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Examining the Influence of Perceived Risk on Online Purchase Intention: A Structural Equation Modelling Study Leveraging Multigroup Analysis

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E-commerce, Online Shopping, Online Purchase Intention, Perceived Risk, Consumer Behaviour, Risk Dimensions

ABSTRACT

Nowadays, online shopping is a necessary component of modern life, allowing consumers to conveniently buy products and services. But, with the ease and convenience come certain risks that consumers experience. This research investigates the relationship between perceived risks and intention to purchase online, while also exploring how sociodemographic variables influence individuals' risk perceptions. Using a survey and structural equation modeling, the analysis of 308 participants across India identifies significant impacts of delivery, financial, and security risks on consumers' purchase intentions. Concerning the moderating impact of sociodemographic factors, only gender exhibited a moderating effect, while age and income did not influence the risk-intention relationship. These findings offer practical guidance for e-commerce players to mitigate consumer concerns and promote online shopping confidence..

1. CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

The rise of online shopping in recent years can be attributed to its myriad advantages such as convenience, accessibility, and wide-ranging options, making it an indispensable aspect of modern living. For both buyers and marketers, the Internet brought about a multitude of crucial opportunities, mutual benefits, and streamlined and enhanced communication (Cristian et al., 2011). The Indian e-commerce market is poised for significant growth, with a projected CAGR of 27% that would push its valuation to US$ 325 billion by 2030 (IBEF, 2023).

However, the transition from traditional in-person commerce to online trading has raised various worries among consumers. Consumers' confidence in online transactions hinges on assurance of product quality, trust, and security and privacy of their personal information. Consumers' perceptions of risk can greatly influence their intentions to buy online (Bashir et al., 2021). This uncertainty can arise due to several issues, including concerns about the product's quality, the retailer's dependability, and the safety and security of personal information (Almaiah, Alfaisal, et al., 2022; Alrawad et al., 2023). Perceived risk is particularly significant when it comes to online shopping because customers frequently can't personally examine the product before making the purchase and must instead rely on the vendor's information. Prior research presents mixed results about the influence of perceived risk on purchase behaviour. While studies by Heikkilä et al. (2013) and Zepeda et al. (2003) did not find a significant correlation, Teng et al. (2009) observed a positive association. Conversely, research by Wang and Hazen (2016), Wu et al. (2017), and Youn and Kim (2018) suggests a negative relationship. High levels of perceived risk can create a barrier to online purchasing, leading to a decrease in consumer trust and a reduced willingness to buy (Gefen and Straub, 2004; Pavlou, 2003). Conversely, low levels of perceived risk can increase consumers' confidence in the online shopping experience and lead to a greater willingness to purchase (Kim et al., 2008; Teo and Yu, 2005).

However, there are differences in viewpoints among scholars concerning the notion of perceived risk. According to some academics, perceived risk is a single dimension that includes all forms of uncertainty in online shopping (Almaiah, Alfaisal, et al., 2022; Alrawad et al., 2023; Bonnin, 2020). Some contend, however, that perceived risk needs to be viewed as a multifaceted concept due to the intricacy of this idea. As a result, scholars have investigated how perceived risk affects consumers' decisions to make online purchases by putting forth and analysing a variety of uncertainties. These comprise the product's inherent uncertainties, such as financial, functional, and physical uncertainty (Almaiah, Alfaisal, et al., 2022; Alrawad et al., 2023); uncertainties associated with the e-retailer, such as informational uncertainties, privacy, and post-.

purchase (Alrawad et al., 2023; Song et al., 2022); and uncertainties of the technologies such as psychological, delivery risks, security and time-related (Alrawad et al., 2023; Bashir et al., 2021; Chang, 2021; Kamalul Ariffin et al., 2018a).

Much of the existing research focuses on broad categories of risk, neglecting the diverse factors that contribute to individual perceptions, especially in the Indian context. Additionally, the rapidly evolving e-commerce environment, with its emerging technologies and consumer behaviours, warrants a continuous re-evaluation of the risk landscape.

Thus, the study's objectives are to determine all potential sources of online shopping risks and investigate how varying degrees of perceived risk affect an online purchase in the Indian setting. Furthermore, this study also finds out to what extent demographic variables moderate the relationship between perceived risks and intention to buy online.

The perceived risk influences the online shopping decisions of the consumers hence it is a very important factor for the business. A good understanding of perceived risks will help the businesses reduce them, thereby giving consumers the opportunity to trust and have confidence in the online shopping platform. The reinforcement of good customer experience through the proactive actions taken by the business would lead to the patronage of the company by its customers.

2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Some researchers looking at e-commerce have specifically studied the perceived risks influencing the online buying intention. "Perceived risk" refers to the degree to which consumers feel uncertainty and emotional strain concerning the likelihood of undesirable occurrences associated with a particular product or service (Bauer R. A., 1960). The activities that customers take when making online purchases of goods or services are referred to as online shopping intentions (Cox, 1967).

2.1 Online purchase intention

“The customers’ readiness to purchase goods/services in online mode through the Internet is defined as online purchase intention” (Meskaran *et al.*, 2013). Online shopping recently has proved to be of great benefit to consumers as it adds to their convenience and provides greater choice. Forster and Ya Tang (2005) states that it is also an alternative for consumers in times of disaster. Further, at the time of COVID-19 online shopping was highly preferred to escape from the risks of offline purchases (Chauhan and Shah, 2020).

Despite several benefits, the downside of every concept should also be studied. This brings into picture the demerits, harms, and risks associated with online shopping. The risk connected with online shopping affects the buying behaviour of consumers and thus plays a very critical role (Zhang *et al.*, 2011). Therefore, consumers may decide against making an online purchase if they perceive any risk (Amirtha *et al.*, 2020).

2.2 Perceived risk

Bauer R. A. (1960) was the pioneer in introducing the idea of perceived risk. Perceived risk is "the consumer's perception of the uncertainty and adverse consequences of buying a product or service". According to Bauer R. A. (1960) and Cox & Rich (1964), perceived risk has two key dimensions: consequences and uncertainty. Users become less likely to buy the goods once they realize there are higher risks involved (Roselius, 1971; Taylor, 1974).

Perceived risk dimensions

The early studies by (Cox and Rich, 1964) opened the areas of uncertainties affecting consumer purchase decisions. They put forth consequences and uncertainty as a determinant factor in the perception of risk. By taking into account perceived risk as a multidimensional term, (Cox, 1967) tried to improvise the concept**.** The most well-known risk variables, according to certain studies, are those related to finances, performance, psychology, social interaction, time, and privacy (Bhatnagar *et al.*, 2000; Forsythe *et al.*, 2006). To better understand perceived risk, academics have begun to look at and propose new dimensions, including security risk, delivery risk, privacy risk, and after-sale risk (Kamalul Ariffin *et al.*, 2018a; Lu *et al.*, 2005; Tham *et al.*, 2019).

This study employed a model, derived from existing literature, to examine how different perceived risks relate to the intention to make online purchases. The model also incorporated moderating factors like age, gender, and income (refer Fig 1).

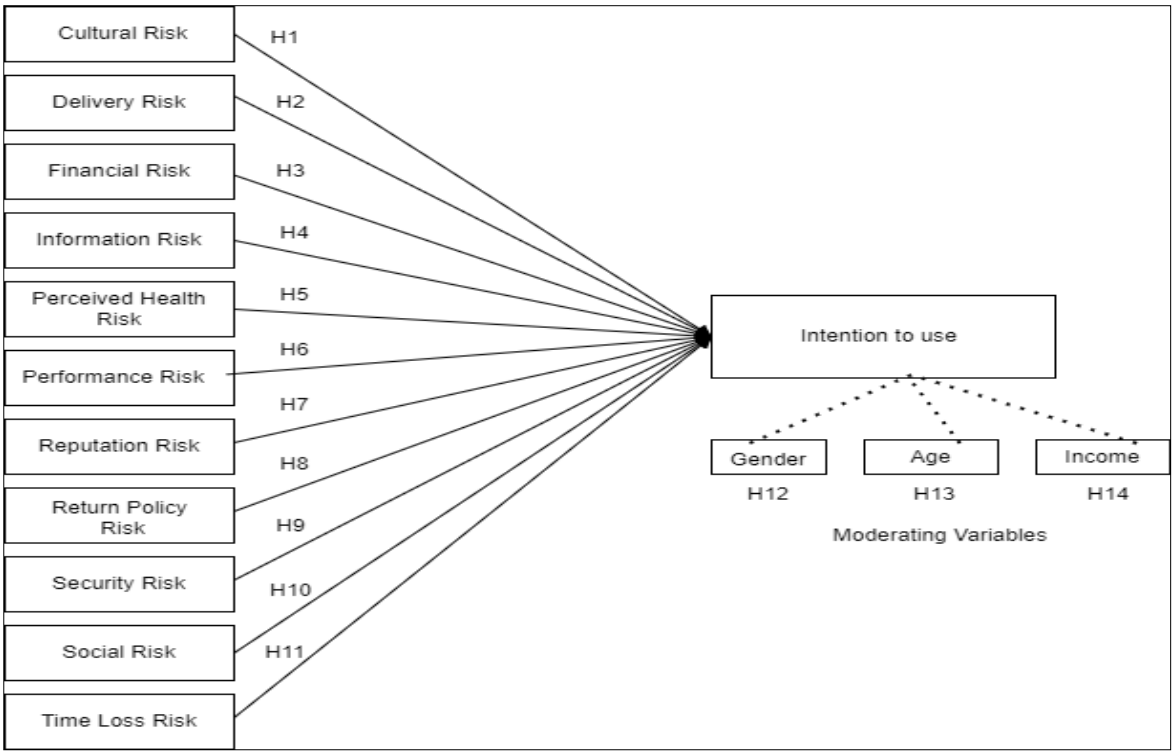

Figure 1: Theoretical Model

2.3.1 Cultural risk

Cultural risk refers to the influence of cultural differences on consumers' perception of risk when making online purchases (Tikhomirova *et al.*, 2021). Zendehdel et al. (2016) say specific groups of customers exist worldwide, each with its unique behavioural and purchasing tendencies. Customers on the platform find it difficult to trust it due to issues like inaccurate translations and communication barriers with sellers (Tikhomirova *et al.*, 2021). As a result, marketers must meet the expectations of these individual customers. Hence the hypothesis is formulated as

H1: Cultural risk adversely impacts online purchase intent.

Delivery risk

Consumers are anxious about whether or not their orders will arrive on time. They will be unable to use or consume the merchandise until it is delivered (Lu *et al.*, 2005). Internet purchase carries the risk of damaged goods and misplaced ones. These mishaps might exacerbate unhappiness. Khan et al. (2015) suggest that addressing customer concerns regarding delivery reliability and transparency leads to higher levels of satisfaction with online purchases. Their findings are supported by Daniel Silaban, Meiliana Jaunanda (2020) and Mofokeng (2021). Hence the hypothesis is suggested as

H2: Delivery risk adversely impacts online purchase intent.

Financial risk

If the product fails to perform as expected or does not justify the price paid for it, an online customer may experience financial loss from the transaction (Pavlou, 2003) or from choosing a subpar or unknown brand (Beneke *et al.*, 2012; Demir, 2011). The likelihood of financial danger increases as one may predict when items get more expensive. Although the popularity of online shopping has skyrocketed and growth is predicted, certain drawbacks are becoming more widely talked about. **Concerns regarding online security, particularly when using credit cards and sharing personal information, pose a significant barrier to e-commerce growth** Hence the hypothesis is posited as

H3: Financial risk adversely impacts online purchase intent.

Information risk

The potential for the person to be working in a setting with asymmetric information is information risk. Consumers are confronted with an array of information uncertainty while utilizing an online business, including an absence of data, information overload, and data disorganization (Soto-Acosta *et al.*, 2014). The perceived information risk increases the concern of customers from the risk perspective, which, in turn, creates a threat to their purchase intentions. Information risks play a significant role in influencing online shopping behavior (Al-Majali, 2020; Bashir *et al.*, 2021). Hence the hypothesis is formulated as

H4: Information risk adversely impacts online purchase intent.

Perceived health risk

Perceived health risk is defined as "the probability of getting sick" (Brewer *et al.*, 2004). Previous research has indicated that consumer perceptions of health risks hold importance in shaping buying intentions (Shin and Kang, 2020; Zhang and Yu, 2020). But, within the Indian context, the perception of health risks with online shopping has remained under-researched. Hence, this hypothesis has been formulated:

H5: Perceived Health risk adversely impacts online purchase intent.

Performance risk

Performance risk is the possibility that a product will not function as intended or will perform incorrectly after purchase (Crespo *et al.*, 2009). Consumers buying online won't have the ability to touch or try on products before making their purchases (Nepomuceno *et al.*, 2014). This circumstance raises questions about the product's quality and increases the chance that it will not function as intended (Almaiah, Al-Otaibi, *et al.*, 2022). This suspicion could also reflect the buyer's anxiety about buying a fake product (Almousa, 2014; Amirtha *et al.*, 2020). It negatively affects purchase intention. Hence the hypothesis is suggested as

H6: Functional risk adversely impacts online purchase intent.

Reputation risk

This is the risk of purchasing from an unreliable or fraudulent website or a website with a poor reputation. Frik et al. (2019) found that Security, privacy (including knowledge, information collecting, and control), and reputation (including company background and customer evaluations) all have a significant impact on trust and desire to purchase, while website quality has a little impact. (Rafqi Ilhamalimy and Ali, 2021) assert that businesses should be able to provide customers with trustworthy features and services, as well as increased security when they make an online transaction. Perceived brand leadership influences the effective process and cognitive evaluation, which impacts the post-purchase phase of ECT and establishes satisfaction and repurchase intention (Chiu & Cho, 2021). Hence the hypothesis is posited as

H7: The Reputation risk adversely impacts online purchase intent.

Return policy risk

Returning unsuitable items is done in accordance with the return policy. In this case, the return policy refers to the return of any things that do not meet the consumers' expectations or are not in accordance with them. Customers have the option to return a product and receive a refund under this policy (Tham *et al.*, 2019). On the other side, the time required to return the item, or the additional costs customers must pay may raise the risk. Risks associated with return policies can impact client satisfaction (Balhareth *et al.*, 2021). The enjoyment will decline as the danger rises. Hence the hypothesis is formulated as

H8: Return Policy risk adversely impacts online purchase intent.

Security risk

Customers who shop online are vulnerable to security threats. Their data might be stolen or exploited by third parties (Jain and Kulhar, 2019). When it comes to online transactions, security pertains to a website's ability to stop unauthorized access or disclosure of users' personal information (Mofokeng, 2021). Customers' happiness with online retailers declines when they believe their security is jeopardized (Mofokeng, 2021). Hence the hypothesis is suggested as

H9: Security risk adversely impacts online purchase intent.

Social risk

Social risk refers to purchasing a specific brand or product which leads to a **decline in an individual's social standing or reputation.** Beyond traditional concerns about online purchases, consumers increasingly consider how their choices might be judged by others, adding a new layer of complexity to their perceived risk (Beneke *et al.*, 2012; Demir, 2011). Hence, there is concern about the buyer's ego and how reference groups will view a purchase (Almousa, 2014; F Farzianpour, M Pishdar, 2014; Mitchell and Greatorex, 1993). Hence the hypothesis is posited as

H10: Social risk adversely impacts online purchase intent.

Time loss risk

When a product undergoes repair or replacement, time, convenience, or effort are wasted (Ko *et al.*, 2004). Time risk is the inconvenience that comes with shopping online, which can be brought on by issues with ordering, navigating, or timely delivery of goods (Forsythe *et al.*, 2006). It is a potential waste of time caused by spending too much time studying and making a poor purchasing selection (CA Ingene, 1985; Cunningham M. S., 1967; Roselius, 1971; Stone and Grønhaug, 1993). Hence the hypothesis is formulated as

H11: Time Loss risk adversely impacts online purchase intent.

The influence of demographic variables

Sociodemographic variables have historically received limited attention in risk perception studies within the literature. However, the available findings have shown mixed results (Siegrist and Árvai, 2020). Research proposes that the level of perceived risk tends to vary significantly based on gender, age, and experience level. Consequently, the proposed hypotheses are given below:

H12: Perceived risk influences the willingness of different genders' online purchase intent.

H13: Perceived risk influences the willingness of different age groups' online purchase intent.

H14: Perceived risk influences the willingness of different income groups' online purchase intent.

3. RESEARCH METHODOLOGY

This research aims to identify key risk factors associated with online shopping, exploring how demographic background influences consumers' perception of these risks and their resulting purchasing behaviour.

This study developed a research model based on current literature. Initially, confirmatory factor analysis (CFA) was performed to validate the measurement model. We tested the series of hypotheses sequentially using Structural Equation Modeling (SEM). Smart PLS4.0 was used to perform the CFA and SEM analyses.

3.1 Development of the questionnaire

A comprehensive literature review was used to develop the questionnaire, which consists of 40 questions and statements to measure perceived risk and 3 questions to measure consumer purchase intention. The statements as well as their sources are demonstrated in Table 1. Pilot testing involving six individuals was conducted to enhance the questionnaire's quality.

The questionnaire consisted of three sections. Part 1 of the survey gathers demographic information, explores prior online shopping experience, assesses internet usage habits, and measures online shopping frequency. Part 2 comprised of questions to measure respondents' perceptions of risk while Part 3 contained questions surveying respondents' impression of online purchase intention. Each question in Part 2 and Part 3 was rated using a 5-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree"). Participants were able to indicate how much they agreed with each statement using this scale.

Table 1. Measurement Scales

Factor	Items		Source
Cultural Risk	CR1	Product information, customer support and website content not available in their native language.	(Tikhomirova et al., 2021; Zendehdel et al., 2016)
	CR2	Unfamiliar customs regulations and procedures when buying from foreign websites.	
	CR3	Different measurement systems on foreign websites.	
Delivery Risk	DR1	Late delivery of products	(Alrawad et al., 2023; Tham et al., 2019)
	DR2	Non-delivery of goods	
	DR3	Damage of products during delivery	
	DR4	Loss of products during delivery	
	DR5	Estimated delivery time and options	
	DR6	Shipment information	
Financial Risk	FR1	The product will not work	(Tham et al., 2019)
	FR2	Secure payment options	
	FR3	Loss of money due to online scams	
	FR4	Unauthorized access to my bank account and credit card information during online transactions.	
	IR1	Accuracy and reliability of the information provided	

Information Risk	IR2	Insufficient information	(Alrawad et al., 2023)
	IR3	Overload information	
	IR4	Information disorganized	
Perceived Health Risk	PHR1	Adverse effects on my health	(Alkhawaldeh, 2023)
	PHR2	Accuracy and credibility of health-related information provided	
	PHR3	Detailed information of ingredients and potential side effects	
	PHR4	Approvals from regulatory bodies	
Performance Risk	PR1	Receiving a product that does not meet my expectations	(Almousa, 2014)
	PR2	Receiving products that are different from what is advertised	
	PR3	Guarantee for the product	
Reputation Risk	RR1	The reputation of the online seller	(Frik et al., 2019)
	RR2	High rating and positive reviews from other customers	
	RR3	Number of years the online seller has been in business	
Return Policy Risk	RPR1	Complicated return process	(Adi Susilo et al., 2023a)
	RPR2	Additional costs when returning products	
	RPR3	Review and consider the return policy	
Security Risk	SCR1	Security measures implemented by online sellers to protect my personal data.	(Adi Susilo et al., 2023a; Alrawad et al., 2023)
	SCR2	Risk of Identity theft	
	SCR3	Sharing unnecessary personal information to minimize security risk	
Social Risk	SR1	Negative social judgment	(Adi Susilo et al., 2023b)
	SR2	Products that do not align with societal expectations	
	SR3	Recommendations from friends and relatives	
	SR4	Product or brand is endorsed by influential individuals.	
Time Loss Risk	TLR1	Spending time navigating complex website processes	(Forsythe et al., 2006)
	TLR2	Time and effort required to create and authenticate an account on websites.	
	TLR3	Wasting time on websites that may not have the products or services I need	
Intention to use	IU1	I purchase products online regularly.	(Bhukya & Singh, 2015)
	IU2	I will continue to make online purchase in near future.	
	IU3	I feel confident about purchasing product online.	

3.2 Sample and data collection

The target population consisted of people who have been shopping more than two months. Convenience sampling was employed to distribute the questionnaires. Respondents were instructed to devote around 10 minutes to responding to the

Google form that served as the instrument for data collection. Out of 350 filled questionnaires, 42 were excluded because of information quality issues, bringing about a sum of 308 substantial surveys for information investigation.

4. RESULT

There were two primary stages to the data analysis procedure. Using a variety of statistical methods, we built and tested the measurement model in the first stage. First, a variety of metrics, including the Cronbach Alpha value, Average variance explained (AVE), and composite reliability were employed to evaluate the reliability and convergent and validity. Discriminant validity was ensured by using Fornell-Larcker criterion and Heterotrait-Monotrait (HTMT) measures. Furthermore, a sequence of multigroup analyses was carried out to evaluate measurement invariance among various groups.

In the second stage, path analysis and multigroup analysis were done to evaluate the research model and put the proposed hypotheses to the test (F. Hair Jr *et al.*, 2014; Ray and Sahney, 2018).

4.1 Analysis of measurement model

Reliability and Convergent Validity

Table 2. Measurement Model Analysis Results

Latent construct	Items	FL	CA	CR	AVE
Cultural Risk	CR1	0.737	0.7	0.826	0.615
	CR2	0.74			
	CR3	0.868			
Delivery Risk	DR1	0.737	0.863	0.898	0.594
	DR2	0.813			
	DR3	0.783			
	DR4	0.773			
	DR5	0.764			
	DR6	0.754			
Financial Risk	FR2	0.807	0.768	0.856	0.665
	FR3	0.803			
	FR4	0.835			
Information Risk	IR1	0.844	0.789	0.877	0.703
	IR3	0.83			
	IR4	0.841			
Perceived Health Risk	PHR1	0.763	0.812	0.876	0.639
	PHR2	0.819			
	PHR3	0.844			
	PHR4	0.769			
Performance Risk	PR1	0.835	0.733	0.849	0.653
	PR2	0.865			
	PR3	0.718			
Reputation Risk	RR1	0.869	0.724	0.845	0.649
	RR2	0.857			

	RR3	0.676			
Return Policy Risk	RPR1	0.855	0.766	0.865	0.682
	RPR2	0.821			
	RPR3	0.8			
Security Risk	SCR1	0.82	0.755	0.857	0.668
	SCR2	0.749			
	SCR3	0.877			
Social Risk	SR1	0.777	0.732	0.83	0.551
	SR2	0.728			
	SR3	0.764			
	SR4	0.698			
Time Loss Risk	TLR1	0.619	0.649	0.808	0.587
	TLR2	0.856			
	TLR3	0.804			
Intention to use	IU1	0.926	0.916	0.947	0.857
	IU2	0.931			
	IU3	0.919			

Table 2 shows the loading results, composite reliability (CR) of factors, Cronbach's Alpha values, and the variance accounted for (AVE).

Indicator reliability

The reflected measurement models' validity and reliability were assessed in the first phase. After the PLS-SEM method was used, it was found that some indications did not reach the suggested threshold level. To be more precise, indicators FR1 and IR2 were disregarded since, in line with earlier studies (Ray and Sahney, 2018), their loadings were much lower than the threshold of 0.70. On the other hand, because of their composite dependability and Average Variance Extracted (AVE) values surpassing the specified threshold values, indicators RR3, SR4, and TLR1 were kept. There may be issues with content validity if these markers are eliminated. Table 2 displays the final measurement models along with the indicator outer loadings. Indicator validity is confirmed if the loading factor value exceeds 0.70. In this study, all indicators demonstrated loading factor values above 0.70, affirming their validity (Kamalul Ariffin *et al.*, 2018a).

Internal consistency reliability

Due to its perceived suitability, "composite reliability" was selected as the metric for evaluating internal consistency dependability in this work (F. Hair Jr *et al.*, 2014; Ray and Sahney, 2018). There was a high degree of internal consistency reliability among all the reflective latent variables, as indicated by the composite reliability values for each construct in the final model being higher than the suggested threshold level of 0.70 (see Table 2). Using Cronbach's alpha (value greater than 0.70), the internal consistency of the measurement model was also verified.

Convergent validity

At the construct level, Average Variance Extracted (AVE) was used to evaluate convergent validity. The AVE for each latent construct exceeds the suggested cut-off of 0.50, as can be seen in Table 2, following the recommendations of (F. Hair Jr *et al.*, 2014; Ray and Sahney, 2018). Convergent validity is so confirmed.

Discriminant validity

Table 3. Fornell-Larcker criterion: Results of Discriminant Validity

Latent Variables	Cultural Risk	Delivery Risk	Financial Risk	Information Risk	Intention to Use	Perceived Health Risk	Performance Risk	Reputation Risk	Return Policy Risk	Security Risk	Social Risk	Time Loss Risk
Cultural Risk	**0.784**											
Delivery Risk	0.519	**0.771**										
Financial Risk	0.418	0.545	**0.815**									
Information Risk	0.534	0.747	0.499	**0.838**								
Intention to Use	-0.357	-0.522	-0.645	-0.447	**0.926**							
Perceived Health Risk	0.511	0.701	0.517	0.666	-0.412	**0.799**						
Performance Risk	0.546	0.691	0.508	0.674	-0.466	0.582	**0.808**					
Reputation Risk	0.528	0.697	0.515	0.653	-0.481	0.603	0.655	**0.805**				
Return Policy Risk	0.511	0.727	0.457	0.651	-0.383	0.743	0.62	0.61	**0.826**			
Security Risk	0.467	0.618	0.442	0.605	-0.289	0.735	0.517	0.505	0.661	**0.817**		
Social Risk	0.426	0.616	0.393	0.538	-0.374	0.527	0.558	0.456	0.525	0.455	**0.742**	
Time Loss Risk	0.413	0.61	0.377	0.479	-0.376	0.561	0.511	0.454	0.539	0.591	0.476	**0.766**

The Fornell–Larcker criterion, often viewed as the most cautious assessment method (F. Hair Jr *et al.*, 2014), was employed to assess the discriminant validity of the constructs. As shown in Table 3, each construct's square root of average variance extracted (AVE) exceeds its correlation with other constructs, aligning with the guidance of (Fornell and Larcker, 1981). Consequently, the study has successfully demonstrated the discriminant validity of the constructs.

Table 4. Heterotrait-monotrait ratio (HTMT): Results of Discriminant Validity

Latent variables	Cultural Risk	Delivery Risk	Financial Risk	Information Risk	Intention to Use	Perceived Health Risk	Performance Risk	Reputation Risk	Return Policy Risk	Security Risk	Social Risk	Time Loss Risk
Cultural Risk												
Delivery Risk	**0.656**											
Financial Risk	0.54	**0.65**										

Information Risk	0.717	0.904	**0.636**									
Intention to Use	0.419	0.585	0.711	**0.525**								
Perceived Health Risk	0.677	0.837	0.644	0.836	**0.473**							
Performance Risk	0.745	0.871	0.652	0.89	0.564	**0.765**						
Reputation Risk	0.723	0.872	0.67	0.853	0.586	0.78	**0.901**					
Return Policy Risk	0.678	0.891	0.588	0.835	0.456	0.945	0.84	**0.804**				
Security Risk	0.648	0.76	0.572	0.775	0.336	0.944	0.701	0.667	**0.866**			
Social Risk	0.586	0.766	0.488	0.689	0.445	0.675	0.754	0.626	0.693	**0.604**		
Time Loss Risk	**0.612**	**0.791**	**0.487**	**0.641**	**0.473**	**0.754**	**0.718**	**0.652**	**0.749**	**0.827**	**0.656**	

In Table 4, discriminant validity is assessed using the 'Heterotrait-Monotrait Ratio (HTMT)' measure. Upon examination, the HTMT values for all constructs in the final model were found to be below the recommended threshold of 0.90, except four values. These four values are close to 0.90 and, therefore are still considered acceptable. Consequently, the study demonstrates strong discriminant validity among the constructs.

4.2 Analysis of structural model and testing of hypotheses

Table 5. Results of structural model analysis

Hypothesis	Paths	Beta	T - Statistics	P - Values	Results
H1	Cultural risk -> Intention to use	-0.011	0.213	0.831	Insignificant
H2	Delivery risk -> Intention to use	-0.18	2.295	0.022	Significant
H3	Financial risk -> Intention to use	-0.5	9.425	0	Significant
H4	Information risk -> Intention to use	-0.038	0.561	0.575	Insignificant
H5	Perceived health risk -> Intention to use	-0.024	0.34	0.734	Insignificant
H6	Performance risk -> Intention to use	-0.044	0.708	0.479	Insignificant
H7	Reputation risk -> Intention to use	-0.094	1.535	0.125	Insignificant
H8	Return policy risk -> Intention to use	0.047	0.694	0.488	Insignificant
H9	Security risk -> Intention to use	0.206	3.316	0.001	Significant
H10	Social risk -> Intention to use	-0.027	0.502	0.616	Insignificant
H11	Time loss risk -> Intention to use	-0.109	1.725	0.085	Insignificant

All of the primary hypotheses modelled were tested as shown in Table 5. The findings demonstrated that three out of the eleven hypotheses (H2, H3, and H9) received empirical support. This suggests that these three components of perceived risk exert a significant influence on customers' intention to engage in online purchases. However, the remaining eight hypotheses,

which pertain to the influence of cultural risk (H1), information risk (H4), perceived health risk (H5), performance risk (H6), reputation risk (H7), return policy risk (H8), social risk (H10), and time loss risk (H11) on customers' intention to purchase online, did not receive empirical support.

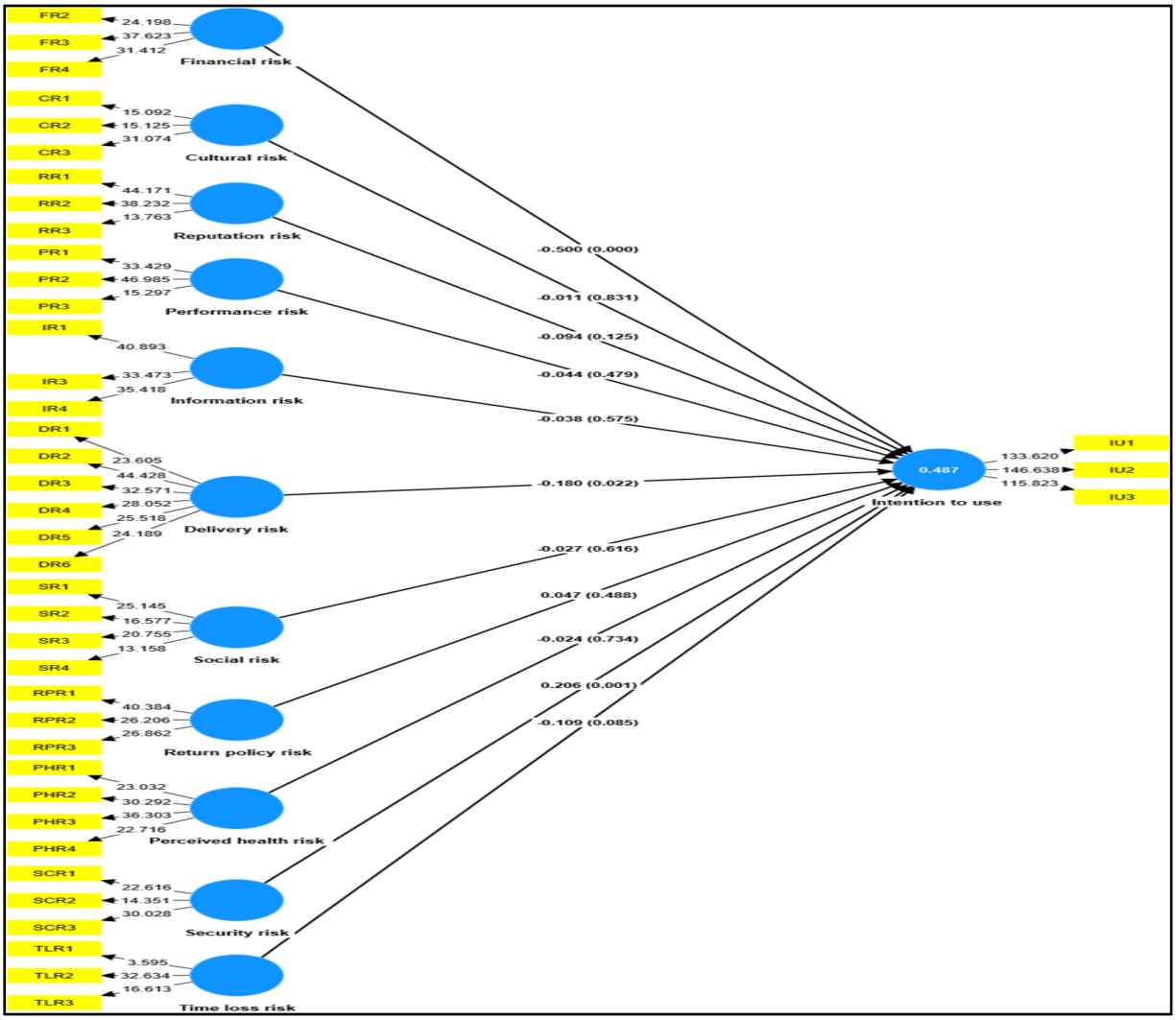

Fig. 2 SEM diagram

4.3 Multi-group analysis

Table 6. Multi-Group Analysis

Relationships	B (P-Value)	B (P-Value)	Difference	P-Value	Results
Paths for Gender	**Male**	**Female**			
Delivery risk -> Intention to use	0.054 (0.618)	-0.375 (0.004)	0.429	0.01	Significant
Financial risk -> Intention to use	-0.644 (0.000)	-0.362 (0.000)	-0.283	0.005	Significant
Security risk -> Intention to use	0.068 (0.503)	0.281 (0.000)	-0.212	0.099	Insignificant
Paths for Age groups	**24 years and above**	**Under 24 years**			
Delivery risk -> Intention to use	-0.360 (0.036)	-0.117 (0.155)	0.243	0.181	Insignificant
Financial risk -> Intention to use	-0.472 (0.000)	-0.456 (0.000)	0.016	0.878	Insignificant
Security risk -> Intention to use	0.217 (0.243)	0.054 (0.505)	-0.163	0.442	Insignificant

Paths for Income	Rs 50,000 and above	Less than Rs 50,000			
Delivery risk -> Intention to use	-0.002 (0.990)	-0.199 (0.011)	-0.197	0.352	Insignificant
Financial risk -> Intention to use	-0.488 (0.000)	-0.518 (0.000)	-0.029	0.855	Insignificant
Security risk -> Intention to use	0.309 (0.075)	0.180 (0.007)	-0.13	0.479	Insignificant

Table 6 presents a comparison of the associations among sociodemographic variables concerning financial risk, security risk, and delivery risk. The table also shows the intention to use for each of these factors.

The first moderating variable is gender. For males only the p-value for financial risk is less than 0.05 indicating its significance. For delivery risk (p-value=0.618) and security risk (p-value=0.503), the p-value is greater than 0.05 thus these are insignificant in case of males. On the other hand, for females all three risks: delivery risk (p-value=0.011), financial risk (p-value=0.000) and security risk (p-value=0.007) are significant as the p-value is less than 0.05 for all. Looking at the difference between the perception of males and females towards these risks and intention to use online shopping is significant in case of delivery risk and financial risk only. For security risk, it is insignificant. Overall, it highlights the substantial moderating effect of difference in gender.

The next moderating variable is age. Among the people from 24 years or above age group, both delivery risk (p-value=0.036) and financial risk (p-value=0.000) are found to be significant, with a p-value less than 0.05. Security risk has a p-value of 0.243 rendering it insignificant. In contrast, for customers under 24 years of age, only financial risk (p-value=0.000) yield p-values lower than 0.05, indicating its significance. Delivery risk with p-value=0.155 and security risk with p-value=0.505 are thus insignificant. When examining the distinction in how both the age groups perceive these risks, the p-values are as follows: delivery risk=0.181, financial risk=0.878, and security risk=0.442. It's evident that the difference is statistically insignificant for all the three risks. Therefore, differences in age groups have no impact on the relationship between perceived risks and customers' intention to make a purchase.

The last moderating variable is income. In this variable it's worth noting that among individuals with income Rs. 50,000 or above, only financial risk (p-value=0.000) is statistically significant, with p-values less than 0.05. For delivery risk (p-value=0.990) and security risk (p-value=0.075) the p-value is quite high and above 0.05 mark indicating that these are insignificant. Alternatively, for customers below the income of Rs. 50,000, all the risks namely delivery risk (p-value=0.011), financial risk (p-value=0.000) and security risk (p-value=0.007) is deemed significant, as its p-value falls below 0.05. When comparing how both income groups perceive these risks, the p-values are as follows: delivery risk=0.352, financial risk=0.855, and security risk=0.479. The data indicates that there is no statistically significant difference among all three risks and intentions to use online shopping. Relationships between perceived risks and buying intention are not influenced by income differences overall.

5. DISCUSSION

Finding the variables influencing consumers' perceptions of risk and uncertainty in connection to their plans to make online purchases is the main goal of this study. Consequently, based on prior research, a research model was constructed to examine the link between various perceived risks and consumers' intention to engage in purchases of services and goods online. Moderating effect of sociodemographic variables such as income, gender, and age are also incorporated in the model. It was hypothesized that consumer perceived risk variables would exert a substantial negative influence on their online purchase intentions. The analysis revealed that 48.7% of the variability in individuals' willingness to shop online can be attributed to their perceived risk associated with online shopping.

This study identified three primary risk factors significantly deterring online purchase intentions: financial risk, delivery risk, and security risk. Interestingly, no statistically significant impacts were observed for cultural risk, social risk, information risk, performance risk, product risk, perceived health risk, time-loss risk, and reputation risk.

The results of H2 are consistent with earlier studies showing a negative relationship between online purchase intention and delivery risk. Customer satisfaction is contingent upon the perception of low delivery risk. In the current era of fierce e-commerce competition, online retailers must closely monitor prompt delivery and customer service to meet consumer expectations. Any delays or lack of transparency in deliveries can result in customer discontent (Adi Susilo *et al.*, 2023). Delivery risk contains a range of product delivery issues, including delays brought on by logistical or warehouse faults, product harm sustained during transit, and non-receipt of the ordered item (Alrawad *et al.*, 2023; Kamalul Ariffin *et al.*, 2018b). Previous studies have demonstrated the impact of perceived delivery risk on customers' inclination to purchase online (Alrawad *et al.*, 2023; Amirtha *et al.*, 2020). Customers perceive that the risk of delayed delivery or non-delivery directly affects their decision-making process regarding online purchases. Likewise, concerns about the potential for product damage or loss during the delivery process significantly influence their overall willingness to carry out online transactions. When an online platform provides estimated delivery times and options, it enhances the likelihood of customers making a purchase.

Furthermore, access to detailed shipment information contributes to their confidence in the delivery process. Consequently, these factors underscore how delivery risk substantially shapes consumers' intentions to make online purchases.

The outcomes of H3 are consistent with earlier research by (Beneke *et al.*, 2012; Cemberci *et al.*, 2013), which claim that the financial risk is a crucial component in consumers' decision to refrain from online purchasing and is an important predictor of intent to make an online purchase. The findings indicate a negative relationship between financial risk characteristics and intentions to make online purchases. The availability of secure payment options (such as PayPal and encrypted transactions) enhances customers' willingness to engage in online shopping. Concerns regarding potential financial losses due to online scams impact their decisions to make online purchases. Worries about the potential unauthorized access to their bank account and credit card information during online transactions also influence their inclination to shop online. These findings underscore the prominent role of financial risk in shaping consumers' intentions to shop online.

The H9 results align with earlier studies that have demonstrated the negative correlation between online purchasing intents and security risk. Karnik (2014) argued that as internet vendors operate on a global scale, consumers' perception of risk escalates when they perceive internet security to be lacking. Furthermore, security was expressly linked by (Azizi and Javidani, 2010) to the disclosure of private financial data, including account and credit card numbers, PINs, and other sensitive information. According to Kamalul Ariffin et al. (2018a), consumers are concerned that the protection of their banking credentials, such as information about their credit or debit cards used for online payments, may not be adequately secured. Moreover, consumers harbour anxieties about the vulnerability and hackability of online shopping websites, leading to apprehensions about the security measures implemented by online retailers to protect their personal data. Customers also worry that, depending on their surfing history, internet retailers may access and maybe divulge their personal data in order to target them with advertisements. Consequently, they refrain from sharing unnecessary personal information when making online purchases to mitigate security risks. These factors collectively underscore how consumers' intentions to shop online are significantly influenced by security concerns.

The current findings support the existence of moderating effects by gender in the relations between financial risks, delivery risks, and consumer intentions to utilize online shopping. A gender comparison indicates a notable difference in perceptions concerning delivery and financial risks while security risk does not exhibit significant gender-based variations. The findings reveal that financial risk is significant for males, whereas for females, all three risks (financial, delivery, and security) demonstrate significance. The comparison between the two age groups and income groups did not yield significant differences in their perceptions of all three risk types.

Managerial and academic implications

This study holds great significance for both the academic and practical spheres. First of all, e-commerce companies have a stake in understanding and influencing consumers' online buying habits. As a result, identifying the key relevant risks and concerns influencing consumers' intentions to make purchases online can improve their experiences and allay concerns about these services (Almaiah, Ayouni, *et al.*, 2022). Consequently, drawing from the conclusions of this study, online retailers can implement various measures to alleviate customers' perceived risks in the online realm. Given the significant impact of financial risk on online shopping behavior, it is essential for e-retailers to take proactive measures to mitigate customers' concerns regarding potential financial loss. As customers are wary of purchasing products that may not meet expectations or seem overpriced, businesses need to address these risks by implementing several strategies like transparent pricing, money back guarantee etc.

Additionally, stores can enhance security assurance by adopting and regularly updating their security systems, employing secure connections (HTTPS), and prominently displaying security badges. Likewise, addressing customer concerns about delivery can be achieved by offering estimated delivery times, diverse options, and providing shipment tracking availability. Furthermore, the study attempted to capture the different opportunities and constraints that may impact the dynamics of online shopping by assessing the behavioural intention for doing online shopping within a structure of socioeconomic variables such as gender, age, and income. This study employed sociodemographic characteristics as moderators, yielding a deeper understanding of how diverse individuals perceive and respond to various online shopping risks. This approach allowed for more nuanced, context-sensitive findings that reflect the complexities of real-world online consumer behaviour.

This study contributes significantly to the existing literature by proposing and validating a conceptual model of online perceived risk. The model's robustness is bolstered by data collected from a diverse, pan-Indian participant pool, offering valuable insights into risk perception. Furthermore, the study stands out in its application of multigroup analysis to examine the moderating effects of sociodemographic variables.

6. LIMITATIONS AND FUTURE RESEARCH

This study acknowledges some limitations and hence gives paths for upcoming research. Firstly, the data utilized for validation were gathered solely from e-shoppers in India. This could potentially limit generalizability, as it does not account for perspectives from other nationalities. To enhance the applicability of the findings, it is recommended that future research consider cultural variations among e-shoppers from diverse ethnic backgrounds or nationalities. Secondly, the study did not explore specific industries, like the apparel and fashion industries, because of time constraints. Future research could address

this gap. Additionally, although this study looked at online shopping, future research could focus on online shopping intention, adoption, and behaviour separately and consider other risk variables such as technological risk, privacy risk, and quality risk. Future research may also look at the government influence and the mediating role of trust. Lastly, it's important to keep in mind that even though the study's sample size was judged adequate for the analysis using PLS-SEM given the quantity of variables, a bigger sample size might improve the model's overall fit even more. Future research endeavours should aim to diversify samples by including participants from various developing and developed countries.

REFERENCES

[1] Adi Susilo, Saripudin iip, Rizki Yuniarti and Andyni Yulfanis Aulia Masrifa. (2023), "An Empirical Study of Factors Affecting Repurchase Intention in Online Store in Indonesia During Pandemi Covid-19", Formosa Journal of Sustainable Research, Vol. 2 No. 1, pp. 255–266, doi: 10.55927/fjsr.v2i1.2503.

[2] Almaiah, M., Al-Otaibi, S., Lutfi, A., Almomani, O., Awajan, A., Alsaaidah, A., Alrawad, M., et al. (2022), "Employing the TAM Model to Investigate the Readiness of M-Learning System Usage Using SEM Technique", Electronics, Vol. 11 No. 8, p. 1259, doi: 10.3390/electronics11081259.

[3] Almaiah, M.A., Alfaisal, R., Salloum, S.A., Hajjej, F., Shishakly, R., Lutfi, A., Alrawad, M., et al. (2022), "Measuring Institutions' Adoption of Artificial Intelligence Applications in Online Learning Environments: Integrating the Innovation Diffusion Theory with Technology Adoption Rate", Electronics, Vol. 11 No. 20, p. 3291, doi: 10.3390/electronics11203291.

[4] Almaiah, M.A., Ayouni, S., Hajjej, F., Lutfi, A., Almomani, O. and Awad, A.B. (2022), "Smart Mobile Learning Success Model for Higher Educational Institutions in the Context of the COVID-19 Pandemic", Electronics, Vol. 11 No. 8, p. 1278, doi: 10.3390/electronics11081278.

[5] Al-Majali, M.M. (2020), "Influence of perceived risk dimensions on consumers' attitudes towards buying electric vehicles (EVs) in Jordan", Jordan Journal of Business Administration, Vol. 16 No. 2, pp. 445–472, doi: 10.35516/0338-016-002-006.

[6] Almousa, M. (2014), "The Influence of Risk Perception in Online Purchasing Behavior: Examination of an Early-Stage Online Market", International Review of Management and Business Research, Vol. 3 No. 2, pp. 779–787.

[7] Alrawad, M., Lutfi, A., Alyatama, S., Al Khattab, A., Alsoboa, S.S., Almaiah, M.A., Ramadan, M.H., et al. (2023), "Assessing Customers Perception of Online Shopping Risks: A Structural Equation Modeling–based Multigroup Analysis", Journal of Retailing and Consumer Services, Vol. 71, p. 103188, doi: 10.1016/j.jretconser.2022.103188.

[8] Amirtha, R., Sivakumar, V.J. and Hwang, Y. (2020), "Influence of Perceived Risk Dimensions on e-Shopping Behavioural Intention among Women—A Family Life Cycle Stage Perspective", Journal of Theoretical and Applied Electronic Commerce Research, Vol. 16 No. 3, pp. 320–355, doi: 10.3390/jtaer16030022.

[9] Azizi, S. and Javidani, M. (2010), "Measuring e-shopping intention: An Iranian perspective", African Journal of Business Managemen, Vol. 4 No. 13, pp. 2668–2675.

[10] Balhareth, H., Al-Debei, M.M., Johar MGM, Shukri, S.M., Alsoud, A.R. and Khatibi, A. (2021), "The E-Commerce and Online Marketing Era: Internet Shopping Risks", International Journal of EBusiness and EGovernment Studies, Vol. 13 No. 2, doi: 10.34109/ijebeg. 202113211.

[11] Bashir, S., Khwaja, M.G., Mahmood, A., Turi, J.A. and Latif, K.F. (2021), "Refining e-shoppers' perceived risks: Development and validation of new measurement scale", Journal of Retailing and Consumer Services, Vol. 58, p. 102285, doi: 10.1016/j.jretconser.2020.102285.

[12] Bauer R. A. (1960), "Consumer Behavior as Risk Taking", Proceedings of the 43rd National Conference of the American Marketing Association, June 15, 16, 17, Chicago, Illinois, 1960.

[13] Beneke, J., Greene, A., Lok, I. and Mallett, K. (2012), "The influence of perceived risk on purchase intent – the case of premium grocery private label brands in South Africa", Journal of Product & Brand Management, Vol. 21 No. 1, pp. 4–14, doi: 10.1108/10610421211203060.

[14] Bhatnagar, A., Misra, S. and Rao, H.R. (2000), "On risk, convenience, and internet shopping behavior", Communications of the ACM, Vol. 43 No. 11, pp. 98–105, doi: 10.1145/353360.353371.

[15] Bonnin, G. (2020), "The roles of perceived risk, attractiveness of the online store and familiarity with AR in the influence of AR on patronage intention", Journal of Retailing and Consumer Services, Vol. 52, p. 101938, doi: 10.1016/j.jretconser.2019.101938.

[16] Brewer, N.T., Weinstein, N.D., Cuite, C.L. and Herrington, J.E. (2004), "Risk Perceptions and Their Relation to Risk Behavior", Annals of Behavioral Medicine, Vol. 27 No. 2, pp. 125–130, doi:

10.1207/s15324796abm2702_7.

[17] CA Ingene, M.H. (1985), "Risk management by consumers", Research in Consumer Behavior, Vol. 1, pp. 103–158.

[18] Cemberci, M., Civelek, M.E. and Sozer, E.G. (2013), "The Determinants of Intention to Shop Online and Effects of Brand Equity on E-Store Patronage", Journal of Global Strategic Management |, Vol. 13, pp. 125–145.

[19] Chang, T.-S. (2021), "Social distancing in retail: Influence of perceived retail crowding and self-efficacy on employees' perceived risks", Journal of Retailing and Consumer Services, Vol. 62, p. 102613, doi: 10.1016/j.jretconser.2021.102613.

[20] Chauhan, V. and Shah, H. (2020), "An empirical analysis into sentiments, media consumption habits, nd consumer behaviour during the Coronavirus (COVID-19) outbreak.", Purakala, Vol. 31 No. 20, pp. 353–378, doi: 10.13140/RG.2.2.32269.15846.

[21] Cox, D.F. (1967), Risk Taking and Information Handling in Consumer Behavior, edited by Cox, D.F., Division of Research, Graduate School of Business Administration, Harvard University, Boston.

[22] Cox, D.F. and Rich, S.U. (1964), "Perceived Risk and Consumer Decision-Making—The Case of Telephone Shopping", Journal of Marketing Research, Vol. 1 No. 4, pp. 32–39, doi: 10.1177/002224376400100405.

[23] Crespo, Á.H., del Bosque, I.R. and de los Salmones Sánchez, M.M.G. (2009), "The influence of perceived risk on Internet shopping behavior: a multidimensional perspective", Journal of Risk Research, Vol. 12 No. 2, pp. 259–277, doi: 10.1080/13669870802497744.

[24] Cristian, M., Enache, E. and Ciorãoteanu, G. (2011), "Principles and Evolutions of the Internet Marketing", Ovidius University Annals, Economic Sciences Series, Ovidius University of Constantza, Faculty of Economic Sciences, Vol. 0 No. 1, pp. 1414–1419.

[25] Cunningham M. S. (1967), "The Major Dimensions of Perceived Risk", Risk Taking and Information Handling in Consumer Behavior.

[26] Daniel Silaban, Meiliana Jaunanda, F.F. (2020), "Perceived Risk and Intention to Purchase from Overseas Sellers in Shopee: Jabodetabek Consumer Perspective", Jurnal Ilmiah Manajemen Bisnis Dan Inovasi Universitas Sam Ratulangi, Vol. 7 No. 2, pp. 259–271.

[27] Demir, M.Ö. (2011), "Risk Algısının Marka Sadakatine Etkisi: Cep Telefonları Kategorisinde Bir Uygulama", Ege Akademik Bakis (Ege Academic Review), Vol. 11 No. 2, pp. 267–267, doi: 10.21121/eab.2011219570.

[28] F Farzianpour, M Pishdar, M.S. (2014), "Consumers' Perceived Risk and Its Effect on Adoption of Online Banking Services", American Journal of Applied Sciences, Vol. 11 No. 1, p. 47.

[29] F. Hair Jr, J., Sarstedt, M., Hopkins, L. and G. Kuppelwieser, V. (2014), "Partial least squares structural equation modeling (PLS-SEM)", European Business Review, Vol. 26 No. 2, pp. 106–121, doi: 10.1108/EBR-10-2013-0128.

[30] Fornell, C. and Larcker, D.F. (1981), "Evaluating Structural Equation Models with Unobservable Variables and Measurement Error", Journal of Marketing Research, Vol. 18 No. 1, pp. 39–50, doi: 10.1177/002224378101800104.

[31] Forster, P.W. and Ya Tang. (2005), "The Role of Online Shopping and Fulfilment in the Hong Kong SARS Crisis", Proceedings of the 38th Annual Hawaii International Conference on System Sciences, IEEE, pp. 271a–271a, doi: 10.1109/HICSS.2005.615.

[32] Forsythe, S., Liu, C., Shannon, D. and Gardner, L.C. (2006), "Development of a scale to measure the perceived benefits and risks of online shopping", Journal of Interactive Marketing, Vol. 20 No. 2, pp. 55–75, doi: 10.1002/dir.20061.

[33] Frik, A., Nurgalieva, L., Bernd, J., Lee, J.S., Schaub, F. and Egelman, S. (2019), "Privacy and security threat models and mitigation strategies of older adults", Proceedings of the 15th Symposium on Usable Privacy and Security, SCOUPS 2019, pp. 21–40.

[34] Gefen, D. and Straub, D.W. (2004), "Consumer trust in B2C e-Commerce and the importance of social presence: experiments in e-Products and e-Services", Omega, Vol. 32 No. 6, pp. 407–424, doi: 10.1016/j.omega.2004.01.006.

[35] Heikkilä, J., Pouta, E., Forsman-Hugg, S. and Mäkelä, J. (2013), "Heterogeneous Risk Perceptions: The Case of Poultry Meat Purchase Intentions in Finland", International Journal of Environmental Research and Public Health, Vol. 10 No. 10, pp. 4925–4943, doi: 10.3390/ijerph10104925.

[36] IBEF. (2023), "E-COMMERCE", No. August.

[37] Jain, R. and Kulhar, M. (2019), "Barriers to online shopping", International Journal of Business Information Systems, Vol. 30 No. 1, p. 31, doi: 10.1504/IJBIS.2019.097043.

[38] Kamalul Ariffin, S., Mohan, T. and Goh, Y.-N. (2018a), "Influence of consumers' perceived risk on consumers' online purchase intention", Journal of Research in Interactive Marketing, Vol. 12 No. 3, pp. 309–327, doi: 10.1108/JRIM-11-2017-0100.

[39] Kamalul Ariffin, S., Mohan, T. and Goh, Y.-N. (2018b), "Influence of consumers' perceived risk on consumers' online purchase intention", Journal of Research in Interactive Marketing, Vol. 12 No. 3, pp. 309–327, doi: 10.1108/JRIM-11-2017-0100.

[40] Karnik, S. (2014), "A study of dimensions of consumer's perceived risk and their influences on consumers buying behaviour.", Altius Shodh Journal of Management and Commerce, Vol. 1 No. 2, pp. 162–169.

[41] Khan, S.A., Liang, Y. and Shahzad, S. (2015), "An Empirical Study of Perceived Factors Affecting Customer Satisfaction to Re-Purchase Intention in Online Stores in China", Journal of Service Science and Management, Vol. 08 No. 03, pp. 291–305, doi: 10.4236/jssm.2015.83032.

[42] Kim, D.J., Ferrin, D.L. and Rao, H.R. (2008), "A trust-based consumer decision-making model in electronic commerce: The role of trust, perceived risk, and their antecedents", Decision Support Systems, Vol. 44 No. 2, pp. 544–564, doi: 10.1016/j.dss.2007.07.001.

[43] Ko, H., Jung, J., Kim, J. and Shim, S.W. (2004), "Cross-Cultural Differences in Perceived Risk of Online Shopping", Journal of Interactive Advertising, Vol. 4 No. 2, pp. 20–29, doi: 10.1080/15252019.2004.10722084.

[44] Lu, H., Hsu, C. and Hsu, H. (2005), "An empirical study of the effect of perceived risk upon intention to use online applications", Information Management & Computer Security, Vol. 13 No. 2, pp. 106–120, doi: 10.1108/09685220510589299.

[45] Meskaran, F., Ismail, Z. and Shanmugam, B. (2013), "Online purchase intention: Effects of trust and security perception", Australian Journal of Basic and Applied Sciences, Vol. 7 No. 6, pp. 307–315.

[46] Mitchell, V.-W. and Greatorex, M. (1993), "Risk Perception and Reduction in the Purchase of Consumer Services", The Service Industries Journal, Vol. 13 No. 4, pp. 179–200, doi: 10.1080/02642069300000068.

[47] Mofokeng, T.E. (2021), "The impact of online shopping attributes on customer satisfaction and loyalty: Moderating effects of e-commerce experience", edited by Tan, A.W.K.Cogent Business & Management, Vol. 8 No. 1, doi: 10.1080/23311975.2021.1968206.

[48] Nepomuceno, M.V., Laroche, M. and Richard, M.-O. (2014), "How to reduce perceived risk when buying online: The interactions between intangibility, product knowledge, brand familiarity, privacy and security concerns", Journal of Retailing and Consumer Services, Vol. 21 No. 4, pp. 619–629, doi: 10.1016/j.jretconser.2013.11.006.

[49] Pavlou, P.A. (2003), "Consumer Acceptance of Electronic Commerce: Integrating Trust and Risk with the Technology Acceptance Model", International Journal of Electronic Commerce, Vol. 7 No. 3, pp. 101–134, doi: 10.1080/10864415.2003.11044275.

[50] Rafqi Ilhamalimy, R. and Ali, H. (2021), "Model Perceived Risk and Trust: E-WOM and Purchase Intention (The Role of Trust Mediating in Online Shopping in Shopee Indonesia)", Dinasti International Journal of Digital Business Management, Vol. 2 No. 2, pp. 204–221, doi: 10.31933/dijdbm.v2i2.651.

[51] Ray, S.K. and Sahney, S. (2018), "Indian consumers' risk perception in buying green products: the case of LED light bulbs", Asia Pacific Journal of Marketing and Logistics, Vol. 30 No. 4, pp. 927–951, doi: 10.1108/APJML-08-2017-0181.

[52] Roselius, T. (1971), "Consumer Rankings of Risk Reduction Methods", Journal of Marketing, Vol. 35 No. 1, pp. 56–61, doi: 10.1177/002224297103500110.

[53] Shin, H. and Kang, J. (2020), "Reducing perceived health risk to attract hotel customers in the COVID-19 pandemic era: Focused on technology innovation for social distancing and cleanliness", International Journal of Hospitality Management, Vol. 91, p. 102664, doi: 10.1016/j.ijhm.2020.102664.

[54] Siegrist, M. and Árvai, J. (2020), "Risk Perception: Reflections on 40 Years of Research", Risk Analysis, Vol. 40 No. S1, pp. 2191–2206, doi: 10.1111/risa.13599.

[55] Song, M., Xing, X., Duan, Y., Cohen, J. and Mou, J. (2022), "Will artificial intelligence replace human customer service? The impact of communication quality and privacy risks on adoption intention", Journal of Retailing and Consumer Services, Vol. 66, p. 102900, doi: 10.1016/j.jretconser.2021.102900.

[56] Soto-Acosta, P., Jose Molina-Castillo, F., Lopez-Nicolas, C. and Colomo-Palacios, R. (2014), "The effect of information overload and disorganisation on intention to purchase online", Online Information Review,

Vol. 38 No. 4, pp. 543–561, doi: 10.1108/OIR-01-2014-0008.

[57] Stone, R.N. and Grønhaug, K. (1993), "Perceived Risk: Further Considerations for the Marketing Discipline", European Journal of Marketing, Vol. 27 No. 3, pp. 39–50, doi: 10.1108/03090569310026637.

[58] Taylor, J.W. (1974), "The Role of Risk in Consumer Behavior", Journal of Marketing, Vol. 38 No. 2, pp. 54–60, doi: 10.1177/002224297403800211.

[59] Teng, W., Lu, H.-P. and Yu, H. (2009), "Exploring the mass adoption of third-generation (3G) mobile phones in Taiwan", Telecommunications Policy, Vol. 33 No. 10–11, pp. 628–641, doi: 10.1016/j.telpol.2009.07.002.

[60] Teo, T.S.H. and Yu, Y. (2005), "Online buying behavior: a transaction cost economics perspective", Omega, Vol. 33 No. 5, pp. 451–465, doi: 10.1016/j.omega.2004.06.002.

[61] Tham, K.W., Dastane, O., Johari, Z. and Ismail, N.B. (2019), "Perceived Risk Factors Affecting Consumers' Online Shopping Behaviour", Journal of Asian Finance, Economics and Business, Vol. 6 No. 4, pp. 245–256, doi: 10.2139/ssrn.3498766.

[62] Tikhomirova, A., Huang, J., Chuanmin, S., Khayyam, M., Ali, H. and Khramchenko, D.S. (2021), "How Culture and Trustworthiness Interact in Different E-Commerce Contexts: A Comparative Analysis of Consumers' Intention to Purchase on Platforms of Different Origins", Frontiers in Psychology, Vol. 12, doi: 10.3389/fpsyg.2021.746467.

[63] Wang, Y. and Hazen, B.T. (2016), "Consumer product knowledge and intention to purchase remanufactured products", International Journal of Production Economics, Vol. 181, pp. 460–469, doi: 10.1016/j.ijpe.2015.08.031.

[64] Wu, X., Qi, W., Hu, X., Zhang, S. and Zhao, D. (2017), "Consumers' purchase intentions toward products against city smog: exploring the influence of risk information processing", Natural Hazards, Vol. 88 No. 1, pp. 611–632, doi: 10.1007/s11069-017-2884-5.

[65] Youn, H. and Kim, J.-H. (2018), "Is unfamiliarity a double-edged sword for ethnic restaurants?", International Journal of Hospitality Management, Vol. 68, pp. 23–31, doi: 10.1016/j.ijhm.2017.09.003.

[66] Zendehdel, M., Paim, L.H. and Delafrooz, N. (2016), "The moderating effect of culture on the construct factor of perceived risk towards online shopping behaviour", edited by Wright, L.T. Cogent Business & Management, Vol. 3 No. 1, p. 1223390, doi: 10.1080/23311975.2016.1223390.

[67] Zepeda, L., Douthitt, R. and You, S. (2003), "Consumer Risk Perceptions Toward Agricultural Biotechnology, Self-Protection, and Food Demand: The Case of Milk in the United States", Risk Analysis, Vol. 23 No. 5, pp. 973–984, doi: 10.1111/1539-6924.00374.

[68] Zhang, L., Tan, W., Xu, Y. and Tan, G. (2011), "Dimensions of perceived risk and their influence on consumers' purchasing behavior in the overall process of B2C", Lecture Notes in Electrical Engineering, Vol. 111 LNEE, pp. 1–10, doi: 10.1007/978-3-642-24823-8_1.

[69] Zhang, X. and Yu, X. (2020), "The Impact of Perceived Risk on Consumers' Cross-Platform Buying Behavior", Frontiers in Psychology, Vol. 11, pp. 1–13, doi: 10.3389/fpsyg.2020.592246.