

Determinants of Gambling Behaviour Prevalence in Ilorin, Nigeria: A Multidimensional Analysis

Musa Ilias Biala^{1,2*}, Opeyemi Enitan Alabi¹, Gbenga Friday Akintunde¹

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¹Department of Economics and Development Studies, Kwara State University, Malete, Nigeria

²**ORCID:** 0000-0003-0659-288X

*Corresponding author: Musa Ilias Biala: musa.biala@kwasu.edu.ng

Abstract: In this study, we investigated the determinants of prevalence of gambling behaviour in Ilorin, Nigeria, against the backdrop of the rising prevalence of gambling activities in urban centres and limited empirical evidence on their multidimensional drivers. A cross-sectional survey was conducted among 398 respondents selected through multi-stage stratified random sampling from betting outlets across three local government areas. Using the theory of planned behaviour as the theoretical framework, data were analysed using binary logistic regression, multivariate logit, and ordered logistic regression. The study found that gambling behaviour in Ilorin is primarily driven by economic, psychological, demographic, technological, and social factors. Overall, the findings suggest that gambling behaviour in Ilorin is influenced by psychological motivations, income, expected monetary returns, social dynamics, and technological advancement rather than by religious or regulatory constraints. These findings contribute to gambling literature by demonstrating that social pressures and opportunity structures override personal attitudes and religious restraints in conservative contexts. Targeted peer-led interventions, digital regulation, psychological counselling, peer- and media-driven awareness campaigns, and financial literacy programmes are recommended to reduce the adverse social and economic consequences of gambling in Ilorin and similar areas.

Keywords: Gambling Intensity, Gambling Participation, Religiosity, Betting, Theory of Planned Behaviour, Gambling Prevalence.

Introduction

Gambling has emerged as a major socio-economic activity worldwide, with particularly rapid growth in developing economies such as Nigeria. Globally, the gambling industry was valued at over USD 450 billion in 2022, with Africa's contribution rising due to its youthful population and expanding access to mobile and digital technologies (Statista, 2023). In Nigeria, gambling has become deeply embedded in everyday life, driven by increased internet penetration, widespread mobile phone usage, and persistent economic hardship, especially unemployment (Olaore, et al., 2021).

Technological advancement has fundamentally transformed gambling practices. Traditional forms such as lotteries and casino games have been complemented—and in many cases overtaken—by online gambling platforms, mobile betting applications, and digital payment systems. These innovations have lowered entry barriers and increased accessibility, particularly among young people, leading to higher participation rates and heightened vulnerability to gambling-related problems (Griffiths & Calado, 2022). In Nigeria, this trend is evident in the sharp rise in youth gambling. Reports indicate that over 40% of Nigerians aged 18–40 actively engage in gambling, contributing to an industry valued at over ₦730 billion annually, while daily spending on sports betting alone is estimated at ₦1.8 billion (Olaore et al., 2021).

Despite its economic contributions such as job creation, tax revenue, and increased commercial activity, gambling poses significant social challenges. Excessive gambling has been linked to addiction, financial distress, family conflict, social disintegration, and increased crime (Badji et al., 2023). It is also associated with unemployment, mental health problems, depression, and anxiety (Badji et al., 2023; Olaore et al., 2021). Moreover, gambling is often condemned on moral and religious grounds, particularly within Islam and Christianity. In Nigeria, where religion strongly shapes social norms and individual behaviour, religiosity may deter gambling, though its influence varies depending on personal beliefs and exposure.

However, despite the strong religious orientation of Ilorin, gambling activities have become increasingly visible across the metropolis. Betting shops, online gambling platforms, lottery outlets, and sports betting advertisements have proliferated in recent years, particularly among young adults. This trend presents a paradox because both Islam and Christianity, the dominant religions in Ilorin, generally discourage gambling and classify it as morally undesirable. Despite its strong religious character, with a predominantly Muslim population alongside a significant Christian community, Ilorin has witnessed increasing visibility and accessibility of gambling outlets, advertisements, and activities. This religious-economic paradox raises critical questions: How does gambling thrive in a community where religious teachings explicitly condemn it? Why are young, educated individuals in a conservative environment turning to activities their faith prohibits?

Existing studies on gambling in Nigeria (e.g., Abolakale et al., 2023; Akanle & Fageyinbo, 2016; Temitope, 2019) have concentrated primarily on sports betting among youths in southern cities such as Lagos, Ibadan, and Port Harcourt, with relatively little attention devoted to northern and north-central urban centres. Consequently, empirical evidence regarding the factors driving gambling behaviour in Ilorin remains limited. Furthermore, most studies focus on isolated determinants such as income, peer influence, or technology, while

neglecting the combined effects of economic, psychological, technological, cultural, social, regulatory, and demographic factors.

Understanding why gambling continues to thrive in a highly religious environment is important for policy formulation and behavioural interventions. As gambling participation expands alongside unemployment, economic uncertainty, and digital technology adoption, there is a growing need to identify the factors influencing gambling participation, gambling intensity, and preferences for different gambling forms. This study, therefore, sought to examine the economic, psychological, technological, cultural, social, regulatory, and demographic factors that influence gambling participation and intensity in Ilorin; and determine which specific gambling types (sports betting, lottery, casino games, online gambling, card games) are influenced by these factors.

This paper contributes to the literature by incorporating the multidimensional factors (economic, psychological, social, technological, cultural, demographic, and regulatory) to offer a broad and contextually grounded understanding of gambling behaviour in a rapidly expanding but under-researched area. Another key contribution of the paper is its disaggregation of gambling behaviour into participation, intensity, and type of gambling, which provides more distinct insights than studies that treat gambling as a single outcome.

The remainder of this paper is organised as follows. Section 2 reviews relevant conceptual and empirical literature on gambling behaviour, with emphasis on economic, social, psychological, technological, cultural, regulatory, and demographic determinants. Section 3 describes the methodology employed for the study. While Section 4 presents and discusses the empirical findings, Section 5 draws conclusions, and offers policy recommendations aimed at mitigating the adverse effects of gambling.

Literature Review

Gambling is the audacious act of staking valuable assets or monetary resources on unpredictable outcomes, driven by an intoxicating mix of chance, risk, and anticipation. It dances precariously between the lure of windfall gains and the abyss of ruin, fueled by the human desire to conquer uncertainty and control fate (Vijayakumar & Vijayakumar, 2023). However, gambling encompasses various activities such as lottery, sports betting, bingo, casino games like roulette, and card games like poker, rummy, and teen patti, with online platforms showing a significant increase in popularity, especially among the youth due to factors like availability, accessibility, affordability, anonymity, and convenience (Vijayakumar & Vijayakumar, 2023).

Gambling and crime have historically been intertwined, with gambling being viewed as both a criminal activity and a leisure pursuit, leading to fluctuations in societal attitudes and policies over time (Aguocha & George, 2021). The cultural perception of gambling in Nigeria is equally complex, oscillating between viewing it as a legitimate form of entertainment and a morally dubious activity. Thus, gambling in Nigeria is a high-stakes arena, reflecting broader socio-economic trends and the complex dance between tradition and modernity.

Gambling encompasses a wide range of activities, each with its unique characteristics and appeal. It can be categorized into various types based on the mode of play, legal status, and risk involved: casino gambling, sports betting, card games, gambling machines, lottery and raffle, scratch cards/tickets, bingo, and stock market investment.

The literature has attributed several factors to increasing gambling. These factors are grouped as follows.

Economic Factors and Gambling

Economic circumstances are consistently identified as important correlates of gambling participation. Income is particularly relevant, although its relationship with gambling may differ across socioeconomic groups. Individuals with higher incomes may engage in gambling primarily as a form of recreation or entertainment, whereas economically disadvantaged individuals may view gambling as a potential means of improving their financial circumstances. Dowling et al. (2022), for instance, associated socioeconomic disadvantage with greater vulnerability to gambling-related harms. This relationship may be particularly pronounced in developing-country settings, where limited employment opportunities, financial insecurity, and weak social protection can increase the appeal of gambling as an alternative source of income. Evidence from Kenya indicates that young people from low-income households may perceive gambling as a means of achieving financial improvement or upward mobility (Sultana et al., 2021; Njonge & Ronoh, 2022).

Employment status is another important economic correlate. Unemployment may create financial strain while simultaneously increasing exposure to boredom, stress, and unstructured leisure time, conditions that may be associated with greater gambling involvement (Kim & King, 2020). Similar evidence has been reported in Nigeria, where unemployment and job insecurity have been linked to gambling participation (Olaore et al., 2021). Taken together, the literature suggests that economic circumstances are closely intertwined with gambling behaviour, although the nature and strength of this relationship may depend on the broader socioeconomic and institutional context.

Cultural Factors and Gambling

Gambling behaviour is also embedded within broader cultural and religious environments that shape its social acceptability and individual attitudes. Where gambling is culturally normalized, individuals may encounter fewer social barriers to participation, potentially increasing its prevalence (Kim & King, 2020). In developing-country contexts, gambling may intersect with traditional beliefs, social practices, aspirations for economic mobility, and perceptions of success. Njonge and Ronoh (2022), for example, reported that some Kenyan youths perceive gambling as a potential pathway to financial improvement and enhanced social status. Similarly, Getahun and Kassa (2019) found that gambling may be incorporated into social gatherings in Ethiopia, thereby contributing to its social acceptance.

Religious beliefs constitute another important dimension of the cultural environment. Major religious traditions generally discourage or condemn gambling, although the strength with which these teachings translate into individual behaviour may vary across social contexts. Kim and King (2020) noted negative religious attitudes towards gambling within Christian contexts, while Bitanhirwe et al. (2022) emphasized the strong prohibition of gambling within Islamic teachings. This distinction is particularly relevant to Ilorin, where both Islam and Christianity are influential. Although religious norms may discourage gambling, their influence may coexist with economic pressures, peer influence, and the increasing accessibility of gambling opportunities. Consequently, religious

disapproval does not necessarily eliminate gambling participation but may instead shape its acceptability, expression, and social visibility.

Regulatory Policies and Gambling

The regulatory environment represents an important institutional dimension of gambling behaviour because laws, licensing arrangements, advertising restrictions, age requirements, and monitoring mechanisms can influence the availability and accessibility of gambling opportunities. In developed gambling markets, regulatory frameworks have increasingly had to adapt to technological innovations that introduce new forms of gambling and new avenues for consumer exposure. Turner and Shi (2024), for example, emphasized the regulatory challenges associated with emerging technologies such as virtual and augmented reality, particularly in relation to consumer protection and responsible gambling.

These challenges can be more pronounced in developing-country settings where regulatory institutions may face limitations in monitoring rapidly expanding gambling markets. Bitanirwe et al. (2022) identified inadequate regulation as a challenge to effective gambling control in sub-Saharan Africa, particularly where informal and poorly monitored forms of gambling coexist with regulated activities. In Nigeria, Aguocha and George (2021) similarly highlighted regulatory gaps associated with online gambling, which can complicate efforts to monitor both legal and illegal activities.

Technological Advancements and Gambling

Technological development has substantially transformed the accessibility and nature of gambling. Internet connectivity, smartphones, mobile payment systems, and online betting platforms have reduced many of the geographical and temporal barriers traditionally associated with gambling. Consequently, gambling can increasingly be accessed privately and continuously through personal digital devices. Evidence from developing countries illustrates this transformation. Sultana et al. (2021) found that online betting in rural Bangladesh is shaped by the interaction between technological accessibility and traditional beliefs, while Njonge and Ronoh (2022) associated the availability of online gambling platforms with increased gambling involvement among Kenyan youth.

The Nigerian context reflects similar developments. Victor-Aigbodion (2022) reported that online gambling platforms have made gambling more accessible to adolescents, thereby creating additional challenges for effective regulation and parental supervision. Technological advancement may therefore operate through several interconnected mechanisms, including increased accessibility, convenience, anonymity, and exposure to gambling promotions. The rapid digitalization of gambling consequently makes technological factors particularly relevant to understanding contemporary gambling participation in contexts such as Ilorin.

Psychological Factors and Gambling

Psychological characteristics and experiences constitute another important dimension of gambling behaviour. Research has linked gambling involvement and gambling-related problems to factors such as cognitive distortions, emotional dysregulation, stress, impulsivity, and adverse life experiences. Thurm et al.

(2023), for example, identified associations between stressful life events, cognitive distortions, emotion-regulation difficulties, and gambling severity. These findings suggest that gambling may sometimes function as a maladaptive coping mechanism in response to psychological distress. Kim and King (2020) similarly highlighted psychological and cognitive similarities between gambling and gaming, suggesting that shared mechanisms may become increasingly relevant as gambling becomes integrated into digital environments.

Evidence from developing countries is broadly consistent with these observations. Njonge and Ronoh (2022) reported associations between gambling among Kenyan youths and psychological conditions such as depression, anxiety, and low self-esteem. In Ethiopia, Getahun and Kassa (2019) identified personal and environmental stressors as relevant to problematic gambling. Nigerian studies have likewise emphasized the roles of peer pressure, financial stress, and psychological distress in gambling involvement (Victor-Aigbodion, 2022; Sulaiman & Sulaiman, 2023). Collectively, these findings indicate that gambling behaviour cannot be adequately understood solely in terms of economic incentives or accessibility; psychological experiences and individual coping processes also form an important part of the behavioural context.

Demographics and Gambling

Among demographic characteristics, age and gender have received considerable attention in the literature. Younger individuals may exhibit greater vulnerability to risky gambling because of factors such as impulsivity, peer influence, and greater exposure to contemporary digital gambling platforms (Mbiriri, 2023). Gender differences have also been reported, with males generally exhibiting higher levels of participation in some forms of gambling, particularly strategic and high-stakes activities, while females may show greater participation in certain chance-based forms. However, the expansion of online gambling may be narrowing traditional gender differences by making gambling more accessible across demographic groups (Akingbade et al., 2019; Turner & Shi, 2024).

Educational attainment may also differentiate gambling participation. Higher levels of education may be associated with greater awareness of gambling risks and improved capacity to evaluate uncertain outcomes, whereas individuals with lower educational attainment may experience greater vulnerability in some contexts (Getahun & Kassa, 2019; Bitanirwe et al., 2022). Nevertheless, the relationship between education and gambling is not necessarily uniform across settings or gambling forms.

Overall, the literature indicates that gambling participation is multidimensional, reflecting the interaction of individual characteristics with economic circumstances, social and cultural norms, psychological conditions, technological accessibility, and the regulatory environment. However, only few studies have examined the multidimensional determinants of general and specific gambling participation and intensity using appropriate econometric methods, such as binary and ordered logistic regression models. This multidimensional perspective provides a useful basis for examining gambling participation in Ilorin, where these factors operate simultaneously within a distinct socioeconomic, cultural, and institutional setting. Furthermore, gambling studies in a highly religious environment such as Ilorin is limited.

Based on the identified gaps in the literature, this study addresses the following research questions:

1. What factors determine gambling participation and intensity in Ilorin city?
2. How do these factors influence participation in specific types of gambling such as sports betting, lottery, casino games, online gambling, and card games?

These questions guided the empirical analysis and provided the basis for examining the multidimensional determinants of gambling behaviour in Ilorin.

Methodology

This study primarily draws upon the theory of planned behaviour (TPB) to provide a comprehensive understanding of gambling behaviour (Ajzen, 1991). The TPB is widely used in behavioural studies (e.g., Biala, 2019; Biala, et al., 2025a; 2025b) to explain and predict human behaviour based on three primary determinants: attitudes towards the behaviour, subjective norms, and perceived behavioural control (Ajzen, 1991). The TPB posits that if people have a positive disposition (attitude) towards a behaviour, if they think their significant others want them to perform the behaviour (subjective norm), and if they believe they can perform the behaviour (perceived behavioural control), then the intention to perform the behaviour is heightened and thus, the behaviour will be performed (Biala, 2019). The more favourable the attitude and the subjective norm towards a particular behaviour and the greater the behavioural control, the stronger the intention to engage in the behaviour. And the stronger the intention, the more likely the behaviour is performed.

As applied to gambling behaviour, attitude encompasses beliefs about the likely outcomes of gambling (e.g., financial gain, entertainment, social status) and the subjective value attached to those outcomes. Individuals who hold favourable attitudes towards gambling—believing it to be lucrative, exciting, or socially rewarding—are more likely to develop strong intentions to gamble. Conversely, those who perceive gambling as morally wrong, financially ruinous, or socially deviant are less inclined to engage. The TPB thus predicts that attitude exerts a direct positive influence on gambling intention and subsequent behaviour.

Subjective norms represent the perceived social pressure to engage or not engage in gambling. This construct captures the influence of significant others (family members, peers, religious leaders, or reference groups) on gambling. When gambling is normalised within an individual's social circle, or when there is perceived approval from influential others, the subjective norm favouring gambling strengthens behavioural intention. In collectivist societies such as Nigeria, where peer and family approval carry substantial weight, subjective norms may be particularly potent predictors of gambling behaviour. Conversely, in highly religious communities like Ilorin, subjective norms rooted in religious teachings may discourage gambling—though economic pressures may weaken this effect.

Perceived behavioural control (PBC) refers to the individual's perception of how easy or difficult it is to engage in gambling. PBC encompasses beliefs about internal constraints (e.g., self-discipline, addiction vulnerability) and external constraints (e.g., access to betting outlets, availability of funds, technological access). Individuals who perceive gambling as easily accessible, affordable, and within their control are more likely to form strong intentions to gamble. Importantly, PBC can directly influence behaviour when it accurately reflects actual control; for example, when a person with easy access to online betting platforms and disposable income gambles without necessarily forming a prior

conscious intention. The TPB acknowledges this direct path from PBC to behaviour, which is particularly relevant for understanding impulse gambling and the role of technological advancements in lowering barriers to participation.

Figure 1 presents the extended TPB framework which includes the constructs of the basic framework as applied to gambling behaviour.

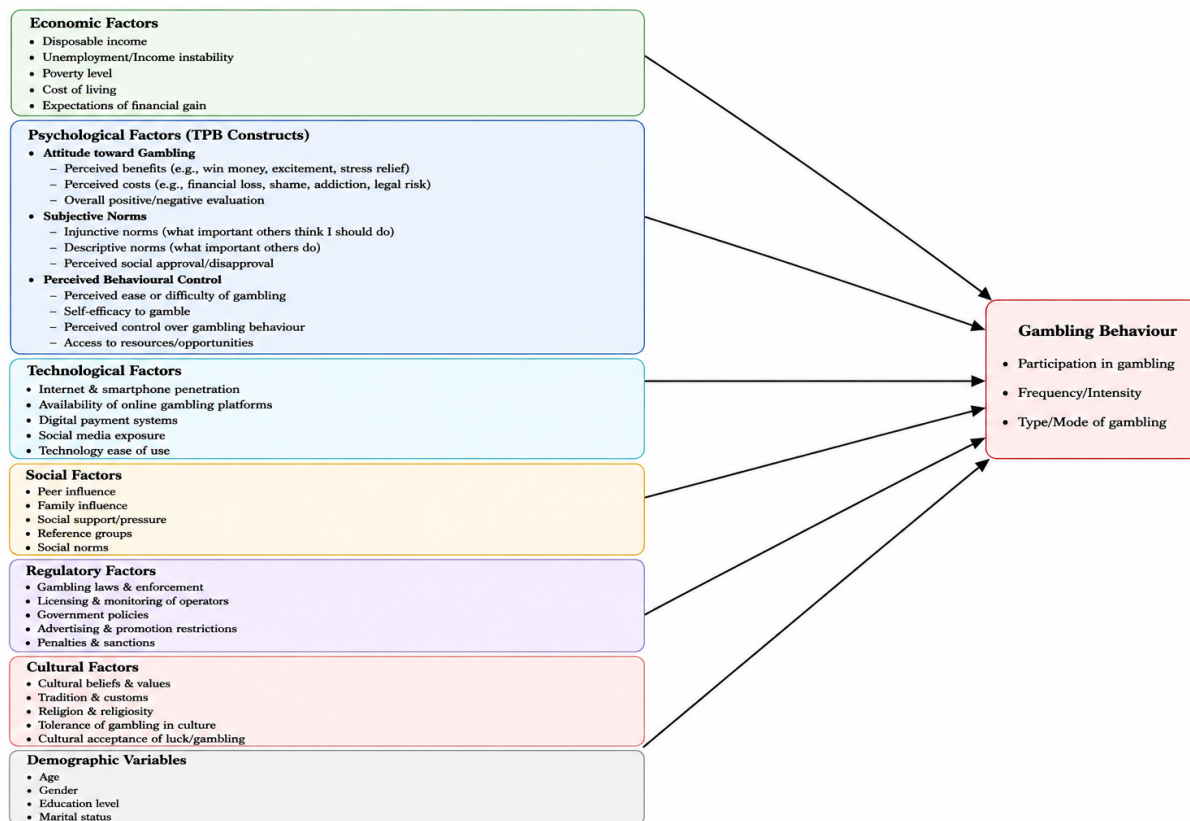


Figure 1 Extended theory of planned behaviour framework for gambling behaviour
Source: Authors' construct

Although the TPB posits that behavioural intention constitutes the principal proximal determinant of behaviour, the present study does not seek to test the complete intention–behaviour mechanism. Rather, TPB is employed as a theoretical lens for identifying and organising factors that may shape gambling behaviour, while the empirical analysis focuses directly on actual gambling behaviour. This approach is justified by the multidimensional nature of gambling, which extends beyond psychological considerations to include technological accessibility, cultural influences, economic circumstances, demographic characteristics, social influences, and the regulatory environment. Several of these factors may facilitate or constrain actual gambling behaviour through mechanisms that are not necessarily captured by behavioural intention. Accordingly, the study adopts an extended, determinant-oriented application of TPB and estimates the direct associations between the identified multidimensional factors and gambling behaviour. Figure 1 presents the extended TPB framework as applied to gambling

behaviour in this study. The resulting model should therefore be interpreted as an empirical model of the determinants of gambling behaviour rather than as a test of the complete TPB causal pathway.

Model Specification

Building on the theoretical framework established in above, this subsection translates the TPB constructs into empirically testable econometric models. While the core TPB constructs explain the psychological pathway to gambling behaviour, this study extends the framework by incorporating external factors as distal determinants. Economic, technological, cultural, regulatory, social and demographic factors (age, gender, education, marital status) were hypothesised to influence gambling behaviour indirectly through attitudes, subjective norms, and perceived behavioural control, as well as directly, particularly in the case of perceived behavioural control where external access and opportunity are concerned.

Gambling Participation Model

According to TPB gambling behaviour (*Gam*) is influenced by intention to gamble (*Int*) which is in turn influenced by attitude towards gambling (*Att*), subjective norms about gambling (*Sn*), and perceived behavioural control over gambling (*Pbc*). Thus, the structural relationships can be expressed as:

$$(Gam_i) = f(Int_i, Pbc_i) \quad (1)$$

$$Int_i = f(Att_i, Sn_i, Pbc_i) \quad (2)$$

Concatenating in (1) and (2) yields the TPB model

$$(Gam_i) = f(Att_i, Sn_i, Pbc_i) \quad (3)$$

from which

$$P(Gam_i = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_1 Att_i + \beta_2 Sn_i + \beta_3 Pbc_i + \varepsilon_i)}} \quad (4)$$

was specified. Gam_i is the probability of participating in gambling. By carrying out a logit transformation, Equation (4) becomes

$$\text{Logit}(P(Gam_i = 1)) = \ln\left(\frac{P(Gam_i=1)}{1-P(Gam_i=1)}\right) = \beta_0 + \beta_1 Att_i + \beta_2 Sn_i + \beta_3 Pbc_i + \varepsilon_i \quad (5)$$

which simplifies to the baseline equation:

$$Gam_i = \beta_0 + \beta_1 Att_i + \beta_2 Sn_i + \beta_3 Pbc_i + \beta_2 Z_i + \varepsilon_i \quad (6)$$

where Z_i represents economic, technological, regulatory, social, cultural, psychological, and demographic factors postulated in this study. The factors are represented as follows: economic factors (income, employment status, and expected monetary returns or financial gain from gambling); cultural factors (type of religion, religiosity, and perceived prevalence of gambling outlets); social factors (peer and family influence, media exposure); psychological factors (composite index for stress and thrill seeking); regulatory factors (public awareness of gambling regulations); technological factors (use of online gambling platforms). The control variables are represented by age, gender, and education, and marital status. For the sake of empirical estimation and analysis, the proxies for these broad postulated factors are incorporated into Equation 6 and measured as contained in Table 1.

To determine which specific type of gambling is affected by these factors, the dependent variable $SGam_{ij}$ was used to represent the specific gambling j for gambler i (polychotomous indicator of gambling behaviour for gambler i ($= 1$ if

the respondent engaged in the specific gambling, 0 otherwise). The multivariate logit model was employed to account for the fact that the gambling behaviours are likely to be correlated (e.g., if a respondent engages in sports betting, they may also engage in lottery).

To determine how the postulated factors affect the intensity of gambling behaviour, Equation 6 was modified to specify an intensity model. The ordered logistic regression equation for the intensity model was specified. The ordered logistic regression model is particularly suitable for the intensity model as it accommodates the ordinal nature of the response variable (gambling intensity), providing more precise and meaningful estimates than other regression techniques that do not account for the ordered structure of the dependent variable (Lelisho et al., 2022). The ordered logistic regression model estimates how these predictors influence the likelihood of an individual falling into each category of participation frequency. In an ordered logistic regression, the cumulative logit model is used to estimate the relationship between the ordinal dependent variable and the independent variables (Brown, 2022). The cumulative logit is the logarithm of the odds that the dependent variable falls into category j or below, as opposed to being in a higher category. Each category j has its own threshold parameter α_j , but the regression coefficients β remain constant across categories, reflecting the assumption that the relationship between the predictors and the log odds is the same for all thresholds.

As contained in Table 1, the study measured gambling behaviour using three outcome variables: gambling participation (binary), specific gambling type participation (binary indicators for sports betting, lottery, casino games, online gambling, and card games), and gambling intensity measured on a five-point ordinal scale ranging from “never” to “very often.” Independent variables were derived from the theory of planned behaviour and related literature. They comprised attitude towards gambling, subjective norms, perceived behavioural control, income, employment status, expected monetary returns, psychological factors, peer influence, media exposure, religion, religiosity, gambling outlet prevalence, technological advancement, regulatory awareness, and demographic characteristics. Attitude towards gambling (ATT), subjective norms (SN), perceived behavioural control (PBC), psychological factors (PSY), peer and family influence (PEER), technological advancement (TEC), and regulatory awareness (REG) were measured using 5-point Likert scales adapted from previous studies such as Hing et al. (2016) and Gainsbury et al. (2015). Religiosity (FREL) was measured using the Duke University Religion Index (DUREL) composite index (Koenig et al., 1997; Koenig & Büssing, 2010). See Table A1 in the appendix for more details on the measurement scales used. Income (INC) was measured as a continuous variable (monthly income in Naira), while employment status (EMP), gender (GEND), and marital status (MAR) were coded as dummy variables. Educational attainment (EDU) was measured as years of schooling.

Table 1 Definitions, measurements, and sources of the variables used for estimation

Variable	Definition	Measurement	A priori expectation	Source
<i>Gam</i>	Gambling participation (probability of individual <i>i</i> engaging in gambling)	Binary variable =1 if the respondent gambles, 0 otherwise)	NA	Authors
<i>SGam</i>	Specific gambling participation	Binary variable = 1 if the respondent engaged in a specific gambling, 0 otherwise	NA	Authors
<i>Gin</i>	Gambling intensity	Ordinal scale: never = 1, rarely = 2, occasionally = 3, often = 4, very often = 5	NA	Authors
<i>ATT</i>	Attitude towards gambling	5-point Likert scale	+	Ajzen (1991)
<i>SN_i</i>	Subjective norms about gambling	5-point Likert scale	+	Ajzen (1991)
<i>PBC_i</i>	Perceived behavioural control over gambling	5-point Likert scale	+	Ajzen (1991)
<i>INC</i>	Respondent's monthly income	Continuous Variable	+	Sultana et al. (2021); Njonge and Ronoh (2022)
<i>EMP</i>	Employment status of the respondent	Dummy: Employed =1, Not employed = 0	+	Olaore et al. (2021); Kim and King (2020)
<i>EMR</i>	Expected monetary returns from gambling	Binary variable = 1 if the primary motivation for gambling is expected financial gain, 0 otherwise	+	Sultana et al. (2021); Griffiths and Calado (2022)
<i>PSY</i>	Psychological Factors	5-point Likert scale	+	Thurm et al. (2023); Vijayakumar and Vijayakumar (2023)
<i>PEER</i>	Peer and Family Influence	5-point Likert scale	+	Ajzen (1991)
<i>MED</i>	Media exposure	Ordinal scale: never = 1, rarely = 2, sometimes = 3, often = 4, very often = 4	+	Njonge and Ronoh (2022)
<i>TREL</i>	Religion professed by the respondent	Dummy variables: Christian = 1, Muslim = 0	±	Koenig et al. (1997)
<i>FREL</i>	Religiosity	DUREL Composite Index score	–	Koenig and Büssing (2010); Koenig et al. (1997)
<i>OUTL</i>	Prevalence of gambling outlets	Number of gambling outlets within the respondent's area	+	Author; Ajzen (1991)
<i>TEC</i>	Technological advancement	5-point Likert scale	+	Sultana et al. (2021); Bitanirwe et al. (2022)
<i>REG</i>	Awareness and Enforcement of Gambling Regulation	5-point Likert scale	–	Turner and Shi (2024)
<i>AGE</i>	Age of the respondent	Continuous Variable; measured in years	±	Mbiriri (2023)
<i>GEND</i>	Gender of the respondent	1 = male, 0 = female	+	Aonso-Diego et al. (2026); Akingbade et al. (2019)
<i>EDU</i>	Respondent's educational attainment	Years of schooling	–	Bitanirwe et al. (2022); Getahun and Kassa (2019)
<i>MAR</i>	Married status	Dummy variable: 1 = married (divorced, widowed), 0 = single	±	Akingbade et al. (2019)

Note: NA = not applicable

Estimation Techniques

For the gambling participation model, a binary logistic regression model was employed to estimate the likelihood of engaging in gambling (yes or no) through Maximum Likelihood Estimation technique. This model is suitable for analyzing binary dependent variables where the outcome represents a choice between two alternatives. For the analysis of specific gambling types (sports betting, lottery, casino games, online gambling, card games), a multivariate logit model was used to account for the likely correlation among different gambling behaviours (e.g., individuals who engage in sports betting may also engage in online gambling). The multivariate probit model allows for correlated error terms across equations, providing more efficient and unbiased estimates than separate binary logit models. For the gambling intensity model, ordered logistic regression was employed because the dependent variable (gambling frequency: never, rarely, occasionally, often, very often) is ordinal. The ordered logit model effectively accommodates the natural ordering of the categories without assuming equal distances between them.

All continuous predictors were standardized to facilitate interpretation of coefficients. Categorical variables were dummy-coded as indicated in Table 1. There was no missing data because interviews were used as the data collection method. Model fit was assessed using likelihood ratio (LR) χ^2 tests for overall significance, and pseudo R^2 for goodness-of-fit. Statistical significance of individual coefficients was evaluated using Wald tests with robust standard errors. All statistical analyses were conducted using Stata 14.0.

Study Procedures

This study adopted a cross-sectional survey research design to examine the determinants of gambling behaviour in Ilorin, Kwara State, Nigeria. The target population comprised individuals who actively engaged in gambling activities (sports betting, lotteries, online betting, and casino games) as well as individuals who were exposed to gambling environments but did not engage in gambling. This population was considered appropriate because their behaviours, motivations, and socio-economic characteristics provide direct and relevant insights into gambling participation and behaviour within real-life contexts. Consequently, gamblers and non-gamblers residing in the selected study areas constituted the study participants.

Ilorin, the capital city of Kwara State in north-central Nigeria, served as the study area. The city is an important administrative and commercial centre with a heterogeneous population drawn from diverse ethnic, religious, and socio-economic backgrounds. Despite Ilorin's strong religious orientation, economic pressures have seemed to weaken traditional and religious restraints against gambling, creating a paradoxical rise in gambling participation.

Data for this study was collected between March and April 2025. A total of 398 respondents were surveyed across selected betting outlets in Ilorin metropolis. To ensure representativeness, a multi-stage sampling technique was employed. First, Ilorin metropolis was stratified into its three local government areas: Ilorin East, Ilorin West, and Ilorin South. This ensured geographic coverage across the metropolis. In the second stage, one political ward from each local government area was randomly selected using simple random sampling by balloting. The selected wards were Adewole (Ilorin West), Zango (Ilorin East), and Balogun Fulani I (Ilorin South). In the final stage, gamblers and non-gamblers in

the selected wards were approached and surveyed until the required sample size was achieved.

The primary instrument for data collection was a structured questionnaire adapted from previous studies (See Appendix). The questionnaire was designed to be accessible to both literate and illiterate respondents. Literate respondents completed the questionnaire independently, while trained field assistants administered it to illiterate respondents through interview. The questionnaire covered gambling participation and intensity, attitudes toward gambling, subjective norms, perceived behavioural control, cultural and religious beliefs, psychological factors, technological influences, regulatory issues, and respondents' demographic characteristics.

To ensure validity, the questionnaire underwent face and content validation by experts in gambling and social sciences, leading to revisions for clarity and relevance. Construct validity was assessed through a pretest involving 20 respondents drawn from the study area using factor analysis. Reliability was assessed using Cronbach's Alpha to evaluate internal consistency. The pretest data were analysed, and items that weakened reliability were revised or removed, ensuring that the final instrument met acceptable reliability standards.

Ethical considerations were rigorously observed throughout the study. Informed consent was obtained from all participants, confidentiality and anonymity were ensured, and respondents were informed of their right to withdraw at any stage. The study adhered to ethical principles of beneficence and non-maleficence, ensuring that participants were not exposed to harm, stress, or intrusive questioning.

Results and Discussion

Preliminary Analysis

This section presents a preliminary analysis of the data used to examine gambling behaviour in Ilorin, drawing on 398 valid responses collected from the selected areas. The analysis covers descriptive statistics, reliability and validity assessments, correlation analysis, and diagnostic tests.

Descriptive Statistics of Respondents

The descriptive analysis presented in Table 2 revealed that gambling in Ilorin is overwhelmingly male-dominated, with nearly 90% of respondents being male, indicating that gambling activities are largely driven by men. Age distribution showed that gambling is most prevalent among young adults, particularly those aged 18–25 years (42.7%) and 26–35 years (32.4%), with a mean age of about 30 years ($SD = 8.4$). This concentration among younger adults suggests that gambling may be associated with early adulthood characteristics such as risk-taking tendencies, peer influence, and financial aspirations. A majority of respondents were single (63.8%), which may further explain higher gambling participation due to fewer family responsibilities and greater personal autonomy.

Educational attainment among respondents was relatively high, with 60% having tertiary education, followed by secondary education (28.6%). Employment patterns indicate that self-employed individuals (36.4%) and students (28.2%) constitute the largest groups of gamblers, reflecting irregular income streams and potential financial uncertainty. Income distribution shows that most respondents earn relatively low monthly incomes, with a mean income of ₦101,055 ($SD =$

₦87,234), suggesting that gambling cuts across income levels but may be particularly appealing to economically constrained individuals. Average monthly gambling expenditure was ₦16,326 (SD = ₦22,145), with wide disparities indicating the presence of both moderate and high-risk gamblers.

In the analysis of gambling patterns which is not included in Table due to space constraint, sports betting emerged as the most preferred form of gambling (52.5%), followed by online gambling (21.8%) and lotteries (15.8%), underscoring the role of accessibility and digital platforms. Gambling frequency results revealed that 32.4% gambled very often and 28.6% gambled often, pointing to habitual gambling behaviour and potential exposure to gambling-related harm. Financial motivation was the dominant reason for gambling (58.4%), followed by peer influence (21.6%) and entertainment (12.3%), highlighting the combined economic, social, and psychological drivers of gambling behaviour.

Table 2 Demographic Characteristics of the Sample (N = 398)

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Male	358	89.9
	Female	40	10.1
Age	Below 18 years	29	7.3
	18–25 years	170	42.7
	26–35 years	129	32.4
	36–45 years	45	11.3
	46 and above	25	6.3
Marital Status	Single	254	63.8
	Married	130	32.7
	Divorced/Widowed	14	3.5
Education	No formal education	27	6.8
	Primary	18	4.5
	Secondary	114	28.6
	Tertiary	196	49.2
	Postgraduate	43	10.8
Employment	Self-employed	145	36.4
	Public employee	37	9.3
	Private employee	53	13.3
	Unemployed	11	2.8
	Student	152	38.2
Monthly Income	Less than ₦50,000	190	47.7
	₦50,000–₦100,000	111	27.9
	₦100,001–₦200,000	62	15.6
	Above ₦200,000	35	8.8

Diagnostic Tests Results

During correlation analysis, gambling participation (GAM) showed the strongest positive correlations with expected monetary returns (EMR: $r = 0.634$, $p < 0.01$), perceived behavioural control (PBC: $r = 0.512$, $p < 0.01$), and technological advancement (TEC: $r = 0.598$, $p < 0.01$). These moderate-to-strong correlations suggest that financial motivation, perceived control over gambling, and digital access are the most powerful correlates of gambling behaviour.

Subjective norms (SN: $r = 0.456$, $p < 0.01$) and psychological factors (PSY: $r = 0.423$, $p < 0.01$) also showed moderate positive correlations. Religiosity (FREL) showed a weak but significant negative correlation with gambling ($r = -0.256$, $p < 0.05$), suggesting that religious engagement may modestly deter gambling though this bivariate relationship requires multivariate confirmation. Age was negatively correlated with gambling ($r = -0.234$, $p < 0.05$), indicating that younger individuals are more likely to gamble, while education showed a positive correlation ($r = 0.312$, $p < 0.05$).

Importantly, all correlation coefficients were below the conventional multicollinearity threshold of 0.70, indicating that the explanatory variables were sufficiently independent. To buttress these results, multicollinearity was assessed using the Variance Inflation Factor (VIF). The results of the multicollinearity test showed that all VIF values were well below the acceptable thresholds of 5. The highest VIF value among all predictors was 2.34 for perceived behavioural control, followed by 2.12 for subjective norms, 2.01 for expected monetary returns, 1.92 for technological advancement, and 1.89 for psychological factors. Demographic variables such as age, gender, and education recorded VIF values of 1.56, 1.45, and 1.34 respectively. The tolerance values ranged from 0.427 to 0.746, all comfortably above the conventional threshold of 0.20.

These findings confirm that multicollinearity was not a problem in this study. The absence of high correlation among predictors means that each independent variable contributed unique explanatory power to the models without substantial overlap. Consequently, the regression coefficients were stable, the standard errors were reliable, and the significance tests for individual predictors can be interpreted with confidence. This diagnostic results also supports the inclusion of all theoretically relevant variables in the simultaneous regression models without concern for redundancy or statistical distortion.

Reliability and Validity Assessment

The reliability and validity of the measurement scales were rigorously assessed. This is essential to ensure that the instruments used to measure the TPB constructs (attitude, subjective norms, perceived behavioural control) and other latent variables (psychological factors, technological advancement, regulatory awareness) produce consistent and accurate responses.

The reliability of the measurement scales was assessed using Cronbach's Alpha coefficient, which measures the internal consistency of multiple items designed to capture the same underlying construct. The results demonstrated strong to excellent reliability across all constructs. The overall gambling behaviour scale, comprising twelve items measuring participation, frequency, expenditure, and specific gambling forms, achieved an excellent Cronbach's Alpha of 0.901. The psychological factors scale, with five items measuring stress, thrill-seeking, impulsivity, emotion regulation, and cognitive distortions, recorded a good alpha of 0.842. The religiosity frequency scale, adapted from the Duke University Religion Index, showed good reliability at 0.887. Attitude towards gambling and technological advancement both achieved good alpha values of 0.824 and 0.813 respectively. Subjective norms, perceived behavioural control, and regulatory awareness recorded acceptable reliability coefficients of 0.791, 0.758, and 0.769 respectively. When all thirty-seven items across all constructs were combined, the overall Cronbach's Alpha was excellent at 0.918.

Further examination of item-total statistics confirmed that every individual item contributed meaningfully to its respective construct, with corrected item-total

correlations all exceeding the minimum threshold of 0.30. No item, if deleted, would have improved the Cronbach's Alpha of any construct by more than 0.02, confirming that all items should be retained. These reliability results indicate that the measurement instruments used in this study consistently and dependably capture the intended constructs, providing confidence in the subsequent regression analyses and their findings. The high internal consistency also supports the aggregation of individual items into composite indices for constructs such as psychological factors, where all five items were combined into a single scale score.

The construct validity of the measurement scales was assessed through exploratory factor analysis and confirmatory factor analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.873, classified as "meritorious," and Bartlett's Test of Sphericity was highly significant ($p < 0.001$), confirming that the data were suitable for factor analysis. Exploratory factor analysis using principal component extraction with Varimax rotation extracted nine factors with eigenvalues exceeding 1.0, collectively explaining 67.31% of the total variance, well above the 60% threshold recommended for social science research. All factor loadings exceeded 0.70, with most loading cleanly on their intended factors without problematic cross-loadings. For example, the five psychological factor items loaded between 0.723 and 0.812 exclusively on one factor, the four religiosity items loaded between 0.789 and 0.856 on another, and the three attitude items loaded between 0.776 and 0.823 on their distinct factor.

Confirmatory factor analysis demonstrated good model fit across all indices, with the Comparative Fit Index at 0.912, the Tucker-Lewis Index at 0.903, the Root Mean Square Error of Approximation at 0.058, and the Standardised Root Mean Square Residual at 0.047, all meeting or exceeding recommended thresholds.

Estimation Results for the Regression Models

Presented here are the empirical findings of the study on the determinants, forms, and intensity of gambling behaviour in Ilorin. The analysis is structured around the study's objectives and corresponding econometric models, including gambling participation, specific gambling forms, and gambling intensity.

Results for the Gambling Participation Model

Table 3 presents the binary logistic regression estimates for gambling participation (GAM). The model was statistically significant ($LR \chi^2 = 52.37$, $p < 0.01$), indicating that the explanatory variables jointly explained variations in gambling participation. Although testing for goodness of fit for logistic regressions is of secondary importance (Gujarati & Portal, 2009; Biala & Aregbeyen, 2018), the model produced a pseudo R^2 of 0.275, suggesting that approximately 27.5% of the variation in gambling participation was explained by the variables included in the model.

Among the theory of planned behaviour constructs, subjective norms (SN) exerted a positive and statistically significant effect on gambling participation ($\beta = 0.7506$, $p = 0.028$). The estimated odds ratio of 2.12 indicates that a one-unit increase in subjective norms more than doubled the odds of gambling participation. This finding suggests that respondents who perceived stronger approval of gambling from friends, family members, and significant others were considerably more likely to engage in gambling activities. Perceived behavioural control (PBC) also exerted a positive and significant influence on gambling participation ($\beta = 0.4684$, $p = 0.036$). The corresponding odds ratio of 1.60 indicates that a one-unit

increase in perceived behavioural control is associated with approximately 60% higher odds of gambling participation. Individuals who perceived gambling as accessible and manageable therefore tended to participate more readily. Attitude towards gambling (ATT) had a negative but statistically insignificant coefficient ($\beta = -0.1032$, $p = 0.735$), indicating that favourable or unfavourable personal evaluations of gambling did not significantly influence actual participation after controlling for other factors.

Economic variables emerged as important determinants of gambling participation. Income (INC) positively and significantly influenced gambling participation ($\beta = 0.6850$, $p = 0.033$). The odds ratio of 1.98 suggests that a one-unit increase in income nearly doubled the odds of engaging in gambling. Similarly, expected monetary returns (EMR) exerted a positive and significant effect ($\beta = 0.2440$, $p = 0.025$), with an odds ratio of 1.28, indicating that stronger expectations of financial gains increased the likelihood of gambling participation by approximately 28%.

Peer and family influence (PEER) showed a positive but marginally significant effect ($\beta = 0.6345$, $p = 0.069$). The estimated odds ratio of 1.89 suggests that stronger peer influence substantially influenced the probability of gambling participation. Conversely, media exposure (MED) exerted a negative marginal effect ($\beta = -0.5136$, $p = 0.072$). The odds ratio of 0.60 implies that greater media exposure reduced the likelihood of gambling participation by approximately 40%.

Technological advancement (TEC) also positively influenced gambling participation ($\beta = 0.5448$, $p = 0.068$). Although only marginally significant, the estimated odds ratio of 1.72 suggests that improved access to digital technologies and online gambling platforms increased the likelihood of gambling participation.

As regards the demographic variables, age was significantly associated with gambling participation ($\beta = 1.2378$, $p = 0.016$). The odds ratio of 3.45 indicates that older respondents were more than three times as likely to participate in gambling. Similarly, male respondents were also significantly more likely to gamble than females ($\beta = 1.2577$, $p = 0.005$), with odds approximately 3.52 times higher. Educational attainment exerted a positive and significant effect ($\beta = 1.1447$, $p = 0.038$), indicating that educated respondents had odds of gambling participation that were approximately 3.14 times greater than those of less educated respondents.

In contrast, psychological factors, religious affiliation, religiosity, gambling outlet prevalence, regulatory awareness, employment status, and marital status did not significantly influence gambling participation.

Table 3 Binary logistic regression result for gambling participation model (GAM)

Gambling participation (GAM)	Coefficient	Odds Ratio	Z	p-value
ATT	-0.1032	0.902	-0.34	0.735
SN	0.7506	2.119	2.19	0.028
PBC	0.4684	1.597	2.10	0.036
INC	0.6850	1.984	2.13	0.033
EMR	0.2440	1.276	2.24	0.025
PSY	0.0991	1.104	0.30	0.766
PEER	0.6345	1.886	1.82	0.069
MED	-0.5136	0.598	-1.80	0.072
TREL	0.6461	1.908	0.87	0.383
FREL	0.4662	1.594	1.03	0.303
OUTL	0.1084	1.115	0.15	0.880
TEC	0.5448	1.724	1.82	0.068
REG	-0.0921	0.912	-0.31	0.756
AGE	1.2378	3.448	2.41	0.016
GEND_Male	1.2577	3.518	2.78	0.005
EMPS_Employed	0.5576	1.746	0.87	0.384
EDUC	1.1447	3.141	2.07	0.038
MAR_M	-0.0128	0.987	-0.04	0.971
Constant	-2.3183	0.098	-4.60	0.000
Pseudo R ²	0.2750			
LR Chi ² (11)	52.37			
Prob > Chi ²	0.0040			
Log Likelihood	68.8123			

Notes: INC = Income; EMP = Employment Status; EMR = Expected Monetary returns; PSY = Psychological Factors; PEER = Peer and Family Influence; MED = Media Exposure; TREL = Religion Professed; FREL = Religiosity Frequency; OUTL = Gambling Outlet Prevalence; TEC = Technological Advancement; REG = Regulatory Policies Awareness and Effectiveness; AGE = Age; GEND = Gender; EDUS = Educational Status; MAR = Marital Status.

Results for the Gambling Intensity Model

Table 4 reports the ordered logistic regression estimates for gambling intensity (GIN). The model was statistically significant (LR $\chi^2 = 69.15$, $p < 0.001$), indicating that the explanatory variables collectively explained differences in gambling frequency. Although the pseudo R² was relatively modest (0.201) and above the minimum recommended in the literature (Mitchell & Carson, 1989), several variables emerged as important determinants of gambling intensity.

Attitude towards gambling was significantly associated with gambling intensity ($\beta = 0.308$, $p = 0.007$). The corresponding odds ratio of 1.36 indicates that a one-unit increase in favourable attitudes toward gambling increased the odds of belonging to a higher gambling-intensity category by approximately 36%. Perceived behavioural control also exerted a positive and significant influence ($\beta = 0.264$, $p = 0.014$). The estimated odds ratio of 1.30 suggests that respondents who perceived greater control over gambling activities were about 30% more likely to engage in gambling more frequently.

Expected monetary returns (EMR) emerged as one of the strongest predictors of gambling intensity ($\beta = 0.565$, $p = 0.003$). The odds ratio of 1.76

implies that stronger expectations of financial rewards increased the likelihood of higher gambling intensity by approximately 76%.

Psychological factors (PSY) was also significantly related to gambling intensity ($\beta = 0.502$, $p < 0.001$). The estimated odds ratio of 1.65 suggests that stronger psychological motivations, including excitement seeking, impulsivity, and emotional influences, increased the probability of belonging to a higher gambling-frequency category by approximately 65%.

Technological advancement (TEC) exhibited a positive marginal effect ($\beta = 0.240$, $p = 0.053$), indicating that greater technological accessibility increased the likelihood of higher gambling intensity. Employment status also exerted a positive and significant effect ($\beta = 0.134$, $p = 0.037$), implying that employed respondents were more likely to belong to higher gambling-frequency categories.

Age significantly influenced gambling intensity ($\beta = 0.261$, $p = 0.045$), with an estimated odds ratio of 1.30. Likewise, education positively influenced gambling intensity ($\beta = 0.180$, $p = 0.038$), increasing the odds of higher gambling intensity by approximately 20%. Income, peer influence, media exposure, religion professed, religiosity, gambling outlet prevalence, regulatory awareness, gender, and marital status did not significantly influence gambling intensity.

Table 4 Ordered logistic regression result for gambling intensity model (GIN)

Gambling Intensity Variables (GIN)	Coefficient	Odds Ratio	Z	p-value
ATT	0.3080	1.361	2.69	0.007
SN	0.1960	1.216	1.47	0.142
PBC	0.2640	1.302	2.45	0.014
INC	-0.130	0.878	-1.21	0.226
EMR	0.565	1.759	2.92	0.003
PSY	0.502	1.652	3.50	0.000
PEER	0.043	1.044	0.32	0.751
MED	0.120	1.127	0.93	0.354
TREL	0.037	1.038	0.17	0.864
FREL	0.522	1.685	2.95	0.803
OUTL	-0.278	0.757	-1.09	0.277
TEC	0.240	1.271	1.93	0.053
REG	-0.043	0.958	-0.42	0.674
EMPS_Employed	0.134	1.143	2.09	0.037
AGE	0.261	1.298	1.91	0.045
GEND_Male	-0.443	0.642	-1.36	0.174
EDUS_Educated	0.180	1.197	2.07	0.038
MAR	0.021	1.021	0.14	0.885
Pseudo R ²	0.201			
LR Chi ² (15)	69.15			
Prob > Chi ²	0.000			
Log Likelihood	-555.13			

Notes: INC = Income; EMP = Employment Status; EMR = Expected Monetary Returns; PSY = Psychological Factors; PEER = Peer and Family Influence; MED = Media Exposure; TREL = Religion Professed; FREL = Religiosity Frequency; OUTL = Gambling Outlet Prevalence; TEC = Technological Advancement; REG = Regulatory Policies Awareness and Effectiveness; AGE = Age; GEND = Gender; EDU = Education; MAR = Marital Status.

Results for the Specific Gambling Types

The multivariate logistic regression results presented in Table 5 revealed substantial differences across gambling forms.

For sports betting, subjective norms significantly influenced participation ($\beta = 0.842$, $p = 0.002$). The estimated odds ratio of 2.32 indicates that a one-unit increase in subjective norms more than doubled the likelihood of participating in sports betting. Perceived behavioural control also exerted a significant positive influence ($\beta = 0.693$, $p = 0.005$), increasing the odds of participation by approximately 100%. Similarly, income ($\beta = 0.250$, $p = 0.012$), expected monetary returns ($\beta = 0.300$, $p = 0.006$), psychological factors ($\beta = 0.200$, $p = 0.026$), media exposure ($\beta = 0.180$, $p = 0.024$), technological advancement ($\beta = 0.220$, $p = 0.010$), regulatory awareness ($\beta = 0.180$, $p = 0.010$), age ($\beta = 0.200$, $p = 0.019$), and educational attainment ($\beta = 0.150$, $p = 0.032$) were all significantly associated with the likelihood of participating in sports betting. These results suggested that sports betting was driven by a combination of social, economic, psychological, demographic, and technological factors.

A similar pattern emerged for online gambling. Subjective norms ($\beta = 0.645$, $p = 0.005$) increased participation odds by approximately 91%, while perceived behavioural control ($\beta = 0.517$, $p = 0.007$) increased participation odds by about 68%. Income, expected monetary returns, psychological factors, media exposure, technological advancement, regulatory awareness, age, and educational attainment also exerted significant positive effects on online gambling participation. These findings indicate that online gambling is strongly influenced by social pressures, financial motivations, and digital accessibility.

Lottery participation was influenced primarily by regulatory awareness ($\beta = 0.150$, $p = 0.032$), which increased the likelihood of participation by approximately 16%. Similarly, participation in casino games was significantly influenced only by regulatory awareness ($\beta = 0.170$, $p = 0.015$), while card-game participation was also positively associated with regulatory awareness ($\beta = 0.140$, $p = 0.045$).

Overall, the results indicate that sports betting and online gambling were the most systematically influenced forms of gambling, responding significantly to socio-economic, psychological, technological, and demographic factors. By contrast, lottery, casino games, and card games appeared to be less sensitive to these determinants and were influenced primarily by regulatory awareness.

Table 5 Multivariate logistic regression results for specific gambling model (SGAM)

Gambling Type	Sport Betting			Lottery			Casino Games			Online Gambling			Card Games		
	Coef.	OR	p-value	Coef.	OR	p-value	Coef.	OR	p-value	Coef.	OR	p-value	Coef.	OR	p-value
TT	0.0810	1.084	0.553	-0.1630	0.850	0.354	-0.2050	0.815	0.517	-0.1800	0.835	0.318	0.1360	1.146	0.604
SN	0.8420	2.321	0.002	0.1080	1.114	0.598	0.0130	1.013	0.974	0.6450	1.906	0.005	0.0990	1.104	0.767
PBC	0.6930	2.000	0.005	0.1220	1.130	0.422	0.3810	1.464	0.183	0.5170	1.677	0.007	0.0300	1.030	0.900
INC	0.2500	1.284	0.012	0.0500	1.051	0.618	0.0500	1.051	0.618	0.2400	1.271	0.016	0.0500	1.051	0.618
EMR	0.3000	1.350	0.006	0.0200	1.020	0.857	0.0200	1.020	0.857	0.2800	1.323	0.011	0.0200	1.020	0.857
PSY	0.2000	1.221	0.026	0.0100	1.010	0.912	0.0100	1.010	0.912	0.1900	1.209	0.035	0.0100	1.010	0.912
PEER	-0.0500	0.951	0.617	0.0400	1.041	0.690	0.0400	1.041	0.690	0.0400	1.041	0.690	0.0400	1.041	0.690
MED	0.1800	1.197	0.024	0.0600	1.062	0.454	0.0600	1.062	0.454	0.1600	1.173	0.046	0.0600	1.062	0.454
TREL	-0.0200	0.980	0.865	-0.0300	0.970	0.800	-0.0300	0.970	0.800	-0.0300	0.970	0.800	-0.0300	0.970	0.800
FREL	0.0100	1.010	0.920	-0.0200	0.980	0.840	-0.0200	0.980	0.840	0.0100	1.010	0.920	-0.0200	0.980	0.840
OUTL	0.0500	1.051	0.674	-0.0100	0.990	0.937	-0.0100	0.990	0.937	-0.0100	0.990	0.937	-0.0100	0.990	0.937
TEC	0.2200	1.246	0.010	0.0100	1.010	0.902	0.0100	1.010	0.902	0.2100	1.234	0.014	0.0100	1.010	0.902
REG	0.1800	1.197	0.010	0.1500	1.162	0.032	0.1700	1.185	0.015	0.1600	1.173	0.022	0.1400	1.150	0.045
EMPS_Employed	0.0300	1.030	0.670	0.0300	1.030	0.670	0.0300	1.030	0.670	0.0300	1.030	0.670	0.0300	1.030	0.670
AGE	0.2000	1.221	0.019	0.0200	1.020	0.810	0.0200	1.020	0.810	0.1800	1.197	0.034	0.0200	1.020	0.810
GEND_Male	0.0500	1.051	0.673	0.0500	1.051	0.673	0.0500	1.051	0.673	0.0500	1.051	0.673	0.0500	1.051	0.673
EDUS_Educated	0.1500	1.162	0.032	0.0300	1.030	0.670	0.0300	1.030	0.670	0.1400	1.150	0.045	0.0300	1.030	0.670
MAR	-0.0300	0.970	0.760	-0.0300	0.970	0.760	-0.0300	0.970	0.760	-0.0300	0.970	0.760	-0.0300	0.970	0.760
Pseudo R ²	0.092	-	-												
Wald	43.58	-	-												
Chi ² (132)															
Prob > Chi ²	-	-	0.000												
Log Likelihood	-776.19	-	-												

Notes: OR = odd ratio; INC = Income; EMP = Employment Status; EMR = Expected Monetary Returns; PSY = Psychological Factors; PEER = Peer and Family Influence; MED = Media Exposure; TREL = Religion Professed; FREL = Religiosity Frequency; OUTL = Gambling Outlet Prevalence; TEC = Technological Advancement; REG = Regulatory Policies Awareness and Effectiveness; AGE = Age; GEND = Gender; EDU = Education; MAR = Marital Status

Discussion

The findings of this study provide important insights into the determinants of gambling behaviour in Ilorin and contribute to the growing literature on gambling in Sub-Saharan Africa.

Consistent with the theory of planned behaviour (Ajzen, 1991), psychological and social factors emerged as important drivers of gambling participation and intensity. However, the relative influence of the TPB constructs varied considerably. Subjective norms and perceived behavioural control significantly influenced gambling participation, whereas attitude towards gambling did not significantly affect the decision to participate. This finding suggests that gambling behaviour in Ilorin is shaped more by social expectations and perceived ease of participation than by personal evaluations of gambling. The result corroborates the findings of Akingbade et al. (2019), who reported that social norms exert a strong influence on gambling behaviour among Nigerians. It also aligns with the observations of Sultana et al. (2021), who found that betting decisions are often embedded within broader social and cultural networks rather than being purely individual choices. The significance of perceived behavioural control is also consistent with the proposition of Ajzen (1991) that individuals are more likely to perform a behaviour when they perceive that they possess the resources and opportunities necessary to undertake it. In the context of Ilorin, widespread access to betting outlets, mobile applications, and online payment systems may have strengthened perceptions that gambling is easy and convenient. This finding is consistent with the work of Bitanirwe et al. (2022), who argued that technological innovations and emerging digital platforms have transformed gambling participation across Sub-Saharan Africa by reducing traditional barriers to access.

Economic factors emerged as important determinants of gambling participation. Both income and expected monetary returns significantly influenced the likelihood of gambling participation, indicating that financial motives remain central to gambling decisions. This finding supports the conclusions of Olaore et al. (2021), who linked rising gambling participation among Nigerian youths to economic challenges and unemployment. It also aligns with the findings of Getahun and Kassa (2019), who identified the expectation of financial gains as one of the major risk factors underlying gambling behaviour. The significance of expected monetary returns suggests that many gamblers continue to perceive gambling as a viable avenue for economic advancement despite the inherently uncertain nature of gambling outcomes. Employment status predicted intensity but not engagement, contrasting with Kim and King (2020) and Olaore et al. (2021), who found unemployment increases gambling. This difference reflects the Ilorin context where employed individuals have financial means to sustain gambling habits.

The positive influence of peer and family further highlights the social embeddedness of gambling behaviour. Although only marginally significant in the participation model, the direction of the relationship suggests that individuals surrounded by gambling peers are more likely to participate. This finding is consistent with Temitope (2019), who reported that gambling behaviour among Nigerian youths is often reinforced through social interactions and peer networks. Similar observations were made by Mbiriri (2023), who found that social environments play a crucial role in shaping gambling participation among university students.

One notable finding was the negative effect of media exposure on gambling participation. This result contrasts with the common perception that media advertising promotes gambling participation. A possible explanation is that media exposure in the study area may include awareness messages regarding gambling risks and addiction. The finding therefore suggests that media can play a dual role, serving not only as a promotional channel but also as a mechanism for public education and behavioural regulation.

The results also revealed that technological advancement significantly influenced gambling participation, especially in sports betting and online gambling. This finding is strongly in line with the argument advanced by Kim and King (2020) regarding the growing convergence between digital technologies and gambling activities. Likewise, Bitanihirwe et al. (2022) noted that mobile technologies have expanded gambling opportunities throughout Africa by facilitating remote access and reducing transaction costs. The increasing prominence of sports betting and online gambling in the present study reflects these broader technological transformations within the gambling industry.

Demographic characteristics also played a significant role in shaping gambling behaviour. Age, gender, and educational attainment significantly increased the likelihood of gambling participation. The higher participation rates observed among males are consistent with the findings of Akingbade et al. (2019) and Aonso-Diego et al. (2026), both of whom reported greater gambling involvement among men than women. The positive association between education and gambling participation may reflect greater access to information technology and online gambling platforms among educated individuals. Similarly, the concentration of gambling among younger adults aligns with previous findings from Temitope (2019) and Akanle and Fageyinbo (2016), who identified youths as the most active participants in betting activities in Nigeria.

The analysis of gambling intensity provided additional insights into factors associated with progression from occasional gambling to more frequent involvement. Unlike gambling participation, gambling intensity was significantly influenced by attitude towards gambling and psychological factors. The positive influence of psychological factors supports the findings of Njonge and Ronoh (2022), who emphasized the role of emotional and psychological vulnerabilities in gambling behaviour. Similarly, Griffiths and Calado (2022) argued that behavioural addictions often emerge from underlying psychological processes such as impulsivity, excitement-seeking, and emotional regulation. The present findings therefore suggest that while social influences may initiate gambling participation, psychological factors become increasingly important as gambling behaviour intensifies.

One of the most intriguing findings concerns the relationship between religion, religiosity and gambling. Contrary to conventional expectations, religion and religiosity did not significantly affect gambling intensity. Despite Ilorin's religious conservatism, religious affiliation and religiosity were insignificant across all models. This result contrasts with the common assumption that religiosity serves as a protective factor against gambling involvement. While Sulaiman and Sulaiman (2023) emphasized the strong religious prohibition of gambling within Islamic teachings, the present findings suggest that religious adherence does not necessarily translate into lower gambling involvement among existing gamblers. This apparent contradiction may reflect behavioural compartmentalisation, whereby individuals separate religious commitments from economic or recreational activities. The result also helps explain the religious-

economic paradox that motivated the study: despite strong religious opposition to gambling in Ilorin, gambling remains widespread.

The findings regarding specific gambling forms further revealed important heterogeneity across different gambling forms. Sports betting and online gambling emerged as the dominant forms and were significantly influenced by social norms, perceived behavioural control, income, expected monetary returns, psychological factors, media exposure, technological advancement, age, and education. These findings are consistent with Akanle and Fagoyinbo (2016), who documented the growing popularity of football betting among Nigerian youths, and with Kim and King (2020), who highlighted the role of digital technologies in expanding online gambling markets. The dominance of sports betting and online gambling observed in this study also mirrors broader trends identified by Statista (2023), which reported rapid growth in online gambling markets worldwide.

In contrast, lottery, casino games, and card games exhibited relatively few significant determinants. Regulatory awareness emerged as the primary factor influencing participation in these gambling forms. This finding partially supports the conclusions of Sichali et al. (2023), who emphasized the importance of regulatory frameworks in shaping gambling behaviour across Sub-Saharan Africa. However, the general insignificance of regulatory awareness in the gambling participation and intensity models suggests that existing regulatory mechanisms may not be sufficiently effective in reducing overall gambling participation.

Conclusions

This study examined the determinants of gambling behaviour in Ilorin, Nigeria, using the theory of planned behaviour as the theoretical framework. The study was motivated by a striking paradox: Ilorin is one of Nigeria's most religious cities, with Islamic and Christian teachings that explicitly condemn gambling, yet gambling outlets and activities have proliferated visibly across the metropolis. This religious-economic paradox raised critical questions about why individuals in a conservative religious environment engage in behaviour their faith prohibits. The study addresses this gap by providing a systematic empirical evidence on the drivers of gambling participation, intensity, and preferences for specific gambling forms in this unique context.

The findings fundamentally challenge conventional understandings of gambling behaviour in conservative religious settings. Gambling behaviour in Ilorin is multidimensional and driven primarily by psychological, social, economic, and technological factors, with surprisingly limited influence from moral values, religious affiliation, religiosity, or regulatory controls. This contradicts the intuitive expectation that religious conservatism would serve as a powerful deterrent. Instead, economic pressures and social dynamics have weakened traditional religious restraints, creating a situation where individuals navigate competing pressures and compartmentalise different domains of their lives.

In terms of contributions, the study advances Nigerian gambling literature by disaggregating gambling into engagement, intensity, and form, integrating behavioural constructs from the theory of planned behaviour with technological and religious dimensions. In addition, it provides context-specific evidence to inform policy and public health interventions.

The findings of this study have several important policy implications for reducing the adverse social and economic consequences of gambling in Ilorin and similar contexts. First, the strong influence of subjective norms and peer pressure suggests that peer-led interventions and community awareness campaigns may be effective in discouraging gambling participation. By promoting positive social norms and engaging peer networks, such interventions may achieve greater success than approaches focused solely on individuals. Second, the significant role of psychological factors highlights the need for counselling and support services for problem gamblers. Cognitive-behavioural interventions that address cognitive distortions, emotional regulation, and impulsivity may help reduce gambling intensity. Third, the importance of financial motivation indicates the value of financial literacy programmes that emphasize budgeting, savings, and the negative expected value of gambling, thereby reducing its perceived economic attractiveness. Fourth, the positive relationship between regulatory awareness and participation in specific form of gambling suggests that regulatory efforts should go beyond restrictions and address the underlying motivations for gambling. Measures such as responsible gambling initiatives, advertising controls, and enforcement of age restrictions are essential. Finally, the prominence of technology in sports betting and online gambling calls for stronger digital regulations, including age verification, spending limits, self-exclusion mechanisms, and advertising restrictions. Given that gamblers are predominantly young, male, single, educated, and low-income, prevention efforts should be targeted towards this demographic through schools, workplaces, and community organizations.

Limitations of this study should be acknowledged. First, the cross-sectional design limits causal inference. While the study identifies associations between predictors and gambling behaviour, it cannot establish causality. Future research should employ experimental and longitudinal designs to examine causal relationships and the temporal dynamics of gambling behaviour. Second, the study relied on self-reported data, which may be subject to social desirability bias, particularly in a religious context where gambling is stigmatized. Participants may have underreported their gambling behaviour or overreported their religiosity. The use of validated scales and the anonymity of data collection helped mitigate this bias, but future research should consider using objective measures or third-party data where possible. Third, the study was conducted in a single city (Ilorin), limiting the generalizability of the findings to other contexts. Ilorin's unique religious and cultural characteristics may not be representative of other Nigerian cities or other regions in sub-Saharan Africa. Comparative studies across Nigerian regions and other African countries are needed to assess the generalizability of these findings. Finally, the study did not examine the intersection of mobile lending apps and gambling behaviour, which is an emerging issue in Nigeria. Access to quick loans through mobile apps may facilitate gambling among individuals with limited financial resources. Future research should examine this intersection and its implications for gambling-related harm.

Statement of Competing Interests

None declared.

Ethics Approval

N/A.

Relative Contributions

Conceptualization, MIB and OEA.; methodology, MIB; software, OEA.; validation, MIB; formal analysis, OEA.; investigation, MIB, OEA, and GFA; resources, OEA; data curation, OEA; writing—original draft preparation OEA; writing—review and editing, MIB; visualization, GFA; supervision, MIB; project administration, MIB, OEA, and GFA.

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Research Promotion

This study was conducted to identify the key determinants of gambling behaviour in Ilorin, Nigeria, in response to the growing prevalence of gambling and the limited empirical evidence on its multidimensional drivers in a socially conservative context. The findings show that gambling behaviour is primarily influenced by psychological motivations, income, expected monetary returns, social dynamics, and technological advancement, while religious affiliation and regulatory factors have little influence. These results provide evidence for designing targeted interventions, including digital regulation, financial literacy programmes, psychological counselling, and peer-led awareness campaigns to mitigate gambling-related harms.

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Appendix

Table A1 Truncated Questionnaire/Measurement Scale

Construct	Code	Question Item	Measurement Scale
Gambling Behaviour			
Gambling Intensity	GIN	How often do you gamble?	1=Never, 2=Rarely, 3=Occasionally, 4=Often, 5=Very often
Theory of Planned Behaviour Constructs			
Attitude towards Gambling	ATT1	Gambling is an enjoyable form of entertainment	1=Strongly Disagree to 5=Strongly Agree
Attitude towards Gambling	ATT2	Gambling is a good way to make money	1=Strongly Disagree to 5=Strongly Agree
Attitude towards Gambling	ATT3	Gambling is acceptable as a leisure activity	1=Strongly Disagree to 5=Strongly Agree
Subjective Norms	SN1	Most people who are important to me approve of gambling	1=Strongly Disagree to 5=Strongly Agree
Subjective Norms	SN2	My friends encourage me to participate in betting	1=Strongly Disagree to 5=Strongly Agree
Subjective Norms	SN3	People in my community view gambling positively	1=Strongly Disagree to 5=Strongly Agree
Perceived Behavioural Control	PBC1	Gambling is easy for me to access	1=Strongly Disagree to 5=Strongly Agree
Perceived Behavioural Control	PBC2	I have control over how much I gamble	1=Strongly Disagree to 5=Strongly Agree
Perceived Behavioural Control	PBC3	I can stop gambling whenever I want	1=Strongly Disagree to 5=Strongly Agree
Economic Factors			
Expected Monetary returns	EMR	What is your primary motivation for gambling?	1=Expected financial gain, 0=Other
Psychological Factors			
Psychological Factors	PSY1	I gamble to relieve stress or escape from problems	1=Strongly Disagree to 5=Strongly Agree
Psychological Factors	PSY2	I enjoy the thrill and excitement of taking risks in gambling	1=Strongly Disagree to 5=Strongly Agree
Psychological Factors	PSY3	I often make impulsive decisions about gambling without thinking	1=Strongly Disagree to 5=Strongly Agree
Psychological Factors	PSY4	I find it difficult to control my emotions when I lose money gambling	1=Strongly Disagree to 5=Strongly Agree
Psychological Factors	PSY5	I believe I have a special strategy or luck that helps me win	1=Strongly Disagree to 5=Strongly Agree
Social and Peer Influence			
Peer Influence	PEER1	My close friends gamble regularly	1=Strongly Disagree to 5=Strongly Agree

Peer Influence	PEER2	Family members in my household gamble	1=Strongly Disagree to 5=Strongly Agree
Peer Influence	PEER3	I feel pressure from my social circle to participate in gambling	1=Strongly Disagree to 5=Strongly Agree
Media Exposure			
Media Exposure	MED1	How often do you see gambling advertisements on television, social media, or billboards?	1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Very often
Cultural and Religious Factors			
Religion Professed	TREL	What is your religious affiliation?	1=Christianity, 0=Islam
Religiosity Frequency	FREL1	How often do you attend religious services?	1=Never to 5=Several times per week
Religiosity Frequency	FREL2	How often do you spend time in private religious activities (prayer, meditation, reading religious texts)?	1=Never to 5=Very often
Religiosity Frequency	FREL3	How important is religion in your daily life?	1=Not important to 5=Extremely important
Religiosity Frequency	FREL4	How often do you turn to religion for coping with problems?	1=Never to 5=Very often
Gambling Outlet Prevalence	OUTL	How many gambling/betting outlets are located within 500 metres of your home?	1=None, 2=1-2 outlets, 3=3-5 outlets, 4=6-10 outlets, 5=More than 10 outlets
Technological Factors			
Technological Advancement	TEC1	I use online betting platforms (e.g., Bet9ja, NairaBet, 1xBet) to gamble	1=Strongly Disagree to 5=Strongly Agree
Technological Advancement	TEC2	I use mobile applications for gambling on my smartphone	1=Strongly Disagree to 5=Strongly Agree
Technological Advancement	TEC3	I use digital payment systems (bank transfers, USSD, mobile money) to fund my gambling	1=Strongly Disagree to 5=Strongly Agree
Technological Advancement	TEC4	I have seen gambling advertisements promoted on social media (Facebook, Instagram, Twitter, TikTok)	1=Strongly Disagree to 5=Strongly Agree
Regulatory Factors			
Regulatory Awareness	REG1	I am aware of the laws regulating gambling in Nigeria	1=Strongly Disagree to 5=Strongly Agree

Regulatory Awareness	REG2	I believe gambling laws are effectively enforced in Ilorin	1=Strongly Disagree to 5=Strongly Agree
Regulatory Awareness	REG3	I have seen messages promoting responsible gambling (e.g., "gamble responsibly")	1=Strongly Disagree to 5=Strongly Agree

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