

The impact of foreign ownership on user satisfaction: Evidence from bus service market in Morocco

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Abstract:

This study examines whether the origin of ownership—foreign versus domestic—affects user satisfaction in Morocco's delegated urban bus transport sector. While the public versus private ownership debate is extensive, the performance difference between foreign-owned and domestic-owned private operators remains an under-researched area in public service literature. Drawing on Multinational Enterprise (MNE) theory and Industrial Organization (IO) theory, the study argues that foreign-owned firms may possess firm-specific advantages that lead to superior service outcomes. Using survey data from 11,646 bus users across 14 Moroccan cities and employing a multilevel mixed-effects ordered logistic regression, the paper analyzes satisfaction across 13 service dimensions. The results provide robust evidence that foreign ownership is strongly and positively associated with higher user satisfaction across all measured dimensions, including comfort and convenience, bus cleanliness and maintenance, and overall service. The findings show that shifting from a domestic to a foreign operator decreases the probability of a user being "Very Dissatisfied and Dissatisfied" with the overall service by 43.7 percentage points while increasing the probability of being "Satisfied and very satisfied" by 40.7 percentage points. These findings support the hypothesis that foreign-owned operators benefit from transferable capabilities and strategic advantages, offering important insights for policymakers seeking to improve public service delivery through international partnerships.

Keywords: User satisfaction, Urban bus transport, foreign ownership, Multilevel modeling, public service quality.

Classification JEL: G32; D12

Paper type: Empirical Research

1. Introduction

Urban public transport is essential for ensuring mobility, social inclusion, and sustainable urban development, especially in fast-growing cities. In response to the inefficiencies often associated with publicly operated services, many governments have, over the past three decades, turned to private-sector participation by contracting out bus services (Sheng & Meng, 2020). While this shift has revived the longstanding debate on the relative efficiency of public versus private ownership (Borger et al., 2002; Perry et al., 1988; Zehmed & Jawab, 2017), a more refined question remains insufficiently explored: within the sphere of private provision, does the origin of ownership—foreign versus domestic—affect service quality and user satisfaction?

This question is particularly relevant in Morocco, where urban bus services are primarily provided by private firms through delegated management contracts. This model, principally guided by Law n° 54.05, was adopted as an alternative to the previous failures of direct public operation (Zehmed, 2021). It is characterized by competition *for* the market, wherein a single private operator is granted exclusive monopoly rights within a defined territory for a period of 10 to 15 years. This market structure has led to high concentration, with the two dominant players being ALSA Maroc, a subsidiary of the multinational enterprise, and the Moroccan-owned City Bus Transport. Together, they account for an estimated 80–90% of sector revenue (Conseil de la concurrence, 2022). This market composition, featuring dominant foreign firms alongside a range of domestic competitors, provides a compelling setting to examine the influence of ownership origin on service delivery and user satisfaction.

The theoretical foundation for expecting performance differences between foreign and domestic firms is well-established. Multinational Enterprise (MNE) Theory emphasizes that foreign firms often possess firm-specific advantages (FSAs)—such as superior technology, advanced management competencies, and brand equity—that allow them to overcome the "liability of foreignness" and outperform local rivals (Caves, 1974, 1996; Dunning, 1988; Hymer, 1960, 1976). Industrial Organization (IO) Theory complements this by focusing on how these firms leverage their advantages through strategic behavior, such as creating barriers to entry and exploiting economies of scale, often within oligopolistic market structures (Acocella, 1992; Caves, 1996; Lyons, 1987).

A substantial body of empirical evidence supports these theories, documenting the performance superiority of foreign-owned firms across various indicators. Studies have consistently shown that foreign firms exhibit higher productivity (Gelübcke, 2013; Xu et al., 2022), greater profitability (Jusoh, 2015; Webster et al., 2022), higher export intensity (Boddin et al., 2017), and more investment in R&D and innovation (Phan, 2024). This performance edge extends to human capital, with foreign firms tending to pay higher wages and provide more training (Gelübcke, 2013; Webster et al., 2022). Crucially, a growing body of literature suggests this superiority also applies to service-oriented outcomes. Studies in the banking sector of emerging markets, for instance, have found that customers of foreign banks report higher satisfaction and perceive a higher level of service quality (Moghavvemi et al., 2018; Sichinsambwe et al., 2017). Understanding user satisfaction is critical in transport services, where perceived quality directly influences mode choice, system legitimacy, and long-term ridership. According to Expectancy Disconfirmation Theory (Oliver, 1980, 1993), satisfaction arises from the comparison between users' expectations and their actual experience of the service. It encompasses both specific service attributes (e.g., reliability, comfort, frequency) and an overall evaluative judgment (Abenzoza et al., 2017). While previous studies have examined how ownership (public vs private) affects user satisfaction in public transport services (Zhang et al., 2016)—there is a notable absence of research directly comparing foreign-owned (FO) private firms to domestically-owned (DO) private firms under controlled institutional conditions.

This paper contributes to filling the research gap by analyzing user satisfaction data from Moroccan cities where FO and DO bus operators operate under an identical delegated management framework. Grounded in the theoretical insights of MNE theory and IO theory, we hypothesize that FO firms—owing to their firm-specific advantages and strategic capabilities—are more likely to deliver higher quality services and, in turn, generate greater user satisfaction than their domestic counterparts. To test this hypothesis, we draw on a large-scale dataset of 11,646 user responses across 14 cities and employ a multilevel modeling approach that accounts for both individual-level heterogeneity and operator- or city-level contextual factors, ensuring a rigorous assessment of ownership effects.

The remainder of the paper is organized as follows. Section 2 provides an overview of urban bus sector in Morocco. Section 3 presents the relevant theoretical and empirical literature. Section 4 describes the data, variables, and econometric strategy. Section 5 reports the main empirical results. Section 6 concludes with key findings, policy implications, and suggestions for future research.

2. An overview of urban bus sector in Morocco

In Morocco, Organic Law No. 113-14 empower cities and their inter-municipal cooperation entities to manage public transport services. The law also provides a legal framework for various institutional arrangements, such as direct public provision, delegated management, local development companies, and public-private partnerships. At the national level, the Ministry of Interior serves as the key supervisory authority. It oversees the urban mobility sector, supports local governments, and coordinates state-level strategies, including the design, implementation, and monitoring of national policies to promote and enhance public transport systems.

Actually, urban bus services are primarily provided by private firms through delegated management contracts. This model, principally guided by Law n° 54.05, has been adopted as an alternative to the previous failures of direct public operation and per-line concessions models (Zehmed, 2021). This arrangement is characterized by competition for the market which occurs during a public tendering process, after which a single private operator is granted exclusive monopoly rights to provide service within a defined geographic territory for a limited duration, typically 10 to 15 years. Under this arrangement, operational and financial risks are transferred to the private operator, which is expected to fund major capital investments.

By 2022, the market was highly concentrated, with 10 private groups operating 33 urban and peri-urban networks across more than 300 municipalities and urban centers, serving over 18 million people. Six firms—ALSA Maroc, City Bus Transport, Lux Transport, Karama Bus, Foughal Bus, and Vectalia Maroc—operate in multiple cities, while four others are limited to a single city. The two dominant players are ALSA Maroc, a subsidiary of the multinational enterprise, and the Moroccan-owned City Bus Transport. Together, they account for an estimated 80–90% of sector revenue, with ALSA alone controlling over half the national bus fleet (Conseil de la concurrence, 2022). Between 2018 and 2020, only the two foreign operators—ALSA and Vectalia—expanded their market shares, increasing by 22.5 and 1.5 percentage points respectively, following new contracts in major cities. In contrast, all domestic operators experienced losses, with City Bus declining by 15.8 points, Lux Transport by 4.1, Karama Bus by 2.2, Foughal Bus by 1.5, and Lima Bus by 0.4.

This market composition, featuring both foreign and a range of domestic competitors, provides a compelling setting to examine the influence of firm ownership origin on service delivery and user satisfaction.

3. Literature review

This section provides a comprehensive overview of the theoretical underpinnings and empirical evidence concerning the impact of foreign ownership on firm performance, culminating in the identification of a research gap and the formulation of a hypothesis.

3.1 Theoretical background

Performance gaps between FO and DO firms are explained mainly by two complementary theoretical lenses: MNE Theory and IO Theory (Bellak, 2004; Cardoso, 2011)

MNE Theory emphasizes the role of FSAs in driving the superior performance of multinational enterprises (Caves, 1974, 1996; Dunning, 1988). These FSAs are often intangible assets and capabilities, such as superior technology, marketing capabilities, R&D intensity, brand equity, privileged access to information, raw materials, or distribution channels, and advanced management competencies (Adarkwah & Malonæs, 2022; Rugman et al., 2011). The foundational OLI paradigm (Ownership, Location, Internalization) asserts that such ownership-specific advantages are a prerequisite for firms to internationalize (Dunning, 1988), enabling MNEs to overcome the liability of foreignness (Hymer, 1960, 1976) compete effectively in foreign markets. Moreover, these advantages may be enhanced through the process of internationalization itself, as global operations allow MNEs to exploit economies of scale, access diverse resources, and reallocate activities across jurisdictions for strategic benefit (Buckley & Casson, 1976, 1976).

IO Theory complements MNE Theory by focusing on strategic and structural dimensions of how foreign firms exploit their advantages. It contends that FSAs do not pre-exist in a vacuum but often emerge through oligopolistic rivalry and strategic interaction (Acocella, 1992; Caves, 1996). Following Hymer, (1960, 1976), IO theory posits that MNEs use their home-country endowments—such as financial capital, firm size, and prior multinational experience—as weapons in market contests. These firms may engage in excess capacity creation, acquisition of rivals, and barrier-building through proprietary assets or even collusion to maintain market power and reduce competition (Harris, 2002; Lyons, 1987). Moreover, FO firms benefit from economies of scale and scope due to their larger size and geographical dispersion compared to DO firms (Dunning, 1993; Shepherd, 1986; Spence, 1984), while having advantages in overcoming entry barriers related to capital requirements, advertising, and R&D investments (Caves, 1996).

Together, MNE theory and IO theory offer a comprehensive framework for explaining why foreign-owned firms often enjoy a performance edge over their domestic counterparts. While MNE theory emphasizes internally transferable FSAs and the conditions that enable their cross-border deployment, IO theory focuses on the market structures and strategic behaviors that sustain and amplify these advantages in host countries.

3.2 Empirical evidence, research gap, and hypothesis

A substantial body of empirical evidence documents the performance superiority of FO firms across a range of indicators. In terms of productivity, FO firms consistently demonstrate higher levels of efficiency. A large global sample from 2006-2017 revealed a statistically significant positive relationship between foreign ownership and firm productivity (Xu et al., 2022), while studies in Germany found that foreign-controlled affiliates achieved superior annual labor productivity (Gelübcke, 2013; Weche Gelübcke, 2013). Regarding financial performance, Webster et al., (2022) found that firms with any foreign ownership were approximately 142% more profitable than other firms in Sub-Saharan African countries, while Jusoh, (2015) showed a positive relationship between foreign ownership and profitability measures in Malaysia.

FO firms also demonstrate superiority in export intensity and innovation. Boddin et al., (2017) found that the propensity of FO firms to export was 17.6% higher compared to DO firms in developing countries. In R&D and innovation, foreign-owned firms exhibit a higher likelihood of making R&D expenditures, with odds 56.6% higher than for local firms (Phan, 2024). FO firms also tend to pay above-average wages and are more inclined to employ workers with higher education or provide training (Gelübcke, 2013; Webster et al., 2022). Additionally, foreign ownership contributes positively to growth measures, with increasing foreign ownership associated with sales, employment, and labor productivity growth (Pasali & Chaudhary, 2020).

Crucially, customer satisfaction and service quality also appear to be positively influenced by foreign ownership. Studies in the banking sector of emerging markets have found that customers of foreign banks report higher satisfaction and perceive a higher level of service quality (Moghavvemi et al., 2018; Sichinsambwe et al., 2017). Other research suggests that consumers may perceive foreign firms as having higher competence, which leads to increased customer satisfaction (Poddar et al., 2015).

Despite this well-documented evidence in manufacturing and private services, these theories remain underexplored in public service sectors like urban transport. This study aims to contribute to closing this research gap by examining delegated urban bus services in Morocco, a context where FO firms (e.g., ALSA Maroc and Vectalia Maroc) and DO firms operate under uniform regulatory conditions. This setting provides a quasi-experimental framework to isolate the effect of ownership on service performance.

Drawing upon the theoretical foundations of the MNE theory and IO theory, we hypothesized that foreign-owned firms, by virtue of their firm-specific advantages and strategic behaviors, may deliver higher quality services and, consequently, elicit greater user satisfaction than their domestic counterparts. Accordingly, the central hypothesis of this study is:

H1: *Passengers served by foreign-owned companies in Morocco report higher satisfaction with bus services than those served by domestic-owned firms.*

4. Methodology

4.1 Data and variables

This study draws on data from a web-based survey conducted between April and May 2019, which aimed to evaluate user satisfaction and service quality in Morocco's public bus transport sector. This convenience web-survey targeted individuals who had used bus services at least once in the previous year. After data cleaning, 14 628 valid responses were retained, covering 29 cities served by 11 different firms at the time of the survey. To ensure consistency and data reliability, responses from operators no longer active in the market (e.g., those in Casablanca and Rabat-Salé) and from cities with fewer than 200 respondents were excluded. This filtering resulted in a working sample of 11,646 responses from 14 cities and 6 firms (table 1). Each respondent provided socio-demographic data, trip-related information, and satisfaction ratings for different service attributes and overall service. We examine 13 dependent variables in total: 12 service quality attributes and one overall satisfaction score, all measured on a 5-point Likert scale (1 = very dissatisfied, 5 = very satisfied).

To assess whether the ownership type of bus service providers influences user satisfaction, it is essential to account for both individual user characteristics and the broader operating environment of the companies. In addition to user-level variables, this study includes city-level control variables such as population size and population density, which may independently affect satisfaction levels. Table 2 provides an overview of all variables used in the analysis, along with their definitions and coding schemes.

Table 1: Distribution of respondents across city-operator

Cities	Bus firms	Firm ownership	Number of survey's participants
Agadir	Alsa Maroc	Foreign	1499
Tanger			1618
Marrakech			1131
Khouribga			440
Safi	Victalia Maroc		733
Total foreign subsample			5421
Meknes	City bus transport	Domestic	917
Kenitra			793
Oujda			748
Tétouan			785
Fez			976
El Jadida			393
Taza	Foughal bus		401
Settat	Lux transport		482
Beni Mellal	Karama bus		730
Total domestic subsample			6225
Total Sample			11 646

Source: author's conception

Table 2: Variables used in the analysis

Level	Variable	Definition	Measurement/ coding
1	Satisfaction with SCF	Service coverage and frequency	1 (Very dissatisfied) to 5 (Very satisfied)
1	Satisfaction with SIP	Service information provision	1 to 5
1	Satisfaction with PCC	Passenger comfort and convenience	1 to 5
1	Satisfaction with SP	Service punctuality	1 to 5
1	Satisfaction with SS	Safety and security	1 to 5
1	Satisfaction with FP	Fare pricing	1 to 5
1	Satisfaction with PA	Passenger accessibility	1 to 5
1	Satisfaction with VCM	Vehicle cleanliness and maintenance	1 to 5
1	Satisfaction with IC	Intermodal connectivity	1 to 5
1	Satisfaction with DP	Driver performance	1 to 5
1	Satisfaction with TCS	Ticketing and customer service	1 to 5
1	Satisfaction with FSA	Field staff attitude	1 to 5
1	Satisfaction with overall service (OS)	Overall satisfaction with bus service	1 to 5
1	Male	Gender of respondent	1 = Male; 0 = Female (ref.)
1	Young	Age under 25	1 = Yes; 0 = No (ref.: age ≥ 25)
1	Employed	Currently in the labor force	1 = Yes; 0 = No (ref.: students, unemployed, etc.)
1	Daily	Uses bus at least once a day	1 = Yes; 0 = Occasional use (ref.)
1	Route Type	Type of route used	1 = Urban; 0 = Peri-urban (ref.)
1	Reason: Work, Study, etc.	Purpose of travel	Multiple dummies coded 1 if selected, 0 otherwise
2	Foreign Ownership	Ownership of the operator	1 = Foreign-owned; 0 = Domestic (ref.)
2	Population	Population of the city in thousands	Continuous
2	Density	Inhabitants per square kilometer	Continuous

Source : author's conception

4.2 Multilevel mixed-effects ordered logistic regression model

In this study, the satisfaction outcomes—both overall and attribute-specific—are measured on a 5-point Likert scale, where higher values indicate greater satisfaction. Therefore, ordered logistic regression is the appropriate technique for such ordinal outcomes (Long & Freese, 2014). Furthermore, the structure of our data is hierarchical where individuals are nested within city–bus operator pairs, which violates the independence assumption required by standard regression models (Snijders, 2016). Multilevel modeling accounts for this by decomposing the variance in satisfaction into individual and contextual components (Borra & Chiavarini, 2005; Chica-Olmo et al., 2018). To account for both clustering and the ordinal measurement of satisfaction, this study employ a multilevel mixed-effects ordered logistic regression model.

We specify a two-level multilevel model to estimate 13 separate equations—12 corresponding to satisfaction with specific service attributes, and one for overall satisfaction. At Level 1, individual-level control variables include gender, age, employment status, frequency of bus use, purpose of travel, and route type. These covariates are commonly used in public transport satisfaction studies to capture user heterogeneity (Fiorio et al., 2013; Mouwen, 2015; Zhang et al., 2016). At Level 2, the primary explanatory variable of interest—**foreign ownership**—is a binary variable coded as 1 for foreign-owned operators and 0 for domestic-owned operators. We also include two contextual control variables at this level: city population and population density, which capture differences in city size and urban form that may influence satisfaction independently of operator performance (Abenzoza et al., 2017; Diana, 2012)

Let Y_{ij}^* be a latent continuous variable representing the unobserved satisfaction of user i in city-operator pair j . The observed ordinal variable Y_{ij} is linked to the latent variable through a series of cut-points τ_k such that:

$$Y_{ij} = \begin{cases} 1 & \text{if } Y_{ij}^* \leq \tau_1 \\ 2 & \text{if } \tau_1 \leq Y_{ij}^* \leq \tau_2 \\ \vdots & \\ \vdots & \\ K & \text{if } \tau_{K-1} < Y_{ij}^* \end{cases}$$

The latent response model is:

$$Y_{ij}^* = X_{ij}\beta + Z_j\gamma + u_j + \epsilon_{ij}$$

Where:

- X_{ij} are individual-level covariates (Level 1),
- Z_j are city/operator-level covariates (Level 2),
- $u_j \sim N(0, \sigma_u^2)$ is the random intercept at Level 2 capturing unobserved city/operator-level variation.
- ϵ_{ij} : logistic error term

The cumulative logit for category k is :

$$\text{Logit} \left(P(Y_{ij} \leq k) \right) = \tau_k - (X_{ij}\beta + Z_j\gamma + u_j) \text{ for } k = 1, \dots, K - 1$$

To assess the extent of between-group variability, we compute the Intraclass Correlation Coefficient (ICC) using the logistic distribution variance of $\frac{\pi^2}{3} \approx 3.29$. The ICC measures the proportion of total variance attributable to Level 2 (city-operator) differences and is calculated as:

$$ICC = \frac{\sigma_u^2}{\sigma_u^2 + 3.29}$$

To interpret the effect size of foreign ownership in a more intuitive way, we compute Average Marginal Effects (AMEs). In ordered logistic models, AMEs represent the average change in the predicted probability of being in each satisfaction category when the ownership variable changes from domestic to foreign, holding all other covariates constant (Long & Freese, 2014; Williams, 2012):

$$AME = \frac{1}{N} \sum_{i=1}^N [P(Y_i = k | X_i = Ownership = 1) - P(Y_i = k | X_i = Ownership = 0)]$$

Where:

- N is the total number of respondents,
- $P(Y_i = k | X_i, Ownership)$ is the predicted probability of respondent being in satisfaction category k , conditional on covariates X_i and firm ownership status.

5. Results and discussion

This section presents and interprets the empirical findings of the study. It begins with descriptive statistics to summarize the data and provide an initial comparison of user satisfaction between foreign-owned and domestic-owned operators. It then presents the results of the multilevel mixed-effects ordered logistic regression models, analyzing the influence of firm ownership on satisfaction while controlling for a range of individual and contextual factors. Descriptive statistics and regression modeling were performed using Stata 17.0.

5.1 Descriptive statistics

Table 3 provides summary statistics for all variables used in the analysis, while table 4 presents the correlation matrix among the independent variables, confirming the absence of severe multicollinearity. A key observation from the dependent variables is the generally low level of passenger satisfaction with bus services in the surveyed cities. Across the 13-satisfaction metrics, the mean scores are predominantly low, with 11 attributes scoring below 3.0 on a 5-point Likert scale. The lowest mean satisfaction scores are for Passenger Comfort & Convenience (Mean = 1.825) and Service Punctuality (Mean = 1.856), indicating these are areas of significant user dissatisfaction. Conversely, users report relatively higher satisfaction with Driver Performance (Mean = 3.203) and Fare Pricing (FP) (Mean = 3.078). The sample is characterized by a high proportion of young (71.1%) and daily (73.3%) users, with a significant majority using the bus for study-related travel (73.4%).

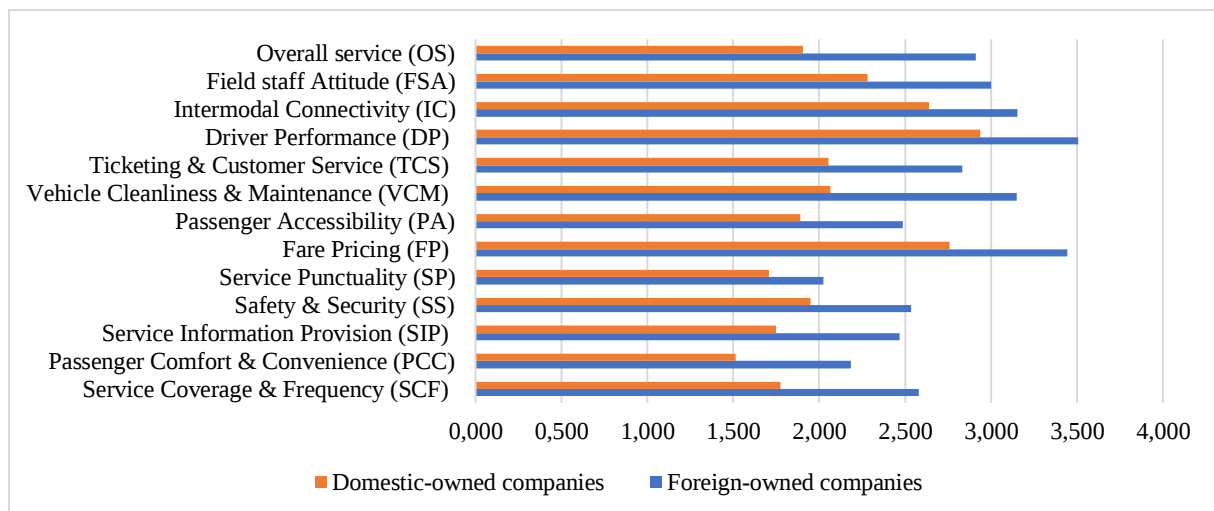
Figure 1 offers a direct visual comparison of mean satisfaction scores between users of foreign-owned and domestic-owned bus companies. The figure reveals a stark and consistent pattern: for every single service attribute, as well as for overall satisfaction, foreign-owned operators achieve substantially higher mean satisfaction scores than their domestic counterparts.

The gap in satisfaction is particularly pronounced for service quality dimensions that are directly related to capital investment and operational management. For instance, the largest differences are observed for Vehicle Cleanliness & Maintenance, Service Coverage & Frequency and Ticketing & Customer Service. This suggests that foreign operators may be outperforming domestic firms in fleet modernization, maintenance routines, and operational efficiency. The smallest, though still noticeable, gaps are seen in Service Punctuality and Intermodal Connectivity. This preliminary evidence provides strong initial support for the study's main hypothesis (H1), suggesting that the origin of the operator is systematically associated with user satisfaction levels.

Table 3 : Descriptive statistics

	<i>N</i>	<i>Mean</i>	<i>Std, dev,</i>	<i>Min</i>	<i>Max</i>
Dependent variables					
Service Coverage & Frequency (SCF)	11 646	2,148	1,239	1	5
Passenger Comfort & Convenience (PCC)	11 646	1,825	1,141	1	5
Service Information Provision (SIP)	11 646	2,083	1,211	1	5
Safety & Security (SS)	11 646	2,222	1,368	1	5
Service Punctuality (SP)	11 646	1,856	1,141	1	5
Fare Pricing (FP)	11 646	3,078	1,391	1	5
Passenger Accessibility (PA)	11 646	2,167	1,298	1	5
Vehicle Cleanliness & Maintenance (VCM)	11 646	2,570	1,428	1	5
Ticketing & Customer Service (TCS)	11 646	2,416	1,270	1	5
Driver Performance (DP)	11 646	3,203	1,297	1	5
Intermodal Connectivity (IC)	11 646	2,878	1,199	1	5
Field staff Attitude (FSA)	11 646	2,617	1,346	1	5
Overall service (OS)	11 646	2,372	1,275	1	5
Independent variables					
Individual-level					
Male	11 646	0,490	0,500	0	1
Young	11 646	0,711	0,454	0	1
Employed	11 646	0,220	0,414	0	1
Daily	11 646	0,733	0,443	0	1
Urban	11 646	0,823	0,382	0	1
Work	11 646	0,210	0,407	0	1
Study	11 646	0,734	0,442	0	1
Health	11 646	0,087	0,282	0	1
Entertainment	11 646	0,175	0,380	0	1
Shopping	11 646	0,253	0,435	0	1
Other	11 646	0,143	0,350	0	1
City-operator level					
Foreign ownership	11 646	0,465	0,499	0	1
Population	11 646	647740.1	393493	141637	1323005
Density	11 646	4050.4	2216.81	509	7067

Source : Author's calculation

Figure 1: Mean scores of satisfactions with bus service provided by domestic and foreign owned firms.


Source : Author's calculation

Table 4: Correlation Matrix of independent variables

Variables	Male	Young	Employed	Daily	Urban	Work	Study	Health	Entertainment	Shopping	Other	Foreign	Population	Density
Male	1													
	-													
Young	0.199***	1												
		-												
Employed	0.199***	0.595***	1											
		-	-											
Daily	0.0858***	0.166***	0.157***	1										
		-	-	-										
Urban	0.0773***	0.0101	0.000800	0.00505	1									
		-	-	-	-									
Work	0.140***	0.400***	0.606***	0.0630***	0.0244**	1								
		-	-	-	-	-								
Study	0.165***	0.534***	0.671***	0.330***	0.0187*	0.391***	1							
		-	-	-	-	-	-							
Health	0.0203*	0.0885***	0.0570***	0.0489***	0.0347***	0.154***	0.0350***	1						
		-	-	-	-	-	-	-						
Entertainment	0.108***	0.0567***	0.0743***	0.167***	0.00834	0.0936***	0.107***	0.353***	1					
		-	-	-	-	-	-	-	-					
Shopping	0.0338***	0.138***	0.119***	0.159***	0.000884	0.137***	0.166***	0.453***	0.433**	1				
		-	-	-	-	-	-	-	-	-				
Other	0.124***	0.194***	0.161***	0.225***	0.0127	0.00785	0.318***	0.179***	0.108**	0.126***	1			
		-	-	-	-	-	-	-	-	-	-			
Foreign	0.000197	0.0262**	0.0124	0.0397***	0.0535***	0.0234*	0.0171	0.0198*	0.124**	0.0749***	0.0222*	1		
		-	-	-	-	-	-	-	-	-	-	-		
Population	0.00766	0.0451***	0.0416***	0.0190*	0.0712***	0.00475	0.0586***	0.0227*	0.0694**	0.000478	0.0174	0.478***	1	
		-	-	-	-	-	-	-	-	-	-	-	-	
Density	0.0550***	0.0617***	0.0422***	0.0185*	0.194***	0.0372***	0.0779***	0.0366***	0.0228*	0.0518***	0.79*	0.417***	0.571***	1

* p < 0.05, ** p < 0.01, *** p < 0.001

Source: Author's calculation

5.2 The effect of firm ownership on satisfaction with bus service

To examine the impact of firm ownership on user satisfaction, we estimated 13 multilevel mixed-effects ordered logistic regression models—one for each service attribute and overall satisfaction. Although not reported in table 5, likelihood ratio tests consistently favored the multilevel specification over standard ordered logistic models at the 1% significance level. The Intraclass Correlation Coefficients (ICCs) further support the use of a multilevel approach. For example, the ICC for the *Overall Satisfaction* model is 0.142, indicating that 14.2% of the variation in satisfaction is explained by differences across city-operator pairs—highlighting the importance of accounting for hierarchical data structure.

Before assessing the main hypothesis, we discuss the effects of the control variables, contextualizing them within the existing literature.

5.2.1 Discussion of control variables

According to results in table 5, gender differences in satisfaction are mixed. Male users report higher satisfaction with *Safety and Security* but lower satisfaction with *Fare Pricing* and *Field Staff Attitude*. These findings reflect context-specific perceptions and align with studies

highlighting gendered priorities in transport, where men tend to value efficiency and cost, while women are often more sensitive to comfort and safety (Pani et al., 2023; Singh & Kathuria, 2023). Age also significantly shapes satisfaction levels. Younger respondents (under 25) consistently reported higher satisfaction across multiple service dimensions such as *Passenger Comfort and Convenience* and *Service Punctuality*. This result aligns with Abenoza et al., (2017) and Haryadi, (2022), but contrasts with Ji & Gao, (2010), who reported the opposite. Employment status showed limited influence on satisfaction, with only one significant negative coefficient (for *Service Information Provision*). This suggests that occupational status may not be a strong determinant of satisfaction in the Moroccan context—contrasting with earlier findings from Borra & Chiavarini, (2005) and Zhang et al., (2016), where employment status influenced satisfaction more distinctly. In contrast, frequency of use is a strong and consistent predictor. Daily users report significantly lower satisfaction across nearly all service attributes. This challenges earlier studies suggesting a positive relationship between high frequency of use and satisfaction (e.g., (Fiorio et al., 2013; Woldeamanuel & Cyganski, 2011; Zhang et al., 2016).

Route type also showed limited influences satisfaction. Urban route users express higher satisfaction with *Fare Pricing* and *Passenger Accessibility*, but lower satisfaction with *Service Punctuality* and *Driver Performance*, likely reflecting the operational challenges posed by urban congestion. Regarding trip purpose, significant differences were observed. Users traveling for entertainment or shopping consistently report higher satisfaction across multiple service attributes, potentially due to more relaxed schedules or discretionary nature of these trips. Conversely, health-related trips are associated with lower satisfaction, especially in safety, cleanliness, and accessibility.

At the city-operator level (Level 2), the control variables for city Population and Density are statistically insignificant in nearly all models. This result aligns with studies like (Fiorio et al., (2013) and Zhang et al., (2016) but contrast with Abenoza et al., (2017), which found them to be significant. Our results suggest that once the specific operator's identity and performance (captured by the foreign ownership variable and the random intercept) are accounted for, the general urban context of city size has little additional explanatory power.

5.2.2 The impact of foreign ownership

The central finding of this study relates to the main explanatory variable, Foreign Ownership. As shown in Table 5, the coefficient for foreign ownership is positive and highly statistically significant ($p < 0.001$ in 11 of 12 models) across all service quality attributes and for overall satisfaction. This provides powerful and consistent empirical support for our primary hypothesis (H1). The results clearly indicate that passengers served by foreign-owned companies report significantly higher levels of satisfaction than those served by domestic-owned companies, even after controlling for a wide range of individual and city-level characteristics.

The direction of the relationship is consistently positive, and the magnitude of the coefficients is substantial. For example, in the model for Overall Service (OS) (Model 13), the coefficient of 2.289 indicates that being a customer of a foreign-owned firm, as opposed to a domestic one, significantly increases the log-odds of reporting a higher level of satisfaction. The largest coefficients are observed for Vehicle Cleanliness & Maintenance ($\beta = 2.720$) and Passenger Comfort & Convenience ($\beta = 2.077$), confirming that the ownership effect is strongest in areas requiring significant capital investment and rigorous management systems.

To provide a more intuitive interpretation of these effects, we examine the Average Marginal Effects (AMEs) presented in Table 5. The results are striking. For Overall Service, shifting to a foreign operator decreases the probability of a user being "Very Dissatisfied and Dissatisfied" by a remarkable 43.7 percentage points. Simultaneously, it increases the probability of being

"Satisfied and Very Satisfied" by 40.7 percentage points. This demonstrates a massive shift away from low satisfaction towards high satisfaction. This pattern holds across attributes. The effect is most pronounced for tangible, quality-of-life aspects of the service. For Vehicle Cleanliness & Maintenance, foreign ownership reduces the probability of being "Very Dissatisfied and dissatisfied" by 48.5 percentage points, while increasing the probability of being "Satisfied and Very Satisfied" by 47.3 percentage points. Similarly, for Ticketing & Customer Service, the probability of being "Very Dissatisfied and dissatisfied" plummets by 34.4 percentage points.

Our finding contributes significantly to a remarkably sparse empirical literature directly comparing service quality and customer satisfaction between foreign-owned and domestic-owned firms. While previous research on this specific dichotomy is limited, the existing studies present mixed results. For instance, Aksoy et al., (2003) found no significant statistical difference in overall satisfaction levels between domestic and foreign airlines. Conversely, our results align with Moghavvemi et al., (2018), who observed higher customer satisfaction among foreign bank customers compared to local bank customers. The consistent positive impact of foreign ownership on passenger satisfaction in our study, particularly in aspects related to capital investment and operational efficiency within the public transport sector, suggests that foreign operators may bring distinct advantages (e.g., access to capital, advanced management practices, international standards) that translate into a superior service experience.

Table 6: Average marginal effects of foreign ownership across the 13 models

Foreign ownership			Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
Service	Coverage	&					
Frequency (SCF)			-36,3%	4,3%	1,5%	25,4%	5,1%
Passenger	Comfort	&					
Convenience (PCC)			-41,4%	12,0%	2,9%	21,6%	4,9%
Service	Information						
Provision (SIP)			-31,2%	3,0%	8,2%	15,9%	4,2%
Safety & Security (SS)			-32,7%	1,4%	2,3%	18,2%	10,8%
Service Punctuality (SP)			-18,4%	5,7%	2,1%	8,8%	1,9%
Fare Pricing (FP)			-18,2%	-9,3%	-1,1%	13,0%	15,5%
Passenger Accessibility (PA)			-30,8%	1,5%	3,9%	17,9%	7,6%
Vehicle	Cleanliness	&					
Maintenance (VCM)			-42,6%	-5,9%	1,2%	24,6%	22,7%
Ticketing	&	Customer					
Service (TCS)			-30,0%	-4,4%	6,4%	20,7%	7,4%
Driver Performance (DP)			-12,4%	-11,8%	-1,8%	12,4%	13,7%
Intermodal Connectivity (IC)			-10,9%	-7,2%	-0,2%	13,5%	4,8%
Field staff Attitude (FSA)			-24,7%	-6,9%	1,1%	21,0%	9,5%
Overall service (OS)			-39,3%	-4,4%	3,1%	32,7%	8,0%

Source: Author's calculation

Table 5: Results of the multilevel mixed-effects ordered logistic regression models.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
	SCF	PCC	SIP	SS	SP	FP	PA	VCM	TCS	DP	IC	FSA	OS
Individual-level													
Gender													
Female	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Male	0.084*	0.163***	-0.028	0.227***	-0.033	-0.394***	0.022	-0.067	-0.341***	0.025	-0.041	-0.376***	-0.099**
	(0.038)	(0.040)	(0.037)	(0.037)	(0.038)	(0.036)	(0.037)	(0.037)	(0.036)	(0.036)	(0.035)	(0.036)	(0.037)
Age													
Adult	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Young	0.212***	0.172**	0.137**	0.192***	0.050	0.304***	0.249***	0.189***	0.131**	0.284***	0.195***	0.005	0.272***
	(0.051)	(0.054)	(0.050)	(0.051)	(0.052)	(0.049)	(0.051)	(0.050)	(0.049)	(0.049)	(0.048)	(0.049)	(0.051)
Occupation													
Not working	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Employed	0.083	0.085	-0.265***	0.075	0.064	0.094	-0.077	0.069	-0.032	-0.103	-0.114	-0.043	0.079
	(0.071)	(0.074)	(0.069)	(0.071)	(0.071)	(0.068)	(0.070)	(0.070)	(0.068)	(0.068)	(0.067)	(0.068)	(0.070)
Frequency of use													
Occasionally	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Daily	-0.399***	-0.242***	-0.125**	-0.103*	-0.294***	-0.274***	-0.084	-0.186***	-0.180***	-0.135**	-0.145***	-0.224***	-0.269***
	(0.045)	(0.047)	(0.044)	(0.044)	(0.045)	(0.043)	(0.044)	(0.044)	(0.043)	(0.043)	(0.042)	(0.042)	(0.044)
Type of route													
Peri-urban	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Urban	0.059	0.059	0.026	0.081	-0.125*	0.223***	0.117*	0.052	-0.084	-0.109*	-0.018	0.054	-0.005
	(0.054)	(0.058)	(0.053)	(0.054)	(0.055)	(0.052)	(0.053)	(0.053)	(0.052)	(0.052)	(0.051)	(0.052)	(0.053)
Reasons of use													
Work	0.010	0.067	0.070	-0.073	-0.063	-0.008	0.166**	-0.076	-0.092	-0.060	-0.048	-0.053	-0.056
	(0.058)	(0.060)	(0.056)	(0.058)	(0.058)	(0.055)	(0.057)	(0.057)	(0.055)	(0.056)	(0.054)	(0.055)	(0.057)
Study	-0.118	-0.051	-0.045	-0.020	-0.122*	-0.046	0.093	0.031	0.003	0.020	0.016	-0.048	-0.078
	(0.060)	(0.063)	(0.059)	(0.060)	(0.061)	(0.058)	(0.060)	(0.060)	(0.058)	(0.058)	(0.057)	(0.058)	(0.060)
Health	-0.308***	-0.296***	-0.041	-0.237**	-0.200**	-0.261***	-0.246***	-0.207**	-0.202**	-0.162*	-0.217**	-0.141*	-0.261***
	(0.074)	(0.079)	(0.073)	(0.074)	(0.076)	(0.072)	(0.073)	(0.074)	(0.071)	(0.072)	(0.070)	(0.071)	(0.074)
Entertainment	0.310***	0.376***	0.110*	0.235***	0.190***	0.208***	0.275***	0.297***	0.143**	0.171***	0.177***	0.084	0.340***
	(0.053)	(0.056)	(0.053)	(0.053)	(0.054)	(0.052)	(0.053)	(0.053)	(0.051)	(0.052)	(0.051)	(0.051)	(0.053)
Shopping	0.137**	0.112*	0.041	0.112*	0.051	0.101*	0.099*	0.103*	0.093*	0.066	0.049	0.147**	0.139**
	(0.049)	(0.052)	(0.049)	(0.049)	(0.050)	(0.048)	(0.049)	(0.049)	(0.047)	(0.048)	(0.047)	(0.048)	(0.049)
Other	0.060	0.008	-0.071	-0.103	-0.052	-0.045	0.032	-0.013	0.075	-0.037	-0.008	0.009	-0.023
	(0.055)	(0.058)	(0.055)	(0.056)	(0.056)	(0.053)	(0.055)	(0.056)	(0.053)	(0.054)	(0.052)	(0.053)	(0.055)
City-operator level													

Firm ownership														
Domestic	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref	ref
Foreign	1.844*** (0.469)	2.077*** (0.481)	1.370*** (0.235)	1.675** (0.514)	0.812* (0.354)	1.315*** (0.385)	1.503*** (0.407)	2.720*** (0.612)	1.565*** (0.338)	1.187*** (0.340)	0.809*** (0.187)	1.440*** (0.387)	2.289*** (0.476)	
Population	-0.485 (0.301)	-0.694* (0.309)	-0.189 (0.151)	-0.870** (0.330)	-0.425 (0.227)	0.158 (0.247)	-0.624* (0.261)	-0.944* (0.393)	-0.346 (0.217)	-0.142 (0.218)	-0.089 (0.120)	-0.254 (0.248)	-0.658* (0.305)	
Density (ln)	-0.112 (0.315)	0.063 (0.324)	0.044 (0.158)	-0.095 (0.346)	-0.245 (0.238)	0.325 (0.259)	0.123 (0.274)	0.182 (0.412)	0.002 (0.227)	0.075 (0.229)	-0.117 (0.125)	-0.020 (0.260)	-0.069 (0.320)	
/														
cut1	-7.000 (5.316)	-7.379 (5.458)	-1.803 (2.669)	-11.538* (5.828)	-7.437 (4.023)	3.718 (4.365)	-6.532 (4.615)	-10.616 (6.943)	-4.911 (3.839)	-2.737 (3.860)	-3.395 (2.119)	-4.293 (4.393)	-9.156 (5.393)	
cut2	-5.325 (5.315)	-5.852 (5.458)	-0.726 (2.669)	-10.453 (5.828)	-6.097 (4.023)	4.847 (4.365)	-5.392 (4.615)	-9.368 (6.942)	-3.882 (3.839)	-1.384 (3.860)	-2.291 (2.119)	-3.020 (4.393)	-7.545 (5.392)	
cut3	-5.184 (5.315)	-5.624 (5.458)	0.052 (2.669)	-10.119 (5.828)	-5.773 (4.023)	5.122 (4.365)	-4.911 (4.615)	-8.997 (6.942)	-2.925 (3.839)	-1.057 (3.860)	-1.178 (2.119)	-2.635 (4.393)	-7.181 (5.392)	
cut4	-2.475 (5.315)	-3.227 (5.457)	2.062 (2.670)	-8.160 (5.827)	-3.589 (4.023)	7.321 (4.365)	-2.926 (4.615)	-6.790 (6.942)	-0.851 (3.839)	1.315 (3.860)	1.045 (2.119)	-0.324 (4.393)	-4.346 (5.392)	
var(_cons[cit y])	0.529** (0.203)	0.557** (0.214)	0.129* (0.051)	0.636** (0.244)	0.300** (0.116)	0.355** (0.137)	0.397** (0.153)	0.906** (0.345)	0.273** (0.106)	0.276** (0.107)	0.080* (0.032)	0.359** (0.138)	0.544** (0.209)	
Level 1 N	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	11 646	
Level 2 N	14	14	14	14	14	14	14	14	14	14	14	14	14	
Log	-	-	-	-	-	-	-	-	-	-	-	-	-	
likelihood	13144.25 7	11896.61 2	15187.08 8	14587.18 0	13224.38 5	16010.92 7	14999.22 9	14774.81 3	16340.04 8	15889.07 9	17198.13 5	16070.90 5	14262.38 7	
ICC	0,138	0,145	0,038	0,162	0,084	0,097	0,108	0,216	0,077	0,077	0,024	0,098	0,142	

Standard errors in parentheses. Population and density variables are transformed into their natural logarithm to provide a uniform distribution. * p < 0.05, ** p < 0.01, *** p < 0.001

Source: Author's calculation

6. Conclusion

This study set out to examine whether the ownership origin—foreign or domestic—of private firms operating delegated urban bus services in Morocco influences user satisfaction. Drawing upon the theoretical foundations of the MNE theory and IO theory, we hypothesized that foreign-owned firms, by virtue of their firm-specific advantages and strategic behaviors, may deliver higher quality services and, consequently, elicit greater user satisfaction than their domestic counterparts.

To test this hypothesis, we used a large-scale user satisfaction dataset comprising 11,646 responses from 14 Moroccan cities, where both foreign and domestic operators coexist under a uniform regulatory framework. Employing a multilevel mixed-effects ordered logistic regression model, we analyzed satisfaction across 13 service quality attributes. The empirical results provided robust evidence that foreign ownership is significantly and positively associated with higher levels of user satisfaction in virtually all service dimensions, including overall satisfaction, punctuality, comfort, cleanliness, and vehicle condition. Notably, foreign ownership was found to decrease the likelihood of users reporting low satisfaction while increasing the probability of higher satisfaction levels.

This research makes several important contributions. Theoretically, it moves beyond the traditional public-private dichotomy to address a crucial gap in the literature regarding the performance of foreign versus domestic private firms in public service delivery. It provides one of the first large-scale empirical tests of this relationship in the urban transport sector, lending strong support arguments of MNE and IO theories in a novel context.

Practically, the findings have significant policy implications. For municipal and national governments in developing countries, this study validates the strategy of using public-private partnerships with experienced international firms as an effective tool to rapidly and substantially improve public service quality. The results suggest that attracting foreign direct investment in public transport can serve as a catalyst for modernization and enhanced user welfare. Furthermore, the high standards set by foreign operators can create a positive spillover effect, establishing a new market benchmark that may compel domestic firms to improve their own performance, fostering a "race to the top" that benefits all consumers.

Despite its robust findings, this study has limitations that open avenues for future research. First, the analysis is based on cross-sectional data, which captures associations but cannot definitively establish causality. A longitudinal study tracking satisfaction levels in a city before and after a change in operator ownership would provide stronger causal evidence. Second, the data relies on subjective user satisfaction ratings. Future research could triangulate these perceptions with objective, operational data, such as GPS-tracked punctuality, fleet age statistics, and official maintenance records. Finally, this study focuses solely on the user. A more holistic analysis could investigate the impact of foreign ownership on other stakeholders, including employee working conditions and the financial sustainability of the concession models for the delegating public authorities.

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