ISSN: 1648-715X / eISSN: 1648-9179

VILNIUS TECH
Vilnius Gediminas Technical University

INTERNATIONAL JOURNAL OF STRATEGIC PROPERTY MANAGEMENT

2025
Volume 29
Issue 5
Pages 398–408
https://doi.org/10.3846/ijspm.2025.25134

ESTABLISHMENT OF HOUSING TRANSFER INSPECTION ITEMS USING SEM: EMPIRICAL STUDY IN TAIWAN

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Article History:
- received 19 December 2024
- accepted 24 July 2025

Abstract. Disputes during the housing transfer process often lead to dissatisfaction for homeowners. This study aims to address these issues by (1) proposing a comprehensive house inspection guideline with key items and criteria, and (2) evaluating how inspection services influence homebuyers' purchase intentions and perceived value. Based on comprehensive literature review and expert input, eight major inspection categories and 43 criteria were identified. These formed the basis for a Structural Equation Modeling (SEM) framework and three hypotheses. A pilot survey with 50 participants confirmed strong reliability (Cronbach's Alpha: 0.880–0.945). Of 500 distributed questionnaires, 206 valid responses were collected. SEM analysis showed that inspection services significantly enhance both purchase intentions and perceived value, with R^2 values exceeding 79% in most areas, except for environmental inspections. Building structure, water supply/drainage and water leakage are the most influential findings in shaping perceived value. These results highlight the importance of targeted inspection services in addressing homebuyer perceived value and improving the overall housing experience in Taiwan.

Keywords: house inspection, Structural Equation Modeling (SEM), perceived value, housing transfer.

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1. Introduction

In the past, homebuyers in the housing market primarily sought a stable and simple living environment. However, as living standards improved, people began to desire more comfortable and livable homes with ample space, modern amenities, and convenient access to nearby facilities (Qiao et al., 2024). Additionally, the rapid development of the telecommunications industry and the growing focus on smart cities and living environments have further shifted buyer preferences (Mo et al., 2024). Today, the demand has evolved from basic needs to a desire for multifunctional buildings. House inspections play a critical role in real estate transactions. Not only do they help buyers ensure that the home is comfortable and habitable by seeking expert opinions, but they are also necessary for ensuring that the transaction proceeds smoothly and legally (Chen et al., 2023). However, a standardized system and information symmetry for house inspections is still lacking, and much of the process depends on the seller's quality. As a result, disputes can arise after transactions when inspections are insufficient or overlooked (Koch, 2018).

Information asymmetry is common in the housing market and can easily lead to losses for homebuyers, even undermining their confidence in making a purchase. For developers or real estate agents, this means they must invest more manpower and costs to convince consumers and boost their trust and willingness to buy. Additionally, in the absence of a standardized home inspection and handover system, there is a risk of unreliable inspection agencies conducting inspections arbitrarily or unscrupulous developers inflating prices. Such practices not only negatively impact the housing market but also weaken the confidence of reputable sellers, with disputes frequently arising as a result (Miah, 2021; Wright, 2021). Disputes in housing and real estate construction are widespread, with 4.7 million cases reported in New York in 2009 alone. Although the figures are lower in Taiwan, the number of disputes remains significant – 1,912 cases in 2014, 1,753 in 2015, 1,834 in 2016, and 1,735 in 2017 (Sonik & Herrera, 2022). Understanding homebuyers' purchase intentions and perceived value is essential for addressing information asymmetry and helping to reduce such conflicts.

The objectives of this research are twofold: (1) to present a comprehensive house inspection guideline outlining the necessary inspections and criteria, and (2) to assess the impact of house inspection services on homebuyers' purchase intentions and their perceived value of housing products. The houses in this study are limited to residential properties and exclude buildings intended for other uses. Since declared monuments in Taiwan typically refer to buildings or structures over 50 years old, all houses included in this study are less than 50 years old and thus subject to housing transfer inspection.

2. Literature review

The research on house inspections aims to enhance buyers' trust and confidence in the properties they intend to purchase. Studying purchasing behavior and perceived value is essential to identify the factors that have the most significant impact on attracting potential buyers (Tan et al., 2020). To gain deeper insights into consumer purchasing behavior, it is crucial to incorporate elements of sociology, psychology, economics, and marketing into the analysis. Scholars divide the concept of purchasing behavior into two definitions: the narrow definition focuses on consumers' direct purchasing actions to acquire goods or services, including the decision-making process (Korfmacher & Holt, 2018). The broader definition encompasses not only consumer behavior but also the purchasing behavior of businesses and other commercial organizations. According to previous studies, consumer behavior refers to the processes of seeking, purchasing, using, and evaluating products, services, and ideas to satisfy their needs (Robb et al., 2022; Chakraborty et al., 2024).

Numerous studies have explored the key elements and stages involved in consumer decision-making, often dividing the process into five distinct phases, consistent with established frameworks (Suzuki et al., 2022). Beyond decision-making behavior, perceived value plays a pivotal role in shaping a buyer's willingness to purchase, particularly in the context of property. Consumer perceptions and values are influenced by their sensory and physiological experiences, which affect how they evaluate products and services (Cao et al., 2020). Research by Sonik and Herrera (2022) emphasizes that American consumers consider "perceived quality" and "perceived value" as major factors driving purchase intentions. Similarly, prior studies have shown that customer satisfaction is closely linked to perceived value. To fully understand this relationship, it is essential to first examine patterns in consumer behavior (Becker et al., 2023; Guenther et al., 2023; Martín, 2019).

When purchasing products or services, consumers typically compare the benefits they receive with the price they pay to make an overall assessment. A consumer's perceived value of a product reflects the balance between perceived quality and the costs or losses they incur. These two factors are compared to determine the perceived value. If the quality of the product or service outweighs the cost, it increases the consumer's willingness to purchase (Lau, 2018). This idea also forms the basis for models linking perceived value and purchase willingness, suggesting that overall customer value represents the benefits customers believe they will gain from a product or service, while overall customer cost refers to the expenses, they anticipate incurring (Goodall & Stone, 2024). Consumer value is commonly categorized into five key types that form the foundation of many consumer-related theories: (1) Functional Value: the practical or utilitarian benefits derived from a product's performance; (2) Social Value: the extent to which a product enhances the consumer's social image or acceptance; (3) Emotional Value: the feelings or emotional satisfaction gained through use; (4) Knowledge Value: the value derived from satisfying curiosity or acquiring new information; and (5) Contextual Value: the perceived value that varies depending on the time, situation, or environment of use (Nasreen & Ruming, 2021; Chen et al., 2023). Alternatively, perceived value is sometimes framed across four dimensions: emotional, social, quality/performance, and price/cost, offering a different lens for understanding consumer motivations and behavior (Alkhatib et al., 2024; Astrachan et al., 2014; Dash & Paul, 2021; Sweeney & Soutar, 2001).

Additionally, perceived price—both monetary and non-monetary—plays a significant role in influencing a customer's willingness to purchase products or services (Förster, 2024). Perceived monetary price refers to the financial cost that consumers associate with purchasing a product or service, while non-monetary price includes factors like time spent, effort in searching for the item, and other resources expended (Taufik et al., 2023). Research on consumer price acceptance highlights that every consumer has a certain price range they find acceptable for different products. If the price falls within this range, their willingness to purchase increases significantly (Blocker et al., 2023). Scholars further categorized perceived price, conducting an open survey of 94 business management students to examine the impact of market price information on their perceptions. The survey identified five negative and two positive roles of price (Blocker et al., 2023; Hasselwander & Weiss, 2024; Ciunova-Shuleska et al., 2024).

Negative roles:

- Value consciousness: Reflects the consumer's focus on the relationship between the price paid and the quality received.
- Price consciousness: Consumers prioritize purchasing items at the lowest possible prices.
- Coupon proneness: Discount coupons positively influence purchase decisions and increase the likelihood of buying.
- Sales proneness: Price promotions positively impact purchase evaluations, boosting the tendency to buy.
- Price mavenism: The degree to which an individual becomes a source of information on product prices and low-cost purchasing opportunities.

Positive roles:

- Price-quality schema: The common belief that higher prices are associated with better product quality.

- Prestige sensitivity: Consumers feel a sense of superiority and elevated status when purchasing higher-priced items.

3. Expert interview and variable selection

The industry involves numerous parties, each providing house inspection services and having different roles and perspectives. As a result, the items, methods, and levels of care in inspections can vary widely. To establish a comprehensive house inspection system, it is essential to first define and categorize the inspection items. This serves as a foundation for further research and analysis. Consequently, this chapter focuses on gathering case studies and insights from professionals across various fields within the housing inspection industry. The goal is to identify and summarize common inspection items and classify them to create a standardized house inspection protocol.

A literature review provides an initial understanding of the current state of the housing inspection industry, including its challenges and issues. To develop a comprehensive and systematic house inspection standard, it is crucial to gather insights from various professionals in the field. This involves conducting expert interviews to assess the needs of all stakeholders and examine the significance and necessity of house inspection from multiple perspectives (Chen et al., 2023; Ciunova-Shuleska et al., 2024). Experts in different roles within the housing inspection field are therefore invited to participate in interviews, addressing the following four key points:

1. What role does the expert play in the housing inspection industry?
2. What objectives does the expert aim to achieve in the house inspection process based on their role?
3. What goals do house buyers have for the house inspection? Are house inspection procedures essential for them?
4. What are the typical items inspected during the house inspection procedure?

Once the questions are finalized, interviews are conducted with experts from relevant fields within the housing inspection industry. The criteria for selecting these experts include: (1) a minimum of five years of experience in house inspection or related fields; and (2) representation from various roles in the industry, such as builders, construction companies, third-party inspection units, and other relevant personnel. Using these criteria, the study randomly sampled and interviewed ten experts in the housing inspection industry. The results of the interviews, including both the questions posed and the experts' responses, are summarized as follows:

1. The expert interviews in this study included professionals from various roles within the housing inspection industry. House inspection personnel, depending on whether they represent the seller or the buyer, have different concerns and approaches. Seller representatives generally conduct simpler inspections, aiming to facilitate the sale of the house. In contrast, buyer representatives perform thorough and detailed inspections to uncover any defects or weaknesses. They often offer a range of inspection services at different price points, with more expensive options providing more comprehensive and detailed assessments.
2. From the customer's perspective, when a house is delivered, the seller is expected to provide inspection personnel to assess the quality of the house. If buyers have additional quality requirements, they must hire an independent inspection service, which involves extra costs. Independent inspections are expected to ensure that the house meets quality standards and provides the buyer with peace of mind.
3. The interviews revealed that the goals and methods of house inspections vary depending on whether the inspector is representing the buyer or the seller. However, there are standard procedures that can help minimize or avoid disputes in real estate transactions.
4. During this phase of expert interviews, consultations were also held regarding house inspection guidelines, including the essentials and criteria for conducting inspections.

Tables 1 to 3 present detailed summaries derived from the four previously discussed sources. Table 1 emphasizes the importance of the house inspection project, Table 2 outlines findings related to homebuyers' willingness to purchase, and Table 3 illustrates customers' perceived value. Based on insights from the literature review and expert interviews, this study organizes the house inspection items into a structured, three-tiered hierarchy. The classification includes the following eight main categories: (1) Appearance and function; (2) Building structure; (3) Fire extinguishing system; (4) Water supply and drainage; (5) Power system; (6) Water leakage; (7) Environmental quality; (8) Contract document.

At this stage, drawing on the literature review, expert recommendations, and various practical house inspection forms, a set of housing inspection items has been identified and categorized into eight major categories based on their nature. These include essential items that should be inspected as well as non-essential items with higher added value. The initial classification is preliminary, with the intention to refine it further based on the results of a forthcoming questionnaire survey. This framework guides the development of question items for subsequent research. Additionally, any missing items or potential additions suggested by respondents during the survey is incorporated into the final framework to ensure its completeness and accuracy (Adekunle et al., 2024; Ahmad et al., 2024; Demirkesen et al., 2024).

Based on the literature review and expert input, the SEM questionnaire in this study is organized into three main sections: (1) Importance of house inspection items: This section assesses the perceived importance of various house inspection items, as structured through expert

Table 1. SEM questionnaire-operational definition and question items for housing inspection items

Variable	Operational definition	Question list	Source
Appearance and functional	Consumers attachment to house inspection items	Building appearance inspection	The structure of the housing inspection project developed by this research
		Check whether the installation of the item is correct and whether the specifications meet the requirements	
		Check whether the item is damaged, degraded, dirty, etc.	
		Verify the design quality of the building	
Building structure		Structural strength inspection (including external walls)	
		Interpretation of architectural condition	
		Tile inspection	
		Check the condition of the heat ventilation and air conditioning system as well as piping in the building	
Fire extinguishing system		Calculation of ventilation equipment efficiency	
		Fire protection zone inspection for kitchens in high buildings	
		Fire safety equipment inspection (including alarms)	
		Functional inspection of gas equipment and pipelines	
Water supply and drainage	Consumers attachment to house inspection items	Internal inspection of floor drainage	The structure of the housing inspection project developed by this research
		Functional inspection of water supply and drainage equipment and pipelines	
		Inspection of drainage pipe permeability, water trap, and water drainage slope	
		Water supply inspection and pressure detection	
Power system		General functional inspection of low-voltage power equipment	
		Inspection of lighting, socket wiring inspection and shunt load calculation	
		Power socket voltage/polarity (live wire and neutral wire) and grounding inspection	
		Leakage protection shunt inspection and function test	
		Check for household load and shunt non-fuse switch and wire diameter compliance	
		switchboard inspection	
		Telephone, Internet and TV line wiring methods and test	
Water leakage		Leakage and moisture hazard detection of roof system, wall, ceiling, floor and other building parts	
		Leakage detection of cold and hot water supply pipes	
		Bathroom and balcony floor leak detection	
		Inspection of the external spray water test of the airtight window	
		Caulking inspection	
Environmental quality		Air quality testing (PM2.5/formaldehyde/carbon monoxide/TVOC/HCHO/ trihalomethane)	
		Drinking water heavy metal detection	
		High/low frequency electromagnetic wave comprehensive intensity detection	
		Ionizing radiation detection in indoor space	
		Indoor natural lighting inspection	
		Equipment and pipeline noise inspection	
		Insulation efficiency test for roof panels and wall	
Contract document		Whether the work items stipulated in the contract are completed and whether the components are all installed	
		Verification of main building materials specifications and purchase contracts	
		Building (number of pings, area) measurement	

Table 2. SEM questionnaire-operational definition and question items for house purchase intention

Variable	Operational definition	Questions list
House purchase intention	Will the behavior of house inspection services increase the willingness of consumers to buy houses?	I might buy it because my house has a house inspection service
		I have a high probability of buying a house with house inspection services
		I plan to buy a house with house inspection service in the future. The probability is very high
		I tend to buy houses with house inspection services
		I am willing to try to buy a house with house inspection services

Table 3. Operational definition and question items of SEM questionnaire-perceived value

Variable	Operational definition	Questions list
Emotional value	Consumers' emotional recognition of house inspection services	I like the content of the house inspection service
		I think the house inspection service is necessary
		I would recommend the house inspection service to my friends
Knowledge value	Consumers' subjective understanding and knowledge of house inspection services	I know what kind of house inspection service is
		I know the impact of the house inspection service on the house
		I have enough knowledge of house inspection
Functional value	The usefulness of the product or service for the consumer	I think the inspection items of the house inspection service are helpful to the quality of the house
		At the price of the house inspection service I know, I think the house inspection service is excellent value for money
		I think the content of the manufacturer's house inspection service is clear and clear
Price value	Consumers' consideration for service quality and price	I think the service price paid is in line with the value of the quality of the house inspection I have received
		I think the price of house inspection service is a quality indicator
		I am willing to pay a higher price in order to get a better house inspection service

interviews. The operational definition refers to the extent to which consumers consider each component of the inspection process to be significant. Details of this section are presented in Table 1. (2) House purchase willingness: Willingness is defined as a subjective evaluation of the likelihood of engaging in a particular behavior. In this context, it pertains to purchase intention, operationally defined as a consumer's readiness or intent to purchase a given service. The related questions and definitions are outlined in Table 2, which presents the questionnaire items associated with purchase willingness. (3) Perceived value: Drawing from the literature discussed in Section 2, perceived value is defined as the consumer's subjective evaluation of the overall worth of a product or service offered by a company. It is further divided into four dimensions: emotional value, knowledge value, functional value, and price value. The operational definitions and associated questionnaire items for each dimension are provided in Table 3.

4. Questionnaire development and hypotheses

Structural Equation Modeling (SEM), also known as covariance structure analysis, is a statistical technique used to test hypotheses and analyze the theoretical internal structure of causality (Alhammadi et al., 2024; Al-Mhdawi et al., 2024; Waqar et al., 2024). This multivariate analysis method examines the relationships between latent variables and observed variables, similar to the relationship between true scores and observed scores in classical test theory (Waqar et al., 2023; Thneibat, 2024; Konanahalli et al., 2024). SEM integrates factor analysis and path analysis, encompassing both measurement and structural models (Chen et al., 2024; Emaminejad et al., 2024; Konanahalli et al., 2024). To meet the research objectives, the chosen method must satisfy several criteria: (1) it should maximize the explained variance of dependent constructs, (2) support exploratory and theory-testing research, (3) accommodate complex models with numerous constructs and indicators, (4) be appropriate for medium sample sizes, (5) require minimal assumptions about data distribution, (6) be suitable for early-stage theoretical frameworks, and (7) work well with reflective measurement models. Given these requirements, Partial Least Squares SEM (PLS-SEM) mixed with Covariance Based SEM (CB-SEM) is recommended (Al-khatib et al., 2024; Astrachan et al., 2014; Chen et al., 2024; Dash & Paul, 2021), as illustrated in Figure 1, the proposed SEM path diagram.

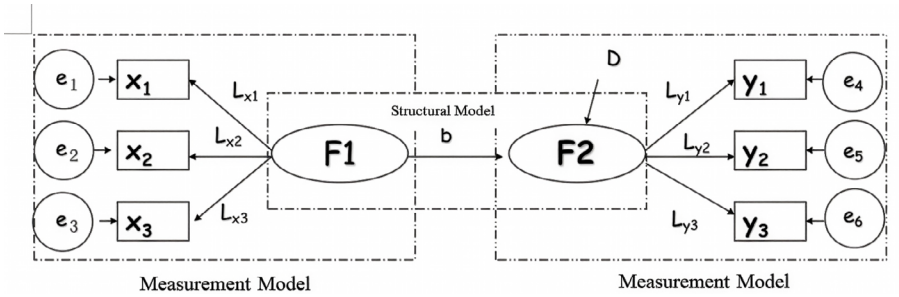


Figure 1. Schematic diagram of SEM path

1. Rectangle: represents the observation variable, generally denoted by x, y.
2. Ellipse: represents latent variables, generally denoted by ζ and η.
3. Circle: indicates the measurement error, generally denoted by δ and ε. This error reflects the discrepancy when observed variables x and y used to indirectly measure ξ and η; The circle also represents the structural error caused by the endogenous variable η impacting the exogenous variable ξ.
4. Oval → Rectangle: denotes the factor structure, illustrating the regression path between observed variables and latent variables.
5. Ellipse → Ellipse: represents causality, indicating the direct effect of an exogenous variable ξ on an endogenous variable η.

The SEM hypotheses and mechanisms were designed to examine how house inspection services affect house buyers' purchase intentions and the perceived value of housing products. Three hypotheses were proposed for this research illustrated in Figure 2.

Hypothesis 1 (H1): House inspection positively influences house purchase willingness.

Hypothesis 2 (H2): House purchase willingness positively affects customer perceived value.

Hypothesis 3 (H3): House inspection services positively impact customer perceived value.

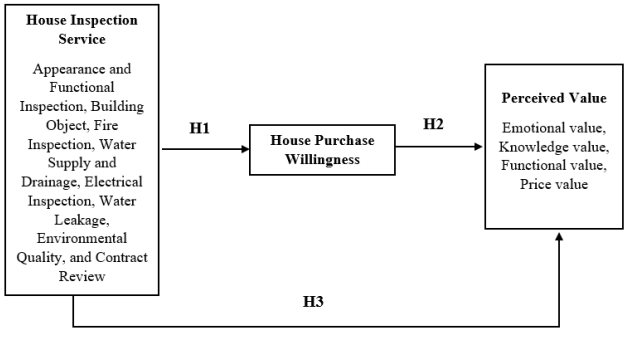


Figure 2. The SEM hypotheses diagram

5. Result analysis and discussion

The questionnaire returns were analyzed using AMOS (Analysis of Moment Structures) software. Prior to distributing the main questionnaire, a pre-test analysis was conducted using a sample of 50 responses to evaluate the clarity, reliability, and suitability of the survey items. The questionnaire also gathered eight key demographic and background variables: gender, age, education level, occupation, personal monthly income, intended use of the property, willingness to purchase, and prior experience with house inspections. Based on the results of the pre-test, the final questionnaire was developed with a total of 55 items, including 38 questions on house inspection projects, 5 questions on purchase intention, and 12 questions on perceived value. All items were measured using a five-point Likert scale. The Cronbach's alpha values ranged from 0.856 to 0.945, indicating high reliability and strong internal consistency across the constructs.

The finalized SEM questionnaire consisted of three primary sections, each corresponding to the eight major house inspection categories: Appearance and function, Building structure, Fire extinguishing system, Water supply and drainage, Power system, Water leakage, Environmental quality, and Contract documents. A total of 500 questionnaires were distributed, with 217 valid responses collected after excluding 11 invalid entries, yielding an overall response rate of 42.6%. Among the respondents, 140 were male, accounting for 68% of the total, while 66 were female, representing 32%. The majority of respondents were male. In terms of age, the largest group was 41–50 years old, comprising 42.2% of the sample, followed by those aged 31–40, who made up 27.2%. Regarding education level, most respondents held a college or university degree (54.4%), followed by those with a graduate degree (27.2%). In terms of occupation, the primary groups were from the service industry (28.2%), public service/education sectors (15.5%), and manufacturing (15.5%). The primary purpose for purchasing a home was self-use (86.4%). As for purchase intention, the majority had already purchased a home (48.5%), while 38.3% indicated they intended to

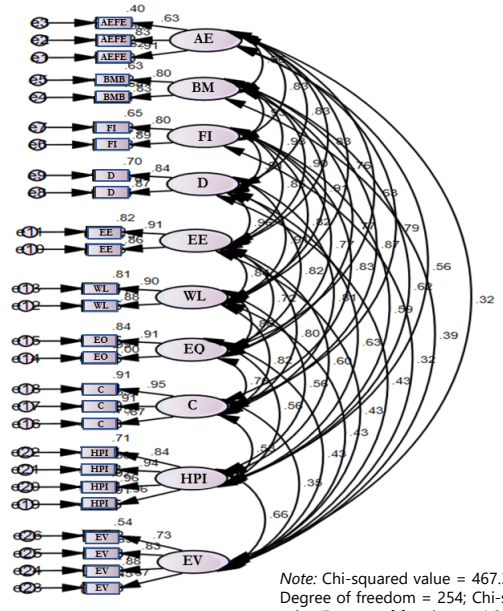
buy. A total of 94 respondents (45.6%) had prior experience with house inspections. Among them, 48.9% had conducted inspections three or more times, while 36.1% had done so once. The analysis process was carried out in three steps:

1. Calculate the Pearson correlation coefficient matrix and remove items with excessively high correlations.
2. Perform reliability analysis using internal consistency. Items with a Cronbach's Alpha coefficient greater than 0.7 indicate high internal consistency (Chen et al., 2024). If the coefficient is below 0.7, the questions will be revised, merged, or removed.
3. Apply factor analysis to eliminate questions with a commonality score below 0.5.

SPSS software was used to calculate the Cronbach's Alpha coefficients in this research. AMOS 25.0 software was utilized to verify and analyze the structural equation model. This study examines potential variables by constructing structural equations based on eight major test items, purchase intentions, and perceived value. Confirmatory Factor Analysis (CFA) was employed to assess how well the measured variables represent the underlying constructs. The model evaluation included eight indicators: χ^2/DF, AGFI, GFI, RMSEA, CFI, SRMR, and TLI. Chi-square/degree of freedom (χ^2/DF): The chi-square test is sensitive to sample size, so the ratio of chi-square value to degrees of freedom is used to evaluate model fit. A smaller χ^2/DF ratio indicates a better fit between the model and the observed data. Typically, a ratio less than 3 is considered good, though some scholars suggest that a ratio less than 5 also indicates acceptable fit (Chen et al., 2021).

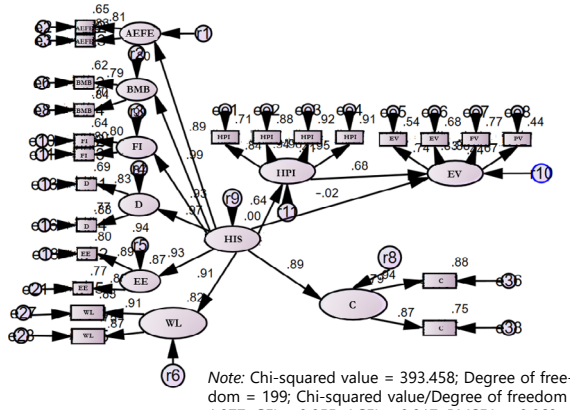
- Adjusted Goodness of Fit Index (AGFI): The AGFI adjusts for the number of parameters and observed variables, providing a fit measure that is not affected by sample size. A value greater than 0.9 is typically considered acceptable (Chen et al., 2021). However, due to the difficulty in achieving this threshold, some scholars recommend a lower standard of 0.8, which is adopted in this study (Chen et al., 2021).
- Goodness-of-Fit Index (GFI): The GFI value ranges from 0 to 1, with values closer to 1 indicating a better fit of the model. Achieving a GFI of 0.9 is challenging, so a more relaxed standard of 0.8 is sometimes used, which is also applied in this study (Chen et al., 2024).
- Root Mean Square Error of Approximation (RMSEA): RMSEA measures the model's approximation error. Values less than 0.08 suggest good fit, while values greater than 0.1 indicate poor fit (Chen et al., 2021, 2024).
- Comparative Fit Index (CFI): CFI is unaffected by sample size and performs well even with small samples. A CFI value closer to 1 indicates a better model fit, with values above 0.9 generally considered acceptable (Chen et al., 2024).
- Standardized Root Mean Squared Residual (SRMR): SRMR reflects the normalized residual variability, with values between 0 and 1. A value below 0.05 is considered acceptable for model fit (Chen et al., 2024).
- Tucker-Lewis Index (TLI): TLI values closer to 1 indicate better model fit, with values above 0.9 generally considered indicative of a good fit (Chen et al., 2024).

The measurement model and path analysis are illustrated in Figures 3 and 4. After obtaining results from the 8 indicators, we calculated the Composite Reliability (CR) and Average Variance Extracted (AVE) values. The recommended threshold for combined reliability is 0.6 or higher (Chen et al., 2024), while the recommended threshold for AVE is 0.5 or higher (Chen et al., 2021). In this study, the CR values for overall combined reliability ranged from 0.83 to 0.96, exceeding the 0.6 threshold, and the AVE values ranged from 0.611 to 0.923, meeting the recommended minimum of 0.5. These results are presented in Table 4. To test the hypotheses, we calculated the Path Analysis values and T values, with results shown in Table 5. The findings indicate that Hypotheses H1 and H3 were supported, while Hypothesis H2 was not.



Note: Chi-squared value = 467.338; Degree of freedom = 254; Chi-squared value/Degree of freedom = 1.840; GFI = 0.860; AGFI = 0.807; RMSEA = 0.06; CFI = 0.961; TLI = 0.950; SRMR = 0.022.

Figure 3. Overall measurement model



Note: Chi-squared value = 393.458; Degree of freedom = 199; Chi-squared value/Degree of freedom = 1.977; GFI = 0.955; AGFI = 0.817; RMSEA = 0.069; CFI = 0.955; TLI = 0.947; SRMR = 0.025.

Figure 4. Overall structure model

Table 4. Combined reliability CR value & variation in extraction of AVE

Item	Combined reliability CR value	Average variation extraction of AVE
Appearance and functional inspection	0.838	0.638
Building structure	0.798	0.664
Fire extinguishing system	0.834	0.716
Water supply and drainage	0.845	0.732
Power system	0.949	0.903
Water leakage	0.884	0.792
Environmental quality	0.960	0.923
Contract document	0.936	0.829
Purchase intentions	0.960	0.858
Perceived value	0.862	0.611

Table 5. Hypothetical verification

Item	Basic statistical analyses	*T* value (significance)	Hypothetical verification
House inspection → House purchase intentions	0.64	9.093***	H1 was established
House inspection → Perceived value	–0.02	0.258 (0.797)	H3 was not established
House purchase intentions → Perceived value	0.68	7.056***	H2 was established
House inspection → Appearance and function	0.89	14.280***	–
House inspection → Building structure	0.99	14.531***	–
House inspection → Fire extinguishing system	0.93	–	–
House inspection → Water supply and drainage	0.97	15.264***	–
House inspection → Power system	0.93	14.412***	–
House inspection → Water leakage	0.91	13.341***	–
House inspection → Environmental quality	–	–	–
House inspection → Contract document	0.89	14.760***	–

Note: *** $p < 0.001$.

The statistical analysis results and CR values are presented in Table 5. The findings support the first hypothesis, confirming that house inspection services positively influence consumers' willingness to buy a house. The second hypothesis is also supported, indicating that a higher willingness to purchase a house enhances the perceived value of the property. This suggests that a strong willingness to buy correlates with a greater perceived value. Additionally, providing high-quality house inspection services can enhance transparency, bolster consumer confidence, and increase willingness to purchase. Consumer expectations regarding housing and environmental quality also impact the quality of construction projects by builders.

When consumers are highly motivated to purchase a house, they tend to have a thorough understanding of housing information and the house inspection process. Consumers seek not just a reputable house inspection company, but also high-quality inspection services. To ensure meaningful house inspections, consumers need to be informed about the content, cost, and scope of the inspection; otherwise, the inspection may become a mere formality without enhancing the quality of the house. The eight major house inspection projects significantly influence the overall service quality, with impacts varying based on the type of housing, such as pre-sale homes, middle-aged properties, new constructions, and collective housing. To evaluate the relationship between house inspection services and their impact, R^2 values were calculated, as shown in Table 6. A higher R^2 indicates a stronger ability to explain the relationship between the inspection items and perceived value. The R^2 values for each aspect are above

Table 6. Calculation result of R^2

Item	R^2
House inspection service	1.000
Appearance and function	0.80
Building structure	0.98
Fire extinguishing system	0.86
Water supply and drainage	0.94
Power system	0.87
Water leakage	0.82
Environmental quality	–
Contract document	0.79
Purchase intention	0.40
Perceptual value	0.44

79%, except for environmental inspection, which is less directly related to the property itself. These results confirm that seven aspects of house inspection criteria are directly linked to buyers' perceived value.

The above-mentioned findings can be effectively linked to UN Sustainable Development Goal (SDG) 11: Sustainable cities and communities, particularly its targets related to safe, inclusive, resilient, and sustainable housing and urban development. (1) Informed and motivated consumers promote safer housing choices (SDG 11.1): When consumers are highly motivated and well-informed about the house inspection process, they are more likely to select homes that meet safety and quality standards. This reduces the risk of post-purchase issues and contributes to the development of safe and resilient communities. (2) High-quality inspection services enhance urban housing standards: The demand for reputable and high-quality inspection services drives improvement in industry practices. This ensures that housing units, whether pre-sale, newly built, or older constructions, meet minimum structural, environmental, and safety criteria, aligning with SDG 11.3—enhancing inclusive and sustainable urbanization. (3) Transparency in inspection content, cost, and scope promotes accountability: When consumers understand the details of what inspections cover, the process becomes meaningful rather than procedural. This supports sustainable governance of housing markets, echoing SDG 11's focus on participatory, integrated decision-making and transparency. (4) Quantitative evaluation (R^2 values) reinforces evidence-based urban planning: The use of R^2 values to assess the impact of inspection criteria on perceived value supports data-driven decision-making, which is essential for planning sustainable, inclusive housing policies under SDG 11. (5) Customization by housing type supports inclusivity and affordability Recognizing that inspection needs vary by housing type (e.g., pre-sale vs. collective housing) helps tailor services to diverse populations and housing conditions. This aligns with SDG 11.1 and 11.3, which emphasize equitable access to adequate housing for all. (6) Environmental inspection as an emerging but underused component: The relatively lower R^2 for environmental inspection suggests a gap that can be improved to better support SDG 11.6, which focuses on reducing the environmental impact of cities, including housing-related issues such as pollution and resource efficiency.

Among the seven major factors that Taiwanese customers associate with perceived value, elements such as the power system, appearance, and fire extinguishing system are consistently important across all regions. However, building structure and water supply/drainage systems hold exceptional significance. This emphasis reflects the unique living environment in Taiwan, where residents face frequent earthquakes, heavy rainfall, and high humidity. Additionally, water leakage closely linked to both structural integrity and drainage performance emerges as a critical concern, further influencing perceived value. These three factors are particularly distinctive compared to other regions globally. Therefore, it is recommended that areas with similar environmental conditions take these findings into consideration. For environmental quality, in today's Taiwan society, when conducting house inspections and handovers, environmental quality items are relatively few. However, this does not mean that consumers do not care about them. Rather, when purchasing a home, buyers have already considered factors such as the location of the house, whether there is sufficient natural lighting, and the severity of surrounding noise. They only proceed with the purchase if they find these aspects acceptable. Therefore, it's unlikely they would start complaining about such issues during the inspection and handover phase, as these problems are not newly emerging at that point. Factors such as surrounding road noise and natural lighting are already known and unrelated to construction quality or other environmental factors. This is the main reason that makes this dimension ranked last.

The theoretical implication highlights how the SEM-validated inspection framework enhances academic understanding of the key factors influencing housing transfer decisions from the perspective of customer perceived value. On the practical side and societal impact, the findings emphasize that structural integrity is the top priority during home inspections, particularly given Taiwan's high seismic activity. Additional critical aspects include drainage slope, bathroom fixtures, and the positioning of drainage outlets. An inadequate slope can hinder proper drainage and increase the risk of flooding. Bathroom systems are examined to ensure smooth drainage and sufficient water pressure. For high-rise residents, pressure booster systems are essential; without them, low water pressure can cause significant inconvenience. Furthermore, poorly designed piping, leading to frequent clogs and drainage issues, remains a common and persistent complaint. Water leakage is often directly associated with efflorescence. As urban development continues to expand rapidly, construction interfaces have become increasingly complex. Poor construction quality and errors, combined with the frequency of earthquakes and heavy rainfall in urban areas, have indirectly contributed to leakage issues. Water leakage that affects residents' property has been a long-standing concern and the results of this study also reflect these findings.

6. Conclusions

Conducting inspections during house transactions is essential to ensure that the process proceeds smoothly, transparently, and in compliance with legal standards. Although house inspections have been practiced for decades, their quality often varies and is largely influenced by the seller. Inadequate or overlooked inspections can lead to post-transaction disputes, underscoring the need for standardized practices. This study aims to develop standardized house inspection criteria using the SEM approach. The research began with an extensive literature review to establish a preliminary guideline for house inspections,

focusing on core inspection items and evaluation criteria. This was followed by expert interviews to refine the SEM hypotheses and construct the theoretical framework. Based on prior research and using a convenience sampling method, 10 experts identified eight major aspects of house inspection, comprising a total of 43 criteria. These aspects were categorized into three core hypotheses: (H1) House inspection positively influences purchasing decisions, (H2) Willingness to purchase positively affects customers' perceived value, and (H3) House inspection services positively influence customers' perceived value. A pilot survey was conducted with 50 participants to assess the reliability of the SEM-based questionnaire. Cronbach's Alpha values for all eight aspects ranged from 0.880 to 0.945, well above the 0.70 threshold, indicating strong internal consistency and suitability for wider application. A nationwide survey was subsequently distributed, yielding 206 valid responses from a sample of 500 participants. Data analysis confirmed the proposed hypotheses, with significant path coefficients for H1 (9.093) and H3 (7.056). Additionally, the R^2 values for each inspection aspect exceeded 79%, with the exception of environmental inspection, which was found to be less directly related to the physical attributes of the property.

These findings confirm that seven of the eight key house inspection criteria are strongly correlated with buyers' perceived value and can be meaningfully aligned with UN SDG 11: Sustainable cities and communities, particularly its focus on promoting safe, inclusive, resilient, and sustainable housing. The results suggest that while house inspection services play a critical role in shaping purchasing decisions, their influence on perceived value is indirect. Instead, their impact is mediated through purchase intention. In other words, comprehensive and high-quality house inspections increase buyers' willingness to purchase, which subsequently enhances their perceived value of the property. The SEM-validated inspection framework deepens theoretical understanding of housing transfer decisions through the lens of customer perceived value. Practically, the study underscores the importance of structural integrity in home inspections, especially in earthquake-prone Taiwan. Key concerns include drainage slope, water pressure, and bathroom fixture performance—issues that affect daily living. Poor piping design and inadequate pressure systems often cause drainage problems, especially in high-rises. Water leakage, frequently linked to efflorescence, remains a widespread issue due to rapid urban development, construction flaws, and natural factors like earthquakes and rainfall. These findings reflect long-standing concerns affecting residential property conditions. Future research could perform cross-analyses of various housing types and compare different regions to identify potential variations. Based on the findings, it is recommended to establish standardized guidelines, with certification granted upon passing a qualification exam. Prior to the exam, candidates should complete relevant training to ensure their professional competence is properly demonstrated and validated.

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