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*Research Article*

# Analysis of Factors Influencing Public Acceptance of Air Taxis in South Korea

**A Perceived Value for Users and Society Approach**

**Ansun Park [1,2] and Seungmin Lee [1,2]**

[1] *Technology Policy Research Division, Electronics and Telecommunications Research Institute (ETRI), Daejeon 34129, Republic of Korea*
[2] *Science and Technology Management and Policy, University of Science and Technology (UST), Daejeon 34113, Republic of Korea*

Correspondence should be addressed to Seungmin Lee; todtom@etri.re.kr

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Air taxis, a core service within urban air mobility (UAM), have the potential to enhance user satisfaction and address societal challenges such as traffic congestion and environmental pollution. However, the success of this service is often hindered by various concerns. To ensure successful implementation, we investigate the factors influencing public acceptance of air taxis. This study distinguishes itself from previous research in three key aspects. First, it introduces a novel classification of the factors into individual and societal dimensions. Second, it is among the first to apply a value-based adoption model to understand the intention to adopt air taxis, including UAM. Third, it uniquely considers the Korean perspective, unlike most existing studies that focus on Western cultural contexts. To identify the consumers' perceptions, we conducted interviews with experts and surveyed a sample of 1,000 members of the general public in Korea. Our findings suggest that perceived value for society, as well as perceived value for individual users, significantly influences adoption intention. We discuss both academic insights and practical implications for policy and industry, supporting the commercialization of Korean UAM (K-UAM) promoted by the Korean government.

**Keywords:** adoption intention; air taxi; factor analysis; perceived value; public acceptance; structural equation modeling; urban air mobility

## 1. Introduction

As urbanization has advanced, city residents encounter inadequate transportation roads and facilities, leading to pervasive traffic congestion and significant associated costs [1]. In addition, carbon dioxide emissions from automobile exhaust exacerbate global warming and air pollution [2]. To address these social, economic, and environmental challenges, there is a growing demand for innovative urban transportation solutions. However, constructing additional infrastructure to alleviate congestion in metropolitan areas comes with substantial costs. Urban air mobility (UAM), an urban transportation system utilizing electric-powered aircraft with vertical takeoff and landing (VTOL) capabilities, emerges as a promising alternative to traditional ground transportation [3, 4]. Recent technological advancements have significantly increased the feasibility of UAM, making it applicable in various fields, including cargo transportation and passenger travel. Prominent corporations, including Airbus, Boeing, Hyundai, Ehang, Joby Aviation, and Volocopter, are pioneering the collaborative development of novel air mobility services, capitalizing on electric VTOL (eVTOL) technology [5–7]. Air taxis, in particular, are expected to act as an urban mobility service for passengers [8].

While air taxis have the potential to provide users with considerable benefits, such as reductions in travel time and improvements in the overall travel experience, they also raise significant concerns related to user safety or privacy and travel cost [3]. Additionally, the inherent human tendency toward habitual behavior poses a challenge to the adoption of new transportation modes [9, 10]. This resistance is especially pronounced among individuals accustomed to conventional forms of air travel, leading to uncertainty regarding their willingness to board air taxis. Previous studies highlight that for the launch of breakthrough technologies such as air taxis, achieving a critical mass is contingent upon widespread public acceptance [10]. Thus, research should be conducted to understand potential consumers' perceptions of air taxis and to identify the factors influencing their usage intentions.

In response to the potential of UAM to transform urban transportation, the South Korean government unveiled a strategic policy framework known as the K-UAM Roadmap in May 2020. This roadmap is dedicated to facilitating the commercialization of air taxi operations by 2025, highlighting a comprehensive approach to seamlessly merging air taxis with existing transportation networks [11]. Given the imminent commercialization of air taxis, the present moment offers a critical opportunity to examine the factors influencing the acceptance of air taxis in the South Korean context. Several studies analyzing factors that may influence UAM preference have been predominantly conducted in North America and Europe, thereby leaving a gap in understanding the dynamics of Asian markets.

Numerous theoretical frameworks have been developed to understand consumer acceptance of new technology. Yet, the increasing complexity of products and services, driven by emerging technologies, necessitates a reevaluation of these frameworks, especially regarding consumer beliefs and behavioral intentions. A significant contribution to this area is the value-based adoption model (VAM), which aims to clarify the adoption process of mobile Internet by assessing the benefits and costs from the consumer's perspective [12]. This model reveals that perceived value mediates the relationship between consumers' beliefs—encompassing benefits and sacrifices—and their adoption intentions to adopt new technologies. In contrast to the mobile Internet, whose effects are limited to its adopters and users, the implication of air taxi services extends far beyond individual consumer to affect the broader community, operating potentially as a novel form of public transit. Initially, this service may operate along fixed routes with set schedules, similar to air shuttles or metros, connecting urban stations. Eventually, it could evolve into on-demand services without predefined paths, adding layers of complexity to adoption and use. This complexity suggests that adopting and utilizing such technology requires consideration of both personal and societal impacts. Consequently, it is crucial to explore the factors influencing adoption intentions, incorporating both personal and community-level perspectives.

This study aims to investigate how potential users in South Korea perceive the sacrifices and benefits of air taxis, as well as the impact of these perceptions on the perceived value of the service. It also examines how the perceived value influences their willingness to adopt air taxis. Our research classifies the perceived value into two constructs based on the range of utility the service provides: perceived value for users and perceived value for society reflecting user-centered and society-oriented perspectives, respectively. We introduce and empirically test a framework to understand the behavior of consumers who consider not only self-interest but also the collective good when adopting novel products or services arising from innovative technologies. This framework contributes to developing strategies that foster public acceptance of such advancements by taking crucial community concerns and satisfactions into consideration in air taxi operations.

The remainder of this paper is organized as follows. Section 2 reviews the literature on air taxis and technology acceptance models (TAMs), exploring the expected attributes of air taxis that influence public acceptance through expert interviews. In Section 3, the research model and hypotheses are presented. Section 4 outlines the research methodology, while Section 5 presents the obtained results. Practical and academic implications derived from our study, as well as prospects for future research, are deliberated in Section 6.

## 2. Theoretical Background

*2.1. Air Taxi and Its Policy Status in Korea.* An air taxi, also known as a drone taxi, is a compact commercial aircraft designed to make short flights on demand. The aircraft typically refers to a VTOL vehicle powered by electricity [3]. Air taxis are a subset of the UAM concept. UAM is an emerging concept of an aerial transportation system that aims to extend urban and suburban transportation to aerial routes. UAM encompasses a wide range of airborne vehicles, including small unmanned aerial systems (UASs), drones, VTOL vehicles, and other forms of aircraft designed for short-distance travel in and around cities. The emergence and evolution of UAM are driven by technological advancements and growing demands for complementing traditional ground transportation. The progression in battery technologies, one of the key enablers, has facilitated the practical realization of electrically powered aviation vehicles. Their use in public and commercial cases has dramatically increased in recent years. They can be utilized to effectively address intracity mobility needs, including unmanned air taxis, intercity flights, and airborne medical emergency responses providing ride-hailing services.

Air taxis, one of the practical applications of the broader UAM concept, represent an innovative means of mass transit, facilitating rapid passenger transportation between cities or within urban areas. These vehicles are designed to operate in designated airspaces known as corridors, allowing them to circumvent the complex routing strategies typically associated with helicopter travel [13]. The infrastructure supporting air taxi operations, termed "vertiports," serves as nodes for travelers to embark and disembark [14]. Envisioned as a pivotal element of future transportation ecosystems, air taxis are set to integrate with mobility-as-a-service (MaaS), aiming to provide seamless mobility solutions by combining various transportation modalities into a unified, accessible service.

In recent years, countries around the globe have been actively engaged in the research and development (R&D) of UAM, with significant technological advancements paving the way for the commercialization of these services. Notably, the South Korean government established an organization, the "Drone Transport Division" dedicated to UAM under the Ministry of Land, Infrastructure and Transport (MOLIT) in August 2019 [11]. This division is tasked with laying the foundational groundwork for industrial support and policy implementation, aiming for the initial commercial launch of Korean UAM (K-UAM) services in 2025. Furthering this endeavor, in 2020, South Korea launched the UAM Team Korea, a public–private policy consultative council designed to foster collaboration across industry, academia, research, and government sectors. Alongside this, the K-UAM Roadmap was announced, detailing support for the private industry and outlining strategies for infrastructure development to facilitate a stable UAM ecosystem and assert global market leadership [11]. Building on these foundations, the K-UAM Operation Concept 1.0 was then published in September 2021, containing the UAM service structure and operation method, as the initial step toward the commercialization of UAM in 2025 [15]. South Korea's K-UAM Grand Challenge is also being implemented to verify the safety and reliability of UAM prior to commercialization, establish the operational concept and technology standards adapted to domestic conditions, and provide field demonstration support to the private industry [11, 16].

*2.2. Literature Review.* Several prior studies on UAM and air taxis have also been conducted. Uber [17] pointed out that battery technology, aircraft efficiency and reliability, air traffic control systems, costs, safety, noise, pollution, infrastructure, and pilot training are important for the successful activation of UAM in the market. NASA [18] noted concerns about safety, privacy, and aesthetics. The European Union Aviation Safety Agency (EASA) [19] conducted the first EU study on citizens' acceptance of UAM, revealing a generally positive outlook but highlighting safety, security, noise, and environmental concerns. Planing and Pinar [20] noted the importance of consumer and societal acceptance, citing technical and legal challenges, while Fu et al. [21] focused on travel time, cost, and safety in Munich. Identifying positive and negative aspects that lead to the acceptance or rejection of air taxis is crucial for their future integration into urban mobility systems. However, these studies were limited attempts to explore the factors influencing UAM acceptance through simple surveys or expert interviews rather than technology adoption frameworks.

Theories and models regarding user acceptance of technology have increasingly been used to investigate the adoption of UAM since 2020. Information systems researchers have long sought to understand why people accept or reject information technology, often using the theory of reasoned action (TRA), which posits that beliefs influence behavioral intentions through attitudes [22]. Then, the theory of planned behavior (TPB) extends TRA by adding perceived behavioral control as a determinant of intentions [23]. Further developed from TRA and TPB, the TAM has become the most prominent model for explaining technology adoption and usage [24]. Al Haddad et al. [25] refined TAM to include factors such as safety, trust, affinity to automation, data concerns, social attitude, perceived costs, and value of time savings, which they found to be influential in shaping UAM usage intentions. Yavas and Yavas Tez [26] highlighted perceived usefulness and overall reliability in their UAM acceptance and usage model. Employing an extension of TAM based on the Unified Theory of Acceptance and Use of Technology (UTAUT), Ariza-Montes et al. [27] identified positive attitudes, performance benefits, and social influence as significant drivers, while noting that anxiety negatively affects usage intentions.

This body of previous research indicates that both positive and negative expectations for air taxi attributes must be considered because risk and benefit perception has been recognized as a key determinant of acceptance [9, 28, 29]. Addressing challenges while leveraging advantages is crucial for the effective implementation of these disruptive technologies, which, while beneficial, also introduce new risks [28]. Besides, most existing research relies on the TAM, which was designed to elucidate the adoption of traditional technologies within organizational contexts, where employees use technology for work-related purposes and costs and operational responsibilities are managed by the organization. In organizational settings, the major concerns for technology users are usefulness and ease of use. However, consumers estimate and maximize the value of each alternative by considering all relevant benefit and sacrifice factors when making decisions. Addressing this issue, Kim et al. [12] introduced VAM, which grounds an individual's acceptance of technological innovations in the theory of consumption value [30]. VAM identifies perceived value as a mediator linking customers' beliefs—comprising benefits and sacrifices—to their adoption intentions.

*2.3. Expected Attributes of Air Taxi Influencing Public Acceptance.* Defining "public acceptance of air taxis" is essential for research as the public acceptance varies across technology sectors. Accordingly, it is essential to first determine which technological sector air taxi services belong to. Renn [31, 32] categorizes technology into three groups: everyday, work, and external, each evaluated differently based on societal and individual impacts. Everyday technologies used daily for personal purposes offer benefits such as enhanced convenience and communication but also pose challenges including privacy concerns. The market, driven by consumer needs, preferences, and perceived values, primarily influences the adoption of these technologies. Work technologies, in contrast, are adopted by organizations for operational needs. Finally, external technologies represent large-scale technologies and systems with far-reaching societal impacts, such as infrastructural projects including transportation systems. Their adoption involves stakeholders beyond end users [33]. Schubert and Klein [32, 34] describe acceptance in this context as the active or passive approval of decisions by others, which can be expressed in the attitudes and behavior of individual or complex social actors. Thus, "public acceptance of air taxis" involves both individual purchase decisions and societal approval of the large-scale implementation of UAM technologies and services. Indeed, achieving successful public acceptance will require a framework to address the impact on both individuals and broader entities.

To identify the attributes of air taxis expected to influence public acceptance in the Korean context, we conducted an exploratory study that integrated the relevant research results [3, 4, 10, 17–21, 25] with in-depth interviews with UAM experts. This expert panel consisted of eight researchers, each with a minimum of 20 years of experience in R&D at a Korean research institute. This method ensured that our analysis was both comprehensive and grounded in substantial practical expertise. These experts proposed the air taxi expectations, which are considered consumers' pretrial beliefs about the service characteristics, as defined by Olson and Dover [35]. The expectations for air taxis were then segmented based on Wejnert's categories. Wejnert [36] lists two categories of consequences associated with adoption outcomes of innovations: public versus private and benefits versus costs. These classifications enable us to address the positive and negative aspects of the service's adoption for both individual consumers and society.

Consequently, the expectations for air taxis were classified into these two categories, resulting in a total of four distinct domains, as detailed in Table 1. In the domain of private benefits, expectations are viewed as positive outcomes of an innovation that affect individual adopters, enhancing their personal well-being. These include time savings, ease of use, enjoyment, and user image. Conversely, negative private consequences encompass both monetary and nonmonetary aspects, such as indirect costs or risks from the consumer's perspective, including monetary cost, user safety risk, and privacy risk. From the society-oriented perspective, there are two other domains. Positive impacts on broader entities such as countries, states, organizations, and social movements, often concerning societal well-being or environmental protection, include traffic congestion reduction, environmental friendliness, and city image. The domain of public costs is related to social uncertainty or concern [37], such as noise, city safety risks, and city security risks.

## 3. Research Model and Hypotheses

In this section, we propose a research model, as shown in Figure 1. This research model is based on a VAM to examine the adoption of air taxi services, a new information and communication technology (ICT) application, from a value perspective. According to Zeithaml [38], a consumer's perception of the benefits received versus the costs incurred is crucial in determining the overall utility of an item. Similarly, prior studies indicate that perceived value is the ratio or trade-off between desirable attributes and the required sacrifices [39, 40]. Altogether, a value in consumer purchase decisions represents the consumer's overall assessment of a product or service's utility [41], as evaluated by thoroughly weighing the relative benefits and risks associated with it [30, 42]. Thus, the perceived value of air taxi services in this study is defined as a potential consumer's overall perception of air taxis based on their benefits and sacrifices. Perceived benefits are the advantages that potential users derive from the adoption of air taxis [30], while perceived sacrifices refer to the unsatisfactory spending for the consumption of the service [12].

We further divided the perceived value of air taxi services into two dimensions: value for users and value for society. The perceived value for users is determined after considering the relative weights of the benefits and sacrifices that individuals can derive from using air taxis. On the other hand, the perceived value for society encompasses both the collective benefits that the entire community can gain and the sacrifices it must endure, thereby reflecting the societal impacts associated with adopting such services. In the same manner, each perceived benefit and sacrifice can be categorized into personal and social dimensions. The results of the categorization correspond to the domains presented in Table 1 as air taxis offer both satisfaction and challenges to individual consumers and the broader community.

*3.1. Perceived Value and Adoption Intention.* Economic utility theory posits that consumers strive to optimize their utility or fulfillment within the constraints of their available resources. A greater perceived value tends to result in a more favorable decision to adopt the innovation. Our definition of perceived value aligns with this principle, thus serving as an indicator of adoption intention [12]. Hence, we propose the following hypotheses to delve deeper into how these two dimensions of perceived value influence the intention to adopt air taxi services:

- H1: Perceived value for users positively affects adoption intention.
- H2: Perceived value for society positively affects adoption intention.

*3.2. Individual Benefits.* Perceived benefits play a crucial role in enhancing the value perception associated with technological innovations [12]. More specifically, at the personal level, individual benefits refer to the domain of positive private consequences. Air taxis can save time on my journeys to reach destinations more quickly [4, 43]. Using air taxis will also enhance the enjoyment of my journey [20]. The ease of use refers to users' perception of the difficulty in using the technology, encompassing the evaluation of how effortless it is to utilize [24]. In this study, it is defined as the overall user-friendliness of using air taxis to reach destinations, which positively contributes to the perceived value for users. Moreover, user image, the degree to which individuals perceive that the adoption of innovation will enhance their status, is positively related to perceived value [42, 44]. This involves the pride or social evaluation users gain from using air taxis. Thus, we posit that

- H3: Travel time savings positively affect perceived value for users.

Table 1: Expectations for air taxis.

| Expectation | Consumer perspective (private consequences) | Society perspective (public consequences) |
|---|---|---|
| Positive aspects (benefits) | • Time savings<br>• Ease of use<br>• Enjoyment<br>• User image | • Traffic congestion reduction<br>• Environmental friendliness<br>• City image |
| Negative aspects (costs) | • Monetary cost<br>• User safety risk<br>• User privacy risk | • Noise<br>• City safety risk<br>• City security risk |

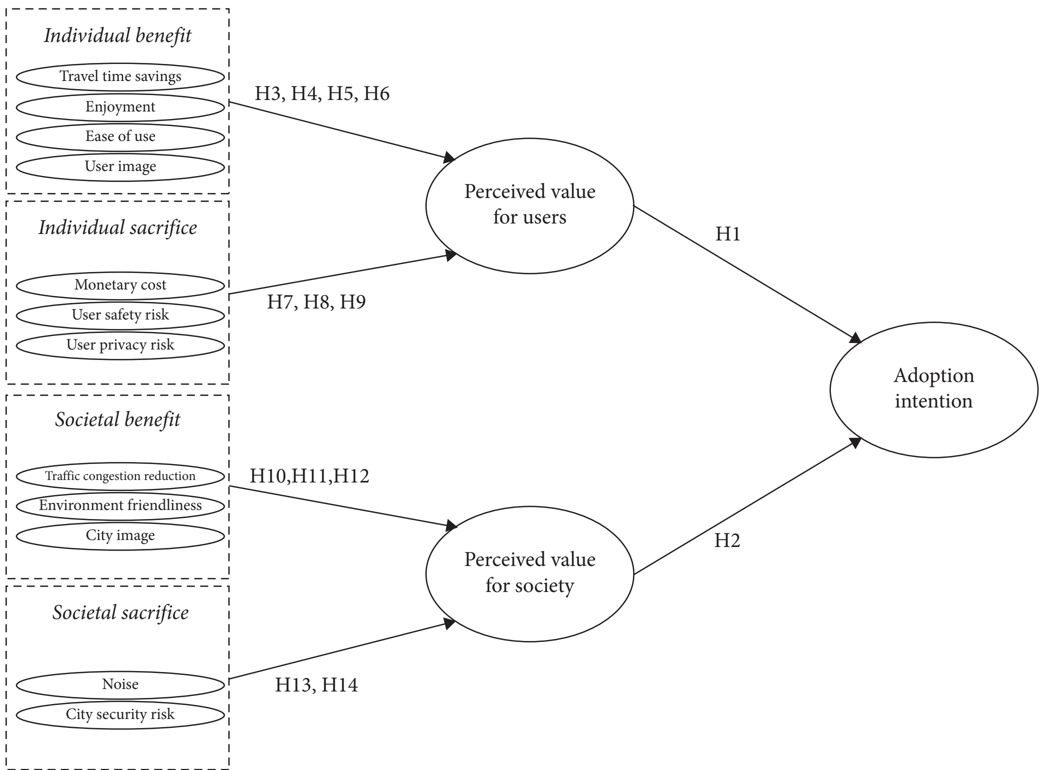


Figure 1: Research model.

- H4: Enjoyment positively affects perceived value for users.
- H5: Ease of use positively affects perceived value for users.
- H6: User image positively affects perceived value for users.

*3.3. Individual Sacrifices.* In contrast, a higher perception of sacrifices reduces the perceived value of a product or service and negatively impacts the overall value perception of technological innovations [12]. At the personal level, individual sacrifices entail negative private consequences that a consumer faces to obtain these benefits. Previous exploratory research has identified price as the most significant barrier to air taxi adoption [19]. Consequently, we propose that monetary cost represents a critical component of the individual sacrifices. In terms of nonmonetary aspects, potential risks such as user safety and privacy concerns may be critical factors that detract from the perceived value of using air taxis for users [3, 45]. Sjöberg [46] emphasizes the importance of distinguishing between personal risk and general risk. In the context of UAM and air taxi services, this implies that perceived personal risks, such as cost and safety concerns, might primarily influence the perceived value for users. Hence, we hypothesize as follows:

- H7: Monetary cost negatively affects perceived value for users.
- H8: User safety risk negatively affects perceived value for users.
- H9: User privacy risk negatively affects perceived value for users.

*3.4. Societal Benefits.* Meanwhile, societal benefits refer to the collective advantages that accrue to society from adopting the innovation. A significant advantage is the reduction of traffic congestion, which can lead to more efficient transportation networks for the public [10]. Additionally, the environmental friendliness of air taxis is noteworthy, particularly their potential to reduce emissions compared to traditional vehicles [10]. Furthermore, in this paper, city image is defined as the extent to which individuals perceive that adopting advanced transportation technologies such as air taxis can elevate a city's status, portraying it as forward-thinking and technologically advanced [44]. Based on the considerations that societal benefits improve the perceived value for society, we posit the following hypotheses:

- H10: Traffic congestion reduction positively affects perceived value for society.
- H11: Environmental friendliness positively affects perceived value for society.
- H12: City image positively affects perceived value for society.

*3.5. Societal Sacrifices.* There are also potential societal sacrifices to consider. Noise generated by air taxis could negatively impact the perceived value for society as increased noise pollution can affect the quality of life for city residents [3, 10, 19]. Additionally, security risks associated with integrating new transportation technologies into urban areas may pose concerns, such as unauthorized hovering near military zones [3, 19, 47]. Complementing the discussion on personal sacrifices, Sjöberg's [46] findings also highlight how general risks are more aligned with societal concerns. In the context of air taxi services, societal sacrifices such as noise pollution and security risks may therefore have a greater impact on the perceived value for society. Understanding this distinction is crucial for addressing public concerns and ensuring broader acceptance of UAM. Given that these societal sacrifices could diminish the perceived value for society, we hypothesize that

- H13: Noise negatively affects perceived value for society.
- H14: City secure risk negatively affects perceived value for society.

## 4. Research Methodology

*4.1. Constructs and Measures.* To test the proposed research model, we carried out an empirical analysis through questionnaires. The measurement items were either adopted or adapted from validated scales in previous related studies. The research instrument comprised a total of 60 items, including 48 items on expected attributes, eight items on perceived values, and four items on intentions. The reliability and validity of all measurement items were analyzed, as reported later in this paper. The constructs were assessed by asking subjects to indicate their level of agreement with a set of statements using a seven-point Likert scale. Table 2 lists the measurement items for each construct.

*4.2. Data Collection.* Empirical data for this study were collected via an online survey conducted on potential users or adopters of air taxi services in South Korea. Most potential consumers were unfamiliar with or had little knowledge of this form of aerial mobility. To help respondents understand air taxis, an explanation with illustrations was provided to them. They were also informed to consider the initial commercialization phase of air taxis, where vertiports would primarily be established on rooftops of major buildings and transfer centers in central urban areas. This request aimed to standardize respondents' understanding of where and how air taxis would operate. The survey was conducted in August 2022 by Macromill Embrain, a professional research company, targeting individuals aged 20–69. All respondents participated voluntarily and were assured that their anonymized responses would be used only for this study. Written informed consent was obtained from each participant. The survey resulted in 1,496 completed responses. Inattentive responses were screened and removed based on consistent, repetitive patterns or incorrect answers to bogus items [52], leaving 1,000 samples for statistical analysis. Table 3 provides the descriptive statistics of the respondents' characteristics including gender, age, educational background, and income. Chi-square tests confirmed that the sample's gender and age composition aligned with South Korean population data from Statistics Korea [53].

## 5. Data Analysis and Results

*5.1. Reliability and Validity of Instruments.* Before hypothesis tests, statistical analysis was carried out to assess the reliability and validity of the measurement instruments and latent variables. As shown in Table 4, the Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy was 0.911, exceeding the minimum threshold of 0.50. Additionally, Bartlett's test of sphericity was highly significant, with a $p$ value of 0.001 or less. These results indicate that the items were appropriate for factor analysis. Then, exploratory factor analysis (EFA) was conducted using principal component analysis with VARIMAX rotation in SPSS28. All items of the variables loaded highest on their own constructs with factor loadings above 0.50, demonstrating their construct validity. A total of 15 factors, each with an eigenvalue greater than 1.0, were identified, explaining 80.1% of the total variance. The factors were presented in the order of their eigenvalues, which represent the amount of variance explained by each factor.

Confirmatory factor analysis (CFA) was performed using AMOS29 on the factors retained after EFA to assess construct reliability, as well as convergent and discriminant validity, both subtypes of construct validity. The results are summarized in Table 5. First, the measurement model was tested for model fit. The minimum discrepancy per degrees of freedom (CMIN/df), comparative fit index (CFI), normalized fit index (NFI), Tucker–Lewis index (TLI), incremental fit index (IFI), standardized root mean square residual (SRMR), and root mean squared error of

Table 2: Constructs and measurement items.

| Construct | Item | Description | Reference |
|---|---|---|---|
| Travel time savings | TIME1 | Using air taxis will allow for fast transportation to the destination | [43] |
| | TIME2 | Using air taxis can save me time when traveling to the destination | |
| | TIME3 | Using air taxis will enable me to arrive at the destination at the scheduled arrival time | |
| | TIME4 | Using air taxis will allow for an unhurried arrival at the destination | |
| Enjoyment | ENJ1 | Using air taxis will allow for a pleasant journey to the destination | [42, 48] |
| | ENJ2 | Using air taxis will not be boring while traveling to the destination | |
| | ENJ3 | Using air taxis will make my journey enjoyable | |
| | ENJ4 | Using air taxis will allow me to enjoy the travel time to the destination | |
| Ease of use | EOU1 | It will be understandable how to use air taxis | [24] |
| | EOU2 | It will be easy to use air taxis | |
| | EOU3 | It will be easy to grasp the way of using air taxis | |
| | EOU4 | It will not require much effort to use air taxis | |
| User image | UID1 | Using air taxis can make me stand out | [42, 44] |
| | UID2 | Using air taxis will improve the image that others have of me | |
| | UID3 | Using air taxis will allow me to leave a good impression on others | |
| | UID4 | Using air taxis can give me a feeling of improved social status | |
| Monetary cost | COST1 | Using air taxis may require paying a substantial amount | [49] |
| | COST2 | The cost of using air taxis may be burdensome | |
| | COST3* | The cost of using air taxis is expected to be satisfying. (reversed) | |
| | COST4 | Using air taxis is likely to increase the expenses for reaching the destination | |
| User safety risk | USR1 | Using air taxis may pose risks to my safety during my journey to the destination | [42] |
| | USR2 | Using air taxis may involve the risk of battery explosions during my journey to the destination | |
| | USR3 | Using air taxis may entail the risk of reduced performance or errors due to adverse weather conditions (e.g., rain, wind, thunder, lightning, hail) during my journey to the destination | |
| | USR4 | Using air taxis may involve the risk of collisions or crashes during my journey to the destination | |
| User privacy risk | UPT1 | Using air taxis may result in the arbitrary collection of personal information (e.g., location, travel history, payment information) | [50] |
| | UPT2 | Using air taxis may result in the leakage of personal information (e.g., location, travel history, payment information) | |
| | UPT3 | Using air taxis may result in the unauthorized use of personal information (e.g., location, travel history, payment information) | |
| | UPT4 | Maintaining security for personal information (e.g., location, travel history, payment information) may be difficult when using air taxis | |
| Traffic congestion reduction | TRF1 | Using air taxis will lead to a decrease in vehicles on the road | [10] |
| | TRF2 | Using air taxis can reduce congested sections of the road | |
| | TRF3 | Using air taxis will make road traffic flow smoothly | |
| | TRF4 | Using air taxis can alleviate urban traffic congestion | |
| Environmental friendliness | ECO1 | Using air taxis will be effective in reducing greenhouse gas emissions compared to other modes of transportation | [51] |
| | ECO2 | Using air taxis will be effective in reducing fine dust emissions compared to other modes of transportation | |
| | ECO3 | Using air taxis will be effective in preventing air pollution | |
| | ECO4 | Using air taxis will be effective in addressing the issue of global warming | |
| City image | CID1 | Using air taxis will be effective for improving the image of the city or country | [44] |
| | CID2 | Using air taxis can cultivate an innovative and advanced city or country image | |
| | CID3 | Using air taxis can cultivate an image of a livable city or country | |
| | CID4 | Using air taxis can attract tourists to the city or country | |
| Noise | NOI1 | Using air taxis will lead to noise problems in the city | [19] |
| | NOI2 | Using air taxis, citizens may experience mental harm (e.g., stress, decreased concentration) due to urban noise | |
| | NOI3 | Using air taxis, citizens may experience physical harm (e.g., headaches, sleep disorders, hearing impairment) due to urban noise | |
| | NOI4 | Using air taxis, citizens may experience daily life discomfort due to urban noise | |

Table 2: Continued.

| Construct | Item | Description | Reference |
|---|---|---|---|
| City security risk | CSR1 | Using air taxis, information about the city or country's spaces (e.g., surrounding buildings, private properties, public lands) can be collected without consent | [19] |
| | CSR2 | Using air taxis, information about the city or country's spaces (e.g., surrounding buildings, private properties, public lands) can be leaked | |
| | CSR3 | Using air taxis, information about the city or country's spaces (e.g., surrounding buildings, private properties, public lands) can be used for purposes without consent | |
| | CSR4 | Using air taxis may make it difficult to maintain security for information about the city or country's spaces (e.g., surrounding buildings, private properties, public lands) | |
| Perceived value for users | VU1 | Compared to the fee I need to pay, the use of air taxis will offer value for money | [12] |
| | VU2 | Compared to the effort I need to put in, the use of air taxis will be beneficial to me | |
| | VU3 | Compared to the risk I need to take, the use of air taxis will be advantageous to me | |
| | VU4 | Overall, the use of air taxis will deliver me good value | |
| Perceived value for society | VS1 | Compared to the risk society should bear, the introduction of air taxis will provide advantages to public | [12] |
| | VS2 | Compared to the inconvenience society should endure, the introduction of air taxis will bring convenience to public | |
| | VS3 | The introduction of air taxis to society can address societal issues in a cost-effective manner | |
| | VS4 | Overall, the introduction of air taxis to society will deliver good value to public | |
| Adoption intention | INT1 | I will consider using air taxis | [12, 42] |
| | INT2 | I intend to use air taxis in the future | |
| | INT3 | I plan to use air taxis in the future | |
| | INT4 | I recommend that others use air taxis | |

*Reverse-coded in analyses.

Table 3: Respondents' demographic profiles.

| Category | Items | Percentage (%) |
|---|---|---|
| Gender | Female | 48.9 |
| Chi-squared = 0.676; Reference value < 3.838 | Male | 51.1 |
| Monthly household income* | Less than 2 | 9.3 |
| | 2 to less than 3 | 17.7 |
| | 3 to less than 4 | 17.5 |
| | 4 to less than 5 | 14.6 |
| | 5 to less than 6 | 14.2 |
| | 6 to less than 7 | 6.2 |
| | 7 to less than 8 | 7.1 |
| | 8 to less than 9 | 4.3 |
| | 9 or more than | 9.1 |
| Age<br>Chi-squared = 1.625;<br>Reference value < 9.488 | 20–29 | 18.8 |
| | 30–39 | 17.5 |
| | 40–49 | 21.7 |
| | 50–59 | 22.9 |
| | 60–69 | 19.1 |
| Level of education | Middle school or less | 0.6 |
| | High school | 19.3 |
| | Junior college | 14.2 |
| | Undergraduate | 56.6 |
| | Master's degree | 7.9 |
| | Doctor's degree | 1.4 |
| Total | 100.0% | |

*Unit: million KRW.

approximation (RMSEA) all met the required standards, indicating a good overall model fit. Following the suggestions of Hair et al. [54], any variable item with loadings less than 0.5 was removed to ensure convergent validity. Most factor loadings exceeded 0.6, except for the third item of monetary cost (COST3), which had a low factor loading of

Table 4: Results of exploratory factor analysis.

| Factor | Item | Communality | Loading | Mean | SD | Eigen value | Variance explained | Cronbach's alpha |
|---|---|---|---|---|---|---|---|---|
| Traffic congestion reduction | TRF1 | 0.833 | 0.881 | 3.69 | 1.62 | 3.719 | 21.971 | 0.962 |
| | TRF2 | 0.927 | 0.925 | 3.99 | 1.66 | | | |
| | TRF3 | 0.938 | 0.925 | 3.87 | 1.61 | | | |
| | TRF4 | 0.899 | 0.891 | 3.83 | 1.63 | | | |
| User privacy risk | UPT1 | 0.840 | 0.852 | 4.88 | 1.32 | 3.517 | 13.552 | 0.943 |
| | UPT2 | 0.890 | 0.885 | 4.83 | 1.37 | | | |
| | UPT3 | 0.876 | 0.882 | 4.70 | 1.40 | | | |
| | UPT4 | 0.820 | 0.852 | 4.60 | 1.38 | | | |
| User image | UID1 | 0.737 | 0.798 | 4.61 | 1.48 | 3.466 | 6.671 | 0.920 |
| | UID2 | 0.878 | 0.894 | 4.10 | 1.49 | | | |
| | UID3 | 0.881 | 0.893 | 4.02 | 1.46 | | | |
| | UID4 | 0.792 | 0.844 | 4.37 | 1.58 | | | |
| Environmental friendliness | ECO1 | 0.769 | 0.812 | 5.57 | 1.23 | 3.440 | 5.734 | 0.929 |
| | ECO2 | 0.839 | 0.850 | 5.53 | 1.21 | | | |
| | ECO3 | 0.878 | 0.878 | 5.36 | 1.27 | | | |
| | ECO4 | 0.830 | 0.843 | 5.15 | 1.32 | | | |
| Adoption intention | INT1 | 0.894 | 0.825 | 3.99 | 1.67 | 3.435 | 5.725 | 0.960 |
| | INT2 | 0.914 | 0.841 | 4.21 | 1.71 | | | |
| | INT3 | 0.930 | 0.856 | 3.91 | 1.68 | | | |
| | INT4 | 0.837 | 0.779 | 3.83 | 1.59 | | | |
| Noise | NOI1 | 0.704 | 0.824 | 5.17 | 1.27 | 3.378 | 5.630 | 0.926 |
| | NOI2 | 0.882 | 0.908 | 5.09 | 1.22 | | | |
| | NOI3 | 0.871 | 0.899 | 5.00 | 1.27 | | | |
| | NOI4 | 0.838 | 0.870 | 5.06 | 1.26 | | | |
| City security risk | CSR1 | 0.865 | 0.860 | 5.40 | 1.18 | 3.356 | 5.593 | 0.937 |
| | CSR2 | 0.894 | 0.876 | 5.40 | 1.18 | | | |
| | CSR3 | 0.844 | 0.842 | 5.29 | 1.24 | | | |
| | CSR4 | 0.779 | 0.804 | 5.23 | 1.27 | | | |
| Travel time savings | TIME1 | 0.820 | 0.807 | 6.27 | 0.95 | 3.303 | 5.505 | 0.925 |
| | TIME2 | 0.854 | 0.832 | 6.31 | 0.91 | | | |
| | TIME3 | 0.843 | 0.826 | 6.18 | 0.97 | | | |
| | TIME4 | 0.779 | 0.794 | 6.07 | 1.04 | | | |
| Ease of use | EOU1 | 0.788 | 0.848 | 4.60 | 1.41 | 3.290 | 5.483 | 0.908 |
| | EOU2 | 0.858 | 0.892 | 4.46 | 1.40 | | | |
| | EOU3 | 0.820 | 0.867 | 4.71 | 1.33 | | | |
| | EOU4 | 0.709 | 0.822 | 4.48 | 1.40 | | | |
| Enjoyment | ENJ1 | 0.806 | 0.805 | 5.27 | 1.33 | 3.256 | 5.426 | 0.919 |
| | ENJ2 | 0.814 | 0.812 | 5.58 | 1.21 | | | |
| | ENJ3 | 0.872 | 0.861 | 5.40 | 1.29 | | | |
| | ENJ4 | 0.763 | 0.767 | 5.44 | 1.26 | | | |
| City image | CID1 | 0.771 | 0.749 | 5.00 | 1.32 | 3.077 | 5.128 | 0.897 |
| | CID2 | 0.817 | 0.788 | 5.45 | 1.19 | | | |
| | CID3 | 0.788 | 0.774 | 4.98 | 1.33 | | | |
| | CID4 | 0.715 | 0.738 | 5.33 | 1.26 | | | |
| User safety risk | USR1 | 0.740 | 0.830 | 4.99 | 1.35 | 2.804 | 4.674 | 0.851 |
| | USR2 | 0.763 | 0.833 | 4.82 | 1.36 | | | |
| | USR3 | 0.673 | 0.687 | 5.79 | 1.10 | | | |
| | USR4 | 0.731 | 0.752 | 5.49 | 1.20 | | | |
| Perceived value for society | VS1 | 0.706 | 0.801 | 4.53 | 1.27 | 2.803 | 4.672 | 0.862 |
| | VS2 | 0.795 | 0.807 | 4.53 | 1.24 | | | |
| | VS3 | 0.719 | 0.745 | 4.28 | 1.25 | | | |
| | VS4 | 0.729 | 0.650 | 4.56 | 1.21 | | | |
| Perceived value for users | VU1 | 0.787 | 0.796 | 4.71 | 1.23 | 2.780 | 4.633 | 0.860 |
| | VU2 | 0.820 | 0.790 | 4.66 | 1.25 | | | |
| | VU3 | 0.682 | 0.706 | 4.24 | 1.33 | | | |
| | VU4 | 0.636 | 0.570 | 4.32 | 1.37 | | | |

Table 4: Continued.

| Factor | Item | Communality | Loading | Mean | SD | Eigen value | Variance explained | Cronbach's alpha |
|---|---|---|---|---|---|---|---|---|
| Monetary cost | COST1 | 0.716 | 0.759 | 6.15 | 1.04 | 2.448 | 4.080 | 0.747 |
| | COST2 | 0.781 | 0.827 | 6.08 | 1.00 | | | |
| | COST3 | 0.500 | 0.544 | 4.63 | 1.21 | | | |
| | COST4 | 0.599 | 0.714 | 5.86 | 1.05 | | | |

*Note:* KMO = 0.911; Bartlett's test of sphericity $\chi^2 = 52991.144$, $df = 1770$, $p < 0.001$.
Abbreviations: KMO, Kaiser–Meyer–Olkin; SD, standard deviation.

Table 5: Results of confirmatory factor analysis.

| Factor | Item | Loading | AVE | CR | Cronbach's alpha |
|---|---|---|---|---|---|
| Travel time savings | TIME1 | 0.887 | 0.758 | 0.926 | 0.925 |
| | TIME2 | 0.913 | | | |
| | TIME3 | 0.870 | | | |
| | TIME4 | 0.811 | | | |
| Enjoyment | ENJ1 | 0.852 | 0.744 | 0.921 | 0.919 |
| | ENJ2 | 0.867 | | | |
| | ENJ3 | 0.916 | | | |
| | ENJ4 | 0.811 | | | |
| Ease of use | EOU1 | 0.856 | 0.716 | 0.909. | 0.908 |
| | EOU2 | 0.927 | | | |
| | EOU3 | 0.854 | | | |
| | EOU4 | 0.736 | | | |
| User image | UID1 | 0.746 | 0.749 | 0.922 | 0.920 |
| | UID2 | 0.948 | | | |
| | UID3 | 0.945 | | | |
| | UID4 | 0.804 | | | |
| Monetary cost | COST1 | 0.826 | 0.582 | 0.804 | 0.797 |
| | COST2 | 0.817 | | | |
| | COST3 | Delete | | | |
| | COST4 | 0.869 | | | |
| User safety risk | USR1 | 0.673 | 0.587 | 0.849 | 0.851 |
| | USR2 | 0.706 | | | |
| | USR3 | 0.801 | | | |
| | USR4 | 0.869 | | | |
| User privacy risk | UPT1 | 0.899 | 0.806 | 0.943 | 0.943 |
| | UPT2 | 0.943 | | | |
| | UPT3 | 0.901 | | | |
| | UPT4 | 0.847 | | | |
| Traffic congestion reduction | TRF1 | 0.857 | 0.865 | 0.962 | 0.962 |
| | TRF2 | 0.950 | | | |
| | TRF3 | 0.974 | | | |
| | TRF4 | 0.935 | | | |
| Environmental friendliness | ECO1 | 0.806 | 0.768 | 0.93 | 0.929 |
| | ECO2 | 0.876 | | | |
| | ECO3 | 0.930 | | | |
| | ECO4 | 0.888 | | | |
| City image | CID1 | 0.843 | 0.689 | 0.898 | 0.897 |
| | CID2 | 0.866 | | | |
| | CID3 | 0.842 | | | |
| | CID4 | 0.766 | | | |
| Noise | NOI1 | 0.735 | 0.764 | 0.928 | 0.926 |
| | NOI2 | 0.910 | | | |
| | NOI3 | 0.936 | | | |
| | NOI4 | 0.902 | | | |

Table 5: Continued.

| Factor | Item | Loading | AVE | CR | Cronbach's alpha |
|---|---|---|---|---|---|
| City security risk | CSR1 | 0.920 | 0.792 | 0.938 | 0.937 |
| | CSR2 | 0.946 | | | |
| | CSR3 | 0.874 | | | |
| | CSR4 | 0.814 | | | |
| Perceived value for users | VU1 | 0.844 | 0.624 | 0.868 | 0.860 |
| | VU2 | 0.899 | | | |
| | VU3 | 0.709 | | | |
| | VU4 | 0.689 | | | |
| Perceived value for society | VS1 | 0.683 | 0.614 | 0.863 | 0.862 |
| | VS2 | 0.832 | | | |
| | VS3 | 0.797 | | | |
| | VS4 | 0.813 | | | |
| Adoption intention | INT1 | 0.929 | 0.858 | 0.960 | 0.960 |
| | INT2 | 0.944 | | | |
| | INT3 | 0.958 | | | |
| | INT4 | 0.872 | | | |

*Note:* CMIN $(\chi^2) = 4519.860$, $df = 1547$, $p < 0.001$, CMIN/$df = 2.922$, CFI = 0.943, NFI = 0.916, TLI = 0.937, IFI = 0.943, RFI = 0.907, SRMR = 0.0386, RMSEA = 0.044, GFI = 0.862.
Abbreviations: AVE, average variance extracted; CE, composite reliability; CFI, comparative fit index; CMIN, minimum discrepancy; GFI, goodness of fit index; IFI, incremental fit index; NFI: normed fit index; RFI, relative fit index; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual; TLI: Tucker–Lewis index.

0.438 and was thus excluded from further analysis. Additionally, the average variance extracted (AVE) values for each variable were higher than the threshold of 0.50, and the composite reliability (CR) values for each variable exceeded 0.70, which suggests an appropriate level of convergent validity and internal consistency among the items [54, 55]. The reliability of the instruments was further examined using Cronbach's alpha for all 15 factors, which were all greater than 0.70 [54].

Finally, the square roots of the AVE for each construct exceeded all correlation values between that construct and any other constructs, demonstrating discriminant validity [56], as shown in Table 6.

*5.2. Hypothesis Test.* The hypotheses were analyzed through structural equation modeling (SEM) to test 14 proposed relationships between the variables, which were retained after CFA. The analysis was performed using AMOS29. The results presented in Table 7 show that the model fit was found to be acceptable because all the values of CFI, NFI, TLI, IFI, and RFI except GFI were greater than the recommended value of 0.9, except for GFI. The indices' values of the theoretical framework indicate that the fit of the basic model is adequate [54].

Specifically, the hypothesis testing results are as follows:

First, perceived values for both users ($\beta = 0.453$; $p < 0.001$) and society ($\beta = 0.363$; $p < 0.001$) positively and significantly determined the intention to adopt air taxis, confirming H1 and H2. Therefore, both the perception of value for users and the perception of value for society are prerequisites for air taxi acceptance, as suggested by the VAM.

Second, in terms of individual benefit aspects, travel time saving was the strongest positive factor influencing the perceived value for users of air taxis ($\beta = 0.340$; $p < 0.001$). Enjoyment, ease of use, and user image also had positive and significant impacts on perceived value for users. Overall, H3, H4, H5, and H6 are supported.

Third, concerning individual sacrifice aspects, monetary cost negatively impacted the perceived value for users of air taxis ($\beta = -0.284$; $p < 0.001$), whereas user safety risk and user privacy risk were found to be insignificant. Consequently, H7 was accepted, while H8 and H9 were rejected.

Fourth, in the context of societal benefit aspects, city image was the strongest positive factor influencing the perceived value for society of air taxis ($\beta = 0.315$; $p < 0.001$). Additionally, traffic congestion reduction ($\beta = 0.239$; $p < 0.001$) and environment friendliness ($\beta = 0.235$; $p < 0.001$) also positively and significantly affected the perceived value for society. Thus, H10, H11, and H12 are supported.

Finally, regarding societal sacrifice aspects, noise was the negative factor influencing the perceived value for users of air taxis ($\beta = -0.090$; $p < 0.01$). However, city security risk was found to have an insignificant impact. Hence, H13 was accepted, while H14 was not accepted.

## 6. Discussion and Implications

*6.1. Main Findings.* In this study, we tested a total of 14 hypotheses and obtained the following meaningful results. First, the two-dimensional value perceived by individuals determined the adoption intention of air taxis. Perceived value for users has a significant positive effect on adoption intention (H1), indicating that individuals who perceive high personal value in using air taxis are more likely to adopt this service. Likewise, perceived value for society also positively influenced adoption intention (H2), suggesting that higher perceived societal value enhances the overall acceptance among potential users.

Table 6: Correlation of latent variables.

| | TIME | ENJ | EOU | UID | COST | USR | UPT | TRF | ENV | CID | NOI | CSR | VU | VS | INT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TIME | **0.871** | | | | | | | | | | | | | | |
| ENJ | 0.568 | **0.862** | | | | | | | | | | | | | |
| EOU | 0.290 | 0.279 | **0.846** | | | | | | | | | | | | |
| UID | 0.185 | 0.384 | 0.192 | **0.865** | | | | | | | | | | | |
| COST | 0.298 | 0.121 | −0.067 | −0.008 | **0.763** | | | | | | | | | | |
| USR | 0.240 | 0.060 | −0.032 | −0.005 | 0.427 | **0.766** | | | | | | | | | |
| UPT | 0.033 | −0.001 | −0.02 | 0.051 | 0.340 | 0.476 | **0.898** | | | | | | | | |
| TRF | 0.027 | 0.155 | 0.173 | 0.253 | −0.118 | −0.169 | 0.029 | **0.93** | | | | | | | |
| ENV | 0.423 | 0.343 | 0.212 | 0.186 | 0.107 | 0.026 | 0.017 | 0.286 | **0.876** | | | | | | |
| CID | 0.450 | 0.475 | 0.293 | 0.385 | 0.102 | 0.053 | −0.043 | 0.392 | 0.504 | **0.83** | | | | | |
| NOI | 0.049 | 0.045 | −0.065 | −0.031 | 0.325 | 0.342 | 0.311 | 0.03 | −0.009 | 0.062 | **0.874** | | | | |
| CSR | 0.243 | 0.120 | 0.081 | 0.021 | 0.382 | 0.450 | 0.546 | −0.015 | 0.112 | 0.105 | 0.376 | **0.89** | | | |
| VU | 0.399 | 0.409 | 0.334 | 0.347 | −0.178 | −0.065 | −0.062 | 0.268 | 0.403 | 0.499 | 0.013 | 0.011 | **0.79** | | |
| VS | 0.283 | 0.339 | 0.281 | 0.334 | −0.088 | −0.128 | −0.023 | 0.419 | 0.456 | 0.500 | −0.054 | 0.019 | 0.561 | **0.783** | |
| INT | 0.290 | 0.391 | 0.335 | 0.315 | −0.242 | −0.151 | −0.124 | 0.327 | 0.362 | 0.478 | −0.154 | −0.073 | 0.599 | 0.556 | **0.926** |

*Note:* The diagonal elements in bold are the root AVEs.
Abbreviations: CID: city image; COST: monetary cost; CSR: city security risk; ECO: environmental friendliness; ENJ: enjoyment; EOU: ease of use; INT: adoption intention; NOI: noise; TIME: travel time savings; TRF: traffic congestion reduction; UPT: user privacy risk; USR: user safety risk; VS: perceived value for society; VU: perceived value for users.

Table 7: Hypothesis testing results.

| Test hypothesis | Path | Standardized coefficient | $t$-value | Result |
|---|---|---|---|---|
| Perceived value ⟶ adoption intention | | | Fully supported | |
| H1 | Perceived value for users ⟶ adoption intention | 0.453 | 15.129*** | Supported |
| H2 | Perceived value for society ⟶ adoption intention | 0.363 | 11.566*** | Supported |
| Individual benefit ⟶ perceived value for users | | | Fully supported | |
| H3 | Travel time savings ⟶ perceived value for users | 0.340 | 8.225*** | Supported |
| H4 | Enjoyment ⟶ perceived value for users | 0.149 | 3.777*** | Supported |
| H5 | Ease of use ⟶ perceived value for users | 0.146 | 4.592*** | Supported |
| H6 | User image ⟶ perceived value for users | 0.203 | 6.332*** | Supported |
| Individual sacrifice ⟶ perceived value for users | | | Partially supported | |
| H7 | Monetary cost ⟶ perceived value for users | −0.284 | −7.411*** | Supported |
| H8 | User safety risk ⟶ perceived value for users | −0.052 | −1.358 | Not supported |
| H9 | User privacy risk ⟶ perceived value for users | 0.034 | 0.988 | Not supported |
| Societal benefit ⟶ perceived value for society | | | Fully supported | |
| H10 | Traffic congestion reduction ⟶ perceived value for society | 0.239 | 7.325*** | Supported |
| H11 | Environment friendliness ⟶ perceived value for society | 0.235 | 6.572*** | Supported |
| H12 | City image ⟶ perceived value for society | 0.315 | 7.992*** | Supported |
| Societal sacrifice ⟶ perceived value for society | | | Partially supported | |
| H13 | Noise ⟶ perceived value for society | −0.090 | −2.833** | Supported |
| H14 | City security risk ⟶ perceived value for society | −0.010 | −0.329 | Not supported |

*Note:* CMIN $(\chi^2) = 4861.528$, $df = 1572$, $p < 0.001$, CMIN/$df = 3.093$, CFI = 0.937, NFI = 0.909, TLI = 0.931, IFI = 0.937, RFI = 0.901, SRMR = 0.0579, RMSEA = 0.046, GFI = 0.854.
Abbreviations: CFI, comparative fit index; CMIN, minimum discrepancy; GFI, goodness of fit index; IFI, incremental fit index; NFI: normed fit index; RFI, relative fit index; RMSEA: root mean square error of approximation; SRMR: standardized root mean square residual; TLI: Tucker–Lewis index.
* $p < 0.05$.
** $p < 0.01$.
*** $p < 0.001$.

Second, all hypotheses regarding personal and societal benefits were strongly supported. The results indicate that when assessing the perceived value for users, individuals prioritize factors such as time savings (H3), enjoyment (H4), ease of use (H5), and user image (H6). Moreover, when evaluating the perceived value for society, factors such as traffic congestion reduction (H10), environmental friendliness (H11), and city image (H12) are considered important.

In contrast, monetary cost (H7) and noise (H13) were negative factors affecting the perceived value for users and society, respectively. The findings imply that both individual consumers and society at large consider air taxi costs and noise issues to be significant factors. In particular, the negative effect of monetary cost on perceived value suggests that high costs could exacerbate societal polarization by limiting air taxi services' accessibility to lower-income groups.

Meanwhile, regarding the hypotheses related to individual sacrifices, neither user safety risk (H8) nor user privacy risk (H9) was supported. This suggests that personal safety and privacy issues do not significantly influence the perceived value for Korean potential users of air taxis. Within the domain of societal sacrifices, the city security risk hypothesis (H14) was not supported. These findings contrast with previous research conducted on Western subjects [10, 19, 20, 25], suggesting that safety, privacy, and security concerns do not substantially impact Koreans' perceptions of air taxi value.

Furthermore, these results imply that cultural differences affect the way potential consumers perceive air taxis. The effects of cultural background upon the acceptance of new technologies have been extensively studied [57, 58]. In the context of air taxis, Koreans may exhibit different cultural tendencies compared to their Western counterparts. Remarkably, user image and city image emerge as newly significant determinants in the acceptance of air taxis, highlighting the importance of this research. This observation aligns with the cultural traits of Koreans, who place high significance on "face," a concept defined as the socially desirable images that a person wishes to project to others [59–61]. Additionally, Korean culture tends to emphasize collective well-being and community benefits, whereas Western cultures often prioritize individual rights and personal freedoms [61]. This may lead to differing perceptions of risk associated with air taxis, particularly concerning privacy and safety.

*6.2. Practical Implications.* South Korea is preparing a long-term, phased commercialization roadmap starting with the launch of the K-UAM service in 2025. Based on earlier derived research results, we propose practical business models for K-UAM to successfully achieve commercialization and popularization. Particularly in the early stages of air taxi introduction, it is necessary to establish differentiated strategies focusing on business models for special purposes rather than daily commuting means of transportation. This is because economic feasibility is likely to be the most critical factor in the short-term commercialization of air taxis.

First, tourism and experiential marketing businesses using air taxis are feasible. As shown in the analysis results, in the Korean context, user enjoyment along with user image and city image emerged as important factors. Considering these factors, it seems possible to offer air taxi products that provide unique experiences centered around popular tourist destinations in South Korea.

Second, premium services are designed to target high-income and time-sensitive customers. This business model prioritizes time savings, ease of use, and traffic congestion reduction—factors that are highly valued by Korean consumers. In the initial stage, by operating routes between major business centers and key transportation hubs such as airports and train stations, the service can highlight its efficiency and convenience. Customers are willing to pay high fares, which can help recover initial investments. However, as the service matures, policymakers and businesses should gradually shift their focus to address potential socioeconomic disparities. To balance the need for initial investment recovery with long-term social inclusivity, it is crucial to develop varied pricing strategies and consider subsidy options that ensure that air taxi services are perceived as inclusive and equitable to people from all socioeconomic backgrounds.

Third, emergency logistics transportation services using air taxis enable the rapid transportation of essential medicines in the medical field. For instance, they can also effectively distribute relief supplies and life-saving equipment in disaster situations. This model can operate through public–private partnerships, supported by financial assistance and policy priorities. Ultimately, integrating these business models as part of public services can contribute to long-term social stability and sustainability.

Finally, developing effective marketing strategies and narratives is crucial to effectively communicate the value proposition of air taxis to potential users and society at large. Stakeholders should focus on highlighting the individual and societal benefits of air taxis, while addressing noise concerns through public demonstrations. Understanding cultural differences is also essential for policymakers and industry stakeholders to foster public acceptance and ensure successful implementation in diverse regions. For instance, in Korea, promoting air taxis as a means to enhance national prestige and personal status may be more effective than addressing privacy concerns or emphasizing strict safety measures. By leveraging these tailored marketing and communication strategies, alongside the proposed business models, stakeholders can build a strong and persuasive narrative that supports the long-term sustainability and successful integration of air taxi services into existing transportation infrastructure.

*6.3. Academic Implications.* This paper offers two notable academic implications. First, this research constitutes the initial effort to systematically classify factors influencing air taxi acceptance into individual and societal dimensions. The confirmed hypotheses demonstrate that the intention to adopt air taxis is influenced by the perceived value for both users (H1) and society (H2), thus validating this innovative classification approach. Unlike the acceptance of conventional digital products or services, the adoption of large-scale technologies, which have extensive societal impacts, necessitates both individual consumer decisions and community consensus. Similarly, Upham, Oltra, and Boso's [62] work highlights the complexity of acceptance when both personal convenience and broader societal impacts are involved. In the context of air taxis, perceived personal value might center on individual convenience, time savings, and status, while perceived societal value could encompass broader considerations such as environmental impact, urban planning integration, and public safety. By distinguishing these values, we can better understand the multifaceted public acceptance of air taxis and develop strategies to address both personal and societal concerns. This study, therefore, emphasizes the importance of considering a comprehensive array of public issues, including environmental concerns, in public acceptance studies for disruptive innovations.

Additionally, this study employed a VAM-based research model for investigating the acceptance of air taxis, including UAM. Previous studies on air taxi acceptance primarily utilized the TAM, known for its adaptability across various technologies. However, the VAM is found to be more appropriate for assessing a wide range of variables, encompassing both the anticipated positive and negative outcomes associated with adopting a technology or service. Furthermore, given that air taxis operate at the intersection of the energy and transportation sectors, we demonstrate the VAM's versatility and its relevance in evaluating the public acceptance of technologies within these fields. For instance, Lu and Wang [45] applied value perception to explore how perceived value, defined in terms of benefits such as convenience and sacrifices such as safety concerns, influenced travelers' intentions to adopt ride-hailing services. Similarly, research by Kim et al. [30] on electric vehicles in Korea demonstrated that perceived value plays a crucial role in shaping adoption intentions.

This study also suggests the potential for expanding the VAM, which primarily focuses on cognitive evaluations of benefits and sacrifices, to include technology-induced emotions. Emotions specifically triggered by the use of new technologies can significantly influence perceived value and adoption intentions. Negative emotions such as safety concerns could amplify perceived sacrifices, thus diminishing perceived value, just as enjoyment (H4) enhances the perceived value for users. By integrating these technology-specific emotional responses, the VAM model can offer a more comprehensive understanding of how users evaluate and adopt innovative technologies such as UAM.

In summary, positive and negative perceptions about a certain technology are each allocated into perceived benefits and perceived sacrifices, which are further classified based on whether the impact of adopting the technology affects individuals or society. This approach enables a more realistic prediction of technology acceptance behaviors by better understanding the multifaceted consequences of implementing new technologies.

*6.4. Limitations and Further Studies.* This study was conducted to analyze the factors influencing air taxi acceptance by targeting experts and the general public. Unlike previous studies, the results of this research revealed meaningful findings in the Korean context, which are expected to help establish government policies and build business models. However, several limitations exist as this research was conducted before the full implementation of air taxi services. Accordingly, it will be necessary to track changes in perceptions of air taxi acceptance among actual users over time, especially as pilot projects and commercialization stages progress. This will provide insights into how actual experiences with air taxis influence long-term adoption intentions.

In the future, we also intend to explore broader factors influencing the acceptance of fully autonomous air taxis beyond 2030 that were not fully explored in this research. While this study explains the various factors influencing the adoption of air taxis, it primarily focuses on attributes inherent to air taxis themselves. As Fishbein and Yzer [63] emphasize, social norms may shape the perceived acceptability of air taxis within a community, while individual capabilities, such as familiarity with new technology, and environmental constraints, such as infrastructure and regulatory conditions, may determine whether individuals can act on their intentions. Among these constraints, the strategic placement of vertiports in urban areas with limited transportation infrastructure will also be a key consideration in future research.

Another important area for future research is to investigate how users weigh personal versus societal value in their decision to adopt air taxis. This investigation aims to understand how different segments of the population prioritize these values and how these priorities influence their adoption behavior. We plan to conduct further studies that will explore the moderating effect of a user's tendency toward ethical consumerism on the relationship between perceived personal and societal values and adoption intention. This is because ethical consumption refers to the degree to which individuals consider the ethical implications of their consumption choices, such as environmental impact, social responsibility, and sustainability.

Future studies should integrate these factors to ensure that air taxis are designed and implemented in a way that maximizes both personal and societal values, thereby enhancing public acceptance.

## Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

## Conflicts of Interest

The authors declare no conflicts of interest.


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