the usage of a system is cognitively perceived as relevant with the goals of the individual within a workplace context (Venkatesh and Davis, 2000).

Unified Theory of Acceptance and Use of Technology (UTAUT)

So far, we have thoroughly examined the factors that affect the acceptance of e-transactions and self-service technologies, in order to gain a better understanding of the differences and similarities between the multiple already established models. As all models are efficient in specific perspectives and under certain rules and limitations, the necessity for a more complete approach that can be widely used emerged. This led Vekantesh et al., (2003a), to the development of the Unified Theory of Acceptance and Use of Technology (UTAUT).

The model consists of eight models that are already established in the literature and their significance is already scientifically supported. These models are TAM, TAM2, TPB, DTPD, TRA, IDT, MPCU, SCT (Yu, 2012). The four factors proven to directly affect the adoption of self-service technologies are *performance expectancy, effort expectancy, social influence, facilitating conditions,* while the three factors proven to indirectly affect the adoption of SSTs are *anxiety, self-efficacy* and *attitude towards the technology* (Yu, 2012).

According to Venkatesh *et al.*, (2003a), performance expectancy refers to the level that the individual perceives that using the system will help him perform better in his job. This construct is referred to as *relative advantage* in the IDT and as

perceived usefulness in the TAM model, as mentioned above. The element of performance expectancy is proven to be the most accurate predictor of acceptance, as confirmed by Venkatesh and Davis, (2000). Moreover, the term effort expectancy refers the level that the system is believed to be easy to use by the individual (Yu, 2012). This element is referred to as *perceived ease of use* in the TAM model and as *ease of use* in the IDT as mentioned above.

Additionally, the term *social influence* refers to the level that the individual believes that other individuals that are important to him, believe that he should use the system or not (Venkatesh *et al.*, 2003a). The element of social influence is mentioned as *subjective norm* in the TRA, the TAM model and its' extensions and as *image* in the IDT (Venkatesh *et al.*, 2003a).

The last direct determinant of acceptance in the perspective of the UTAUT model is the term of *facilitating conditions* which refers to the level that the individual believes that the organizational and technical resources necessary exist in order to properly use the system (Venkatesh *et al.*, 2003a). This term is referred to as *perceived behavioral control* in TPB and as *compatibility* in IDT, as mentioned above.

Furthermore, performance expectancy was found to be moderated by the demographic characteristics of age and gender, while effort expectancy was found to be also moderated by gender and age which are further affected by experience (Venkatesh *et al.*, 2003a). Additionally, Social influence was found to be moderated by age, gender, experience and voluntariness to use, while facilitating conditions was proven to be moderated by age and experience (Venkatesh *et al.*, 2003a). Placing the UTAUT model in the perspective of SST and e-transactions acceptance, many studies have confirmed the appropriateness of the model.

Blaise et al., (2018), has tested the appropriateness of the UTAUT model about the m-commerce purchase intentions of individuals and proved the model's efficiency. Furthermore, Slade et al., (2015), proved the efficiency of the model concerning the prediction of adoption of the m-payment platforms, while Bhatiasevi (2016) and Yu (2012), empirically supported the UTAUT model by the m-banking perspective. Additionally, the extension of the model, called UTAUT2, was used by Alalwan et al.,(2017) in order to explain the adoption of e-transactions acceptance and especially the acceptance of e-banking. The UTAUT model was further extended

by including the element of *trust* which was proven to be scientifically supported. Furthermore another extension of the model involving the elements of *innovativeness, risk* and *trust* was empirically supported and underlined the importance of those factors in predicting SSTs acceptance (E. Slade *et al.*, 2015).

Proposed Theoretical Framework

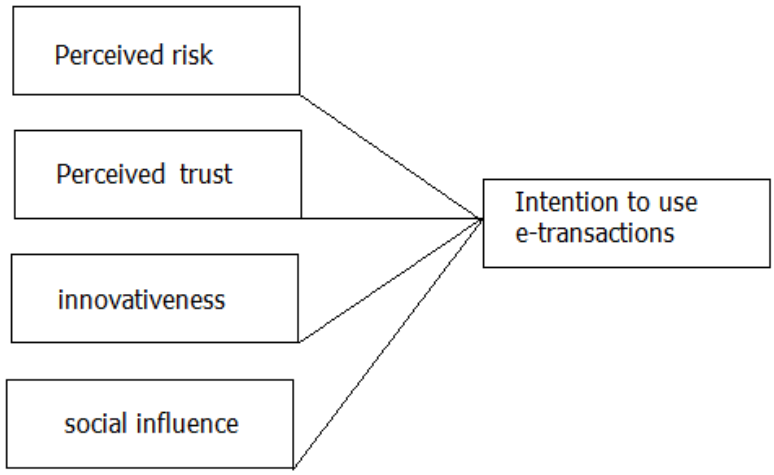

Figure 1 Proposed Theoretical Framework

The theoretical basis for this research is the UTAUT model (Venkatesh *et al.*, 2003b). For the purpose of the research, the extended UTAUT model is used, as proposed by Giovanis et al., (2019), in order to include not only technological and social factors, but the channel and personal factors as well.

This model is appropriate for the current study, as it encompasses the elements of innovativeness together with perceived risk and trust, which is not applied in any other theoretical model. according to the official EU reports, Greece is a country with low e-commerce and e-transactions acceptance rate, compared to the rest of EU countries. So, it is the perfect timing to consider the element of innovativeness because Greeks have been obliged to gradually accept the use of e-transactions since summer 2015, when the flow of capital was significantly limited by the capital controls application of the Greek government. Furthermore, legislation has also gradually obliged the businesses to integrate a POS terminal in their transactions, starting from 2017 (law 4446/2016). Additionally, the Greek citizens had to get more familiar with electronic transactions, while since 2017, a percentage

of their annual spending has to be executed through a credit card (law 145/B/25-1-2017), in order to avoid tax application.

All of the facts mentioned above, resulted in building a transition era for the Greek people from traditional ways of transacting, to electronic ones. It is reasonable to aim to the measurement of the variable of perceived risk and trust, e-transactions are still young for Greece, which might lead to greater perceived risk and less trust to the e-transaction systems. As no literature exists with regards to the effects of the COVID-19 crisis on e-transactions in Thessaloniki, this paper will further elaborate on the work of Giovanis et al., (2019), concerning the effects of the COVID-19 crisis on the e-transactions acceptance in the city of Thessaloniki. Previous research concerning the acceptance of m-banking/ SST services indicated the significant role of the constructs of *perceived usefulness* and *perceived trust* in the adoption rate of SSTs (Giovanis et al., 2019). In addition, the significance of personal traits, such as *innovativeness,* as well as the element of social influence has been proven to affect the m-banking/SSTs systems acceptance (Giovanis, et al., 2019).

Research hypotheses development

As mentioned above, social influence refers to "the extents to which consumers perceive that important others believe they should use a particular technology" (Venkatesh *et al.*, 2003b). As seen in both TAM and UTAT models, the higher the social influence is, the higher is the intention to use (Venkatesh *et al.*, 2003b; E. Slade *et al.*, 2015; Alalwan, Dwivedi and Rana, 2017b). Therefore, the following hypothesis is shaped:

H1. *Social influence positively affects the intention to use e-transactions.*

The term of perceived risk is that of "the potential for loss in the pursuit of a desired outcome of using the service" (Featherman and Pavlou, 2003). As mentioned in the literature review, the element of perceived risk is supposed to affect users' adoption of SSTs in a negative way, as the more a e-transactions platform fails to communicate the safety of its processes, the more aversive the users are. The element is included in the TPB (Ajzen, 1985), as well as in the TAM model (Kesharwani and Singh Bisht, 2012) and has been further supported by Jarvenpaa et al., (2000). Therefore, the following hypothesis is shaped:

H2*. Perceived risk negatively affects the intention to use e-transactions*.

Another critical factor that determines intention to use e-transaction platforms is trust. Trust refers to "potential customers' subjective belief that a service provider will fulfill its obligations" (Alalwan, Dwivedi and Rana, 2017a). The important role of trust is mentioned in the TPD, the TAM model and the extension of UTAUT model. The higher perceived trust is, the higher is the adoption as the consumers does not expect the e-retailer to act in an opportunistic way (Giovanis et al., 2019). Therefore, the following hypothesis is shaped:

H3*. Perceived trust positively effects the intention to use e-transactions.*

The element of innovativeness is included in the IDT theory as well as in the extended UTAUT model. The term refers to "people's tendency to try and adopt new things, new concepts and innovative product and services" (Chiu and Hofer, 2015). As proven by Giovanis et al., (2019), the higher the level of innovativeness is, the more a person intents to use SSTs. Therefore, the following hypothesis is shaped:

H4. *Innovativeness positively affects the intention to use e-transactions.*

In order to gain a deeper insight concerning the intention of the people of Thessaloniki to use e-transaction during the COVID-19 pandemic, this research will further elaborate on the elements of risk and trust. Firstly, the difference between the expected risk and perceived risk will be compared, in order to determine the size of gap of satisfaction for the element of risk. Next, the difference between expected trust and perceived trust will be compared, in order to define the size of gap of satisfaction for the element of trust also. This information will provide a better understanding of whether users tend to trust e-transaction platforms more during the pandemic outbreak, but also whether they perceive the platforms as more or less risky, during the pandemic. Therefore, the following hypotheses are shaped:

H5. *There is difference in the perception of risk, after using e-transactions.*

H6. *There is difference in the perception of trust, after using e-transactions*.

Methodology

Participants

Participants constitute the people that live in the city of Thessaloniki, especially during the COVID-19 crisis. With reference to table 1, the distribution of answers between the two sexes indicate more female respondents, as male respondents form 39.6% of the sample, while female respondents form 60.4% of the sample. More than 67% of respondents belong in the second age group, between 26 and 45 years old, while no answers were collected from people of more than 65 years old. Concerning respondents' education level, 46% stated that acquire a master's degree, while a noteworthy 14% stated that the highest degree of education that they have acquired is a high-school degree. Only 4% of the sample belongs in the higher education scale. Concerning the annual income, more than half of the respondents (61.8%) stated that their income varies between 0€ and 10.000€, while 26.7% stated that their income varies between 10.0001€ and 20.000€. Only three respondents belong in the two highest annual income scales.

Table 1 Demographic Characteristics

Item	*Characteristic*	*Percentage*
Sex	Male	39.6%
	Female	60.4%
Age	<25	28%
	26-45	68%
	46-65	4%
Education	High-School	14%
	Bachelor's degree	36%
	Master's degree	46%
	Ph.D. or higher	4%
Annual income	0-10.000€	61.8%
	10.001€-20.000€	26.7%
	20.001€-30.000€	9.7%
	30.001€-40.000€	0.6%
	40.001€ -	1.2%

Sampling Method

In order to achieve randomness, the method applied was the cluster sampling method, which is the most appropriate for population with large geographical disperse. The targeted location was the city of Thessaloniki Greece, which was separated into 14 sub-regions, based on the official municipalities of the city. Next, each municipality was given a random number ID and through a random number generator, 7 regions were chosen. The online social media platform of Facebook was used in order to randomly reach individuals who live in each region and propose to them to participate in the research.

Sample Magnitude

The data collection period lasted 4 weeks, from September 15 to October 15 and a total of 500 questionnaires were distributed online. The response rate was 32.2% with a total of 161 questionnaires successfully completed.

Instruments

The instrument used was a structured questionnaire based on previous work from Giovanis et al.,(2019), which was electronically distributed through the social media platform of Facebook. The questions used consist of 3 sections. The first section consists of questions that determine the demographic characteristics of the respondents. The second section consists of questions that try to determine the internet usage profile of the respondents as well as the extent to which the respondents uses e-transactions systems but also the extent to which the internet usage and the use of SSts has changed, compared to the previous year. The third section aims to measure the factors that affect the *intention* to use e-transactions systems during the COVID-19 pandemic outbreak and consists of the variables of *innovativeness*, *expected risk*, *expected trust*, *perceived risk*, *perceived trust*, *social influence* and *intention to use*.

Analytical Instruments

The statistical analysis program PSPP was used in order to apply statistical tests to the variables. These tests were Pearson's correlation, cross-tabulation and

paired samples T-test, in order to determine statistically significant correlations between variables, as well as significant differences. Each variable was computed by composing the individual variables into a parent variable in order to summarize the data and apply the statistical analysis.

Results and Discussion

Measurement model assessment

In order to assess the reliability of the constructed variables, based on the given elements, the Cronbach's a is calculated for every variable. A value of 0.70 and more is considered as 'accepted' and indicates internal validity, while a number of 0.90 or more indicates possible redundancies (Tavakol and Dennick, 2011). As presented in table 2, the construct of innovativeness has a level of α coefficient of 0.82. The coefficient for social influence is 0.88 while for the perceived risk construct is 0.89. Expected risk has a α value of 0.84 and for the expected trust construct, the α value is 0.94. Perceived trust indicates a coefficient level of 0.89, while intention to use indicates a coefficient level of 0.84. All constructs indicate a Cronbach's α value that is greater than 0.70, which shows internal validity and reliability.

Table 2 Cronbach's α

Constructs/element	***Cronbach's α***
INNOVATIVENESS	**0.82**
If I heard about a new technology, I would look for ways to experiment with it	
Among my peers, I am usually the first to explore new technologies	
I like to experiment with new technologies	
SOCIAL INFLUENCE	***0.88***
People who are important to me think that I should use e-transactions	
People who influence my behavior think that I should use e-transactions	
People whose opinions I value prefer that I use e-transactions	
PERCEIVED RISK	***0.89***
I do not feel totally safe providing personal private information over e-transaction systems	
I am worried about using e-transactions systems because other people may be able to access my account	
I do not feel secure sending sensitive information across e-transactions	

systems	
EXPECTED RISK	**0.84**
I did not expect to feel totally safe providing personal private information over e-transactions systems	
I expected to be worried about using e-transactions systems because other people may be able to access my account	
I did not expect to feel secure sending sensitive information across e-transactions systems	
EXPECTED TRUST	**0.94**
I expected e-transactions systems to be reliable	
I expected e-transactions systems to be secure	
I expected e-transactions systems to be trustworthy	
PERCEIVED TRUST	**0.89**
I trust e-transactions systems to be reliable	
I trust e-transactions systems to be secure	
I trust e-transactions systems	
INTENTION TO USE	**0.84**
I intend to use e-transactions systems in the future	
I will always try to use e-transactions in my daily life	
I plan to use e-transactions systems frequently	

Descriptive statistics

Concerning the internet usage profile, the almost absolute of 98.15% of respondents stated that they use the internet every day. 55.56% of respondents use the internet more than 4 hours a day, while no correlation was observed between the frequency of internet usage and age/sex or income and education level, which could indicate the universality of internet usage today to all age groups and social statuses. The vast majority of 84% stated that their device of preference in order to use the internet is their smartphone, which is rather expected, taking in consideration the growing rise of smartphone usage today. Most participants' online spending is rather low, as 57% belongs in the lowest spending category of 0-150€ as

average spending per month on e-transactions. Lastly, the frequency of e-transaction and the spending volume has increased compared to last year. 66% of the respondents either agree or strongly agree that the frequency of their e-transactions increased compared to last year's, while 61% stated that they either agree or strongly agree that their spending on e-transactions has increased compared to last year. Unfortunately, no correlation was determined between the rise of either the increase in e-transactions frequency or spending and age/sex or income.

Table 3 Frequency tables: internet usage profile

How often do you use the internet

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Less than once a month	1	1	0.62	0.62	0.62
Once a week	3	1	0.62	0.62	1.24
everyday	5	159	98.15	98.76	100
Total		161	100	100	

On average, how many hours per day do you spend on the internet?

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Less than 1 hours a day	1	1	0.62	0.62	0.62
1-2 hours	2	17	10.49	10.56	11.18
2-3 hours	3	21	12.96	13.04	24.22
3-4 hours	4	32	19.75	19.88	44.1
More than 4 hours a day	5	90	55.56	55.9	100
Total		161	100	100	

Desktop usage

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No use of desktop	0	70	43.21	43.48	43.48
Use of desktop	1	91	55.56	55.9	99.38

Total		161	100	100	
Mobile usage					
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No use of mobile phone	0	25	15.43	15.53	15.53
Use of mobile phone	2	136	83.95	84.47	100
Total		161	100	100	
Tablet usage					
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
No use of tablet	0	145	89.51	90.06	90.06
Use of tablet	3	16	9.88	9.94	100
Total		161	100	100	
How often do you make e-transactions					
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Less than once a month	1	22	13.58	13.75	13.75
Once a month	2	42	25.93	26.25	40
Once a week	3	48	29.63	30	70
More than once a week	4	43	26.54	26.88	96.88
Every day	5	5	3.09	3.13	100
Total		160	100	100	
Which is the average amount of your e-transactions spending per month*?*					
Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
0€,-150€¬	1	92	56.79	57.14	57.14
151€,-300€,	2	35	21.6	21.74	78.88
301€,-450€,	3	20	12.35	12.42	91.3
451€,-600€,	4	8	4.94	4.97	96.27

>600€,	5	6	3.7	3.73	100
Total		161	100	100	

The frequency of your e-transactions has increased, compared to last year's

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Strongly disagree	1	7	4.32	4.35	4.35
Disagree	2	18	11.11	11.18	15.53
Neither agree nor disagree	3	30	18.52	18.63	34.16
Agree	4	73	45.06	45.34	79.5
Strongly agree	5	33	20.37	20.5	100
Total		161	100	100	

The average amount of your e-transactions spending has increased, compared to last year's

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Strongly disagree	1	7	4.32	4.35	4.35
Disagree	2	18	11.11	11.18	15.53
Neither agree nor disagree	3	37	22.84	22.98	38.51
Agree	4	70	43.21	43.48	81.99
Strongly agree	5	29	17.9	18.01	100
Total		161	100	100	

Furthermore, a very interesting finding is that between age and average spending per month. According to table 4 for respondents of 26-45 years old and more, as the age rate increases, the average spending per month on e-transactions decreases. This finding indicates that individuals of 46 years old and higher, do not spend a notable amount of money on e-transactions and there is plenty of room for improvement and establishment of the elements that affect the intention to use e-transactions, with regards to the age groups of 46 years old and more.

This finding is rather controversial with regards to the 2019 Eurostat report for e-commerce across the EU. Based on the report, the e-commerce spending steadily increases among younger age groups, but the heavier spenders are those of 55-74 years. What is further necessary to consider on the matter is the fact that Greece is ranked as the 6th last country to adopt e-commerce, so there is still a long way to reach the proportionally average usage and spending amount of the rest of EU countries. The statistical test applied in order to determine the relationship between the two variables is that of cross-tabulation chi-square and is statistically supported by the significant p-value indication of 0.028.

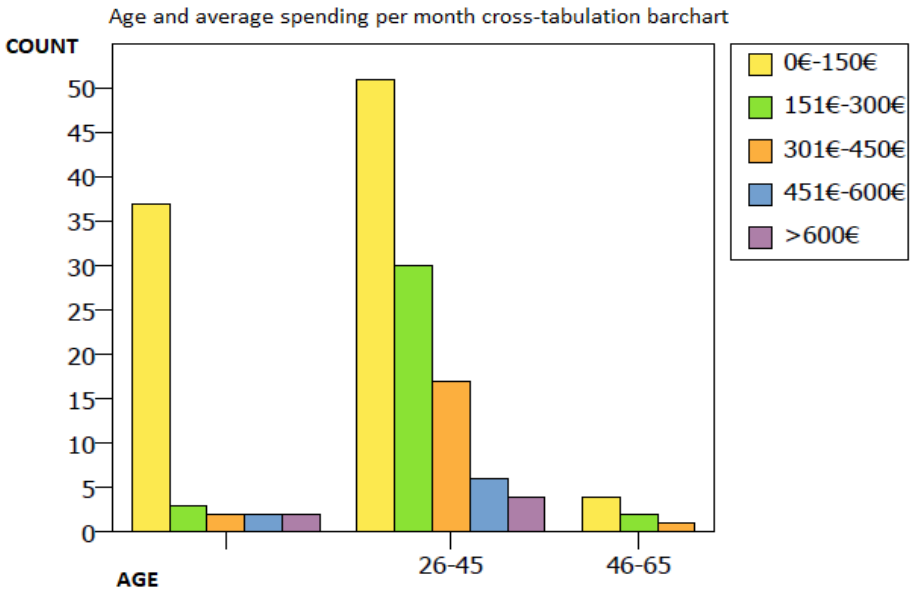

Figure 2 Avg Spending per month/ Age Cross-Tabulation

Table 4 Age and Avg. Spending per Month

AGE	***0€-150€***	***151€300€***	***301€-450€***	***451€-600€***	***>600€***	***Total***
<25	37	3	2	2	2	46
	80.43%	6.52%	4.35%	4.35%	4.35%	100.00%
	40.22%	8.57%	10.00%	25.00%	33.33%	28.57%
	22.98%	1.86%	1.24%	1.24%	1.24%	28.57%
26-45	51	30	17	6	4	108
	47.22%	27.78%	15.74%	5.56%	3.70%	100.00%
	55.43%	85.71%	85.00%	75.00%	66.67%	67.08%
	31.68%	18.63%	10.56%	3.73%	2.48%	67.08%
46-65	4	2	1	0	0	7
	57.14%	28.57%	14.29%	0.00%	0.00%	100.00%
	4.35%	5.71%	5.00%	0.00%	0.00%	4.35%
	2.48%	1.24%	0.62%	0.00%	0.00%	4.35%
Total	92	35	20	8	6	161
	57.14%	21.74%	12.42%	4.97%	3.73%	100.00%
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
	57.14%	21.74%	12.42%	4.97%	3.73%	100.00%

Concerning the core variables' response distribution, table 4 provides in-depth frequency analysis. With regards to the variable of innovativeness, all 3 elements of the construct, indicated high level of agreement. This leads to the conclusion that the innovativeness levels of the sample are high. For each element, the percentage of low innovativeness is 7%, 29% and 13% respectively, which is expected to positively affect intention to use. Additionally, the construct of social influence also indicated low levels of disagreement, which leads to the conclusion that there is high social influence with regards to the use of e-transactions. For each element, the percentage of low social influence is 15%, 15% and 13% respectively, which is expected to positively affect intention to use. Furthermore, the levels of perceived risk are rather high as for each element of the variable, the percentage of respondents who stated that either agree or strongly agree that their perceived risk levels are high, is 51.5%, 46% and 48.4%. This indication leads to the conclusion that in the society of Thessaloniki, consumers understand e-transactions dangers of personal data handling and data breaches, which is expected to negatively affect

intention to use. On the other hand, high levels of trust are observed, as the levels of disagreement with each construct of the variable is 7,4%, 7,4% and 10% respectively. This indicates the high level of trust in the processes of the e-transaction platforms which is expected to positively affect intention to use. With regards to the variable of intention to use, the level of agreement is high for each element of the construct with only 6.2%, 8% and 8% rate of low intention to use, respectively.

Table 5 Frequency tables: Core Variables

If I heard about a new technology, I would look for ways to experiment with it

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Disagree	2	12	7.41	7.45	7.45
Neither agree nor disagree	3	52	32.1	32.3	39.75
Agree	4	80	49.38	49.69	89.44
Strongly Agree	5	17	10.49	10.56	100
Total		161	100	100	

Among my peers, I am usually the first to explore new technologies

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	7	4.32	4.35	4.35
Disagree	2	39	24.07	24.22	28.57
Neither agree nor disagree	3	58	35.8	36.02	64.6
Agree	4	44	27.16	27.33	91.93
Strongly agree	5	13	8.02	8.07	100
Total		161	100	100	

I like to experiment with new technologies

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**

Strongly disagree	1	5	3.09	3.11	3.11
Disagree	2	16	9.88	9.94	13.04
Neither agree nor disagree	3	42	25.93	26.09	39.13
Agree	4	80	49.38	49.69	88.82
Strongly agree	5	18	11.11	11.18	100
Total		161	100	100	

People who are important to me think that I should use e-transactions

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	4	2.47	2.48	2.48
Disagree	2	20	12.35	12.42	14.91
Neither agree nor disagree	3	76	46.91	47.2	62.11
Agree	4	57	35.19	35.4	97.52
Strongly Agree	5	4	2.47	2.48	100
Total		161	100	100	

People who influence my behavior think that I should use e-transactions

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	3	1.85	1.86	1.86
Disagree	2	21	12.96	13.04	14.91
Neither agree nor disagree	3	81	50	50.31	65.22
Agree	4	52	32.1	32.3	97.52
Strongly Agree	5	4	2.47	2.48	100
Total		161	100	100	

People whose opinions I value prefer that I use e-transactions

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	4	2.47	2.48	2.48
Disagree	2	17	10.49	10.56	13.04

Neither agree nor disagree	3	80	49.38	49.69	62.73
Agree	4	55	33.95	34.16	96.89
Strongly Agree	5	5	3.09	3.11	100
Total		161	100	100	

I intend to use e-transactions systems in the future

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	9	5.56	5.59	5.59
Disagree	2	1	0.62	0.62	6.21
Neither agree nor disagree	3	11	6.79	6.83	13.04
Agree	4	95	58.64	59.01	72.05
Strongly agree	5	45	27.78	27.95	100
Total		161	100	100	

I will always try to use e-transactions in my daily life

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	2	1.23	1.25	1.25
Disagree	2	11	6.79	6.88	8.13
Neither agree nor disagree	3	41	25.31	25.62	33.75
Agree	4	73	45.06	45.63	79.38
Strongly agree	5	33	20.37	20.63	100
Total		161	100	100	

I plan to use e-transactions systems frequently

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	4	2.47	2.48	2.48
Disagree	2	9	5.56	5.59	8.07
Neither agree nor disagree	3	27	16.67	16.77	24.84
Agree	4	88	54.32	54.66	79.5
Strongly Agree	5	33	20.37	20.5	100
Total		161	100	100	

I did not expect to feel totally safe providing personal private information over e-transactions systems

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Strongly disagree	1	7	4.32	4.38	4.38
Disagree	2	29	17.9	18.13	22.5
Neither agree nor disagree	3	32	19.75	20	42.5
Agree	4	83	51.23	51.88	94.38
Strongly agree	5	9	5.56	5.63	100
Total		161	100	100	

I expected to be worried about using e-transactions systems because other people may be able to access my account

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Strongly disagree	1	2	1.23	1.26	1.26
Disagree	2	43	26.54	27.04	28.3
Neither agree nor disagree	3	33	20.37	20.75	49.06
Agree	4	68	41.98	42.77	91.82
Strongly Agree	5	15	8.02	8.18	100
Total		161	100	100	

I did not expect to feel secure sending sensitive information across e-transactions systems

Value Label	Value	Frequency	Percent	Valid Percent	Cum Percent
Strongly disagree	1	7	4.32	4.4	4.4
Disagree	2	33	20.37	20.75	25.16
Neither agree nor disagree	3	27	16.67	16.98	42.14
Agree	4	78	48.15	49.06	91.19
Strongly agree	5	16	8.64	8.81	100

Total		161	100	100	
I do not feel totally safe providing personal private information over e-transaction systems					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	3	1.85	1.88	1.88
Disagree	2	41	25.31	25.62	27.5
Neither agree nor disagree	3	34	20.99	21.25	48.75
Agree	4	69	42.59	43.13	91.88
Strongly Agree	5	14	8.02	8.13	100
Total		161	100	100	
I am worried about using e-transactions systems because other people may be able to access my account					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	2	1.23	1.25	1.25
Disagree	2	50	30.86	31.25	32.5
Neither agree nor disagree	3	35	21.6	21.88	54.38
Agree	4	61	37.65	38.13	92.5
Strongly agree	5	13	7.41	7.5	100
Total		161	100	100	
I do not feel secure sending sensitive information across e-transactions systems					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	1	0.62	0.64	0.64
Disagree	2	41	25.31	26.11	26.75
Neither agree nor disagree	3	41	24.07	24.84	51.59
Agree	4	58	35.8	36.94	88.54

Strongly agree	5	20	11.11	11.46	100
Total		161	100	100	
I expected e-transactions systems to be reliable					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Disagree	2	9	5.56	5.63	5.63
Neither agree nor disagree	3	24	14.81	15	20.63
Agree	4	96	59.26	60	80.63
Strongly Agree	5	32	19.14	19.38	100
Total		161	100	100	
I expected e-transactions systems to be secure					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Disagree	2	8	4.94	5	5
Neither agree nor disagree	3	17	10.49	10.63	15.63
Agree	4	93	57.41	58.13	73.75
Strongly agree	5	43	25.93	26.25	100
Total		161	100	100	
I expected e-transactions systems to be trustworthy					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Disagree	2	10	6.17	6.25	6.25
Neither agree nor disagree	3	21	12.35	12.5	18.75
Agree	4	89	54.94	55.63	74.38
Strongly Agree	5	41	25.31	25.62	100
Total		161	100	100	
I trust e-transactions systems to be reliable					
Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**

Strongly disagree	1	2	1.23	1.25	1.25
Disagree	2	10	6.17	6.25	7.5
Neither agree nor disagree	3	37	22.84	23.13	30.63
Agree	4	101	62.35	63.13	93.75
Strongly Agree	5	11	6.17	6.25	100
Total		161	100	100	

I trust e-transactions systems to be secure

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	1	0.62	0.63	0.63
Disagree	2	15	9.26	9.38	10
Neither agree nor disagree	3	34	20.99	21.25	31.25
Agree	4	100	61.11	61.88	93.13
Strongly Agree	5	11	6.79	6.88	100
Total		161	100	100	

I trust e-transactions systems

Value Label	**Value**	**Frequency**	**Percent**	**Valid Percent**	**Cum Percent**
Strongly disagree	1	2	1.23	1.24	1.24
Disagree	2	14	8.64	8.7	9.94
Neither agree nor disagree	3	54	33.33	33.54	43.48
Agree	4	84	51.85	52.17	95.65
Strongly agree	5	7	4.32	4.35	100
Total		161	100	100	

Hypotheses testing

In order to verify the proposed theoretical model, statistical correlation analysis is applied to the variables. The tool that was used to test the hypotheses and detect possible correlations among studied variables, is the Pearson correlation test, which was executed using the PSPP statistical analysis software. All four variables of innovativeness, social influence, perceived risk and perceived trust, were

found to be correlated with the intention to use e-transactions during the COVID-19 pandemic.

Statistically significant moderate positive correlation was yielded between the variables of innovativeness and intention to use with a correlation coefficient of 0,4. Additionally, statistically significant weak positive correlation was yielded between the variables of social influence and intention to use, with a correlation coefficient of 0,29. Furthermore, statistically significant weak positive correlation was yielded between the variables of perceived trust and intention to use with a correlation coefficient of 0,27. Lastly, statistically significant weak negative correlation was yielded between the variables of perceived risk and intention to use with a correlation coefficient of 0,24. Weak negative correlation was also statistically supported between the variables of expected risk and intention to use, while expected trust was found to be significantly weakly positively correlated to intention to use. While these two variables of expected risk and expected trust are not included in the proposed model, further analysis follows in the next section.

H1. *Social influence positively affects the intention to use e-transactions.*

According to table 6, H1 is confirmed and the correlation between the variables of social influence and intention to use e-transactions is statistically supported during the outbreak of the COVID-19 pandemic.

Table 6 Intention to use and social influence

		Intention to Use	***Social Influence***
Intention to Use	Pearson Correlation	1	0.29
	Sig. (2-tailed)		0

H2. *Perceived risk negatively affects the intention to use e-transactions.*

According to table 7, H2 is also confirmed and the correlation between the variables of perceived risk and intention to use e-transactions is statistically supported during the outbreak of the COVID-19 pandemic.

Table 7 Intention to use and perceived risk

		Intention to Use	***Perceived Risk***
Intention to Use	Pearson Correlation	1	-0.24
	Sig. (2-tailed)		0,002

H3. *Perceived trust positively effects the intention to use e-transactions*

According to table 8, H3 is additionally confirmed and the correlation between the variables of perceived trust and intention to use e-transactions is statistically supported during the outbreak of the COVID-19 pandemic.

Table 8 Intention to use and perceived trust

		Intention to Use	***Perceived Trust***
Intention to Use	Pearson Correlation	1	0.27
	Sig. (2-tailed)		0,001

H4. Innovativeness positively affects the intention to use e-transactions.

According to table 9, H4 is additionally confirmed and the correlation between the variables of innovativeness and intention to use e-transactions is statistically supported during the outbreak of the COVID-19 pandemic.

Table 9 Intention to use and Innovativeness

		Intention to Use	***Innovativeness***
Intention to Use	Pearson Correlation	1	0.4
	Sig. (2-tailed)		0

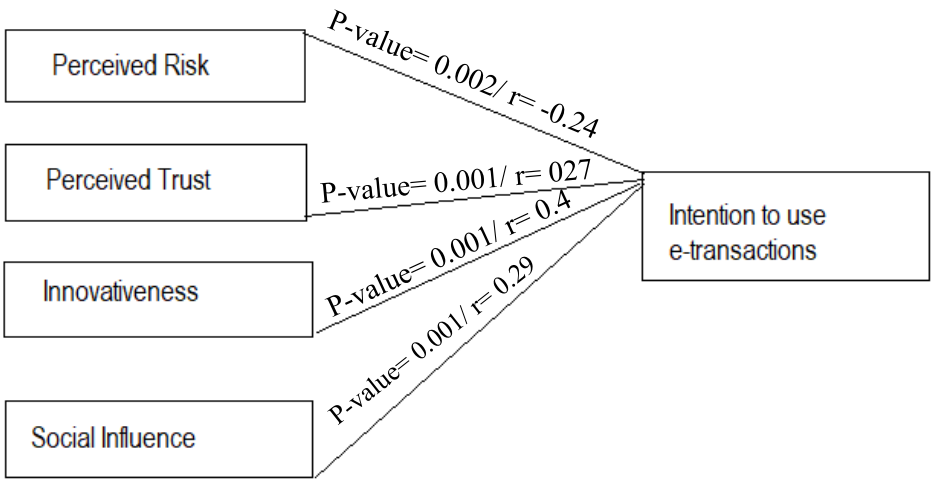

Figure 3 Validated Theoritical Model

Gap of Satisfaction

In order to further elaborate on the matter, this research tried to determine the difference between expected risk and perceived risk, as well as the difference between expected trust and perceived trust, before and after transacting, online during the COVID-19 pandemic outbreak. This finding will reveal whether the people of Thessaloniki actually perceived e-transactions systems as safe according to their personal data management and their perception with regards to the intentions of the e-retailers to act in an ethical and predictable way. According to table 10, the variables indicate a statistically significant correlation level with a p-value indication that is less than 0.05.

H5. *There is difference in the perception of risk, after using e-transactions.*

Based on table 10, H5 is not confirmed, as the p-value indication is higher than 0.05. This leads to the result that, there is no different with regards to risk perception, before and after using the e-transaction systems during the COVID-19 pandemic outbreak.

H6. *There is difference in the perception of trust, after using e-transactions.*

Based on table 10, H6 is confirmed, as the p-value indication is less than 0.05. This leads to the result that, there is statistically significant difference with regards to trust perception, before and after using the e-transaction systems during the COVID-19 pandemic outbreak. Furthermore, high positive difference is observed between the means of the samples, which indicated that the expectations of the respondents, with regards to trust in e-transaction systems, were not met, after completing the e-transactions.

Table 10 Paired Samples T-test, Risk & Trust

Paired Sample Correlations

		N	Correlation	Sig.
Pair 1	PERC.RISK & EXP.RISK	156	0.72	0
Pair 2	PERC.TRUST & EXP.TRUST	160	0.46	0

Paired Samples Test

		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	Perceived Risk - Expected Risk	-0.26	1.98	0.16	-0.57	0.06	-2	155	0.108
Pair 2	Perceived Trust- Expected Trust	-1.18	2.22	0.18	-1.52	-0.8	-7	159	0

Conclusions

Summarizing, this research has confirmed that the proposed theoretical model is appropriate to be used during the COVID-19 pandemic outbreak, in order to determine the factor that affect the intention to use e-transactions. Concerning the sample, it included individuals that live in the city of Thessaloniki. The respondents stated that almost all of them use the internet daily, while their device of preference to use the internet for personal reasons, is their smartphone. Additionally, most of them stated that both the frequency of their online spending and the amount of money they spend, has increased, compared to last year, when the COVID-19 pandemic outbreak was not a reality.

What should be taken in consideration, is the fact that the people of older age do not spend a notable amount of money on e-transactions, which indicates opposition to the rest of European results and can possibly be explained by the low e-transactions acceptance of the Greek people in general. Significantly, the results of this research further prove the significance of the extended UTAUT model with regards to the intention to use e-transactions. The variables of innovativeness, social influence, perceived risk and perceived trust, all affect the intention to use. The variable of perceived risk negatively affects intention to use, while the other 3, affect intention to use positively which is completely consistent with the existing bibliography on the matter.

Furthermore, analysis was conducted with regards to possible alteration between expected and perceived risk and trust, in order to further contribute to the determination of the drives that make individuals transact online. No alteration was indicated with regards to expected and perceived risk, before and after using the e-transaction platforms, which leads to the result that when using e-transaction systems, their expectations were met and they were not either over satisfied or unsatisfied. Moreover, with regards to trust, statistically significant alteration was found, which led to the result that individuals were unsatisfied after using the e-transaction systems, compared to the expectations they had built before using them. This indication should be taken in consideration, as trust significantly affects perceived risk and the higher the levels of trust are, the lower the levels of perceived risk are (Pavlou, 2002).

Managerial Implications and Further Research Proposals

Despite the significant results that this research has provided, limitations have been applied, without downgrading the validity of the findings. Firstly, the results were gathered during the COVID-19 outbreak period, when social distancing measures were applied by the government. This affected the methodology, by forcing the limitation to online only surveying.

An even deeper understanding could be provided by applying also qualitative research methods through physical presence of the respondents, which is proposed for further study, when this will be applicable again.

Moreover, due to the fact that the society is currently under pressure and that this research is conducted within a timeframe of 4 Months for academic purposes, the sample can be increased, if a bigger time period is allowed for further study. This could affect the non-significant findings of correlation between perceived and expected risk, as well as demographics and increase in the frequency of e-transactions within the last year.

This model is proposed to be measured again in the Greek society and the second larger city of Greece, Thessaloniki, in the future, as e-transactions become more and more popular in Greece and the current status of low-adoption is expected to increase in the future, according to the EU reports.

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Appendix

Greek Legislation

1. Νόμος 4446/2016 - ΦΕΚ 240/Α/22-12-2016
2. ΠΟΛ:1005/2017 - ΦΕΚ 145/Β/25-1-2017

Research Questionnaire

Modeling the E-Transactions Intentions of Thessaloniki Residents, Due to the COVID-19 Pandemic

This research is conducted for academic purposes, for the International Hellenic University and its main goal is to examine the effects of the COVID - 19 pandemic on the intention of the population of Thessaloniki to use e-transactions. The aspects include: i) perceived risk, ii) perceived trust, iii) innovativeness iv) social influence, v) intention to use. Before we get started, we would like to assure you that all answers you provide to this questionnaire are completely confidential and anonymous and will be used exclusively for statistical purposes.

Section 1, Demographic Characteristics:

What is your sex?	Male	Female
	1	2

In which age group do you belong	<25	26-45	46-65	>65
	1	2	3	4

What is the highest degree or level of education you have completed?	High-School	Bachelors' Degree	Masters' Degree	Ph.D. or Higher
	1	2	3	4

What is your annual income?	0-10.000€	10.001€-20.000€	20.001€-30.000€	30.001€-40.000€	40.001€ -
	1	2	3	4	5

Section 2, Internet usage respondent profile:

How often do you use the internet?	Less than once a month	Once a month	Once a week	More than once a week	Every day
	1	2	3	4	5

On average, how many hours per day do you spend on the	Less than 1 hour a day	1-2 hours	2-3 hours	3-4 hours	More than 4 hours a day
	1	2	3	4	5

internet?					

Where do you use the internet from? internet?	Home	School/university library	Café	Friend's house	Office
	1	2	3	4	5
Which device do prefer, in order to use the internet for personal reasons?	Desktop	Mobile phone	Tablet	VR/AR headset	
	1	2	3	4	

How often do you make e-transactions?	Less than once a month	Once a month	Once a week	More than once a week	Everyday
	1	2	3	4	5

What is the reason for your e-transactions?	Pay bills	Purchase groceries	Purchase clothes/accessories	Purchase online services	Other__
	1	2	3	4	5

Which payment method is of your preference?	Cash on delivery	Credit card	Bank transfer	PayPal	Other__
	1	2	3	4	5

Which is the average amount of your e-transactions spending per month?	0€-150€	151€-300€	301€-450€	451€-600€	>600€
	1	2	3	4	5

The frequency of your e-transactions has increased, compared to last year's	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	1	2	3	4	5

The average amount of your e-transactions spending has increased, compared to last year's	Strongly disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
	1	2	3	4	5

Section 3a, Social influence

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

People who are important to me think that I should use e-transactions	1	2	3	4	5
People who influence my behavior think that I should use e-transactions	1	2	3	4	5
People whose opinions I value prefer that I use e-transactions	1	5	3	4	5

Section 3b, Innovativeness

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
If I heard about a new technology, I would look for ways to experiment with it	1	2	3	4	5
Among my peers, I am usually the first to explore new technologies	1	2	3	4	5
I like to experiment with new technologies	1	5	3	4	5

Section 3c, Intention to use

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I intend to use e-transactions systems in the future	1	2	3	4	5
I will always try to use e-transactions in my daily life	1	2	3	4	5
I plan to use e-transactions systems frequently	1	5	3	4	5

Section 3d, Expected Risk

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree

I did not expect to feel totally safe providing personal private information over e-transactions systems	1	2	3	4	5
I expected to be worried about using e-transactions systems because other people may be able to access my account	1	2	3	4	5
I did not expect to feel secure sending sensitive information across e-transactions systems	1	5	3	4	5

Section 3e, Perceived risk

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I do not feel totally safe providing personal private information over e-transactions systems	1	2	3	4	5
I am worried about using e-transactions systems because other people may be able to access my account	1	2	3	4	5
I do not feel secure sending sensitive information across e-transactions systems	1	5	3	4	5

Section 3f, Expected Trust

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I expected e-transactions systems to be reliable	1	2	3	4	5
I expected e-transactions systems to be secure	1	2	3	4	5

I expected e-transactions systems to be trustworthy	1	5	3	4	5

Section 3g, Perceived trust

	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
I trust e-transactions systems to be reliable	1	2	3	4	5
I trust e-transactions systems to be secure	1	2	3	4	5
I trust e-transactions systems	1	5	3	4	5