

Transaction Cost Economics Framework Development for Malaysian Housing Development

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Abstract: Housing development is a high-risk, multifaceted and cross-subsidies business. Therefore, it is essential to thoroughly evaluate its viability through comprehensive feasibility studies. It is imperative to carry out meticulous investment appraisals, specifically in the realm of Malaysian housing developments, known for their substantial regulatory expenses that consequently elevate housing costs. Thus, this study aims to demonstrate the development of the transaction cost economics (TCE) framework recommended to unbundle the hidden cost components within the housing development processes. TCE adoption is useful to coordinate and optimise the economic activities within these processes. To overcome the shortcomings of TCE, the RIBA Plan of Work 2013 stages and key tasks are integrated with the housing development stages, processes and cost components to determine the essential economic activities, highlighting the corresponding parties, processes and costs. The TCE framework is established by experts from various sectors, including government agencies, local authorities, professionals and developers. This is achieved through the use of sequential explanatory mixed methods, which are employed to handle the diverse variables and aspects that hinder the nature of the research. Initially, a literature review identified 26 anticipated TCE components. However, data gathering revealed a total of 38 TCE components. The open-ended questionnaire and semi-structured interview were analysed and triangulated using frequency analysis, content validity ratio analysis and content analysis to ensure all necessary elements were included and unnecessary items removed. Eventually, the findings are applied in the development of the proposed TCE framework for Malaysian housing development. This framework outlines the necessary economic activities along with their associated development costs and TCE categorisation. It can be used to accurately prepare feasibility studies. To conclude, the research outcome improves the efficiency of economic transactions in Malaysian housing development by identifying and organising the various cost components involved, allowing for the optimisation of transaction costs and increased transparency of housing development expenses.

Keywords: Transaction cost economics (TCE), Malaysian construction industry, Malaysian housing development, Framework development, Construction management practices

INTRODUCTION

Despite its importance in human sociological and developmental needs, as well as acting as a country's performance measurement tool, many people still struggle to afford a house (Ismail et al., 2019; Baqutaya, Ariffin and Raji, 2016; Samad et al., 2016; Osmadi et al., 2015). Malaysia has also regrettably fallen under this housing affordability issue. The World Bank Group in *The Malaysian Reserve* (Kaur,

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2019) and Khazanah Research Institute (2015) reported that housing affordability in Malaysia has decreased over time, with numerous states now having housing that is "severely unaffordable" (Hassan, Ahmad and Hashim, 2021; Kaur, 2019). This scenario is further supported by the Ministry of Finance Malaysia's report in 2019, which showed a housing median multiple affordability score of 4.1, indicating that house prices in Malaysia are considered to be seriously unaffordable (Ministry of Finance Malaysia, 2020).

Adequate housing is considered one of the many responsibilities of the government. Hence, the legal responsibility for adequate housing in Malaysia is shared by both the federal and state governments, with local authorities falling under the jurisdiction of the state government. As a result, the Malaysian housing industry is a multifaceted business and is highly regulated by various laws, policies, guidelines and standards, imposed at the federal, state and local government levels (Foo, 2020; CIDB [Construction Industry Development Board Malaysia], 2021) which makes it a highly risky business.

Extensive research has been undertaken on the factors influencing the demand and supply of production to identify the underlying causes of high housing prices. The demand factors for housing include demographic characteristics, the levels and distribution of income, the availability and cost of financing, government policies related to housing, taxation and property rights, as well as personal preferences such as location and house size. On the other hand, the supply factors for housing include land costs, government policies regarding land usage and planning, financing availability and cost and construction costs including materials, machinery and equipment and labour expenses (Yakob, Yusof and Hamdan, 2012; Khazanah Research Institute, 2015; Panagiotidis and Printzis, 2016; Osmadi et al., 2015; Kamal, Hassan and Osmadi, 2016; Olanrewaju et al., 2018; Yap and Ng, 2018; Foo, 2018; Zaini, Arupin and Hadi, 2020; Amit, Sapiri and Yusof, 2020; Hassan, Ahmad and Hashim, 2021; Daud, Rosly dan Sori, 2022; Musaddad, Maamor and Zainol, 2023).

Interestingly, both demand and supply perspectives further delineate that the need to fulfil the government's policies is one of the key factors that increase housing prices (Khazanah Research Institute, 2015; Samad et al., 2016; Tan, Samihah and Phang, 2017; REHDA [Real Estate and Housing Developers' Association] Selangor, 2019; Hassan, Ahmad and Hashim, 2021; Liu and Ong, 2021; CIDB, 2021). Various studies in developed countries, such as the United Kingdom and the United States, also agree that town planning practices partly contribute to the increase in land prices and housing prices (Ahmad, Ahmad and Aziz, 2009; REHDA Selangor, 2019).

As explained previously, the demand and supply factors of production, as well as fulfilling government policies and the housing development processes, affect the housing prices and the housing development cost components. This leads to the suggestion of analysing the Malaysian housing development processes and cost components from the perspective of feasibility studies. The housing development cost components consist of three major elements: land costs, hard costs and soft costs (Foo, 2018). Foo (2020; 2018) further emphasised that Malaysia's average building cost per square meter is relatively low, whereas capital contributions and compliance costs, such as development charges and planning authorities, can range from 2.8% to 19.9% of the gross development value (GDV) in high-rise development, or from 9.5% to 35.1% of GDV in landed development.

Malaysian housing developers face significant compliance costs due to numerous procedures involved in housing projects (Daud, Rosly and Sori, 2022; Tan, Samihah and Phang, 2017). These costs can range from 2.1% to 35.1% of the selling price of a typical unit, which is a substantial amount. As a result, many developers pass on these costs to the buyers, leading to an increase in housing prices (Liu and Ong, 2021; Yap and Ng, 2018; Tan, Samihah and Phang, 2017). REHDA Selangor (2019) suggested that reviewing or abolishing unnecessary compliance charges or fees can help reduce the costs of doing business, thereby incentivising developers to build more cost-effective housing. A CIDB report in 2021 also suggested reducing unproductive costs and minimising cross-subsidies to lower compliance costs.

Hence, this study aims to demonstrate the development of the transaction cost economics (TCE) framework, an economic tool recommended to unbundle the hidden housing development cost components within the housing development processes. The identification and determination of the essential transaction cost components, also known as economic activities, in their respective housing development stages and processes will assist in achieving process coordination. Additionally, the categorisation and types of transaction cost component according to respective development cost components (land, hard and soft costs) are important and will assist in achieving cost transparency. This provides a clear illustration of economic activities and cost components to be incorporated for a more accurate and precise feasibility study preparation.

TRANSACTION COST ECONOMICS OVERVIEW

Coase (1937) initially introduced transaction costs as “the costs of using the price mechanism in the market” and “the cost of coordinating economic activity” in his journal “The Nature of The Firm”. Williamson (1981) then further developed the concept by introducing the TCE theory. This introduction aimed to define transaction costs as the costs of running the economic system, encompassing the costs of agreement drafting, negotiating and enforcing, as well as governance and bonding costs for securing commitments. Additionally, Joskow (1985) further shaped the definition of transaction costs that include the costs to acquire and process information, organisation costs, legal or contractual costs, as well as costs resulting from pricing inefficiency and behaviour of production. Due to the evolution of the TCE theory, TCE application in the construction industry has been used to provide a platform to allow parties to have a better understanding of the hidden costs associated with project work (Rajeh, Tookey and Rotimi, 2013).

Transaction Cost Economics Application in the Construction Industry

The evolution of TCE theory has made its adoption in the construction industry viable, with adjustments tailored to accommodate the industry's unique and complex characteristics. Previous applications of TCE in construction have demonstrated potential to enhance project performance by improving contractual procedures, promoting long-term strategic procurement methods, enhancing cost estimation and identifying practical contractual solutions for specific circumstances. These improvements contribute to enhancing the overall procurement process. TCE facilitates the assessments of hidden expenses and its transaction cost analysis can establish formalised standards and strategies through improved contracts and cost

estimating, thereby mitigating risks and issues and ultimately reducing transaction costs. TCE application in the construction industry is closely associated with project management, transaction costs, cost-benefit analysis, risk management, decision-making and other related areas (Dudkin and Vällilä, 2006; Ho and Tsui, 2009; Rajeh, Tookey and Rotimi, 2013; Zainuddin, Mustapa and Mustapa, 2022; Zainuddin and Mustapa, 2023; Zainuddin, Mustapa and Mustapa, 2021).

Benefits of Transaction Cost Economics Application in the Construction Industry

Building on previous successful applications in the construction industry, TCE is viewed as beneficial and constructive for construction management practice. Nozeman (2010) underscored the significance of understanding transaction costs to achieve optimal cost efficiency.

Additionally, Cho in 2011 applied a transaction cost framework to the housing redevelopment process in Korea, revealing various identifiable transactions and cost-incurring hazards arising from uncertainty, as the framework's primary concern is process efficiency. His successful application was influenced by pioneers in transaction cost framework such as Alexander (1992; 2001a; 2001b; 2001c) for land use planning and control, Buitelaar (2004) for the land development process and McCann et al. (2005) for environmental policies. This research successfully demonstrated the usefulness of the transaction costs approach for analysing interactions between cross-public and public institutions, operationalised through tasks such as identifying transactions and their associated costs, assessing the effectiveness of current governance structures in minimising transaction costs and proposing new governance models to replace ineffective mechanisms.

Furthermore, according to Qian, Chan and Khalid (2015) identified the transaction costs arising from additional activities involved in delivering green buildings and explored methods to potentially reduce them. The research highlighted that transaction costs, unlike actual construction costs, are often opaque, making it unclear how they accrue at each stage of development. To delineate the stages of transactions and assess associated costs, the research adhered to the well-established RIBA Plan of Work 2013 (RIBA [Royal Institute of British Architects], 2013), emphasising the importance of understanding the nature and structure of transaction costs. Notably, the study found that transaction costs vary significantly among countries (Qian, Chan and Khalid, 2015).

Limitations of Transaction Cost Economics Application in the Construction Industry

Previous research has naturally been confronted with multiple challenges in the journey to successfully adopt and apply TCE in the construction industry. The first limitation is the inconsistencies in the definition of "transaction costs" (Farajian, 2010; Kissel, 2014). The term "transaction cost" is not defined consistently in the industry because not all parties involved in construction projects fully understand and accept the idea of transaction costs. Due to the lack of a systematic and consistent definition, as a result, it is unclear whether transaction costs can be reduced, as it is difficult to identify them, leading to some transaction costs being missed (Li, Arditi and Wang, 2014; 2015). Therefore, to address the inconsistent

definition, a standard platform of measurement should be established to guarantee consistency in the activities listed in the pre-contract and post-contract phases of housing development (Zainuddin and Mustapa, 2023).

The second limitation of TCE theory was first acknowledged by Williamson, who introduced the concept of TCE theory in 1981 when he concluded that measuring transaction costs poses significant difficulties due to their wide range and subjective nature (Williamson, 1996b; Rajeh, Tookey and Rotimi, 2013; Ho and Tsui, 2009; Antinori and Sathaye, 2007; Dudkin and Vällilä, 2006; Chang and Ive, 2000; Zainuddin, Mustapa and Misnan, 2022; Zainuddin and Mustapa, 2023). This might explain the lack of TCE applications in various industries, including the construction industry. Allen (2006) further asserts that if transaction costs could be quantified with a respectable degree of accuracy, the theory would have greater utility. The lack of a standardised transaction cost definition is a drawback and limitation that has hindered numerous attempts at TCE quantification in different research fields (Serigati and Azevedo, 2016). For instance, economics professionals have struggled to incorporate transaction costs into their analysis due to inconsistent definitions and frameworks, as well as difficulties in measurement and quantification (McCann et al., 2005). There are also limitations in the accounting system to quantify and access data on transaction costs (Li, Arditi and Wang, 2014), as this constraint originates from insufficient and private information about transaction costs (Dudkin and Vällilä, 2006).

Transaction Cost Components in the Construction Industry

Various applications of TCE in the construction industry have determined that transaction costs are defined as costs incurred from transaction activities in the construction industry (Li, Arditi and Wang, 2014), which supports the notion that TCE is a theory and methodology that evaluates the cost-effectiveness of institutional arrangements in managing transaction (Whittington and Young, 2013).

A more thorough TCE application indicates that TCE theory allows industry players to better understand the hidden costs associated with the pre-contract and post-contract phases of project work. Considering that TCE is a crucial component in any construction project, hence, it is essential to evaluate transaction costs in construction (Rajeh, Tookey and Rotimi, 2013). Figure 1 depicts the transaction cost components in the construction industry, including the TCE categorisation and types. The elaboration of the TCE categorisation will assist in coordinating and improving redundant transaction activities (Rajeh, Tookey and Rotimi, 2013), as well as achieving cost transparency by providing a clear illustration of economic activities and costs to be incorporated in the preparation of the feasibility studies.

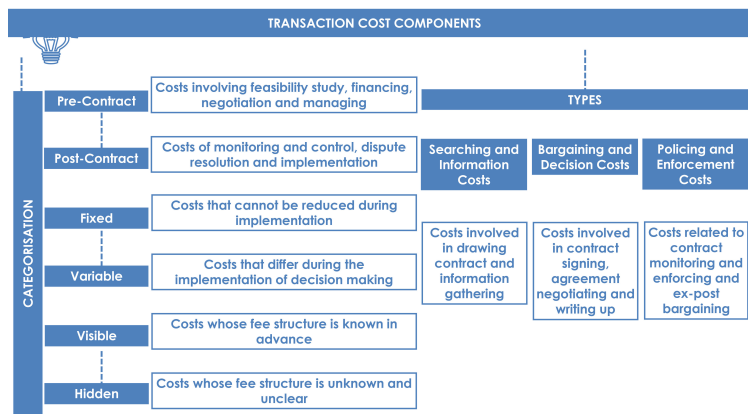


Figure 1. Transaction cost components categorisation

Transaction Cost Components in Housing Development

To successfully apply TCE theory in housing development specifically, strategies that address TCE limitations should be established. These strategies could be adapted from previous successful research and adjusted accordingly to suit the nature of housing developments. As previously highlighted, a better understanding of the nature and structure of transaction costs is required, as there is no standardisation in TCE reviews currently. Hence, this research proposes the well-established RIBA Plan of Work 2013 as the basis to illustrate the transaction stages and study the transaction costs involved within these stages. It is also noteworthy that previous research has stated that transaction costs may vary considerably in each country (Qian, Chan and Khalid, 2015).

Considering Malaysia's context, TCE application for Malaysian housing development should be done by integrating the housing development stages, processes and development cost components (land, hard and soft costs) with the RIBA Plan of Work 2013 stages and key tasks. This integration aims to delineate the overall development processes and transaction cost components, as well as to provide a standard platform of measurement to ensure consistency in activities listed in the pre-contract and post-contract phases of housing development processes.

The RIBA Plan of Work 2013 is beneficial in providing a stage-by-stage model for managing the building design and construction process, offering benefits such as ensuring the best outcomes, guiding thinking on key themes and facilitating integrated projects (Dale, 2013). The guides based on the plan of work offer practical advice and support for running efficient and successful projects, providing user-friendly resources and highlighting best practices. However, the Plan lacks control over individual outputs, leaving this as an internal matter for participating organisations (Dale, 2013; Davies, 2015; Bailey, 2019).

The RIBA Plan of Work 2013 has been successfully utilised in other TCE research within the construction industry as a standard platform of measurement to ensure consistency in activities, as TCE is not clearly and consistently defined within the industry. Qian, Chan and Khalid (2013) utilised the RIBA Plan of Work 2013 to identify new transaction costs and activities in delivering green buildings, exploring the

potential for reducing transaction costs. Additionally, Bean, Mustapa and Mustapa (2019) used the RIBA Plan of Work 2013 to uncover transaction costs within the BIM-adopted procurement, determining that transaction costs in BIM-adopted procurement are lower than those in other procurement types and provided a framework as a basic guideline for construction players.

The decision to utilise the RIBA Plan of Work 2013 over the recently updated RIBA Plan of Work 2020 is based on the familiarity of Malaysian housing development actors with the 2013 edition. Additionally, the 2020 version primarily focuses on sustainability, which is not within the scope of this research that centres on conventional housing. The original RIBA Plan of Work 2013 includes eight stages: strategic definition, preparation and brief, concept design, developed design, technical design, construction, handover and close out and in use. However, for this research, the in-use stage has been removed, as it is not involved in the housing development processes. The housing development processes ended with the handover of houses to buyers, not involving the maintenance stage.

Therefore, the stages and processes of Malaysian housing development have been integrated with the RIBA Plan of Work 2013's stages and their key support tasks, resulting in the identification of 26 transaction cost components, as depicted in Figure 2.

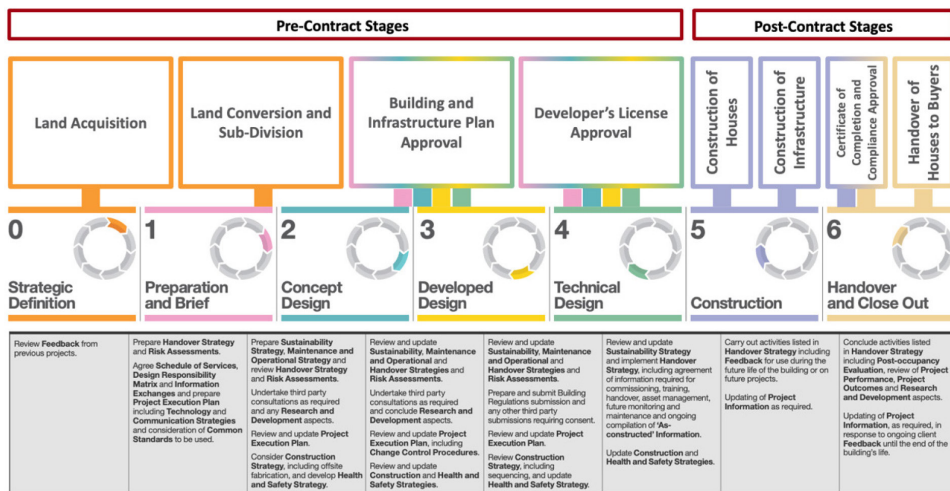


Figure 2. Housing development stages and processes with the RIBA Plan of Work 2013's stages and key tasks as transaction cost components
Source: RIBA (2013)

This combination is expected to unbundle the essential processes, activities and associated development cost components (land, hard and soft costs), as well as highlight the hidden costs within Malaysian housing development. The 26 key support tasks derived from the RIBA Plan of Work 2013, which are translated into 26 transaction cost components, are assigned to their specific housing development stages, processes and development cost components, in accordance with the RIBA Plan of Work 2013 stages. Their assignment and anticipated categorisation and types are based on theoretical ideal studies, as shown in Table 1.

Table 1. Anticipated TCE components from the literature review

Housing Development Stages	Housing Development Processes	RIBA Plan of Work 2013 Stages	Transaction Cost Components Derived from RIBA Plan of Work 2013	Categorisation of Development Cost Components		Categorisation of Transaction Cost Components		Types of Transaction Cost Components		
				Anticipated		Anticipated		Searching and Information	Bargaining and Decision	Policing and Enforcement
				Land/Hard/Soft	Fixed/Variable	Visible/Hidden	Anticipated			
Pre-contract stage	1. Land acquisition 2. Land conversion and sub-division	Strategic definition	1. Initial considerations for assembling the project team.	Land; Hard; Soft	Variable	Hidden		✓		✓
			2. Establish project programme.							
			3. Review feedback from previous projects.							
	1. Building and infrastructure plan approval 2. Developer's license approval	Preparation and brief	1. Prepare the project roles table and contractual tree and continue assembling the project team.	Soft	Fixed/Variable	Visible/Hidden		✓		✓
			2. Review project programme.							
			3. Prepare handover strategy and risk assessments.							
			4. Agree on the schedule of services, design responsibility matrix and information exchanges and prepare project execution plan including technology and communication strategies and consideration of common standards to be used.							
		Concept design	1. Review project programme.	Soft	Fixed/Variable	Visible		✓		✓
			2. Prepare sustainability strategy, maintenance and operational strategy and review handover strategy and risk assessments.							

(Continued on next page)

Table 1. Continued

Housing Development Stages	Housing Development Processes	RIBA Plan of Work 2013 Stages	Transaction Cost Components Derived from RIBA Plan of Work 2013	Categorisation of Development Cost Components		Categorisation of Transaction Cost Components		Types of Transaction Cost Components		
				Components		Components		Searching and Information	Bargaining and Decision	Policing and Enforcement
				Anticipated	Fixed/Hard/Soft	Anticipated	Fixed/Visible/Hidden			
Post-contract stage	1. Construction of houses 2. Construction of infrastructure 3. Certificate of completion and compliance approval	Construction	2. Prepare and submit building regulations submissions and any other third-party submissions requiring consent.	Land; Hard; Soft	Fixed	Visible	Visible	✓	✓	
			3. Review and update the project execution plan.							
			4. Review construction strategy, including sequencing and updating the health and safety strategy.							
			1. Administration of building contracts, including regular site inspections and review of progress.	Hard; Soft	Fixed	Visible	Visible			✓
			2. Review and update the sustainability strategy and implement the handover strategy, including agreement of information required for commissioning, training, handover, asset management, future monitoring and maintenance and ongoing compilation of "as-per constructed" information.							
			3. Update construction and health and safety strategies.							

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Table 1. Continued

Housing Development Stages	Housing Development Processes	RIBA Plan of Work 2013 Stages	Transaction Cost Components Derived from RIBA Plan of Work 2013	Categorisation of Development Cost Components		Types of Transaction Cost Components			
				Categorisation of Transaction Cost Components					
				Anticipated	Anticipated	Anticipated	Anticipated	Anticipated	Anticipated
				Land/Hard/Soft	Fixed/Variable	Visible/Hidden	Searching and Information	Bargaining and Decision	Policing and Enforcement
	1. Certificate of completion and compliance approval 2. Handover of houses to buyers	Handover and close out	1. Conclude administration of building contract. 2. Carry out activities listed in the handover strategy, including feedback for use during the future life of the building or on future projects. 3. Updating of project information as required in response to ongoing client feedback until the end of the building's life.	Hard; Soft	Fixed	Visible/Hidden			✓

From the table, it can be deduced that there are more TCE components at the pre-contract stage than at the post-contract stage. Additionally, in terms of TCE categorisation, many TCE components are categorised as fixed and visible costs at pre-contract and post-contract stages, with the majority categorised as searching and information cost and bargaining and decision cost.

RESEARCH METHODOLOGY

The nature of this research covers multifaceted and cross-subsidies businesses, with the construction industry being known for its complexity and uncertainty. To address the variety of variables and factors affecting this research, a mixed-method approach is appropriate and suitable. This method involves collecting and analysing quantitative data followed by qualitative data in two consecutive stages within one research study (Ivankova et al., 2006) to overcome the weaknesses of each method. This approach is well-suited to the nature of this research and has been successfully applied by Dyer (1997), Rajeh, Tookey and Rotimi (2013), Rajeh et al. (2015), Ismail, Isa and Yusop (2018), Abdel-Galil, Ibrahim and Alborkan (2020) and Wu et al. (2022).

The research methodology for this research is executed in sequential rounds of data collection and data analysis, starting with quantitative methods. A survey with an open-ended questionnaire will be used to gather as much data as possible. This will be followed by qualitative methods using semi-structured interviews. The research methodology design for the framework development is depicted in Figure 3.

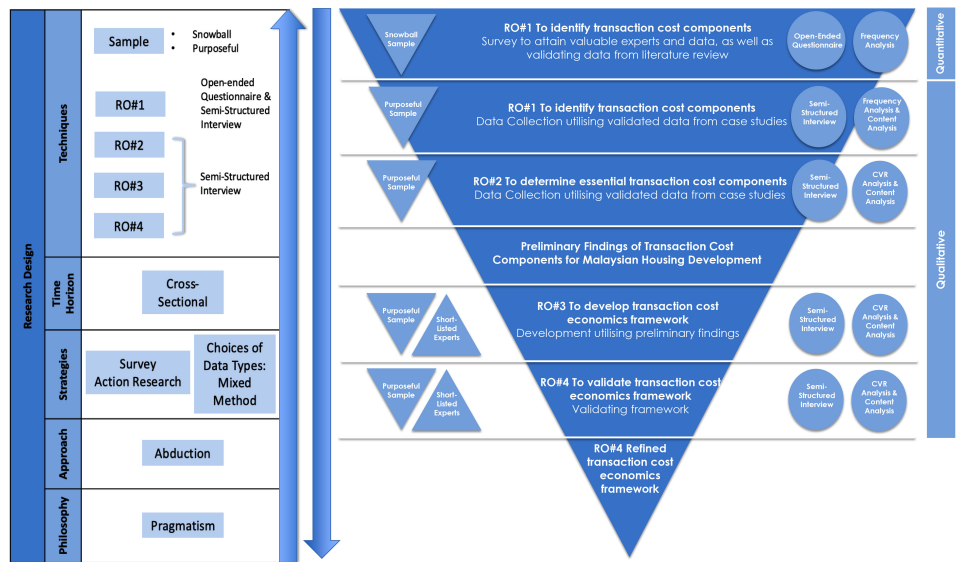


Figure 3. Research methodology design

Quantitative Data Collection and Analysis

The chosen quantitative technique for the first round of data collection, aimed at identifying transaction cost components in pre- and post-contract phases of Malaysian housing development, is a survey utilising an open-ended questionnaire. The purpose of this study was to gather a substantial amount of valuable data from various stakeholders directly involved in Malaysian housing development. This was achieved through purposive sampling and snowball sampling techniques. Additionally, the study aimed to validate the accuracy and reliability of the literature review used in the research instrument.

Open-ended questionnaires allow respondents to provide free-form responses using their own words and thoughts, rather than selecting from predefined options. These questionnaires are designed to elicit qualitative data and capture the richness and complexity of individual perspectives and attitudes. Open-ended items can be used alongside closed-ended items to provide a more comprehensive evaluation of attitudes (Lena, 2022).

The quantitative analysis selected for the first round of data collection to partially identify transaction cost components in pre- and post-contract of Malaysian housing development is frequency analysis. Frequency analysis is a method of data analysis that involves analysing the occurrence and distribution of frequencies within a dataset. It is used to identify patterns, trends and relationships in the data (Pawar et al., 2023). Frequency distribution can help identify the most frequent categorisation and types of transaction cost components identified by experts. It can also be useful in determining the most significant and redundant transaction cost components based on their frequencies in pre- and post-contract stages of Malaysian housing development.

Qualitative Data Collection and Analysis

The qualitative technique selected for the following round of data collection to fully identify transaction cost components in pre- and post-contract stages of Malaysian housing development was conducted through semi-structured interviews. These interviews enable the identification of transaction cost components and provide insights and clarifications from expert respondents regarding the Malaysian housing development processes, economic activities and associated cost components.

Semi-structured interviews are a research method used to gain insight into hidden aspects of social life and explore under-researched topics. It allows researchers to investigate the experiences, opinions, emotions and motivations of individuals in-depth, which may be challenging to obtain with other methods (Aleksandra, 2023; Blackford, 2022).

For the second round of data collection aimed at identifying transaction cost components in pre- and post-contract stages of Malaysian housing development, qualitative analysis involves both frequency analysis and content analysis. Frequency analysis helps determine the significance and redundancy of transaction cost components based on their frequencies in these stages.

Content analysis is a method of data analysis that involves examining and categorising textual data to identify patterns and themes. This approach can be applied to various types of data, including archived documents, social media posts, audio files and visual content. The process entails collecting and organising data, developing a typology or coding scheme and systematically analysing the

data to uncover recurring themes or patterns. Content analysis provides valuable insights into diverse phenomena; however, ensuring validity and reliability is crucial to ensure accurate and meaningful results (Tunison, 2023; Costa et al., 2021; Kleinhessel et al., 2020; Schweizer, 2019).

For the subsequent round of data collection aimed at determining essential transaction cost components in Malaysian housing development, the chosen qualitative analysis includes content validity ratio (CVR) analysis and content analysis. These analyses build upon the findings from the first objective, which focused on identifying transaction cost components in pre- and post-contract stages of Malaysian housing development. The findings are further analysed using CVR formula calculations to pinpoint the crucial transaction cost components.

CVR is an evaluation method used to ensure that a measure includes all essential items and excludes undesirable ones within a specific construct domain. Proposed by Lawshe in 1975, CVR involves a panel of experts who individually evaluate each item and rate its relevance to the construct being measured. The ratings provided by the experts are then analysed to determine the proportion who consider each item essential. Typically, a CVR value of 0.60 or higher is generally considered acceptable. This process ensures that the instrument effectively captures the intended content and is suitable for its intended purpose (Nordin, Jamal and Anuar, 2022; Anggara and Abdillah, 2023; Prananto, Rakhmawati and Pamungkas, 2022).

RESULTS AND DISCUSSION

To ensure reliable and valuable opinions, the identification of the panel of experts was carefully managed. Experts were identified through a snowball sampling method initiated by the respondents themselves within the housing sector. Initially, respondents were engaged through an open-ended questionnaire to speed up the data saturation process and questioned about the transaction cost components in pre- and post-contract of Malaysian housing development. Subsequently, they were asked to nominate and recommend other experienced experts within the industry who, in their opinion, have sufficient experience and expertise in dealing with the housing development process (Naderifar, Goli and Ghaljaie, 2017). The potential experts are those with vast working experience in the construction industry in Malaysia, particularly those with direct experience in housing development at pre- and post-contract and those with sound knowledge and experience regarding identifying TCEs in housing development.

This research finally managed to attain 25 expert respondents from various sectors, namely two government agencies, four local authorities, five professionals and 14 developers from southern and central. Only expert respondents from the southern and central regions have been selected for this research as it was found that even the housing development projects in the same district have different locality's governance and procedures due to different local authorities, so these two regions alone could produce enough rich data required for this research. Table 2 details the 25 short-listed expert respondents to participate in this research.

Table 2. Expert respondents' details

Respondent	Region	Sector	Position
R1	Southern (Johor, Melaka and Negeri Sembilan)	Local authority	Head of Development Plan and Geographic Information Systems (GIS) Division
R2			Head of OSC (One Stop Centre) Division
R3			Director of Town and Country Planning Division
R4			Head of OSC Division
R5		Professional	Lecturer and environmental impact assessment consultant
R6			Licensed land surveyor
R7			Licensed land surveyor
R8			Supply chain and contract management executive
R9		Developer	Senior contract executive
R10			Project cost controller
R11			Contract manager
R12			Executive director
R13			Planning manager
R14			General manager
R15			Senior contract executive
R16			Planning manager
R17	Central (Putrajaya, Selangor and Kuala Lumpur)	Government agency	Director of Legislative and Regulatory Planning Division
R18			Senior assistant director of the Progress Control Consultants Division
R19		Professional	Principal
R20			Executive director
R21		Developer	Head of Procurement Division
R22			Executive vice president
R23			Operational excellence manager
R24			Senior contract executive
R25			Head of Real Estate and Leisure Division

The table illustrates that this research has achieved a balanced perspective by including expert respondents from various sectors, including government agencies responsible for housing policies, local authorities involved in policy enforcement and professionals and developers affected by these policies. This balanced perspective ensures unbiased findings as the data collection involves a broad spectrum of players in the housing development industry.

Most expert respondents possess over 10 years of experience, holding middle to top management positions within their organisation. This underscores their qualification under the predefined criteria for respondents in this research. They bring extensive industry experience, direct involvement in housing development at pre- and post-contract stages and expertise in identifying TCE within the housing development process.

Identification of Transaction Cost Components for Malaysian Housing Development

The identification of transaction cost components for Malaysian housing development was achieved through two rounds of data collection, as explained in the Research Methodology section. The first round involved a quantitative approach using an open-ended questionnaire survey, while the second round utilised a qualitative approach through semi-structured interviews. This data triangulation method was employed to further enhance the research findings.

Quantitative Findings

Initially, there were 26 anticipated TCE components identified from the literature review, however, quantitative data collection managed to identify up to 33 TCE components, as seven additional components were added by the expert respondents as tabulated in Table 3.

Table 3. Identification of transaction cost components for Malaysian housing development through quantitative

Housing Development Stages	Literature Review	Respondents Identification
Pre-contract	20	25
Post-contract	6	8
Total	26	33

Findings from the literature review identified a total of 26 transaction cost components from the RIBA Plan of Work 2013, with 20 components at the pre-contract stage and six at the post-contract stage. However, the actual identified transaction components differed from the anticipated number outlined in the literature. Expert respondents identified a higher number of transaction cost components, adding seven additional components they deemed relevant. These included economic activities such as negotiation of contracts, land acquisition, macroeconomic government policy changes, tender strategy, procurement strategy, dispute resolution and contribution to local authorities.

The findings from the questionnaire survey validated the literature review applied to the instrument and were published in a Scopus-indexed journal (Zainuddin, Mustapa and Mustapa, 2021). However, the quantitative approach

alone is not enough to attain rich data and clarification, therefore the qualitative approach utilising semi-structured interviews was conducted to carry out the following data collection.

Qualitative Findings

The findings from previous data collection affirm that the literature review applied in the research instrument is valid enough for subsequent data collection. Hence, the same literature review contents used in the open-ended questionnaire instrument were incorporated into the Semi-Structured Interview instrument for the second round of qualitative data collection, ensuring data triangulation.

Table 4 summarises the number of transaction cost components identified in pre- and post-contract stages of Malaysian housing development based on the literature review and actual identification by 25 expert respondents. In total, 38 transaction cost components were identified, including 12 additional components suggested by experts.

Table 4. Identification of transaction cost components for Malaysian housing development through qualitative

Housing Development Stages	Literature Review	Respondents Identification
Pre-contract	20	29
Post-contract	6	9
Total	26	38

Out of 25 expert respondents, 20 identified a higher number of transaction cost components than initially anticipated, adding 12 additional components they deemed relevant. These included economic activities such as negotiation of contracts, land acquisition, macroeconomic government policy changes, tender strategy, management approval (added to four stages), procurement strategy, dispute resolution, contribution to local authorities and pandemic-related (force majeure) costs. This finding highlights that the anticipated transaction cost components derived from the RIBA Plan of Work 2013 serve as a "global ideal guideline" and do not fully encompass the impact of local governance and procedures. The summary of the additional transaction cost components in the pre- and post-contract stages of Malaysian housing development, categorised according to their respective stages, processes and development cost components, is tabulated in Table 5.

Table 5. Additional TCE components from respondents' identification

Stages	Additional Transaction Cost Components from Respondents Identification	Categorisation of Development Cost Components		Categorisation of Transaction Cost Components		Types of Transaction Cost Components		
		Land/Hard/Soft	Fixed/Variable	Visible/Hidden	Searching and Information	Bargaining and Decision	Policing and Enforcement	
Pre-contract	Strategic definition	Soft	Variable	Hidden	✓	✓		
	Land acquisition	Land; Hard; Soft	Fixed	Visible	✓	✓	✓	
	Macroeconomic government policies changes	Land; Soft	Variable	Visible		✓	✓	
	Tender strategy	Soft	Fixed	Visible		✓	✓	
	Management approval	Soft	Fixed	Hidden		✓	✓	
	Management approval	Soft	Fixed	Hidden		✓	✓	
	Management approval	Soft	Fixed	Hidden		✓	✓	
	Management approval	Soft	Fixed	Hidden		✓	✓	
	Procurement strategy	Soft	Fixed	Hidden		✓	✓	
	Management approval	Soft	Fixed	Hidden		✓	✓	
Construction	Dispute resolution	Hard; Soft	Variable	Hidden	✓	✓	✓	
	Contributions to local authorities	Land; Hard; Soft	Fixed	Visible			✓	
	Pandemic-related (force majeure) costs	Hard; Soft	Variable	Hidden	✓	✓	✓	
Post-contract	Handover and close out							

Determination of Essential Transaction Cost Components for Malaysian Housing Development

The previous research findings, achieved through triangulation of open-ended questionnaires and semi-structured interviews, were utilised to determine transaction cost components in Malaysian housing development. To analyse these findings, CVR analysis was selected. CVR ensures inclusions of all essential items and exclusions of non-essential ones within a particular construct domain. Proposed by Lawshe (1975), CVR calculates the level of agreement among a panel of “experts” on whether an item is “essential.” According to Taherdoost (2016), for a panel of 25 experts, a minimum CVR value of 0.37 is considered acceptable. Therefore, any transaction cost components scoring below 0.37 in CVR were deemed redundant and removed. Based on the CVR Analysis, 25 out of 38 identified transaction cost components were determined to be essential. Among these, 24 components were anticipated, while one additional component was added by respondents, as depicted in Table 6.

Table 6. Determination of essential transaction cost components for Malaysian housing development

Housing Development Stages	Respondents Identification		Respondents Determination	
	Anticipated	Addition	Anticipated	Addition
Pre-contract	20	9	19	–
Post-contract	6	3	5	1
Total	38		25	

Transaction Cost Economics Framework Development for Malaysian Housing Development

The results obtained from analysing and identifying essential TCE components in Malaysian housing development, based on input from expert respondents across various sectors, were utilised in developing the proposed TCE framework for Malaysian housing development. The findings indicated that, according to expert respondents, only 25 out of 38 transaction cost components were deemed essential and included in the framework development. However, while some components were regarded as less essential based on CVR calculation, those identified as essential by a majority of experts warrant further investigation and research for better assessment.

Previous research has emphasised that items agreed upon by more than half of expert respondents should still be considered “appropriate” and qualified (Şürtücü and Maslakçı, 2020). Therefore, the proposed framework initially includes all 38 transaction cost components identified by expert respondents. This allows the selected expert respondents tasked with validating the framework to reassess and refine it without bias, ensuring comprehensive coverage.

The TCE framework for Malaysian housing development is developed by integrating the housing development stages, processes and development cost components with the RIBA Plan of Work 2013 stages and key tasks. This integration provides a clear view of the overall development processes and components listed in the pre-contract and post-contract of Malaysian housing development. The proposed TCE framework serves as an economic tool designed to unbundle the essential processes, economic activities and associated development cost components, thereby highlighting hidden costs within Malaysian housing development. The proposed framework is outlined in Table 7.

The TCE framework, initially introduced by Ronald Coase, focuses on transaction costs and economic coordinating mechanisms. This framework can be applied to the construction management analysis (Winch, 1989; Walker and Wing, 1999), enabling the economisation of transaction costs. By accounting for hidden costs of coordination, the framework leverages its potential for institutional analysis and design.

The key elements of the TCE framework should be systematically integrated by analysing relevant information. Operationalising this framework in property development starts with identifying and outlining the relevant processes and their transaction cost implications. This is followed by assessing the relative efficiency of alternative forms to improve process efficiency. The TCE framework provides a practical and effective method for evaluating economic efficiency (Cho, 2011).

Firstly, the TCE framework for Malaysian housing development outlines the essential components with their categorisation according to their respective housing development stages, processes and development cost components. Secondly, the colour code indicates the essentiality levels for each component. Yellow-coloured components indicated that they are determined as essential anticipated components, whereby orange-coloured components indicated that they are determined as essential additional components, whereas blue-coloured components indicated that they are determined as secondary essential components that are worth investigating further as they are determined as essential by more than half of respondents. Thirdly, the TCE categorisation and types of the transaction cost component according to development cost components (land, hard and soft costs) will assist in achieving process coordination and cost transparency by providing a clear illustration of economic activities and costs to be incorporated into the preparation of the feasibility study. As an example, any components identified as fixed costs as well as policing and enforcement costs are unavoidable and unremovable costs as they are compulsory and enforced by the local authorities.

Table 7. Proposed TCE framework for Malaysian housing development

Housing Development Stages	Housing Development Process	RIBA Plan of Work 2013 Stages	Normal Procurement Key Tasks (Derivation of Transaction Cost Components)	Tick (✓) on Components of Transaction Costs Involved in Normal Procurement (A)	Categorisation of Development Cost Components	Categorisation of Transaction Cost Components (Categorise the Components if it is Not as Anticipated)						
						Categorisation of Transaction Cost Components (B)			Types of Transaction Cost Components (C)			
						Fixed (F)	Variable (V)	Hidden (H)	Searching and Information Costs (1)	Bargaining and Decision Costs (2)	Policing and Enforcement Costs (3)	
Pre-contract transaction costs	1. Land acquisition 2. Land conversion and subdivision	Strategic definition	Initial considerations for assembling the project team		Soft	16	7	15	13	15		11
			Establish project programmes		Soft	11	9	7	13	10		11
			Review feedback from previous projects		Soft	3	11	1	13	9		1
			Negotiation of contract		Soft	6	10	6	10	15		–
			Land acquisition		Land: Hard/Soft	10	5	14	1	9		12
			Macro economy government policies		Land: Soft	6	8	13	1	7		13
			Tender strategy		Soft	7	5	10	2	5		11
			Prepare project roles and responsibilities and continue assembling the project team		Soft	16	5	17	4	13		8
			Review project programmes		Soft	10	11	8	14	16		2
			Finalise employer strategy and risk assessments		Soft	15	7	16	5	13		9
	1. Building and infrastructure plan approval 2. Developer's license approval	Preparation and brief	Agree schedule of services, design responsibilities, matrix and information exchanges and prepare project execution plan		Soft	12	9	15	6	11		7
			Develop project strategy and communication									
			Consideration of business standards to be used									
			Management approval		Soft	11	1	4	8	0		7
			Review project programme		Soft	10	11	8	13	17		3
			Prepare sustainability strategy, performance and operational strategy and review handover strategy and risk assessments		Soft	14	8	19	3	13		10
			Engage external party consultations as required and any research and development aspects		Soft	12	10	20	2	11		9
			Review and update project execution plan		Soft	11	11	10	12	14		3

(Continued on next page)

Table 7. Continued

Housing Development Stages	Housing Development Process	RIBA Plan of Work 2013 Stages	Normal Procurement Key Tasks Extracted from RIBA Plan of Works 2013 (Derivation of Transaction Cost Components)	Tick (✓) on Transaction Costs Involved in Normal Procurement (A)	Categorisation of Development Cost Components	Categorisation of Transaction Cost Components (Categorise the Components if it is Not as Anticipated)									
						Categorisation of Transaction Cost Components (B)					Types of Transaction Cost Components (C)				
						Land/Hard/Soft	Fixed (F)	Variable (V)	Visible (V)	Hidden (H)	Searching and Information Costs (1)	Bargaining and Decision Costs (2)	Policing and Enforcement Costs (3)		
			Consider construction strategy, including offsite fabrication and develop health and safety strategy	Management approval	Soft	14	8	15	7	15	11	6			
					Additional components	9	3	2	10	1	11	7			
					Developed design	11	11	16	6	11	7	10			
					Additional components	11	10	17	4	9	8	9			
						6	16	9	13	16	14	3			
						11	11	12	10	15	13	5			
						9	3	2	10	1	11	7			
					Additional components	10	11	16	5	10	6	10			
					Technical design		20	3	21	2	6	4	21		
						8	16	11	13	15	17	5			
			Prepare and submit building regulations submission and any other third-party submissions requiring consent	Review and update project execution plan	Soft	6	14	9	11	12	11	7			
					Additional components	7	1	-	8	-	1	8			
					Management approval	9	4	2	11	1	12	7			
					Developed design	11	11	16	6	11	7	10			
					Additional components	11	10	17	4	9	8	9			
						6	16	9	13	16	14	3			
						11	11	12	10	15	13	5			
						9	3	2	10	1	11	7			
					Additional components	10	11	16	5	10	6	10			
					Technical design		20	3	21	2	6	4	21		

(Continued on next page)

Table 7. Continued

Housing Development Stages	Housing Development Process	RIBA Plan of Work 2013 Stages	Normal Procurement Key Tasks Extracted from RIBA Plan of Works 2013 (Derivation of Transaction Cost Components)	Tick (✓) on Components of Transaction Costs Involved in Normal Procurement (A)	Categorisation of Development Cost Components	Categorisation of Transaction Cost Components (Categorise the Components if it is Not as Anticipated)						
						Categorisation of Transaction Cost Components (B)			Types of Transaction Cost Components (C)			Policing and Enforcement Costs (3)
						Fixed (F)	Variable (V)	Visible (V)	Hidden (H)	Searching and Information Costs (1)	Bargaining and Decision Costs (2)	
Post contract transaction costs	1. Construction of houses 2. Construction of infrastructure	Construction	Components of transaction costs	Administration of building contract, including regular site inspections and review of progress Review and update sustainability strategy and implement handover strategy, including agreement of information required for commissioning, training, handover, asset management, future monitoring and maintenance and ongoing completion of "as-per-constructed" information Update construction and health and safety strategies	Soft	19	4	21	2	6	1	21
					Soft	14	8	19	3	4	2	18
					Soft	8	14	13	9	10	8	12
			Additional components		Hard Soft	3	17	10	10	12	10	6
					Land: Hard Soft	7	-	7	-	-	-	7
					Hard Soft	3	8	1	10	6	7	5
	Certificate of completion and compliance approval Handover of houses to buyers	Handover and close out	Components of transaction costs	Conclude administration of building contract Carry out activities listed in handover strategy including feedback for use during the future life of the building or on future projects Updating of project information as required	Hard Soft	15	6	11	10	11	10	7
					Soft	16	2	7	11	4	10	14
					Soft	8	9	4	13	9	9	8
			Additional components			-	-	-	-	-	-	-

CONCLUSIONS AND RECOMMENDATION

This study demonstrates the development of the TCE framework for Malaysian housing development, outlining the overall housing development processes and the corresponding development cost components of housing projects in Malaysia. By unbundling the essential processes, economic activities and associated cost components, it can assist in highlighting the hidden economic activities and subsequently, the associated cost components that may not be considered accurately in the total development cost components (land, hard and soft costs) in typical Malaysian housing development.

This TCE framework can also be used for feasibility studies to assess the viability of a proposed housing development, as well as cost plans and control among practitioners to accurately budget and estimate housing development costs. Highlighting the TCE and suggesting improvements to the current practice can promote economic transaction efficiencies for Malaysian housing development.

The proposed TCE framework has been validated and refined by selected experts comprised of government agencies, local authorities and developers to establish this framework's credibility and usefulness.

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