

Factors influencing the adoption intention of self-service checkout till points in South African grocery retail: the moderating role of perceived security measures

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ABSTRACT

Despite the global growth of self-service checkout till points (SSCOTs), there is limited understanding of the factors influencing consumers' adoption intention in emerging markets such as South Africa.

This study examines the influence of perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, perceived enjoyment, perceived self-efficacy, attitudes, and perceived shopping well-being on consumers' adoption intention of SSCOTs, while also investigating the moderating role of perceived security measures.

Data were collected from 230 young South African adults (18–35 years) and analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to validate the measurement model and test the hypothesised relationships.

The results indicate that both functional and experiential perceptions significantly shape attitudes, which in turn influence adoption intention. Perceived enjoyment emerged as the strongest predictor, and perceived security strengthened the relationship between attitudes and adoption intention.

This study contributes to the literature by extending the Technology Acceptance Model (TAM) to include emotional and security-related constructs, providing a more comprehensive framework for understanding SSCOT adoption. Practically, the findings offer actionable insights for South African grocery retailers seeking to implement SSCOTs, helping to optimise user experience, build consumer trust, and enhance adoption.

Keywords: self-service checkout till points, adoption intention, perceived security, grocery retail, South Africa

1. INTRODUCTION

Self-service technologies are reshaping retail, offering consumers greater autonomy, efficiency, and control over their shopping experiences (Duarte et al., 2022; Kim & Cheng, 2025). A prominent example in grocery retail is self-service checkout till points (SSCOTs), which enable consumers to scan, bag, and pay independently, reducing queues and labour costs (Weijters et al., 2007; Mukerjee, 2020). The Technology Acceptance Model (TAM) (Davis, 1989) provides a framework to understand technology adoption, highlighting perceived ease of use and perceived usefulness as primary determinants of attitudes and, ultimately, adoption intention.

While SSCOTs are widely adopted in countries such as the United States (Walmart) (Walmart, 2023) and the United Kingdom (Tesco, Sainsbury) (Retail Gazette, 2023), their adoption in South African grocery retail is still emerging. In South Africa, innovations such as Checkers' Xpress Trolley, which allows scanning and payment directly on the cart, demonstrate growing experimentation with self-service technologies in the local grocery retail market (Shoprite Holdings, August 2025). Prior research confirms that perceived ease of use and perceived usefulness strongly predict self-service technology adoption (Blut, Wang & Schoefer, 2016). Other factors, including interaction quality, technology readiness, convenience, enjoyment, and motivation, further influence adoption (Liljander et al., 2006; Considine & Cormican, 2016; Wang, 2017; Lyu, Lim & Choi, 2019). Collectively, these findings indicate that SSCOT adoption is multidimensional, encompassing functional attributes, experiential benefits, and personal factors.

Despite their advantages, SSCOTs also present challenges. Users may value speed and autonomy but express concerns about usability, reduced human interaction, and potential fraud or theft (Curran & Meuter, 2005; Duarte et al., 2022). In South Africa, additional contextual factors—such as load shedding, inconsistent internet access, and perceived threats to employment—may further shape consumer perceptions, suggesting that SSCOT adoption must be considered within a broader socio-economic and technological environment.

While earlier studies have focused on functional and experiential determinants of SSCOT adoption (Weijters et al., 2007), the moderating role of perceived security measures—consumers' perceptions of data privacy and protection—remains underexplored. This issue is particularly relevant for South Africa's digitally literate youth, who are both receptive to innovation and sensitive to digital risks (Lubbe et al., 2025).

This study therefore examines how functional, experiential, and personal factors influence attitudes toward SSCOTs, perceived shopping well-being, and adoption intention among South African young adults (18–35 years, spanning Generation Z and Millennials). A key contribution is examining perceived security measures as a moderator between attitudes and adoption intention. By focusing on this demographic in an emerging market, the study extends the TAM framework and provides insights for retailers seeking to implement SSCOTs within similar environments.

2. RESEARCH OBJECTIVES

- To examine the influence of perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, perceived enjoyment, and self-efficacy on attitude toward SSCOTs in South African grocery retail.
- To examine the influence of attitude toward SSCOTs on perceived shopping well-being and adoption intention.

- To investigate the influence of perceived shopping well-being on adoption intention of SSCOTs.
- To examine the moderating role of perceived security measures in the relationship between attitudes and adoption intention.

The remaining sections of this paper provide a literature review to support hypotheses development, describe the research methodology, discuss the findings, and outline the study's implications. Finally, the study's limitations and recommendations for future research are presented.

3. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

3.1 SSCOT ADOPTION IN SOUTH AFRICAN RETAIL

Self-service checkout till points (SSCOTs) have become prevalent in global retail due to their potential to enhance operational efficiency and improve customer experiences (Lu et al., 2019; Fernandes & Oliveira, 2021). The Technology Acceptance Model (TAM) and Unified Theory of Acceptance and Use of Technology (UTAUT) have frequently been applied to explain user adoption, focusing on variables such as perceived ease of use, perceived usefulness, enjoyment, and self-efficacy (Davis, 1989; Venkatesh et al., 2003).

However, in emerging markets like South Africa, SSCOT adoption has not yet kept pace with global trends. According to Ntuli (2020) and Mhlanga (2020), South African grocery retailers have largely adopted self-service solutions in online environments but have yet to broadly implement in-store SSCOTs, primarily due to high setup costs, infrastructural limitations, and concerns around theft and consumer readiness. Early innovations, such as Checkers' Xpress Trolley (August 2025 trial), which allows shoppers to scan items as they shop and pay directly on the cart (Shoprite Holdings, 2025), indicate growing experimentation with self-service technologies, but widespread SSCOT adoption remains limited. While Western literature has identified security concerns as a major barrier to SST adoption (Weijters et al., 2007; Lee & Yang, 2013), few studies have examined how perceived security measures may moderate SSCOT adoption in the South African context - a market characterised by digital fraud, infrastructural inequalities, and heightened concerns around transaction safety (Chikandiwa et al., 2013).

The current study addresses this gap by focusing on young adult consumers, a tech-savvy segment most likely to engage with self-service innovations (Kallweit et al., 2014). Limited empirical work has been conducted in South Africa on this group's attitude toward SSCOTs and how perceived security influences adoption intention. Accordingly, this study seeks to contribute by integrating key adoption variables— perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, perceived enjoyment, perceived self-efficacy, and examining the moderating role of perceived security measures in the South African grocery retail sector among young consumers.

4. Theoretical Framework

4.1 THEORETICAL BACKGROUND - TECHNOLOGY ACCEPTANCE MODEL (TAM)

The Technology Acceptance Model (TAM), originally developed by Davis (1986), is adapted from the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975). According to TAM, a user's behavioural intention to use a technology-based system and ultimately their actual usage, is primarily influenced by their attitude towards the technology. This attitude is, in turn, shaped by two key perceptions: perceived ease of use and perceived usefulness (Mukerjee, 2020).

4.2 HYPOTHESES DEVELOPMENT AND CONCEPTUAL MODEL

Based on the literature review, a model was developed (See Figure 1).

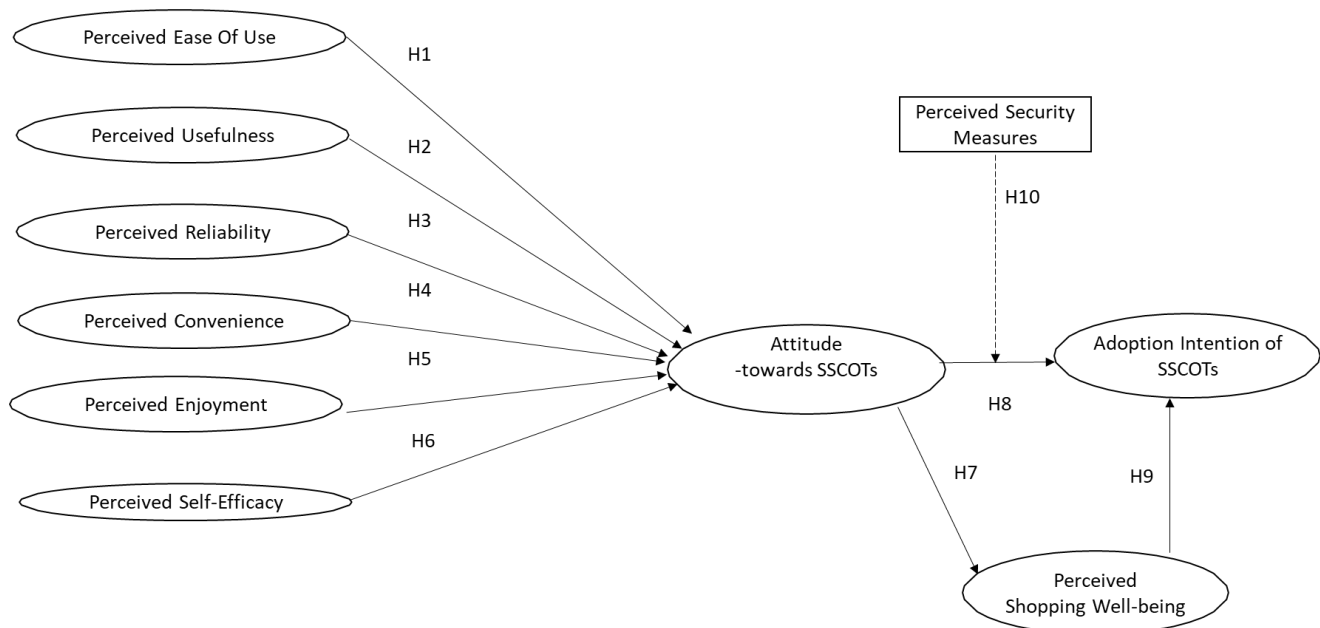


FIGURE 1: CONCEPTUAL MODEL

Source: (Authors' own construction, 2023)

4.3 PERCEIVED EASE OF USE, PERCEIVED USEFULNESS AND ATTITUDE TOWARDS SSCOT:

Davis (1989) defined perceived ease of use as “the degree to which a person believes that using a particular system would be free of effort,” and perceived usefulness as “the degree to which a person believes that using a particular system would enhance his or her job performance.” These two constructs serve as critical determinants in predicting user adoption of new technologies and have been widely applied in the context of information systems and self-service technologies. Literature indicates that perceived ease of use significantly influences users’ attitudes toward technology, including self-service checkout till points (SSCOTs) (Weijters et al., 2007). This finding is consistent across studies in both organisational behaviour and SSCOT adoption. Additionally, users evaluate SSCOTs based on the perceived benefits they offer, with perceived usefulness emerging as a key driver of positive attitudes, particularly in retail contexts where functional shopping outcomes are valued (Weijters et al., 2007).

Perceived ease of use and perceived usefulness have been extensively reviewed in the adoption of SSCOTs and other self-service technologies across numerous industries, including banking (Baabdullah et al., 2019), hospitality (Lu et al., 2019), agriculture (Caffaro et al., 2020), and automobiles (Yuen et al., 2020). As commercial and technology markets continued to grow, Lin et al. (2007) examined the integration of the technology readiness (TR) construct with the TAM in the context of adoption intention of e-service systems, to better understand individual consumers’ cognitive inclination to accept new technology. Thus, the following hypotheses are proposed:

H1: Perceived ease of use positively influences attitudes towards SSCOTs.

H2: Perceived usefulness positively influences attitudes towards SSCOTs.

4.4 PERCEIVED RELIABILITY AND ATTITUDE TOWARDS SSCOT:

Extensive literature substantiates that the perceived reliability of self-service checkout till points (SSCOTs) is a major determinant of young shoppers' attitudes toward SSCOTs (Weijters et al., 2007; Demoulin & Djelassi, 2016). Weijters et al., (2007) defined reliability as "the correct technical functioning of an SSCOT and the accuracy of service delivery," emphasising that a reliable SSCOT ensures consistent and dependable performance, which fosters user trust. Further reinforcing this concept, Demoulin and Djelassi (2016) found that reliability significantly influences customers' willingness to use SSCOTs, particularly among younger demographics who are more inclined to trust and engage with technology. In this context, reliability translates to the smooth operation of the SSCOT and its capacity to perform as expected without frequent failures or errors. Duarte et al., (2022) expanded on this by linking reliability to dependability and user-friendliness, suggesting that users perceive SSCOTs as more technically accurate than human service employees. This perception of technical superiority contributes to the trustworthiness of SSCOTs, making them a preferred choice for tasks requiring precision and minimal errors.

The consistency and predictability of SSCOTs in executing tasks accurately enhance their reliability and appeal to users, particularly those who value efficiency and accuracy in service delivery. Moreover, studies have shown that the adoption of reliable SSCOTs can lead to increased customer satisfaction and loyalty. For instance, a reliable SSCOT not only speeds up the checkout process but also reduces the likelihood of mistakes, which can lead to customer frustration and dissatisfaction (Duarte et al., 2022). As a result, the perceived reliability of SSCOTs is pivotal in shaping young shoppers' attitudes, influencing their overall shopping experience and their likelihood of returning to use the technology. Thus, the following hypothesis is proposed:

H3: Perceived reliability positively influences attitudes towards SSCOTs.

4.5 PERCEIVED CONVENIENCE AND ATTITUDE TOWARDS SSCOT:

As Shahid, Iqbal, Hassan, and Habibah (2018) describe, convenience relates to the customer's ease of access to services offered by an organisation, making it fitting to examine the perceived convenience of SSCOTs in the grocery retail environment. One of the fundamental utilitarian benefits of using SSCOTs is time-saving, whereby consumers can perform transactions more efficiently (Duarte et al., 2022). Time-saving is crucial in the context of grocery shopping, where the ability to quickly and accurately complete purchases can significantly enhance customer satisfaction. SSCOTs are designed to streamline the shopping process, reducing the time spent in queues and interactions with staff. This efficiency aligns with the preferences of younger, tech-savvy consumers who value speed and convenience in their shopping experiences. Increased convenience provided by SSCOTs can also reduce cognitive, emotional, and physical affliction for the user (Thomas-Francois & Somogyi, 2023). Cognitive load refers to the mental effort required to use a system, and SSCOTs that are intuitive and user-friendly can minimise this burden. Emotional affliction relates to stress or frustration arising from a complicated or unreliable system, which SSCOTs can alleviate by providing a smooth and predictable user experience. Physical affliction involves the physical effort required to interact with a system, and well-designed SSCOTs can reduce this effort through ergonomic interfaces and streamlined processes.

Thus, a SSCOT designed to lessen the effort and complexity required to complete transactions is more likely to attract positive user attitudes (Duarte et al., 2022). When consumers perceive a SSCOT as convenient, they are more likely to accept and regularly use the technology, leading to higher levels of satisfaction and loyalty. The perceived ease of use, combined with the time-saving benefits, makes SSCOTs an attractive option for busy consumers looking to optimise their grocery shopping routines. Furthermore, the perceived convenience of SSCOTs can influence customer perceptions of the overall service quality offered by the retailer. As Berry et al., (2002) noted, convenience is

a critical component of service quality that can influence customer satisfaction and behavioural intentions. Thus, the following hypothesis is proposed:

H4: Perceived convenience positively influences attitudes towards SSCOTs.

4.6 PERCEIVED ENJOYMENT AND ATTITUDE TOWARDS SSCOT:

In addition to the utilitarian aspects of SSCOTs—such as perceived usefulness, reliability, and convenience—users also seek enjoyment through novelty, aesthetic appeal, and playfulness (Weijters et al., 2007; Duarte et al., 2022). Perceived enjoyment is a central hedonic motive in the use of SSCOTs. It refers to the extent to which a customer feels that using an in-store SSCOT is fun and pleasant, independent of the pragmatic shopping needs being addressed (Weijters et al., 2007; Park et al., 2021). This aspect of perceived enjoyment is crucial as it influences user engagement and satisfaction. Studies have shown that individuals who experience joy or contentment in using public self-service technologies, are more inclined to continue using the service (Pillai et al., 2020). This hedonic motivation can drive repeated use and loyalty, as customers associate positive emotions with the SSCOT experience. For instance, Duarte et al., (2022) emphasise that the integration of playful elements and visually appealing interfaces can significantly enhance user enjoyment, making the shopping process not only efficient but also enjoyable. Roy et al., (2023) examine customer engagement with digitised interactive platforms in retail, highlighting the transformative role of interactive platforms in fostering meaningful interactions between consumers and brands. Thus, the following hypothesis is proposed:

H5: Perceived enjoyment positively influences attitudes towards SSCOTs.

4.7 PERCEIVED SELF-EFFICACY AND ATTITUDE TOWARDS SSCOT:

Self-Efficacy relates to the confidence one possesses in executing the necessary skills to accomplish a task (Demoulin & Djelassi, 2016). Perceived self-efficacy is a critical determinant of technology adoption, reflecting an individual's belief in their ability to successfully engage with new technologies. Self-efficacy also conveys one's perception of internal control, encompassing beliefs about the ease or difficulty of performing a behaviour (Demoulin & Djelassi, 2016). This perception of control is integral to the user experience, as individuals with high self-efficacy are more likely to approach SSCOTs with a positive attitude, anticipating successful interaction and minimal frustration. Gelbrich and Sattler (2014) found that, from an information technology perspective, higher levels of self-efficacy decrease anxiety associated with using new technology and enhance the influence of perceived ease of use on usage intention. This relationship highlights the importance of enhancing self-efficacy to facilitate technology adoption, as anxiety is a common barrier, particularly among individuals less familiar or confident with new systems. Demoulin and Djelassi (2016) emphasise that self-efficacy affects not only initial adoption but also continued use and satisfaction. Users who feel competent and confident are more likely to explore advanced features, customise their experience, and fully leverage SSCOT capabilities, resulting in deeper engagement, greater satisfaction, and loyalty. Thus, the following hypothesis is proposed:

H6: Perceived self-efficacy positively influences attitudes towards SSCOTs.

4.8 PERCEIVED SHOPPING WELL-BEING, ATTITUDE TOWARDS SSCOT AND ADOPTION INTENTION OF SSCOTS:

In the context of e-retailing, shopping well-being is increasingly recognised as a critical component of an individual's subjective well-being, reflecting overall life satisfaction (Dogra, Nasir, & Adil, 2023). Self-service technologies,

such as self- service checkout tills (SSCOTs), can enhance customer satisfaction by offering greater control and convenience (Meuter et al., 2000). Similarly, Dabholkar (1996) highlighted that consumer evaluations of SSCOTs are positively influenced by the efficiency and ease these technologies provide, leading to more favourable attitudes toward their use. Although studies explicitly linking well-being and technology adoption are limited, evidence suggests that positive well-being outcomes can increase the likelihood of adopting new technologies (Papagiannidis et al., 2017).

The Technology Acceptance Model (TAM) posits that an individual's attitude toward a technology significantly affects their intention to adopt it (Davis, 1989). Adoption intention reflects the motivational factors that drive behaviour and the effort individuals are willing to exert to use a technology (Weijters et al., 2007). Accordingly stronger positive attitudes toward SSCOTs are expected to increase both perceived shopping well-being and adoption intention. As consumers experience greater satisfaction and ease with SSCOTs, their willingness to use these systems is likely to rise, promoting broader adoption within retail environments. Thus, the following hypotheses are proposed:

H7: Attitudes towards SSCOTs positively influence perceived shopping well-being.

H8: Attitudes towards SSCOTs positively influence adoption intention of SSCOTs.

H9: Perceived shopping well-being positively influences adoption intention of SSCOTs.

4.9 MODERATING ROLE OF PERCEIVED SECURITY MEASURES

Recent studies emphasise that consumers prioritise the safeguarding of personal information during transactions, highlighting the critical role of security measures in fostering trust and moderating the relationship between users' attitudes and their intention to adopt self-service technologies (Meurisch & Mühlhäuser, 2021; Sohn et al., 2024). Ensuring the confidentiality and integrity of customer data is imperative for the successful integration of SSCOTs by grocery retailers. This security contributes significantly to enhanced shopping well-being and satisfaction among consumers. For instance, Sohn et al., (2024) found that robust security measures in self-service technologies directly influence user trust, which is essential for encouraging adoption and sustained use. Similarly, Meurisch and Mühlhäuser (2021) demonstrated that perceptions of data security and privacy are paramount in shaping positive user attitudes towards new technologies. These findings highlight that security is not merely a technical requirement but a fundamental factor influencing consumer behaviour and attitudes.

The inclusion of perceived security as a moderating variable is particularly novel in the context of emerging markets and digitally literate consumer segments, such as young South African adults. In these contexts, security concerns, ranging from data privacy to potential fraud can amplify or dampen the influence of attitudes on adoption intentions. This aligns with prior research on perceived safety risk in self-service technologies, such as Baba et al., (2023), who found that trust and safety perceptions significantly moderated adoption of self-ordering kiosks in Malaysian quick-service restaurants. By conceptualising perceived security as a moderator, the study highlights its role in strengthening the positive link between attitudes and adoption intentions in an emerging market grocery retail context. Thus, the following hypothesis is proposed:

H10: Perceived security measures in SSCOTs positively moderate the relationship between consumers' attitudes towards SSCOTs and their adoption intention.

5. METHODOLOGY

5.1 APPROACH AND SAMPLING

The sampling strategy employed in this study was purposive sampling. This method was chosen to ensure the accessibility and availability of respondents, specifically targeting young adults aged 18–35 years in South Africa. This demographic was selected because they represent a consumer segment likely to be familiar with and receptive to innovations such as self-service checkout till points (SSCOTs). As part of the sampling criteria, respondents were required to have shopped at a brick-and-mortar grocery outlet within the six months prior to the survey. A total of 230 responses were deemed usable after data cleaning.

5.2 DATA COLLECTION AND SAMPLE

Data collection was conducted through both an electronic self-administered survey distributed online, and a physical paper-based survey distributed face-to-face at a university in South Africa, spanning from August to October 2023. The survey instrument comprised 54 questionnaire items adapted from validated literature. The questionnaire was structured to collect demographic information as well as data on consumer perceptions toward SSCOTs.

The first section of the questionnaire gathered demographic details, including gender, age, education level, and grocery shopping behaviour. The core section of the survey consisted of items measuring young consumers' attitudes toward SSCOTs, using a five-point Likert scale. Respondents indicated their level of agreement with each statement on a scale from 1 (Strongly disagree) to 5 (Strongly agree). Data were subsequently analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM) to examine the relationships between perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, enjoyment, perceived self-efficacy, attitude, shopping well-being, adoption intention, and the moderating role of perceived security measures.

A pilot study with 30 participants was conducted to assess the validity and reliability of a questionnaire by testing its layout, clarity, and potential difficulties participants might face when answering the questions, before fully implementing it in a larger study. This pilot phase involved using modified scales from existing validated research and analysing the responses to identify any issues with the questionnaire design. Perceived Ease of Use (PEU) was measured with four items; Perceived Usefulness (PUS) with five items, both adapted from Ntuli (2020). Perceived Reliability (PRL) was measured with three items, adapted from Duarte et al., (2022), while Perceived Convenience (PCV) was measured with four items, adapted from Thomas-Francois and Somogyi (2023). Perceived Enjoyment (PEJ) was measured with four items, adapted from Park et al., (2021). Perceived Self-Efficacy (PSE) was measured with three items, and Adoption Intention (AI) with four items, both adapted from Gelbrich and Sattler (2014). Perceived Security Measures (PSM) was measured with three items, adapted from Rahman et al., (2022). Attitude (ATT) was measured with five items, adapted from Park et al., (2021) as well as Thomas-Francois and Somogyi (2023), and Perceived Shopping Well-Being (PSW) was measured with four items, adapted from Dogra et al., (2023).

The detailed analysis process began with data preparation, which involved cleaning the dataset, checking for incomplete responses, outliers, and ensuring that the data met the assumptions required for subsequent analyses.

The testing process consisted of two phases. First, the measurement model was evaluated to ensure the reliability and validity of the latent variables and their corresponding indicators. Second, the structural model was assessed to determine the significance of the hypothesised relationships within the research framework, examining the influence of perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, perceived enjoyment, and

perceived self-efficacy on attitude, perceived shopping well-being, and adoption intention of SSCOTs, as well as the moderating role of perceived security measures.

6. DATA ANALYSIS AND RESULTS

6.1 DATA ANALYSIS

A preliminary data analysis using descriptive statistics was carried out utilising SPSS version 30. The analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) technique, a variance-based approach to structural equation modelling. PLS-SEM is particularly suitable for this study due to its predictive orientation (Hair et al., 2022) and its ability to handle complex models with multiple constructs and moderating effects (Hair et al., 2022). The study employed the bootstrapping method with 5,000 subsamples to assess the significance of path coefficients. The analysis followed the two-phase process recommended by Hair et al., (2022): first, the measurement model was assessed to ensure the reliability and validity of latent constructs; second, the structural model was evaluated to determine the significance and strength of hypothesised relationships, including moderation. SmartPLS version 4.0 software was the tool used for the measurement and structural model analyses.

6.2 RESULTS

6.2.1 Sample Characteristics

The study sample consisted of 230 respondents, with the majority identifying as female (60.4%), followed by male (38.7%), and a small proportion (0.9%) preferring not to disclose their gender. Most participants were aged 18–21 years (55.2%), followed by 22–25 years (29.6%), 26–30 years (5.2%), and 31–35 years (10.0%). These respondents are the target group most likely to engage with SSCOTs in South African grocery retail settings (see Table 1: Sample Characteristics).

Shopping frequency at grocery retail stores varied, with 43.5% reporting shopping 2–3 times per month, 32.2% shopping 4 or more times per month, and smaller proportions shopping less frequently. Regarding educational attainment, 52.6% of respondents had completed high school, 30.4% held undergraduate degrees, and 13.9% had postgraduate qualifications, with minimal representation from other educational levels.

Retailer preferences were predominantly for Pick n Pay (34.8%) and Checkers (33.9%), followed by Woolworths (15.7%), Shoprite (9.1%), Spar (3.9%), and other retailers (2.6%).

TABLE 1: OVERVIEW OF SAMPLE CHARACTERISTICS

	Absolute Frequency	Percentage
Gender		
Male	89	38,7
Female	139	60,4
Prefer not to say	2	0,9
Age		
18 - 21 years old	127	55,2
22 - 25 years old	68	29,6
26 - 30 years old	12	5,2
31 - 35 years old	23	10,0

	Absolute Frequency	Percentage
Education		
High school	121	52,6
Higher certificate	3	1,3
Diploma	2	0,9
Undergraduate degree	70	30,4
Postgraduate degree	32	13,9
Other	2	0,9
Frequency of shopping at a grocery retail store		
Less than once a month	7	3,0
Once a month	49	21,3
2 – 3 times a month	100	43,5
4 or more times a month	74	32,2
Grocery retailer preference		
Pick n Pay	80	34,8
Checkers	78	33,9
Woolworths	36	15,7
Shoprite	21	9,1
Spar	9	3,9
Other (Specify)	6	2,6
Total	230	

Source: Processed data (2025)

6.2.2 Common Method Bias

A full collinearity test based on the variance inflation factor (VIF) was performed (Kock, 2015). The outer model VIF values ranged from 1.357 to 3.754, while the inner model VIF values ranged from 1.000 to 2.285. As all values were below the conservative threshold of 5 and, in most cases, below the stricter 3.3 guideline, these results confirm that common method bias was not a concern in this study.

6.2.3 Measurement model validation

To determine convergent validity, the factor (outer) loadings, composite reliability, and average variance extracted (AVE) were assessed. The factor loadings indicate the reliability of individual measurement items and should exceed 0.7 (Hair et al., 2022). In this study, the acceptable loadings ranged from 0.725 to 0.927, indicating strong item reliability. The following loadings items were deleted due weak factor loadings *PUS3 “I believe that the purchasing process carried out by self-checkout till points would be clear and easy to understand.” *PUS5 “I would use self-checkout till points at grocery retailers if I am able to receive the necessary technical assistance/support.” *PCV4 “Self-service checkout till points at grocery retailers could allow me to shop whenever I choose.”

The Cronbach’s alpha values ranged from 0.757 to 0.918, while composite reliability values ranged from 0.771 to 0.919. Given that both Cronbach’s alpha and composite reliability exceed the recommended thresholds of 0.60–0.70 (Hair et al., 2022), the constructs demonstrate a high degree of internal consistency. To confirm convergent validity, AVE values should be greater than 0.50 (Hair et al., 2022). In this study, AVE values ranged from 0.640 to 0.803, indicating that the constructs adequately capture the variance in their respective indicators (see Table 2).

TABLE 2: OVERVIEW OF MEASUREMENT RESULTS.

Construct	Items	Factor Loadings	Cronbach's α	Composite Reliability (CR)	AVE
Adoption Intention of SSCOTs	AI1: I would be willing to use self-service checkout till points when purchasing my products from grocery retail shops.	0.882	0.918	0.919	0.803
	AI2: If I get a chance, I will use self-service checkout till points in a grocery store.	0.885			
	AI3: Given that I had access to a self-checkout till point, I predict that I would use it.	0.899			
	AI4: I plan to use self-service checkout till points if/when available.	0.918			
Attitude Towards SSCOTs	ATT1: I would like to use self-service checkout till points in grocery shops.	0.830	0.882	0.892	0.682
	ATT2: It would be a pleasure for me to use self-service checkout till points in grocery shops.	0.911			
	ATT3: It would be desirable for me to learn how to use self-service checkout till points in grocery shops.	0.753			
	ATT4: I believe purchasing products through self-service checkout till points at grocery retailers could be rewarding.	0.780			
	ATT5: Purchasing products through self-service checkout till points at grocery retailers could be wise / good / sensible.	0.846			
Perceived Convenience	PCV1: Using self-service checkout till points at grocery retailers would be convenient for me.	0.892	0.867	0.872	0.789
	PCV2: Self-service checkout till points at grocery retailers could make my shopping less time consuming.	0.889			
	PCV3: I think using self-service checkout till points at grocery retailers would be a convenient way to shop.	0.883			
Perceived Ease of Use	PEU1: I think that I could easily learn how to use self-service checkout till points in grocery retail shops.	0.725	0.841	0.861	0.678
	PEU2: think that self-service checkout till points in grocery retail shops would be a flexible technology to interact with.	0.866			
	PEU3: Self-service checkout till points could facilitate the purchase of my products from grocery retailers.	0.826			
	PEU4: I think it would be easy to perform the tasks necessary for the purchase of my products from grocery retailers using self-service checkout till points.	0.869			
Perceived Enjoyment	PEJ1: I believe I would have fun using self-service checkout till points in grocery retail shops.	0.858	0.901	0.909	0.772
	PEJ2: Using self-service checkout till points in grocery retail shops would be pleasant.	0.913			

Construct	Items	Factor Loadings	Cronbach's α	Composite Reliability (CR)	AVE
	PEJ3: would find self-service checkout till points in grocery retail shops to be enjoyable.	0.918			
	PEJ4: I believe it would be interesting to use self-service checkout till points.	0.822			
Perceived Reliability	PRL1: I believe that using self-service checkout till points will be accurate (i.e. I will get and pay for just what I ordered).	0.803	0.757	0.771	0.671
	PRL2: believe using self-service checkout till points at grocery retailers would not result in errors in the prices and purchase of my products.	0.805			
	PRL3: Using self-service checkout till points is something I expect to work very well in grocery retail shops.	0.848			
Perceived Security Measures	PSM1: I would use a self-service checkout till point if the system ensures the safety of my personal information.	0.905	0.878	0.916	0.801
	PSM2: I would use a self-service checkout till point if it protects me against fraud across all channels.	0.927			
	PSM3: I would use a self-service checkout till point if I can trust that it will not share my personal information, including my shopping behaviour, with others.	0.851			
Perceived Self-Efficacy	PSE1: I believe I would be able to use self-service checkout till points in grocery retail shops if there was no one around to tell me what to do.	0.875	0.762	0.766	0.680
	PSE2: I believe I would be able to use self-service checkout till points in grocery retail shops if I had just the built-in help facility for assistance.	0.764			
	PSE3: I believe I would be able to use self-service checkout till points in grocery retail shops even if I had never used a checkout service like this before.	0.831			
Perceived Shopping Well-Being	PSW1: Using self-service checkout till points to shop would satisfy my overall shopping needs.	0.779	0.821	0.859	0.640
	PSW2: Using self-service checkout till points to shop would play an important role in my social well-being.	0.806			
	PSW3: Using self-service checkout till points to shop would play an important role in my leisure well-being.	0.796			
	PSW4: Using self-service checkout till points to shop would ensure a good quality of life for me.	0.817			
Perceived Usefulness	PUS1: Self-service checkout till points could improve my performance in purchasing products from grocery retailers.	0.895	0.836	0.840	0.752
	PUS2: The use of self-service checkout till points at grocery retailers could enhance my shopping effectiveness.	0.848			
	PUS4: The use of self-service checkout till points could be beneficial for the purchase of my products.	0.859			

*PUS3, *PUS5, *PCV4: Items deleted due to weak factor loadings

To assess discriminant validity, the study employed the Heterotrait-Monotrait (HTMT) criterion, which requires values to be below 0.90 for conceptually similar constructs (Hair et al., 2022). As shown in Table 3, all HTMT values fall below the 0.90 threshold, indicating that the constructs are distinct from one another. This result confirms that there is no multicollinearity issue between the measurement items, supporting the discriminant validity of the constructs used to measure consumers' perceptions, attitudes, and adoption intentions toward SSCOTs in South African grocery retail.

TABLE 3: HETEROTRAIT-MONOTRAIT RATIO (HTMT)

	AI	ATT	PCV	PEU	PE	PR	PSM	PSE	PSW	PE
AI										
ATT	0,854									
PCV	0,718	0,767								
PEU	0,681	0,703	0,708							
PE	0,694	0,820	0,643	0,537						
PR	0,651	0,747	0,663	0,593	0,554					
PSM	0,284	0,382	0,266	0,335	0,304	0,431				
PSE	0,606	0,557	0,478	0,588	0,500	0,506	0,343			
PSW	0,573	0,686	0,544	0,361	0,573	0,548	0,288	0,388		
PU	0,581	0,659	0,704	0,630	0,470	0,579	0,109	0,359	0,606	

Source: Processed data (2025).

Notes: AI=Adoption Intention, ATT=Attitude, PCV=Perceived Convenience, PEU=Perceived Ease of Use, PE=Perceived Enjoyment, PR=Perceived Reliability, PSM=Perceived Security Measures, PSE=Perceived Self-Efficacy, PSW=Perceived Shopping Well-Being, PU=Perceived Usefulness

To assess the explanatory power of the structural model, R^2 values were examined. R^2 was 0.618 for adoption intention, 0.715 for attitude towards SSCOTs, and 0.393 for perceived shopping well-being. According to Schumacher et al., (2016), R^2 represents the percentage of variance in a dependent variable explained by its predictors, indicating that the developed model demonstrates moderate to substantial explanatory power (Hair et al., 2022).

Model fit was further assessed using the Standardized Root Mean Square Residual (SRMR) and the squared Euclidean distance (d_{ULS}). The SRMR measures the average magnitude of discrepancies between observed and model-implied correlations, whereas d_{ULS} represents the squared Euclidean distance between the empirical and model-implied covariance matrices (Hair et al., 2022). The model yielded an SRMR value of 0.077 and a d_{ULS} value of 3.921, both indicating an acceptable and satisfactory model fit.

6.2.4 Structural Model Assessment

The path model results, presented in Table 4, show the estimated relationships among the constructs in the context of SSCOT adoption. Perceived ease of use was found to positively and significantly influence consumers' attitudes towards SSCOTs ($\beta = 0.138$, $t = 2.347$, $p = 0.019$), while perceived usefulness also had a significant positive influence on attitude ($\beta = 0.126$, $t = 2.087$, $p = 0.037$). Perceived reliability was positively associated with attitude ($\beta = 0.199$, $t = 4.217$, $p < 0.001$), as was perceived convenience ($\beta = 0.154$, $t = 2.475$, $p = 0.013$) and perceived enjoyment ($\beta = 0.419$, $t = 8.454$, $p < 0.001$). The hypothesised relationship between perceived self-efficacy and attitude was not supported ($\beta = 0.045$, $t = 0.840$, $p = 0.401$). Consumers' attitudes towards SSCOTs had a positive and significant influence on perceived shopping well-being ($\beta = 0.627$, $t = 13.346$, $p < 0.001$), and attitude also positively influenced adoption intention ($\beta = 0.712$, $t = 14.523$, $p < 0.001$). In contrast, the relationship between perceived shopping well-being and adoption intention was not statistically significant ($\beta = 0.090$, $t = 1.751$, $p = 0.080$). The moderating influence

of perceived security measures on the relationship between attitude and adoption intention was supported ($\beta = -0.046$, $t = 2.312$, $p = 0.021$).

TABLE 4: STANDARDIZED PATH ESTIMATES AND HYPOTHESES SUMMARY.

	Hypothesis	β	Mean	SD	t-value	p-values	Outcome
H1	Perceived Ease of Use -> Attitude Towards using SSCOTs	0,138	0,141	0,059	2,347	0,019	Supported
H2	Perceived Usefulness -> Attitude Towards using SSCOTs	0,126	0,124	0,060	2,087	0,037	Supported
H3	Perceived Reliability -> Attitude Towards using SSCOTs	0,199	0,197	0,047	4,217	0,000	Supported
H4	Perceived Convenience -> Attitude Towards using SST	0,154	0,158	0,062	2,475	0,013	Supported
H5	Perceived Enjoyment -> Attitude Towards using SSCOTs	0,419	0,418	0,050	8,454	0,000	Supported
H6	Perceived Self-Efficacy -> Attitude Towards using SSCOTs	0,045	0,044	0,053	0,840	0,401	Not Supported
H7	Attitude Towards using SSCOTs -> Perceived Shopping Well-Being	0,627	0,632	0,047	13,346	0,000	Supported
H8	Attitude Towards using SSCOTs -> Adoption Intention of SST	0,712	0,712	0,049	14,523	0,000	Supported
H9	Perceived Shopping Well-Being -> Adoption Intention of SSCOTs	0,090	0,087	0,051	1,751	0,080	Not Supported
H10	Perceived Security Measure x Attitude Towards using SSCOTs -> Adoption Intention of SSCOTs	-0,046	-0,045	0,020	2,312	0,021	Supported

Source: Processed data (2025)

7. MAIN FINDINGS

The findings provide insights into the factors influencing consumer adoption of SSCOTs in grocery retail settings, particularly within emerging markets. Perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, and perceived enjoyment all had positive and significant influence on attitudes toward SSCOTs. These results indicate that consumers' perceptions of how easy, useful, reliable, convenient, and enjoyable SSCOTs are play a critical role in shaping consumers overall attitude toward using SSCOTs. Among these factors, perceived enjoyment exerted the strongest influence ($\beta = 0.419$, $t = 8.454$, $p < 0.001$), highlighting that the emotional appeal of SSCOTs, in addition to their functional benefits, substantially drives attitudes. In contrast, the hypothesised relationship between perceived self-efficacy and attitude was not supported ($\beta = 0.045$, $t = 0.840$, $p = 0.401$), suggesting that confidence in one's ability to use technology does not significantly affect attitudes toward SSCOTs in this context.

Attitudes toward SSCOTs positively influenced both perceived shopping well-being ($\beta = 0.627$, $t = 13.346$, $p < 0.001$) and adoption intention ($\beta = 0.712$, $t = 14.523$, $p < 0.001$). This indicates that a positive attitude not only enhances consumers' perceptions of the shopping experience but also increases the likelihood of intending to adopt SSCOTs. The direct relationship between perceived shopping well-being and adoption intention was not significant ($\beta = 0.090$, $t = 1.751$, $p = 0.080$), suggesting that while SSCOTs may improve consumers' shopping experience, this does not necessarily translate into a direct intention to adopt SSCOTs.

7.1 MODERATION ANALYSIS

The moderating role of perceived security measures on the relationship between attitude and adoption intention was supported ($\beta = -0.046$, $t = 2.312$, $p = 0.021$). This finding highlights the importance of security perceptions in strengthening the relationship between positive attitudes and adoption intention. It highlights that when consumers feel confident in the security of SSCOTs, their favourable attitudes toward the technology are more likely to result in genuine adoption intentions, a consideration particularly relevant in emerging markets, where concerns around data protection and transactional security may be heightened.

8. DISCUSSION

In South Africa, grocery retailers are beginning to implement self-service checkout technologies to enhance convenience and efficiency. Checkers has pioneered this shift with its Xpress Trolley, the country's first smart shopping trolley, which allows shoppers to scan and bag items as they go, track a live running total, and pay directly on the trolley, bypassing traditional checkout queues (Shopriteholdings, 2025). This study provides insights into consumers' perceptions of self-service checkout till points (SSCOTs) in South African grocery retail, explicitly addressing the research objectives. In line with the first objective, which examined how perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, perceived enjoyment, and perceived self-efficacy influence attitudes. The findings are consistent with the Technology Acceptance Model (TAM) (Davis, 1989), highlighting the importance of cognitive perceptions in shaping anticipated technology adoption. Beyond cognitive evaluations, participants also perceived affective and experiential factors specifically perceived enjoyment and perceived convenience as influential in shaping their attitudes. This suggests that emotional responses may play a meaningful role in potential SSCOT adoption, supporting extensions of TAM that incorporate affective perceptions. Interestingly, perceived self-efficacy was not reported as significantly influencing attitudes, diverging from prior research (Compeau & Higgins, 1995). This may reflect participants' general confidence with technology or the perceived intuitiveness of SSCOTs, reducing reliance on individual skills to navigate these systems.

Regarding the second and third objectives, which investigated the impact of attitudes on perceived shopping well-being and adoption intentions, as well as the influence of perceived shopping well-being on adoption intentions, participants reported that positive attitudes were associated with anticipated improvements in shopping well-being and adoption intentions. However, perceived shopping well-being alone was not strongly associated with adoption intentions. This indicates that while SSCOTs are perceived as potentially enhancing the overall shopping experience, improvements in perceived well-being may not directly translate into adoption. Instead, cognitive perceptions, affective responses, and perceived trust collectively shape participants' anticipated willingness to accept SSCOTs. In relation to the fourth objective which investigated the moderating role of perceived security measures, participants perceived security measures as likely to influence the relationship between attitudes and adoption intentions. This highlights the importance of trust in shaping consumers' willingness to accept SSCOTs, particularly in emerging markets where concerns about digital security and privacy are heightened (Gefen et al., 2003). Retailers and technology providers should therefore prioritise visible and well-communicated security features to strengthen perceived trustworthiness and encourage adoption.

9. THEORETICAL IMPLICATIONS

This study advances the Technology Acceptance Model (TAM) by integrating emotional constructs and, critically, perceived security measures as a moderating variable influencing the relationship between attitudes and adoption

intentions. By emphasising perceived security, the research highlights its pivotal role in influencing consumer behaviour toward self-service checkout till points (SSCOTs) in emerging market contexts. This integration broadens TAM's explanatory scope, offering a more comprehensive framework for understanding the multifaceted drivers of retail technology adoption. Empirical evidence from this study confirms that perceived ease of use and perceived usefulness remain fundamental predictors of attitudes toward SSCOTs, consistent with TAM's original propositions. Importantly, the findings demonstrate the substantial influence of perceived enjoyment, perceived reliability and perceived convenience, suggesting that TAM can be meaningfully extended to incorporate emotional and experiential dimensions alongside traditional cognitive evaluations.

Moreover, the moderating role of perceived security highlights the critical importance of trust-related constructs in technology adoption, particularly in markets where digital literacy varies and concerns regarding technology use are heightened. These results indicate that security considerations can significantly influence the attitude–intention relationship, positioning perceived security as a crucial contextual factor in adoption models applied not only to South Africa but also to other emerging markets facing similar technological and socio-economic conditions. Overall, this study advocates for the adaptation and contextualisation of existing technology adoption frameworks by incorporating localised factors, such as security perceptions and emotional engagement, to more accurately capture the complexities of consumer behaviour. By doing so, the research contributes to theoretical advancement that extends beyond the immediate sample, providing insights applicable to broader emerging market contexts and guiding future studies on retail technology adoption.

10. PRACTICAL IMPLICATIONS

Self-service checkout till points (SSCOTs) empower consumers by providing greater control over their shopping experiences. The study's findings suggest that grocery retailers should adopt a multi-faceted approach addressing functional, experiential, and security dimensions. Enhancing functional usability requires ensuring that SSCOT interfaces are intuitive and user-friendly, with clear on-screen instructions and options for error recovery, complemented by usability testing with young consumers to identify and resolve potential pain points before full implementation. Experiential value can be elevated by introducing features that increase enjoyment, such as gamified scanning experiences or personalised recommendations during checkout, while reducing perceived inconvenience through optimised queue management, sufficient SSCOT availability, and integration with mobile apps for pre-scanning or digital wallet payments. Strengthening perceived security measures is critical; retailers should implement secure payment gateways and fraud detection systems while clearly communicating these measures through in-store signage, app notifications, and marketing materials to build consumer trust. Providing on-site staff support for first-time users can further alleviate anxiety around digital transactions, especially in emerging markets. Targeted marketing that highlights SSCOTs' efficiency, enjoyment, and security is likely to appeal to both cognitive and affective consumer criteria, particularly among digitally literate, early-adopter segments such as Gen Z and Millennials. Finally, establishing continuous feedback mechanisms, including post-transaction surveys and app-based feedback channels, will allow retailers to monitor user experience and address issues in real time, ensuring sustained satisfaction and adoption.

11. POLICY IMPLICATIONS

Policymakers in emerging markets play a crucial role in supporting the safe and effective adoption of SSCOTs. Regulatory frameworks should mandate robust security and data privacy standards, including encryption, secure authentication, and breach response protocols, while ensuring periodic audits of retail SSCOT systems to protect

consumers. Strengthening consumer protection laws against digital fraud and the misuse of personal data is essential, accompanied by public education initiatives to raise awareness of SSCOT security features and safe transaction practices. Digital literacy programs in collaboration with educational institutions and community organisations can further empower consumers to adopt SSCOTs confidently and securely. Finally, industry-government collaboration can drive innovation by encouraging pilot programs and co-developing market-appropriate security solutions that balance technological efficiency with consumer safety. Together, these practical and policy measures can reduce perceived risks, enhance trust, and facilitate greater SSCOT adoption, promoting digital inclusion, improving customer satisfaction, and supporting broader economic growth in emerging markets.

12. LIMITATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This study employed purposive sampling to target young adult users of SSCOTs. While this approach was effective in reaching the intended demographic, it limits the generalisability of the findings to the broader population. Future research could adopt probability sampling techniques or conduct comparative studies across multiple consumer segments to enhance representativeness. The cross-sectional design also constrains the ability to infer causal relationships; longitudinal studies would provide deeper insights into changes in attitudes and adoption behaviours over time. Moreover, the conceptual model could be extended to include additional factors such as trust, perceived risk, personality traits, and cultural influences, which may further shape SSCOT adoption.

13. CONCLUSION

This study examined the factors influencing young South African consumers' adoption intention of self-service checkout till points (SSCOTs) in grocery retail. The findings indicate that perceived ease of use, perceived usefulness, perceived reliability, perceived convenience, and perceived enjoyment significantly influence attitudes toward SSCOTs. Positive attitudes were found to enhance both adoption intention and perceived shopping well-being, although perceived shopping well-being alone did not directly influence adoption. Furthermore, perceived security measures were shown to moderate the relationship between attitudes and adoption, highlighting the importance of trust and data protection in consumers' decision-making, particularly in emerging markets. These results highlight that while functional and experiential benefits are essential, ensuring robust and transparent security measures is critical to converting favourable attitudes into adoption intentions. Practically, grocery retailers, including Checkers, Pick n Pay, Spar, Woolworths, and Shoprite, can leverage these insights to optimise SSCOT design, enhance the shopping experience, and strengthen customer satisfaction and loyalty, especially in emerging markets. Retailers should focus not only on efficiency and convenience but also on creating engaging and secure self-service experiences to foster adoption. Overall, this study demonstrates that SSCOTs represent a transformative retail innovation, combining operational efficiency with customer empowerment. By integrating functional, experiential, and security considerations, retailers in South Africa and similar emerging markets can advance customer-centric, technology-enabled shopping experiences while supporting successful digital transformation.

14. ETHICS

This study received approval from the University of the Witwatersrand Research Ethics Committee (Ethics Clearance Number: R14/49). Participants were assured that their responses would remain confidential and anonymous. Participation was entirely voluntary, and respondents were informed that they could withdraw from the study at any time without any penalty or obligation to provide a reason.

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