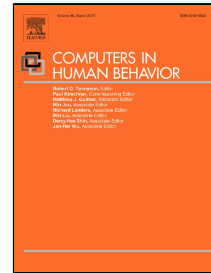


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Modelling and Testing Consumer Trust Dimensions in E-commerce

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**Highlights**

- Evaluative framework for measuring the dimensions of consumer trust in e-commerce.
- Measures the three main dimensions of trust: competence, integrity, and benevolence.
- Consumers with high overall trust demonstrate a higher intention to e-commerce.

## Modelling and Testing Consumer Trust Dimensions in E-commerce

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## Modelling and Testing Consumer Trust Dimensions in E-commerce

### Abstract

Prior research has found trust to play a significant role in shaping purchase intentions of a consumer. However there has been limited research where consumer trust dimensions have been empirically defined and tested. In this paper we empirically test a path model such that Internet vendors would have adequate solutions to increase trust. The path model presented in this paper measures the three main dimensions of trust, i.e. competence, integrity, and benevolence. And assesses the influence of overall trust of consumers. The paper also analyses how various sources of trust, i.e. consumer characteristics, firm characteristic, website infrastructure and interactions with consumers, influence dimensions of trust. The model is tested using 365 valid responses. Findings suggest that consumers with high overall trust demonstrate a higher intention to purchase online.

**Keywords:** E-commerce; Competence; Integrity; Benevolence; Trust.

# Modelling and testing consumer trust dimensions in E-commerce

## 1. Introduction

E-commerce transactions are the sales of products and services over the Internet, which in the past years have been growing tremendously. Nevertheless, E-commerce is still a relatively new concept for most people, and as trust increases with familiarity, it is important to find ways to encourage consumers to continuously use e-commerce (Jones & Leonard, 2008; W.-T. Wang, Wang, & Liu, 2016). Eurostat study reveals that in 2013, 38% of the European Union population (individuals aged between 16 to 74 years' old, from all 28 countries) have ordered or bought goods or services for private use on the Internet. However large discrepancies exist among these 28 countries (OECD, 2013). Whereas in Germany 60% of the population (with the same characteristics) purchases online, and 57% in Sweden, the figure stands at just 15% in Portugal. Electronic commerce typically lacks human warmth (Hassanein & Head, 2007; Lu, Fan, & Zhou, 2016) and lack of trust is one of the most frequently cited reasons why consumers do not purchase from Internet vendors (Grabner-Krauter & Kaluscha, 2003; D. J. Kim, Yim, Sugumaran, & Rao, 2015; J.-M. Lee & Rha, 2016). Moreover, recent studies have also addressed trust from the perspective of its different relationships (Söllner, Hoffmann, & Leimeister, 2015) and how privacy assurance and concerns affect trust (Aïmeur, Lawani, & Dalkir, 2016; Bansal, Zahedi, & Gefen, 2015). However, a research question still remains to be answered: Does overall trust significantly influence consumers' intention to purchase online? With this in mind, this study's objective is to focus on the Portuguese scenario and consumers with regard to their trust and their intent to purchase online. The two main advantages of choosing Portugal and its consumers is the lack of existing literature regarding e-commerce in Portugal, and also the big potential for improvement and for increasing the Portuguese online market, as the number of internet users, online buyers, the average amount of money spent per purchase and the volume of e-commerce business has been growing since 2009 and are predicted to continue doing so at least until 2017 (IDC & ACEPI, 2013; Netsonda & ACEPI, 2014).

Chen and Dhillon (2003) presented a conceptual model for instituting consumer trust in internet vendors, which establishes a conceptual basis for undertaking empirical work on consumer trust in e-commerce. However, more than 10 years later, no one has tried to empirically study this conceptual model. Behind this model there are three trust dimensions: competence, integrity and benevolence; and there are four sources of trust: consumer characteristics, firm characteristics, website infrastructure and interactions that represent the dimensions of consumer trust in an Internet vendor. Recent studies empirically tested some of these sources of trust and trust dimensions, but in

all this research the focus was always based on just one dimension, or on a pair of sources. The uniqueness of this study is that it uses empirical testing, combining all the trust dimensions and the sources of trust of the path model together in a country characterised by a low level of online purchase in order to track and influence the behaviour trends of Portuguese online consumers.

The outcome of this research reveals an evaluative framework for measuring the dimensions of consumer trust in e-commerce. Consequently, by pinpointing this guiding framework, this research can be used to develop measures for ensuring consumer trust in e-commerce.

This study is organized in seven sections. Following on from this Introduction, the next section recounts the theoretical background, and includes the literature review in support of the definition of the hypotheses presented in Section 3. The methods are established in Section 4, followed by the data analysis, and the results discussed in Section 5, and finally a conclusion is presented.

## **2. Literature review and research model**

### **2.1. Literature review**

In the field of consumer behaviour, for many years, a vast number of studies have been carried out that develop intention based theories. Oliver (1980) proposed a model – the expectation and disconfirmation theory (EDT), which expresses consumer satisfaction as a function of expectation and expectancy disconfirmation. Satisfaction, in turn, is believed to influence attitude change and purchase intention (Oliver, 1980). From Ajzen & Fishbein (1980), the theory of reasoned action (TRA) was created, which claims that individuals' performance are determined by their behavioural intentions, which, in turn, is determined by the individual's attitude and subjective norms. Building upon TRA, Davis (1985) developed the technology acceptance model (TAM) to explain the acceptance of information systems. Empirical studies of TAM have shown that users' attitudes towards using an information system impact the actual usage of the system (Hassanein & Head, 2007). Another evolution of the TRA is the theory of planned behaviour (TPB) from Ajzen (1991), which focuses on cases where users do not have complete control over the choice, but are somehow conditioned by non-motivational factors that are related to the availability of certain requirements and resources. Just like its predecessor, the TPB considers intention as being the best indicator of behaviour, as it captures the motivational factors that influence a behaviour; these are indicators of how hard people are willing to try and of how much of an effort they are planning to exert when performing a behaviour (Icek Ajzen, 1991).

Recently, many empirical tests have been made linking the above-referred theories with e-commerce and trust, as one can see in Table 1. More precisely, Grandón (2011), Palvia (2009), Shih

(2004), Teo & Liu (2005) and Vijayasathy (2004) all tested models that were grounded on TRA, whereas TAM was the base for the researches of Hassanein & Head (2007), Lin (2007), Palvia (2009), Shih (2004) and Vijayasathy (2004). Finally, developing models of TPB were tested by Crespo & Bosque (2010), Gorge (2004), Grandón et al. (2011), Hsu et al. (2006), Lin (2007), Vijayasathy (2004) and Wang et al. (2007).

An extensive literature review is presented further on in this section (summarized in Table 1), which was made in order to contextualize the sources of consumer trust (consumer and firm characteristics, website infrastructure and interactions), in order to explain in which manner these sources influence the dimensions of consumer trust: competence, integrity and benevolence of an Internet vendor, and finally to examine the existent empirical research on the dimensions and sources of consumer trust in E-Commerce.

Chen & Dhillon (2003) presented a path model which combines the dimensions of consumer trust and the sources of trust, in order that Internet vendors can build and win consumer trust to survive and to realize financial success. The Theory of Planned Behaviour further proposes that intention to perform a behaviour is the proximal causal of such behaviour, that is to say, the degree of conscious effort that a person will exert in order to perform that behaviour (S. C. Chen & Dhillon, 2003).

Finally, as is possible to see in Table 1, it is reasonable to conclude that since no one has ever tested the path model of Chen & Dhillon (2003), that there is a huge opportunity for doing so. Therefore, empirically testing the dimensions of consumer trust, as they suggest, is a large advancement in e-commerce literature and is of major interest for internet vendors, and thus it is the purpose of this research.

**Table 1.**  
Literature Review

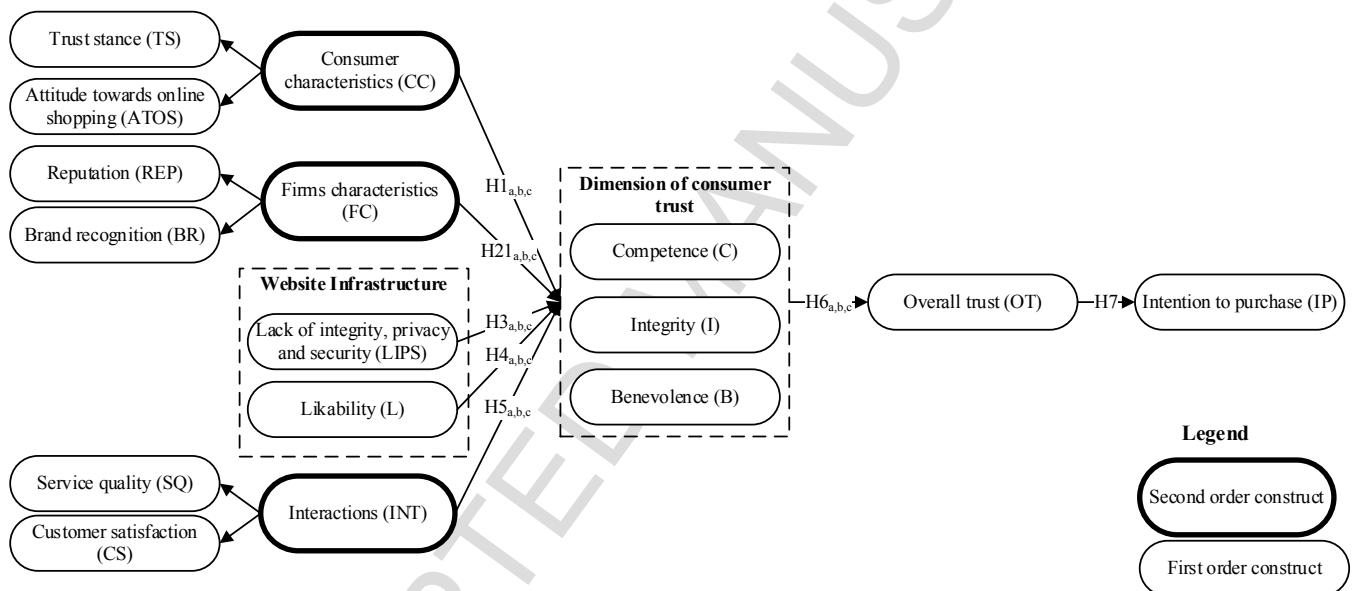
| Author                       | Models used                             | Dependent variable   | Constructs |      |    |     |    |    |   |      |    |    |     |   |   |   |    |   |
|------------------------------|---|--|------------|------|----|-----|----|----|---|------|----|----|-----|---|---|---|----|---|
|                              |   |  | TS         | ATOS | CC | REP | BR | FC | L | LIPS | SQ | CS | INT | C | I | B | OT | I |
| (Dan J. Kim, 2008)           | Trust-based consumer decision-making m. | Intention, Purchase  |            |      |    |     |    |    |   |      | X  |    |     |   |   |   |    | X |
| (D. Harrison McKnight, 2002) | Trust building m.                       | Intention to Follow, Intention to Share Personal Information, Intention to Purchase              |            |      |    | X   |    |    |   |      | X  | X  |     |   |   |   |    | X |
| (Kiku Jones, 2008)           | -                                       | C2C E-commerce trust   | X          |      |    |     | X  |    |   | X    |    |    |     |   |   |   |    |   |
| (Palvia, 2009)               | TAM; TRA                                | Trustworthiness of web vendor; Intention to Participate in Exchange Relationship with Web Vendor | X          |      |    |     |    |    |   |      | X  | X  |     | X | X | X | X  | X |
| (Gefen, 2000)                | -                                       | Purchase   | X          |      |    |     |    |    |   |      |    |    |     |   |   |   |    |   |
| (Angel Herrero Crespo, 2010) | TPB                                     | Intention  |            | X    |    |     |    |    |   |      |    |    |     |   |   |   |    |   |
| (Carlos Flavián, 2006)       | -                                       | Trust  |            |      |    |     |    |    |   | X    |    | X  |     |   |   |   |    |   |
| (Ming-Shen Wang, 2007)       | TPB                                     | Behavioural Intention  |            | X    |    |     |    |    |   |      |    |    | X   |   |   |   |    |   |
| (George, 2004)               | TPB                                     | Internet purchasing  | X          | X    |    | X   |    |    |   |      |    |    |     |   |   |   |    |   |
| (Lin, 2007)                  | TAM; TPB                                | Actual usage   |            | X    |    |     |    |    |   | X    |    |    |     |   |   |   |    | X |
| (Kaouther Ben Mansour, 2014) | -                                       | Purchase Intention   |            |      |    | X   |    |    |   |      | X  | X  |     |   | X | X |    |   |
| (Meng-Hsiang Hsu, 2006)      | EDT; TPB                                | Continuance Intention  |            | X    |    |     |    |    |   |      |    |    | X   |   |   |   |    |   |
| (Vijayasathy, 2004)          | TAM; TPB; TRA                           | Intention  |            | X    |    |     |    |    |   | X    | X  |    |     |   |   |   |    |   |
| (Ilyoo B. Hong, 2011)        | -                                       | Purchase Intention   |            |      |    |     |    |    |   |      |    |    |     | X | X | X | X  |   |
| (Thompson S. H. Teo, 2005)   | TRA                                     | Willingness to buy   |            |      | X  |     |    |    | X |      |    |    |     |   |   |   |    | X |
| (Regina Connolly, 2007)      | -                                       | Perceived Risk   | X          | X    |    |     |    |    |   |      |    |    |     | X | X |   |    |   |
| (Jiunn-Woei Lian, 2008)      | -                                       | Attitude towards Online Shopping   |            |      |    |     |    |    |   |      | X  |    |     |   |   |   |    |   |
| (Elizabeth E. Grandón, 2011) | TPB; TRA                                | Intention  |            | X    |    |     |    |    |   |      |    |    |     |   |   |   |    |   |
| (Shih, 2004)                 | TAM; TRA                                | User Acceptance  |            | X    |    |     |    |    |   | X    |    | X  |     |   |   |   |    |   |
| (Yeung, 2010)                | -                                       | Purchase likelihood  |            |      |    |     |    |    |   |      |    |    |     | X | X | X | X  |   |
| (Lin, 2007)                  | SOR                                     | Purchase Intention   | X          |      |    |     |    | X  |   | X    | X  |    |     |   |   |   |    |   |
| (Norizan Kassim, 2010)       | -                                       | Customer Loyalty   |            |      |    |     |    |    |   |      |    | X  |     |   |   |   |    |   |
| (Khaled Hassanein, 2007)     | TAM                                     | Attitude   |            |      |    |     |    |    |   |      |    |    |     |   |   |   |    | X |
| (Steve Muylle, 2004)         |   | Website user satisfaction  |            |      |    |     |    |    |   | X    |    |    |     |   |   |   |    |   |
| (Moshe Zviran, 2006)         |   | User Satisfaction  |            |      |    |     |    |    |   | X    |    |    |     |   |   |   |    |   |
| (Narasimha Paravastu, 2014)  | EDT                                     | Satisfaction   | X          |      |    |     |    |    |   |      |    | X  | X   |   |   |   |    |   |

Note: Trust stance (TS); Attitude towards online shopping (ATOS); Consumer characteristics (CC); Reputation (REP), Brand recognition (BR); Firm Characteristics (FC); Likability (L); Lack of integrity, privacy and security (LIPS); Service quality (SQ); Customer satisfaction (CS); Interactions (INT); Competence (C); Integrity (I); Benevolence (B); Overall trust (OT); Intention to purchase (IP).



## 2.2. Research model

The research model presented in Figure 1 has four sources of consumer trust: consumer characteristics; firm characteristics; website infrastructure – composed by a lack of integrity, privacy, and security and likability; and interactions. In the model below, the three constructs are shown in bold, as they are of the second order. Consumer characteristics is a second order construct of attitude towards online shopping and trust stance; firm characteristics is a second order construct of reputation and brand recognition; and interactions is a second order construct of service quality and customer satisfactions. The sources of consumer trust influence the dimensions of consumer trust, which are: competence, integrity and benevolence of the internet vendor. In turn, these dimensions, influence the overall trust of a consumer, consequently impacting their intention to purchase online. Hypotheses were created for each source and dimension and these are explained forward in this chapter.



**Figure 1.** Research model

### 2.2.1. Sources of consumer trust

#### *Consumer characteristics*

The first disposition to trust is a general inclination, i.e. not situation specific, to display a trusting stance toward others (Gefen, 2000). When explaining individual actions, the following elements are considered: attitude towards online shopping - attitude is considered to result from individual beliefs regarding behaviour and its consequences and the importance that is given to these beliefs, and thus consumers' attitudes towards e-commerce are influenced by the degree to which they consider online shopping to be a good experience (Crespo & Bosque, 2010); and the trust stance – as consumers are rational and are affected by their perception of trust in a vendor,

they only share personal and sensitive information with a web vendor when they trust certain aspects of the site (Palvia, 2009). Based on this, we postulate the following hypothesis:

**H1.** *Consumer characteristic is a second order construct of trust stance and attitude towards online shopping. Consumer characteristics positively influence the following perceptions of an Internet vendor: (a) competence; (b) integrity, and; (c) benevolence.*

#### *Firm characteristics*

In digital storefronts, online transactions involve trust in one-to-one relationships (between a buyer and a seller). Trust is formed when the buyer has a belief that the transaction partner will behave with goodwill and in a favourable way, although the acceptance of trust involves taking certain risks (Hong & Cho, 2011). Different stakeholders may have different views and requirements of online trust (Shankar, Urban, & Sultan, 2002). In the case of Internet shopping, the perceived reputation of a vendor has revealed to be significantly related to consumers' trust in the vendor (Teo & Liu, 2005). At the same time, consumers are exposed to realities that are created by the firm, and they may consciously or unconsciously select facts that are compatible with their configuration of attitudes and beliefs, and these facts are retained and thereafter retrieved from memory to reconstruct an image when the firm is brought to mind, which reveals brand recognition (Nguyen & Leblanc, 2001). The hypothesis formulated to enquire about the influence of firm characteristics on consumers' trust is:

**H2.** *Firm characteristics is a second order construct of reputation of an Internet vendor and brand recognition. Firm characteristics positively influence the following perceptions of an Internet vendor: (a) competence; (b) integrity, and; (c) benevolence.*

#### *Website infrastructure*

On the one hand, the likability of a website involves the ease with which the user can learn to manage the system and can memorise the basic functions, the efficiency of the site's design, the degree of error avoidance, and the general satisfaction of the user (Flavián, Guinalau, & Gurrea, 2006). General usability of a website has an impact on the establishment of trust (Roy, Dewit, & Aubert, 2001), and if customers are satisfied with the website, then their intention to purchase increases (M. K. Chang, Cheung, & Lai, 2005). As websites serve as the interface for the e-commerce system, likability studies have largely addressed e-commerce website design, with a particular focus on ease-of-use and user-friendliness, whilst information quality is a key feature that influences user satisfaction and loyalty towards e-commerce (Huang & Benyoucef, 2013). On the other hand, marketing researchers have stated that perceived risk affects purchasing behaviour, because for many people, web-browsing feels safe, however transacting on the Internet is a vast

landmine, where there is no integrity among the internet vendors, and the web environment has no privacy or security, thus inviting disaster. This results in perceived risk, which equates to the extent to which a user believes it is unsafe to use the web, or that negative consequences are possible, which explains that lack of integrity, privacy and security, which all negatively affect consumers' intentions to transact with a web-based vendor (McKnight, Choudhury, & Kacmar, 2002). As both website likability and the need for web security have different ways of affecting consumers' trust, website infrastructure was divided into two different constructs, and then the following two different hypotheses were formulated:

*H3. Likability of the website infrastructure positively influences the following perceptions of an Internet vendor: (a) competence; (b) integrity, and; (c) benevolence.*

*H4. Lack of integrity, privacy and security of the website infrastructure negatively influence the following perceptions of an Internet vendor: (a) competence; (b) integrity, and; (c) benevolence.*

#### *Interaction*

Participating in an e-commerce relationship results in a degree of consumer dependence on the web vendor for products and services, and it is only through participation in an exchange relationship that customers gain experience, deriving value and satisfaction (Palvia, 2009). These customer attitudes and interactions are strongly influenced by content quality (Huang & Benyoucef, 2013), and they are the reason why satisfaction is an effective consumer condition which results from a global evaluation of all the aspects which make up consumer relationship (Flavián, et al., 2006). Furthermore, intention to shop online is related to Internet shopping history, and has a direct impact on consumer behaviour. Knowing how past experience affects purchasing behaviour is important, given that previous e-commerce consumers behave differently from new consumers (Weisberg, Te'eni, & Arman, 2011). Accordingly, the following hypothesis was defined:

*H5. Interaction is a second order construct of service quality and customer satisfaction. The interactions between consumers and the firm positively influence the following perceptions of an Internet vendor: (a) competence; (b) integrity, and; (c) benevolence.*

### **2.2.2. Dimensions of trust**

Chen & Dhillon (2003) proposed in their research that competence, integrity and benevolence are all dimensions of trust in an Internet vendor. Competence refers to companies' ability to fulfil promises made to consumers. Integrity suggests that a company acts in a consistent, reliable and honest manner. Benevolence is the ability of a company to hold consumer interests ahead of their own self-interest, and indicates a sincere concern for the welfare of customers. These three

dimensions of trust vary independently, but are all interrelated and they jointly contribute to overall consumer trust (S. C. Chen & Dhillon, 2003). In order to enquire whether competent, integrated and benevolent are more likely to be trusted by consumers, we hypothesized that:

*H6. The following perceptions of an Internet vendor positively influence overall trust of the consumer: (a) competence; (b) integrity, and; (c) benevolence.*

### **2.2.3. Overall trust**

Trust has been viewed through diverse disciplinary lenses and filters: economic, social/institutional, behavioural/psychological, managerial/organizational and technological (Dan J. Kim, Ferrin, & Rao, 2008). However, the problem of having trust as a concept is that it still does not have a universally accepted definition and there is no unified way to estimate trust value (W.-L. Chang, Diaz, & Hung, 2014), although many have attempted to conceptualize and clarify trust (Grabner-Krauter & Kaluscha, 2003). When looking specifically at the online context, trust is defined as one's attitude of confident expectation regarding an online situation of risk whereby one's vulnerabilities will not be exploited (Beldad, Jong, & Steehouder, 2010). For e-vendors, it is therefore critical to promote trust, in order to transform a potential consumer from being a curious observer, to becoming one who is willing to transact via the site (McKnight, et al., 2002), and who does not desist before confirming their purchase (Chau, Hu, Lee, & Au, 2007). Based on the arguments above, we postulate the following hypothesis:

*H7. Overall trust in an Internet vendor positively influences the intention of the consumer to purchase online.*

## **3. Methods**

### **3.1. Measurement instruments**

The items for all the constructs are included in Appendix A, and they were collected from relevant literature, namely: attitude towards online shopping (ATOS) - from Crespo & Bosque (2010); reputation (REP) - from Teo & Liu (2005); brand recognition (BR) - from Nguyen & Leblanc (2001), likability (LIK) - from Flavián et al. (2006); lack of integrity, privacy and security (LIPS) - from McKnight et al. (2002), and; trust stance (TS), service quality (SQ), customer satisfaction (CS), competence (C), integrity (I), benevolence (B), overall trust (OT), and intention to purchase (IP) - from Palvia (2009). Based on the literature, a questionnaire was developed in English and was divulged online, using surveymonkey.com. A seven-point quantitative scale was used to measure all the items, where 1 was 'strongly disagree', and 7 was 'strongly agree'.

### 3.2. Data collection

In September, 2014, a pilot survey was conducted with 30 answers in order to gauge the structure and content before deciding which would be the final items to analyse. The data from the pilot survey was included in the main survey and they revealed that there was no need to add modifications to the initial pilot survey. In October, 2014, the survey was shared through email, targeting individuals from 16 to 74 years' old, and a total of 548 answers were achieved, 365 of which were considered to be valid cases, i.e. complete answers, which represented an overall response rate of 66%.

The sample was taken solely from people residing in Portugal and is constituted of 365 individuals - 165 male (45%) and 200 female (55%). The average age is 29, the youngest respondent being 17, and the oldest 62. Despite the wide array of respondents in terms of age, the first quartile has a stronger concentration (from 17 to 27 years' old), representing 67% of the respondents. Regarding the maximum education level, we verify that 44% of the observations have a Masters' degree (or equivalent level), 36% have a Bachelors' degree (or equivalent level), and 12% have Upper Secondary Education level.

The results show that 82% of the sample has purchased online over the past 6 months, whereby the higher the education degree, the higher the percentage of respondents that made an e-purchase. Also noteworthy is the observation that women tend to be slightly more willing to purchase online, whereby 84% of them have made a purchase over the internet during the past 6 months, against 81% of men, although, on one hand, women may be more concerned about online issues, such as trust, security and confidentiality (Kolsaker & Payne, 2002) and yet, on the other hand, women usually emphasized communication and functionality more than men do (Murphy & Tocher, 2011).

## 4. Data analysis and results

In this study, a two-step method was used to test the model: firstly the measurement model, and secondly the structural model. The partial least squares (PLS) method was used, which is a structural equation model (SEM) technique. It tests and estimates causal relations, using a combination of statistical data and qualitative assumptions. More precisely, PLS is a variance-based technique (the other family of techniques is co-variance-based). PLS was considered the most appropriated method for this study, due to: the early stage of theoretical development; to the path model in question, which has never been tested before, and; simultaneously, it is considered to be a

high complex research model. This method aims to statistically test and estimate causal relations, using a combination of statistical data and qualitative causal assumptions (Henseler, Ringle, & Sinkovics, 2009). The software used for applying the method was PLS Smart 2.0 Software (C. M. Ringle, Wende, & Will, 2005).

#### 4.1. Measurement model

Table 2 shows the loadings, composite reliability, alpha and average variance extracted for all the measured items. As PLS prioritizes indicators due to their individual reliability, it was necessary to measure internal consistency by verifying whether all the constructs are above 0.7, in Cronbach's alpha (CA) - based on each indicator inter-correlation (assuming that all are equally reliable); and on composite reliability (CR) - based on the quantification of internal consistency and reliability of each construct (assuming that the indicators have different loadings). For indicator reliability, it is important that factor loadings are statistically significant, and greater than 0.7. Here, all items were retained, except for item I1, which was eliminated due to its low loading. In order for latent variables to be able to explain more than half of the indicators, it is important that average variance extracted (AVE) should be above 0.5, thus guaranteeing convergent validity (Table 2).

For discriminant validity, we verified that all loadings (in bold) had higher values than their cross loadings (see Appendix B). This is an important criterion for accessing discriminant validity. The other criterion was that the square root of AVE needs to be greater than the correlations between the constructs, which can be seen in Table 3 (Henseler, et al., 2009). The unique exceptions, as expected, are for second order constructs, which are in Table 3, highlighted in grey. We can conclude that the instrument present discriminant validity.

**Table 2**

Factor loading, composite reliabilities, cronbach alpha and average variance extracted (n=365)

| Constructs                              | Loadings     | CR    | CA    | AVE   | Constructs            | Loadings     | CR    | CA    | AVE   |
|---|--------------|-------|-------|-------|-----------------------|--------------|-------|-------|-------|
| Trust Stance                            |              | 0.923 | 0.874 | 0.799 | Customer Satisfaction |              | 0.976 | 0.963 | 0.932 |
| TS1                                     | <b>0.900</b> |       |       |       | CS1                   | <b>0.964</b> |       |       |       |
| TS2                                     | <b>0.903</b> |       |       |       | CS2                   | <b>0.968</b> |       |       |       |
| TS3                                     | <b>0.878</b> |       |       |       | CS3                   | <b>0.964</b> |       |       |       |
| Attitude Toward Online Shopping         |              | 0.968 | 0.956 | 0.884 | Competence            |              | 0.966 | 0.930 | 0.935 |
| ATOS1                                   | <b>0.929</b> |       |       |       | C1                    | <b>0.967</b> |       |       |       |
| ATOS2                                   | <b>0.909</b> |       |       |       | C2                    | <b>0.967</b> |       |       |       |
| ATOS3                                   | <b>0.968</b> |       |       |       | Integrity             |              | 0.963 | 0.953 | 0.811 |
| ATOS4                                   | <b>0.953</b> |       |       |       | I2                    | <b>0.928</b> |       |       |       |
| Reputation                              |              | 0.901 | 0.835 | 0.752 | I3                    | <b>0.935</b> |       |       |       |
| Rep1                                    | <b>0.842</b> |       |       |       | I4                    | <b>0.854</b> |       |       |       |
| Rep2                                    | <b>0.896</b> |       |       |       | I5                    | <b>0.943</b> |       |       |       |
| Rep3                                    | <b>0.862</b> |       |       |       | I6                    | <b>0.898</b> |       |       |       |
| Brand Recognition                       |              | 0.923 | 0.875 | 0.800 | I7                    | <b>0.840</b> |       |       |       |
| BR1                                     | <b>0.907</b> |       |       |       | Benevolence           |              | 0.915 | 0.814 | 0.843 |
| BR2                                     | <b>0.904</b> |       |       |       | B1                    | <b>0.914</b> |       |       |       |
| BR3                                     | <b>0.872</b> |       |       |       | B2                    | <b>0.923</b> |       |       |       |
| Likability                              |              | 0.968 | 0.961 | 0.812 | Overall Trust         |              | 0.950 | 0.928 | 0.825 |
| L1                                      | <b>0.904</b> |       |       |       | OT1                   | <b>0.885</b> |       |       |       |
| L2                                      | <b>0.921</b> |       |       |       | OT2                   | <b>0.954</b> |       |       |       |
| L3                                      | <b>0.919</b> |       |       |       | OT3                   | <b>0.950</b> |       |       |       |
| L4                                      | <b>0.935</b> |       |       |       | OT4                   | <b>0.839</b> |       |       |       |
| L5                                      | <b>0.914</b> |       |       |       | Intention to Purchase |              | 0.899 | 0.863 | 0.642 |
| L6                                      | <b>0.911</b> |       |       |       | IP1                   | <b>0.857</b> |       |       |       |
| L7                                      | <b>0.797</b> |       |       |       | IP2                   | <b>0.862</b> |       |       |       |
| Lack of integrity, Privacy and Security |              | 0.931 | 0.913 | 0.694 | IP3                   | <b>0.754</b> |       |       |       |
| LIPS1                                   | <b>0.843</b> |       |       |       | IP4                   | <b>0.747</b> |       |       |       |
| LIPS2                                   | <b>0.886</b> |       |       |       | IP5                   | <b>0.779</b> |       |       |       |
| LIPS3                                   | <b>0.840</b> |       |       |       |                       |              |       |       |       |
| LIPS4                                   | <b>0.830</b> |       |       |       |                       |              |       |       |       |
| LIPS5                                   | <b>0.833</b> |       |       |       |                       |              |       |       |       |
| LIPS6                                   | <b>0.763</b> |       |       |       |                       |              |       |       |       |
| Service Quality                         |              | 0.940 | 0.915 | 0.797 |                       |              |       |       |       |
| SQ1                                     | <b>0.863</b> |       |       |       |                       |              |       |       |       |
| SQ2                                     | <b>0.916</b> |       |       |       |                       |              |       |       |       |
| SQ3                                     | <b>0.897</b> |       |       |       |                       |              |       |       |       |
| SQ4                                     | <b>0.895</b> |       |       |       |                       |              |       |       |       |

**Note:** Trust stance (TS); Attitude towards online shopping (ATOS); Consumer characteristics (CC); Reputation (REP), Brand recognition (BR); Firm Characteristics (FC); Likability (L); Lack of integrity, privacy and security (LIPS); Service quality (SQ); Customer satisfaction (CS); Interactions (INT); Competence (C); Integrity (I); Benevolence (B); Overall trust (OT); Intention to purchase (IP).

**Table 3**

Descriptive statistics, square root of AVE, and correlations between constructs

|      | Mean  | SD    | TS           | ATOS         | CC           | REP          | BR           | FC           | L            | LIPS         | SQ           | CS           | INT          | C            | I            | B            | OT           | IP           |
|------|-------|-------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| TS   | 5.320 | 1.177 | <b>0.894</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| ATOS | 5.477 | 1.297 | 0.606        | <b>0.940</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |              |
| CC   | 5.415 | 1.125 | 0.860        | 0.927        | <b>0.829</b> |              |              |              |              |              |              |              |              |              |              |              |              |              |
| REP  | 5.453 | 1.113 | 0.595        | 0.501        | 0.603        | <b>0.867</b> |              |              |              |              |              |              |              |              |              |              |              |              |
| BR   | 5.470 | 1.090 | 0.690        | 0.599        | 0.710        | 0.747        | <b>0.894</b> |              |              |              |              |              |              |              |              |              |              |              |
| FC   | 5.463 | 1.028 | 0.691        | 0.592        | 0.706        | 0.926        | 0.943        | <b>0.823</b> |              |              |              |              |              |              |              |              |              |              |
| L    | 5.526 | 1.078 | 0.691        | 0.503        | 0.649        | 0.555        | 0.679        | 0.664        | <b>0.901</b> |              |              |              |              |              |              |              |              |              |
| LIPS | 4.511 | 1.396 | -0.130       | -0.09        | -0.119       | -0.071       | -0.063       | -0.071       | -0.078       | <b>0.833</b> |              |              |              |              |              |              |              |              |
| SQ   | 5.432 | 1.093 | 0.654        | 0.57         | 0.675        | 0.592        | 0.722        | 0.707        | 0.706        | -0.047       | <b>0.893</b> |              |              |              |              |              |              |              |
| CS   | 5.722 | 1.196 | 0.677        | 0.582        | 0.693        | 0.649        | 0.799        | 0.780        | 0.727        | -0.057       | 0.834        | <b>0.965</b> |              |              |              |              |              |              |
| INT  | 5.560 | 1.091 | 0.695        | 0.601        | 0.714        | 0.647        | 0.793        | 0.775        | 0.748        | -0.054       | 0.961        | 0.954        | <b>0.885</b> |              |              |              |              |              |
| C    | 5.885 | 1.194 | 0.695        | 0.598        | 0.711        | 0.634        | 0.708        | 0.721        | 0.587        | -0.129       | 0.619        | 0.717        | 0.696        | <b>0.967</b> |              |              |              |              |
| I    | 5.546 | 1.145 | 0.692        | 0.572        | 0.694        | 0.639        | 0.762        | 0.753        | 0.665        | -0.139       | 0.654        | 0.755        | 0.734        | 0.763        | <b>0.918</b> |              |              |              |
| B    | 4.978 | 1.274 | 0.588        | 0.410        | 0.540        | 0.558        | 0.602        | 0.622        | 0.583        | -0.087       | 0.564        | 0.603        | 0.608        | 0.521        | 0.690        | <b>0.901</b> |              |              |
| OT   | 5.602 | 1.163 | 0.693        | 0.576        | 0.696        | 0.630        | 0.713        | 0.722        | 0.647        | -0.125       | 0.651        | 0.731        | 0.720        | 0.815        | 0.793        | 0.620        | <b>0.908</b> |              |
| IP   | 5.268 | 1.213 | 0.651        | 0.555        | 0.663        | 0.560        | 0.623        | 0.635        | 0.591        | -0.112       | 0.601        | 0.630        | 0.643        | 0.711        | 0.707        | 0.572        | 0.759        | <b>0.801</b> |

**Notes:** Standard deviation (SD); Trust stance (TS); Attitude towards online shopping (ATOS); Consumer characteristics (CC); Reputation (REP), Brand recognition (BR); Firm Characteristics (FC); Likability (L); Lack of integrity, privacy and security (LIPS); Service quality (SQ); Customer satisfaction (CS); Interactions (INT); Competence (C); Integrity (I); Benevolence (B); Overall trust (OT); Intention to purchase (IP).



As the results indicate, the measure model verifies all of these requisites, which can be confirmed in Tables 2 and 3. It is now possible to state that the measure model has good internal consistency, indicator reliability, convergent validity and discriminant validity, and that all the constructs are usable to test the structural model, as they are all statistically distinct.

#### 4.2. Structural model

A bootstrapping with 5,000 resamples was used to estimate the path significance levels, based on t-statistic values to test the research model, and the results are presented in Table 4. The research model explains 61.8% of variation in competence. The hypotheses of consumers characteristics ( $\hat{\beta} = 0.328$ ;  $p < 0.01$ ), firm characteristics ( $\hat{\beta} = 0.326$ ;  $p < 0.01$ ), lack of Integrity, privacy and security ( $\hat{\beta} = -0.056$ ;  $p < 0.10$ ), and interactions ( $\hat{\beta} = 0.207$ ;  $p < 0.05$ ) are all statistically significant for explaining competence. Thus hypotheses H1a, H2a, H4a, and H5a are supported. Only hypothesis H3a, i.e. likability ( $\hat{\beta} = -0.001$ ;  $p > 0.10$ ), is not supported for explaining competence.

66.0% of variation in integrity is explained in the research model. The hypotheses of consumers characteristics ( $\hat{\beta} = 0.192$ ;  $p < 0.01$ ), firm characteristics ( $\hat{\beta} = 0.354$ ;  $p < 0.01$ ), likability ( $\hat{\beta} = 0.140$ ;  $p < 0.05$ ), lack of integrity, privacy and security ( $\hat{\beta} = -0.068$ ;  $p < 0.05$ ), and interactions ( $\hat{\beta} = 0.214$ ;  $p < 0.01$ ) are all statistically significant to explain competence. Consequently all the hypotheses H1b, H2b, H3b, H4b, and H5b are supported for explaining integrity.

This research model explains 45.2% of variation in benevolence. The hypotheses of firm characteristics ( $\hat{\beta} = 0.304$ ;  $p < 0.01$ ), likability ( $\hat{\beta} = 0.213$ ;  $p > 0.05$ ) and interactions ( $\hat{\beta} = 0.165$ ;  $p < 0.1$ ) are statistically significant for explaining competence. Hypotheses H2c, H3c and H5b are also supported. However, both hypothesis H1c and H4c, i.e. consumer characteristics (0.066;  $p > 0.10$ ) and lack of integrity, privacy and security ( $\hat{\beta} = -0.032$ ;  $p > 0.10$ ), are not supported to explain benevolence.

74.5% of variation in overall trust is explained in this research model. The hypotheses of competence ( $\hat{\beta} = 0.504$ ;  $p < 0.01$ ), integrity ( $\hat{\beta} = 0.308$ ;  $p < 0.01$ ) and benevolence ( $\hat{\beta} = 0.145$ ;  $p < 0.01$ ) are statistically significant for explaining overall trust, whereas H6a, H6b, H6c are supported, which is a satisfactory result, as it means that competence, integrity and benevolence of a vendor explain almost 3/4 of consumer trust.

Finally, the model explains 57.5% of variance in intention to purchase. The hypothesis of overall trust ( $\hat{\beta} = 0.759$ ;  $p < 0.01$ ) is statistically significant for explaining intention to purchase, and thus H7 is also supported.

This means that out of a total of 19 hypotheses presented in the model, 16 hypotheses are supported, and only 3 are not, yielding a 84% acceptance rate.

**Table 4**Parameters estimates, Hypotheses, Beta values, T-Values and R<sup>2</sup>

| Independent constructs                                      | Hypothesis (supported)        | Beta        | T-Statistics        | R <sup>2</sup>       |
|---|-------------------------------|-------------|---------------------|----------------------|
| <b>Competence</b>   |                               |             |                     | <b>61.8%</b>         |
| Consumers Characteristics                                   | H1a(√)                        | 0.328       | 5.660***            |                      |
| Firm Characteristics  | H2a(√)                        | 0.326       | 5.874***            |                      |
| Likability  | H3a(X)                        | -0.001      | 0.012               |                      |
| Lack of Integrity, Privacy and Security                     | H4a(√)                        | -0.056      | 1.790*              |                      |
| Interactions  | H5a(√)                        | 0.207       | 2.313**             |                      |
| <b>Integrity</b>  |                               |             |                     | <b>66.0%</b>         |
| Consumers Characteristics                                   | H1b(√)                        | 0.192       | 3.519***            |                      |
| Firm Characteristics  | H2b(√)                        | 0.354       | 3.851***            |                      |
| Likability  | H3b(√)                        | 0.140       | 2.257**             |                      |
| Lack of Integrity, Privacy and Security                     | H4b(√)                        | -0.068      | 2.146**             |                      |
| Interactions  | H5b(√)                        | 0.214       | 2.779***            |                      |
| <b>Benevolence</b>  |                               |             |                     | <b>45.2%</b>         |
| Consumers Characteristics                                   | H1c(X)                        | 0.066       | 1.069               |                      |
| Firm Characteristics  | H2c(√)                        | 0.304       | 3.851***            |                      |
| Likability  | H3c(√)                        | 0.213       | 2.657**             |                      |
| Lack of Integrity, Privacy and Security                     | H4c(X)                        | -0.032      | 0.696               |                      |
| Interactions  | H5c(√)                        | 0.165       | 1.781*              |                      |
| <b>Overall Trust</b>  |                               |             |                     | <b>74.5%</b>         |
| Competence  | H6a(√)                        | 0.504       | 8.227***            |                      |
| Integrity   | H6b(√)                        | 0.308       | 4.504***            |                      |
| Benevolence   | H6c(√)                        | 0.145       | 3.398***            |                      |
| <b>Intention to Purchase</b>                                |                               |             |                     | <b>57.5%</b>         |
| Overall Trust   | H7(√)                         | 0.759       | 19.847***           |                      |
| <b>Second order constructs (reflective-reflective type)</b> | <b>First order constructs</b> | <b>Beta</b> | <b>T-Statistics</b> | <b>R<sup>2</sup></b> |
| Consumer Characteristics                                    | Trust Stance                  | 0.860       | 51.937***           | 74.0%                |
|   | ATOS                          | 0.927       | 96.316***           | 85.9%                |
| Firm Characteristics  | Reputation                    | 0.926       | 76.233***           | 85.7%                |
|   | Brand Recognition             | 0.943       | 130.482***          | 88.9%                |
| Interactions  | Service quality               | 0.961       | 157.695***          | 92.3%                |
|   | Customer Satisfaction         | 0.954       | 183.212***          | 91.1%                |

Note: \* p<10; \*\*p<0.05; \*\*\* p<0.01

Relative to the second order constructs, the findings were that consumer characteristics is statistically significant for explaining 74% of variance in trust stance (0.860; p<0.01), and 85.9% of variation in attitude towards online shopping (0.927; p<0.01); firm characteristics is statistically significant for explaining 85.7% of variance in reputation (0.926; p<0.01) and 88.9% of variance in brand recognition (0.943; p<0.01); and interactions is statistically significant to explain 92.3% of variance in service quality (0.961; p<0.01) and 91.1% of variance in customer satisfaction (0.954;

$p < 0.01$ ).

## 5. Discussion and Conclusions

### 5.1. Theoretical implications

The primary contribution and strength of this research lies on the path model, which combines the sources and dimensions of trust in order to explain overall trust on consumers' intention to purchase online.

Previous studies, such as those of Gefen (2000), identified that primarily people's disposition to trust affects their trust in the vendor. Mcknight et al. (2002), postulate that structural assurance, perceived web vendor reputation and website quality are all powerful levers that vendors can use to build consumer trust. A study on the effect of trust and risk in consumers' electronic commerce purchasing decisions by Kim et al. (2008) found that consumer disposition to trust, reputation, privacy concerns, security concerns, information quality of the website and company reputation all have strong effect on consumers' trust in the website. At the same time, Chang (2008) measured the importance of web site brand, and website quality on influencing purchase intention. Lately, in their research, Crespo & Bosque (2010) conclude that attitude towards e-commerce, subjective norm and perceived risk are the main factors that affect the decision to purchase from electronic retailers, thus confirming that greater usability and website satisfaction increases consumers' trust and loyalty (Flavián, et al., 2006), and that website quality and third party institutions improve consumers' trust (Jones & Leonard, 2008).

Consistent with the above referenced studies, our results show that consumer characteristics is explained by trust stance in 74.0% of cases, and attitude towards online shopping in 85.9% (Flavián, et al., 2006; Palvia, 2009). Firm characteristics is explained by reputation in 85.7% of cases (Teo & Liu, 2005), and by brand recognition in 88.9% (Nguyen & Leblanc, 2001). Website infrastructure is formed by likability (Flavián, et al., 2006) and lack of integrity, privacy and security (McKnight, et al., 2002). Interactions is explained by service quality (92.3%), and consumer satisfaction (91.1%) (Palvia, 2009). As expected, the sources of trust ( $H1_{a,b}$ ,  $H2_{a,b,c}$ ,  $H3_{b,c}$ ,  $H4_{a,b}$  and  $H5_{a,b,c}$ ) explain the dimensions of consumer trust in competence in 61.8% of cases, integrity in 66.0% and benevolence in 45.2%. Interestingly, in the literature review there are no indications that consumer characteristics and lack of integrity, privacy and security, influenced benevolence ( $H1_c$  and  $H4_c$ ). In addition, there are also no indications that likability influences competence ( $H3_a$ ). Theoretically, our results suggest that overall trust is explained in 74.5% of cases by competence, benevolence and integrity ( $H6_{a,b,c}$ ). The overall trust explains 57.5% of online purchase intention ( $H7$ ) according to

Palvia (2009), whose previous study concluded that firms need to develop and nurture consumer trust by addressing its specific components (competence, benevolence and integrity), in order that the customers engage in a transaction and create long-term relationships. Table 5 summarizes the results demonstrated above in this section, with a hypotheses conclusion analyses:

**Table 5**  
Hypotheses conclusions

| Hypotheses | Independent Variables                | Dependent Variables | Findings  | Conclusion    |
|------------|--------------------------------------|---------------------|---|---------------|
| H1a        | Consumer Characteristics             | Competence          | Positive and statistically significant ( $\hat{\beta}=0,328$ ; $\rho<0,001$ ) | Supported     |
| H1b        |                                      | Integrity           | Positive and statistically significant ( $\hat{\beta}=0,192$ ; $\rho<0,001$ ) | Supported     |
| H1c        |                                      | Benevolence         | Non-significant effect ( $\hat{\beta}=0,066$ ; $\rho>0,1$ )                   | Not Supported |
| H2a        | Firm Characteristics                 | Competence          | Positive and statistically significant ( $\hat{\beta}=0,326$ ; $\rho<0,001$ ) | Supported     |
| H2b        |                                      | Integrity           | Positive and statistically significant ( $\hat{\beta}=0,354$ ; $\rho<0,001$ ) | Supported     |
| H2c        |                                      | Benevolence         | Positive and statistically significant ( $\hat{\beta}=0,304$ ; $\rho<0,001$ ) | Supported     |
| H3a        | Likability                           | Competence          | Non-significant effect ( $\hat{\beta}=-0,001$ ; $\rho>0,1$ )                  | Not Supported |
| H3b        |                                      | Integrity           | Positive and statistically significant ( $\hat{\beta}=0,140$ ; $\rho<0,05$ )  | Supported     |
| H3c        |                                      | Benevolence         | Positive and statistically significant ( $\hat{\beta}=0,213$ ; $\rho<0,05$ )  | Supported     |
| H4a        | Lack of Integrity Privacy, Security, | Competence          | Negative and statistically significant ( $\hat{\beta}=-0,056$ ; $\rho<0,1$ )  | Supported     |
| H4b        |                                      | Integrity           | Negative and statistically significant ( $\hat{\beta}=-0,068$ ; $\rho<0,05$ ) | Supported     |
| H4c        |                                      | Benevolence         | Non-significant effect ( $\hat{\beta}=-0,032$ ; $\rho>0,1$ )                  | Not Supported |
| H5a        | Interactions                         | Competence          | Positive and statistically significant ( $\hat{\beta}=0,207$ ; $\rho<0,05$ )  | Supported     |
| H5b        |                                      | Integrity           | Positive and statistically significant ( $\hat{\beta}=0,214$ ; $\rho<0,001$ ) | Supported     |
| H5c        |                                      | Benevolence         | Positive and statistically significant ( $\hat{\beta}=0,165$ ; $\rho<0,1$ )   | Supported     |
| H6a        | Competence                           | Overall Trust       | Positive and statistically significant ( $\hat{\beta}=0,504$ ; $\rho<0,001$ ) | Supported     |
| H6b        | Integrity                            |                     | Positive and statistically significant ( $\hat{\beta}=0,308$ ; $\rho<0,001$ ) | Supported     |
| H6c        | Benevolence                          |                     | Positive and statistically significant ( $\hat{\beta}=0,145$ ; $\rho<0,001$ ) | Supported     |
| H7         | Overall Trust                        | Purchase Intention  | Positive and statistically significant ( $\hat{\beta}=0,759$ ; $\rho<0,001$ ) | Supported     |

An important contribution is the hierarchical component model. The hierarchical component model is a reflective-reflective type (Christian M Ringle, Sarstedt, & Straub, 2012) with the following second order constructs: consumer characteristics, firms characteristics, and interaction. That reveals important to explain the three dimensions of consumer trust.

Additionally, we test the mediator effect of overall trust. In doing so we follow the guidelines of Preacher & Hayes (2008), Hair et al. (2014), and Nitzl et al. (2016). In case of mediator variables, it is necessary that direct and indirect effects are statistically significant. After these two criteria were met we could compute the variance accounted for (VAF) (Hair Jr, et al., 2014). Based on the findings reported in Table 6 we can conclude that the overall trust (OT) is a partial mediator of: competence on intention to purchase (IP), integrity on IP, and benevolence on IP.

**Table 6**

Mediation approach

| Effect of             | Direct effect (t-value) | Indirect effect (t-value) | Total effect (t-value) | VAF (%) | Conclusions       |
|-----------------------|-------------------------|---------------------------|------------------------|---------|-------------------|
| Competence → OT → IP  | 0.214***                | 0.196***                  | 0.410***               | 47.8%   | Partial mediation |
| Integrity → OT → IP   | 0.158**                 | 0.119***                  | 0.277***               | 43.0%   | Partial mediation |
| Benevolence → OT → IP | 0.111**                 | 0.057***                  | 0.168***               | 33.9%   | Partial mediation |

Notes: Overall trust (OT); intention to purchase (IP); \*\*\*p<0.01; \*\*p<0.05; \*p<0.10; VAF=variance accounted for; VAF < 20% → indicates no mediation; 20% ≤ VAF ≤ 80% → partial mediation; VAF > 80% → full mediation.

## 5.2. Managerial contributions

As transactions through the internet develop and mature, success will be largely dependent on gaining and maintaining trust (Roy, et al., 2001). This depends, on one hand, on the comfort that consumers feel when buying and seeking products from the Internet vendors, on receiving free products and information by the vendors, and on the other hand, on providing information to the vendor in order to develop a valuable relationship. The overall trust that a consumer has on an Internet vendor depends on the trustworthiness of the vendors, if they are reliable and consumers like to trust them, and this will significantly influence their intention to purchase online. In order to increase the overall trust of the consumers in their business, Internet vendors should relate to the consumers' perceived competence, integrity and benevolence. Firstly, perceived competence is achieved when the consumer believes that the online vendor has the ability to handle sales transactions, which has been gained from expertise in doing business. Secondly, perceived integrity is when the consumer believes that the Internet vendor is honest and acts sincerely, without overcharging during sales transactions and keeps to their commitments, and is genuine. Lastly, perceived benevolence happens when the consumer believes that the Internet vendor acts in their best interest, and, in case of need, the vendor would do their best to help.

Therefore, in order to improve this image and to then increase online sales performance, Internet vendors should be aware that, although nowadays consumers are becoming more receptive towards online shopping than they were before, it is important that the consumer enjoys visiting the website in order to develop a trust stance. It is also positive if the consumer likes the idea of using the Internet to purchase. Having a good reputation in the market, by being honest and consumer-oriented, helps create a good image in the consumers' eyes, who need to believe that the Internet vendor will always fulfil their promises. This might result in the consumer encouraging their friends and relatives to do business with these Internet vendors. A website infrastructure that is easy to understand and locate information when used for the first time could improve internet vendors' performance (Janda, Trocchia, & Gwinner, 2002), i.e. it is structured and organized in such a way that gives consumers the feeling that they are in control while navigating the website, along with the notion that it is safe to provide personal information, such as credit card details, thus facilitating the process of buying online and excluding the usual hesitation of consumers. Additionally, some consumer characteristics must be taken into account. For example, male users might be best targeted with more attractive visual elements and summary content, whereas female users could be targeted by verbal advertisements and text-heavy content, due to their tendency so seek information (Shaouf, Lü, & Li, 2016). It is similarly essential to increase the interactions with a quality service in which consumers can find significant value on shopping from a certain Internet vendor website, one recurrent approach to increasing the interactions is offering prizes or other incentives to encourage them to have a more interactive relationship with their website (J. Chen, Teng, Yu, & Yu, 2016).

Finally, consumers can have a worthwhile experience, with reduced effort if the steps that are required between the selection of goods and making payment are minimized (Law & Ng, 2016), where the time spent feels reasonable whilst, simultaneously, it is vital to guarantee that customers are satisfied with the vendor, by feeling pleased that they did the right thing in making purchases from them.

### 5.3. Limitations and further research

During the study the limitations found were mainly concerned with the constructs that we wanted to measure, because, although the amount of literature related with trust, e-commerce and purchase intention is vast, empirical data combining these three subjects were not easy to come by. Furthermore, whereas there was a suggestion in the survey for the respondents to consider only one Internet vendor when answering the questionnaire, this self-selection of the website could influence the results. This could originate from the fact that we do not know whether the answers would differ

if the answers were limited to only one industry sector (such as internet banking, travelling agencies or supermarkets, for example), neither whether the study considered the effect of companies' size or business strategies

With regards to further research, the outcome of this study can be applied to further specific researches which focus on different natures, such as geographical regions, certain products or services and industries or markets, by adapting the path model in order that the demographic characteristics of the consumers would count in the results. This study can also be used to carry out empirical research in specific fields, such as, for example, the role of brands (Carlson & O'Cass, 2011) or multi-channel distribution (Agatz, Fleischmann, & Nunen, 2008). Further research can also consider the classification of the service, or the product (S. Lee & Park, 2009), or the different e-shoppers' typologies (Jaishankar Ganesh, 2010).

Consumer characteristics, firms characteristics, and interaction that was modelled as the hierarchical component model, i.e. the reflective-reflective type of second order constructs were proposed and tested for reliability and validity of the scales. Consequently, these constructs can be used for further research.

#### **5.4. Conclusion**

E-commerce and trust fields are both very rich in terms of literature, which is increasing by the day, mainly at an independent level, and in very specific factor analyses. However, studying these two fields together whilst considering all the dimensions and sources of consumer trust, has received limited interest, which represents an opportunity for improvement. This study formulates and empirically tests a path model to explain how consumers' overall trust influences their online purchase intention. Based on a sample of 365 individuals from Portugal, the path model proposed is substantial in explanatory power and is robust under several circumstances. The results from the research suggest that consumer characteristics (trust stance and attitude towards online shopping), firm characteristics (reputation and brand recognition), lack of integrity, privacy and security and likability (website infrastructure), and interactions (service quality and customer satisfaction), are the major sources of trust that influence the three dimensions of consumer trust, namely: competence, integrity and benevolence; which explains that overall trust has a direct effect on intention to purchase online.

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## APPENDIX A - Table with constructs

| Constructs                                     | Description  | Items | Source                   |
|--|--|-------|--------------------------|
| Trust Stance (TS)                              | I like to use the web site of this online vendor.  | TS1   | (Palvia, 2009)           |
|  | I like the layout of the web site of this online vendor.   | TS2   |                          |
|  | I like to visit the web site of this online vendor.  | TS3   |                          |
| Attitude Toward Online Shopping (ATOS)         | I like the idea of (...using the Internet to purchase in the next 6 months...)                           | ATOS1 | (Crespo & Bosque, 2010)  |
|  | (Using the Internet to purchase in the next 6 months...) is a wise idea                                  | ATOS2 |                          |
|  | (Using the Internet to purchase in the next 6 months...) is a good idea                                  | ATOS3 |                          |
|  | (Using the Internet to purchase in the next 6 months...) is a positive idea                              | ATOS4 |                          |
| Reputation (REP)                               | Has a good reputation in the market  | REP1  | (Teo & Liu, 2005)        |
|  | Has a reputation for being honest  | REP2  |                          |
|  | Has a reputation for being consumer-oriented   | REP3  |                          |
| Brand Recognition (BR)                         | In my opinion, ABC has a good image in the minds of consumers.   | BR1   | (Nguyen & Leblanc, 2001) |
|  | In general, I believe that ABC always fulfills the promises that it makes to its customers.              | BR2   |                          |
|  | I would encourage friends and relatives to do business with ABC  | BR3   |                          |
| Likability (L)                                 | In this website everything is easy to understand   | L1    | (Flavián, et al., 2006)  |
|  | This website is simple to use, even when using it for the first time                                     | L2    |                          |
|  | It is easy to find the information I need from this website  | L3    |                          |
|  | The structure and contents of this website are easy to understand  | L4    |                          |
|  | It is easy to move within this website   | L5    |                          |
|  | The organization of the contents of this site makes it easy for me to know where I am when navigating it | L6    |                          |
|  | When I am navigating this site, I feel that I am in control of what I can do                             | L7    |                          |
| Lack of Integrity, Privacy and Security (LIPS) | Entering credit card information over the Web is unsafe  | LIPS1 | (McKnight, et al., 2002) |
|  | I think it is risky to provide one's credit card information to web-based vendors                        | LIPS2 |                          |
|  | I hesitate to enter my credit card information on the web  | LIPS3 |                          |
|  | Entering personal information over the web is unsafe   | LIPS4 |                          |
|  | I think it is risky to provide one's social security number to web-based vendors                         | LIPS5 |                          |
|  | I would hesitate to enter personal information like my name, address and phone number on the web         | LIPS6 |                          |
| Service Quality                                | The time I spend in order to shop at this online vendor's site is highly reasonable.                     | SQ1   | (Palvia, 2009)           |
|  | The effort involved in shopping at this online vendor's site is worthwhile.                              | SQ2   |                          |
|  | The shopping experience at this online vendor's site is excellent.                                       | SQ3   |                          |
|  | I found significant value by shopping at this online vendor's site.                                      | SQ4   |                          |
| Customer Satisfaction (CS)                     | Overall, I am satisfied with this online vendor.   | CS1   | (Palvia, 2009)           |
|  | I did the right thing when I decided to use this online vendor.  | CS2   |                          |
|  | I am very pleased with making purchases from this online vendor.   | CS3   |                          |
| Competence (C)                                 | I believe this online vendor has the ability to handle sales transactions on the Internet.               | C1    | (Palvia, 2009)           |
|  | I believe this online vendor has sufficient expertise to do business on the Internet.                    | C2    |                          |
| Integrity (I)                                  | I believe this online vendor will not charge more for Internet shopping.                                 | I1*   | (Palvia, 2009)           |
|  | I believe this online vendor is honest to its customers.   | I2    |                          |
|  | I believe this online vendor acts sincerely in dealing with customers.                                   | I3    |                          |
|  | I believe this online vendor will not overcharge me during sales transactions.                           | I4    |                          |
|  | I believe this online vendor is truthful in its dealings with me.  | I5    |                          |
|  | I believe this online vendor would keep its commitments.   | I6    |                          |
|  | I believe this online vendor is genuine.   | I7    |                          |
| Benevolence (B)                                | I believe this online vendor would act in my best interest.  | B1    | (Palvia, 2009)           |
|  | If I required help, I believe this online vendor would do its best to help me.                           | B2    |                          |

| Constructs                 | Description  | Items | Source         |
|----------------------------|--|-------|----------------|
| Overall Trust (OT)         | I like to trust this online vendor.  | OT1   | (Palvia, 2009) |
|                            | I find this online vendor trustworthy.   | OT2   |                |
|                            | I like the reliability of this online vendor.  | OT3   |                |
|                            | I value the trustworthy characteristics of this online vendor.   | OT4   |                |
| Intention to Purchase (IP) | I would feel comfortable buying products from this online vendor.  | IP1   | (Palvia, 2009) |
|                            | I would feel comfortable seeking product/service information from this online vendor.                        | IP2   |                |
|                            | I would feel comfortable receiving free product/service information from this online vendor.                 | IP3   |                |
|                            | I would feel comfortable providing information to this online vendor in order to receive customized service. | IP4   |                |
|                            | I would feel comfortable developing a valuable relationship with this online vendor.                         | IP5   |                |

**Note:** \* I1 was excluded due to low loadings.

## APPENDIX B – Table with loadings and cross loadings

**Table**  
Cross loadings

| Items | TS           | ATOS         | CC           | Rep          | BR           | FR           | L            | LIPS         | SQ           | CS           | INT          | C            | I      | B      | OT     | IT     |
|-------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------|--------|--------|--------|
| TS1   | <b>0.900</b> | 0.611        | <b>0.817</b> | 0.596        | 0.650        | 0.669        | 0.654        | -0.167       | 0.670        | 0.685        | 0.707        | 0.689        | 0.676  | 0.571  | 0.679  | 0.624  |
| TS2   | <b>0.903</b> | 0.502        | <b>0.748</b> | 0.497        | 0.607        | 0.595        | 0.641        | -0.100       | 0.541        | 0.569        | 0.579        | 0.595        | 0.627  | 0.519  | 0.581  | 0.569  |
| TS3   | <b>0.878</b> | 0.505        | <b>0.736</b> | 0.497        | 0.590        | 0.585        | 0.556        | -0.076       | 0.535        | 0.552        | 0.567        | 0.572        | 0.547  | 0.481  | 0.592  | 0.549  |
| ATOS1 | 0.571        | <b>0.929</b> | <b>0.865</b> | 0.501        | 0.583        | 0.583        | 0.491        | -0.123       | 0.566        | 0.569        | 0.593        | 0.594        | 0.557  | 0.387  | 0.584  | 0.554  |
| ATOS2 | 0.532        | <b>0.909</b> | <b>0.834</b> | 0.422        | 0.511        | 0.502        | 0.443        | -0.088       | 0.483        | 0.507        | 0.516        | 0.517        | 0.514  | 0.374  | 0.491  | 0.470  |
| ATOS3 | 0.593        | <b>0.968</b> | <b>0.900</b> | 0.492        | 0.589        | 0.582        | 0.489        | -0.075       | 0.556        | 0.566        | 0.586        | 0.573        | 0.547  | 0.404  | 0.552  | 0.535  |
| ATOS4 | 0.581        | <b>0.953</b> | <b>0.885</b> | 0.469        | 0.567        | 0.558        | 0.469        | -0.053       | 0.537        | 0.545        | 0.564        | 0.561        | 0.533  | 0.377  | 0.536  | 0.527  |
| Rep1  | 0.577        | 0.476        | 0.578        | <b>0.842</b> | 0.641        | <b>0.787</b> | 0.476        | -0.072       | 0.476        | 0.569        | 0.544        | 0.619        | 0.543  | 0.384  | 0.577  | 0.540  |
| Rep2  | 0.480        | 0.408        | 0.488        | <b>0.896</b> | 0.658        | <b>0.823</b> | 0.482        | -0.071       | 0.498        | 0.549        | 0.546        | 0.508        | 0.566  | 0.547  | 0.522  | 0.446  |
| Rep3  | 0.494        | 0.422        | 0.504        | <b>0.862</b> | 0.644        | <b>0.799</b> | 0.486        | -0.042       | 0.566        | 0.571        | 0.594        | 0.526        | 0.554  | 0.518  | 0.543  | 0.473  |
| BR1   | 0.634        | 0.545        | 0.649        | 0.739        | <b>0.907</b> | <b>0.885</b> | 0.667        | -0.078       | 0.647        | 0.712        | 0.708        | 0.650        | 0.691  | 0.547  | 0.665  | 0.578  |
| BR2   | 0.571        | 0.510        | 0.596        | 0.666        | <b>0.904</b> | <b>0.847</b> | 0.558        | -0.032       | 0.633        | 0.684        | 0.687        | 0.614        | 0.669  | 0.536  | 0.591  | 0.515  |
| BR3   | 0.649        | 0.553        | 0.661        | 0.592        | <b>0.872</b> | <b>0.794</b> | 0.595        | -0.057       | 0.659        | 0.753        | 0.735        | 0.636        | 0.684  | 0.533  | 0.657  | 0.579  |
| Lik1  | 0.622        | 0.430        | 0.569        | 0.470        | 0.564        | 0.556        | <b>0.904</b> | -0.049       | 0.646        | 0.644        | 0.674        | 0.503        | 0.572  | 0.487  | 0.554  | 0.519  |
| Lik2  | 0.621        | 0.438        | 0.574        | 0.473        | 0.586        | 0.571        | <b>0.921</b> | -0.087       | 0.620        | 0.634        | 0.655        | 0.506        | 0.587  | 0.522  | 0.569  | 0.527  |
| Lik3  | 0.649        | 0.467        | 0.606        | 0.522        | 0.630        | 0.619        | <b>0.919</b> | -0.052       | 0.649        | 0.667        | 0.687        | 0.537        | 0.612  | 0.533  | 0.603  | 0.529  |
| Lik4  | 0.622        | 0.475        | 0.598        | 0.505        | 0.643        | 0.619        | <b>0.935</b> | -0.093       | 0.655        | 0.670        | 0.692        | 0.536        | 0.618  | 0.549  | 0.596  | 0.516  |
| Lik5  | 0.599        | 0.474        | 0.586        | 0.478        | 0.635        | 0.601        | <b>0.914</b> | -0.074       | 0.641        | 0.657        | 0.678        | 0.556        | 0.588  | 0.507  | 0.583  | 0.520  |
| Lik6  | 0.650        | 0.464        | 0.604        | 0.536        | 0.629        | 0.627        | <b>0.911</b> | -0.052       | 0.653        | 0.693        | 0.702        | 0.568        | 0.629  | 0.540  | 0.602  | 0.555  |
| Lik7  | 0.593        | 0.423        | 0.551        | 0.511        | 0.588        | 0.590        | <b>0.797</b> | -0.083       | 0.584        | 0.612        | 0.624        | 0.493        | 0.583  | 0.536  | 0.568  | 0.561  |
| LIPS1 | -0.151       | -0.133       | -0.157       | -0.097       | -0.092       | -0.101       | -0.082       | <b>0.843</b> | -0.090       | -0.086       | -0.092       | -0.148       | -0.134 | -0.063 | -0.144 | -0.114 |
| LIPS2 | -0.126       | -0.069       | -0.104       | -0.078       | -0.083       | -0.086       | -0.041       | <b>0.886</b> | -0.037       | -0.029       | -0.035       | -0.117       | -0.130 | -0.061 | -0.104 | -0.081 |
| LIPS3 | -0.094       | -0.077       | -0.093       | -0.054       | -0.011       | -0.033       | -0.052       | <b>0.840</b> | -0.006       | -0.012       | -0.009       | -0.103       | -0.116 | -0.037 | -0.097 | -0.080 |
| LIPS4 | -0.053       | -0.028       | -0.044       | -0.049       | -0.021       | -0.036       | -0.042       | <b>0.830</b> | 0.003        | -0.031       | -0.014       | -0.061       | -0.046 | -0.035 | -0.087 | -0.098 |
| LIPS5 | -0.094       | -0.041       | -0.071       | -0.058       | -0.043       | -0.053       | -0.117       | <b>0.833</b> | -0.080       | -0.086       | -0.086       | -0.099       | -0.133 | -0.125 | -0.093 | -0.082 |
| LIPS6 | -0.094       | -0.073       | -0.091       | 0.000        | -0.034       | -0.019       | -0.026       | <b>0.763</b> | 0.024        | -0.015       | 0.005        | -0.086       | -0.091 | -0.088 | -0.084 | -0.108 |
| SQ1   | 0.520        | 0.457        | 0.539        | 0.465        | 0.563        | 0.553        | 0.567        | -0.053       | <b>0.863</b> | 0.659        | <b>0.797</b> | 0.491        | 0.512  | 0.405  | 0.503  | 0.465  |
| SQ2   | 0.626        | 0.551        | 0.649        | 0.542        | 0.682        | 0.660        | 0.653        | -0.036       | <b>0.916</b> | 0.789        | <b>0.893</b> | 0.610        | 0.634  | 0.502  | 0.633  | 0.577  |
| SQ3   | 0.592        | 0.487        | 0.592        | 0.567        | 0.651        | 0.654        | 0.681        | -0.045       | <b>0.897</b> | 0.752        | <b>0.864</b> | 0.535        | 0.609  | 0.577  | 0.586  | 0.542  |
| SQ4   | 0.594        | 0.536        | 0.624        | 0.536        | 0.676        | 0.654        | 0.617        | -0.036       | <b>0.895</b> | 0.773        | <b>0.873</b> | 0.569        | 0.576  | 0.522  | 0.595  | 0.558  |
| CS1   | 0.655        | 0.567        | 0.673        | 0.651        | 0.787        | 0.774        | 0.711        | -0.064       | 0.803        | <b>0.964</b> | <b>0.920</b> | 0.697        | 0.752  | 0.598  | 0.715  | 0.627  |
| CS2   | 0.649        | 0.570        | 0.672        | 0.610        | 0.774        | 0.746        | 0.697        | -0.056       | 0.795        | <b>0.968</b> | <b>0.917</b> | 0.701        | 0.714  | 0.561  | 0.712  | 0.607  |
| CS3   | 0.654        | 0.548        | 0.660        | 0.617        | 0.753        | 0.738        | 0.695        | -0.046       | 0.816        | <b>0.964</b> | <b>0.927</b> | 0.678        | 0.719  | 0.585  | 0.691  | 0.592  |
| C1    | 0.662        | 0.580        | 0.684        | 0.601        | 0.679        | 0.687        | 0.580        | -0.118       | 0.589        | 0.693        | 0.668        | <b>0.967</b> | 0.740  | 0.509  | 0.801  | 0.705  |

|     |       |       |       |       |       |       |       |        |       |       |       |              |              |              |              |              |
|-----|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|--------------|--------------|--------------|--------------|--------------|
| C2  | 0.682 | 0.576 | 0.691 | 0.626 | 0.690 | 0.706 | 0.556 | -0.133 | 0.608 | 0.693 | 0.678 | <b>0.967</b> | 0.736        | 0.498        | 0.774        | 0.669        |
| I2  | 0.647 | 0.524 | 0.641 | 0.592 | 0.694 | 0.692 | 0.613 | -0.105 | 0.600 | 0.706 | 0.680 | 0.722        | <b>0.928</b> | 0.612        | 0.730        | 0.641        |
| I3  | 0.648 | 0.541 | 0.653 | 0.583 | 0.707 | 0.694 | 0.622 | -0.113 | 0.598 | 0.695 | 0.674 | 0.729        | <b>0.935</b> | 0.630        | 0.728        | 0.655        |
| I4  | 0.561 | 0.447 | 0.552 | 0.503 | 0.609 | 0.599 | 0.549 | -0.122 | 0.540 | 0.605 | 0.597 | 0.577        | <b>0.854</b> | 0.569        | 0.598        | 0.554        |
| I5  | 0.633 | 0.541 | 0.646 | 0.612 | 0.722 | 0.717 | 0.645 | -0.142 | 0.633 | 0.720 | 0.705 | 0.714        | <b>0.943</b> | 0.667        | 0.771        | 0.667        |
| I6  | 0.641 | 0.531 | 0.643 | 0.603 | 0.716 | 0.709 | 0.619 | -0.162 | 0.629 | 0.725 | 0.705 | 0.747        | <b>0.898</b> | 0.637        | 0.772        | 0.672        |
| I7  | 0.604 | 0.501 | 0.606 | 0.551 | 0.655 | 0.648 | 0.537 | -0.105 | 0.525 | 0.613 | 0.592 | 0.615        | <b>0.840</b> | 0.605        | 0.667        | 0.621        |
| B1  | 0.541 | 0.359 | 0.485 | 0.493 | 0.521 | 0.543 | 0.556 | -0.101 | 0.524 | 0.525 | 0.548 | 0.435        | 0.617        | <b>0.914</b> | 0.545        | 0.493        |
| B2  | 0.539 | 0.393 | 0.506 | 0.531 | 0.584 | 0.598 | 0.516 | -0.061 | 0.511 | 0.580 | 0.569 | 0.519        | 0.649        | <b>0.923</b> | 0.593        | 0.556        |
| OT1 | 0.632 | 0.528 | 0.637 | 0.547 | 0.624 | 0.629 | 0.583 | -0.086 | 0.557 | 0.622 | 0.614 | 0.712        | 0.711        | 0.565        | <b>0.885</b> | 0.671        |
| OT2 | 0.659 | 0.544 | 0.660 | 0.594 | 0.667 | 0.677 | 0.611 | -0.140 | 0.616 | 0.707 | 0.689 | 0.797        | 0.771        | 0.588        | <b>0.954</b> | 0.739        |
| OT3 | 0.649 | 0.567 | 0.670 | 0.610 | 0.687 | 0.696 | 0.618 | -0.125 | 0.636 | 0.718 | 0.706 | 0.791        | 0.766        | 0.561        | <b>0.950</b> | 0.725        |
| OT4 | 0.575 | 0.443 | 0.556 | 0.537 | 0.610 | 0.617 | 0.535 | -0.101 | 0.550 | 0.603 | 0.601 | 0.649        | 0.622        | 0.540        | <b>0.839</b> | 0.613        |
| IP1 | 0.640 | 0.572 | 0.669 | 0.547 | 0.655 | 0.647 | 0.581 | -0.131 | 0.632 | 0.684 | 0.686 | 0.714        | 0.702        | 0.483        | 0.756        | <b>0.857</b> |
| IP2 | 0.579 | 0.499 | 0.593 | 0.521 | 0.545 | 0.571 | 0.556 | -0.081 | 0.530 | 0.572 | 0.575 | 0.710        | 0.636        | 0.435        | 0.713        | <b>0.862</b> |
| IP3 | 0.425 | 0.348 | 0.423 | 0.347 | 0.377 | 0.389 | 0.381 | -0.019 | 0.395 | 0.377 | 0.404 | 0.424        | 0.448        | 0.442        | 0.463        | <b>0.754</b> |
| IP4 | 0.429 | 0.340 | 0.420 | 0.355 | 0.375 | 0.392 | 0.397 | -0.114 | 0.392 | 0.379 | 0.402 | 0.407        | 0.451        | 0.476        | 0.484        | <b>0.747</b> |
| IP5 | 0.477 | 0.399 | 0.480 | 0.411 | 0.465 | 0.471 | 0.391 | -0.088 | 0.390 | 0.418 | 0.421 | 0.485        | 0.524        | 0.480        | 0.532        | <b>0.779</b> |

**Notes:** Trust stance (TS); Attitude towards online shopping (ATOS); Consumer characteristics (CC); Reputation (REP), Brand recognition (BR); Firm characteristics (FC); Likability (L); Lack of integrity, privacy and security (LIPS); Service quality (SQ); Customer satisfaction (CS); INT (Interactions); Competence (C); Integrity (I); Benevolence (B); Overall trust (OT); Intention to purchase (IP).