Adoption and Usage of E-Payment Methods in Brazil

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This study investigates the determinants influencing the adoption and usage of e-payment systems in Brazil, emphasizing perceived usefulness, ease of use, trust, risk, incentives, and social influence. Drawing on the Technology Acceptance Model (TAM), the research surveyed 180 Brazilian users to evaluate behavioral and demographic predictors of e-payment adoption. Results from correlation and regression analyses revealed that perceived usefulness and income were the strongest predictors across multiple usage metrics—frequency, amount spent, and percentage of monthly expenses via e-payment. Perceived risk and trust were also influential, albeit to a lesser degree. Contrarily, incentives and social influence did not significantly affect adoption behavior. These findings underscore the importance of perceived value and security in shaping digital payment behaviors in emerging markets. The study contributes to the literature by refining existing models of technology acceptance and offering insights for policymakers and fintech providers aiming to enhance financial inclusion and digital adoption in Brazil.

Keywords: e-payment adoption, perceived usefulness, Brazil, Technology Acceptance Model, financial inclusion

INTRODUCTION

Recent years have witnessed an increased use of electronic payments (hereafter "e-payments) throughout the world, with the highest initial adoption in developed economies, followed by increasing and accelerated adoption and usage in medium-income and other developing economies (Caldeira et al., 2021; Gaya, 2022). The substitution of digital transaction methods, as distinguished from transactions using physical currency, is transforming the economic behavior of people, businesses, and other institutions on a global scale.

E-payment systems represent a comprehensive framework designed to facilitate the exchange of monetary value for goods and services conducted over digital platforms (Fali et al., 2018). These systems, leveraging internet-based technologies, enable relatively smooth financial transactions between consumers and merchants within the realm of e-commerce. The utilization of e-payment systems is purported to yield advantages for diverse stakeholders including payers, financial institutions, businesses, and governmental entities. Such advantages include enhanced transactional efficiency, near-immediate processing, heightened transparency, minimized temporal expenditure, cost-effectiveness, and bolstered trust dynamics between transacting parties. Consequently, the adoption and proliferation of efficient and dependable e-payment systems hold promise for catalyzing global expansion and integration of electronic financial infrastructures (Fali et al., 2018). Presumably, reporting and control mechanisms are rendered more facile as well, potentially for both parties of a transaction.

Previous research has revealed a number of antecedents for the adoption and usage of fintech, particularly of e-payments by individuals. The factors that exert influence on individual adoption and usage decisions have been found to play a part in various countries, although to greater and lesser degrees. Technology adoption is important in Latin American countries both for its speed and because it can significantly impact the competitiveness and growth of businesses in the region. Factors such as company size, industry, informal sector competition, and exporting play a crucial role in determining the initial adoption and intensification of technology in these countries (Waters, 2015). Understanding the determinants of technology adoption dynamics is essential for companies and policymakers in developing countries to make informed decisions and effectively leverage technology for economic development (Waters, 2015).

Brazil has been no stranger to this worldwide phenomenon. As the largest economy in South America, a member of regional trade agreements such as Mercosur, an OECD-designated middle-income economy, and notably an original member of BRICs, this nation is interconnected with, and a growing part of, the global economic order. As such, the process of change toward digital payments and how it is proceeding in this salient national economy invites study. E-payments in Brazil play a role in promoting financial inclusion and integrity in the country. E-payments, including mobile payments, are seen as a crucial step in the dematerialization of money and are expected to have significant social outreach due to the widespread use of mobile devices in Brazil (Almeida, 2013). However, the challenges concerning e-payments, financial inclusion, and financial integrity must be addressed to ensure that e-payments effectively contribute to these goals. The development of regulatory frameworks and policies around e-payments, such as the integration of banks, mobile network operators, retail, and e-government interests, is essential for the successful implementation and growth of e-payment systems in Brazil (Almeida, 2013).

While the antecedents of e-payment utilization among individuals in different countries have some shared common attributes, nations may nonetheless reveal differences in how these decisions are determined. The present research was undertaken to build on previous research regarding Brazilian adoption and usage of e-payment methods and to quantify the relationships among previously identified variables to better elucidate the determining factors in adoption and usage behavior.

LITERATURE REVIEW

Research in financial technology has revealed several prominent drivers influencing the nature and use of varied e-payment platforms. Almeida (2013) found that concerns on the part of consumers, businesses, and governmental agencies shaped the initial formats of financial technology in general, and e-payment in particular within the Brazilian environment. While legal and ethical concerns such as the potential for money laundering and fraud constrained the readiness to allow and utilize e-payment methods, at the same time secure e-payment formats were also seen as a partial solution to these problems as they already existed. Others, such as Winn (2015), have expanded the scope of potential benefits derived from fintech, noting that e-payment provides a means for addressing poverty, economic development, demographic inclusiveness, and increased opportunity in developing economies.

These observations were echoed by Gaya, who found that the accelerated use of e-payment among Latin American countries presented an opportunity for greater security, efficiency, and economic inclusiveness. More recently, Smeets and Zeisberger (2020) argued along similar lines, and also that the economic effects of the COVID pandemic would be partially ameliorated by e-payment. Lai (2017) discusses the Technology Acceptance Model (TAM) and its significance in predicting information technology adoption. TAM is widely used in analyzing factors influencing adoption intentions beyond convenience and usefulness perceptions. It focuses on the effects of ease of use, usefulness, and convenience on adoption intentions. The study adapts the 1996 version of TAM by omitting attitude towards intention to use and convenience directly towards intention to use while extending it to include security as a crucial factor in e-payment adoption (Lai, 2017). TAM has been extensively tested and proven valid in explaining information system acceptance and use, leading to various proposed extensions to the model.

While new modes of fintech are growing among developing economies, the specific conditions among these environments have led to distinctions among and within countries, both with respect to types of available e-payment platforms and to the patterns of adoption by businesses and consumers. Winn compared and contrasted Kenya, Brazil, and India, finding commonality in the growth of e-payment usage, but at the same time finding national distinctions in the forms and uses of the new technology. Similarly, Groppa (2012) compared mobile payment methods in Kenya, Ecuador, and Brazil, discerning that differences in the regulatory environment would eventually impact usage in the long term, as well as the actual monetary systems of the countries. Kenya used a mild regulatory framework, while Ecuador had adopted a state-controlled system. Brazil, as distinguished from both countries, was in the process of developing a payment system within the banking industry.

The characteristics of the Brazilian fintech environment were born, according to Almeida (2013), from the environment of near-chronic high inflation that Brazil sometimes experienced throughout history, particularly in the first decade of the millennium. The result has been an especially sophisticated system of payments. The aim has been to strike a balance between inclusiveness and popularization on the one hand, and financial security on the other. In turn, this environment has likely played a part in the nature of Brazilian national adoption and usage.

Research on the determinants of digital payment usage has revealed several different factors playing a role in the behavior of consumers (Jain and Jain, 2023). For example, perceived usefulness, convenience, and simplicity have played a part. Such factors have been identified in adoption and usage rates in many different countries, including China, the United States, Spain, Egypt, and Peru (see for example Aurazo and Vega (2021)). Conversely, lack of trust, exclusivity of mobile devices for transactions, and other factors can weigh against adoption and usage (Aurazo and Dinitz, 2023).

Regarding the Brazilian experience, Caldeira (2023) examined some of the common factors determining usage and found that Brazilians were affected by the same factors that have been shown to relate to usage in other settings. Further causal relationships were identified by Neto, Luis, and de Figueiredo (2022). From a survey of 1,742 Brazilian users, income was shown to positively moderate performance expectations and negatively moderate perceived costs and perceived risk. Age positively moderated performance expectations, and negatively moderated cost perception. Previously, Ramos-de-Luna (2019) also found that attitude, personal innovation in IT, and perceived usefulness had predictive power of intention to use Near Field Communications (NFT) technology for payments in Brazil. On examining the 2019 edition of the IT Households survey in Brazil, Araujo and Diniz (2023) found that women and low-income earners were less likely to use e-payments.

HYPOTHESIS DEVELOPMENT

Incentives

The available research affirms the idea that incentives play a crucial role in influencing individuals' willingness to embrace e-payment services. This influence remains consistent irrespective of the specific incentive amount, the type of incentive, or the duration of the promotional period (Zhao and Zhang, 2019). Consequently, incentives hold significant importance in boosting the adoption of e-payment methods

(Banka, 2013). Factors such as financial education, discounts, and user-friendliness impact consumer acceptance of e-payments, while merchant adoption is influenced by factors like tax benefits and user-friendliness. Hence, we propose a direct and positive connection between incentives and the adoption of e-payment services.

H_{1a}: *Incentives (INC) are positively related to the composite e-payment adoption construct. (Usage)*

H_{1b}: *Incentives (INC) are positively related to frequency of use.*

H_{1c}: *Incentives (INC) are positively related to the amount spent per month via e-payment.*

H_{1d}: *Incentives (INC) are positively related to the percent of monthly expenses made via e-payment.*

Perceived Usefulness

A potential adopter's perception of an application's usefulness determines whether they should use it or not, based on whether they think it will improve how they do their jobs (Davis, 1989). A study done in Semarang found that the relationship between perceived security and usability is mediated by perceived usefulness (Ardiansah et al., 2019). According to the TAM model and empirical research, we hypothesize that perceived usefulness influences e-payment behavior positively.

The likelihood of someone considering the use of an application depends on their judgment of its practicality, gauged by whether they believe it will enhance their job performance, as noted by Davis in 1989. A study conducted in Semarang unveiled that the connection between the perceived security and usability of an application is influenced by the perception of its usefulness (Ardiansah, 2019). The study involved a survey with 402 participants and data was analyzed using structural equation modeling. The results show that trust, usefulness, and perceived quality directly influence mobile payment acceptance. The study highlighted the importance of understanding the factors that lead consumers to use or not use mobile payment services, especially in the face of growing competition among service providers (Tharcisio Alexandrino Caldeira et al., 2021). In alignment with the Technology Acceptance Model (TAM) and empirical investigations, we put forth the hypothesis that the perception of usefulness has a positive impact on e-payment usage behavior.

H_{2a}: *Perceived Usefulness (PU) is positively related to the composite e-payment adoption construct. (Usage)*

H_{2b}: *Perceived Usefulness (PU) is positively related to frequency of use.*

H_{2c}: *Perceived Usefulness (PU) is positively related to the amount spent per month via e-payment.*

H_{2d}: *Perceived Usefulness (PU) is positively related to the percent of monthly expenses made via e-payment.*

Perceived Ease of Use

Perceived ease of use relates to the proportion of potential users who believe that an application presents significant challenges in its usage, yet they perceive its performance benefits to outweigh the effort required to operate it, as described by Davis in 1989. Simplifying offerings and providing clear guidelines and rules can help alleviate consumer reservations about embracing novel technologies, particularly in the realm of e-payment services. A study of Nigerian e-banking systems conducted in 2014 by Tella and Olasina revealed a robust correlation between perceived usability and consumers' intentions to use these systems. It is reasonable to infer that there is a positive association between the adoption of e-payment services and the perceived ease of use.

H_{3a}: *Ease of Use (EU) is positively related to the composite e-payment adoption construct. (Usage)*

H_{3b}: *Ease of Use (EU) is positively related to frequency of use.*

H_{3c}: *Ease of Use (EU) is positively related to the amount spent per month via e-payment.*

H_{3d}: *Ease of Use (EU) is positively related to the percent of monthly expenses made via e-payment.*

Perceived Risk

Perceived risk pertains to the uncertainty associated with a product or service, coupled with the revelation of the outcomes that result from using it, as outlined by Bauer in 1960. An examination of internet users in Malaysia unearthed a substantial adverse influence on their inclination to embrace e-payment, as reported by Chin and Ahmad in 2013. In a study involving 200 respondents in Ho Chi Minh City, a model accounting for 38% of e-payment adoption was constructed, which measured perceived risk and trust (Nguyen and Huynh, 2018). Additionally, a lower level of perceived risk has been consistently identified as statistically significant in impacting the intention to adopt an e-payment system. Hence, it is reasonable to expect that the adoption of e-payment services is negatively influenced by perceived risk.

H_{4a}: *Perceived Risk (PR) is negatively related to the composite e-payment adoption construct. (Usage)*

H_{4b}: *Perceived Risk (PR) is negatively related to frequency of use.*

H_{4c}: *Perceived Risk (PR) is negatively related to the amount spent per month via e-payment.*

H_{4d}: *Perceived Risk (PR) is negatively related to the percent of monthly expenses made via e-payment.*

Perceived Trust

Perceived trust in using e-payment services assumes greater significance when perceived usefulness and usability are also considered significant factors. The intention to adopt technology is closely associated with ease of use and the perceived utility it offers. However, when survey responses were analyzed, a study involving millennial college students in Indonesia, conducted by Ardiansah and colleagues in 2019, found that perceived security emerged as a stronger predictor of behavior. In a survey regarding Iranian perceptions of security and trust, it was revealed that access to security guidelines and general security considerations significantly impact trust (Barkhordari, 2017). The adoption of e-payment services is positively influenced by trust.

H_{5a}: *Perceived Trust (PT) is positively related to the composite e-payment adoption construct. (Usage)*

H_{5b}: *Perceived Trust (PT) is positively related to frequency of use.*

H_{5c}: *Perceived Trust (PT) is positively related to the amount spent per month via e-payment.*

H_{5d}: *Perceived Trust (PT) is positively related to the percent of monthly expenses made via e-payment.*

Social Influence

Social influence can be defined as the degree to which an individual is susceptible to recommendations and suggestions stemming from interpersonal relationships, which, in turn, exert an impact on their attitudes, perceptions, and beliefs, as articulated by Bearden and colleagues in 1989. In a survey encompassing Indonesian electronic money users, the significance of word-of-mouth communication in the adoption of e-payment methods by merchants and small business owners seeking additional information and assurance was underscored, as identified by (Khatimah et al., 2019). Notably, close relationships were found to exert a substantial influence on social influence, as indicated by the observed positive correlation between students' intentions to utilize e-payment systems and other subjective norms in Malaysia, as

revealed by Jusoh and Teng in 2019. Consequently, we postulate that there exists a positive correlation between social influence and the adoption of e-payment services.
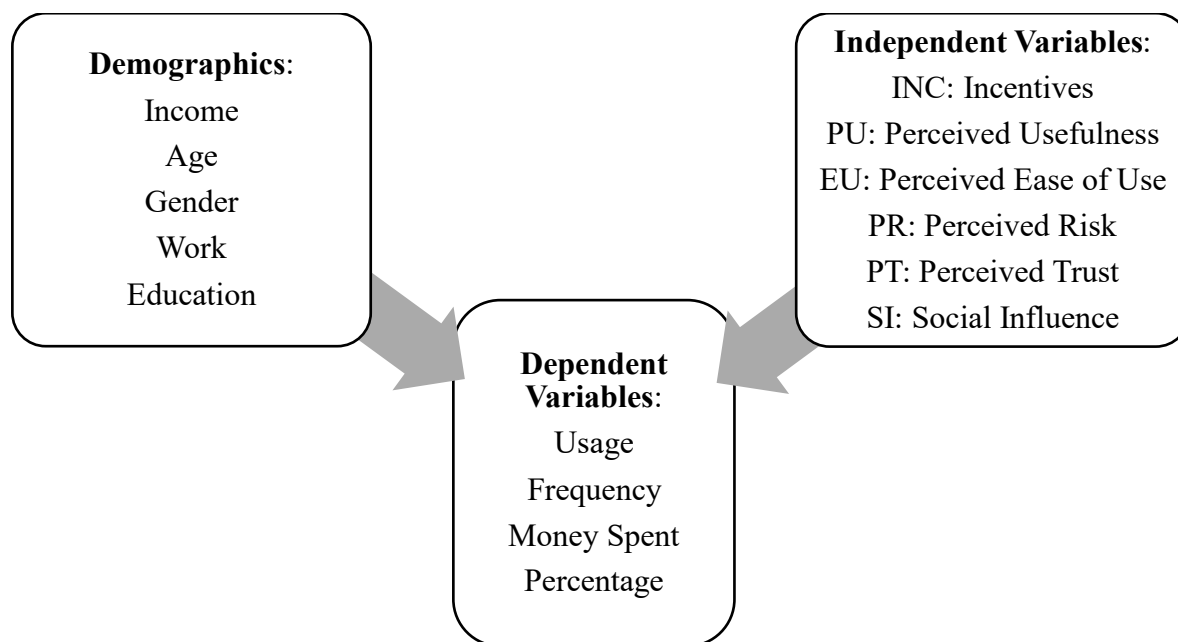
H₆ₐ: *Social Influence (SI) is positively related to the composite e-payment adoption construct. (Usage)*

H₆ᵦ: *Social Influence (SI) is positively related to frequency of use.*

H₆꜀: *Social Influence (SI) is positively related to the amount spent per month via e-payment.*

H₆d: *Social Influence (SI) is positively related to the percentage of monthly expenses made via e-payment.*

FIGURE 1
PROPOSED E-PAYMENT MODEL

Demographics:
Income
Age
Gender
Work
Education

Dependent Variables:
Usage
Frequency
Money Spent
Percentage

Independent Variables:
INC: Incentives
PU: Perceived Usefulness
EU: Perceived Ease of Use
PR: Perceived Risk
PT: Perceived Trust
SI: Social Influence

METHODOLOGY

In 2021, a Portuguese survey was uploaded in Qualtrics and distributed to friends and colleagues of our key contact person. The distribution strategy involved utilizing electronic mail and social media channels to facilitate a convenient sampling method. This method yielded a total of 180 valid responses from participants.

The research survey was structured into three distinctive sections. The initial section was dedicated to inquiries concerning attitudes and perceptions, and these aspects were assessed using 7-point Likert scales. The second section was designed to gauge the frequency of engagement by participants with diverse devices, software, activities, and items in the context of e-payment systems. This section introduced 5-point Likert scales for the assessment and encompassed an analysis of the monthly frequency and extent of e-payment spending, the total monthly expenditure through e-payment methods, and the proportion of monthly expenses attributable to e-payments. The final section was devoted to the collection of demographic information, with the objective of creating profiles of the participants based on their background characteristics, including age group, employment status, student status, educational background, gender, and income level.

Overall, the valid cases were distributed among male individuals (58.9%) and female individuals (40.6%). Most respondents (n=33 or 18.3%) were aged 46- 50 (see Table 1). The average age was 44.92, with a standard deviation of 13.62. About 68.3% (n=123) of respondents work full-time, with 18.9% unemployed, and 12.2% working part-time. The education level is relatively high with 99 respondents (55.0%) having earned a postgraduate degree. About 49 (27.2%) respondents hold a college degree and 31 (17.2%) have graduated from high school. The high percentage of respondents with a master's or higher education may be explained by the fact that the sample was drawn from a distribution through a university professor, a dentist, a physician, and some graduate students.

TABLE 1
DESCRIPTIVE STATISTICS FOR DEMOGRAPHIC VARIABLES

Variables	Frequencies	Percentage	Mean	S.D.
Gender			0.4078*	0.493
Female	73	40.6		
Male	106	58.9		
Missing	1	0.6		
Total	180	100		
Age			44.92**	13.62
18-20	7	3.9		
21-25	18	10.0		
26-30	5	2.8		
31-35	14	7.8		
36-40	18	10.0		
41-45	23	12.8		
46-50	33	18.3		
51-55	19	10.6		
56-60	18	10.0		
61 and over	24	13.3		
Missing	1	0.6		
Total	180	100		
Work			0.748*	0.398
Un-employed	34	18.9		
Part-time	22	12.2		
Full-time	123	68.3		
Missing	1	0.6		
Total	180	100		
Education			15.87***	2.46
High School	31	17.2		
Higher Education	49	27.2		
Post Graduate	99	55.0		
Missing	1	0.6		
Total	180	100		

Income			9,088.57	5,810.16
1,000 or less	9	5.0		
1,000-2,000	13	7.2		
2,001-4,000	14	7.8		
4,001-6,000	29	16.1		
6,001-8,000	24	13.3		
8,001-10,000	16	8.9		
10,001-12,000	19	10.6		
12,001-15,000	19	10.6		
15,001-20,000	17	9.4		
20,001 and over	15	8.3		
Missing	5	2.8		
Total	**180**	**100**		

*Male = 0 and Female = 1; Full Time = 1, Part-time = 0.5, and Unemployed = 0
**Each category is coded to its mean age
***Each category is coded to the usual number of years required to complete the level of education

Cronbach's alpha analysis was conducted on the six primary constructs utilizing the Statistical Package for the Social Sciences (SPSS) as presented in Table 2. The outcomes for the Brazilian respondents revealed the lowest alpha value recorded at 0.733 for the construct of social influence. It can be noted that all alpha coefficients surpassed the threshold of 0.7, thereby establishing the reliability of the constructs. Additionally, the observed means display relatively elevated values for perceived usefulness (PU; 6.369) and perceived ease of use (EU; 6.240). These high mean scores signify Brazilians attribute perceived usefulness and ease of use in comparison to other factors.

The determination of incentives was accomplished by utilizing multiple-choice questions administered through a Likert scale. This measurement entailed users expressing their level of agreement or disagreement on a 7-point scale regarding the influence of specific factors on e-payments, namely discounts, coupons, cashback, membership points, and gifts. The calculated average value for the variable denoted as "INC" (incentives) was 4.149, a value near the average score for perceived risk (PR), which was recorded at 4.702. It is important to note that the variable social influence (SI) exhibited a mean value of 3.963, the lowest when compared to the other factors under consideration.

The construct of "USAGE" was established as a composite variable for different adoption behaviors. The research adopted an ordinal coding approach for three dependent variables, specifically, the frequency of monthly e-payment usage, the monthly monetary expenditure, and the percentage of monthly expenses conducted through e-payment methods. The calculation of Cronbach's alpha for this usage measure yielded a coefficient of 0.802, indicating a satisfactory level of internal consistency. Consequently, the behavioral aspect referred to as "USAGE" held significant importance as it amalgamated all three dimensions by averaging their respective ordinal values.

TABLE 2
CRONBACH ALPHAS AND DESCRIPTIVE ANALYSIS OF MAJOR CONSTRUCTS

	Items	Alpha	Mean	S.D.
INC	5	0.763	4.149	0.877
PU	8	0.851	6.369	0.882
EU	6	0.878	6.240	1.052
SI	3	0.733	3.963	1.518
PR	6	0.888	4.702	1.635
PT	5	0.865	5.115	1.386
USAGE	3	0.802	6.674	1.956

RESULTS

To evaluate the measurement of e-payment usage in this study, the survey posed three pivotal questions: "How often do you use e-payments?", "Approximately how much money do you spend via e-payment per month?" and "Approximately what percentage of your monthly expenses are paid via e-payment?" We found that approximately 43.3% of the total valid respondents reported e-payment usage exceeding 13 times per month, with 11.7% utilizing it 5-6 times monthly. The average frequency of e-payment usage among Brazilians was 9.92 times per month (see Table 3).

Monetary outlays through e-payment exhibited variability, with over 88.3% respondents spending less than 12,000 BR (approximately 1,600 USD) monthly. The highest number or median level of monetary transactions fell within the range of 2,501-5,000 BR (500-1,000 USD). This observation suggests that e-payment is predominantly linked with lower-tier expenditures, while alternative payment methods may be preferred for more substantial purchases. Regarding monthly expenses, the survey disclosed that only a small fraction of respondents (2.8%) refrained from employing e-payment systems for money transfers or transactions. On average, Brazilian respondents reported monthly expenditures of 4330.33 BR (approximately 900 USD) via e-payment methods.

Furthermore, the mean percentage of e-payment usage among the respondents was found to be 58.16% per month, with a standard deviation of 26.52%. This implies that 60% of respondents' monthly expenditures were used via e-payment.

In Table 4, the findings of bivariate analysis are displayed. Items 1-5 relate to demographics, followed by the independent variables from 6-11, as well as Usage, which is the mean of the three dependent variables of usage as item 12. Dependent variables are listed in items 13-15. Gender and usage frequently correlate negatively, meaning males are more likely to use e-payment methods than women. Age and education are found to be positive. Another significant correlation is between work and gender.

Regarding the relationship between independent and dependent variables, major correlations can be shown. The variables of perceived usefulness, perceived ease of use, perceived risk, and perceived trust had statistical significance among six tested constructs and usage metrics (see Table 4). In our sample, incentives and social influence were found to be statistically significant. Usage had a significant correlation with perceived usefulness (0.456**) and with perceived ease of use (0.362**). The relation of perceived risk (0.278**) and perceived trust (0.264**) with the construct of usage was also significant. Frequency of usage had a significant correlation with perceived usefulness (0.342**), perceived ease of use (0.295**), perceived risk (0.298**), and perceived trust (0.269**). Money spent was only correlated to perceived usefulness, ease of use, and perceived trust, but not with perceived risk, as indicated by a correlation coefficient of 0.142. Amongst the independent variables, perceived usefulness is significantly correlated with all the dependent variables.

TABLE 3
DESCRIPTIVE STATISTICS FOR DEPENDENT VARIABLES

Variables	Frequencies	Percentage	Mean	S.D.
Freq of Use			9.92	4.36
0	3	1.7		
1-2	8	4.4		
3-4	16	8.9		
5-6	21	11.7		
7-8	18	10		
9-10	19	10.6		
11-12	16	8.9		
13 or more	78	43.3		
Missing	1	0.6		
Total	180	100		
Money Spent			4330.33	3670.47
0	5	2.8		
1-200	5	2.8		
201-400	6	3.3		
401-800	5	2.8		
801-1200	22	12.2		
1201-2500	30	16.7		
2501-5000	50	27.8		
5001-8000	25	13.9		
8001-12000	11	6.1		
12000 and over	19	10.6		
Missing	2	1.1		
Total	180	100		
Percent of Use			58.16	26.52
0	5	2.8		
1-10	10	5.6		
11-20	7	3.9		
21-30	15	8.3		
31-40	10	5.6		
41-50	10	5.6		
51-60	11	6.1		
61-70	26	14.4		
71-80	44	24.4		
81-90	41	22.8		
Missing	1	0.6		
Total	180	100		

TABLE 4
PEARSON CORRELATION

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender	0.41	0.49	1.000													
2. Age	44.92	13.62	0.014	1.000												
3. Work	0.75	0.40	.254**	-.266**	1.000											
4. Education	15.87	2.47	-0.056	.264**	.206**	1.000										
5. Income	9088.57	5810.16	.235**	.358**	0.089	.403**	1.000									
6. INC	4.15	0.88	-0.135	-0.070	-0.005	-0.026	-0.071	1.000								
7. PU	6.37	0.88	-0.055	-0.048	-0.018	0.100	0.008	.453**	1.000							
8. EU	6.24	1.05	0.040	0.090	-0.101	0.084	0.070	.332**	.701**	1.000						
9. SI	3.96	1.52	-0.030	-0.064	-0.063	-0.008	-0.024	.247**	.297**	.196*	1.000					
10. PR	4.70	1.63	0.153	-0.060	0.120	-0.019	0.070	0.105	.351**	.473**	0.071	1.000				
11. PT	5.11	1.39	0.125	-0.048	-0.016	0.030	0.097	.195*	.399**	.472**	.199*	.702**	1.000			
12. Usage	6.67	1.96	-0.045	0.049	0.070	.262**	.345**	0.097	.456**	.362**	0.081	.278**	.264**	1.000		
13. Frequency	9.92	4.36	0.014	-0.042	0.129	0.127	.220**	0.074	.342**	.295**	0.072	.298**	.269**	.858**	1.000	
14. MoneySpent	4330.34	3670.48	0.098	0.145	0.134	.300**	.560**	0.005	.245**	.208**	0.006	0.142	.187*	.731**	.527**	1.000
15. Percentage	58.16	26.51	-0.147	-0.038	-0.010	.211**	.188*	0.121	.448**	.333**	0.066	.241**	.189*	.873**	.630**	.485**
**. Correlation is significant at the 0.01 level (2-tailed).																
*. Correlation is significant at the 0.05 level (2-tailed).																

Since there are some correlations among independent variables, a stepwise regression analysis was conducted to select the best predicting variables; the outcomes of stepwise regression are shown in Table 5. At the 0.01 level, statistical significance was found for all models. The model presents a high R Square value for the money spent on e-payments (40.8%). Composite usage is at 31.3%, the frequency of use is at 20.9%, and the percentage of paid expenses is also at 20.9%. Among the four models, we found money spent on e-payments to be the strongest model for predicting monthly usage (40.8%) and a weaker model for both frequency and percentage of use (20.9%).

In the context of parametric tests, two demographic variables, namely income and age, were observed. The findings revealed that income held a notably more significant influence, and it demonstrated statistical significance in predicting overall usage (t = 4.451), the frequency of use (t = 2.297), and the monetary expenditures (t = 8.64**) in e-payment transactions. However, income did not exhibit any discernible impact on the percentage of monthly expenditure via e-payment.

Regarding the amount of money spent, it was observed that this variable could be predicted by two demographic factors: income (t = 8.64) and age (t = -2.018). This association is logically attributed to the link between the amount spent via e-payment and individuals' disposable income. Although other demographic variables exhibited statistical significance in bivariate analysis, their significance diminished in stepwise regressions due to their correlation with other independent variables. Consequently, only income and age retained their statistical significance in predicting various aspects of e-payment usage. Specifically, income was found to affect overall usage, frequency of use, and monetary expenditures, while age was also determined to be statistically significant in predicting the money spent. However, no other demographic variables were identified as predictors for the percentage of monthly expenditure via e-payment.

In relation to the other six constructs, perceived usefulness emerges as a factor of relatively higher importance. It is noteworthy that perceived usefulness exhibits a positive association with various dimensions, as it significantly explains total usage (t = 6.472), frequency of usage (t = 3.772), the monetary expenditures through e-payment (t = 3.832), and percentage of monthly expenditures (t = 5.966). This suggests that, for the Brazilian population, perceived usefulness plays a pivotal role in elucidating all four regression models.

Additionally, for the frequency of e-payment usage, it was identified that perceived risk exerts an influence (t = 2.134). As previously highlighted, in the Brazilian context, the demographic variable of income, together with perceived usefulness and perceived risk, collectively contribute to the prediction of the frequency of e-payment usage.

To simplify the predicting variables, it is recommended that income and perceived usefulness are relatively more important factors explaining e-payment adoption in Brazil. Age and perceived risk were also identified in one of the four regression models as relatively significant predictors.

TABLE 5
STEPWISE REGRESSION ANALYSIS

	Usage		Freq of Use		Money Spent		Percent of Use	
	U.C. B	t	U.C. B	T	U.C. B	t	U.C. B	t
Constant	-0.624	-0.611	-3.215	-1.310	-3856.620	-1.962*	-27.983	-1.913
Income	0.000	4.451**	0.000	2.297*	0.389	8.64**		
Age					-40.956	-2.018		
PU	1.011	6.472**	1.535	3.772**	1045.399	3.832**	13.688	5.966**
PR			0.484	2.134*				
R Square	0.313		0.209		0.408		0.209	
F	30.486		11.720		30.540		35.596	

Legend: U.C. B = Unstandardized Coefficients B
Level of Significance at 0.05 = * and 0.01 = **

TABLE 6
RESULTS OF HYPOTHESIS TESTING

Attitudes:	(a) Usage	(b) Frequency	(c) Money Spent	(d) Percentage
H1 Incentives	Do not accept	Do not accept	Do not accept	Do not accept
H2 Perceived Usefulness	Accept**	Accept**	Accept**	Accept**
H3 Ease of Use	Accept**	Accept**	Accept**	Accept**
H4 Perceived Risk	Accept**	Accept**	Do not accept	Accept**
H5 Perceived Trust	Accept**	Accept**	Accept*	Accept*
H6 Social Influence	Do not accept	Do not accept	Do not accept	Do not accept

Level of significance at 0.05 = * and 0.01 = **

CONCLUSIONS

In the Brazilian national context, demographic factors exhibited a limited impact on e-payment usage. Variables such as working status, education, and gender exhibited skewed distributions, which constrained the variability of these factors. As a result, some statistical significance identified in previous studies were not validated. However, through a bivariate Pearson correlation analysis, it was evident that income displayed statistical significance. This suggests that individuals who are older tend to have higher incomes and, consequently, are more inclined to make expenditures and utilize e-payment systems.

A stepwise regression analysis was conducted to account for the interrelated nature of independent variables. Among the demographic factors, age and income emerged were the most influential in predicting e-payment behavior within at least one predictive model. This was inconsistent with the previous study

(Chen et al., 2021), as no significance was found between gender and its effect on e-payment usage. Furthermore, all six theoretical constructs exhibited correlations with e-payment usage in various ways. According to the stepwise regression models, the most robust predictors of adoption included perceived usefulness and perceived risk. This is consistent with a study that investigated the adoption of mobile payment services in Brazil and analyzed the influence of technology readiness on acceptance. The study examines the relationship between constructs such as perceived usefulness, perceived ease of use, trust, and perceived quality. The results show that trust, usefulness, and perceived quality directly influence mobile payment acceptance (Tharcisio et al. et al., 2021). In contrast, social influence emanating from family, friends, peers, supervisors, experts, government entities, the news media, and social media was not identified as crucial for e-payment adoption among Brazilians. Moreover, the effects of incentives also appeared to be less significant in this context.

This is a preliminary study that explored the demographic variables, different perception variables, and e-payment behaviors among Brazilians. We used international students, faculty in Brazil, and their families and friends. The convenient sample seems to collect responses from people of higher socioeconomic status in Brazil. Future studies with large sample sizes are recommended.

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