

LJMS LABUAN E-JOURNAL OF MUAMALAT AND SOCIETY

EXPLORING RISK IN BNPL ADOPTION AMONG MILLENNIALS IN SABAH, MALAYSIA: A CONCEPTUAL STUDY

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Received 20 January 2026: Revised 13 February 2026: Accepted 23 February 2026

ABSTRACT

This study investigates the role of perceived risk in the adoption of Buy Now Pay Later (BNPL) services by conceptualising perceived risk as a hierarchical construct composed of multiple dimensions. Despite the rapid growth of BNPL usage in Malaysia, particularly following accelerated digitalisation during the COVID-19 pandemic, the influence of perceived risk on adoption remains underexplored, largely because prior studies have treated perceived risk as a single-dimensional concept and focused primarily on users in Peninsular Malaysia, leaving millennials in Sabah understudied. Guided by perceived risk theory, this study proposes a multidimensional framework comprising financial, performance, psychological, privacy, security, time, social, and delivery risks as first-order constructs that together form a second-order perceived risk construct. The framework highlights the relative importance of different risk dimensions and offers theoretical insights into hierarchical risk perceptions. By focusing on millennials in Sabah, the study contributes to theory and provides practical guidance for BNPL providers and policymakers in designing strategies to mitigate risk and support a well-being-oriented digital financial ecosystem in emerging markets.

KEYWORDS: *PERCEIVED RISK, BNPL, SECOND-ORDER CONSTRUCT, FIRST-ORDER CONSTRUCT, MILLENNIAL, SABAH*

ABSTRAK

Kajian ini meneliti peranan risiko anggapan dalam penerimaan perkhidmatan Beli Sekarang Bayar Kemudian (BNPL) dengan merangka risiko anggapan sebagai satu konstruk hierarki yang terdiri daripada pelbagai dimensi. Walaupun penggunaan Beli Sekarang Bayar Kemudian (BNPL) di Malaysia berkembang pesat, terutamanya selepas digitalisasi dipercepatkan semasa pandemik COVID-19, pengaruh risiko anggapan terhadap penerimaan masih kurang diterokai. Ini sebahagian

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besarnya kerana kajian terdahulu lebih menumpukan risiko anggapan sebagai konsep satu dimensi dan memfokuskan kepada pengguna di Semenanjung Malaysia, menjadikan pengalaman milenial di Sabah kurang diberi perhatian. Berdasarkan teori risiko anggapan, kajian ini mencadangkan rangka kerja multidimensi yang merangkumi dimensi kewangan, prestasi, psikologi, privasi, keselamatan, masa, sosial, dan penghantaran sebagai kontrak aras pertama yang membentuk kontrak risiko anggapan aras kedua. Rangka kerja ini menekankan kepentingan relatif setiap dimensi risiko dan menawarkan pandangan teori mengenai risiko anggapan secara hierarki. Dengan menumpukan perhatian kepada milenial di Sabah, kajian ini menyumbang kepada pembangunan teori dan memberikan panduan praktikal kepada penyedia perkhidmatan Beli Sekarang Bayar Kemudian (BNPL) dan penggubal dasar dalam merangka strategi untuk mengurangkan risiko serta menyokong ekosistem kewangan digital yang berorientasikan kesejahteraan di pasaran membangun.

KATA KUNCI: RISIKO ANGGAPAN, BNPL, KONSTRUK PERINGKAT KEDUA, KONSTRUK PERINGKAT PERTAMA, MILENIAL, SABAH

1. INTRODUCTION

The rapid expansion of digital financial technologies has fundamentally transformed consumer payment behaviour across the globe. Innovations such as mobile wallets, embedded credit and alternative financing mechanisms have increased access to short-term credit, particularly among younger consumers who prioritise convenience and immediacy. Within this evolving digital finance landscape, Buy Now Pay Later (BNPL) services have emerged as a prominent payment solution, enabling consumers to defer payments with minimal upfront costs. Despite their growing popularity, BNPL services have also generated increasing concern regarding users' exposure to various forms of risk, including financial vulnerability, privacy breaches and behavioural consequences.

Perceived risk has long been recognised as a critical determinant of technology adoption, particularly in digital environments characterised by uncertainty and information asymmetry (Featherman & Pavlou, 2003). In financial technology contexts, users' adoption decisions are shaped not only by perceived benefits but also by concerns over potential losses and negative outcomes. Prior studies in Malaysia further affirm that perceived risk plays a significant role in shaping digital service adoption, especially when financial transactions and personal data are involved (Alomran, 2018). This theoretical perspective is especially relevant for BNPL services, which combine elements of consumer credit, e-commerce and financial technology, thereby exposing users to multiple and overlapping sources of perceived risk. As BNPL connects instalment credit with online purchase and delivery, perceived risk extends beyond financial, privacy and security concerns to include delivery, time and performance risks that arise within fulfilment processes.

In Malaysia, the relevance of BNPL adoption has intensified alongside rapid digitalisation, a trend that was accelerated by behavioural changes during the COVID-19 pandemic. National statistics show substantial increases in digital engagement and online commerce: government data indicate widespread ICT use and growing e-commerce expenditure across business sectors (DOSM, 2025). More recently, BNPL services have gained widespread acceptance, with an estimated 5.1 million Malaysians reported to be using BNPL platforms, positioning Malaysia among the leading adopters in Southeast Asia (Statista, 2024). While this growth reflects the increasing normalisation of digital credit, it also raises concerns regarding consumer protection and financial discipline, particularly among millennials who constitute a major segment of BNPL users.

Existing empirical studies on BNPL adoption consistently demonstrate that perceived risk significantly influences behavioural intention. International evidence highlights the importance of financial and privacy risks in shaping users' willingness to adopt BNPL services (Wijaya *et al.*, 2022; Raj *et al.*, 2025). Similarly, behavioural intention studies indicate that heightened perceptions of risk can weaken users' trust and reduce adoption likelihood, even when BNPL is perceived as convenient (Aprianto & Hadibrata, 2023). However, much of this literature conceptualises perceived risk as a

unidimensional construct, capturing its overall effect without distinguishing between specific risk components.

This limitation is also evident within the Malaysian BNPL literature. Although recent studies confirm the significance of perceived risk in influencing BNPL adoption, some Malaysian studies, such as Osman *et al.* (2024), focus primarily on behavioural predictors like attitude and subjective norms, rather than examining perceived risk as a multidimensional construct. As a result, these studies provide limited insight into which types of risk matter most to users (Soong *et al.*, 2024). Such an approach constrains both theoretical development and practical relevance, leaving policymakers and service providers unclear about which specific risks require targeted intervention.

Moreover, BNPL research in Malaysia remains geographically concentrated in Peninsular Malaysia, leaving East Malaysian states such as Sabah relatively underexplored (Halim *et al.*, 2024; Soong *et al.*, 2024). This omission is noteworthy, given Sabah's distinct socioeconomic conditions, infrastructural limitations and logistical challenges, which may intensify certain forms of perceived risk, particularly delivery, time and performance risks. Recent studies that extend BNPL analysis beyond Peninsular Malaysia have been largely confined to Sarawak, indicating that empirical attention to East Malaysia is only beginning to emerge and remains geographically uneven (Tang *et al.*, 2025). Ignoring these regional differences risks producing overly generalised conclusions that may not adequately reflect the lived experiences of BNPL users outside major urban centres, a concern also echoed in broader reviews of the BNPL literature that highlight gaps in regional and contextual coverage (Ishak *et al.*, 2025).

To address these gaps, the present study conceptualises perceived risk as a second-order construct comprising multiple first-order dimensions, including financial, performance, psychological, privacy, security, time, social and delivery risks. The study aims to examine the hierarchical influence of these risk dimensions on behavioural intention towards BNPL adoption among millennials in Sabah. By adopting a multidimensional risk framework within an underexplored regional context, this conceptual study extends perceived risk theory in digital finance and contributes context-specific insights to the Malaysian BNPL literature. The findings are expected to inform BNPL providers and policymakers in designing more targeted risk mitigation and consumer protection strategies in emerging digital economies.

In this study, millennials are understood as adults born between 1981 and 1996, a definition commonly used in Malaysian FinTech research and one that provides a consistent analytical boundary for examining this cohort's financial behaviours (Rahim *et al.*, 2023). This generation differs meaningfully from Gen Z, particularly in their patterns of digital financial engagement. Evidence indicates that Malaysian millennials show a higher level of FinTech readiness and adoption compared with younger cohorts, making them an especially relevant group for understanding BNPL usage (Rahim *et al.*, 2023).

Their position in the life course, often characterised by stable employment, household responsibilities, and ongoing credit management, places them at the intersection of everyday financial obligations and the appeal of short term, app-based credit such as BNPL. As a result, concerns relating to financial, privacy and security, and delivery or performance risks are likely to be more salient for this group. This is consistent with findings from payment and credit studies which demonstrate that multidimensional perceived risk meaningfully shapes consumer decision making (Mahbob *et al.*, 2023; Trinh *et al.*, 2020).

Recent BNPL research further shows that younger adults' use of these services is also influenced by psychological factors such as impulse control, emotional coping, and financial stress, highlighting that perceived risk extends beyond the purely functional or economic domains (Schomburgk & Hoffmann, 2023; Nguyen & Pham, 2024). Taken together, these insights indicate that millennials constitute a theoretically coherent and empirically justified population for examining a multidimensional

perceived risk framework in the context of BNPL adoption in Sabah (Mahbob *et al.*, 2023; Trinh *et al.*, 2020).

Theoretically, this study advances perceived risk research by tailoring an established hierarchical specification to the BNPL setting, where short term instalment credit is embedded in online purchase and fulfilment processes. It formalises a second order construct composed of eight first order dimensions, namely financial, performance, psychological, privacy, security, time, social and delivery risks, and argues that the relative salience of these dimensions may vary under Sabah's conditions. In doing so, the study extends second order, multidimensional risk models established for digital services and payment credit to the BNPL context, clarifying how these eight risks are combined within a single hierarchical structure in this specific setting (Featherman & Pavlou, 2003; Trinh *et al.*, 2020).

2. LITERATURE REVIEW

Conceptual Foundations of Perceived Risk

The concept of perceived risk originates from Bauer's (1960) seminal view of consumer behaviour as a decision-making process undertaken under uncertainty, where outcomes may entail adverse consequences. Early conceptualisations treated risk as a general sense of unease associated with purchase decisions. Subsequent theoretical developments have refined this view by recognising that consumers do not perceive risk as a single homogeneous construct, but rather as a bundle of distinct concerns. Jacoby and Kaplan (1972) and Peter and Ryan (1976) were among the first to formalise this multidimensional perspective, identifying specific categories of loss that consumers seek to avoid.

This theoretical shift marked an important advance, as it acknowledged that different risk components may exert varying degrees of influence depending on context. Building on this foundation, Featherman and Pavlou (2003) extended the multidimensional risk framework to digital environments, demonstrating that perceived risk plays a decisive role in shaping adoption behaviour for electronic services. Their work represents a methodological strength in the literature, as it empirically validates perceived risk as a second-order construct formed by multiple first-order dimensions. Importantly, they show that aggregate measures of risk obscure the relative salience of individual risk types, thereby limiting explanatory power.

Perceived Risk in Digital and Online Service Adoption

Empirical evidence across a wide range of digital contexts consistently supports the relevance of perceived risk in influencing behavioural intention. Studies on electronic bill payment systems (Featherman & Pavlou, 2003), online hotel booking platforms (Alomran, 2018), and online shopping environments (Mahbob *et al.*, 2023) reveal that higher levels of perceived risk are associated with lower adoption intention. Mahbob *et al.* (2023), for instance, found that financial, product, and non-delivery risks significantly affect online purchase intentions among Malaysian millennials, with non-delivery risk having the strongest impact. A key strength of this stream of research lies in its application of structured adoption models, often integrating perceived risk with established frameworks such as TAM or TPB.

Despite acknowledging the multidimensional nature of risk conceptually, many empirical studies operationalise perceived risk in a simplified manner. For example, some focus narrowly on isolated facets of risk rather than examining distinct components comprehensively. Siu and Ismail (2022) demonstrate that perceived risk negatively affects online purchase intention in the Klang Valley, yet their model treats risk as a composite construct rather than unpacking the relative influence of individual risk dimensions, which constrains deeper insight into which specific risks most deter consumers, a limitation with implications for managerial strategy and policy design in Malaysian e-commerce contexts. Recent meta-analyses and reviews also argue that overlooking the multidimensional nature of perceived risk leads to inconsistent findings and limits theoretical development as well as practical insights across digital adoption studies (e.g. Amirtha *et al.*, 2021).

This simplification raises concerns about construct validity, particularly in digital finance contexts where users face multiple, overlapping technological, financial, and behavioural risks, and where the importance of specific risk dimensions can differ across users and situations.

Perceived Risk in BNPL Adoption: Empirical Insights and Limitations

More recent studies on Buy Now Pay Later adoption generally align with findings from the broader digital finance literature, confirming that perceived risk negatively influences behavioural intention. International evidence shows that concerns related to financial loss, data privacy and repayment obligations discourage BNPL usage, even when the service is viewed as convenient (Wijaya *et al.*, 2022; Raj *et al.*, 2025). These studies offer useful initial insights into BNPL related risk perceptions and benefit from relatively large samples and robust analytical methods.

Nonetheless, a key limitation persists perceived risk is still predominantly modelled as a unidimensional construct. Although studies such as Raj *et al.* (2025) demonstrate a significant overall relationship between perceived risk and BNPL adoption, they do not clarify which specific types of risk are most influential. Consequently, it remains unclear whether users are more concerned about financial overextension, data misuse, service reliability or social judgement. This lack of detail constrains theoretical progress and limits the practical value of existing findings for BNPL providers and regulators seeking targeted interventions.

In addition, several risk dimensions commonly examined in the wider technology adoption literature, such as performance risk, time risk, social risk and delivery risk, are mostly absent from BNPL focused studies, especially in emerging market contexts. This gap is notable because BNPL operates at the intersection of financial commitment and online purchase processes, where concerns about delivery, reliability and timing can be as salient as concerns about financial exposure.

Existing BNPL studies therefore tend to treat risk as a general construct or emphasise broad attitudinal drivers, without specifying how different types of risk matter within the BNPL environment. This leaves insufficient theoretical attention to how BNPL relevant risks, including financial, psychological, privacy, security, time, social, performance and delivery risks, may operate collectively within a hierarchical structure. Furthermore, while evidence suggests that younger users often experience higher stress, repayment pressure and concerns linked to service reliability (Schomburgk & Hoffmann, 2023), current BNPL studies do not incorporate these distinct risk dimensions into a single, multidimensional perceived risk framework. By contrast, multidimensional and second order risk models have been validated in related but non BNPL settings such as digital services and credit card usage (Featherman & Pavlou, 2003; Trinh *et al.*, 2020), yet these models do not capture key BNPL specific dimensions, particularly delivery, performance and time risks, that are integral to BNPL transactions.

Malaysian Context and Regional Research Gaps

Within Malaysia, empirical research on BNPL adoption remains limited and geographically concentrated. Existing studies tend to focus on users in Peninsular Malaysia, often in urban settings where digital infrastructure and logistics are relatively developed. While these studies confirm the relevance of perceived risk, they rarely move beyond general measures or explore contextual variation across regions (Soong *et al.*, 2024; Osman *et al.*, 2024). This narrow focus risks overgeneralisation, particularly in a country characterised by significant regional diversity.

Sabah, in particular, presents a distinct context where infrastructural constraints, delivery delays and limited access to financial services may amplify certain risk perceptions. Yet empirical evidence capturing these dynamics remains scarce. The absence of region-specific analysis represents a substantive gap in the Malaysian FinTech literature, limiting understanding of how perceived risk operates outside major urban centres.

Theoretical discussions of perceived risk rarely consider how infrastructure and logistics influence the structure of risk perceptions. In the case of BNPL, which depends on reliable delivery and effective mechanisms for resolving disputes, the dimensions of delivery, performance and time risk are likely to become particularly salient in contexts where delays, inconsistent service quality or difficulties returning goods are more common, as is often the case outside major urban centres. This perspective broadens perceived risk theory by suggesting that the importance of different risk dimensions is shaped not only by individual judgements but also by the logistical and institutional conditions in which consumers make their decisions (Featherman & Pavlou, 2003).

Implications for the Present Study

The reviewed literature reveals two interrelated gaps. First, although perceived risk is widely acknowledged as a determinant of BNPL adoption, its multidimensional and hierarchical nature remains underexplored. Second, there is a lack of context sensitive research that accounts for regional variation within Malaysia, particularly in Sabah. These gaps underscore the need for a more refined conceptual approach that captures the relative importance of distinct risk dimensions.

In response, the present study conceptualises perceived risk as a second order construct, composed of eight first order dimensions, namely financial, performance, psychological, privacy, security, time, social and delivery risks. The refinement is to tailor this established hierarchical specification to the BNPL context, where short term instalment credit is embedded within online purchase and fulfilment, by treating all eight dimensions as constitutive of perceived risk and by proposing that their relative salience is sensitive to the Sabah context. By adopting this approach, the study seeks to extend existing BNPL adoption models and provide a more nuanced understanding of risk perceptions among millennials in Sabah. This conceptual refinement not only advances theory but also enhances the relevance of findings for practitioners and policymakers operating in emerging digital finance environments.

Drawing on the multidimensional perceived risk literature, this study identifies eight key risk dimensions that underpin BNPL adoption among millennials in Sabah, Malaysia. Table 1 summarises these dimensions, outlining their conceptual definitions and supporting references, and provides the foundation for the conceptual propositions developed in the following section.

TABLE 1: THE DEFINITION OF RISK DIMENSION

No	Risk dimension	Definition	Key references
1	Financial Risk	Concerns about potential loss of money or financial detriment in transactions, including fraud and unsatisfactory services.	Stone & Grønhaug (1993); Featherman & Pavlou (2003); Hanafizadeh & Khedmatgozar (2012)
2	Performance Risk	Possibility that a product may be defective, fail to function as intended, or not deliver expected benefits.	Stone & Grønhaug (1993); Featherman & Pavlou (2003)
3	Psychological Risk	The potential negative impact on an individual's self-image, ego, or peace of mind resulting from using a product or service.	Stone & Grønhaug (1993); Featherman & Pavlou (2003)
4	Privacy Risk	Potential loss of control over personal information or risk of misuse/identity spoofing.	Featherman & Pavlou (2003); Hanafizadeh & Khedmatgozar (2012)
5	Security Risk	Potential loss from system vulnerabilities, network attacks, or data breaches.	Pennington <i>et al.</i> (2003); Featherman & Pavlou (2003); Hanafizadeh & Khedmatgozar (2012)
6	Time Risk	Possibility of wasting time due to poorly designed technology-based services.	Stone & Grønhaug (1993); Featherman & Pavlou (2003)

7	Social Risk	Potential loss of social status, causing an individual to appear foolish or outdated.	Stone & Grønhaug (1993); Featherman & Pavlou (2003)
8	Delivery Risk	Potential failures/issues in delivery of online orders, including delays, wrong addresses, or difficulties in returns.	Stone & Grønhaug (1993); Featherman & Pavlou (2003); Hanafizadeh & Khedmatgozar (2012)

Source: Table by Authors

Empirical Evidence on BNPL and Related Technology Adoption

Building on the conceptual risk dimensions presented in Table 1, it is important to examine how these dimensions have been operationalised in prior empirical studies. A synthesis of the literature not only highlights which risk components have been considered but also identifies methodological limitations and gaps relevant to the present study.

BNPL-Specific Studies

Table 2 summarises recent BNPL studies that explore the influence of perceived risk on behavioural intention across different national contexts. While these studies consistently recognise the role of risk, several limitations emerge. For example, Soong *et al.* (2024), Raj *et al.* (2025), and Wijaya *et al.* (2022) report that perceived risk negatively influences adoption, while Aprianto and Hadibrata (2023) find a positive but statistically insignificant relationship. However, most focus on Gen Z populations and do not distinguish between specific risk dimensions. This single-dimensional treatment of perceived risk limits understanding of which types of risk are most salient. Moreover, because these studies focus mainly on India, Indonesia, and Peninsular Malaysia, the experiences of millennials in Sabah remain unexplored.

TABLE 2: SUMMARY OF BNPL STUDIES

No	Author & year	Context/Service & Location	Risk Dimension Examined	Key Finding	Limitation / Gap Identified
1	Soong <i>et al.</i> (2024)	BNPL & Malaysia	Perceived Risk	Perceived risk was not a significant predictor of behavioural intention to use BNPL when other factors such as perceived usefulness, ease of use, and social influence were considered	<p>Limitation - Gen Z; risk types not separated</p> <p>Gap Identified Millennials; focus on Sabah; specific BNPL risks</p>
2	Raj <i>et al.</i> (2025)	BNPL & India	Perceived Risk	Perceived risk had a significant negative effect on consumers' behavioural intention.	<p>Limitation - Gen Z in India; risk types not separated</p> <p>Gap Identified - Millennials; Sabah context; specific BNPL</p>

				risks
3	Aprianto & Hadibrata (2023)	BNPL & Jakarta, Indonesia	Perceived risk	<p>Perceived risk had a positive effect on purchase decisions; however, the effect was not statistically significant.</p> <p><u>Limitation</u> - Gen Z; Jakarta Indonesia; risk types not separated</p> <p><u>Gap Identified</u> - Millennials; Sabah context; specific BNPL risks</p>
4	Wijaya <i>et al.</i> (2022)	BNPL & Indonesia	Perceived risk	<p>Perceived risk had a significant effect on behavioural intention.</p> <p><u>Limitation</u> Gen Z in Indonesia; risk types not separated</p> <p><u>Gap Identified</u> Millennials; BNPL risks</p>

Source: Table by Authors

Overall, while these studies establish a foundational relationship between perceived risk and BNPL adoption, they offer limited guidance on which specific risk dimensions are most influential, particularly for millennials in the Sabah context.

Related Technology and Traditional Adoption Studies

Table 3 extends the review to research on other digital and traditional technology adoption contexts. These studies are relevant because they operationalise perceived risk as a multidimensional or second-order construct, providing methodological and theoretical insights that can inform BNPL research. For example, Featherman and Pavlou (2003) examined multiple risk dimensions in electronic bill payment systems in the United States, finding that financial, privacy, time, and performance risks significantly influenced adoption, while social and psychological risks were less salient. Alomran (2018) and Trinh *et al.* (2020) further demonstrated the utility of modelling perceived risk as a second-order construct, showing that different risk dimensions exert varying degrees of influence across services and contexts.

Importantly, this hierarchical conceptualisation has also been empirically validated in the Malaysian context. Siu and Ismail (2022) modelled perceived risk as a second-order construct comprising financial, product, psychological, information security, and delivery risks, and found that aggregated perceived risk had a significant negative effect on online purchase intention. Their findings provide strong local empirical support for treating perceived risk as a multidimensional construct, reinforcing the suitability of adopting a similar higher-order modelling approach in BNPL research.

**TABLE 3: SUMMARY OF STUDIES ON TECHNOLOGY AND TRADITIONAL ADOPTION
(NON-BNPL)**

No	Author & year	Context/service & location	Risk dimension examined	Key finding	Limitation / gap identified
1	Featherman & Pavlou (2003)	e-billPay & United States	Performance risk, financial risk, time risk, psychological risk, social risk, privacy risk and overall risk	- Performance, privacy, financial, time, and overall risk were significant predictors of e-billPay adoption, while social and psychological risks were not significant for behavioural intention. * Predictor of overall risk have failed to capture a specific type of risk.	<u>Limitation</u> - US students; overall risk not specific <u>Gap Identified</u> - BNPL risk dimensions in Sabah
2	Alomran (2018)	e-hotel booking & Saudi Arabia	Perceived Risk treated as a second-order construct and financial, performance risk, psychological, privacy, service, security, time and social risk as dimension of risk which is first-order construct.	- Financial, privacy, time, and psychological risks significantly influenced e-hotel booking, with financial risk being the most prominent, followed by privacy, time, and psychological risks. - Social and service risk were not significant. *Performance risk was weak in explaining the variance due to $R^2 = 0.169$.	<u>Limitation</u> - E-hotel in Saudi Arabia; not applicable to BNPL <u>Gap Identified</u> - Second-order construct for BNPL; psychological risk
3	Trinh <i>et al.</i> (2020)	credit card usage & Vietnam	Perceived risk treated as a second-order construct and psychological, finance, performance, privacy, time, social and security risk as dimension of risk which is first-order construct.	All risk dimensions significantly influenced credit card usage, with psychological risk being the most prominent, followed by financial, performance, privacy, time, social, and security risks.	<u>Limitation</u> - Credit card users in Vietnam; not directly BNPL <u>Gap Identified</u> - Second-order construct for BNPL; key risks

4	Siu & Ismail (2022)	Online Shopping & Malaysia	Perceived risk, emphasized on delivery risk such as product, convenience, financial and non- delivery risk.	Perceived risk had a negative and significant effect on online purchase intention; trust mediated the effect of perceived risk on intention, and subjective norms moderated this relationship.	<u>Limitation-</u> Online shoppers in Malaysia; not directly BNPL <u>Gap Identified-</u> Delivery risk for BNPL in Sabah
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Source: Table by Authors

These studies collectively demonstrate that a second-order conceptualisation of perceived risk allows for a more nuanced understanding of adoption behaviour. However, none directly examines BNPL adoption among millennials in Sabah, leaving a critical empirical and contextual gap. They also underscore the relevance of including psychological, financial, and delivery risks, which are consistently influential across different service contexts.

3. PROPOSED CONCEPTUAL PROPOSITIONS

Building on the literature review and prior theoretical insights, Figure 1 presents the proposed conceptual framework for this study. Here, perceived risk is conceptualised as a hierarchical construct comprising eight dimensions: financial, performance, psychological, privacy, security, time, social, and delivery risks. The framework proposes that these dimensions collectively influence behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah. This visualisation integrates the theoretical insights from Table 1 with empirical evidence from Tables 2 and 3, providing a coherent foundation for the formulation of propositions. Based on this framework, the following conceptual propositions are proposed.

Financial Risk (P1)

Financial risk refers to the possibility of monetary loss or financial detriment, including fraud or unsatisfactory transactions (Featherman & Pavlou, 2003). Prior research indicates that concerns over repayment obligations or unexpected fees may discourage the adoption of BNPL services (Raj *et al.*, 2025; Wijaya *et al.*, 2022). Among Malaysian millennials, financial uncertainty may be particularly pronounced due to limited disposable income.

P₁: Financial risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Performance Risk (P2)

Performance risk captures the potential for the BNPL service to fail in delivering expected benefits or functioning as intended (Featherman & Pavlou, 2003). While BNPL-specific studies on this dimension are limited, broader research on digital services shows that platform reliability and functionality are critical factors in adoption decisions (Alomran, 2018).

P₂: Performance risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Psychological Risk (P3)

Psychological risk refers to the potential negative impact on a consumer's self-image, emotional well-being, or stress levels that may arise from using a service (Stone & Grønhaug, 1993). In the context of BNPL, these risks can emerge from over-indebtedness, social pressures to maintain certain consumption standards, or impulsive spending behaviour. Empirical studies indicate that psychological and attitudinal factors contribute to risky BNPL behaviour among younger consumers

(Nguyen & Pham, 2024). Moreover, higher BNPL usage has been linked with increased financial stress and reduced overall well-being, illustrating the emotional burden these services can impose (Schomburgk & Hoffmann, 2023). Large-scale health research further suggests that BNPL use is associated with higher odds of depression and anxiety symptoms, reinforcing the notion that such financial tools may exacerbate psychological strain among vulnerable users (Shah *et al.*, 2025).

P₃: Psychological risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

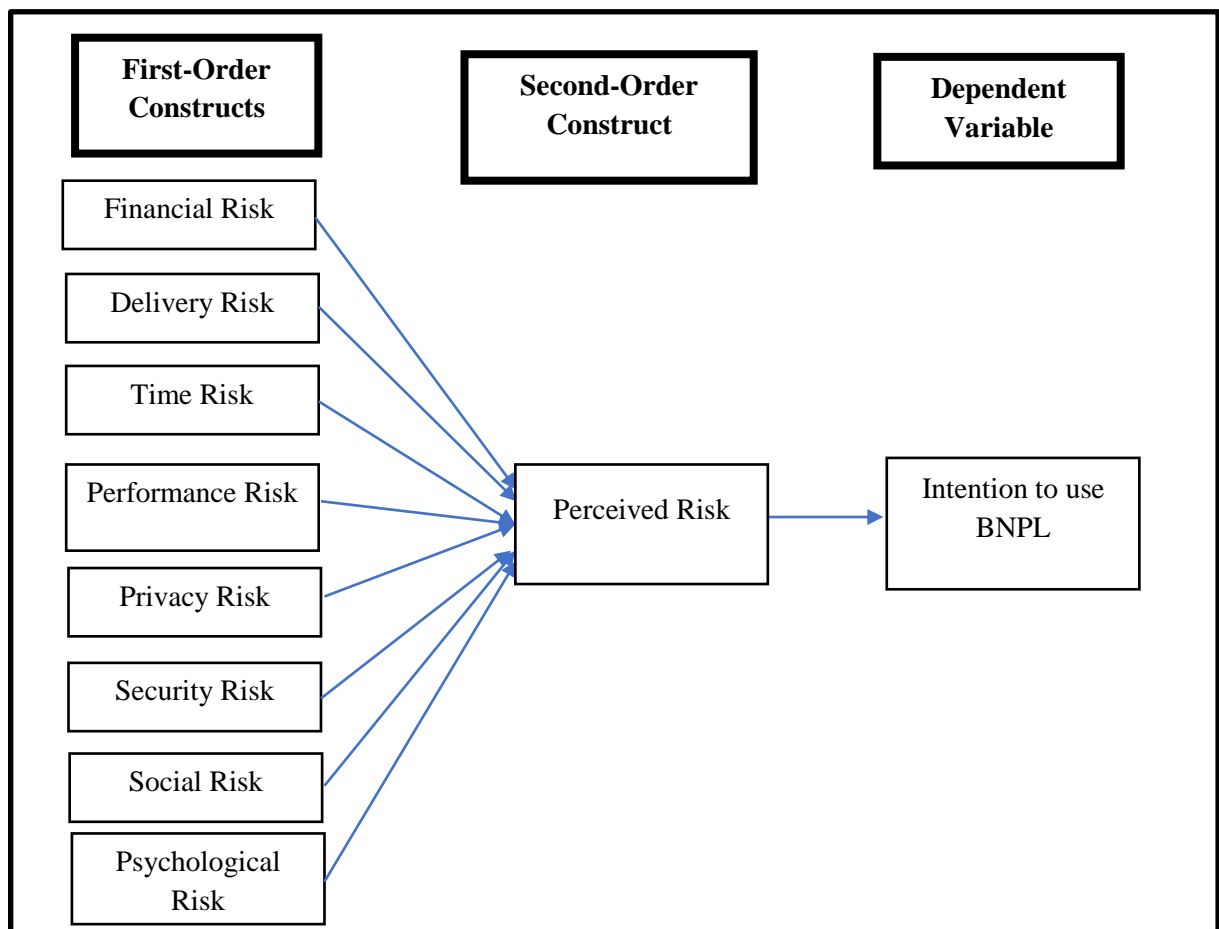


FIGURE 1: CONCEPTUAL FRAMEWORK

Source: Figure by Authors

Privacy Risk (P4)

Privacy risk refers to the potential loss of control over personal information or the misuse of sensitive data (Featherman & Pavlou, 2003). Since BNPL adoption requires sharing financial and personal information, users may exercise caution, particularly in digital finance contexts where trust is paramount (Aprianto & Hadibrata, 2023).

P₄: Privacy risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Security Risk (P5)

Security risk relates to potential losses arising from system vulnerabilities, cyberattacks, or data breaches (Pennington *et al.*, 2003; Hanafizadeh & Khedmatgozar, 2012). Studies on digital finance adoption show that perceptions of inadequate cybersecurity can discourage service adoption (Alomran, 2018; Trinh *et al.*, 2020).

P₅: Security risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Time Risk (P6)

Time risk reflects potential loss of time due to inefficient or poorly designed services (Featherman & Pavlou, 2003). Delays in application processing or problem resolution may reduce usage, particularly in BNPL contexts where timely transactions are expected.

P₆: Time risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Social Risk (P7)

Social risk encompasses the potential loss of social status or fear of negative evaluation by others (Featherman & Pavlou, 2003). Millennials may be particularly influenced by peer perceptions when adopting innovative financial services such as BNPL.

P₇: Social risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Delivery Risk (P8)

Delivery risk involves failures in order fulfilment, such as delayed delivery, receiving incorrect items, or difficulties with returns, and has been shown to negatively influence consumers' online purchase intentions (Masoud, 2013; Mahbob *et al.*, 2023). Since BNPL is closely linked to online commerce, inefficient delivery systems may increase adoption hesitancy, especially in regions such as Sabah with logistical challenges.

P₈: Delivery risk is likely to reduce behavioural intention to adopt Buy Now Pay Later (BNPL) services among millennials in Sabah.

Collectively, these propositions conceptualise perceived risk as a hierarchical construct made up of eight dimensions, each potentially influencing the adoption of Buy Now Pay Later (BNPL). Figure 1 illustrates these relationships and provides a theoretical basis for future empirical studies. By examining each dimension individually, this framework offers a nuanced understanding of risk perceptions and their relative impact on behavioural intention, addressing both theoretical and contextual gaps in the existing literature.

4. CONCEPTUAL IMPLICATIONS AND CONTRIBUTIONS

Perceived risk has been widely recognised as a critical determinant of technology adoption behaviour (Featherman & Pavlou, 2003; Alomran, 2018; Trinh *et al.*, 2020; Soong *et al.*, 2024; Raj *et al.*, 2025; Aprianto & Hadibrata, 2023; Wijaya *et al.*, 2022). Prior research highlights that technology adoption is influenced by multiple dimensions of perceived risk, which are context-dependent and may vary across technologies and user populations (Featherman & Pavlou, 2003; Alomran, 2018; Trinh *et al.*, 2020). For example, social and psychological risks have been reported as either significant or insignificant in affecting behavioural intention in different studies, reflecting contextual and demographic variations (Trinh *et al.*, 2020). Such inconsistencies may be explained by differences in cultural, socioeconomic, and demographic factors, with rural–urban variations highlighted by Tambotuh *et al.* (2015) and Setiawan *et al.* (2025).

Most existing studies on BNPL adoption have focused on Gen Z users in Malaysia, India, and Indonesia (Raj *et al.*, 2025; Wijaya *et al.*, 2022; Soong *et al.*, 2024), with limited attention to millennials despite their prominent role in driving BNPL growth. Millennials represent a substantial portion of the global population, accounting for roughly 1.8 billion people, or about 23 % of the

world's population (World Economic Forum, 2021). Industry forecasts further indicate that broad consumer adoption of BNPL, including among younger users, is a key factor in the projected expansion of the market through 2032 (Fortune Business Insights, 2025).

Millennials and Gen Z also exhibit distinct behavioural patterns and higher financial exposure in digital transactions compared to older cohorts; in particular, younger users show greater interest in and willingness to engage with FinTech products and services than older adults (Krupa & Buszko, 2023; Leang *et al.*, 2023). Typically employed with stable incomes, millennials actively adopt innovations that offer flexibility and convenience, and they frequently engage in digital financial services, including FinTech solutions that facilitate credit and payment options (Azhar *et al.*, 2023; Rahim *et al.*, 2023). These patterns highlight that millennials are not only early adopters of digital financial innovations but also key drivers of emerging credit-based digital services in Malaysia and beyond.

In the context of Sabah, millennials may perceive BNPL-related risks differently from those in Peninsular Malaysia due to regional variations in digital infrastructure and socioeconomic conditions (MCMC, 2023; DOSM, 2024), as well as differences in digital literacy. Evidence suggests that native communities in Sabah experience a significant digital divide, characterised by lower digital skills, limited access, and reduced ICT usage, which may influence how young consumers perceive and respond to credit-based digital services (Fang *et al.*, 2022). Building on Tambotuh *et al.* (2015), who emphasised rural–urban differences in technology adoption and supported by empirical evidence from credit-based and online services (Setiawan *et al.*, 2025; Trinh *et al.*, 2020; Mahbob *et al.*, 2023), this study identifies financial, delivery, time, performance, privacy, security, social, and psychological risks as likely salient for millennials in Sabah. Delivery risk is particularly critical, as BNPL adoption is closely tied to e-commerce, where delays, product errors, or difficulties in returns can significantly affect user experience and adoption intentions (Mahbob *et al.*, 2023).

Theoretical Contribution

By integrating generational and regional considerations into a framework of second-order and first-order constructs, this study extends the literature on BNPL adoption and perceived risk. It highlights the hierarchical nature of risk perceptions and provides a comprehensive model that captures the multidimensional aspects of perceived risk in emerging markets. The framework addresses gaps in existing research by focusing on millennials, a generation that has been underexplored in BNPL adoption studies, and by examining how contextual factors in Sabah influence risk perceptions.

More specifically, the study adapts an established hierarchical specification of perceived risk to the BNPL setting, where short-term instalment credit is embedded in online purchase and fulfilment processes. It formalises a second order construct composed of eight first order dimensions (financial, performance, psychological, privacy, security, time, social and delivery risks) and argues that the relative salience of these dimensions may vary under Sabah's conditions. Taken together, the framework extends second-order, multidimensional risk models from digital services and credit-card contexts to BNPL and provides a clear basis for understanding how these eight dimensions combine within a single hierarchical structure in this specific context (Featherman & Pavlou, 2003; Trinh *et al.*, 2020).

Practical Contribution

The proposed framework offers actionable insights for BNPL service providers and policymakers. Understanding the relative salience of different risk dimensions allows providers to design risk mitigation strategies, enhance service delivery, improve security measures, and implement privacy safeguards. Policymakers can also develop financial education and consumer protection initiatives tailored to millennials in Sabah, helping to increase responsible adoption and reduce exposure to financial risks.

Future Research Directions

This conceptual framework provides a foundation for empirical testing of BNPL adoption among millennials in Sabah. Future research could quantitatively validate the proposed hierarchical model using surveys and structural equation modelling (SEM), examine cross-generational differences in BNPL risk perceptions by comparing millennials and Gen Z, and explore regional variations in risk perceptions within Malaysia as well as in other emerging markets. Additionally, longitudinal studies could investigate the dynamic relationships between risk perceptions and actual BNPL usage behaviours over time. By focusing on hierarchical risk perceptions, generational nuances, and regional context, such studies would contribute to a more comprehensive understanding of digital financial service adoption in emerging markets and offer a robust model for examining BNPL and other credit-based technologies.

5. CONCLUSION

This conceptual study explored the multidimensional nature of perceived risk in the adoption of BNPL services among millennials in Sabah, Malaysia. By proposing a second-order construct comprising eight risk dimensions, including financial, performance, psychological, privacy, security, time, social, and delivery, this study builds on established conceptualisations of perceived risk as a hierarchical, multidimensional construct in technology adoption research (Featherman & Pavlou, 2003; Alomran, 2018; Trinh *et al.*, 2020).

The study makes several contributions. Theoretically, it advances the BNPL adoption literature by adapting a second-order perceived-risk model to a setting where short-term instalment credit is embedded within online purchase and fulfilment, and by arguing that the relative salience of risk dimensions may vary under Sabah's conditions. This responds to calls for context-specific investigations of perceived risk and FinTech adoption in emerging markets (Raj *et al.*, 2025; Wijaya *et al.*, 2022; Soong *et al.*, 2024). Practically, the analysis offers guidance for BNPL service providers and policymakers to design targeted risk-mitigation strategies, enhance service delivery, improve cybersecurity and privacy safeguards, and tailor financial education initiatives for millennials, consistent with prior FinTech adoption and consumer-protection studies (Aprianto & Hadibrata, 2023; Krupa & Buszko, 2023).

Finally, this study identifies avenues for future research, including quantitative testing of the proposed hierarchical model using SEM, cross-generational comparisons, regional analyses, and longitudinal studies, as suggested in prior perceived risk and digital finance research (Featherman & Pavlou, 2003; Trinh *et al.*, 2020; Mahbob *et al.*, 2023). By integrating generational differences, regional context, and multidimensional risk perceptions, this study enriches the theoretical understanding of technology adoption in emerging markets and serves as a foundation for both research and practice in the rapidly evolving BNPL landscape.

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