



**6th UNDERGRADUATE
SEMINAR ON BUILT
ENVIRONMENT
AND TECHNOLOGY
(USBET) 2023**

**SUSTAINABLE BUILT
ENVIRONMENT**

25 - 27 SEPTEMBER 2023

E-PROCEEDING

USBET 2023



e-Proceeding

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Published by,

Department Of Built Environment Studies And Technology
Faculty Of Architecture, Planning & Surveying
Universiti Teknologi MARA Perak Branch, Seri Iskandar Campus
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eISSN 2821-3076



02 October 2023 | Perak, Malaysia
Universiti Teknologi MARA, Perak Branch, Seri Iskandar Campus

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6th Undergraduate Seminar on Built Environment and Technology 2023

- E- Proceedings-

Organized by,

College of Built Environment (KAB) UiTM Perak Branch



THE IMPACT OF MATERIAL PRICE FLUCTUATION ON HOUSING PROJECTS

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ABSTRACT

The impact of material price fluctuation in housing project is significant and requires attention from contractors, developers, and policymakers. The construction industry heavily relies on various materials, such as steel, cement, sand, aggregate and concrete and their prices are subject to market dynamics and global trends. The aim of the study is to analyze about the impact of material price fluctuation in housing project. In addition, the objectives have been entitled for this research which are to observe the effects of material price fluctuation towards housing project, to determine the factors that cause the fluctuation in the price of housing project materials and to identify ways to reduce the price fluctuation of housing project materials.

Keywords: *price fluctuation, material price, housing project*

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INTRODUCTION

Material price fluctuations have a profound impact on housing projects, influencing project budgets, timelines, and overall project feasibility. The construction industry heavily relies on various materials, such as steel, cement, sand, aggregate and concrete, the prices of which are subject to market dynamics and global trends. Understanding the consequences of material price fluctuations is crucial for contractors, developers, and policymakers involved in the housing sector. According to a report by Turner and Townsend, (2021), material prices in the construction industry have experienced notable fluctuation in recent years. Factors such as inflation rate, interest rate, currency exchange rate, high demand and market demand fluctuations have contributed to this instability. The impact of material price fluctuations extends beyond financial implications, increase in project abandonment, increase in cost of construction, unemployment of construction workers, affecting the affordability of housing, project timelines, and the overall construction industry dynamics. According to Procore Technologies, (2020) highlights that sudden spikes in material prices can lead to delays in project timelines. Construction projects heavily rely on timely and consistent material deliveries, and disruptions caused by price fluctuations can result in delays, increased construction costs, and contractual disputes.

Fluctuating material prices can lead to compromises in the quality and performance of housing projects. Cost fluctuations may necessitate the use of alternative, lower-quality materials to stay within budget. This can impact the durability, longevity, and overall quality of the constructed housing units, potentially leading to maintenance issues and reduced customer satisfaction according to Alashwal, A. M., & Hamzah, N., (2017). Understanding the effects of material price fluctuations is crucial for contractors, developers, and policymakers involved in the housing sector. In their study on the effects of material price fluctuations on the construction industry in India, according to Singhal and Choudhary (2019) found that unstable material prices lead to higher project costs and reduced profit margins for contractors. This can affect the overall financial health of housing projects and hinder industry growth. According to Deloitte (2016) emphasizes the effects of material price fluctuations on project planning and risk management. Contractors and developers need to incorporate effective risk management strategies to address the uncertainties associated with material price fluctuations and ensure project success. Material price fluctuations have significant effects on housing projects, impacting project costs, increase in project abandonment, timelines, and affordability. Contractors, developers, and policymakers need to be aware of these effects and implement strategies to mitigate the risks associated with material price fluctuations. By adopting effective better contract procedures, good human resource management and improve contractor financial utilization, stakeholders can navigate the challenges posed by material price fluctuations and ensure the successful completion of housing projects.

The aim of this study is to analyze about the impact of material price fluctuation on housing projects. To obtain this aim, the objectives are:

- i. To observe the effects of material price fluctuation towards housing project.
- ii. To determine the factors that cause the fluctuation in the price of housing project materials.
- iii. To Identify ways to reduce the price fluctuation of housing project materials.

LITERATURE REVIEW

Price Fluctuation

According to Jayasinghe et al. (2015), price fluctuations represent both the rise and fall of resource and service prices, as well as those that may result in payments from the employer to the contractor and vice versa. Price fluctuations, according to Deo (2007), can be used to anticipate the future cost of a project or to bring previous costs up to date. Price escalation is an increase in the contract price caused by unusual circumstances that occur during contract execution Government Procurement Policy Board (GPPB) (2008). Price variations, according to Subasinghe (2009), constitute a risk, and the variables influencing them are inescapable and difficult to foresee. According to Gavin (2008), inflation is the key factor influencing price changes in civil engineering construction. The variation in the pricing of housing units over time is referred to as price fluctuation in a housing project. Market circumstances, supply and demand dynamics, economic trends, interest rates, and local or regional variables can all because housing prices to change. Economic crises, material price changes, fuel price variations, and market conditions are among the primary external elements driving price swings, according to Hanna and Blair (1993). According to Mossa (2013), the main internal causes of price fluctuations in Ethiopian road construction projects are poor estimation, poor planning, poor implementation, and schedule changes, while the main external causes are material price increases, global demand for construction materials, exchange rate fluctuations, and material producers' limited capacity.

The Effects Of Material Price Fluctuation Towards Housing

In many circumstances, increases in building materials prices might have an impact on project implementation. For example, rises in steel costs in late 2019 and 2020 impacted contractors' capacity to execute CIDB (2020) building operations. According to CIDB (2020), there are also contractors who claim that their company's profit margin has fallen and that they are unwilling to accept the proposed contract. As a result, their firm is also experiencing financial difficulties, which is causing a

delay in the construction of the skyscraper. If this occurs, productivity would fall, affecting the growth of the building industry. Construction cost is an essential aspect in construction project management that drives project success, according to Ramli, (2003). However, material costs are clearly the most expensive aspect of any building project according to Ibrahim et al., 2012. According to Thanoon et al., (2003). Contractors should not be able to afford the growth in material production and processing prices, which forces them to raise the selling price of their final unit. Increase in prices of housing materials suddenly become a major problem for the contractor is unable to proceed with the project. Fluctuations in material prices can directly affect construction costs, which can significantly impact the overall budget of a housing project. If the prices of essential construction materials like steel, lumber, cement, or copper increase, it can lead to higher expenses for builders and developers. This, in turn, can raise the overall cost of constructing the housing units, potentially affecting the affordability of the project.

Table 1: The Effects Of Material Price Fluctuation Towards Housing Project

The Effects Of Material Price Fluctuation Towards Housing Project
<ul style="list-style-type: none"> • Increase in final cost of building products
<ul style="list-style-type: none"> • Collapse of building due to less quality materials
<ul style="list-style-type: none"> • Client expectations on quality project delivery
<ul style="list-style-type: none"> • Increase in cost of construction
<ul style="list-style-type: none"> • Low construction product volume
<ul style="list-style-type: none"> • Increase in Project Abandonment
<ul style="list-style-type: none"> • Unemployment of construction workers
<ul style="list-style-type: none"> • Poor workmanship quality

According to Chen (2000) and Lew et al. (2003), Malaysia would need 8,850,554 homes between 1995 and 2020, including 4,964,560 new housing units, to accommodate 20% of the country's population. Unfortunately, only 1,382,917 units were built throughout the 6th Malaysia Plan (1991–1995) and 7th Malaysia Plan (1996–2000). Within the next 20 years, an additional 3,581,643 units must be constructed. In other words, every ten years, 1,790,820 units should be produced; however, between 2001 and 2005, only 844,043 units were built, and during the ninth Malaysian Plan (2006–2010), the average number of housing units needed was 709,400 units. It is obvious that the housing issues are projected to persist for years

to come unless a radical shift in policy towards population growth or a new solution to this increased housing demand is developed.

Table 2: The Factors That Cause The Fluctuation In The Price Of Housing Project Materials

The Factors That Cause The Fluctuation In The Price Of Housing Project Materials
• Inflation rate
• Interest rate
• Currency exchange rate
• High demand
• Shortage of construction material
• Material are selling higher than the ceiling price
• Monetary policy
• Increase in the price of fuel
• Macroeconomic policy

Ways To Reduce The Price Fluctuation Of Housing Project Materials

Even while price fluctuations cannot be foreseen precisely, their influence can be reduced. According to Rammchandra (2010), some strategies to mitigate the negative impact of material price fluctuations on contractors include: maintaining current knowledge, accelerating design time, and subdividing contracts into smaller ones at more affordable prices. One means of limiting the effect is through risk management.

Table 3: Ways To Reduce The Price Fluctuation Of Housing Project Materials

Ways To Reduce The Price Fluctuation Of Housing Project Materials
• Better contract procedures
• Good human resource management

<ul style="list-style-type: none">• Improve contractor financial utilization
<ul style="list-style-type: none">• Application of the value engineering concept
<ul style="list-style-type: none">• Comprehensive and error free designs and specifications

RESEARCH METHODOLOGY

The research approach must be clearly intended for and understood in order to respond to the research question and guarantee that the aim may be attained. This chapter provides a comprehensive summary of the methods of study that were employed to get reliable data and accomplish all the study's objectives. A quantitative method was used to collect the data for this inquiry. This chapter provides a more thorough explanation of the research strategy, research design, research methodology, study area, data sources, including primary and secondary data, and the methods of data analysis utilized for quantitative data analysis in order to support the research aim. The questionnaire was prepared to obtain the data related to the research objectives which are the effects of material price fluctuation towards housing project, the factors that cause the fluctuation in the price of housing project materials and ways to reduce the price fluctuation of housing project materials. The questionnaire survey was distributed to the contractors and people who are working at the contractor's company G7. The method used to distribute the questionnaires and collect the data are via email. To obtain the results of data, all data collected from respondents are analyzed using Statistical Package for Social Science (SPSS) Version 28.0. The information is analyzed with descriptive statistics. Frequencies, mean, and percentage of respondent data can be obtained using this approach to generate an informative result. Furthermore, the questionnaire survey was validated using reliability analysis to determine data dependability. The scope of the study continues to be a limitation for this research even if it was considered successful in terms of reaching its goals. Limitation of study is matter and occurrences that arise in a study which are out of the researchers' control. The study's following restrictions might prevent the results from being generalized. Even if the research has ended and its goals have been met, there are certain restrictions that prevent it from producing the best possible outcomes. Contractor companies G7 that registered under CIDB in Kedah were the subject of this investigation. Firstly, the study's respondents were only concerned with the current state of Kedah. As a result, the conclusion could not be applied to Malaysia as a whole. Contractor companies from other states might have different from those in Kedah. Second, the responders who were being sought for were contractors' companies. The intended respondents' ability to complete the surveys, however, cannot be guaranteed. A few organizations with experience in

construction were also picked as respondents. The findings of the research lack a perspective or further data as a result. The results of the investigation may vary by region.

ANALYSIS OF FINDINGS

This section describes the information of the respondents who answered survey questionnaire. It includes gender, age, the respondent's position held in the organization, years of work experience, and the district the respondent's company operates in.

Analysis Of The Demographic Information

Table 4 : Section A: Demographic Information

Items	Demographic Factors		Frequency	Percentage %
Q1.	Gender	Male	75	80.6
		Female	18	19.4
Q2.	Age	20 – 25 years old	50	53.8
		26 – 30 years old	14	15.1
		31 – 35 years old	8	8.6
		36 – 40 years old	12	12.9
		41 – 45 years old	5	5.4
		46 years old and above	4	4.3
Q3.	Post Held in the Organization	Contractor	4	4.3
		Engineer	32	34.4
		Project Manager	15	16.1
		Quantity Surveyor	26	28.0
		Safety Officer	16	17.2

Q4.	Years of Working Experience	Less than 5 years	50	53.8
		5 – 10 years	19	20.4
		11 – 15 years	13	14.0
		16 – 20 years	7	7.5
		More than 20 years	4	4.3
Q5.	The District of Company Operates in	Alor Setar	36	38.7
		Kuala Muda	7	7.5
		Kubang Pasu	16	17.2
		Kulim	17	18.3
		Langkawi	10	10.8
		Pokok Sena	7	7.5

Based on collected data, the total number of recorded respondent data is 93 respondents. The gender distribution of respondents shows that 75 (80.6%) there are more male than female respondents which is 18 in number respondents (19.4%). Participants are both male and female respondents produce a variety of responses to the survey.

The age of the respondents is categorized into six categories which are 20 to Aged 25 years, 26 to 30 years, 31 to 35 years, 36 to 40 years, 41 to 45 years and 46 years and above. From the results, age 20 to 25 years with 50 number of respondents (53.8%) leads the most respondents. It is followed by respondents who are aged 26 to 30 years with 14 respondents (15.1%). Then, 36 to 40 years old represent 12 respondents (12.9%). In addition, aged 31 to 35 years represent 8 number of respondents (8.6%). Next, 41 to 45 years old represent 5 number of respondents (5.4%). Finally, the lowest respondent, who is 46 years old and above, as many 4 number of respondents (4.3%). Therefore, it shows that respondents aged 20 to 25 years nominated this survey.

There are five types of post held in the organization to be filled in by the respondents. The most common post held in the organization in contractor company are engineer with 32 number of respondents (34.4%). It followed by the second common post held which are quantity surveyor in result of total 26 number of respondents (28.0%). It continues with the third types of post held which is safety officer with 16 number of respondents (17.2%). The lower respondents who are project manager with 15 number of respondents (16.1%). Meanwhile, the lowest respondents who are contractor in result of total 4 number of respondents (4.3%).

The most experience respondents are less than 5 years of working experience equivalent to 50 number of respondents (53.8%). It followed by respondents that have working experience for 5 to 10 years with 19 number of respondents (20.4%). Then, respondents with 11 to 15 years represents 13 number of respondents (14.0%). Besides, respondents that have working experience for 16 to 20 years with 7 number of respondents (7.5%). The least working experience among the respondents are more than 20 years with 4 number of respondents (4.3%).

In this study, state of Kedah divided into few districts, these parts are Alor Setar, Kuala Muda, Kubang Pasu, Kulim, Langkawi and Pokok Sena. Based on the table 4 it shows that district of Alor Setar with 36 number of respondents (38.7%) leads the most respondents. It is followed by respondents who are in the district of Kulim with 17 respondents (18.3%). Then, district of Kubang Pasu represent 16 respondents (17.2%). In addition, district of Langkawi represents 10 number of respondents (10.8%). Next, the district of Pokok Sena represent 7 number of respondents (7.5%). Finally, the district of Kuala Muda, as many 7 number of respondents (7.5%).

ANALYSIS OF EFFECTS OF MATERIAL PRICE FLUCTUATION TOWARDS HOUSING PROJECT

This section's goal is to observe the effects of material price fluctuation towards housing project.

Table 5 : Section B: Effects Of Material Price Fluctuation Towards Housing Project

Effects of Material Price Fluctuation Towards Housing Project								
Item	Criteria	Frequency Analysis					Mean	Ranking
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
		Number of Respondent						
1	Increase in final cost of building products	2	1	8	41	41	4.27	1
2	Collapse of building due to less quality materials	0	5	10	36	42	4.24	2
3	Client expectations on quality project delivery	0	2	9	48	34	4.23	3
4	Increase in cost of construction	1	1	10	49	32	4.18	4
5	Low construction product volume	0	3	13	48	29	4.11	5
6	Increase in project abandonment	0	2	13	54	24	4.08	6
7	Unemployment of construction workers	0	4	15	46	28	4.05	7
8	Poor workmanship quality	1	4	17	41	30	4.02	8
Average Mean Score							4.15	Agree

Table 5 tabulates the analysis summary to identify the level of agreement on effects of material price fluctuation towards housing project. There are eight effects of material price fluctuation towards housing project in this study which are increase in final cost of building products, collapse of building due to less quality materials, client expectations on quality project delivery, increase in cost of construction, low construction product volume, increase in project abandonment, unemployment of construction workers and poor workmanship quality. The highest score ranked on the level of agreement of the effects of material price fluctuation towards housing project was increase in final cost of building products, with a mean of 4.27. According to the previous researcher, one of the key elements contributing to the variance in project costs is the change in material prices. Elinwa and Buba (1993) claim that the main causes of a high final cost of construction goods in Nigeria are the considered cost of materials and volatility in material prices. Secondly, collapse of building due to less quality materials, with a mean of 4.24. Building collapse may result from the

purchasing of poor building materials. Such materials lead to inadequate construction and unanticipated accidents. The researchers said that building collapses occur often in poor countries. For instance, Nigeria frequently has building collapses that are mostly the result of human activity. To support the illustration, Hamma (2017) did several investigations a few years ago to identify the primary reasons of building failure and collapse in Nigeria. Thirdly, client expectations on quality project delivery, with a mean of 4.23. The project's cost is significantly influenced by the identification of the materials and the building details. According to Meng (2012), most construction projects consider cost to be a necessary component, which leads some clients to look for inexpensive pricing. Fourth is increase in cost of construction, with a mean 4.18. According to Windapo and Cattell (2012) stated that building material price stability is a prerequisite for the construction sector to have significant expansion. This price is rising in South Africa, but, at greater rates than anticipated. It has been extremely difficult for clients and project contractors to maintain stable cost projections for building projects. Fifth is low construction product volume, with a mean 4.11. Nigeria's construction output is quite low when compared to the construction industry of several wealthy countries. According to Ganiyu (2016), the Nigerian construction sector is confronting a range of issues, the majority of which are hurting the performance of its contractors in the delivery of sustainable housing. Sixth is increase in project abandonment, with a mean 4.08. Project abandonment refers to the unforeseen cessation of work progress, particularly at the implementation stage, such as the reluctance or inability to finish a contract after the realistic completion term according to Nasar et al., (2003). Many building projects are temporarily or indefinitely abandoned, and many unfinished and abandoned projects are the consequence of financial and material issues, according to Nasar et al. (2003). Seventh is unemployment of construction workers, with a mean 4.05. Labor in the construction sector are extremely diversified, since the industry employs a wide spectrum of both skilled and unskilled workers stated by Akamoah et al (2018). According to Ayodele (2011), changing building material costs are harming the construction business since many contractors are unable to deliver realistic predictions of profit on a project, resulting in layoffs and, in certain situations, firm closure. Eighth is poor workmanship quality, with a mean 4.02. According to Akamoah et al. (2018) identified low quality craftsmanship and limited originality in construction approaches as a result of growing building material costs. According to the findings of the studies, increases in the cost of building materials result in bad and inefficient rates of profitability for contractors, because attempts to balance out are made by utilizing low quality workmanship, so restricting new innovations in construction methods.

ANALYSIS OF FACTORS THAT CAUSE THE FLUCTUATION IN THE PRICE OF HOUSING PROJECT MATERIALS

This section's goal is the factors that cause the fluctuation in the price of housing project materials.

Table 6 : Section C: Factors That Cause The Fluctuation In The Price Of Housing Project Materials

Factors That Cause the Fluctuation in the Price of Housing Project Materials								
Item	Criteria	Frequency Analysis					Mean	Ranking
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
		Number of Respondent						
1	Inflation rate	0	0	7	39	47	4.43	1
2	Interest rate	0	0	11	36	46	4.38	2
3	Currency exchange rate	0	1	10	41	41	4.31	3
4	High demand	0	0	10	46	37	4.29	4
5	Shortage of construction material	1	1	9	41	41	4.29	5
6	Material are selling higher than the ceiling price	1	0	10	44	38	4.27	6
7	Monetary policy	0	1	13	43	36	4.23	7
8	Increase in the price of fuel	0	2	11	44	36	4.23	8
9	Macroeconomic policy	0	1	10	52	30	4.19	9
Average Mean Score							4.29	Agree

Table 6, tabulates the analysis summary to identify the level of agreement on the factors that cause the fluctuation in the price of housing project materials. There are nine factors that cause the fluctuation in the price of housing project materials in this study which are inflation rate, interest rate, currency exchange rate, high demand, shortage of construction material, material is selling higher than the ceiling price, monetary policy, increase in the price of fuel and macroeconomic policy. The highest score ranked on the level of agreement of the factors that causes the increase in the price of housing project materials was inflation rate, with a mean of 4.43. According to Oladipo (2012) stated Inflation can be defined as a sustained increase in the general price level of goods and services in an economy over some time. Inflation reflects the reduction of the purchasing power per unit of money. As the raw materials

increase in price, the building materials will, in turn, become costly and similarly, the corresponding services will become expensive. Thus, inflation will cause the price of building materials to move upward. Bank Negara Malaysia unexpectedly decided to raise its overnight policy rate (OPR) by 25 basis points, to 2% from 1.75%, on May 11th, 2022. Secondly, interest rate, with a mean of 4.38. According to Oladipo (2012) stated borrowing money has a cost, which is the interest rate. Borrowing money will cost more if interest rates rise, which may reduce consumer demand for mortgages and other lending products. Thirdly, currency exchange rate, with a mean of 4.31. According to Agene (1991), changes in a country's import and export will have an impact on the exchange rate. The currency rate of a nation will affect how much building materials cost. Fourth is high demand, with a mean 4.29. In 2019, CIDB (2020) stated the overall of housing material prices increased during the year. This occurs because the increased demand for building materials, as in the projects under the (RMK-9) had been completed and the projects under the (RMK-10) in the early stages of execution. Because of that the demand of materials increase and the prices of the materials become increase. Fifth is shortage of construction material, with a mean 4.29. According to Chalo (2008) shortage of building materials should be controlled so that the shortage of building materials in the market can be reduced. Also, construction industry will be affected from the shortage of construction materials. Besides that, increase of construction materials will lead to an increase in the prices of building materials due to the shortage of building materials on the market. Sixth is material are selling higher than the ceiling price, with a mean 4.27. According to Master Builders Association Malaysia [MBAM] (2020) presents rising prices of building materials will hamper construction industry. Steel bar millers are selling higher than the ceiling price. Seventh is monetary policy, with a mean 4.23. According to Akanni (2014) stated if the economy is in a slump, the government would try to stimulate it by implementing an expansionary monetary policy that would result in a rise in the money supply by lowering interest rates. Eighth is increase in the price of fuel, with a mean 4.23. According to Windapo (2012) the cost of energy sources like fuel might rise, and this can have a big effect on the building sector. For instance, the cost of energy, such as fuel, will affect how much building materials cost. The price of building supplies will rise if fuel prices are high because higher transportation costs will directly affect the price of all building products. Energy costs make up a sizeable portion of the overall cost of any building material. Ninth is macroeconomic policy, with a mean 4.19. Recession is the decline of corporate activity during an economic downturn. All macroeconomic indices, including the GDP (Gross Domestic Product), investment spending, capacity utilization, household income, firm profits, and inflation, are generally slowing down, which typically causes bankruptcies and an increase in unemployment. According to Zhou. J (2013) stated the price of building materials will be lower than it should be due to the slowing demand, which will hinder contractors from working on several projects.

ANALYSIS OF WAYS TO REDUCE THE PRICE FLUCTUATION OF HOUSING PROJECT MATERIALS

This section's goal is to identify ways to reduce the price fluctuation of housing project materials.

Table 7 : Section D: Ways To Reduce The Price Fluctuation Of Housing Project Materials

Ways to Reduce the Price Fluctuation of Housing Project Materials								
Item	Criteria	Frequency Analysis					Mean	Ranking
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree		
		Number of Respondent						
1	Better contract procedures	0	0	0	42	51	4.55	1
2	Good human resource management	0	1	0	48	44	4.45	2
3	Improve contractor financial utilization	0	0	0	52	44	4.44	3
4	Application of the value engineering concept	0	0	0	53	40	4.43	4
5	Comprehensive and error free designs and specifications	0	0	0	55	38	4.41	5
Average Mean Score							4.46	Agree

Table 7, tabulates the analysis summary to identify the level of agreement on ways to reduce the price fluctuation of housing project materials. There are five ways to reduce the price fluctuation of housing project materials in this study which are better contract procedures, good human resource management, improve contractor financial utilization, application of the value engineering concept and comprehensive and error free designs and specifications. The highest score ranked on the level of agreement of the ways to reduce problems due to price fluctuation of housing project materials was better contract procedures, with a mean of 4.55. According to Nwachukwu et al (2014) stated improved contract processes are also expected to reduce the impact of market changes on construction contractors, notably cost increases. Secondly, good human resource management, with a mean of 4.45. According to Jolaiya and Idoro (2010) stated human resource management may not directly influence the price fluctuations of housing project materials, it plays a crucial role in managing costs and mitigating the impact of these fluctuations on project finances. Effective human resource management requires effective motivation and project tracking, which includes identifying dead ends and taking remedial action as

soon as feasible. Thirdly, improve contractor financial utilization, with a mean of 4.44. According to Mojekwu et al. (2013) he stated the contractor must identify and obtain things that are likely to cause delays or be in low supply. Furthermore, the best defense against unexpected is adequate planning and frequent evaluation of cash flows. Companies should also continually assess their profitability in relation to their goals. Fourth is application of the value engineering concept, with a mean 4.43. According to Ibn Homaid (2002) stated a rise in the overall cost of the project can be realized by carefully evaluating pricing, availability of materials, building processes, procurement costs, planning and scheduling, cost, benefit values, and other cost impacting goods. The application of value engineering can help reduce the impact of price fluctuations of housing project materials by identifying cost-effective alternatives and design modifications that provide stability in pricing or mitigate the effects of price volatility. Fifth is comprehensive and error free designs and specifications, with a mean 4.41. According to Geoff (2008), error free design and specification give the contractor a blueprint to all the parts he will need to accurately keep him on track to deliver the expected quality of the building construction, saving time and keeping the cost within the final contract sum. This prevents delays caused by missing details or misinterpretations by the contractor.

DISCUSSION OF FINDINGS

The data obtained from the questionnaires are successfully analyzed in this chapter. The data obtained in this chapter is analyzed to ensure that respondents were answered all the questions for each section. All the results are also being discussed in the findings and discussions. There are four sections to which the respondents must respond. IBM Statistical Package for Social Science (SPSS) version 28.0 was used to collect and compile all data from the respondents. To provide a better view and understanding, each question from each section was analyzed and compiled into a single table. The sample contains 93 respondents; hence the data is regarded as having a fair amount of credibility. According to the analysis, the respondents' response met both the research aim and the research objectives.

CONCLUSION

In conclusion, the study undertaken in this thesis has shed light on the significant and multifaceted impact of material price fluctuations on housing projects. The study has revealed that material price fluctuations can disrupt project budgets, leading to cost overruns and financial instability. This, in turn, can lead to delays in project timelines, affecting overall project schedules and potentially causing missed opportunities in the real estate market. The study has underscored the importance of risk management strategies in mitigating the adverse effects of material price fluctuations. Proper risk

assessment, scenario planning, and effective communication among project stakeholders emerge as crucial elements in navigating the challenges posed by these fluctuations. In some cases, the research has shown that proactive measures, such as hedging strategies or long-term supply contracts, can be employed to minimize the impact of price volatility. This, in turn, can lead to delays in project timelines, affecting overall project schedules and potentially causing missed opportunities in the real estate market. Additionally, the research has highlighted that the intricate network of stakeholders in housing projects, including developers, contractors, suppliers, and investors, can all be affected by the ripple effects of material price changes.

The findings have resulted in several recommendations. Contractor, along with their team, and the government play an important role to make sure the price of construction material at the ceiling price. There are many ways to maintain the price of construction material at the ceiling price and it can consider implementing the following measures:

Contractors and their team play a crucial role in managing the material prices of housing projects within the ceiling prices. Contractors should conduct a detailed analysis of material costs for the housing project. This includes researching market prices, comparing different suppliers, and identifying the most cost-effective options. By thoroughly understanding the pricing landscape, contractors can make informed decisions when procuring materials. Contractors should plan the procurement process well in advance to take advantage of favorable market conditions. By procuring materials early, they can mitigate the impact of potential price increases and secure materials at more favorable rates. This proactive approach helps contractors maintain control over material costs. By implementing these strategies, contractors can effectively manage material prices and work towards keeping them within the ceiling prices established for the housing project.

The government can establish a dedicated body or agency responsible for monitoring material prices in the construction industry. This body can regularly collect data on material costs, track price trends, and ensure transparency in the market. This information can be shared with stakeholders to enable them to make informed decisions and negotiate fair prices. The government also can provide subsidies or financial assistance to housing project developers to offset the cost of materials. This can be in the form of direct subsidies, grants, or low-interest loans that specifically target the procurement of materials. By reducing the financial burden, developers can adhere to the ceiling prices and deliver affordable housing projects.

ACKNOWLEDGEMENT

A special thank you goes to the research team. The cooperation is much appreciated. In addition, we would like to thank Univesiti Teknologi MARA for the support in carrying out this research, and not to forget my supervisor, who guided me throughout this paper period.

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Surat kami : 700-KPK (PRP.UP.1/20/1)

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Sekian, terima kasih.

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