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Mitigating Online Risk Through Trust: A TPB Approach

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Abstract: In the growing digital economy, online shopping presents inherent risks, especially post-pandemic, making consumer trust a critical factor. The Theory of Planned Behavior (TPB) offers a framework for understanding these dynamics and their impact on consumer behaviour. This study explores how trust mitigates perceived online shopping risks, influencing consumer purchase decisions and intentions. The study uses a quantitative approach, surveying 251 consumers who engaged in online shopping during the pandemic and employing TPB to assess trust's mediating role in reducing perceived risks. The study reveals that financial, product, and security risks negatively affect online purchase intention, while trust significantly mediates these effects, enhancing consumer confidence in digital platforms. E-commerce platforms should build trust by improving security, product quality, transparency, and customer service to reduce perceived risks and drive purchase intention. This study integrates multiple risk dimensions within the TPB framework and highlights trust as a pivotal mediator, particularly in the post-pandemic era.
Keywords: Risk Factors; Trust; TPB; Online Purchase Intention; COVID-19.

Abstrak: Dalam ekonomi digital yang terus berkembang, belanja online menghadirkan risiko, terutama pasca pandemi, sehingga kepercayaan konsumen menjadi faktor penting. Teori Perilaku Berencana (TPB) menawarkan kerangka untuk memahami dinamika ini dan dampaknya pada perilaku konsumen.Studi ini meneliti bagaimana kepercayaan memitigasi risiko belanja online yang dirasakan dan memengaruhi keputusan serta niat pembelian konsumen.Penelitian ini menggunakan pendekatan kuantitatif dengan menyurvei 251 konsumen yang berbelanja online selama pandemi, dan menggunakan TPB untuk menilai peran mediasi kepercayaan dalam mengurangi risiko yang dirasakan.Penelitian menunjukkan bahwa risiko finansial, produk, dan keamanan secara negatif memengaruhi niat pembelian online, sementara kepercayaan secara signifikan memediasi dampak tersebut, meningkatkan kepercayaan konsumen terhadap platform digital.Platform e-commerce harus fokus membangun kepercayaan dengan meningkatkan keamanan, kualitas produk, transparansi, serta layanan pelanggan untuk mengurangi risiko yang dirasakan dan mendorong niat pembelian. Studi ini secara unik mengintegrasikan beberapa dimensi risiko dalam kerangka TPB dan menyoroti kepercayaan sebagai mediator kunci, terutama di era pasca pandemi.
Kata Kunci: Faktor Risiko; Kepercayaan; TPB; Niat Pembelian Online; COVID-19.

INTRODUCTION

Indonesia is grappling with substantial challenges stemming from the repercussions of the Coronavirus Disease (COVID-19), exacerbated by stringent measures such as community social activity restrictions and work-from-home directives. These measures have significantly propelled the surge in online shopping trends (Al-Dmour et al., 2022). This shift underscores the critical need to discern the factors influencing online purchase intentions as e-commerce gravitates toward online retail shopping (Ahmed et al., 2017).

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Online shopping is considered risky in the electronic marketplace (Al-Mousa, 2017). This suggests that individuals engaging in online shopping may incur monetary losses due to unsatisfactory products that do not justify the higher prices paid (Harahap, 2020). Moreover, products may fail to meet the performance standards initially depicted on the website, such as their colour, shape, and appearance (Han & Kim, 2017). In addition to convenience, online purchases may entail a certain level of risk concerning security measures and delivery times due to consumers' expectations regarding the quality of product information on websites, online transactions, and shipping (Taufik & Hanafiah, 2019). Furthermore, online buyers may face the prospect of diminished self-esteem due to frustration stemming from failing to achieve their purchasing goals and dissatisfaction with selecting poor-quality products or services (Rahi et al., 2021). Substandard products or services can lead to unfavourable consumer evaluations and assessments based on their preferences (Wu & Wu, 2018).

According to We Were Social, in 2020, there were 175.400 million internet users in Indonesia, indicating a 17 per cent increase or 25 million internet users in the country, with percentages of internet users aged 16 to 64 owning various types of devices, including mobile phones (96 per cent), smartphones (94 per cent), non-smartphone mobile phones (21 per cent), laptops or desktop computers (66 per cent), tablets (23 per cent), game consoles (16 per cent), and even virtual reality devices (5.100 per cent). The surge in online purchases is attributed to the phenomenon of panic buying. Panic buying is defined as consumer behaviour involving the bulk purchase of products to avoid shortages in the future (Shiau et al., 2020). Historically, (Ghouri et al., 2021) reported that panic buying emerged during the Spanish flu epidemic 1918. Besides epidemics, panic buying can also occur during the anticipation of natural disasters (Wekeza & Sibanda, 2019) and non-natural disasters such as nuclear crises (Gao & Shi, 2017). During the COVID-19 pandemic, (Garfin et al., 2020) argue that panic buying arises as a response to stress.

Meanwhile, (Arafat et al., 2020) suggest that the cause of panic buying stems from consumer behaviour factors, particularly the perception of scarcity of goods. This implies that panic buying can occur because many individuals perceive that certain items will become scarce during disease outbreaks. Panic buying manifests as individuals' anxiety and fear resulting from a threat (Wang et al., 2017). The COVID-19 pandemic has prompted consumers and traders to engage in business through digitalised electronic transactions. Traditional markets have begun entering marketplaces to promote their products for online sales, ensuring that their merchandise is sold. Additionally, some retailers have started selling their products online independently, utilising social media platforms such as WhatsApp groups and others, promoting cash-on-delivery services to attract customers to purchase their products (Harahap, 2020).

Beyond merely becoming a habit, increasing online shopping necessitates considering the risks of purchasing products online. Individuals' attitudes significantly impact their online shopping behaviour (Amoroso & Lim, 2017). (Al-Mousa, 2017) asserts that perceived risks in online shopping negatively influence the intention to purchase products online. (Ahmed et al., 2017) indicate that consumers tend to perceive higher risks when shopping online. Online shopping methods differ from traditional transactions, having evolved into more sophisticated processes, thereby exposing and increasing consumers' perceived vulnerabilities to online shopping imbalances.

(Al-Dmour et al., 2022) identifies six additional dimensions of perceived risks, including social, financial, physical, performance, time, and psychological risks (Wu &

Wu). (Duerte et al., 2018) Examine four dimensions of perceived risk in their purchase intention study, encompassing functional, financial, physical, and psychological risks. (Han & Kim, 2017) investigate multidimensional perceived risks, including financial, privacy, product, security, social/psychological, and time-related risks. (Al-Mousa, 2017) emphasises that product, financial, and security risks are the most influential.

The ISACA report "The Global State of Cybersecurity 2020: Threat Landscape and Security Practices" also highlights social engineering as the most significant threat during the pandemic, accounting for 15 per cent of the total. Another form of social engineering fraud is phone scams, where perpetrators deceive individuals through the telephone. Additionally, impersonation, wherein perpetrators impersonate official individuals or institutions to collect consumers' personal information, is another prevalent type of social engineering scam (Wilson et al., 2021).

According to the World Economic Forum in July, digital transactions have become increasingly common during the COVID-19 pandemic. This includes transactions through e-commerce applications (42 per cent), e-banking (34 per cent), food delivery services (34 per cent), digital wallets (27 per cent), and others. Meanwhile, Bank Indonesia notes that from January to July 2020, the monthly value of electronic money transactions reached Rp 16.700 trillion. This figure represents a 59 per cent increase compared to last year's period, which amounted to Rp 9.900 trillion (Shiau et al., 2020).

Research conducted by Nielsen in March and McKinsey & Company in July suggests that Indonesian consumers exhibit a propensity for utilising digital technology but often lack awareness regarding the importance of safeguarding digital data. Consequently, this has led to a surge in fraudulent activities. Kaspersky's research in September 2020 reveals that 38 per cent of internet users in Southeast Asia overlook security measures while browsing the internet amidst the COVID-19 pandemic. Alarmingly, data from the International Telecommunication Union indicates that over 90 per cent of countries, including Indonesia, do not adequately prioritise cybersecurity. This situation is particularly concerning given the onset of a new digital lifestyle amid the COVID-19 pandemic, heightening society's reliance on digital platforms.

The e-commerce landscape via various social media platforms presents positive and negative facets. On the one hand, it enhances the convenience of buying and selling transactions, albeit at the expense of buyers' inability to physically inspect or select items beyond the seller's displayed images. Moreover, challenges in completing payments, mainly due to time-limited payment methods, pose occasional hurdles. Despite the availability of diverse payment methods such as mobile banking, ATMs, internet banking, transfers, credit cards, and cash on delivery, the complexity of obtaining refunds in case of cancelled transactions by the seller remains a significant issue. Such challenges can profoundly impact consumer trust in e-commerce services. Trust, defined by (Keni, 2020) as the perception of buyers regarding the ethical and correct provision of online shopping services by vendors, is pivotal in shaping consumer behaviour. (Marimuthu, 2019) trust is the willingness of online shopping service providers to meet customers' expected needs. Acknowledging trust as the bedrock of business, extensive literature underscores its significant influence on consumer behaviour, mediating the relationship between risk factors and purchase intentions.

The COVID-19 pandemic has accelerated the adoption of electronic transactions, necessitating a deeper understanding of the inherent risks associated with online shopping (Al-Mousa, 2017). Consumer attitudes significantly influence online shopping behaviours

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(Kamalul Ariffin et al., 2018). Additionally, panic buying, highlighted by (Arafat et al., 2020), is driven by consumer perceptions of goods scarcity, reflecting individual anxieties in response to perceived threats (Wilson et al., 2021). This crisis has precipitated a paradigm shift towards electronic transactions facilitated by digitalisation (Khosravi, 2020).

Traditional markets have responded by migrating to online platforms and harnessing social media channels such as WhatsApp groups, often coupled with cash-on-delivery promotions to entice consumers (Harahap, 2020). Recognising and comprehending these risks, particularly amid the surge in online crimes during the pandemic, is paramount. Scholars have expanded the dimensions of perceived risk to encompass social, financial, physical, performance, time, and psychological realms (Wu & Wu, 2018). Research has delved into various perceived risk facets, emphasising product, financial, and security risks as influential factors (Han & Kim, 2017; Al-Mousa, 2017). Trust emerges as a pivotal factor shaping consumer attitudes towards online purchases (Shiau et al., 2020), with evidence suggesting its mediating role between risk factors and purchase intentions (Taufik & Hanafiah, 2019). This study investigates the interplay between financial risk, product risk, security risk, trust, and online purchase intention, offering valuable insights into consumer behaviours across diverse e-commerce landscapes.

This research offers novelty by examining the relationship between financial risk, product risk, security risk, trust, and online purchase intention in the post-pandemic era. Unlike previous studies that primarily focus on one or two dimensions of risk in e-commerce, this research integrates multiple risk dimensions, particularly in the COVID-19 pandemic, which has accelerated the shift toward digital transactions. Furthermore, this study addresses a gap in the literature by focusing on Indonesian consumer behaviour, which has unique characteristics regarding digital technology usage but still lacks awareness regarding the importance of digital data security. The study also considers the role of trust as a mediator linking various risk factors with online purchase intentions. This approach has been underexplored in the context of Indonesia and Southeast Asia.

THEORETICAL REVIEW

Theory of Planned Behaviour. The interpretation of various effects and losses, encompassing financial, product, psychological, social, time, and security impacts, is integral within the theoretical framework discussed by (Amoroso & Lim, 2017). This theory represents a significant advancement and refinement of the Theory of Reasoned Action (TRA), addressing its inherent limitations. A fundamental distinction between this theoretical model and its predecessor lies in incorporating an additional element in the construction model known as Perceived Behavioral Control (PBC), which denotes an individual's perception of their ability to regulate their attitude. The Theory of Planned Behavior (TPB) stands out for its robust predictive capacity. It finds widespread application across diverse fields, particularly in marketing research encompassing purchasing attitudes, advertising, and public relations.

Furthermore, TPB is increasingly employed to understand behaviour in emerging domains such as online activities and contemporary issues like eco-friendly products, health promotion, and entrepreneurial inclinations. The inclusion of risk perception within the TPB framework, as evidenced by (Raza et al., 2018), is warranted given its direct influence on intentions and behaviours, as underscored by scholars such as (Ahmed et al.,

2017); (Chakraborty 2019); (Keni, 2020). Conversely, consumer knowledge emerges as a crucial construct for elucidating or predicting consumer consumption behaviours, closely intertwined with risk perceptions.

Scholars have observed a paradigm shift in consumer behaviour, with the COVID-19 pandemic catalysing heightened digitalisation and online engagement (Khosravi, 2020). This transition has prompted traditional markets to reevaluate their strategies and embrace online platforms as viable avenues for reaching customers (Harahap, 2020). However, amidst the burgeoning online marketplace, consumers face many risks that necessitate careful consideration. Scholars have identified various dimensions of perceived risk, ranging from financial and security concerns to social and psychological factors (Wu & Wu, 2018). Understanding these risks is essential for businesses seeking to build trust and credibility with their online consumers (Shiau et al., 2020). Moreover, trust cannot be understated in shaping consumer attitudes and purchase intentions (Taufik & Hanafiah, 2019). By fostering trust and addressing consumer concerns, businesses can enhance competitiveness and cultivate long-term relationships with online customers. As the e-commerce landscape evolves, research into consumer behaviours and the factors influencing online purchase intentions will remain crucial for informing strategic decision-making and driving sustainable growth in the digital marketplace. This evolution necessitates ongoing exploration into novel technologies, such as artificial intelligence and augmented reality, which have the potential to reshape the online shopping experience and further influence consumer behaviours (Keni, 2020). Additionally, the emergence of new regulatory frameworks and data privacy concerns underscore the importance of ethical business practices and transparency in digital transactions (Haque et al., 2020). Thus, as businesses navigate the complexities of the digital marketplace, a multifaceted approach that encompasses technological innovation, ethical considerations, and consumer-centric strategies will be pivotal for sustained success in the rapidly evolving landscape of e-commerce.

Online Purchase Intention. Interest in making consumer purchases is often influenced by multiple factors, including perceived value and the attractiveness of products or services sellers offer. This sentiment is echoed by (Lin et al., 2020), who suggest that consumers are more inclined to make purchases when they perceive value or are positively influenced by the offerings. Moreover, as discussed (Wekeza & Sibanda, 2019), consumer shopping orientation encompasses a broad spectrum of considerations such as brand awareness, pricing perceptions, perceived risks, and the convenience of the shopping experience. These elements collectively shape consumers' purchasing attitudes and influence their decision-making processes.

Furthermore, online purchase intention is critical to contemporary consumer behaviour, particularly in the digital marketplace. (Rahi et al., 2021) assert that online purchase intention is rooted in the initial desire to engage in transactions via online platforms. Similarly, (Ghouri et al., 2021) define online purchase intention as customers' readiness to conduct online transactions. This readiness, often referred to as online purchase intentions (Keni, 2020), signifies the willingness of online shoppers to utilise virtual shopping platforms for their purchases.

The concept of online purchase intention aligns with the notion that consumer decision-making in online shopping involves various stages, culminating in the intention to utilise a website and complete a transaction. Thus, online purchase intention is a pivotal determinant of consumer behaviour in the digital realm, as highlighted by (Pereira & Tam,

2021). It represents the point at which consumers are prepared to interact with sellers, motivated by the prospect of attaining specific benefits or positive perceptions associated with the products or services offered, as articulated by (Rahi et al., 2021).

Understanding the dynamics of online purchase intention is essential for businesses operating in the digital marketplace. By comprehending the factors influencing consumers' readiness to make online purchases, businesses can tailor their strategies to enhance customer engagement and drive sales. Additionally, fostering trust and providing a seamless shopping experience is crucial for cultivating positive online purchase intentions among consumers, ultimately contributing to the long-term success of businesses in the digital landscape.

Perceived Risk. Perceived risk is fundamental in consumer behaviour, particularly online transactions. (Wu & Wu, 2019) define perceived risk as the uncertainty consumers face when they cannot anticipate the potential outcomes of their transaction decisions. (Al-Dmour et al., 2022) further elaborate on this notion, describing perceived risk as the apprehension arising from consumers' perception of uncertain situations and the anticipated losses associated with their purchasing decisions. (Bonfanti et al., 2021) Add to this understanding by characterising perceived risk as a subjective assessment of the negative consequences of consumer decisions in product purchases. In online transactions, the perceived risk extends to online risk perception, which (Duarte et al., 2018) define as consumers' perceptions of the potential adverse outcomes of online transactions. Financial risk emerges as a significant concern among the various dimensions of perceived risk, influencing consumers' online purchase behaviour. (Giao et al., 2020) emphasise that financial risk, representing the potential for monetary loss in transactions, significantly impacts the decline in online purchases. This sentiment is echoed by (Jang et al., 2020), who found a negative relationship between perceived risk, particularly financial risk, and online shopping behaviour. Similarly, (Long & Khoi, 2020) highlight that various forms of financial loss, such as credit card fraud or receiving lower-quality products, deter online shopping and negatively affect online purchase intentions. Based on the discussion above, thus:

H1: There is a negative and significant influence of financial risk on online purchase intentions.

In addition to financial risk, product risk is another critical factor influencing consumers' attitudes towards online shopping. (Duarte, 2018) notes that product risk, stemming from factors such as high prices and limited information about products on websites, contributes to consumers' reluctance to make online purchases. (Bonfanti et al., 2021) Further, consumers may perceive product risk when encountering difficulties evaluating products, mainly when inadequate information is available online. (Han & Kim, 2017) study in China's central online marketplace corroborates this, demonstrating that product risk negatively affects consumers' purchase intentions. Thus, based on the explanation above.

H2: Product risk negatively and significantly affects online purchase intentions.

Security risk represents another dimension of perceived risk that significantly influences consumers' online purchase intentions. (Marimuthu, 2019) defines security risk

as the potential loss resulting from online fraud or hacking, which compromises the security of internet transactions and online users. (Najib et al., 2022) elaborate on this, highlighting that security risk pertains to exposing sensitive financial information, such as credit card numbers and account details, to unauthorised parties. (Nguyen, 2020) further supports this notion by identifying a significant relationship between security risk and the intention to buy online. Moreover, (Nguyen et al., 2021) suggest that implementing robust privacy policies can mitigate perceived security risks, thereby boosting consumers' intentions to purchase items online. Accordingly.

H3: Security risk negatively and significantly affects online purchase intentions.

In summary, perceived risk, encompassing financial, product, and security dimensions, is pivotal in shaping consumers' online purchase intentions. Acknowledging and addressing these concerns is essential for businesses seeking to foster trust and confidence among online shoppers, ultimately influencing their propensity to engage in online transactions.

The mediating role of trust. Trust is a multifaceted construct crucial in shaping consumer behaviour in online transactions. (Panghal et al., 2017) Highlight the complexity of trust, emphasising that individuals often lack insight into the motives and intentions of others. (Wang et al., 2017) define trust as the willingness of customers to overlook potential weaknesses in online transactions based on their positive expectations regarding the future behaviour of online stores. This underscores the importance of trust in fostering confidence and facilitating successful interactions in the digital marketplace. (Saleem et al., 2017) Further assert that trust directly influences online shopping intentions, indicating its significance in consumer decision-making.

Moreover, trust is crucial in mitigating perceived risks associated with online transactions. Consumers rely on trust, particularly when perceiving risks in purchasing decisions. For instance, (Suhaily & Soelasih, 2017) discuss product risk, which refers to the perception that purchased products may fail to meet expectations. This perception is exacerbated by the challenge consumers face in accurately evaluating the quality of products bought online, as highlighted by (Wu & Wu, 2019). (Wilson et al., 2021) trust plays a pivotal role in shaping the quality of relationships between consumers and online retailers. (Shiau et al., 2020) support this notion by indicating that high levels of trust can reduce the likelihood of consumers switching to alternative service providers, underscoring the role of trust in fostering loyalty and commitment.

Additionally, trust acts as a buffer against security risks, which can undermine consumer confidence in online transactions. (Taufik & Hanafiah, 2019) Provide evidence that security risks diminish consumer confidence, reducing their willingness to purchase online. Similarly, (Wu & Wu, 2019) emphasises the detrimental impact of security risks on consumer buying interest, highlighting the need for robust security measures to bolster trust and reassure consumers. Furthermore, (Raza et al., 2018) note that all online products carry inherent risks, as they may not always function as expected or match their physical descriptions. This discrepancy often stems from challenges in comprehending product specifications on online platforms, exacerbating consumer uncertainty and emphasising the importance of trust in alleviating such concerns. Thus, trust emerges as a critical element in enhancing consumer confidence and reducing perceived risks, ultimately facilitating smooth and successful online transactions (Ghouri et al., 2021).

H4a: Trust mediates the relationship between financial risk and online purchase intention.
H4b: Trust Mediates the Relationship between Product Risk and Online Purchase Intention.
H4c: Trust Mediates the Relationship between Security Risk and Online Purchase Intention.
H5: Trust has a positive and significant effect on online purchase intentions.
H6: Financial Risk has a negative and significant effect on trust.
H7: Product risk has a negative and significant effect on trust.
H8: Security Risk has a negative and significant influence on trust.

Research Framework. This study builds on previous research, including three variables: product risk, financial risk, and security risk. According to previous studies, these risks are the determining factors for online purchase intentions. Meanwhile, the research conducted by (Jang et al., 2020) includes time, social, and security risks. The theoretical framework for this study is demonstrated (Ariffin et al., 2018).

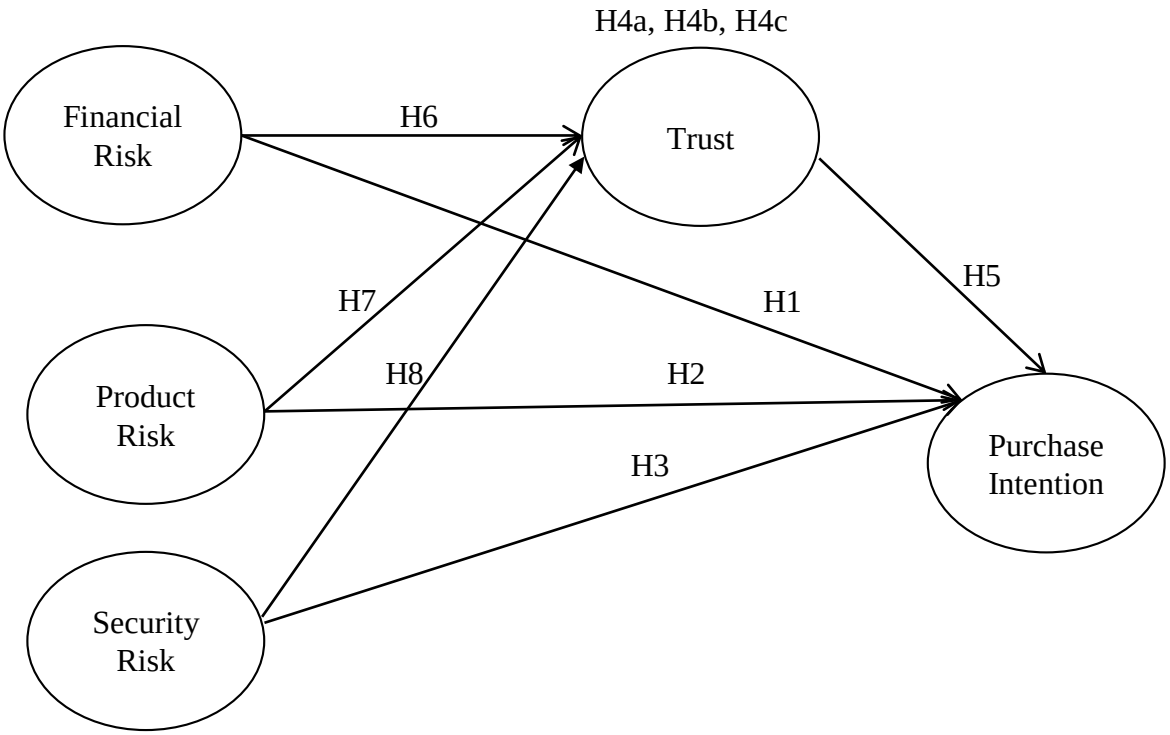

Figure 1. Model Research

METHODS

Construct measurements. Data was collected using quantitative methods and a self-administered questionnaire. A five-point Likert scale (1 = "strongly disagree" to 5 = "strongly agree") was used to assess responses from respondents. FR consists of 3 dimensions adapted from (Kamalul Ariffin et al., 2018), PR adapted three items from (Kamalul Ariffin et al., 2018), SR adapted two items from (Han & Kim, 2017) and (Kamalul Ariffin et al., 2018), TRUST adapted three items from (Ahmed et al., 2017),

while OPI ((Al-Mousa & Al-Saud, 2017). Respondent profiles will also be included, highlighting gender, age, education level, spending, and frequency. There are a total of 214 respondents in this study.

Data collection and samples. In this study, the population is the general public who have purchased products through e-commerce platforms throughout Indonesia; respondents are consumers who have purchased online through several online shops/e-commerce platforms, at least during the pandemic. Covid 19 since March 2020 to December 2020, With a minimum age of 18. The ideal and representative sample size is 100-200, depending on the number of variable indicators estimated (Hair et al., 2018). the number of samples as respondents must be adjusted to the number of question indicators used in the questionnaire, assuming n x 5 observed variables (indicators) up to n x 10 observed variables (indicators). The number of samples in this study was 214. Then, the data were analysed using SmartPLS 3.3.2 to assess the direct and indirect relationships in the structural model. SmartPLS was applied because this study introduced the variables used in the TPB framework. Due to the variant-based algorithm, SmartPLS is more suitable for theory extension (Hair et al., 2018).

RESULTS

Respondents' profile. Of respondents in this study, 52 per cent were male, with an age range of 66.400 per cent between the ages of 26 to 35, 80 per cent of respondents with a bachelor's degree (S1), 45 per cent of respondents in this study came from Jakarta, 54 per cent were respondents who do online shopping 1 to 2 times a month, the most significant expenditure in online transactions is Rp. 200,000 to Rp. 500,000, where there are 147 respondents (68.700 percent). It can be seen in **Table 1.**

Table 1. Respondents' profile

Demographic profile		Frequency	Percentage
Gender	Male	112	52
	Female	102	48
Age	Less than 25 yo	26	12.100
	26 to 35 yo	142	66.400
	36 to 45 yo	46	21.500
Education level	High School	31	14
	Bachelor	171	80
	Master	10	5
	Doctoral	2	1
Frequency of online shopping per month	1 to 2 time	115	54
	3 to 5 time	74	35
	6 to 9 time	16	7
	More than 10 time	9	4
Spending on online shopping	Less than IDR. 100.000	21	9.800
	IDR. 200.000 to IDR.500.000	147	68.700
	IDR. 600.000 to IDR. 900.000	12	5.600
	More than IDR. 1.000.000	34	15.900

Source: Data processed 2024

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Measurement model assessment (outer model). The outer model is the parameter of the measurement model (convergent validity, discriminant validity, composite reliability, and Cronbach's alpha). Including the value as a parameter of the accuracy of the prediction model. The results show that the outer loading value ranges from 0.714 to 0.899, undoubtedly more significant than 0.500 (Hair et al., 2018). Meanwhile, the AVE value ranges from 0.589 to 0.754, representing the appropriate convergent validity (Hanseler et al., 2020). Finally, the composite reliability value (CR) ranged from 0.904 to 0.949. Overall, the measurement model assessment results for the first outer model above are based on the required limit value.

Table 2. Measurement Model Assessment (Outer Model)

Construct	Item	Loadings	CR	AVE
FR	I will spend a lot of money when shopping online.	0.860	0.949	0.757
	Transacting with online sellers takes much time.	0.865		
	Shopping online could make my credit/debit card account insecure.	0.872		
	The online shop/e-commerce will be responsible if there is a problem during the transaction	0.860		
	I do not trust online companies	0.866		
PR	The product's price in the online shop suits the quality of the product the seller offers.	0.894	0.945	0.741
	I am worried that I will receive a product that does not suit with the one ordered online.	0.899		
	I may not get a product that matches the price I ordered online.	0.848		
	It is challenging to know the quality of a product through the internet.	0.878		
	I may always have doubts about product quality when buying online	0.874		
	Generally, products sold online cannot be accounted for for the quality of their products	0.836		
	Product quality can only be known from buyer reviews, photos, and descriptions displayed by the online shop	0.829		
SR	I am confident that third parties will not misuse the personal information I provide.	0.877	0.910	0.716
	Online shop/e-commerce offers sufficient security for online transactions.	0.818		
	Online shop/e-commerce will protect customers' data.	0.850		
	I feel that online transactions at online shops/e-commerce are protected	0.839		
TRUST	The products sold in the Online Shop/e-commerce are of good quality.	0.782	0.904	0.611
	The online shop/e-commerce has good intentions to provide satisfaction to its customers.	0.784		
	The information provided by the online shop/e-commerce is in line with expectations.	0.769		

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	The information submitted by the online shop/e-commerce is very detailed about the products sold.	0.817		
	Sellers in online shops/e-commerce are very transparent about all the information that the customer needs.	0.805		
	Visualisation of the product clarity available in online stores is an attraction for customers to visit.	0.731		
	I plan to shop online shortly.	0.767		
	I decided to make an online purchase because the products matched my needs.	0.839		
	I recommend to my friends and family that shopping at an online shop/e-commerce is the right decision.	0.714		
	Making online purchases in the future is a very good idea	0.762		
OPI	I feel that the products offered by online shop/e-commerce provide benefits to their customers	0.771	0.920	0.589
	I make online purchases because my products mean a lot to me.	0.802		
	I decided to shop online because I liked the products offered more than other products	0.729		
	I feel that the products in the online shop that I choose offer a wide selection of products	0.748		

Source: Data processed 2024

Table 2 shows that the discriminant validity assessment used the Fornell-Larcker criteria and the Heterotrait-Monotrait Ratio (HTMT) (Hair et al., 2018). Tests assess whether each construct is entirely separate from the other constructs. The Fornell-Larcker test shows that all values on the diagonal (in bold) are more significant than adjacent values. This shows that all constructs are different from each other. **Table 3** describes the discriminant validity based on the Fornell-Larcker criteria.

Meanwhile, HTMT requires the ratio between the correlation of items measuring different constructs and those measuring the same construct, which must be below 0.850 (Hair et al., 2018). **Table 4** illustrates that all values are below 0.850. Thus, the discriminant validity of the measurement model has been established.

The Fornell-Larcker Criterion is a technique utilised in structural equation modelling (SEM) to evaluate the discriminant validity of constructs within a measurement model. It assesses whether the constructs are distinct by comparing the square root of the average variance extracted (AVE) for each construct with the correlations between that construct and others in the model. Discriminant validity is confirmed when the AVE of a construct is higher than its correlations with other constructs. In the provided matrix, the diagonal elements represent the square root of the AVE for each construct, while off-diagonal elements represent the correlations between constructs.

Table 3. Discriminant validity assessment (Fornell–Larcker criterion)

	Financial Risk	Product Risk	Security Risk	Trust	Purchase Intention
Financial Risk	0.870				
Product Risk	0.430	0.861			
Security Risk	0.388	0.628	0.846		
Trust	-0.237	-0.206	-0.277	0.782	
Purchase Intention	-0.328	-0.374	-0.387	0.415	0.767

Source: Data processed 2024

Table 3 shows that The examination of the discriminant validity of constructs within the measurement model reveals varying degrees of correlation and average variance extracted (AVE) values. Although specific AVE values for Trust and Purchase Intention are absent, the correlations between these constructs and others are provided. For Financial Risk, despite a high AVE value of 0.870, the absence of the square root complicates the evaluation. However, its correlations with other constructs, such as Product Risk (0.430), Security Risk (0.388), Trust (-0.237), and Purchase Intention (-0.328), suggest potential associations that warrant further investigation. Similarly, Product Risk exhibits a high AVE of 0.861 and demonstrates correlations with Financial Risk (0.430), Security Risk (0.628), Trust (-0.206), and Purchase Intention (-0.374). Security Risk, with an AVE of 0.846, displays correlations with Financial Risk (0.388), Product Risk (0.628), Trust (-0.277), and Purchase Intention (-0.387). Despite the lack of AVE values for Trust and Purchase Intention, their correlations with other constructs suggest potential relationships deserving closer scrutiny. Trust's correlations with Financial Risk (-0.237), Product Risk (-0.206), Security Risk (-0.277), and Purchase Intention (0.782) indicate notable associations. Similarly, the correlations of Purchase Intention with Financial Risk (-0.328), Product Risk (-0.374), Security Risk (-0.387), and Trust (0.415) highlight potential interconnectedness between constructs. These findings underscore the complexity of relationships within the measurement model and emphasise the need for further exploration to elucidate the discriminant validity of the constructs under study.

The Heterotrait-Monotrait Ratio (HTMT), as shown in **Table 4**, serves as a tool within structural equation modelling (SEM) to gauge discriminant validity. Its purpose is to determine if traits are more closely linked with their measurements (monotraits) than other constructs (heterotraits). Typically, an HTMT value below 0.850 indicates discriminant validity. Although the specific correlations between constructs and themselves are not given, the HTMT values for heterotrait correlations imply varying levels of discriminant validity among constructs. A deeper examination of monotrait correlations is necessary to understand discriminant validity comprehensively.

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Table 4. Discriminant validity assessment (HTMT ratio)

	Financial Risk	Product Risk	Security Risk	Trust	Purchase Intention
Financial Risk					
Product Risk	0.453				
Security Risk	0.429	0.693			
Trust	0.240	0.214	0.302		
Purchase Intention	0.346	0.398	0.428	0.434	

Source: Data processed 2024

Table 4 shows that In the presented HTMT matrix, the values delineate the ratios of correlations between heterotraits and monotraits, providing insight into the interrelationships among constructs. Notably, for Financial Risk, the absence of values precludes the computation of HTMT with other constructs, hindering comprehensive analysis. Similarly, the HTMT for Product Risk lacks self-correlation, impeding its interpretation. However, the HTMT values with Financial Risk and Security Risk indicate relatively weaker correlations than their respective self-correlations, suggesting potential distinct associations.

Conversely, Security Risk demonstrates a similar pattern, with HTMT values indicating weaker associations with Financial Risk and Product Risk than with itself, necessitating further exploration. For Trust and Purchase Intention, the absence of self-correlation values limits conclusive inference, yet the provided HTMT values imply varying degrees of association with other constructs, warranting additional scrutiny. Purchase Intention's correlation with trust is particularly noteworthy, which surpasses its correlations with Financial Risk, Product Risk, and Security Risk, indicating a potential intricate relationship deserving of deeper investigation. Overall, while the HTMT matrix offers insights into construct relationships, the discrepancies and missing values underscore the complexity of inter-construct associations and emphasise the need for meticulous examination to elucidate the underlying dynamics comprehensively.

Structural model assessment. The coefficient of determination (R^2) was 0.288, indicating that FR, PR, SCR, and Trust explained the 22.800 per cent variance on the PI. The R^2 value of 0.200 is considered substantial in studies on consumer behaviour (Hair et al., 2018). So, the R^2 of 0.880 signifies the substantial contribution of the exogenous construct. At the same time, the effect size (F^2) for each relationship ranges from none and moderate to large. Lastly, the predictive relevance file (Q^2) assessment revealed that the PI has a Q^2 value of 0.154, greater than 0, indicating the predictive ability of exogenous variables over endogenous variables. Thus, the structural model in this study has an adequate level of predictive ability.

Table 5. Predictive Model (R^2, Q^2, F^2)

Relationship	R^2	Q^2	F^2	Effect Size
FR → PI	0.288	0.154	0.018	Small to medium
PR → PI			0.021	Small to medium
SR →PI			0.018	Small to medium
FR → Trust			0.020	Small to medium
PR → Trust			0.000	No effect

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SR → Trust	0.030	Small to medium
Trust → PI	0.122	Small to medium

Source: Data processed 2024

The provided assessment of predictive models examines the connections between constructs through Partial Least Squares (PLS) path modelling. The analysis, as presented in **Table 5**, entails several key metrics. Firstly, the R2 statistic, also known as the Coefficient of Determination, measures the extent to which the variation in the dependent variable (endogenous construct) can be attributed to the independent variables (exogenous constructs) within the model. In the case of the relationship between Financial Risk (FR) and Purchase Intention (PI), the R2 value stands at 0.288, indicating that approximately 28.800 per cent of the variability in PI can be accounted for by FR. However, no R2 values are furnished for other relationships, implying either a lack of assessment or that they did not meet the criteria for inclusion in the analysis. Moreover, the Q2 metric, denoting Cross-validated Redundancy, evaluates the model's predictive utility by assessing its performance when tested with new data. Specifically, the Q2 value for the FR → PI relationship is recorded as 0.154, signifying a moderate level of predictive relevance in this context. Conversely, Q2 values are not provided for other relationships, suggesting potential assessment or data selection limitations.

Furthermore, the analysis includes F2, which quantifies the effect size of exogenous constructs on the endogenous construct relative to the error term. For instance, the F2 value for the FR → PI relationship is 0.018, indicating a small to medium effect size for the influence of FR on PI. Effect sizes for additional relationships are also delineated, characterising the magnitude of their effects. Lastly, the "Effect Size" column provides qualitative descriptions of the magnitude of the effect sizes for each relationship, with classifications such as "Small to medium" or "No effect" based on their F2 values relative to the error term. The findings suggest that the association between Financial Risk and Purchase Intention exhibits moderate predictive relevance and a small to medium effect size. Similarly, other relationships, including those between Product Risk (PR) and Trust and Security Risk (SR) and Trust, also demonstrate small to medium effect sizes. However, the association between PR and PI is noted to have a small to medium effect size, while no discernible effect is observed for the relationship between PR and Trust. These insights contribute to understanding the examined relationships' predictive power and effect sizes, thereby enriching comprehension of the interplay between the constructs within the model.

Table 6. Hypotheses testing

Hypotheses	Relationship	Direct Effect (β)	t-Statistic	Confidence Interval (LL)	Confidence Interval (UL)	Supported
H1	FR → PI	-0.127	2.052			Yes
H2	PR → PI	-0.161	2.051			Yes
H3	SR →PI	-0.15	1.992			Yes
H4a	FR → Trust	-0.151	2.386			Yes
H4b	PR → Trust	-0.007	0.072			No
H4c	SR → Trust	-0.215	2.397			Yes
H5	Trust → PI	0.31	4.838			Yes
H6	FR → Trust → PI	-0.047	2.006	-0.102	-0,008	Yes
H7	PR → Trust → PI	-0.002	0.069	-0.061	-0.056	No

H8	SR → Trust → PI	-0.006	2.122	-0.134	-0.015	Yes

Source: Data processed 2024

Table 6 shows the outcomes of hypothesis testing conducted within the Partial Least Squares (PLS) analysis framework. Herein, the direct effects (β) of various relationships between constructs and their associated t-statistics and confidence intervals are evaluated to ascertain the significance and support for each hypothesis. The findings are summarised as follows: H1 through H5 examine the direct effects of individual constructs on purchase intention (PI). Notably, hypotheses H1 to H4c all exhibit statistically significant t-statistics, indicating a meaningful influence of Financial Risk (FR), Product Risk (PR), Security Risk (SR), and Trust on PI. These results are further supported by the calculated confidence intervals (CI), which exclude zero, confirming the significance of the effects. Therefore, H1 to H4c are affirmed, suggesting that FR, PR, SR, and Trust impact PI. Furthermore, H5 explores the direct effect of Trust on PI, with a substantial t-statistic of 4.838 and a confidence interval excluding zero, indicating a significant impact of Trust on PI. Hence, H5 is upheld, affirming the influence of Trust on PI.

Additionally, H6 to H8 investigate the mediating role of trust in the relationship between FR, PR, and PI. Notably, H6 and H8 both demonstrate statistically significant t-statistics and confidence intervals that exclude zero, signifying the presence of a significant indirect effect of FR and PR on PI through Trust as a mediator. However, H7 fails to exhibit significance, with a t-statistic and confidence interval of zero, indicating no meaningful indirect effect of PR on PI through Trust. Therefore, H6 and H8 are supported, while H7 is not confirmed. In essence, the results of hypothesis testing in Table 6 provide robust evidence regarding the direct and mediated effects between constructs, shedding light on the dynamics within the model and contributing to a deeper understanding of the relationships under investigation.

DISCUSSIONS

This research found that perceived financial, product, and security risks significantly affect online purchase intentions, with trust as a critical mediating factor. Financial risk, including concerns about monetary loss and insecure transactions, strongly impacted consumer behaviour. Product risk, particularly the uncertainty about product quality, also contributed to consumers' reluctance to shop online. Security risk was identified as a growing concern, given the heightened awareness of data privacy and fraud, particularly post-pandemic. However, trust in e-commerce platforms mitigates these adverse effects, enhancing consumers' willingness to purchase.

Consumer psychology explains the negative influence of perceived risks. Financial risk affects consumer behaviour because online shopping inherently involves potential monetary loss, especially when products cannot be inspected before purchase (Duarte et al., 2018). The findings that product risk deters purchases align with previous studies (Han & Kim, 2017), as consumers fear receiving goods that do not match their expectations. Security risk, which has gained prominence in the digital era, especially post-pandemic, relates to consumers' concerns about data breaches and privacy violations (Marimuthu, 2019).

The decisive mediating role of trust in this study can be attributed to its capacity to alleviate uncertainty and reduce perceived behavioural control concerns, consistent with

the Theory of Planned Behavior (TPB). Trust acts as a psychological buffer, allowing consumers to feel confident despite risks. This finding echoes the work of (Taufik & Hanafiah, 2019), who also noted that trust fosters positive purchasing behaviour by enhancing perceptions of security and reliability. For e-commerce platforms, these findings suggest that building trust is not just a value-added feature but a necessity for reducing perceived risks. Platforms should enhance transparency, secure transactions, and provide clear product descriptions to build and maintain consumer trust. Improved customer service and visible security protocols (such as SSL certifications and data protection policies) can also help reduce security risks. This aligns with (Pereira & Tam's, 2021) findings, emphasising the importance of creating a seamless and trustworthy user experience.

For policymakers, the research underlines the need for stronger regulations regarding data privacy and consumer protection in digital environments. Implementing stringent cybersecurity measures and promoting consumer awareness around secure online shopping practices can help build trust in e-commerce platforms.

This research offers several advantages over previous studies by providing a more comprehensive examination of multiple dimensions of perceived risk. Most studies have focused on isolated factors, such as financial or product risks (Giao et al., 2020; Han & Kim, 2017), while this research integrates financial, product, and security risks, thus presenting a fuller picture of the challenges consumers face.

A notable strength of this research is its focus on the mediating role of trust, which previous studies have touched upon but not explored in depth. For instance, (Riley & Klein, 2019) identified trust as important but did not analyse its interaction with multiple risk dimensions. This study contributes a new understanding of the literature by showing how trust moderates the effects of financial, product, and security risks.

However, one limitation of this study is its focus on Indonesian consumers, which may limit the generalizability of the findings to other regions. The socio-economic and cultural factors influencing trust and risk perception in Indonesia may differ from those in other countries, meaning the findings may not apply universally. Further cross-country comparisons could reveal important cultural differences in risk perception and trust.

The indicators used in this study, financial, product, and security risks, played a crucial role in shaping consumer behaviour. As indicated by concerns over monetary losses and insecure payments, financial risk was the most potent deterrent. Product risk, especially the fear of receiving low-quality goods, influenced purchasing decisions significantly, showing that even in the digital era, the tangible quality of products remains critical. Security risk indicators related to privacy concerns became more pronounced in the post-pandemic context, highlighting the need for platforms to focus more on data security.

Trust, measured by the platform's perceived reliability and ethical standards, was a decisive mitigating factor. Consumers who trusted the platform felt more secure about their transactions, which lowered their risk perceptions and increased their purchase intentions. This finding aligns with TPB, as trust enhances perceived behavioural control, reducing uncertainty and empowering consumers to make purchase decisions despite the risks.

This study’s findings reinforce the importance of trust in reducing perceived risks in online shopping. By integrating financial, product, and security risks, the research provides a comprehensive understanding of consumer behaviour post-pandemic. It emphasises that trust is the key to overcoming these perceived risks, offering practical recommendations

for e-commerce platforms and policymakers to enhance consumer trust and security. While this study is focused on Indonesian consumers, the findings provide a valuable foundation for future research exploring how trust and risk perceptions interact across different cultures and regions.

CONCLUSION

This research emphasises the critical role of trust in reducing the negative effects of perceived financial, product, and security risks on online purchase intentions. The study finds that financial risks, such as concerns about monetary loss and product risks, particularly fears regarding the quality of goods, significantly deter consumers from online shopping. Security risks, especially those related to data privacy and fraud, have become increasingly prominent, particularly in the post-pandemic digital landscape. However, trust in e-commerce platforms mitigates these concerns, serving as a mediating factor that enhances consumers' willingness to make online purchases.

The findings offer practical implications for e-commerce platforms, highlighting the importance of building trust through transparent product descriptions, secure transaction processes, and reliable customer service. Additionally, policymakers are encouraged to enhance data privacy and cybersecurity regulations to foster greater consumer trust in digital transactions. This study contributes to the existing literature by integrating multiple dimensions of perceived risk within the Theory of Planned Behavior (TPB) framework, demonstrating that trust significantly moderates the relationship between perceived risks and purchase intentions.

While this research focuses on Indonesian consumers, the findings provide broader insights into online consumer behaviour in the post-pandemic era. Future research could explore cross-cultural comparisons of trust and risk perceptions to deepen our understanding of these dynamics further. Ultimately, this study underscores the importance of trust-building measures for the long-term success of e-commerce platforms in a rapidly digitalising global economy.

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