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Analysis of Gambling and Betting Expenditures: A Study Based on the Brazilian Institute of Geography and Statistics' Family Budget Surveys

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Abstract: *This study analyzes gambling and betting expenditures in Brazil, using data from the Household Budget Surveys (POF) conducted by the Brazilian Institute of Geography and Statistics (IBGE) for the years 2002, 2008, and 2018. The research problem motivating this study focuses on the need to investigate in detail how these expenditures are distributed across different income groups and the potential financial and emotional effects associated with this practice. The growing gambling and betting market in Brazil, especially in the context of its legalization, raises financial and emotional concerns, particularly among low-income families. The main objective of the research is to investigate the relationship between household income, total expenditures, and gambling and betting expenses through descriptive and regression analyses. The results indicate that, although families' financial conditions have improved over the years, expenses continue to consume a large portion of income, with low-income families allocating a higher proportion of their resources to gambling and betting. The regression analysis between income and gambling and betting expenses revealed a positive and significant linear relationship, according to the F-test, with a p-value of* (3.523×10^{-3})*. This relationship explains approximately 63% of the variation in gambling and betting expenses, according to the coefficient of determination* (R^2) *of 0.6315. Based on these findings, the study proposes the need for public policies that promote financial education and the treatment of pathological gambling, balancing the economic benefits of legalization with the protection of vulnerable populations.*

Keywords: *Expenditures; Gambling and Betting; Income; Public Policies; Regression Analysis..*

Introduction

In recent years, the gambling market has experienced explosive growth worldwide, driven by legislative changes and the accessibility provided by the expansion of the internet. In Brazil, this phenomenon is particularly relevant as public and governmental interest turns towards the legalization and regulation of this constantly evolving industry. Brazil is the 13th largest market in this sector and leads the ranking among Latin American countries, having generated approximately 1.6 million dollars (Newzoo, 2020).

However, this growth brings to light increasing concerns about the potential financial and emotional damages that gambling can cause to the population, due to the abusive frequency with which they are practiced and their influences. In the long term, gambling can trigger a series of consequences that are capable of affecting the mobility of its users, thus developing obesity, isolation, sedentary lifestyle, anxiety, attention deficit in divergent activities, excessive stress, and even severe cases of personality disorder (Lemos, 2012).

Another concern is related to the time that some practitioners dedicate to playing, in order to recover the lost amount. According to the studies by De Lucena et al. (2015) and Lemmens et al. (2011), the time considered as excessive use is when it exceeds two hours per day. Therefore, there are many challenges involved in this gambling market, and it is essential to establish limits and seek support if gambling starts to negatively affect the player's life.

Digital awareness is of utmost relevance in the context of available information and technological resources, especially in areas such as online betting, where the risks can be significant.According to Gainsbury et al. (2015), the lack of information can increase the vulnerability of players and the risks associated with online gambling, including addiction and financial consequences. The ability to analyze and interpret online information can help to combat fraud and make assertive choices, as well as protect personal information.

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Despite the significant growth of the gambling market and its economic relevance in Brazil, there is a significant gap in understanding how this phenomenon impacts the budget of Brazilian families, particularly regarding the relationship between income, general expenses, and gambling and betting expenditures. The research problem motivating this study focuses on the need to investigate in detail how these expenditures are distributed across different income brackets and the potential financial and emotional effects associated with this practice. Understanding these aspects is crucial to support public policies that promote responsible use and mitigate the risks of pathological gambling.

In light of this scenario, the present study aims to analyze gambling and betting expenses using data from the Brazilian Institute of Geography and Statistics (IBGE, 2002, 2008, 2018)[ii]. According to the Inter-Union Department of Statistics and Socioeconomic Studies (DIEESE), the minimum wages in these years were R$ 200, R$ 415, and R$ 954, respectively. Through descriptive analysis, the study sought to understand the relationship between monetary income, total expenses, and gambling and betting expenditures, exploring how these variables interact within the socioeconomic context of Brazilian families.

Furthermore, the relationship between household income and gambling and betting expenditure will be analyzed using a regression model, which will allow us to mathematically describe how expenditure varies as a function of income. By deepening the understanding of gambling and betting expenditure patterns and their correlations with household budgets, the aim is to contribute relevant data that can help formulate effective public policies to prevent and mitigate the harm associated with pathological gambling.

Thus, this study not only provides valuable insights into gambling and betting expenditure behavior in Brazil, but also establishes a solid foundation for making informed decisions and implementing protective measures and support for those who may be negatively affected by this growing phenomenon.

Theoretical Framework

Brazilian legislation on gambling is undergoing significant changes and debates. The regulation of gambling in Brazil has historically been complex and subject to various legal interpretations. Gambling activities in Brazil were largely governed by the Law of Criminal Contraventions of 1941, which prohibited the practice and exploitation of gambling throughout the national territory, except in specific cases authorized by law. Gambling considered lotteries, such as Mega Sena, were allowed and regulated by the government. Law No. 3,688 of October 3, 1941, stated as follows:

> Art. 50. Establish or exploit games of chance in a public place or accessible to the public, with or without payment of admission: Penalty - simple imprisonment, from three months to one year, and a fine of two to fifteen contos de réis, extending the effects of the conviction to the loss of furniture and decorative objects from the location (Brazil, 1941).

In 2010, Brazil established its National Broadband Plan (PNBL), highlighting the growing importance of broadband internet in organizing productive processes, circulating goods and money, and promoting culture. The connection speed capable of transmitting data, audio, and video in real time was crucial for a variety of economic and social activities. However, universal access remained a challenge, especially for developing countries with high income inequality, due to the considerable investments required.

[ii]Data available at: IBGE - Household Budget Survey. Accessed on: Jan. 24, 2024.

The dissemination of broadband and technological development enabled more robust connectivity, creating a conducive environment for more engaging digital experiences, including multiplayer games and online betting platforms. In recent years, the discussion about the regulation of gambling in Brazil has begun to take new directions, with the possibility of legalization and regulation of different forms of gambling. An important milestone occurred in 2018, with the approval of Law No. 13,756, which legalized fixed-odds sports betting, paving the way for a safer and more controlled gambling market (Brasil, 2018).

The complete regulation of Law No. 13,756 made significant progress in 2023, with the publication of decrees and the sanction of Law No. 14,790, which detailed the conditions for the implementation of the online and physical betting market. This new legal framework created the Secretariat of Prizes and Bets (SPA-MF), linked to the Ministry of Finance, responsible for supervising the betting sector. Furthermore, the law established strict controls for platforms, requiring player registration and prohibiting betting with credits, aiming to prevent over-indebtedness (Brasil, 2023).

In parallel, the popularization of high-speed internet and the widespread use of mobile devices have facilitated access to gambling platforms. The accessibility provided by these technologies has allowed players to enjoy gaming experiences anywhere and at any time, consolidating Brazil as an attractive market due to its large population and increasing internet penetration (Bolaño, 2015).

In addition to the rise of the internet, Brazil sought new sources of revenue and the modernization of gambling laws. The expectation was that the regulation, with the approval of Law No. 13.756, could bring economic benefits, such as increased tax revenue and job creation, as well as combatting illegality and protecting consumers (IBJR, 2024).

In 2019, the Brazilian government expressed interest in discussing Bill 186/2014, commonly known as the "Casino Bill", which aimed to legalize casinos in specific tourist areas of the country, seeking to legalize casinos integrated into resorts (Brazil, 2014). However, to date, the measure has not been approved.

According to Oliveira, Silveira, and Silva (2008), the increasing accessibility to the gambling market can pose a significant risk to the population. In Brazil, despite the lack of national epidemiological studies, there has been an observed increase in the number of pathological gamblers, which may be related to the greater availability of gambling games. According to the authors, the Pathological Gambling Outpatient Clinic at the Federal University of São Paulo faced a demand far exceeding its service capacity over the course of ten years of operation. Additionally, a survey indicated that a quarter of the gamblers served had committed an illegal act related to gambling, 78% had incurred debts, 47% had suicidal thoughts, and 14% had attempted suicide. The scarcity of specialized professionals hinders the confrontation of this problem, as does the lack of national epidemiological data, which compromises the formulation of effective public policies. Furthermore, according to Oliveira, Silveira, and Silva (2008), the South Oaks Gambling Screen (SOGS), widely used to identify pathological gambling, has proven effective in Brazil, but further studies are still needed on its application in the national context.

The emotional impact of gambling on people's lives can be profound and devastating. For many gamblers, the vicious cycle of wins and losses can lead to feelings of euphoria followed by despair. Those who develop a gambling addiction often experience high levels of stress, anxiety, and depression. The shame and guilt associated with financial losses and impulsive behaviors can also be overwhelming. Moreover, pathological gambling can cause tensions in family and social relationships, leading to isolation and loss of emotional support. The emotional impact of excessive gambling is a crucial aspect to be considered in the development of effective prevention and treatment strategies (Oliveira; Silveira; Silva, 2008).

On December 12, 2023, Ângela Maria Camila da Paz, a 39-year-old woman from Ceará, was found dead by her sister. Before her death, Ângela sent audio messages to a WhatsApp group of an online betting platform called Blaze, stating that she would commit suicide due

to accumulated debts. According to family information, she compulsively played the game Crash, known in Brazil as "Aviãozinho" on this digital platform, and her debts amounted to approximately 100,000 reais. The exact cause of her death is still under investigation. Ângela leaves behind three children (Rodrigues, 2024).

The impact of gambling on individuals' lives can be felt not only on an emotional level but also on a financial one. To better understand the behavior of Brazilian families regarding their spending and consumption, it is important to refer to studies such as the Pesquisa de Orçamentos Familiares (POF - Household Budget Survey), conducted by IBGE. This survey provides essential data on family consumption habits, including those related to gambling and other expenses that directly affect the quality of life and financial decisions of Brazilian families. The POF collects detailed information on income and expenditure distribution, providing a comprehensive overview of the economic reality of Brazilian households, which is crucial to understanding how factors such as the legalization of gambling and digital accessibility can impact family spending in the current context (IBGE, n.d.).

In addition to analyzing the impact of gambling and betting on family expenses, it is essential to employ statistical tools that allow modeling and testing the relationships between the observed variables. The use of appropriate statistical techniques enables a deeper understanding of consumption patterns and the factors associated with individuals' financial behavior. The next section presents the methodology adopted in this study, detailing the statistical approaches used for the analysis of POF data.

Methodology

This study adopts an exploratory analysis approach, essential to identify patterns, anomalies, trends, and relationships within the data. The variables examined were income, total expenses, and gambling and betting expenditures, measured in minimum wages, extracted from the Family Budget Surveys (POF) of the Brazilian Institute of Geography and Statistics (IBGE) for the years 2002, 2008, and 2018. The POF databases are available on the IBGE website[iii]. To access them, the reader can navigate through the main menu by selecting the options "Estatísticas", then "Sociais", and finally "Saúde", where the "POF - Pesquisa de Orçamentos Familiares" section can be found. The applied methodologies are based on theoretical concepts appropriate for analyzing these variables.

To compare income with total expenses by monetary income class, bar charts were used. Each bar represents the expenses for a given income class. Three groups of bars were created, one for each analyzed year (2002, 2008, and 2018), positioned side by side, allowing for a clear and comparative visualization between the studied periods.

To illustrate the dispersion of income, expenses, and gambling and betting expenditures values in the years 2002, 2008, and 2018, the box plot was employed. This graphical representation provides an informative view of the data distribution, highlighting the median, interquartile range, and possible outliers, allowing for a comparative analysis between the three years.

The relationship between the proportion of gambling and betting expenditures and income was represented by a line graph for the analyzed years (2002, 2008, and 2018), providing a clear visualization and allowing for a comparative analysis of the relationships between these variables over time.

Regarding the statistical tests, the first one applied was the Kendall correlation test, proposed by Maurice G. Kendall in 1938. This non-parametric technique is based on the agreement and disagreement between pairs of observations, providing a robust solution for variables that do not meet parametric assumptions or do not exhibit linear patterns. In this study, it was used to examine the relationship between income, expenses, and spending on gambling and betting. The null hypothesis (H_0) of this test assumes the absence of correlation between the variables,

[iii] Data available at: IBGE - Family Budget Survey. Accessed on: January 24, 2024.

while the alternative hypothesis (H_1) suggests the existence of correlation. The Kendall statistic (τ) was used to indicate the direction of the correlation, and the p-value was employed to assess its statistical significance, with a significance level of $\alpha = 0.05$. If the p-value $< \alpha$, H_0 is rejected, indicating a significant correlation between the variables. To illustrate the strength of the relationships, a correlation matrix was constructed.

Next, a linear regression model was fitted, a statistical technique used to describe the relationship between a dependent variable and an independent variable. This model uses the least squares method to estimate the parameters that best represent the variability of the response variable. In the present study, linear regression was applied to analyze the relationship between income (independent variable) and gambling and betting expenditure (dependent variable), aiming to understand to what extent income influences gambling and betting spending. According to Carnegie Mellon University (2024), the simple linear regression model is given by the equation:

$$Y = \beta_0 + \beta_1 X + \varepsilon$$

where:

- Y represents gambling and betting expenditures,
- X is the explanatory variable, income,
- β_0 is the intercept of the regression line (the value of Y when $X = 0$),
- β_1 is the slope coefficient, which indicates the variation in Y for a unit change in X,
- ε is the random error, representing the variations not explained by the regression.

Residual analysis, an essential step in validating statistical models, as discussed by Montgomery and Runger (2014) , was applied to validate the fitted regression model. To test the assumption of homoscedasticity, the Breusch-Pagan test was employed, which, as defined by Gujarati and Porter (2009) , verifies the constancy of the error variance across observations. In this context, the null hypothesis assumes constant residual variance, while the alternative hypothesis suggests the presence of heteroscedasticity. Additionally, the Shapiro-Wilk test, developed by Shapiro and Wilk (1965) , was used to assess the normality of the regression model residuals, with the null hypothesis indicating that the residuals follow a normal distribution.

The initial model exhibited heteroscedasticity issues, which motivated the application of a logarithmic transformation, a widely used technique to stabilize variance and approximate the residual distribution to normality, as discussed by Wooldridge (2013) . After the transformation, the F-test, developed by Ronald A. Fisher and widely used in analysis of variance (ANOVA), regression, and variance equality tests (Lomax, 2007) , was applied. In this study, the F-test was employed to assess the significance of the adjusted model. Its null hypothesis states that the model does not significantly explain data variation, whereas the alternative hypothesis suggests that the model has significant explanatory power. If the p-value of the F-test is lower than the adopted significance level, the null hypothesis is rejected, indicating that the model is statistically adequate.

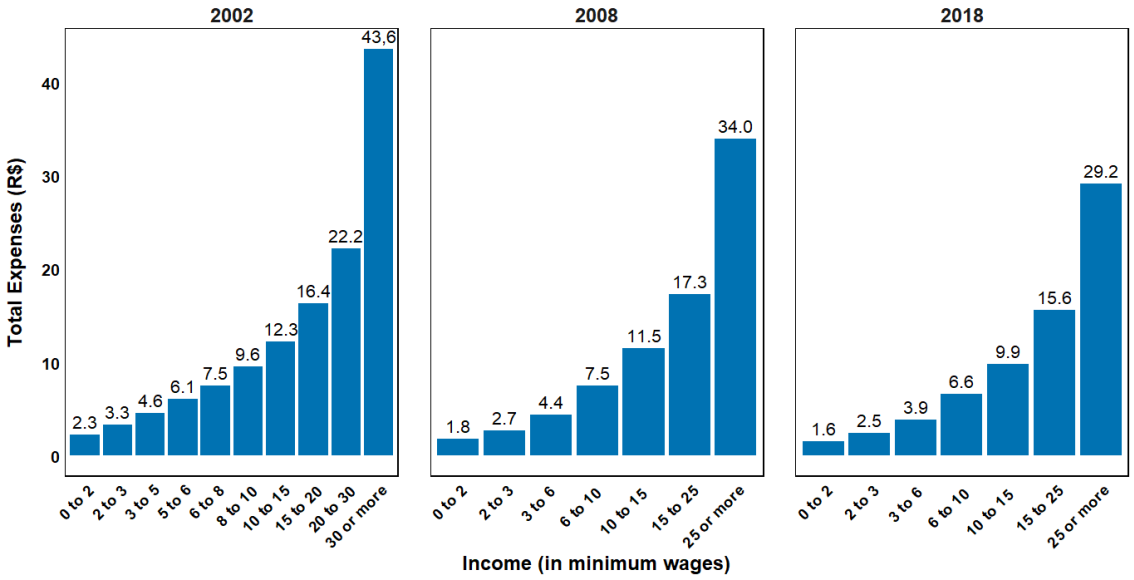
All statistical tests conducted in this study considered a significance level of 5% ($\alpha = 0.05$), a criterion widely used for decision-making in statistical inference.

Results

At first, an illustration of expenses by monetary income classes was conducted to understand variations in consumption patterns over the three studied years. Figure 1 presents bar charts displaying expenses categorized by income classes for the years 2002, 2008, and 2018,

allowing a comparative analysis between different income ranges and their respective financial allocations.

Figure 1: Bar charts of expenses by income classes (2002, 2008, and 2018).



Source: from the authors (2025).

In the analysis, it is observed that in 2002, a large portion of income classes up to 6 minimum wages had expenses exceeding their payment capacity. This behavior suggests a situation of financial vulnerability among these families. However, a positive evolution is observed in the following years: in 2008 and 2018, no income class analyzed had expenses exceeding the maximum limit of their income range, indicating an improvement in the financial balance of these families over the period.

Another relevant aspect identified in the graph is that higher-income classes exhibit significantly higher expenses. However, it is important to highlight that these income brackets encompass families with highly diverse income levels, as the last category includes incomes exceeding a certain minimum value without a defined upper limit. This broad range can lead to significant variations in the expenditure profile within this class.

Next, the dispersion of the variables income, expenses, and gambling and betting expenditures was analyzed through the box plots shown in Figure 2.

For the income variable, expressed in minimum wages, it is observed that dispersion remains relatively stable over the analyzed years. However, a notable outlier above the upper limit is present in the year 2002, indicating that a small portion of the population had significantly higher incomes compared to the rest in that year.

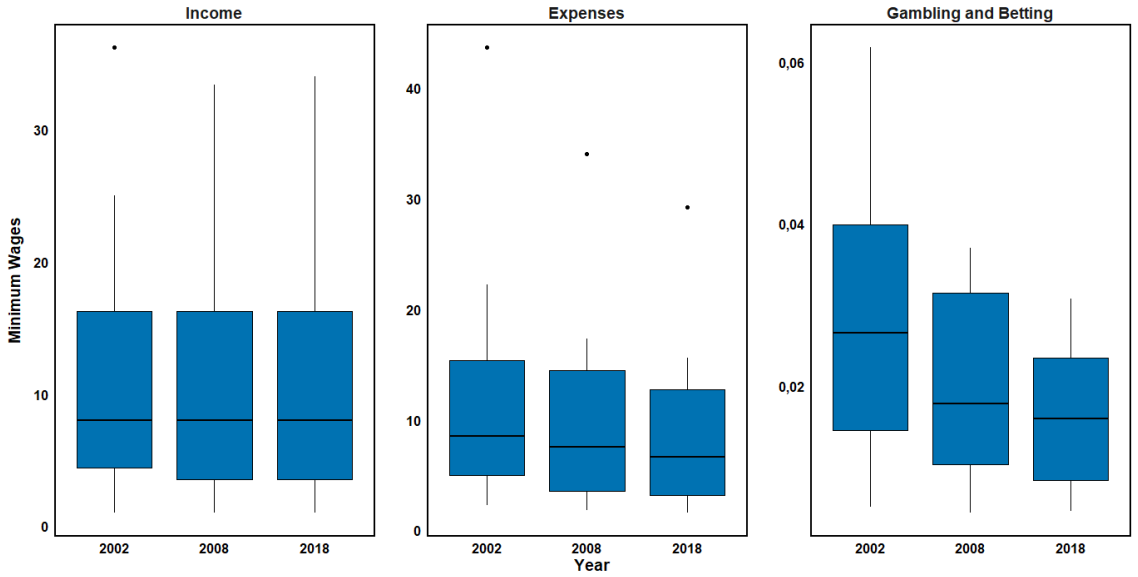
For the expenses variable, a slight reduction is observed over time, consistent with the behavior previously noted in the bar charts, where expenses ceased to exceed income in 2008. However, in all analyzed years, outliers indicate the existence of a minority with considerably higher expenses than most of the population, reflecting atypical spending behaviors.

Finally, for the gambling and betting expenses variable, a decrease is observed over the years. No outliers indicating extremely high expenditures were identified, but it is evident that in 2002, the average gambling and betting expenses were significantly higher compared to the subsequent years. This pattern suggests a decreasing trend in gambling and betting expenses over the analyzed period.

Continuing the analysis, Figure 3 presents the line chart illustrating the proportions of gambling and betting expenses relative to income in the years 2002, 2008, and 2018.

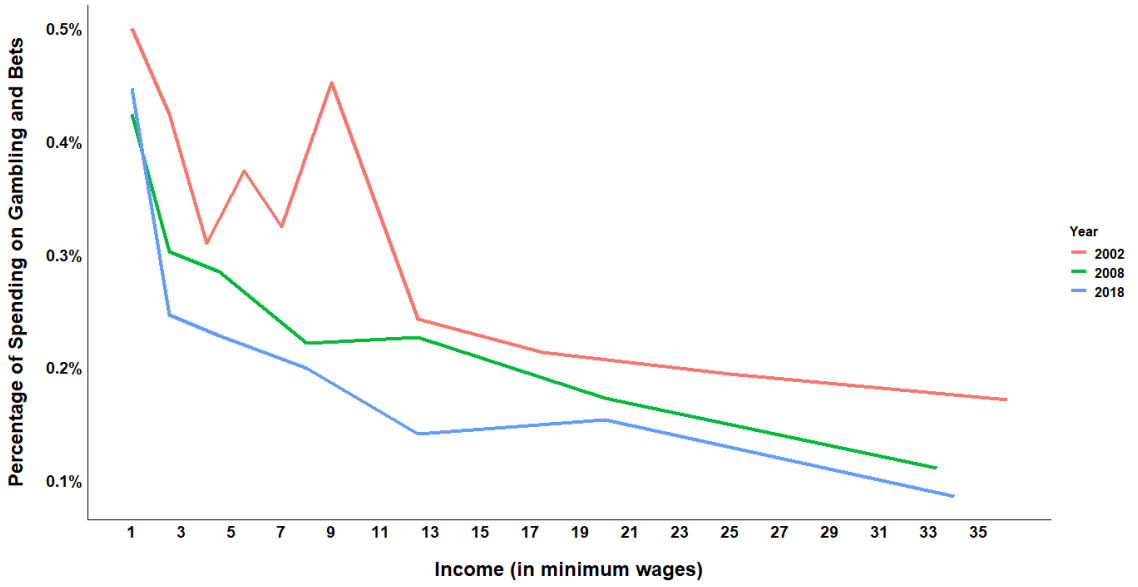
In the graph, it is evident that in 2002, the proportion of gambling and betting expenses

Figure 2: Box plot of income, expenses, and gambling and betting expenditures for the years 2002, 2008, and 2018.



Source: from the authors (2025).

Figure 3: Proportion of gambling and betting expenses relative to income in the years 2002, 2008, and 2018.

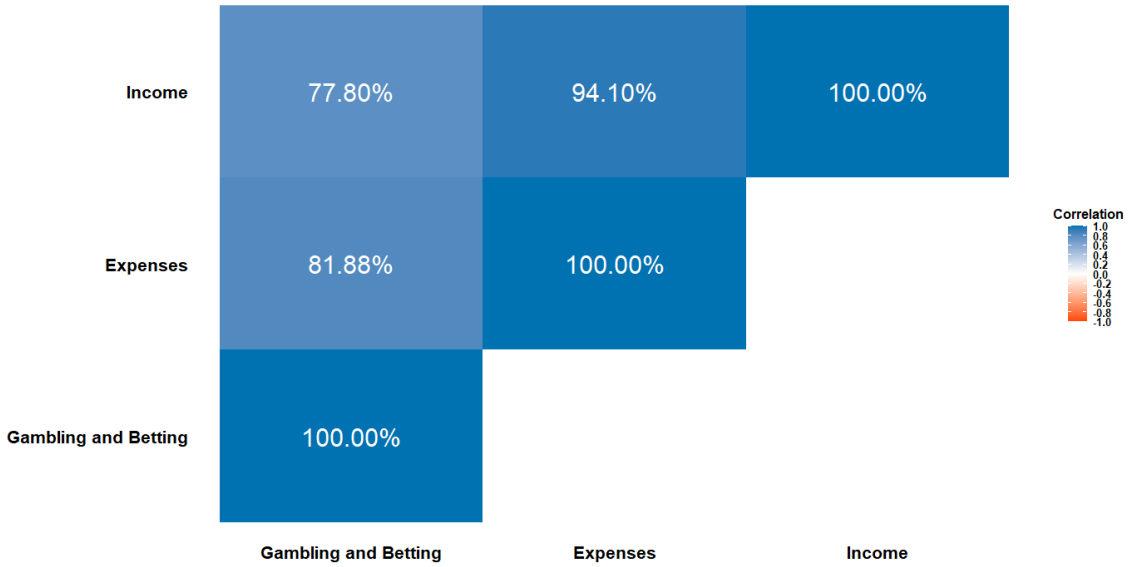


Source: from the authors (2025).

relative to income was significantly higher than in 2008 and 2018 for all income classes, especially for those with an average income between 3 and 11 minimum wages. This trend reflects a reduction in gambling and betting expenditures over the analyzed years. However, the most concerning aspect, which remained consistent across all studied years, is that although gambling and betting expenses represent a small share of total expenditures, they are considerably higher among families with an average income below 3 minimum wages. This finding is alarming, as gambling and betting expenses do not guarantee a return and may further worsen the financial situation of individuals already in a vulnerable condition.

To investigate the relationships between the variables income, expenses, and gambling and betting expenditures, the correlation matrix shown in Figure 4 was constructed.

Figure 4: Correlation matrix between income, expenses, and gambling and betting expenditures.



Source: from the authors (2025).

The matrix with the Kendall correlation estimates for the variables reveals high positive correlations between the three analyzed variables, with a highlight on the correlation between expenses and income (0.941) and between expenses and gambling and betting expenditure (0.819). The correlation between income and gambling and betting expenditure is slightly lower (0.778), but still high. The correlations are positive and statistically significant at the 5% level according to the Kendall correlation test. These results indicate that, as income increases, both general expenses and gambling and betting expenditure tend to rise. However, the correlation between income and gambling and betting expenditure is somewhat weaker, which can be explained by the previously identified fact that, proportionally, lower-income families allocate a larger share of their resources to gambling, which reduces the relative impact of income increase on this variable for higher-income families.

Based on this observation, a simple linear regression analysis was conducted, modeling gambling and betting expenditures as a function of income. The goal was to verify the linear relationship between the two variables and assess the assumptions of the model.

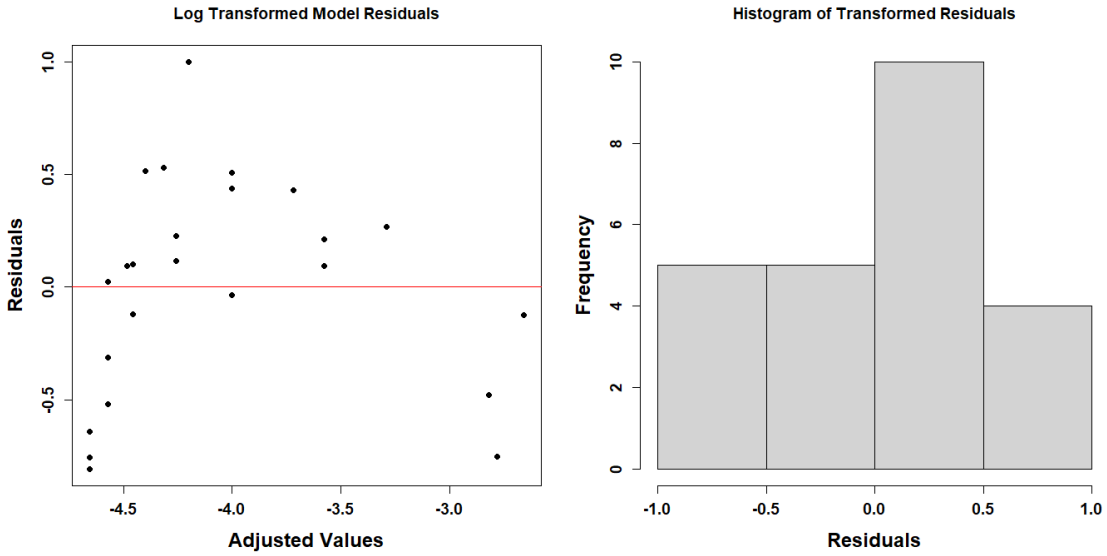
After obtaining the regression model, a residual analysis was performed. For this, a scatter plot, a histogram of the residuals, and the Breusch-Pagan and Shapiro-Wilk tests were used, aiming to assess, respectively, the homoscedasticity and the normality of the residuals. The presence of heteroscedasticity was identified, as the Breusch-Pagan test showed a p-value of 0.03543, indicating non-constant variance in the residuals.

To correct this issue and stabilize the variance of the residuals, a logarithmic transformation was applied to the dependent variable gambling and betting.

After the transformation, a substantial improvement in the model diagnostics was observed. The Breusch-Pagan test showed a p-value of 0.593, indicating homoscedasticity, while the Shapiro-Wilk test yielded a p-value of 0.3751, confirming the maintenance of the normality of the residuals. These results can be visualized in Figure 5, which illustrates the improvement in the post-transformation plots.

These results demonstrate that the logarithmic transformation was effective in eliminating heteroscedasticity without compromising the normality assumption of the residuals. Thus, the adjusted model after the transformation, graphically presented in Figure 6, meets the fun-

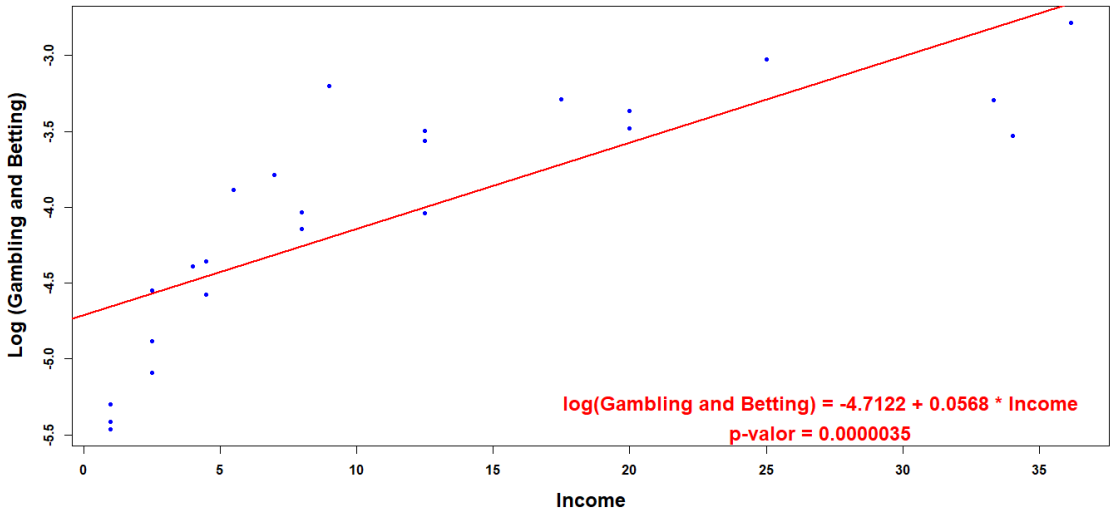
Figure 5: Graphical analysis of the residuals from the transformed linear regression model.



Source: from the authors (2025).

damental assumptions of regression, providing greater confidence in the validity of subsequent analyses and interpretations.

Figure 6: Graphical analysis of the residuals from the transformed linear regression model.



Source: from the authors (2025).

The linear regression model, after the application of the logarithmic transformation, can be mathematically expressed as:

$$\log(\hat{Y}) = -4.7122 + 0.0568X$$

Where:

- $\log(\hat{Y})$ is the logarithmic transformation of the dependent variable Y (Gambling and Betting),

- -4.7122 is the estimated intercept of the model,
- 0.0568 is the estimated coefficient for the variable X,
- X is the independent variable, which in this context is Income.

Alternatively, by inverting the logarithmic transformation, we obtain the following expression for $\hat{Y}$:

$$\hat{Y} = \exp(-4.7122 + 0.0568X)$$

Where:

- $\hat{Y}$ is the estimated value of the dependent variable Y (gambling and betting) after reversing the logarithmic transformation,
- -4.7122 remains the estimated intercept of the model,
- 0.0568 is the estimated coefficient for the variable X (Income) in its original form, without the logarithmic transformation,
- $\exp(\cdot)$ indicates the exponentiation of the expression in the argument, which reverses the logarithmic transformation previously applied.

The intercept coefficient was estimated as $\hat{\beta}_0 = -4,7122$. Although the logarithmic transformation was applied to the variable Y, making the direct interpretation of the intercept in the original context difficult, it is useful for determining the value of Y when $X = 0$. This value is given by the exponential of the intercept:

$$\hat{Y}_0 = \exp(-4.7122) \approx 0.009$$

Therefore, when the independent variable (income) is equal to zero, the estimated value of the dependent variable (gambling and betting) is approximately 0.009.

The coefficient associated with the income variable was estimated as $\hat{\beta}_1 = 0.0568$. This coefficient should be interpreted as the average percentage change in Y for a one-unit increase in X. Since the logarithmic transformation was applied to the dependent variable (Y, gambling and betting), the relationship between X (income) and Y (gambling and betting) is not linear, but rather proportional.

To interpret the effect of a one-unit increase in X, it is necessary to "reverse" the logarithmic transformation. The coefficient 0.0568 indicates that, for a one-unit increase in X (income), the logarithm of Y (gambling and betting) increases by 0.0568. This results in a multiplicative increase in Y, given by $\exp(0.0568)$.

Calculating this increase, we have:

$$\exp(0.0568) \approx 1.0585$$

That is, for each one-unit increase in income, gambling and betting increases, on average, by a proportion of $1.0585 - 1 = 0.0585$, or approximately 5.85%.

This coefficient was highly significant, with a p-value of 3.52×10^{-6}, indicating that the relationship between income and gambling and betting is statistically relevant.

The model as a whole was also significant, with an F-value of 37.7 and a p-value of 3.523×10^{-6}, suggesting that the relationship between the variables is not due to chance. The coefficient of determination (R^2) was 0.6315, meaning that approximately 63% of the variation in gambling and betting can be explained by the income variable. The adjusted R^2, in turn, was 0.6147, confirming the robustness of the model when considering the number of explanatory variables. These results indicate that the income variable has a significant and positive influence

on gambling and betting, and the proposed model provides a substantial explanation of the observed variation in the dependent variable.

The relevance of these analyses aligns with recent studies on the social and economic impact of sports betting. A report by PwC Strategy& on the impact of sports betting on the budgets of families in income classes D and E, as reported by Agência Brasil (2024), highlights that spending on sports betting, especially on online platforms, has led to a significant redistribution of resources, negatively affecting the consumption of essential goods and services, particularly among lower-income families.

This study corroborates our analysis, indicating that gambling and betting expenditure is more prevalent among lower-income classes, worsening the financial situation of families already facing vulnerabilities. According to the PwC Strategy& report cited by Agência Brasil (2024), these expenditures have impacted families' perception of economic improvement. Although indicators such as income and employment have shown improvement, the financial allocation to sports betting has limited the consumption capacity of these families.

Complementarily, Cavalcante et al. (2024) identified a significant correlation between the habit of betting and lower socioeconomic levels, reinforcing that economic factors play a central role in the behavior of online betting consumers.

Therefore, the observed relationship between gambling and betting expenditures and income in the lower classes (as evidenced in Figure 3) reflects a behavior similar to that described in these external studies, not showing a trend of reduced gambling and betting expenditures over time, but rather a significant presence in the lower income brackets. The central concern is that, even with the decrease in the average gambling and betting amounts in the analyzed years, families with lower purchasing power continue to allocate a substantial portion of their income to high-risk activities with no guaranteed return, which may perpetuate a cycle of financial vulnerability.

Final Considerations

The analysis of gambling and betting expenditures, using data from the Family Budget Surveys of the Brazilian Institute of Geography and Statistics (IBGE) for the years 2002, 2008, and 2018, provided a comprehensive view of the financial behavior of Brazilian families with respect to the gambling market. The results indicate an improvement in the financial conditions of families over the years, as evidenced by the reduction in expenses that exceeded their payment capacity. However, total expenses continue to consume almost all available income, highlighting the need for more effective financial management practices.

It was observed in 2002 that there was an outlier in income variation, indicating that a restricted portion of the population had significantly higher incomes, which reflected marked inequalities during that period. In the following years, 2008 and 2018, although extreme values were not observed, the greater dispersion in income suggests an increase in income heterogeneity, reflecting economic dynamics that have amplified inequality among different segments of the population. For the expenses variable, a reduction in dispersion over time was noted, although outliers continue to reflect above-standard expenditures in all the analyzed periods. Meanwhile, gambling and betting expenditures exhibited lower dispersion over the years, indicating a trend of reduction in these values.

The analysis of the proportion of gambling and betting expenditures relative to income revealed that low-income families allocate a proportionally larger share of their resources to these activities, even though, in absolute terms, expenditures are higher among higher-income families. This pattern highlights the vulnerability of low-income families, which experience a more pronounced impact of gambling and betting expenditures on their budgets.

The application of a linear regression model with a logarithmic transformation was essential to investigate the relationship between income and gambling and betting expenditures.

The model showed statistical significance, indicating a positive correlation between the variables and explaining approximately 63% of the variation in gambling and betting expenditures. This suggests that, as income increases, gambling and betting expenditures also grow in absolute terms, reinforcing the importance of understanding the factors driving these expenses to support public policies and intervention strategies.

In light of this evidence, it becomes essential that the legalization of sports betting considers the risks associated with excessive gambling, especially for low-income populations. Public policies should prioritize strategies for the prevention and treatment of pathological gambling, as well as promote financial education to help families recognize the risks involved and manage their resources more efficiently. In this way, it is possible to balance the economic benefits of legalizing betting with the protection of vulnerable populations, fostering a responsible and conscious approach to gambling.

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