



International Symposium “Navigating the Future of Traffic Management” June 29 - July 3 2025, Athens, Greece

Preferences of Public Transport Passengers Towards Contactless Bank Card Payments

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Introduction

The use of **contactless payments** has emerged as one of the most modern and convenient transaction methods for services and goods worldwide. **Public transportation systems** should adapt to societal advancements and operate with passenger needs in mind.

Integrating contactless payments using smart cards into public transport is essential for making these systems a more **attractive and practical alternative for daily commuting**.

A brief literature review highlights the **advantages and challenges of contactless payment systems** and provides insights into passenger reactions. Results show that these systems have gained **widespread adoption in major cities**, such as London with the Oyster Card and Paris with the Navigo Card, demonstrating their potential to improve efficiency and user experience in urban mobility.

Objectives

1. Evaluate Greek **public transport passengers'** preferences regarding **contactless payments** via bank card.
2. Identify the **factors influencing their acceptance** of this payment method.
3. Examine the main reasons that lead passengers to either **prefer or avoid using contactless payment** systems, as well as the role of **demographic characteristics**.

Methodological Approach

To conduct the research, **an acceptance and preference survey** was conducted among public transport passengers. Explicitly, a specially designed questionnaire was developed to address the study's specific objectives. The **online survey** included **452 participants**: 340 from **Athens** and 112 from **Thessaloniki**.

Questionnaire Structure:

- Demographic information
- Frequency and reasons for using public transport
- Current ticket purchasing methods & potential challenges
- Attitude toward technological developments
- Available new payment methods

Sample Statistics

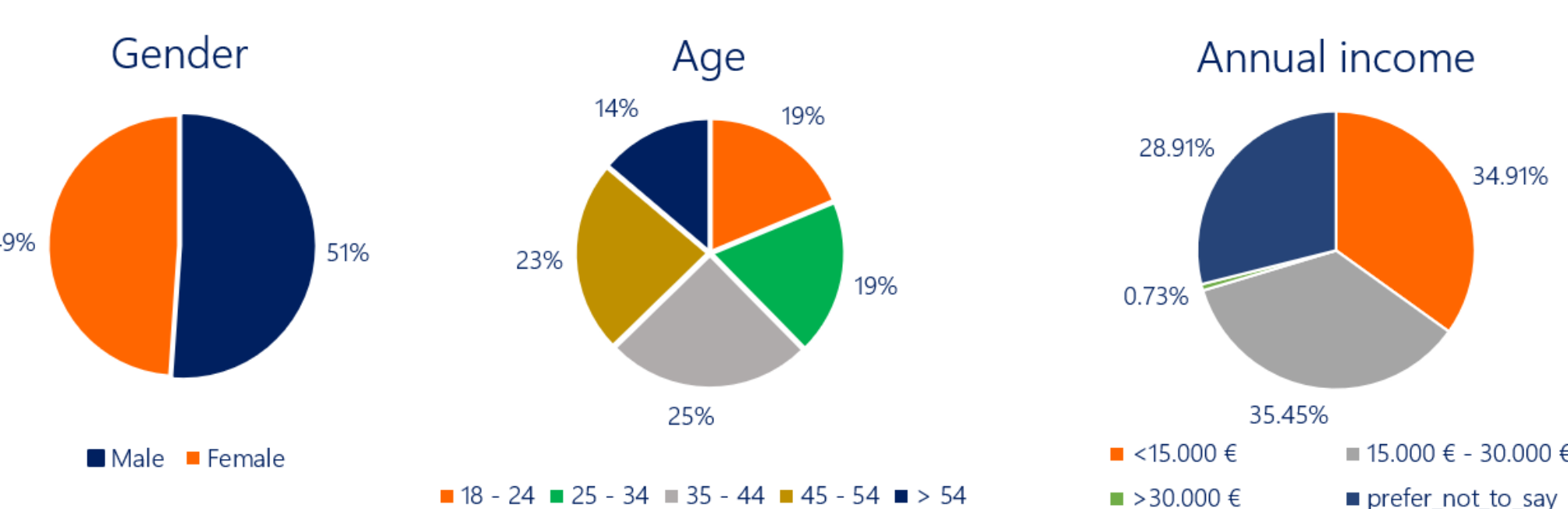


Figure 1: Sample statistics of the stated preference survey.

Descriptive Statistics

- **8 out of 10 transport passengers** express willingness to adopt contactless payments on public transport once available
- **7 out of 10** state they would **use public transport more often** if such a service were offered
- **Benefits of the solution:**
 - 29% Time saving
 - 23% Convenience
 - 21% Cashless ticket purchase

- 35% of transport passengers **express concerns** regarding **payment security**, while 26% are worried about **data protection**

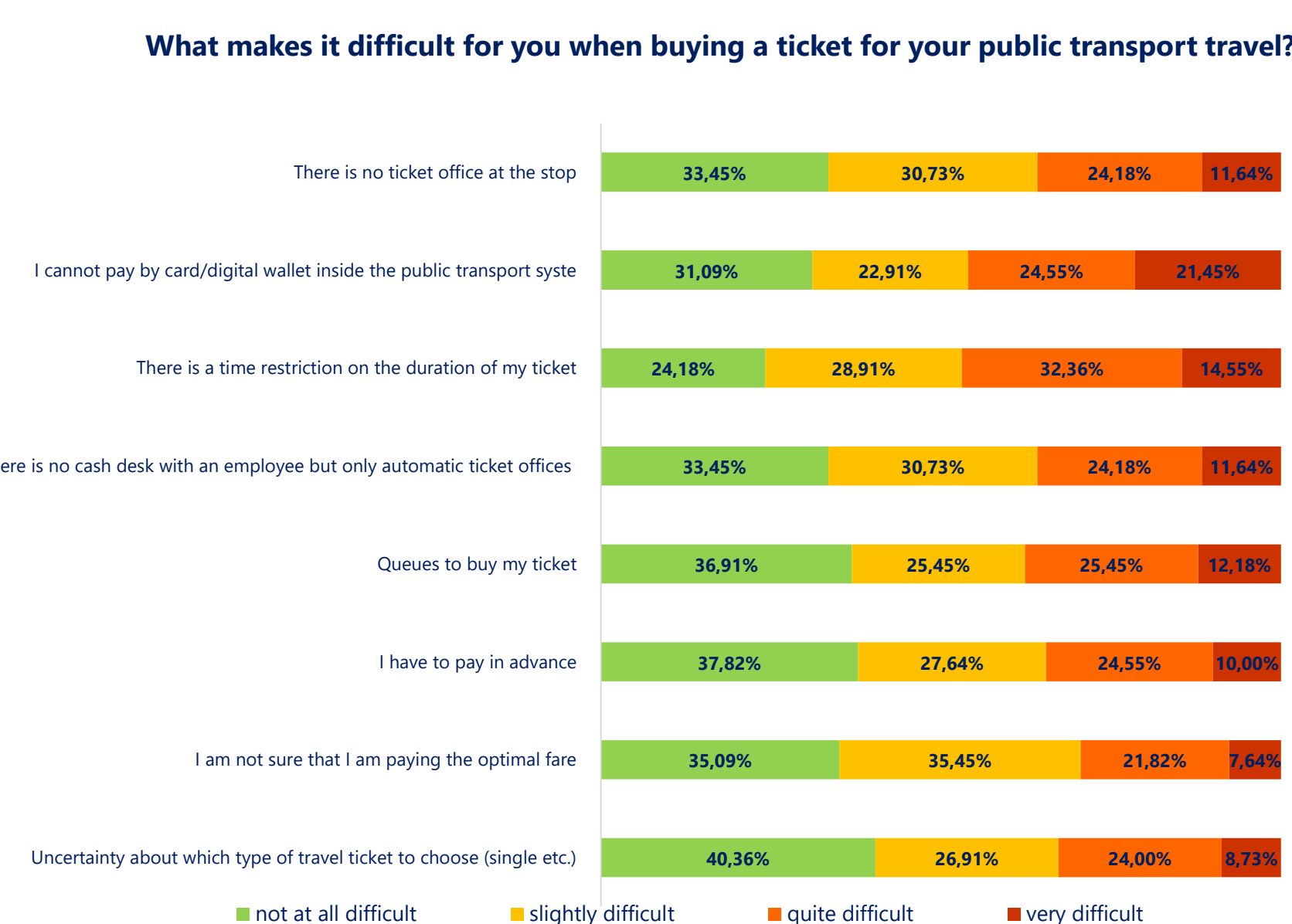


Figure 2: Question about the current ticket purchasing method.

Statistical Analysis

Logistic regression analysis is used to create models for predicting the influence of the presence or absence of certain characteristics in the selection of a particular alternative. In that context, logistic regression models were selected for the analysis. A **binary model** was used to estimate the likelihood of adopting the new payment system, while a **multinomial model** assessed the likelihood of individuals increasing, decreasing, or not altering their use of public transportation.

- **Utility function:** $U_{in} = a_0 + a_1x_1 + a_2x_2 + \dots + a_nx_n + \epsilon_{in}$
- **Probability** of choosing each alternative: $P_i = \frac{e^{U_i}}{1 + e^{U_j}}$

Binary Logistic Model

The binary logistic regression model in Table 1 illustrates how different variables influence the **acceptance of using a contactless bank card** within the public transport system.

Table 1: Binary logistic regression model results.

Variables	Coefficients	P-Value	Odds Ratio
Intercept	-0.707	0.065	-
Age [45-54]	1.003	0.033	2.73
Marital Status [married/cohabiting with a partner]	0.522	0.048	1.69
Difficulty in purchasing tickets due to lack of bank cards	-0.581	0.033	0.56
Interest in information about bank card payment systems	1.496	<0.01	4.46
Need for information from the bank about new payment methods	-0.801	<0.01	0.45
Ability to purchase tickets without cash	0.824	<0.01	2.28
Positive attitude towards technological innovations	1.333	<0.01	3.79

Multinomial Logistic Model

Table 2 presents the findings of the statistical analysis on the question regarding **whether the use of public transport would change if boarding with a contactless payment card**. The available responses were: "I would use PT more", "I would use PT less" and "I would not change my use".

Table 2: Multinomial logistic regression model results.

Variables	Coefficients	P-Value	Odds Ratio	Coefficients	P-Value	Odds Ratio
	"I would use PT more" option			"I would use PT less" option		
Intercept 1	-0.381	0.308	-			
Intercept 2	-	-	-	-0.561	0.362	-
Marital Status [married/cohabiting with a partner]	0.488	0.037	1.63	-0.939	0.026	0.391
Difficulty in purchasing tickets due to payment barriers	0.471	0.045	1.6	-	-	-
Interest in information about bank card payment systems	1.568	<0.01	-	-	-	-
Speed/convenience in ticket purchases	-	-	-	-1.291	<0.01	0.275
Cashless ticket purchase preference	-	-	-	-0.852	0.049	0.427
Negative attitude toward technological innovations	-0.873	<0.01	0.42	-	-	-

Conclusions

- **Information boosts adoption:** Users informed about the new system are more likely to adopt it, as information builds trust and helps them recognize its benefits.
- **Attitude toward technology matters:** Tech-friendly users are more open to adopting contactless payment, while tech-resistant individuals prefer the current system.
- **Middle-aged advantage:** People aged 45–54 are 2.73 times more likely to use bank cards for public transport, likely due to financial independence and card familiarity.
- **Marital status influence:** Married individuals or those living with a partner show higher acceptance, supported by mutual trust and influence within couples.
- **Bank trust is key:** Users seeking payment info from their bank are more cautious and less likely to adopt the system, due to security concerns.
- **Cashless preference drives adoption:** Those preferring cashless ticketing favor card payments, appreciating the practicality and independence from physical sales points.
- **Familiarity as resistance:** Some users resist change due to satisfaction with the current system, while others value the flexibility and reduced need for advance planning offered by contactless options.

Acknowledgments

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No. 101139678.



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