Technological acceptance in the retail sector: an empirical generalisation by a meta-analytic study

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This is the accepted author manuscript of the following article published by EMERALD in *Journal of Systems and Information Technology:*

Santini, F. D. O., Maçada, A. C. G., Freitas Junior, J. C., Ladeira, W. J., & Oliveira, T. (2025). Technological acceptance in the retail sector: an empirical generalisation by a meta-analytic study. Journal of Systems and Information Technology. https://doi.org/10.1108/JSIT-08-2021-0179

TECHNOLOGICAL ACCEPTANCE IN THE RETAIL SECTOR: AN EMPIRICAL GENERALISATION BY A META-ANALYTIC STUDY

ABSTRACT

Purpose: The purpose of this study is to present a systematic analysis employing a meta-analytical approach regarding the antecedents and consequences of the technology acceptance model (TAM) in the retail context. We also analysed five different theoretical models using meta-analytic structural equation modelling (MASEM). Finally, we investigated possible moderators on the relationships between TAM constructs.

Design/methodology/approach: This manuscript is conceptual as it is based on a literature review. In this line, we analysed 85 articles by a meta-analysis that generated 431 effect sizes and identified eight antecedents and two consequences of TAM construct.

Findings: All antecedents and consequences promoted significant effects-sizes with TAM constructs. In the moderation analysis, we determined that top journals and countries with a high human development index (HDI) promoted more substantial effect sizes in the relationship between perceived usefulness (PU) and behavioural intention, and PU and attitude toward system use, respectively. About the theoretical models tested, we found that the antecedents enjoyment and trust represent the best fit in TAM models, which affects attitude and behavioural intentions.

Originality: This research tested the impact of TAM's antecedents, consequences, and moderators in the retail sector and presented important results via a meta-analytical review. This meta-analysis contributes to the marketing literature by offering a set of empirical generalisations, including relationship coefficients and calculated fail-safe numbers.

Keywords: TAM; Retail Sector; Social Influence; Trust; Enjoyment; Meta-analysis

TECHNOLOGICAL ACCEPTANCE IN THE RETAIL SECTOR: AN EMPIRICAL GENERALISATION BY A META-ANALYTIC STUDY

1. INTRODUCTION

The retail sector is a cornerstone of the global economy, with its significance underscored by ongoing technological advancements that are rapidly transforming the industry. Recent analyses highlight how digital transformation and innovations like augmented reality are redefining retail, stressing the importance of agility in addressing emerging challenges (Parashar, 2023). Moreover, the adoption of omnichannel strategies and real-time data analytics has become critical for retailers to adapt to the post-2020 landscape, ensuring resilience and competitiveness in an evolving market (Gottlieb, 2021).

It is important to note that technology is not only found in the products but also in how retailers establish relationships with consumers (e.g., mobile payment; information quality; social relationship; online buying and search process). According to Statista (2020), in 2019, retail e-commerce sales worldwide amounted to 3.53 trillion US dollars, and e-retail revenues are projected to grow to 6.54 trillion US dollars in 2022. Also of interest, Amazon, for which e-commerce represents 47% of its total sales, surpassed Walmart as the world's largest retailer (eMarketer, 2019). Global spending on technology in the retail sector reached US$ 203.6 billion in 2019 and is estimated to grow year-on-year by 3.6%; and projects that artificial intelligence (AI) will manage 85% of customer interactions in the retail sector by 2020 (FungScholars, 2019). For instance, mobile technology investments in the retail sector grew from $4 billion in 2009 to $ 36 billion in 2015 (Lemon and Verhoef, 2016). Matzner et al. (2018) argue that emerging technologies

generate innovation in the retail sector. For example, 46% of retailers plan to introduce Augmented Reality (AR) (Cook, Ohri, and Kusomoto, 2020) and service robots (SR) (Meyer, Jonas, and Roth, 2020). Nevertheless, there is a need to assess whether these technologies add value and will be accepted by the customer.

The unquestionable managerial importance of information technology (IT) in the retail sector is investigated by academics in various journals, countries, and contexts. One of the aspects most often studied concerns how consumers perceive and interact with these technologies, focusing on the propensity of consumers to accept them. The technology acceptance model – TAM (Davis, 1989) – is one of the most useful theoretical constructs for understanding this form of consumer behaviour (Mehrad and Mohammadi, 2017; Rodrigues et al., 2016) and comprises a multidimensional construct composed of two main dimensions: perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). This construct provides insights into why individuals accept or reject modern technology (Munoz-Leiva et al., 2017).

TAM has been widely used in the retail context. The systematic review in the present study identified 98 quantitative studies that tested TAM with some antecedent (e.g., social influence; risk perception) and consequent constructs (e.g., attitude; loyalty). These studies were conducted on different continents (e.g., America, Europe, Asia, and Africa) and involved different retail contexts and consumers (e.g., Banks, Hospitality, Shopping Centers). This diversity of contexts and inherent variation due to the judgment subjectivity of the individuals within that environment has led to difficulty interpreting the results obtained using TAM. For example, Kim and Hyun (2016) presented a negative relationship between risk perception and TAM regarding food retail, while Sinha and Mukherjee (2016) showed a neutral effect on the retail banking sector. Conflicting results can also be seen with other constructs, such as attitude, which has been found to have

neutral effects in some studies (Zaremohzzabieh et al., 2016) and a strong effect in others (Yang, 2005). As AI-powered technologies continue to evolve, their role in consumer interactions has become increasingly significant. For instance, AI-powered chatbots are now being widely adopted in retail to enhance customer purchase behavior through improved information value and technological innovation (Cu Le, 2023) .

Because of the conflicting results reported in the literature and the importance of this construct, we conducted a meta-analysis to enable the integration of TAM's main antecedents and consequences in retail contexts. As Fern and Monroe (1996) and Dickersin (2002) pointed out, the meta-analysis is a powerful tool to promoted theory generalisation. We also conducted a moderation analysis of the main relationships that could explain the mentioned variations found in primary research. Finally, we identified the most popular relationships tested on TAM in the retail context and compared five models with a meta-analytic structural equation modelling (MASEM) approach to demonstrate the best fits and obtain a clearer picture of specific relationships within TAM. Given these aims, our research seeks to answer the following question: What are the key antecedents and consequences of TAM in the retail sector, and how do different theoretical models compare in explaining the variations in attitude toward the system and behavioral intention?"

The remaining sections of this paper are outlined as follows: Section 2 provides a synthesis of the literature on meta-analytic studies using TAM in the retail context; Section 3 describes the methodological design employed in this study to select studies for this meta-analysis; Section 4 presents the findings obtained using comprehensive meta-analysis; Section 5 presents the conclusion of the study.

2. LITERATURE REVIEW

2.1 The technological acceptance model - TAM

Digital social relationships considerably influence decisions regarding new technologies' use (Hudson et al., 2016). Consumers' adoption of an innovative technology depends on several variables and how technology is perceived (Hudson et al., 2016). The relevance of this topic has generated a great deal of research regarding the acceptance of technologies by people and companies under various approaches, especially since the 1990s (Shaikh et al., 2015). The term "technology acceptance" emerged in 1986, coined by Fred D. Davis, who empirically tested how users' beliefs interfered with the acquisition or acceptance of new technology and generated acceptance models.

Davis (1989) drew on studies of psychology called the *Theory of Reasoned Action – TRA*. According to TRA, people's behavioural beliefs (perception about something or a subject) influence their attitudes and trigger expected behaviour (Fishbein et al., 2010). Thus, a person's beliefs can generate an intention to use a particular technology and predict its acceptance (Ma and Liu, 2004). The intention then leads the individual to behave in such a way as to accept or reject the new technology (Davis, 1989), especially when it brings innovation (Ma and Liu, 2004). Although TAM has been validated in several studies and research in diverse areas (Shaikh and Larjaluoto, 2015), the model has certain limitations for some cases and has been modified (Ventakesh et al., 2003). The use of TAM in different areas has spread and gained notoriety, with modifications in explanatory factors and the model of questions asked depending on the final intention of the research and area of activity.

Most of those studies use the Technology Acceptance Model and its versions, including TAM1, TAM2, TAM3, the Unified Theory of Acceptance and Use of

Technology (UTAUT1) and UTAUT2, as a research framework to explore users' acceptance behaviour (Putra, 2019).

Venkatesh & Davis (2000) developed and tested a theoretical extension of TAM called TAM 2. TAM 2 explains PU in terms of two external variables, namely 'social influence processes' and 'cognitive instrumental processes', which have proven to significantly influence user acceptance (Venkatesh and Davis, 2000). They r ealized the need to insert subjective factors regarding the social role perceived by people, especially those that affect the perceived usefulness of the product and its benefits. For example, the relevance that the individual perceives about the work performed by the new technology and the demonstrability of possible outcomes affect the person's perception of the perceived usefulness of the technology. Also, experience with the technology and the image generated by the technology presentation are subjective factors that may affect the intended use of that technology (Venkatesh and Davis, 2000).

Almost a decade later, the TAM3 model was created (Ventakesh and Bala, 2008). The authors included some important predictor variables, defined as computer playfulness, perceived appreciation, objective usability, self-efficacy, perception of external control, and computational anxiety in this new model.

Other researchers, such as Huang in 2007 and Liu and colleagues in 2010, proposed minor changes to existing TAM models. For example, to test the acceptance of mobile learning technology in schools, the external variables of perception of the value of mobility were proposed. This aspect refers to the extent to which the mobility brought by technology is effectively valued. Also added was the perception of fun, which is how much the technology brings user enjoyment. (Huang et al., 2007). In this study, the perception of fun was the most explanatory variable for ease of use. Liu et al. (2010) inserted the design variable into the model, suggesting that the better the IT design, the

greater its chance of acceptance. Recent studies have demonstrated the importance of understanding user continuance intention in mobile payment applications, which directly relates to TAM's relevance in modern digital contexts (Chaw et al., 2024)

Given a large number of models and adaptations of TAM, a unified model with the expansion of external variables capable of explaining technology acceptance, called the *unified theory of acceptance and use of technology* (UTAUT), was developed by Ventakesh et al. (2003). In this new model, the main factors determining technological acceptance were: (a) expected performance, (b) expected effort to use, (c) social influence, and (d) facilitated conditions. Years later, to make the model more consumer-centric, Venkatesh et al. (2012) extended UTAUT to UTAUT2 with the insertion of three new factors: (1) hedonic motivation; (2) habit of use, and (3) price value.

Despite attempts to develop alternative models to test the technology acceptance models, the TAM constructs proposed by Davis et al. (1989) continue to be the most robust, tested, and useful theory to understand the predisposition of consumers to use new technologies (Mehrad and Mohammadi 2017; Rodrigues et al., 2016). For this reason, this meta-analysis will concentrate the analysis on the antecedents, consequences, and moderators of Davis's TAM..

In this case, TAM comprises two main dimensions: (1) perceived ease of use – PEOU, and (2) perceived usefulness – PU. PEOU is associated with the interactive elements that the technology generates in the user (Davis, 1989). The user will mentally evaluate the handling of the technology and, consequently, its performance (Venkatesh and Davis, 2000) (e.g., system quality; design; graphical interface). PU concerns how the consumer sees the technology and how it is used to increase technological performance and the experience of using a particular service (Venkatesh et al., 2008) (e.g., time, security, and price savings).

2.2 Technology in the retail sector

Technological innovations have the potential to change the retail landscape completely (Pantano, 2016). The digital revolution has increasingly generated a division and complementarity between physical and digital channels, enabling consumers to move between physical and online stores within a single buying process (Piotrowicz and Cuthbertson, 2014). Some benefits of digital devices are ubiquity and portability (Pantano et al., 2013). Consumers are no longer limited by store hours or geographic locations, thereby boosting productivity, eliminating shopping distances, and gaining flexibility in defining when, where, and how they buy their goods (Piotrowicz and Cuthbertson, 2014).

A critical factor contributing to the growth of online commerce is the burgeoning use by consumers of self-service technologies (SST) and mobile applications. SST allow consumers to obtain benefits without the presence of any employee providing service (Robertson et al., 2016). Also, social networks such as Facebook and Instagram allow consumers to share and express their thoughts on products and services at any point in the purchasing process (Niemeier et al., 2013). Thus, consumers have the ability to compare prices, search for offers and product information, make payments, and seek opinions from other consumers on their mobile devices (Yarrow, 2014). This shift in consumer behavior has been further supported by the growing adoption of mobile payment applications, which Chaw et al. (2024) found to be influenced by user-friendly design and the continuous improvement of app features.

Retailers are looking to develop user-friendly applications, well-tested and well-developed features and offer benefits such as loyalty programs and new user referral bonuses to attract consumers (Hoehle and Ventakesh, 2015). Also, since the world's largest social network, Facebook, has over 2 billion active users (Statista, 2017),

companies must build online relationships with their customers that encourage them to promote their products and provide positive feedback about their brand (Piotrowicz and Cuthbertson, 2014). The use of technology to create new points of interaction between retail and customer, create new possibilities for consumers, and increase their influence on the decision to buy among other users is the main reflection for the customer of the technology advancement. In retail, however, some other innovations also emerge to qualify the user experience in the purchasing process (Pantano et al., 2016). For example, AI-powered chatbots are being increasingly adopted to enhance the customer experience, offering personalized assistance and improving purchase decisions, as discussed by Cu Le (2023).

One of the problems in the sector is the lack of perception about the benefits of new technologies (Inman et al., 2017). Especially, the use of the internet and ease of comparison between products has made consumers more demanding agents, and the need for active digital marketing should increase the competitiveness of companies (Piotrowicz and Cuthbertson, 2014). Consumers' proper use of software and the internet seems to be the present and future in the market. Digital marketing and e-commerce are expected to become paramount and should be embraced by companies of any size or industry (Pantano et al., 2016).

As we have noted, technology has played an increasingly vital role in retailing, with evolving forms of interaction with consumers, including the role of stores themselves, which has changed. However, it remains the primary point of contact with retailers (Verhoef et al., 2015). Consumers, in turn, continue to value contact and make purchases in physical stores, which remains an exceedingly popular route for the purchase of consumer goods (Verhoef et al., 2015), since when shopping in the store, the customer

has the advantage of receiving the product immediately on purchase (Ailawadi et al., 2017).

The development of technology and the massification of consumer access to new technologies has made it a central part of the retail buying process, bringing the possibility of customisation to each user's shopping experience, greater ease of customer relationship, understanding profiles, and consequently, adapting the shopping experience to each consumer (Kaushik et al., 2015). Furthermore, research by Nguyen et al. (2024) highlights how technology-driven customization enhances user satisfaction, influencing their continued engagement with retail platforms.

2.3 The TAM models tested in the retail context

Various models have been proposed to investigate the antecedents and consequences of the original TAM (Davis, 1989) in the retail context. We opted to investigate the most popular relationships that allow the application of the MASEM approach. For this, we used primary data from our meta-analysis. After that, we created a correlation-covariance matrix across studies according to Cheung and Chan (2005). Guided by this matrix, we determined that three external variables (enjoyment, social influence, and trust) could have an impact on TAM constructs, and TAM constructs could promote direct effects on consumers' attitudes and an indirect effect on behavioural intention.

So, given the range of variables within TAM, different versions of the model have been studied empirically (Scherer, Siddiq, and Tondeur, 2019). Model 1 extends TAM model, combining it with enjoyment (ENJ), social influence (SI), and trust (TRU). Model 2 represents TAM core and focuses on the outcome attitude towards use (AT) and behavioural intention to use (BI). In models 3, 4 to 5, the antecedent variables enjoyment,

social influence, and trust were alternated to analyse the best fit. Below, we present the five models tested using MASEM (see Figure1). Table 1 presents the expected relationship based on a systematic review.

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3. METHODOLOGICAL DESIGN

This meta-analysis followed the procedures suggested by Hunter and Schmidt (2004) and Lipsey and Wilson (2001) and was guided by three steps: (1) data collecting, (2) coding, and (3) calculating process.

Data collection: In this step, we searched published and unpublished studies that could be relevant to this meta-analysis. We used the *Preferred reporting items for systematic review and meta-analysis* (PRISMA) protocols (Moher et al., 2011), as applied in other meta-analyses (e.g., Santini et al., 2019). We used four main search terms on the electronic databases and journal sites, namely: "technology acceptance," "TAM," “ease of use,” and “usefulness.” These terms were identified in the title, abstract, and/or keyword fields. The search was conducted in English and the areas investigated were business, marketing, management, and information systems.

We accessed three electronic databases: EBSCO, Google Scholar, ProQuest, and five academic publishers: Science Direct, Emerald, JSTOR and Taylor and Francis. We also manually searched the leading marketing, retailing, and IT journals (e.g., *European Journal of Marketing; International Journal of Marketing Research; Journal of Academy of Marketing Science; Journal of Business Research; Journal of Consumer Research; Journal of Interactive Marketing; Journal of Marketing; Journal of Marketing Research;*

Journal of Retail; International Journal of Retailing and Distribution Management; Journal of Retailing and Consumer Service; International Review of Retail, Distribution and Consumer Research; Journal of Product of Management Reviews; Technovation; MIS Quarterly: Management Information Systems; Information Systems Research; Journal of Management Information Systems Information and Management). Additionally, we undertook a search of the leading academic marketing and IT congresses (e.g., *Association of consumer research conference; Academy of marketing science conference; European marketing academy conference; INFORMS, Hawaii International Conference on Systems Sciences, 25th European Conference on Information Systems, Global Marketing Conference, Association for Consumer Research Conference*).

The full initial search revealed 458 published and unpublished articles. Of these, 373 were excluded for the following reasons: duplicate research (83), qualitative studies (68), theoretical papers (29), book reviews (17), studies published in other languages (e.g. Chinese; Greek) (36); studies that did not report the necessary effect size (48), and studies that did not test TAM construct (92), thereby the final sample consisted of 85 articles that generated 431 effect-sizes (see Figure 2). Appendix A presents all the studies' details used in the meta-analysis.

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Coding procedures: The coding was performed by two assistant researchers who followed the Rust and Cooil (1994) procedures. The agreement rate was 90%, and a third researcher adjudicated the disagreements. The data extraction was conducted according to previous research in meta-analyses (e.g., Babić-Rosario et al., 2016). The coding followed the effect-size relationship of each endogenous and exogenous variable and both

TAM constructs (PEOU and PU). This coding process also accommodated the moderation variables (methodological and contextual). All the articles included in our analysis reported the correlation between one or more variables of interest, standard regressions, F or T-test, and frequencies. In the case of the effect sizes that were not reported by correlation, we did the conversion following the Hunter and Schmidt (2004) procedures.

Calculating process: First, we calculated the correlation effects sizes in accordance with Hedges and Olkin (1985) concerning the reliability of the scales and sample size. In cases of studies that presented more than one result for the same relationship, we followed the procedures suggested by Hunter and Schmidt (2004), averaging the correlations and treating them as a single study. We applied the random-effects models as suggested by Hunter and Schmidt (2004), making the correlation transformation by Fisher's Z-distribution. The upper and lower confidence interval index was also analysed at the 95% level, which comprises an estimate of the mean range of corrected weighted correlations (Hunter and Schmidt 2004). These analyses were conducted using the metacor and metaphor R package (Viechtbauer, 2010).

After the correlation meta-analysis, we applied meta-analytic structural equation modelling (MASEM) to test five possible TAM models. This method provides a meta-analytic analysis of covariance structure using standard structural equation modelling estimation (Cheung 2015). In this case, we evaluated the fit of structural equation models based on the common guidelines for an acceptable model fit (i.e., *comparative fit index* (CFI) and Tucker–*Lewis index* (TLI) ≥ 0.90; *root mean square error of approximation* (RMSEA) ≤ 0.08; (Cheung 2015; Jak 2015). R packages metaSEM (Cheung 2015) and OpenMx 2.0 (Neale et al. 2016) implemented the required analyses.

Finally, to assess the moderation, we used hierarchical linear meta-analysis (HiLMA) to examine a multivariate regression-based approach (Geyskens et al. 2009). These analyses were conducted using a metaphor R package (Viechtbauer, 2010).

4. FINDINGS

4.1 Preliminary analysis

The systematic review identified eight antecedents and two consequences of TAM in the retail sector. Table 2 presents the main concepts of each construct related to TAM and some studies that tested the relationship mentioned. It is important to note that the studies vary from 2002 to 2019, comprising a vast range of retail contexts (e.g., banking, fashion, hospitality) and types of technological devices (e.g., internet service, mobile service, reality app, social commerce). The studies were conducted on three continents (America, Asia, and Europe).

----- insert table 2 here ---

4.2 Analysis of direct relationships: antecedents of TAM

We analysed the antecedents and consequences of TAM in retail contexts following the procedures mentioned in the methodological design. Table 3 presents the number of effect sizes tested (O), the cumulative sample of studies (N), the general effect size of the relationship (*r*), lower (LCI) and upper (UCI) confidence interval of effect size, standardised effect-size score (Z), the significance level of effect-size (p-value), individual heterogeneity test of the relationship (Q), and level of heterogeneity (I^2).

Note that we applied the outliers tested following the procedures proposed by Viechtbauer and Cheung (2010). In this case, we analysed if the individual study's confidence interval does not overlap the confidence interval of the pooled effect.

----- table 3 here ---

The first relationship tested was perceived benefits and TAM. We observed that nine effect sizes were with PEOU and PU. We also noted a stronger effect of perceived benefits on PU (r = .485) following to PEOU (r = .367). Both relationships were significant (p < .001). The heterogeneity tested presented a relative similarity for both constructs of TAM and perceived benefits. In both cases, the heterogeneity was strong since the index presented was higher than 75% (Higgns et al., 2003). This high level of heterogeneity indicates a low level of confidence in the studies that tested perceived benefits with TAM constructs on retail sectors (Higgns et al., 2003). The appeal of this model lies in that it is both specific and parsimonious and displays a high-level predictive power of technology use. These determinants are also easy for system developers to understand and can be specifically considered during the system requirement analysis and other system development stages. These factors are common in technology-usage settings and can be applied widely to solve the acceptance problem (Taylor and Todd, 1995).

The second relationship tested was perceived enjoyment and TAM constructs (PU and PEOU). Again, both relationships were positive and significant ($r_{\_PEOU}$ = .415; $r_{\_PU}$ = .552; p < .001). We also observed that the direct effects are stronger in the relationship between perceived enjoyment and PU than in perceived enjoyment and PEOU. We observed positive effects on the third relationship tested, perceived innovation and TAM. In this case, we noted that strength is slightly stronger in the relationship with PEOU (r = .394) than with PU (r = .353).

We observed that the effects are negative and significant in the fourth relationship tested. Although the relationship is more robust in the relationship between perceived risk and PU (r = -.213) than PEOU (r = -.185). From the methodological perspective, we could detect that the consistency of the finds is much better in the PEOU perspective since the heterogeneity level, which is related to confidence in primary studies, is much weaker (I^2_{PU} = 90.1%; I^2_{PEOU} = 0.1%).

The fifth relationships analysed were between self-efficacy and PEOU and self-efficacy and PU. Both relationships were significant and positive. In this case, again, a stronger effect was found between self-efficacy and PEOU (r = .509) than PU (r = .284). Note that the relationship between self-efficacy and PEOU was very heterogeneous (I^2 = 97.4%).

The relationship between social influence and TAM was positive, significant, and quite similar. The effect of social influence on PEOU from six studies and a cumulative sample of 6,603 respondents was r = .202. In this relationship between social influence and PU, the effects were r = .219. In this case, we analysed nine effect sizes.

We noted a slightly stronger effect between system quality and PEOU (r = .515) than system quality and PU (r = .464). In both relationships we noted a moderate heterogeneity (I^2_{PEOU} = 49.9%; I^2_{PU} = 54.4%). The last antecedent tested was trust. In this case, we noted that the relationship between trust and PEOU was stronger (r = .308) than trust and PU (r = .308).

4.3 Analysis of direct relationships: consequences of TAM

About the consequences, as mentioned above, the systematic review identified two main constructs: (1) attitude toward the system and (2) behavioural intention. The results are presented in Table 4.

----- insert table 4 here ---

The first consequence construct tested was the attitude toward the system. We analysed 14 effect sizes in the relationship between PEOU and attitude and 18 effect sizes in the relationship between PU and attitude. Both effects were significant and positive. We noted that the relationship was stronger for the relationship of PU toward attitude (r = .577) than PEOU and attitude (r = .328). We checked for evidence of publication bias using Egger's test and funnel plot (Egger et al., 1997; Thornton and Lee, 2000). Publication bias did not influence our results since Egger's test were not significant (PEOU and attitude: t = 1.5299; p = .135; PU and attitude: t = -.26639; p = .791).

----- insert figure 3 here ---

Finally, we tested the relationship between TAM constructs (PEOU/PU) and behavioural intention. Again, we observed a stronger effect between PU and behavioural intention (r = .466) than PEOU and behavioural intention (r = .330). Below, we present Figure 4, again showing the similarity of asymmetry. Once more, the publication bias did not influence our results since Egger's test were not significant (PEOU and behavioral intention: t = -.6219; p = .537 PU and intention: t = 1.1175; p = .269). In the same figure, we also present a forest plot. In this case, we observe the effect sizes in an illustrative way.

----- insert figure 4 here ---

4.4 Meta-analytic structural equation modelling (MASEM)

We evaluate five possible theoretical models by the popular constructs related to TAM in the retail context. The main objective of this analysis is to obtain a comprehensive and in-depth understanding of the proposed models since the results in

the retail context are fragmented and sometimes reveal divergences. Table 5 presents the model fit index of each model tested.

----- insert table 5 here ---

As pointed out in the theoretical section, model 1 extends the original TAM model, combining it with enjoyment (ENJ), social influence (SI), and trust (TRU). Model 2 represents TAM core and focuses on the outcome attitude towards use (AT) and behavioural intention to use (BI). In models 3, 4 to 5, the antecedent variables enjoyment, social influence, and trust were alternated to analyse the best fit. All models proposed a direct effect of PEOU and PE on attitude toward the system and attitude on behavioural intention. We also propose a possible mediation effect of attitude in the relationship between TAM constructs and behavioural intentions. All models present good fits. However, the TLI index of most models (models 1, 2, 4, and 5) was lower than expected, < .90 (Cheung, 2015; Jak, 2015). The best model we found was the third, in which all index fits were adequate. Table and figure 6 present the effects found on the relationships tested.

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All relationships tested, in all models, presented positive and significant effects. We can note that antecedents' relationships with TAM constructs presented stronger effects on the PU dimension than on the PEOU. The exception was found in model 5. Regarding the consequences, we always found stronger effects of PU on attitude toward the system than PEOU. Detailing the best model (3), we found that consumer enjoyment and trust promoted consistent and positive effects for both TAM constructs ($\beta_{enjxPEOU}$ = .456; β_{enjxPU} = .597; $\beta_{truxPEOU}$ = .341; β_{truxPU} = .495; $p < .01$). The effects of PEOU and PE

on attitude were also positive and significant ($\beta_{PEOUxatt} = .223$; $\beta_{PUxatt} = .556$; $p < .01$). In the same line, we found positive effects of attitude toward system and consumers' behavioral intention ($\beta = .699$; $p < .01$).

Finally, in all models, we tested the possible mediation effects of attitude in the relationship between TAM constructs and behavioural intentions (Table 7). The possible mediations were tested by the indirect effects that aim at the product of the direct effects than the indirect effect (Jak, 2015). Following this procedure, we noted that all indirect effects were significant. This outcome indicates that there are partial mediations. In this line, we tested the direct relationship of TAM constructs (PEOU and PU) on the behavioural intention by the saturated model (Chung, 2015; Jak, 2015). We can observe that almost all models (exception, model 1) indicate partial mediation since the effects were diminished but still significant. As noted, model 1 is an exception, showing full mediation effects of attitude on the relationship between PEOU and behavioural intention. The direct effects of PEOU on behavioural intentions were not significant (Jak, 2015), as shown in Table 6.

----- insert Table 7 here ---

4.5 Analysis of moderators

We investigated the moderation effect between TAM constructs and consequences tested (attitude toward the system and behavioural intention). The analysis was made in the consequences constructs because they had more effect size to make a comparison in the meta-regression model.

Appendix B provides detailed information on the moderation analysis, including the methodological and contextual settings, as well as the relationships between TAM constructs and their two consequences. We considered a methodological setting with three possible moderators: (1) journal ranking, (2) sample size, and (3) type of sample.

For journal ranking, we identified two groups by H-Index ranking (Scimagojr, 2019): (1) top journals and (2) non-top journals. We coded the H-Index of each published article and extracted the database's median (65). This analysis is interesting because the journal type can explain the heterogeneity of the finds since some authors (e.g., Lipsey and Wilson, 1993) pointed out that top journals have a preference to publish studies with strongly significant findings. In this case, the analysis found only one significant moderation in the relationship between PU and behavioral intention ($r_{\_top\_journal}$ = .512; $r_{\_nontop\_journal}$ = .386; $p < .05$).

We also considered two groups of sample size – (1) large and (2) small – and type of sample – (1) nonstudent and (2) student. Both were coded by the methodological information collected in each study. In the case of sample size, we considered the median (310) to separate the groups. These analyses were important because studies with students and small sample sizes tend to overestimate the effect sizes since these kinds of samples are more homogeneous (Fern and Monroe, 1996). These assumptions were not confirmed in our analysis because all relationships tested were not significant.

In the contextual moderation analysis, we investigated six variables: (1) cultural orientation, (2) level of uncertainty avoidance, (3) Human Development Index (HDI), (4) country innovation level, (5) type of goods and (6) retail sector.

Regarding cultural orientation, we identified two groups of analysis (1) Eastern and (2) Western culture. This was since culture can promote different consumer behaviours (Minkov and Hofstede, 2012) and could explain some heterogeneity of the main relationship tested. The analysis of this study did not present any significant effect of this variable.

The other moderator is also related to the country's culture. In this case, we analysed the possible effect of uncertainty avoidance in the relationship between TAM

and the consequences. This investigation is critical because the level of uncertainty avoidance is linked to feelings of insecurity related to technology (Laukkanen, 2015; Sampaio et al., 2018). Again, we identified two groups by median (46) of a country index of uncertainty avoidance level (Minkov and Hofstede, 2012). Again, the analysis found no significant moderator effects on the relationships tested.

The HDI index is a statistic compiled by the United Nations that evaluates each county's life expectancy, education, and per capita income indicators. The classification was made by the median (.872). We suspected that countries with high HDI tend to promote stronger effects between TAM and consequences since they have more education and, consequently, more technology familiarly (Kim and Peterson, 2017). This suspicion was confirmed in the relationship between PU and attitude ($r_{\_high\_hdi}$ = .607; $r_{\_high\_hdi}$ = .459; $p < .05$).

We also investigated the possible influence of the country's innovation level. This index was built by Boston Consulting Group and represents the level of innovation of a country. We expected that high-innovation countries tend to promote stronger effects between TAM as a consequence because these nations tend to demonstrate greater skills and familiarity with electronic platforms (Kim and Peterson, 2017). However, in our study, this assumption was not confirmed.

The other moderator analysed was the type of goods. In this case, we identified a retail study that applied TAM in products and services contexts. One main differentiation between product and service is the possibility of tangibilization. In this way, it is well known that services often promote a stronger perception of risk than products (Zeithaml et al., 2002). So, this differentiation could be an influence on technology acceptance in the retail sector. In the case of our analysis, this moderator did not influence the central relationships between PE / PEOU and attitude and behavioural intention. Finally, we also

analysed the possible influence of the retail section on the primary relationship. Again, the results did not confirm moderation influences.

To comprehensively understand the significant moderation, we present Figure 5, which illustrates the effects.

----- insert figure 5 here ---

Figure 5 illustrates how contextual and methodological variables influence the core relationships of the Technology Acceptance Model (TAM) in the retail sector. These effects demonstrate variations in influence coefficients depending on factors such as Human Development Index (HDI), academic journal rankings, and the nature of sample data (students versus general consumers). These findings highlight the importance of considering heterogeneity in empirical studies on technology acceptance, as emphasized by Geyskens et al. (2009) and Viechtbauer and Cheung (2010) in their works on moderation in meta-analyses.

As pointed out in Le (2023) study, variables related to information credibility and technological characteristics, such as interactivity and perceived intelligence, play fundamental roles in adopting AI-based technologies, such as chatbots. This insight is corroborated by Chaw et al. (2024), who highlighted that factors such as user-friendly design and enhanced functionalities directly impact the continued use intention of mobile payment apps, suggesting that optimizing technological experiences is key to user engagement.

The specific results for high HDI contexts indicate greater familiarity with technologies in more developed countries, aligning with the findings of Kim and Peterson (2017), who stated that consumers in high-innovation settings are more likely to adopt new technologies due to higher levels of technological trust. Furthermore, as

demonstrated by Nguyen et al. (2024), the impact of customization on digital platforms also serves as a critical factor in sustaining technology acceptance in these markets.

The consistency of these findings reaffirms the need to analyze moderating factors that impact behavioral intention, particularly in technology-rich environments. Moreover, the positive impact of perceived usefulness (PU) on attitude and behavioral intention underscores the centrality of this construct in TAM, a result widely validated by Venkatesh and Davis (2000) and expanded by Venkatesh et al. (2012) in the context of UTAUT2.

Moreover, the detailed analysis of moderation reveals the influence high-impact journals have in producing stronger coefficients between perceived usefulness (PU) and behavioral intention. This finding suggests that studies published in high-impact journals tend to use more robust samples or rigorous methodologies, as suggested by Lipsey and Wilson (2001) and more recently by Scherer, Siddiq, and Tondeur (2019), reflecting the importance of high research standards for better generalization of findings.

From an applied perspective, the observed moderation effects provide valuable practical implications for implementing emerging technologies in retail. For example, AI-powered chatbots can be strategically targeted at high-HDI markets, where the adoption of technological innovations is more likely due to positive perceptions of usefulness and favorable attitudes. Design strategies focusing on enhancing interactivity and chatbot personalization can further boost information credibility and perceived usefulness, as outlined in the theoretical framework by Le (2023) and reaffirmed by Matzner et al. (2018) in the context of digital transformation.

Finally, recent studies, such as Parashar (2023), emphasize that digitization trends in retail require an integrated approach that accounts for the multichannel nature of consumer-technology interactions. In this context, strategies informed by an

understanding of moderation effects can enable managers to tailor technological solutions, and so optimize their effectiveness and enhance consumer adoption.

5 CONTRIBUTIONS AND IMPLICATIONS

The findings of this meta-analysis highlight the enduring relevance and adaptability of the Technology Acceptance Model (TAM) in the retail sector. By systematically analyzing 85 studies, this research identified eight key antecedents—such as perceived benefits, enjoyment, trust, and system quality—and two critical consequences: attitude toward the system and behavioral intention. These relationships were tested across diverse retail contexts and global datasets, providing significant insights into how consumers perceive and interact with technology.

Table 8 summarizes the study's contributions, emphasizing TAM's robustness in the retail sector. It highlights theoretical advances, such as integrating trust and social influence into TAM, alongside practical applications, like designing user-friendly, trust-focused technologies. Future research directions include exploring new antecedents, conducting cross-industry studies, and investigating AI's impact through longitudinal analyses.

----- insert table 8 here ---

The results reinforce the robustness of the TAM constructs, particularly the dominant role of perceived usefulness (PU) in shaping both attitudes and behavioral intentions. This finding aligns with prior studies, such as those by Davis (1989) and Venkatesh and Davis (2000), which consistently demonstrate that PU has a stronger impact on user acceptance compared to perceived ease of use (PEOU). Moreover, the study's exploration of contextual and methodological moderators revealed that variables

like the Human Development Index (HDI), journal quality, and sample characteristics significantly influence the strength of TAM relationships. For example, high-HDI countries exhibit stronger links between PU and behavioral intention, as consumers in these contexts often display higher technological familiarity and trust, a phenomenon also noted by Kim and Peterson (2017).

The study also contributes to theoretical advancements in TAM by incorporating emerging antecedents such as trust, enjoyment, and social influence. Trust was shown to have a positive effect on both PU and PEOU, corroborating findings by Amin et al. (2014) that emphasize trust's critical role in fostering technology adoption in uncertain environments. Enjoyment and social influence further extend TAM's explanatory power, demonstrating their importance in shaping consumer attitudes in retail contexts. These insights underscore TAM's flexibility in addressing the complexities of technology acceptance across varying environments and populations.

From a practical standpoint, the findings provide actionable guidance for retail managers and technology designers. The strong relationship between PU and behavioral intention suggests that investments in features that enhance perceived usefulness, such as efficiency and reliability, are essential. For instance, Cu Le (2023) highlights how chatbot personalization and interactivity can significantly enhance customer engagement and purchase behavior, reinforcing the need for technologies that align with user preferences. Similarly, the positive effects of enjoyment and interactivity on PEOU suggest that technology interfaces should prioritize user-friendly and engaging designs, a conclusion supported by Chaw et al. (2024) in their study of mobile payment applications.

Additionally, segmentation strategies based on HDI can help managers tailor technology solutions to specific market conditions. For example, in high-HDI markets, retailers might focus on advanced AI-powered tools, leveraging consumers' higher

technological readiness, while in low-HDI contexts, building trust and simplifying interfaces may be more effective.

These findings also emphasize the need for an omnichannel approach that integrates digital and physical retail platforms, allowing for seamless consumer experiences. As Parashar (2023) observes, the increasing digitization of retail demands adaptive strategies that address the diverse ways consumers interact with technology. Retailers must focus on designing systems that not only meet immediate user needs but also evolve with continued use, fostering long-term engagement.

Future research should build on these insights by exploring emerging antecedents such as accessibility, loyalty, and personalization, which remain underexplored in the retail context. Additionally, longitudinal studies are needed to understand how PU and PEOU evolve over time with repeated technology use, addressing a key limitation of cross-sectional analyses. Comparative studies across industries, such as banking, healthcare, and education, could further refine TAM's generalizability and reveal sector-specific nuances. Given the growing integration of AI, future research should also evaluate how AI-driven technologies like predictive analytics and chatbots influence trust and user behavior, as suggested by Nguyen et al. (2024) and Matzner et al. (2018). Understanding these dynamics will provide deeper insights into the intersection of technology design, consumer behavior, and market conditions

6. CONCLUSIONS

We proposed a meta-analysis to investigate TAM's main antecedents and consequences in the retail sector. Additionally, we analysed and compared five possible theoretical models tested in TAM studies in the retail context. This study contributes to a

deeper understanding of the Technology Acceptance Model (TAM) within the retail sector by conducting a comprehensive meta-analysis. It is essential to understand the TAM constructs in relation to the retail sector because significant investments have been made in IT, many of which have been directed toward digitalising the customer experience, including transforming physical products into digital services. The nature of the retail sector in comparison with others (e.g., education, hospitality, and banking) makes a meta-analysis (that allows for an in-depth understanding of TAM constructs in this sector) especially valuable.

Our systematic review identifies 98 quantitative studies that tested the retail sector's PEOU and/or PU. Our review identified eight antecedents and two consequences of TAM. This number is fewer than the 18 antecedents and four consequences found in a TAM meta-analysis applied in the banking sector (Santini et al., 2019) but more than the three antecedents tested in a TAM meta-analysis of the education context (Scherer et al., 2019).

In the direct relationships, we detected that all the antecedents and consequences promoted significant effects-sizes with TAM constructs. Significant effects were also found in the meta-analysis applied in the banking sector for the same constructs (Santini et al., 2019). Regarding PEOU, "system quality" was the strongest antecedent effect, while in PU, it was "perceived enjoyment." Interestingly, "system quality" was also found to be the strongest antecedent of PEOU in the meta-analysis of the banking sector (Santini et al., 2019). Regarding the consequences, we detected a stronger effect in the relationships between PU and attitude and behavioural intention (compared with PEOU). These results are like other meta-analyses of TAM applied in the banking context (Santini et al., 2019), in the education sector (Scherer et al., 2019), and in general settings (Yousafzai et al., 2007).

The five theoretical models tested showed that the best-fit model was composed of consumer enjoyment and trust as antecedents of TAM. In this case, we find a more substantial effect of enjoyment than trust on TAM constructs. We also detected that those more potent effects were always linked to the PU construct (for both enjoyment and trust). Another interesting finding was the stronger effects of PU (than PEOU) on attitude toward the system and the consistent and positive effect of attitude on behavioural intention. We also found that attitude toward the system works as a mediator of TAM constructs on behavioural intentions.

We also detected that top journals and high HDI countries produced stronger effect sizes in the relationship between PU and "behavioural intention" and PU and "attitude toward system use," respectively. These findings reinforce the assumption that top journals tend to publish studies with substantial and significant effects (Lipsey and Wilson, 1993), and people living in countries with higher HDI tend to be more familiar with technological devices (Kim and Peterson, 2017). To better understand this phenomenon, we suggest that future research explore some relationships that are presented in other areas but are not yet consistently included in the retail sector (e.g., accessibility, interaction needs, responses, perceived control, and loyalty).

The meta-analytic structural equation modeling (MASEM) provided evidence supporting the best-fit model, which integrates enjoyment and trust as key antecedents. This model highlights the mediating role of attitudes in the relationship between TAM constructs and behavioral intentions, offering a nuanced perspective on how consumers evaluate and adopt new technologies in retail.

From a practical perspective, the study provides actionable insights for retail managers and technology developers. Emphasizing perceived usefulness through user-centric features, personalization, and reliability can enhance consumer engagement and

adoption. Moreover, tailoring strategies based on contextual factors, such as market HDI, can optimize technology implementation and consumer interaction.

This research not only validates TAM as a theoretical framework but also highlights its practical utility in navigating the complexities of technology acceptance in the retail sector. By addressing the interplay of theoretical constructs and practical applications, our findings aim to foster a more comprehensive and actionable understanding of consumer behavior in this dynamic context.

Finally, we highlight some limitations of our work, such as the exclusion of qualitative studies. This limitation might be overcome by applying a research method other than meta-analysis. Despite its limitations, the usefulness of the meta-analytical approach, given its contribution to the field of knowledge and ability to provide more definitive conclusions, is apparent. Future studies should explore emerging antecedents like accessibility and personalization, as well as conduct longitudinal analyses to capture the dynamic evolution of TAM constructs over time. Additionally, integrating artificial intelligence (AI) and other innovative technologies into TAM frameworks could provide valuable insights into the rapidly transforming retail landscape.

REFERENCES

Ailawadi, K. L. & Farris, P. W. (2017). Managing multi- and omnichannel distribution: metrics and research directions. *Journal of retailing*, 93(1), 120-135.

Amin, M., Rezaei, S., & Abolghasemi, M. (2014). User satisfaction with mobile websites: the impact of perceived usefulness (PU), perceived ease of use (PEOU) and trust. Nankai Business Review International.

Aloysius, J. A., Hoehle, H., Goodarzi, S., & Venkatesh, V. (2018). Big data initiatives in retail environments: Linking service process perceptions to shopping outcomes. *Annals of operations research*, 270(1-2), 25-51.

Bonn, M. A., Kim, W. G., Kang, S., & Cho, M. (2016). Purchasing wine online: The effects of social influence, perceived usefulness, perceived ease of use, and wine involvement. Journal of Hospitality Marketing & Management, 25(7), 841-869.

Chaw, L. Y., Tang, C. M., & Ali, M. (2024). Driving factors behind mobile payment app users' continuance intention: Insights for service providers in Malaysia. Journal of Systems and Information Technology, 26(2), 212-233.

Cheung, M. W. L. (2015). metaSEM: An R package for meta-analysis using structural equation modeling. *Frontiers in Psychology*, 5, 1 - 7.

Cheung, M.W.L. & Chan, W. (2005). Meta-analytic structural equation modeling: a two-stage approach. *Psychological Methods* 10(1), pp. 40–64.

Cook, A. V., Ohri, L., & Kusumoto, L. (2020, March 19). AR/VR Technologies Fuel Quiet Revolution in Shopping. *The Wall Street Journal*. Retrieved from www.wsj.com.

Cu Le, X. (2023). Inducing AI-powered chatbot use for customer purchase: The role of information value and innovative technology. Journal of Systems and Information Technology, 25(2), 219-241. https://doi.org/10.1108/JSIT-09-2021-0206

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 319-340.

Dickersin, K. (2002). Systematic reviews in epidemiology: Why are we so far behind? *International Journal of Epidemiology*, *31*(1), 6-12.

Egger, M., Davey Smith, G., Schneider, M., & Minder, C. (1997), "Bias in meta-analysis detected by a simple, graphical test," British Medical Journal, 315, 629–634. http://dx.doi.org/10.1136/bmj.315.7109.629

Fern, E. F. & Monroe, K. B. (1996). Effect-size estimates: Issues and problems in interpretation. *Journal of Consumer Research*, *23*(2), 89-105.

Fishbein, M. & Ajzen, I. (2010). *Predicting and changing behavior: The reasoned action approach*. New York: Psychology Press.

FungScholar, (2019). Ten digital trends shaping the future of retail. https://www.fungscholars.org/wpcontent/uploads/2019/01/Ten_digital_trends_shaping_the_future_of_retail.pdf

Geyskens, I., Krishnan, R., Steenkamp, J. B. E., & Cunha, P. V. (2009). A review and evaluation of meta-analysis practices in management research. *Journal of Management, 35*(2), 393–419.

Gottlieb, D. (2021, February 2). Lessons and predictions for retail industry post-2020. Forbes.www.forbes.com/councils/forbesbusinessdevelopmentcouncil/2021/02/02/lessons-and-predictions-for-retail-industry-post-2020/

Jak, S. (2015). *Meta-analytic structural equation modelling*. Dordrecht, Neth: Springer.

Hoehle, H. & Venkatesh, V. (2015). Mobile application usability: Conceptualization and instrument development. *MIS Quarterly*, 39(2), 435-472.

Huang, J. H., Lin, Y. R., & Chuang, S. T. (2007). Elucidating user behavior of mobile learning: A perspective of the extended technology acceptance model. *The Electronic Library*, 25(5), 585-598.

Hunter, J. E. & Schmidt, F. L. (2004). *Methods of meta-analysis: Correcting error and bias in research findings*. Sage.

Hudson, S., Huang, L., Roth, M. S., & Madden, T. J. (2016). The influence of social media interactions on consumer-brand relationships: A three-country study of brand perceptions and marketing behaviors. *International Journal of Research in Marketing*, 33(1), 27-41.

Inman, J. J. & Nikolova, H. (2017). Shopper-facing retail technology: A retailer adoption decision framework incorporating shopper attitudes and privacy concerns. *Journal of Retailing*, 93(1), 7-28.

Kaushik, A. K. & Rahman, Z. (2015). An alternative model of self-service retail technology adoption. *Journal of Services Marketing*, 29(5), 406-420.

Kim, H. C. & Hyun, M. Y. (2016). Predicting the use of smartphone-based Augmented Reality (AR): Does telepresence really help? *Computers in Human Behavior*, 59, 28-38.

Kim, Y., & Peterson, R. A. (2017). A Meta-analysis of Online Trust Relationships in E-commerce. *Journal of interactive marketing*, *38*(1), 44-54.

Le, X.C. (2023), "Inducing AI-powered chatbot use for customer purchase: the role of information value and innovative technology", Journal of Systems and Information Technology, Vol. 25 No. 2, pp. 219-241.

Lemon, K. N. & Verhoef, P. C. (2016). Understanding customer experience throughout the customer journey. *Journal of Marketing*, *80*(6), 69-96.

Lipsey, M. W. & Wilson, D. B. (2001). *Practical meta-analysis*. SAGE publications, Inc.

Liu, I. F., Chen, M. C., Sun, Y. S., Wible, D., & Kuo, C. H. (2010). Extending the TAM model to explore the factors that affect intention to use an online learning community. *Computers & Education*, 54(2), 600-610.

Ma, Q. & Liu, L. (2004). The technology acceptance model: A meta-analysis of empirical findings. *Journal of Organizational and End User Computing* (JOEUC), 16(1), 59-72.

Matzner, M., Büttgen, M., Demirkan, H., Spohrer, J., Alter, S., Fritzsche, A., Ng, I., Jonas, J. M., Martinez, V. Möslein, K. M., & Neely A. (2018). Digital transformation in service management. *Journal of Service Management Research*, 2 (2), 2–21.

Mehrad, D. & Mohammadi, S. (2017). Word of mouth impact on the adoption of mobile banking in Iran. *Telematics and Informatics* 34 (7): 1351–1363.

Meyer, P., Jonas, J. M., & Roth, A. (2020). Exploring customers' acceptance of and resistance to service robots in stationary retail – A mixed-method approach. *ECIS*, June 2020.

Moher, D., Altman, D. G., Liberati, A., & Tetzlaff, J. (2011). PRISMA statement. *Epidemiology*, *22*(1), 128.

Munoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic TAM model. *Spanish Journal of Marketing-ESIC*, *21*(1), 25-38.

Neale, M. C., Hunter, M. D., Pritikin, J. N., Zahery, M., Brick, T. R., Kirkpatrick, R. M., & Boker, S. M. (2016). OpenMx 2.0: Extended structural equation and statistical modeling. *Psychometrika*, 81(2), 535-549.

Nguyen, H. T. T., Tapanainen, T., & Hubona, G. (2024). Behavioral responses resulting from e-health services and the role of user satisfaction: The case of the online diabetes test. Journal of Systems and Information Technology, 26(2), 141-163.

Pantano, E., Rese, A., & Baier, D. (2017). Enhancing the online decision-making process by using augmented reality: A two country comparison of youth markets. *Journal of Retailing and Consumer Services*, 38, 81-95.

Parashar, A. (2023, July 24). 5 technological trends that are redefining the retail sector. Forbes.https://www.forbes.com/councils/forbestechcouncil/2023/07/24/5-technological-trends-that-are-redefining-the-retail-sector/

Piotrowicz, W. & Cuthbertson, R. (2014). Introduction to the special issue information technology in retail: toward omnichannel retailing. *International Journal of Electronic Commerce*, Vol. 18 No. 4, pp. 5-16.

Putra, I. D. G. R. D. (2019). The evolution of technology acceptance model (TAM) and recent progress on technology acceptance research in ELT: State of the art article. Yavana Bhasha: Journal of English Language Education, 1(2).

Robertson, N., McDonald, H., Leckie, C., & McQuilken, L. (2016). Examining customer evaluations across different self-service technologies. *Journal of Services Marketing*, 30(1), 88-102.

Rodrigues, L. F., Oliveira, A., & Costa, C. J. (2016). Does Ease-of-Use Contribute to the Perception of Enjoyment? A Case of Gamification in e-Banking. *Computers in Human Behavior* 61: 114–126.

Rogers, E. M. (1995). *Diffusion of Innovations*, (4th ed.). New York: Free Press.

Rust, R. T. & Cooil, B. (1994). Reliability measures for qualitative data: Theory and implications. *Journal of Marketing Research*, *31*, 1–14.

Santini, F. D. O., Ladeira, W. J., Sampaio, C. H., Perin, M. G., & Dolci, P. C. (2019). A meta-analytical study of technological acceptance in banking contexts. International Journal of Bank Marketing.

Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model (TAM): A meta-analytic structural equation modeling approach to explaining teachers' adoption of digital technology in education. Computers & Education, 128, 13-35.

Shaikh, A. A. & Larjaluoto, H. (2015). Making the most of information technology & systems usage: A literature review, framework, and future research agenda. *Computers in Human Behavior*, 49, 541-566.

Sinha, I. & Mukherjee, S. (2016). Acceptance of technology, related factors in use of off branch e-banking: an Indian case study. *The Journal of High Technology Management Research*, *27*(1), 88-100.

Statistics & Facts – Statista (2017). Mobile App Usage - Statistics & Facts. Available on: < https://www.statista.com/topics/1002/mobile-app-usage/>.

Statista, (2020). Worldwide retail e-commerce sales. Available on https://www.statista.com/statistics/379046/.

Suki, N. M., & Suki, N. M. (2011). Exploring the relationship between perceived usefulness, perceived ease of use, perceived enjoyment, attitude and subscribers' intention towards using 3G mobile services. Journal of Information Technology Management, 22(1), 1-7.

Thornton, A., & Lee, P. (2000), "Publication bias in meta-analysis: its causes and consequences," Journal of Clinical Epidemiology, 53(2), 207-216.

Venkatesh, V. & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186-204.

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 425-478.

Venkatesh, V., Thong, J. Y., & Xu, X. (2012). Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*, *36*(1), 157-178.

Venkatesh, V., Brown, S. A., Maruping, L. M., & Bala, H. (2008). Predicting different conceptualizations of system use: the competing roles of behavioral intention, facilitating conditions, and behavioral expectation. *MIS Quarterly*, 483-502.

Verhoef, P., Kannan, P., & Inman, J. (2015). From Multi-Channel Retailing to Omni-Channel Retailing: Introduction to the Special Issue on Multi-Channel Retailing. *Journal of Retailing*, 91 (2), 174-181.

Viechtbauer, W. (2010). Conducting meta-analyses in R with the metaphor package. *Journal of statistical software*, 36(3), 1-48.

Viechtbauer, W., & Cheung, M. W. L. (2010). Outlier and influence diagnostics for meta-analysis. Research synthesis methods, 1(2), 112-125.

Yang, K. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. *Telematics and informatics*, *22*(3), 257-277.

Yarrow, K. (2014). *Decoding the new consumer mind. How and why we shop and buy*. Jossey-Bass.

Zeithaml, V. A., Parasuraman, A., & Malhotra, A. (2002). Service quality delivery through web sites: a critical review of extant knowledge. Journal of the academy of marketing science, 30(4), 362-375.

Zaremohzzabieh, Z., Samah, B. A., Muhammad, M., Omar, S. Z., Bolong, J., Hassan, S. B. H., & Mohamed Shaffril, H. A. (2016). Information and communications technology acceptance by youth entrepreneurs in rural Malaysian communities: The mediating effects of attitude and entrepreneurial intention. *Information Technology for Development*, *22*(4), 606-6.

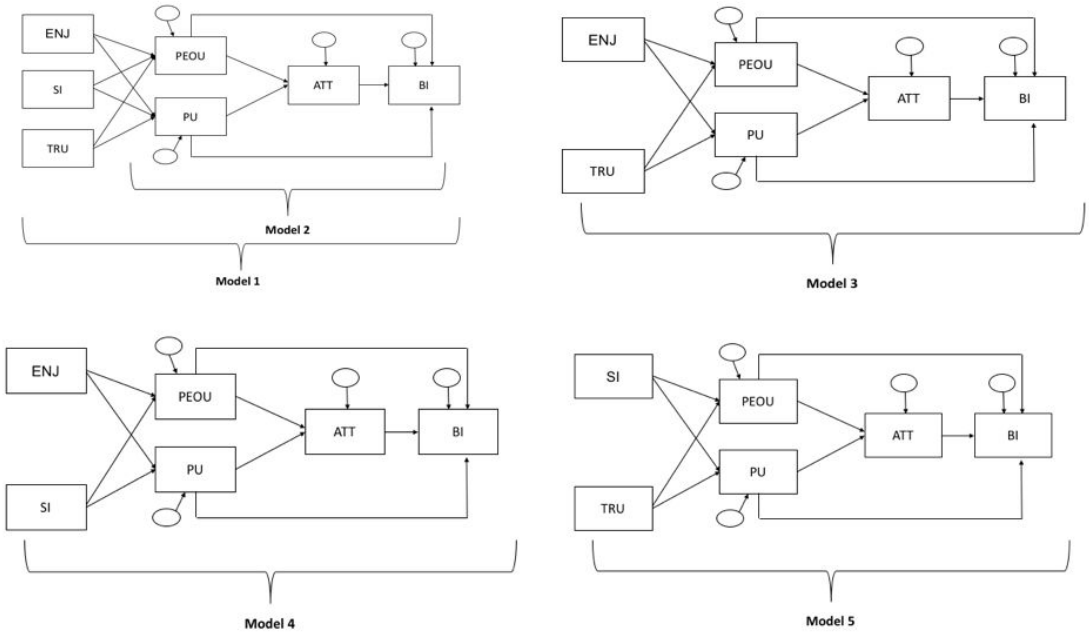


Figure 1: Adoption model
Notes: (ENJ) enjoyment; (SI) social influence; (TRU) trust; (PEOU) perceived ease of use; (PU) perceived usefulness

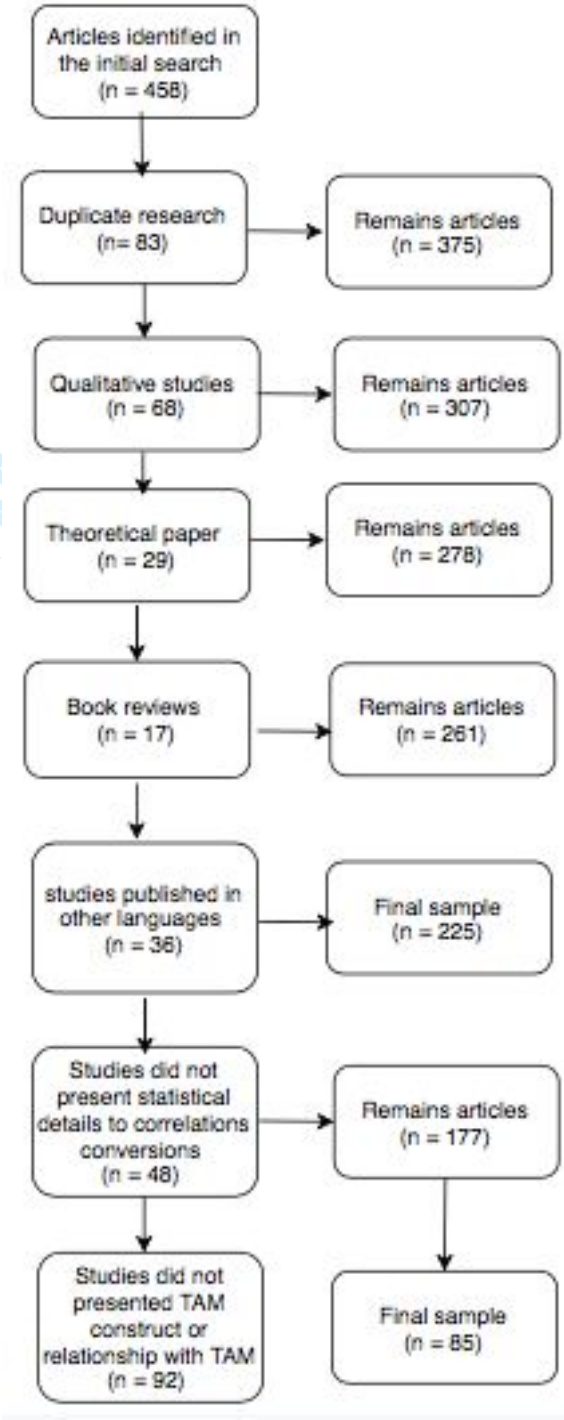


Figure 2: Exclusion criteria's details

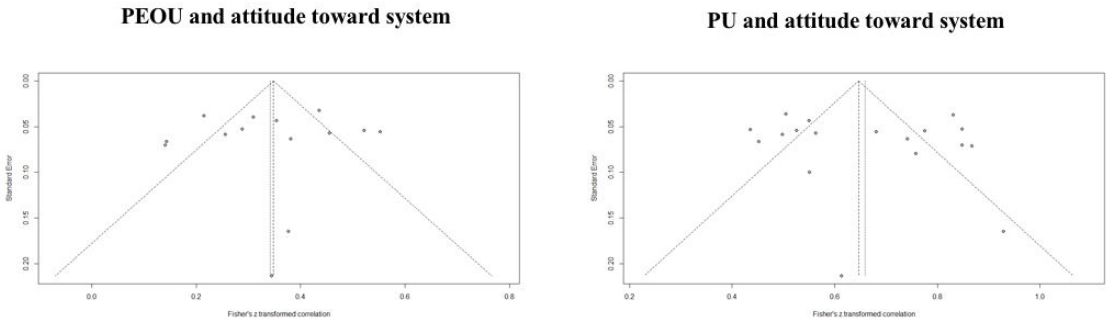


Figure 3: funnel plot

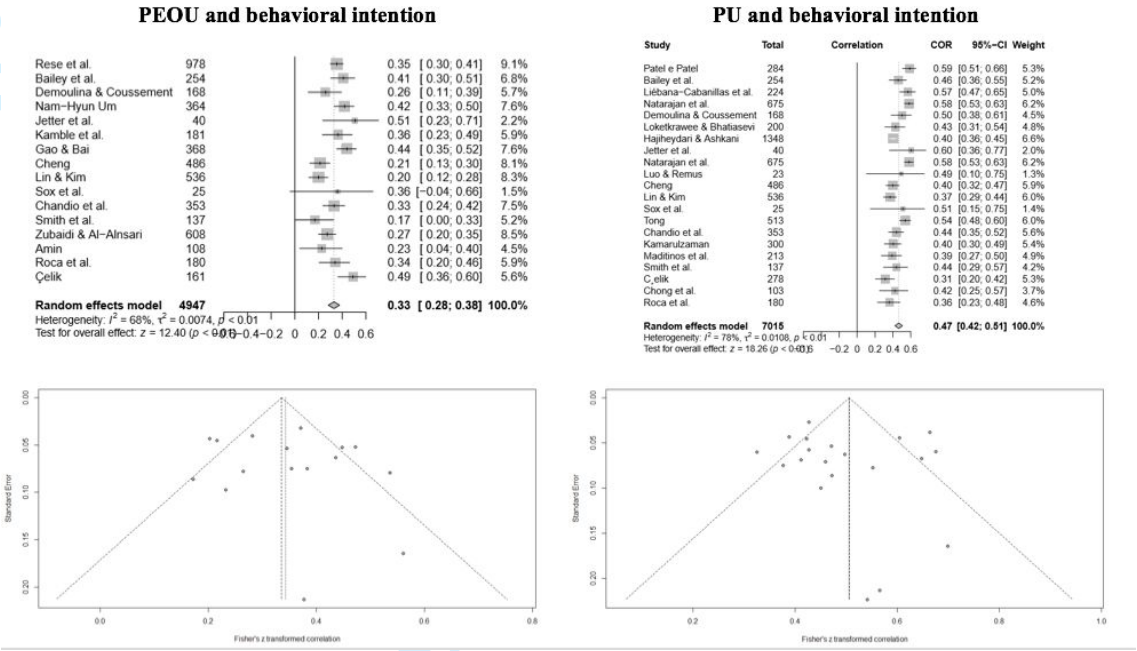


Figure 4: Funnel and forest plot

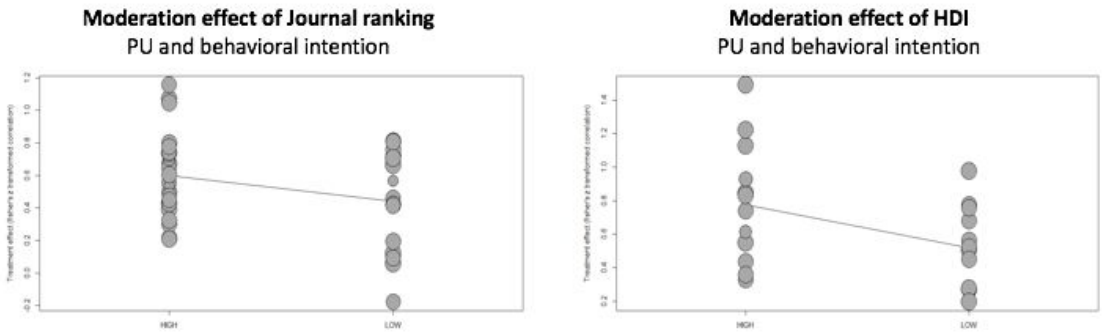
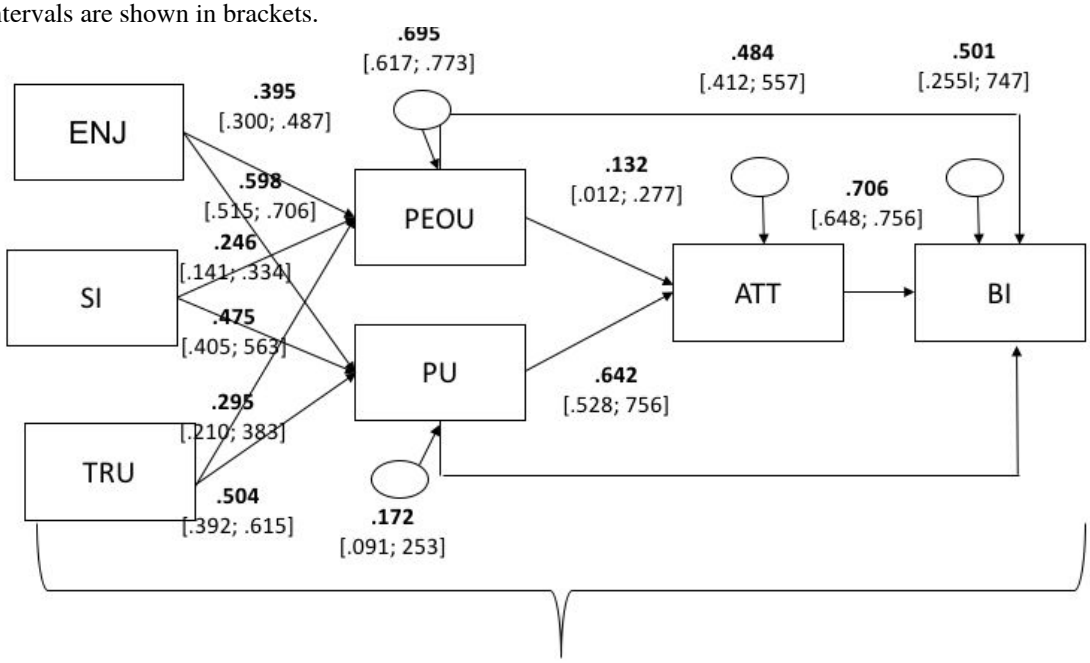


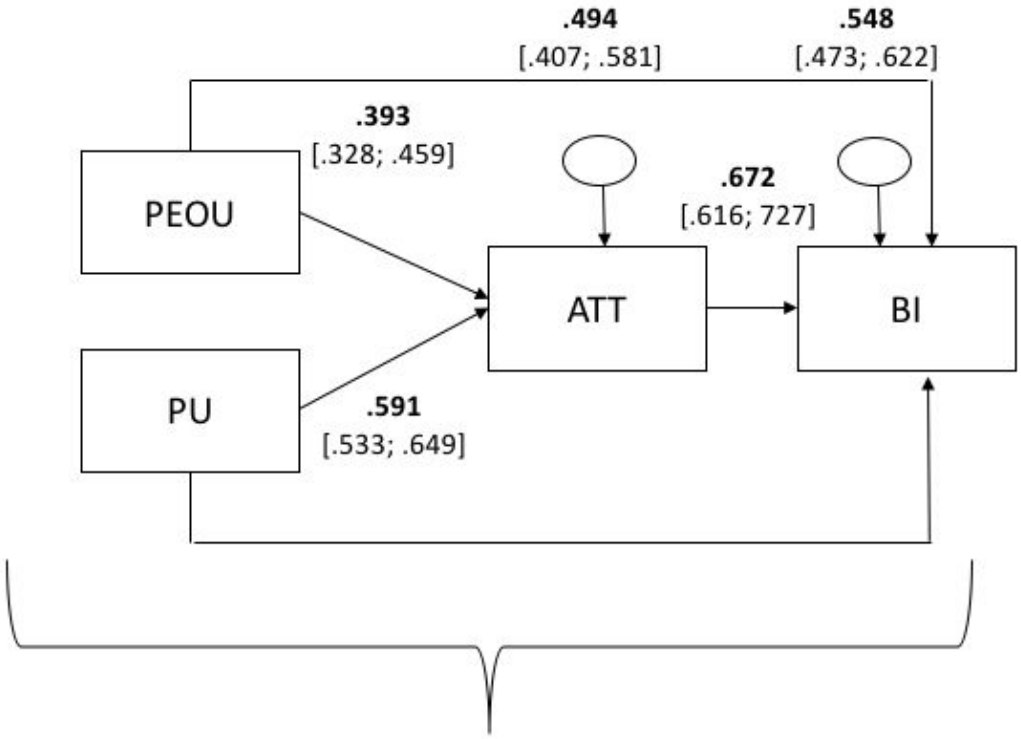
Figure 5: Moderation effects

Figure 6: Meta-analytic structural equation models 1 to 5. Note. The 95% likelihood-based confidence intervals are shown in brackets.



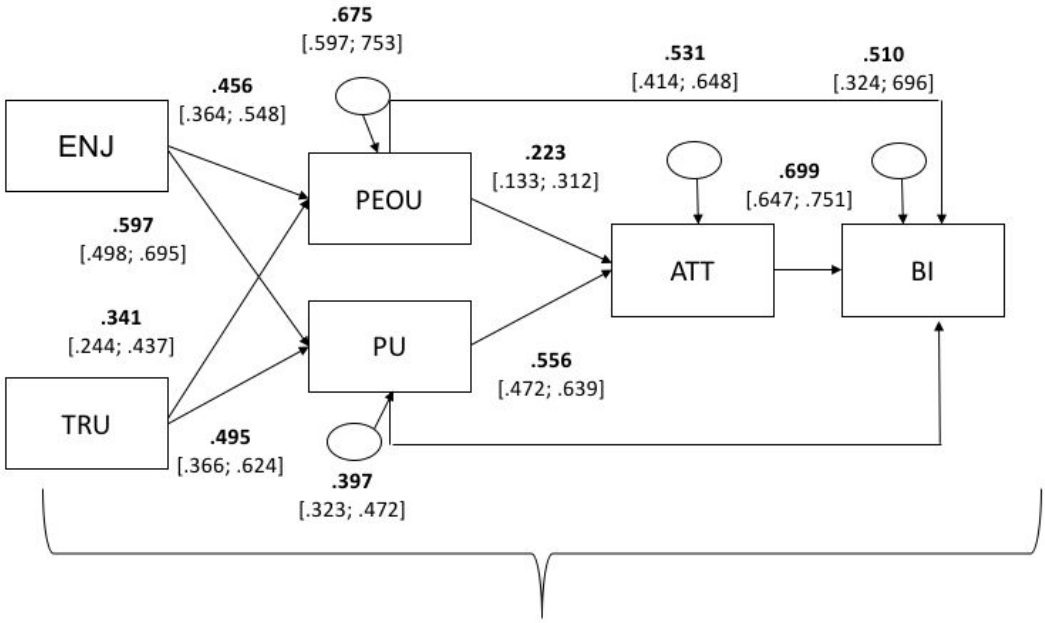
Model 1

χ^2 = 187.48; DF = 12; χ^2/DF = 15.62; RMSEA = .016; CFI: .906; TLI = .835



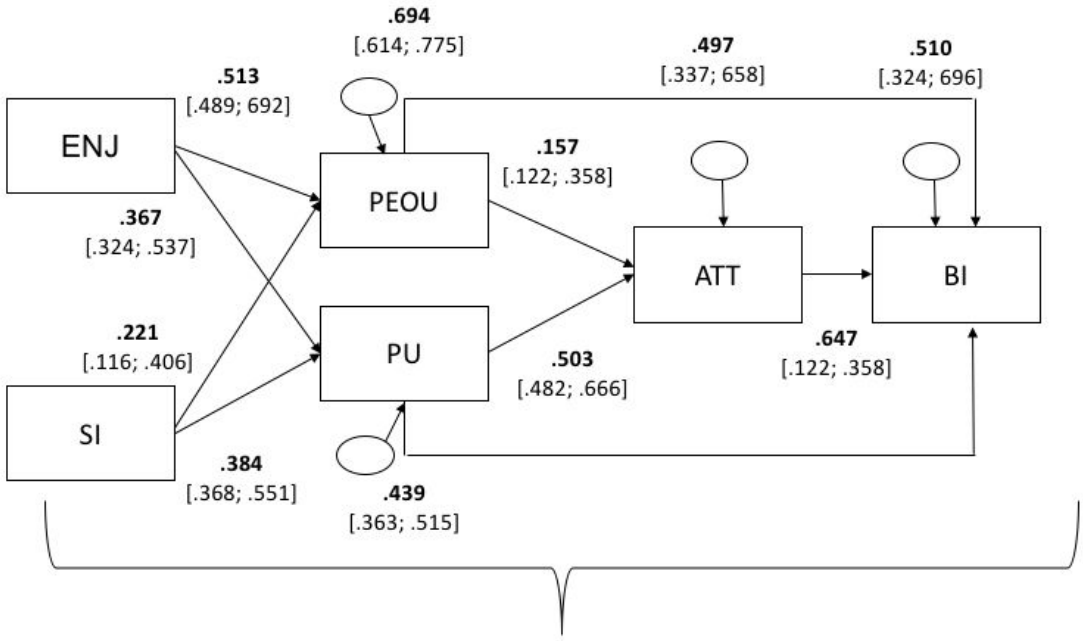
Model 2

χ^2 = 88.15; DF = 3; χ^2/DF = 29.38; RMSEA = .019; CFI: .912; TLI = .825



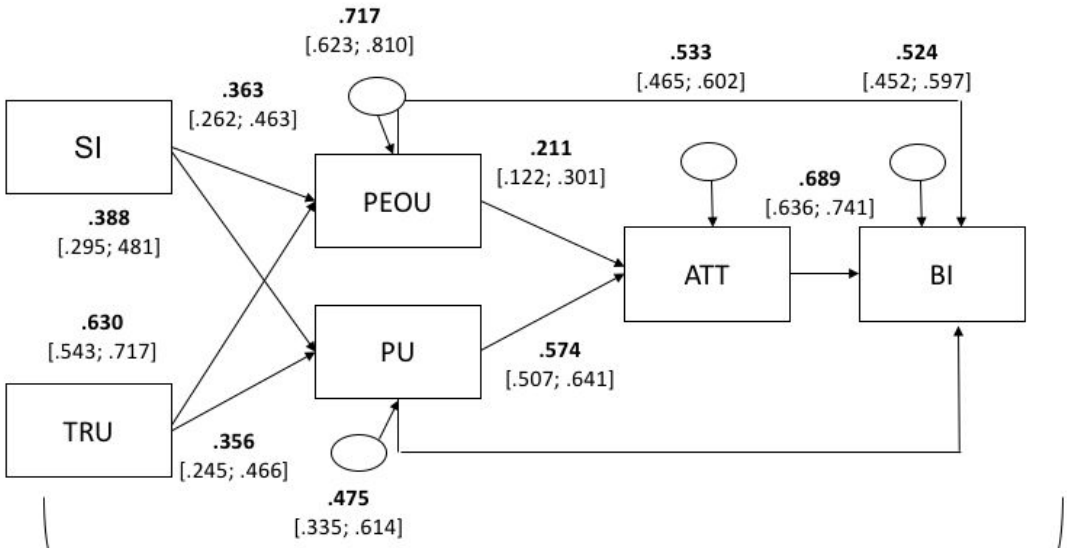
Model 3

χ^2 = 90.59; DF = 8; χ^2/DF = 11.32; RMSEA = .015; CFI: .942; TLI = .902



Model 4

χ^2 = 113.14; DF = 8; χ^2/DF = 14.14; RMSEA = .017; CFI: .936; TLI = .880



Model 5

χ^2 = 119.68; DF = 8; χ^2/DF = 14.96; RMSEA = .12; CFI: .922; TLI = .854

Table 1 – Expected relationships (MASEM)

Relationship	Expected direct relationship	Model
ENJ → PEOU	**Positive effects:** enjoyment is related to the perception of fun and is directly related to perceived ease of use associated with a variety of entertaining and enjoyable services content. In addition, if the user can experience enjoyment through the adoption of new technology, the attitude toward adoption will be positive (Suki & Suki, 2011; Huang et al., 2007)	M1; M3; M4
ENJ → PU	**Positive effects: a** person will be more motivated to do or repeat an enjoyable activity that is enjoyable more as compared to the same activity which is not enjoyable. This feeling will impact on the PU (Suki & Suki, 2011; Liu et al., 2010)	M1; M3; M4
SI → PEOU	**Positive effects:** individuals allow themselves to be influenced by observing others and/or seeking information from others, which represents "social influence". In this vein, research studies also demonstrate social influence as being one of the key determinants in acceptance of information technology because social influence takes effect through the internalisation of perceived ease of use and perceived usefulness within the context of using IT. (Bonn et al., 2016; Ventakesh et al. (2003)	M1; M4; M5
SI → PU		M1; M4; M5
TRU → PEOU	**Positive effects:** trust can be defined as the overall perception of users concerning the trustworthiness of some technology, in this case. That is why one of the first questions consumers ask when making an online purchase is whether the website or app is trustworthy. This way is possible to understand that trust has a positive effect on perceived ease of use. (Amin, Rezaei, and Abolghasemi, 2014).	M1; M3; M5
TRU → PU	**Positive effects:** trust has been shown as a significant factor in influencing consumer behaviour toward a specific technology, especially in uncertain environments, such as e-commerce online customer satisfaction has both a direct and indirect relationship with repurchase intention via online trust, so according to Amin, Rezaei and Abolghasemi (2014) trust has a positive effect on perceived usefulness.	M1; M3; M5
PEOU → ATT	**Positive effects:** PEOU has been identified as the main construct for examining and assessing user acceptance of a particular technology. An important motivational factor for consumers' technology usage intention is PEOU. PEOU usually refers to users' perception of whether performing a particular technical task would require a mental effort on his or her part (Amin, Rezaei, and Abolghasemi, 2014; Davis, 1989)	All models
PU → ATT	**Positive effects:** Davis (1989) defined PU as 'the prospective user's subjective probability that using a specific application system will increase his or her job performance within an organisational context'. Based on his definition, he found PU a major determinant of usage behaviour and intention.	All models
ATT → BI	**Positive effects:**attitude has long been identified as a cause of intention. Prior empirical studies have shown the existence of such a generalised attitude and its influences on the evaluation of new technology behaviour intention in similar situations. So, attitude has a positive effect on BI (Shaikh et al., 2015; Davis, 1989)	All models

Table 2 – antecedents and consequences of TAM

	Construct	Concept	Studies
Antecedent	Perceived benefits	Benefits obtained (revenue; time spent; information) when using technological devices in retail (Higgns et al., 2003)	Liébana-Cabanillas et al. (2017); Li et al. (2017); Jetter et al. (2018)
	Perceived enjoyment	Pleasant feeling when using technological resources (Rodrigues et al., 2016)	Natarajan et al. (2017); Chen et al. (2018); Grob (2018).
	Perceived risk	Risk perception about data privacy; finance damage (Aloysius et al., 2018)	Kamarulzaman (2007); Bailey et al. (2017); Natarajan et al. (2017).
	Personal innovation	Individual traits are linked to being more open-minded to new things and new technologies (Roger, 1995)	Perry (2017); Demoulina and Coussement (2018); Ghazali et al. (2018)
	Social influence	Concept linked to the perception of how much other opinions matter to establish a behaviour (Fishbein and Ajzen, 1975)	Li et al. (2017); Patel and Pattel (2018); Hajiheydari and Ashkani (2018)
	System quality	Perception of the consistency and accuracy of technologies related to retail (Shaikh and Larjaluoto, 2015)	Al-Somali et al., 2009; Demoulina and Coussement (2018).
	Trust	Perception of the reliability and security of technologies used in the retail environment (Lin et al., 2007).	Cyr et al. (2016); Lin and Kim (2016); Bailey et al. (2017)
Consequence	Attitude toward system	Level of effective assessment (positive or negative) that the individual has regarding the use of technologies (Sox, 2016)	Kim and Forsythe (2009); Kaushik and Rahman (2015); Sox (2016)
	Behavioural intention	Predisposition to the use of technologies (Davis, 1999).	Smith et al. (2013); Chandio et al. (2013); Lin and Kim (2016).

Table 3 - Direct results of antecedent constructs

Antecedents of TAM in the retail context									
Ease of Use relationships - PEOU									
Variable	***O***	***N***	***r***	***LCI***	***UCI***	***Z***	***p-value***	***Q***	***I^2***
Perceived benefits	*9*	*2,744*	*.367*	*.260*	*.465*	*6.37*	*.000*	*66.64*	*88.0%*
Perceived enjoyment	*9*	*7,833*	*.415*	*.384*	*.514*	*11.64*	*.000*	*50.14*	*84.0%*
Perceived innovation	*9*	*4.068*	*.394*	*.332*	*.452*	*11.49*	*.000*	*40.02*	*80.0%*
Risk perception	*4*	*2,268*	*-.185*	*-.228*	*-.141*	*-8.17*	*.000*	*1.74*	*0.1%*
Self-efficacy	*4*	*2,103*	*.509*	*.239*	*.706*	*3.47*	*.000*	*116.34*	*97.4%*
Social influence	*6*	*6,603*	*.202*	*.125*	*.278*	*5.06*	*.000*	*11.27*	*82.2%*
System quality	*6*	*2,736*	*.515*	*.471*	*.556*	*19.40*	*.000*	*9.42*	*49.9%*
Trust	*9*	*6,388*	*.308*	*.209*	*.402*	*5.85*	*.000*	*88.11*	*90.9%*
Usefulness relationships - PU									
Variable	***O***	***N***	***r***	***LCI***	***UCI***	***Z***	***p-value***	***Q***	***I^2***
Perceived benefits	*9*	*1,942*	*.485*	*.388*	*.571*	*8.64*	*.000*	*53.64*	*85.1%*
Perceived enjoyment	*9*	*6,694*	*.552*	*.495*	*.604*	*15.50*	*.000*	*49.11*	*83.7%*
Perceived innovation	*7*	*20,145*	*.353*	*.270*	*.431*	*7.83*	*.000*	*29.40*	*79.6%*
Risk perception	*4*	*2,468*	*-.213*	*-.342*	*-.077*	*-3.05*	*.002*	*30.31*	*90.1%*
Self-efficacy	*3*	*755*	*.442*	*.287*	*.574*	*5.18*	*.000*	*11.29*	*82.3%*
Social influence	*9*	*6,356*	*.219*	*.135*	*.300*	*5.04*	*.000*	*56.99*	*86.0%*
System quality	*8*	*4,476*	*.464*	*.417*	*.508*	*16.98*	*.000*	*15.35*	*54.4%*
Trust	*6*	*5,531*	*.284*	*.170*	*.391*	*4.75*	*.000*	*57.37*	*90.8%*

Table 4 - Direct results of consequences constructs

Consequences of TAM on retail context									
Ease of Use relationships - PEOU									
Variable	***O***	***N***	***r***	***LCI***	***UCI***	***Z***	***p-value***	***Q***	***I²***
Attitude	*14*	*5,257*	*.328*	*.267*	*.387*	*9.88*	*.000*	*70.48*	*81.6%*
Behavioral intention	*16*	*4,947*	*.330*	*.281*	*.378*	*12.40*	*.000*	*47.45*	*68.4%*
Usefulness relationships - PU									
Variable	***O***	***N***	***r***	***LCI***	***UCI***	***Z***	***p-value***	***Q***	***I²***
Attitude	*18*	*5,586*	*.577*	*.524*	*.626*	*16.89*	*.000*	*129.61*	*86.9%*
Behavioral intention	*21*	*7,015*	*.466*	*.422*	*.507*	*18.26*	*.000*	*88.91*	*77.5%*

Table 5 – General fit index

Fit index	Model 1	Model 2	Model 3	Model 4	Model 5
χ^2	187.48	88.15	90.59	113.14	119.68
DF	12	3	8	8	8
χ^2/DF	15.62	29.38	11.32	14.14	14.96
RMSEA	.016	.019	.015	.017	.12
CFI	.906	.912	.942	.936	.922
TLI	.835	.825	.902	.880	854

Notes: (χ2) *Chi-square*; (DF) *Degrees of freedom*; (RMSEA) *root mean square error of approximation;* (CFI) *comparative fit index;* (TLI) Tucker–Lewis index

Table 6 – Direct relationships tested by MASEM

Relationships			Model 1	Model 2	Model 3	Model 4	Model 5
Enjoyment	→	PEOU	.395**	--	.456**	.367**	--
Enjoyment	→	PU	.598**	--	.597**	.513**	--
Social influence	→	PEOU	.246**	--	--	.221**	.388**
Social influence	→	PU	.475**	--	--	.384**	.363**
Trust	→	PEOU	.295**	--	.341**	--	.630**
Trust	→	PU	.492**	--	.495**	--	.356**
PEOU	→	Attitude	.132*	.393**	.223**	.157**	.211**
PU	→	Attitude	.642**	.591**	.556**	.503**	.574**
Attitude	→	Behavioral intentions	.706**	.672**	.699**	.647**	.689**

Notes: (**) < .01; (*) < .05

Table 7 – Mediation effects

Relationships					Model 1	Model 2	Model 3	Model 4	Model 5
PEOU	→	Attitude	→	Behavioral intentions	.093*	.264*	156*	.168*	.146*
PEOU			→	Behavioral intentions	.034^{ns}	153*	.075*	.080*	.080*
PU	→	Attitude	→	Behavioral intentions	.453*	.397*	.388*	.401*	.396*
PU			→	Behavioral intentions	.243*	.244*	.231*	.232*	.261*

Notes: (*) < .05; (ns) not

Table 8: Summary of Theoretical Contributions, Practical Implications, and Future Research Directions

Contributions	Theoretical	Practical	Suggestions for Future Research
Core Insights from TAM	Reinforces PU's dominant role in shaping behavior	Design tech that prioritizes PU and enjoyment	Investigate new antecedents like accessibility and loyalty
Moderation Effects	HDI, sample size, and journal quality affect TAM	Segment markets based on HDI and tech familiarity	Conduct cross-industry comparisons to refine moderating effects
Emerging Antecedents	Extends TAM with trust and social influence	Integrate trust-building features into retail tech	Explore sector-specific antecedents and consequences in varying contexts
AI in Retail	Expands TAM to include AI-driven tech adoption	Enhance interactivity in chatbot designs	Assess the impact of AI-enabled systems on trust, PU, and PEOU
Longitudinal Perspectives	Calls for testing TAM constructs over time	Invest in adaptive systems that evolve with use	Develop longitudinal studies to understand shifts in PU and PEOU

Appendix A

STUDIES INCLUDED IN THE META-ANALYSIS

Sample	Author(s)	Year	Journal	N	Country study	Sector	Relationship tested
1	Abbad, M. M.	2013	Behaviour & Information Technology	318	Saudi Arabia	Banking (Internet; Mobile)	ENJ; SI; TRU
2	Agrebi, S., & Jallais, J.	2015	Journal of retailing and consumer services	464	France	Railway Company (Internet shopping - e-ticket -)	ENJ; BI
3	Aldás-Manzano, J., Ruiz-Mafé, C., & Sanz-Blas, S.	2009	Industrial Management & Data Systems.	470	Spain	General products/services (Mobile)	INNO; ATT
4	Aldás-Manzano, J., Ruiz-Mafé, C., & Sanz-Blas, S.	2009	Online Information Review	400	Saudi Arabia	Banking (Mobile)	PB; SQ
5	Al Zubaidi, H., & Al-Alnsari, A. A.	2010	Journal of Transnational Management	608	Kuwaite	General products/services (Internet shopping)	BI
6	Alagoz, S. M., and Hekimoglu, H.	2012	Procedia-Social and Behavioral Sciences	231	Turkey	Food (Online shopping)	ATT
7	Al-Somali, S. A., Gholami, R., & Clegg, B.	2009	Technovation	400	Saudi Arabia	Banking (Internet; Mobile)	ATT; BI
8	Amin, M., Rezaei, S., & Abolghasemi, M.	2014	Nankai Business Review International.	302	Malaysia	General services (Mobile)	TRU
9	Amin, H.	2008	Management Research News.	108	Malaysia	Banking (Internet; Mobile)	BI
10	Amirtha, R., & Sivakumar, V. J.	2018	Information Technology	584	India	General products (Internet shopping)	ATT; BI
11	Arora, S., & Sahney, S. (2018).	2018	Journal of Consumer Marketing	288	India	General products (Internet shopping)	SQ; TRU; ATT; BI
12	Arvidsson, N.	2018	International Journal of Bank Marketing	169	Sweden	Banking (Mobile)	TRU; BI
13	Bashir, I., & Madhavaiah, C.	2015	Journal of Indian Business Research.	697	India	Banking (Internet)	ENJ; SI; TRU; RP; ATT; BI
14	Bailey, A. A., Bonifield, C. M., & Arias, A.	2018	Journal of Retailing and Consumer Services	296	Costa Rica and Colombia	General products/services (Social media)	ENJ; SI; ATT

15	Brandon-Jones, A., & Kauppi, K.	2018	Journal of operations & production management.	139	Netherland	General products/services (Internet shopping)	ATT; BI
16	Bailey, A. A., Pentina, I., Mishra, A. S., & Mimoun, M. S. B.	2017	International Journal of Retail & Distribution Management.	240	United States of America	General products/services (Mobile payments)	SE; ATT; BI
17	Brusch, I., & Rappel, N.	2019	Journal of Retailing and Consumer Services	124	Germany	General products/services (Instagram's instant shopping)	ENJ; INN; BI
18	Çelik, H.	2011	Journal of Retail & Distribution Management	278	Turkey	General products/services (Online shopping)	SN; ATT; BI
19	Çelik, H.	2008	International Journal of Bank Marketing	161	Turkey	Banking (Internet)	RP; ATT; BI
20	Chandio, F. H., Irani, Z., Zeki, A. M., Shah, A., & Shah, S. C.	2017	Information Systems Management	319	Pakistan	Banking (Internet; Mobile)	SQ; BI
21	Cheng, Y. M.	2015	Asia Pacific Management Review	486	Taiwan	Digital games; e-books; e-dictionaries; e-magazines; e-tests (online shopping)	ENJ; BI
22	Chen, S. C., Chen, H. H., & Chen, M. F.	2009	Industrial Management & Data Systems	481	Taiwan	General services (Self-service technologies)	BI
23	Chi, T.	2018	Journal of Retailing and Consumer Services	786	China	Apparel (Mobile commerce)	SQ; ATT; BI
24	Chiou, J. S., & Shen, C. C.	2012	Behaviour & Information Technology	297	NI	Banking (Internet)	TRU; RP; ATT; BI
25	Chong, A. Y. L., Ooi, K. B., Lin, B., & Tan, B. I.	2010	International Journal of Bank Marketing	103	Vietnam	Banking (Internet; Mobile)	TRU
26	Cyr, D., Gefen, D., & Walczuch, R.	2017	Behaviour & Information Technology.	336	Canada and Netherlands	Entertainment (Electronic services - concert ticket)	TRU
27	Cyr, D., Head, M., & Ivanov, A.	2006	Information & management	60	Canada	Entertainment/Hospitality (Electronic services - theatre; restaurant; hotel)	ENJ
28	Dennis, C., Merrilees, B., Hernandez, B., Jimenez, J., & Martín, M. J.	2009	European Journal of Marketing,	805	Spain	General products/services (e-commerce)	SE; ATT; BI
29	Diop, E. B., Zhao, S., & Duy, T. V.	2019	PLoS one	762	China	Grocery (Intelligent transportation system)	ATT; BI

30	Driediger, F., & Bhatiasevi, V.	2019	Journal of Retailing and Consumer Services	263	Thailand	Online Shopping)	ENJ; RP; BI
31	Gillenson, M. L., & Sherrell, D. L.	2002	Information & management	253	United States of America	General store (Virtual store)	ATT; BI
32	Grob, M.	2018	Journal of Retailing and Consumer Services	734	Germany	General services (Mobile)	ENJ; TRU; SN; ATT; BI
33	Guritno, S., & Siringoringo, H.	2013	Procedia-Social and Behavioral Sciences	283	Indonesia	Airlines (Online airline tickets)	TRU; ATTI
34	Hajiheydari, N., & Ashkani, M.	2018	Information Systems	1348	Iran	Social Media (Mobile services - Telegram)	SQ; SN; TRU; ATT; BI
35	Holden, H., & Rada, R.	2011	Journal of Research on Technology in Education	99	United States of America	Education (Electronic services)	ATT
36	Huang, T. L., & Liao, S.	2015	Electronic Commerce Research	220	Taiwan	Fashion/Clothing (Augmented-reality)	ENJ
37	Hur, H. J., Lee, H. K., & Choo, H. J.	2017	Computers in Human Behavior	1288	Korea	Fashion/Clothing (mobile services)	INN; ENJ; BI
38	Jain, G., Rakesh, S., Nabi, M. K., & Chaturvedi, K. R.	2018	Research Journal of Textile and Apparel	270	India	Fashion/Clothing (Online shopping)	ATT; BI
39	Kamarulzaman, Y.	2007	International Journal of Retail & Distribution Management	300	United Kingdom	Hospitality (Electronic services e-travel tickets)	INN; TRU; RP; BI
40	Kapoor, K., Dwivedi, Y., Piercy, N. C., Lal, B., & Weerakkody, V.	2014	Journal of Enterprise Information Management	181	United Kingdom	Library(Radio frequency services) identification integrated services	SQ; ATT; BI
41	Kaushik, A. K., Agrawal, A. K., & Rahman, Z.	2015	Tourism Management Perspectives	338	India	Hospitality (Self-service hotel technologies)	RP; TRU; ATT; BI
42	Kaushik, A. K., & Rahman, Z.	2015	Journal of Services Marketing.	651	India	General retails (Self-checkout systems)	TRU; ATT; BI
43	Kim, J., & Forsythe, S.	2009	European Journal of Marketing	354	United States of America	Fashion/Clothing (Sensory enabling technologies)	ENJ; INN; ATT
44	Kim, M., & Qu, H.	2014	International Journal of Contemporary Hospitality Management	316	United States of America	Hospitality (Self-services technologies - airlines; hotel)	RP; ATT; BI
45	Kwon, J. M., Bae, J. I. S., & Blum, S. C.	2013	Journal of Hospitality and Tourism Technology	235	United States of America	Hospitality (Mobile services)	BI
46	Lee, H. H., Fiore, A. M., & Kim, J.	2006	International Journal of Retail & Distribution Management	206	United States of America	Fashion/Clothing (Online Shopping)	ENJ; ATT; BI
47	Lee, W. I., Chiu, Y. T., Liu, C. C., & Chen, C. Y.	2011	Human Factors and Ergonomics in Manufacturing & Service Industries	441	Taiwan	General services (Self-services technologies -	ENJ; ATT; BI

						ticketing activity, hotel booking, paying utilities, printing services)	
48	Li, R., Chung, T. L. D., & Fiore, A. M.	2017	Journal of Retailing and Consumer Services	210	China	General products and services (E-auction)	ENJ; TRU; ATT
49	Liébana-Cabanillas, F., Marinković, V., & Kalinić, Z.	2017	International Journal of Information Management,	224	Republic of Serbia	General products/Services (Mobile shopping)	TRU; BI
50	Luo, M. M., & Remus, W.	2014	Computers in Human Behavior	161	United States of America	Communication (Online services - Newspaper)	ENJ; BI
51	Maditinos, D., Chatzoudes, D., & Sarigiannidis, L.	2013	Journal of Systems and Information Technology	213	Greek	Banking (Internet; Mobile)	ENJ; SQ; RP; BI
52	McKechnie, S., Winklhofer, H., & Ennew, C.	2006	International Journal of Retail & Distribution Management	300	United Kingdom	Banking (Mobile)	ATT; BI
53	Memarzadeh, F., Blum, S. C., & Adams, C.	2016	Journal of Quality Assurance in Hospitality & Tourism	300	United States of America	Hospitality (E-service hotel reservation)	BI
54	Min, S., So, K. K. F., & Jeong, M.	2019	Journal of Travel & Tourism Marketing	220	United States of America	Uber service (Mobile service)	SI; ATT; BI
55	Munoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F.	2017	Spanish Journal of Marketing-ESIC	103	Spanish	Banking (mobile)	SI; TRU; RP; ATT; BI
56	Muñoz-Leiva, F., Hernández-Méndez, J., & Sánchez-Fernández, J.	2012	Online Information Review	440	Spanish	Hospitality(Travel websites)	TRU; ATT; BI
57	Natarajan, T., Balasubramanian, S. A., & Kasilingam, D. L.	2018	Technology in Society	675	Mturk	General products/services (Mobile shopping)	ENJ; RP; BI
58	Ndubisi, N. O., Lee, C. H., & Eze, U. C.	2011	Asia Pacific Journal of Marketing and Logistics	102	Malaysia	General products/Services (General electronic buying)	TRU; BI
59	Ozdemir, S., Trott, P., & Hoecht, A.	2008	International Journal of Bank Marketing	155	Turkey	Banking (Internet)	RP
60	Patel, K. J., & Patel, H. J.	2018	International Journal of Bank Marketing	284	India	Banking (Internet)	SI; BI
61	Perry, A.	2017	Journal of Fashion Marketing and Management	1002	Mturk	Fashion/Clothing (3D-printed apparel)	ATT; BI
62	Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S.	2004	Internet Research	268	NI	Banking (Online)	SQ; BI
63	Plotkina, D., & Saurel, H.	2019	Journal of Retailing and Consumer Services	415	United States of America	Fashion/Clothing (Augmented reality)	ENJ; ATT
64	Rese, A., Baier, D., Geyer-Schulz, A., & Schreiber, S.	2017	Technological Forecasting and Social Change	978	Germany	General Retails (Augmented-reality	ENJ; INN; ATT; BI

65	Roca, J. C., García, J. J., & De La Vega, J. J.	2009	Information Management & Computer Security	180	Spain	- Ikea; Auto Bild; Mister Spex; Ray-Ban) Trending service (igmarkets.es; renta4.com)	TRU; BI
66	Santouridis, I., & Kyritsi, M.	2014	Procedia Economics and Finance	166	Greek	Banking (Internet)	ATT; BI
67	Savitskie, K., Royne, M. B., Persinger, E. S., Grunhagen, M., & Witte, C. L.	2007	Journal of Global Information Technology Management	292	Norway	General products/services (Internet shopping)	BI
68	Sinha, I., & Mukherjee, S.	2016	The Journal of High Technology Management Research	422	India	Baking (Internet; Mobile)	TRU; ATT; BI
69	Smith, R., Deitz, G., Royne, M. B., Hansen, J. D., Grünhagen, M., & Witte, C.	2013	Journal of Business Research	770	Norway; Germany; United States of America	General products/services (Internet shopping)	BI
70	Skard, S., & Nysveen, H.	2016	Journal of Business-to-Business Marketing	657	Norway	Logistic services (Self-services technologies - My Bring services)	TRU
71	Son, J., Sadachar, A., Manchiraju, S., Fiore, A. M., & Niehm, L. S.	2012	Journal of Research in Interactive Marketing	223	United States of America	Fashion/Clothing (Online collaborative customer co-design - fashion)	ENJ; BI
72	Tong, X.	2010	International Journal of Retail & Distribution Management.	513	China; United States of America	CDs/books, clothing, travel services, etc. (General internet shopping)	ENJ; RP; BI
73	Tseng, S. M.	2015	Journal of Retailing and Consumer Services	177	NI	General services (Self-services technologies - online purchases, package tracking, ticket reservations, online ordering, online registration, etc.)	SQ; BI
74	Um, N. H.	2019	Journal of Promotion Management	364	NI	General products or services (Social commerce sites)	ENJ; TRU; RP; SI; ATT; BI
75	Ur Rahman, S., Khan, M. A., & Iqbal, N.	2018	South Asian Journal of Business Studies	859	Pakistan	General products/services (Online shopping)	TRU; ATT; BI

76	Verma, P., & Sinha, N.	2018	Technological forecasting and social change	327	India	Agricultural services (Mobile-based agricultural extension service)	SI; ATT; BI
77	Vijayasarathy, L. R.	2004	Information & management	281	United States of America	General products/services(Online shopping)	SE; ATT; BI
78	Vrechopoulos, A., & Atherinos, E.	2009	International Journal of Bank Marketing	150	NI	Banking (Internet)	ATT; BI
79	Wang, C. R., & Jeong, M.	2018	International Journal of Hospitality Management	212	United States of America	Online services (Airbnb)	INN; TRU; ATT; BI
80	Wang, Y. S., Wang, Y. M., Lin, H. H., & Tang, T. I.	2003	International journal of service industry management	123	Taiwan	Banking (Internet)	SE; BI
81	Yang, K. C.	2005	Telematics and informatics	866	Singapore	General products/services (Mobile commerce)	INN; ATT
82	Yeh, Y. S., & Li, Y. M.	2009	Online Information Review	212	Taiwan	General products/services (Mobile commerce)	TRU
83	Yen, D. C., Wu, C. S., Cheng, F. F., & Huang, Y. W.	2010	Computers in Human Behavior	221	NI	Communication (Mobile services - wireless)	ATT; BI
84	Zaremohzzabieh, Z., Samah, B. A., Muhammad, M., Omar, S. Z., Bolong, J., Hassan, S. B. H., & Mohamed Shaffril, H. A.	2016	Information Technology for Development	400	Malaysia	General Services (online services)	BI
85	Zhu, D. H., Chang, Y. P., Luo, J. J., & Li, X.	2014	Information Processing & Management	250	China	Social networking sites (General services - Renren)	SI; BI
				32,207			

Notes: (ENJ) enjoyment; (SI) social influence; (RP) Risk perception; (INN) Personal Innovation; (SQ) System Quality; (TRU) Trust; Attitude (ATT); Behavioral intention (BI

REFERENCES INCLUDED IN META-ANALYSIS

Abbad, M. M. (2013). E-banking in Jordan. Behaviour & Information Technology, 32(7), 681-694.

Agrebi, S., & Jallais, J. (2015). Explain the intention to use smartphones for mobile shopping. Journal of retailing and consumer services, 22, 16-23.

Aldás-Manzano, J., Ruiz-Mafé, C., & Sanz-Blas, S. (2009). Exploring individual personality factors as drivers of M-shopping acceptance. Industrial Management & Data Systems.

Aldás-Manzano, J., Lassala-Navarré, C., Ruiz-Mafé, C., & Sanz-Blas, S. (2009). Key drivers of internet banking services use. Online Information Review.

Al Zubaidi, H., & Al-Alnsari, A. A. (2010). Assessing Kuwaitis' intention to shop online using TAM. Journal of Transnational Management, 15(4), 293-307.

Alagoz, S. M., and Hekimoglu, H. (2012). A Study on Tam: Analysis of Customer Attitudes in Online Food Ordering System. Procedia: 62, 1138–143.

Al-Somali, S. A., Gholami, R., & Clegg, B. (2009). An investigation into the acceptance of online banking in Saudi Arabia. Technovation, 29(2), 130-141.

Amin, M., Rezaei, S., & Abolghasemi, M. (2014). User satisfaction with mobile websites: the impact of perceived usefulness (PU), perceived ease of use (PEOU) and trust. Nankai Business Review International.

Amin, H. (2008). Factors affecting the intentions of customers in Malaysia to use mobile phone credit cards. Management Research News.

Amirtha, R., & Sivakumar, V. J. (2018). Does family life cycle stage influence e-shopping acceptance by Indian women? An examination using the technology acceptance model. Behaviour & Information Technology, 37(3), 267-294.

Arora, S., & Sahney, S. (2018). Antecedents to consumers' showrooming behaviour: an integrated TAM-TPB framework. Journal of Consumer Marketing, 35(4), 438-450.

Arvidsson, N. (2014). Consumer attitudes on mobile payment services–results from a proof of concept test. International Journal of Bank Marketing, 32(2), 150-170.

Bashir, I., & Madhavaiah, C. (2015). Consumer attitude and behavioural intention towards Internet banking adoption in India. Journal of Indian Business Research, 7(1), 67-102.

Bailey, A. A., Bonifield, C. M., & Arias, A. (2018). Social media use by young Latin American consumers: An exploration. Journal of Retailing and Consumer Services, 43, 10-19.

Brandon-Jones, A., & Kauppi, K. (2018). Examining the antecedents of the technology acceptance model within e-procurement. International journal of operations & production management, 38(1), 22-42.

Bailey, A. A., Pentina, I., Mishra, A. S., & Mimoun, M. S. B. (2017). Mobile payments adoption by US consumers: An extended TAM. International Journal of Retail & Distribution Management, 45(6), 626-640.

Brusch, I., & Rappel, N. (2019). Exploring the acceptance of instant shopping–An empirical analysis of the determinants of user intention. Journal of Retailing and Consumer Services, 54, 101936.

Çelik, H. (2011). Influence of social norms, perceived playfulness and online shopping anxiety on customers' adoption of online retail shopping. International Journal of Retail & Distribution Management, 39(6), 390-413.

Celik, H. (2008). What determines Turkish customers' acceptance of internet banking?. International Journal of Bank Marketing, 26(5), 353-370.

Chandio, F. H., Irani, Z., Zeki, A. M., Shah, A., & Shah, S. C. (2017). Online banking information systems acceptance: An empirical examination of system characteristics and web security. Information Systems Management, 34(1), 50-64.

Cheng, Y. M. (2015). Towards an understanding of the factors affecting m-learning acceptance: Roles of technological characteristics and compatibility. Asia Pacific Management Review, 20(3), 109-119.

Chen, S. C., Chen, H. H., & Chen, M. F. (2009). Determinants of satisfaction and continuance intention towards self-service technologies. Industrial Management & Data Systems, 109(9), 1248-1263.

Chi, T. (2018). Understanding Chinese consumer adoption of apparel mobile commerce: An extended TAM approach. Journal of Retailing and Consumer Services, 44, 274-284.

Chiou, J. S., & Shen, C. C. (2012). The antecedents of online financial service adoption: the impact of physical banking services on Internet banking acceptance. Behaviour & Information Technology, 31(9), 859-871.

Chong, A. Y. L., Ooi, K. B., Lin, B., & Tan, B. I. (2010). Online banking adoption: an empirical analysis. International Journal of bank marketing, 28(4), 267-287.

Cyr, D., Gefen, D., & Walczuch, R. (2017). Exploring the relative impact of biological sex and masculinity–femininity values on information technology use. Behaviour & Information Technology, 36(2), 178-193.

Cyr, D., Head, M., & Ivanov, A. (2006). Design aesthetics leading to m-loyalty in mobile commerce. Information & management, 43(8), 950-963.

Dennis, C., Merrilees, B., Hernandez, B., Jimenez, J., & Martín, M. J. (2009). Adoption vs acceptance of e-commerce: two different decisions. European Journal of Marketing, 43(9/10), 1232-1245.

Diop, E. B., Zhao, S., & Duy, T. V. (2019). An extension of the technology acceptance model for understanding travelers' adoption of variable message signs. PLoS one, 14(4), e0216007-e0216007.

Driediger, F., & Bhatiasevi, V. (2019). Online grocery shopping in Thailand: Consumer acceptance and usage behavior. Journal of Retailing and Consumer Services, 48, 224-237.

Gillenson, M. L., & Sherrell, D. L. (2002). Enticing online consumers: an extended technology acceptance perspective. Information & management, 39(8), 705-719.

Grob, M. (2018). Heterogeneity in consumers' mobile shopping acceptance: A finite mixture partial least squares modelling approach for exploring and characterising different shopper segments. Journal of Retailing and Consumer Services, 40, 8-18.

Guritno, S., & Siringoringo, H. (2013). Perceived usefulness, ease of use, and attitude towards online shopping usefulness towards online airlines ticket purchase. Procedia-Social and Behavioral Sciences, 81, 212-216.

Hajiheydari, N., & Ashkani, M. (2018). Mobile application user behavior in the developing countries: A survey in Iran. Information Systems, 77, 22-33.

Holden, H., & Rada, R. (2011). Understanding the influence of perceived usability and technology self-efficacy on teachers' technology acceptance. Journal of Research on Technology in Education, 43(4), 343-367.

Huang, T. L., & Liao, S. (2015). A model of acceptance of augmented-reality interactive technology: the moderating role of cognitive innovativeness. Electronic Commerce Research, 15(2), 269-295.

Hur, H. J., Lee, H. K., & Choo, H. J. (2017). Understanding usage intention in innovative mobile app service: Comparison between millennial and mature consumers. Computers in Human Behavior, 73, 353-361.

Jain, G., Rakesh, S., Nabi, M. K., & Chaturvedi, K. R. (2018). Hyper-personalization–fashion sustainability through digital clienteling. Research Journal of Textile and Apparel, 22(4), 320-334.

Kamarulzaman, Y. (2007). Adoption of travel e-shopping in the UK. International Journal of Retail & Distribution Management, 35(9), 703-719.

Kapoor, K., Dwivedi, Y., Piercy, N. C., Lal, B., & Weerakkody, V. (2014). RFID integrated systems in libraries: extending TAM model for empirically examining the use. Journal of Enterprise Information Management, 27(6), 731-758.

Kaushik, A. K., Agrawal, A. K., & Rahman, Z. (2015). Tourist behaviour towards self-service hotel technology adoption: Trust and subjective norm as key antecedents. Tourism Management Perspectives, 16, 278-289.

Kaushik, A. K., & Rahman, Z. (2015). An alternative model of self-service retail technology adoption. Journal of Services Marketing, 29(5), 406-420.

Kim, J., & Forsythe, S. (2009). Adoption of sensory enabling technology for online apparel shopping. European Journal of Marketing, 43(9/10), 1101-1120.

Kim, M., & Qu, H. (2014). Travelers' behavioral intention toward hotel self-service kiosks usage. International Journal of Contemporary Hospitality Management, 26(2), 225-245.

Kwon, J. M., Bae, J. I. S., & Blum, S. C. (2013). Mobile applications in the hospitality industry. Journal of Hospitality and Tourism Technology, 4(1), 1757-9880.

Lee, H. H., Fiore, A. M., & Kim, J. (2006). The role of the technology acceptance model in explaining effects of image interactivity technology on consumer responses. International Journal of Retail & Distribution Management, 34(8), 621-644.

Lee, W. I., Chiu, Y. T., Liu, C. C., & Chen, C. Y. (2011). Assessing the effects of consumer involvement and service quality in a self-service setting. Human Factors and Ergonomics in Manufacturing & Service Industries, 21(5), 504-515.

Li, R., Chung, T. L. D., & Fiore, A. M. (2017). Factors affecting current users' attitude towards e-auctions in China: An extended TAM study. Journal of Retailing and Consumer Services, 34, 19-29.

Liébana-Cabanillas, F., Marinković, V., & Kalinić, Z. (2017). A SEM-neural network approach for predicting antecedents of m-commerce acceptance. International Journal of Information Management, 37(2), 14-24.

Luo, M. M., & Remus, W. (2014). Uses and gratifications and acceptance of Web-based information services: An integrated model. Computers in Human Behavior, 38, 281-295.

Maditinos, D., Chatzoudes, D., & Sarigiannidis, L. (2013). An examination of the critical factors affecting consumer acceptance of online banking. Journal of Systems and information Technology, 15(1), 97-116.

McKechnie, S., Winklhofer, H., & Ennew, C. (2006). Applying the technology acceptance model to the online retailing of financial services. International Journal of Retail & Distribution Management, 34(4/5), 388-410.

Memarzadeh, F., Blum, S. C., & Adams, C. (2016). Business travelers' intention to purchase: The application of technology acceptance model (TAM). Journal of Quality Assurance in Hospitality & Tourism, 17(4), 412-424.

Min, S., So, K. K. F., & Jeong, M. (2019). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. Journal of Travel & Tourism Marketing, 36(7), 770-783.

Munoz-Leiva, F., Climent-Climent, S., & Liébana-Cabanillas, F. (2017). Determinants of intention to use the mobile banking apps: An extension of the classic TAM model. Spanish Journal of Marketing-ESIC, 21(1), 25-38.

Muñoz-Leiva, F., Hernández-Méndez, J., & Sánchez-Fernández, J. (2012). Generalising user behaviour in online travel sites through the Travel 2.0 website acceptance model. Online Information Review, 36(6), 879-902.

Natarajan, T., Balasubramanian, S. A., & Kasilingam, D. L. (2018). The moderating role of device type and age of users on the intention to use mobile shopping applications. Technology in Society, 53, 79-90.

Ndubisi, N. O., Lee, C. H., & Eze, U. C. (2011). Analyzing key determinants of online repurchase intentions. Asia Pacific Journal of Marketing and Logistics, 23(2), 200-221.

Ozdemir, S., Trott, P., & Hoecht, A. (2008). Segmenting internet banking adopter and non-adopters in the Turkish retail banking sector. International Journal of Bank Marketing, 26(4), 212-236.

Patel, K. J., & Patel, H. J. (2018). Adoption of internet banking services in Gujarat. International Journal of Bank Marketing, 36(1), 147-169.

Perry, A. (2017). Factors comprehensively influencing acceptance of 3D-printed apparel. Journal of Fashion Marketing and Management, 21(2), 219-234.

Pikkarainen, T., Pikkarainen, K., Karjaluoto, H., & Pahnila, S. (2004). Consumer acceptance of online banking: an extension of the technology acceptance model. Internet research, 14(3), 224-235.

Plotkina, D., & Saurel, H. (2019). Me or just like me? The role of virtual try-on and physical appearance in apparel M-retailing. Journal of Retailing and Consumer Services, 51, 362-377.

Rese, A., Baier, D., Geyer-Schulz, A., & Schreiber, S. (2017). How augmented reality apps are accepted by consumers: A comparative analysis using scales and opinions. Technological Forecasting and Social Change, 124, 306-319.

Roca, J. C., García, J. J., & De La Vega, J. J. (2009). The importance of perceived trust, security and privacy in online trading systems. Information Management & Computer Security, 17(2), 96-113.

Santouridis, I., & Kyritsi, M. (2014). Investigating the determinants of internet banking adoption in Greece. Procedia Economics and Finance, 9(1), 501-510.

Savitskie, K., Royne, M. B., Persinger, E. S., Grunhagen, M., & Witte, C. L. (2007). Norwegian Internet shopping sites: An application & extension of the technology acceptance model. Journal of Global Information Technology Management, 10(4), 54-73.

Sinha, I., & Mukherjee, S. (2016). Acceptance of technology, related factors in use of off branch e-banking: an Indian case study. The Journal of High Technology Management Research, 27(1), 88-100.

Smith, R., Deitz, G., Royne, M. B., Hansen, J. D., Grünhagen, M., & Witte, C. (2013). Cross-cultural examination of online shopping behavior: A comparison of Norway, Germany, and the United States. Journal of Business Research, 66(3), 328-335.

Skard, S., & Nysveen, H. (2016). Trusting beliefs and loyalty in B-to-B self-services. Journal of Business-to-Business Marketing, 23(4), 257-276.

Son, J., Sadachar, A., Manchiraju, S., Fiore, A. M., & Niehm, L. S. (2012). Consumer adoption of online collaborative customer co-design. Journal of Research in Interactive Marketing, 6(3), 180-197.

Tong, X. (2010), A cross-national investigation of an extended technology acceptance model in the online shopping context. International Journal of Retail & Distribution Management. 38 No. 10, 742-759.

Tseng, S. M. (2015). Exploring the intention to continue using web-based self-service. Journal of Retailing and Consumer Services, 24, 85-93.

Um, N. H. (2019). Antecedents and Consequences of Consumers' Attitude toward Social Commerce Sites. Journal of Promotion Management, 25(4), 500-519.

Ur Rahman, S., Khan, M. A., & Iqbal, N. (2018). Motivations and barriers to purchasing online: understanding consumer responses. South Asian Journal of Business Studies, 7(1), 111-128.

Verma, P., & Sinha, N. (2018). Integrating perceived economic wellbeing to technology acceptance model: The case of mobile based agricultural extension service. Technological forecasting and social change, 126, 207-216.

Vijayasarathy, L. R. (2004). Predicting consumer intentions to use on-line shopping: the case for an augmented technology acceptance model. Information & management, 41(6), 747-762.

Vrechopoulos, A., & Atherinos, E. (2009). Web banking layout effects on consumer behavioural intentions. International Journal of Bank Marketing, 27(7), 524-546.

Wang, C. R., & Jeong, M. (2018). What makes you choose Airbnb again? An examination of users' perceptions toward the website and their stay. International Journal of Hospitality Management, 74, 162-170.

Wang, Y. S., Wang, Y. M., Lin, H. H., & Tang, T. I. (2003). Determinants of user acceptance of Internet banking: an empirical study. International journal of service industry management, 14(5), 510-519.

Yang, K. C. (2005). Exploring factors affecting the adoption of mobile commerce in Singapore. Telematics and informatics, 22(3), 257-277.

Yeh, Y. S., & Li, Y. M. (2009). Building trust in m-commerce: contributions from quality and satisfaction. Online Information Review, 33(6), 1066-1086.

Yen, D. C., Wu, C. S., Cheng, F. F., & Huang, Y. W. (2010). Determinants of users' intention to adopt wireless technology: An empirical study by integrating TTF with TAM. Computers in Human Behavior, 26(5), 906-915.

Zaremohzzabieh, Z., Samah, B. A., Muhammad, M., Omar, S. Z., Bolong, J., Hassan, S. B. H., & Mohamed Shaffril, H. A. (2016). Information and communications technology acceptance by youth entrepreneurs in rural Malaysian communities: The mediating effects of attitude and entrepreneurial intention. Information Technology for Development, 22(4), 606-629.

Zhu, D. H., Chang, Y. P., Luo, J. J., & Li, X. (2014). Understanding the adoption of location-based recommendation agents among active users of social networking sites. Information Processing & Management, 50(5), 675-682.

Appendix B

Methodological settings

	PEOU and attitude						*PU and attitude*				
Moderator	Beta	Correlation	LCI	UCI	p-value	***Moderator***	Beta	Correlation	LCI	UCI	p-value
Journal Ranking						***Journal Ranking***					
High	*1*	*.370*				High	*1*	*.569*			
Low	*-.147*	*.245*	*-.198*	.059	*.163*	Low	*-.081*	*.514*	*-.366*	.224	*.579*
Sample Size						***Sample Size***					
Large	*1*	*.333*				Large	*1*	*.551*			
Small	*.017*	*.330*	*-.195*	.233	*.874*	Small	*-.071*	*.546*	*-.366*	.224	*.637*
Type of sample						***Type of sample***					
Nonstudent	*1*	*.342*				Nonstudent	*1*	*.521*			
Student	*-.068*	*.338*	*-.295*	.158	*.555*	Student	*.260*	*.611*	*-.052*	.572	*.102*

Contextual settings

	PEOU and attitude						*PU and attitude*				
Moderator	Beta	Correlation	LCI	UCI	p-value	***Moderator***	Beta	Correlation	LCI	UCI	p-value
Cultural orient.						***Cultural orient.***					
Western	*1*	*.318*				Western	*1*	*.586*			
Eastern	*-.358*	*.356*	*-.924*	.208	*.215*	Eastern	*.310*	*.518*	*-.218*	.840	*.250*
Unc. Avoidance						***Unc. Avoidance***					
High	*1*	*.290*				High	*1*	*.589*			
Low	*.134*	*.437*	*-.213*	.482	*.448*	Low	*.122*	*.511*	*-.215*	.461	*.477*
HDI index						***HDI index***					
High	*1*	*.269*				High	*1*	*.607*			
Low	*.255*	*.443*	*-.385*	.895	*.435*	Low	*-.645*	*.459*	*-.924*	-.047	*.034*
Innovation level						***Innovation level***					
High	*1*	*.327*				High	*1*	*.577*			
Low	*.117*	*.437*	*-.368*	.603	*.636*	Low	*-.032*	*.492*	*-.498*	.432	*.889*
Type of goods						***Type of goods***					
Product	*1*	*.264*				Product	*1*	*.615*			
Service	*.154*	*.400*	*-.079*	*.387*	*.195*	Service	*.076*	*.645*	-.202	.534	*592*
Type of goods						***Sector***					
Banking	*1*	*.389*				Banking	*1*	*.596*			
General	*.078*	*.443*	*-.385*	.529	*.758*	General	*.155*	*.672*	*-.181*	.493	*.905*
Fashion	*.099*	*.373*	*-.198*	.397	*.512*	Fashion	--	--	--	--	--
Hospitality	--	--	--	--	--	Hospitality	*-.176*	*.486*	*-.662*	.309	*.475*

Methodological settings											
	PEOU and behavioral intention						*PU and behavioral intention*				
Moderator	Beta	Correlation	LCI	UCI	p-value	***Moderator***	Beta	Correlation	LCI	UCI	p-value
Journal Ranking						***Journal Ranking***					
High	*1*	*.336*				High	*1*	*.512*			
Low	*-.105*	*.252*	*-.333*	.124	*.369*	Low	*-.221*	*.386*	*-.429*	-.013	*.036*
Sample Size						***Sample Size***					
Large	*1*	*.293*				Large	*1*	*.507*			
Small	*.042*	*.330*	*-.179*	.263	*.708*	Small	*-.167*	*.409*	*-.371*	.036	*.606*
Type of sample						***Type of sample***					
Nonstudent	*1*	*.306*				Nonstudent	*1*	*.432*			
Student	*.120*	*.366*	*-.129*	.370	*.943*	Student	*.068*	*.498*	*-.172*	.310	*.577*
Contextual settings											
	PEOU and behavioral intention						*PU and behavioral intention*				
Moderator	Beta	Correlation	LCI	UCI	p-value	***Moderator***	Beta	Correlation	LCI	UCI	p-value
Cultural orient.						***Cultural orient.***					
Western	*1*	*.257*				Western	*1*	*.400*			
Eastern	*.146*	*.366*	*-.459*	.753	*.635*	Eastern	*0.54*	*.465*	*-.674*	.783	*.883*
Unc. Avoidance						***Unc. Avoidance***					
High	*1*	*.257*				High	*1*	*.441*			
Low	*.061*	*.364*	*-.251*	.374	*.699*	Low	*-.024*	*.464*	*-.367*	.318	*.886*
HDI index						***HDI index***					
High	*1*	*.279*				High	*1*	*.409*			
Low	*.011*	*.297*	*-.697*	.719	*.975*	Low	*-.116*	*.464*	*-.954*	.722	*.786*
Innovation level						***Innovation level***					
High	*1*	*.347*				High	*1*	*.466*			
Low	*-.081*	*.321*	*-.445*	.281	*.658*	Low	*-.051*	*.458*	*-.483*	.380	*.815*
Type of goods						***Type of goods***					
Product	*1*	*.451*				Product	*1*	*.449*			
Service	*-.361*	*.352*	*-.751*	*.029*	*.069*	Service	*.076*	*.345*	-.202	.534	*592*
Type of goods						***Sector***					
Banking	*1*	*.256*				Banking	*1*	*.256*			
General	*.267*	*.480*	*-.043*	.578	*.091*	General	*.285*	*.454*	*.168*	.602	*.072*
Fashion	*.229*	*.315*	*-.494*	.954	*.534*	Fashion	*-062*	*.240*	*-.432*	.307	*.740*
Hospitality	*-.026*	*.296*	*-.493*	.441	*.912*	Hospitality	*.031*	*.296*	*-.383*	.445	*.882*