

# Financial Considerations of Suppliers, Contractors, And Homeowners in Constructing Decent Residential House Amidst Rising Cost of Materials: A Mixed-Method Study

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**Abstract:** - The purpose of this study was to determine the financial considerations of homeowners, suppliers, and contractors on constructing decent residential house amidst rising costs. This study utilized mixed-method research design. Initially, a semi-structured interview was initiated to determine the financial considerations. Afterwards, a survey was used to collect their ranking of financial considerations. There were eight identified financial consideration as manifested from the thematic analysis. Homeowners listed cost contingency as their primary consideration. For supplier it is material contingency and use of promotions and discounts. While outsourcing was the main considerations for contractors. Results further revealed that bulk buying was least considered by homeowner and debt financing was least considered by both supplier and contractor. When test of difference was taken into account using Kruskal-Wallis' test, four (i.e., cost contingency, debt financing, outsourcing, and bulk buying) were identified to have statistically significant difference. The study was able to identify the financial considerations of the three stakeholders and the way they considered these. Future works should explore other financial consideration that might not considered in this study. At the same time, identifying and looking into financial considerations with types of buildings is worth exploring.

**Key Words:** *Financial Considerations, Decent Residential House, Stakeholders, Rising Costs, Significant Difference.*

## I. INTRODUCTION

Construction, mainly for residential use, serves as a basic need for an individual. Residential construction contributes as an economic engine for most average and below- average income earners since it plays a vital role in the growth and development of the family, community, and country (GUPTA, J. K., 2022).

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However, decent residential construction in the country remains inaccessible for millions of Filipinos as they cannot

afford it, especially low-income families, large families, and those who live in highly urbanized cities. Some clients tend to invest an initial down payment and make affordable monthly mortgage payments toward the cost of their houses. Also, they have experienced different types of contracts that may affect the cost and quality of a residential house they want to live in. Decent residential houses have become a defining economic problem in our era (GUPTA, J. K., 2022).

Construction materials are the key elements in residential construction. However, there are a lot of difficulties affecting the planning phase of construction, especially because of the pandemic. It is very evident that material prices in the Philippines have increased over the past few months. Changes in the costs of construction materials significantly affect the response of contractors, suppliers, and homeowners to every

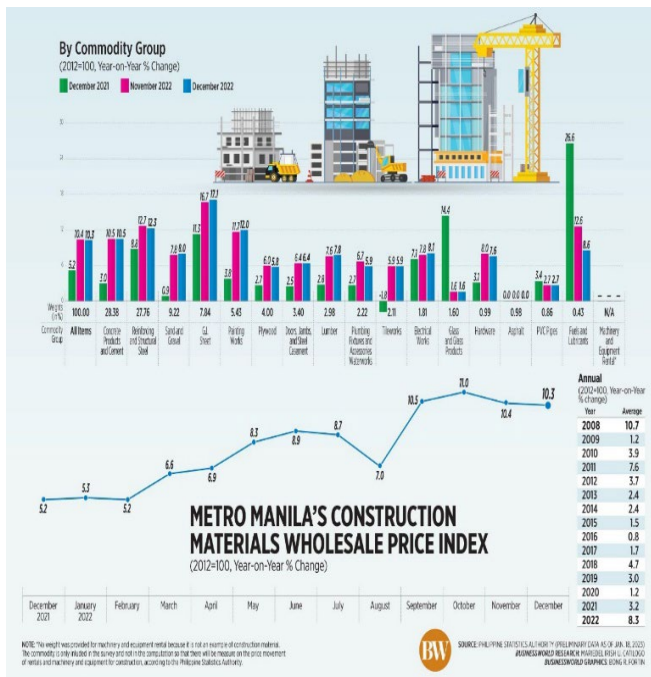
price increase in keeping their businesses and in pursuit of building their own residential houses. The price hike on construction materials is affecting the financial status and needs of contractors, suppliers, and homeowners. In a traditional bid, the contractor usually carries the financial risk of construction materials when the price increases (Cohane, J., Hinckley Allen Construction & Public Contracts, 2021).

Stakeholders encompass individuals who possess an interest in or exhibit care for a project. They actively engage in the project's activities and have a vested interest in its outcomes (Watt et al., 2014). Moreover, the viewpoints held by these stakeholders significantly impact the project's triumph or downfall. Failure to appropriately address and reconcile the concerns of stakeholders has proven to be a leading cause of project failures (Bourne, 2005; Chinyio, 2010).

stated by Windapo and Cattell (2012), changes in the construction industry depend on the price stability of construction materials. The cost of a decent residential construction project depends on the price of construction materials. The cost of construction materials can make up half or 50% of the overall cost of all projects carried out by the construction industry (Caldas et al., 2015).

The industry most affected by the rising cost of construction materials is the construction industry. The overall cost of a residential house will increase as the cost of construction materials increases. Suppliers and contractors are making efforts to avoid overcharging their clients while still maintaining a competitive price for their businesses. Charging too much may mean the risk of losing clients, while charging too little to get more clients may mean the risk of losing their profit or employees. Individuals choose to work with small suppliers and contractors to cut costs. The affordability of houses will then be the next to be affected (Crown Asia Properties, Inc., 2022).

Maintaining steady cost projections is one of the major challenges on construction projects (Akanni et al., 2014). Doloi, H. et al. (2012) state that stakeholders like suppliers, contractors, and clients involved in the construction industry often face substantial project risk as a result of the shifting market value of construction materials. Such contributing factors will be associated with the financial considerations of suppliers, contractors, and future homeowners, depending on their perspectives or experiences.



Graph.1. Price Hike of Construction Materials

## II. REVIEW OF RELATED STUDIES

### 2.1 CONCEPT

Both developed and developing countries are commonly experiencing rising costs for construction materials. Construction materials are supplies used in construction work, from the underground to the finishing. These are basic construction products such as bricks, concrete, aggregates, and cement, i.e., rock, sand, and gravel (Nadramia, T., 2013). As

### 2.2. LOCAL STUDIES

A report from the Philippine Statistics Authority (PSA) indicated on August 11, 2022, that construction retail prices increased by 6.8 percent. This trend was primarily driven by an increase in raw materials, which jumped to 9.4 percent in June 2022, making it a huge leap from 8.3 percent in May and the highest it's ever been in more than 13 years of price stability (Desiderio, L., 2022).

The cost of construction materials is continually rising, with cement and steel bars rising by as much as 25 percent in retail businesses (Cahiles-Magkilat, B., 2022). In addition to the previous month's annual increase (June vs. May 2022), the PSA also reported the following price increases for construction materials: 2.5 percent on carpentry materials such as screws, nails, chinks, molding, timber, plywood, and other wood materials; 4.3 percent on masonry materials such as brick, granite, marble, limestone, glass blocks, concrete blocks, cast

stone, and other rocks for construction use; 4.6 percent on painting materials and other compounds such as paint for aluminum, cement, or other anti-corrosive paint; and 10.6 percent on other miscellaneous construction materials with rising costs in just a month (Desiderio, L., 2022).

### 2.3 INTERNATIONAL STUDIES

Based on a report on material pricing and supply chain volatility by Linesight, a global construction consultant with offices in Ireland mentioned that cement and concrete prices had risen more recently, by about 14% in 2022 (Obando, S., 2022). Furthermore, the rising cost of construction materials in South Africa is at higher rates than expected (Alabi, B., & Fapohunda, J., 2021). Big cities like Johor Bahru and Kuala Lumpur in Malaysia are also getting concerned about rising housing prices (Mansur, S.; Abdul Hamid, A.; Yusof, N., 2016).

Associated General Contractors of America's chief economist, Ken Simonson, says that there are already price increases on construction materials that occurred in January 2023. He revealed that manufacturers of steel, tile, and insulation had already made announcements on price hikes for February. He added that material costs will be a major concern for contractors in 2023 (Leggate, J., 2023).

Moreover, earlier studies have shown that the price of construction materials, such as sand, cement, steel, and piling materials, has a significant impact on how much a project or construction would cost. Contractors may suffer from the rising cost of construction materials, particularly with huge increases of up to 50% in less than 6 months. Typically, they work under a signed contract that does not account for unforeseen changes in price. Not only will the contractors go out of business if the situation is not monitored and controlled, but the clients will also lose the opportunity to have their residential house built quickly and affordably (Mansur, S.; Abdul Hamid, A.; Yusof, N., 2016).

Having a decent residential house is becoming extremely expensive; however, several factors and recommendations can help keep construction costs low and prevent cost overruns. Purchasing materials at the right time is critical. However, a similar study conducted in Canada revealed that reductions in other material types were observed at various points throughout the year. This means that the order in which selections are made can have as much of an impact on a project's budget as the selection itself (Barnett Construction Ltd., 2022).

## 2.4 PRICE INCREASES IN CONSTRUCTION MATERIALS AFFECTING THE FINANCIAL CONSIDERATIONS OF STAKEHOLDERS

### 2.4.1 SUPPLIERS

In a firm-fixed or lump-sum arrangement, suppliers often take on the risk of rising costs of construction materials, even if those increases are unanticipated and not their fault. Paying greater expenses for material supplies is typically viewed as a business risk, but supply shortages may result in an excusable performance delay (ConsensusDocs, n.d.).

Due to factory shutdowns, suppliers will be forced to look for other alternatives to replace the materials if they are simply unavailable. Managing the price increases is now alarming as suppliers raise prices to protect their profits (Meyer, D.; Lenten, B., 2022).

### 2.4.2 CONTRACTORS

Construction contractors are often forced to pass the rising cost of construction materials on to their clients in the form of higher construction costs. The exact cost depends on the project, but the majority of contractors do not have the flexibility to absorb the cost of these increases. The construction industry is a very competitive business, and contractors need to stay profitable in order to stay in business (Cresswell, A., 2022).

Since January 2016, in Malaysia, there has been a crisis in the price of steel bars, which rose by more than 50%. To cover the losses, contractors across the nation had to raise prices by more than 5% due to the rising cost of construction materials. Hence, contractors need to consider the issue seriously and take appropriate actions to ensure that people are able to afford a residential house to live in (Mansur, S.; Abdul Hamid, A.; Yusof, N., 2016).

Fixed contracts, even flexible contracts with maximum prices guaranteed, will continue to be vulnerable to price increases, especially for a contractor who is at risk of getting paid only up to the final fixed price (Cohane, J., 2021). According to Meyer, D.; Lenten, B., (2022), allowing adjustment for construction materials' price increases in the past was for rare contracts. The rising cost of construction materials has traditionally been seen as a risk undertaken by the contractor or supplier in the absence of particular conditions or provisions giving affirmative relief for price increases. An investigation by Akanni, P.; Oke, A.; Omotilewa, O. (2014) found that disputes between contractors and clients result from an increase in contract sums. Since such

projects won't be used during the anticipated period, this could result in cases of abandonment, where investments are tied down.

#### 2.4.3 HOMEOWNERS

The risks of rising costs of construction materials for suppliers and contractors may be passed down to homeowners. A rise in construction material prices might also indicate a drop in new house development for the broader housing industry. This might cause construction delays on current projects. Some homeowners may opt to abandon a project because growing material costs may force them to lower the amenities of their home. (Crown Asia Properties, Inc., 2022).

Nowadays, the rising cost of construction materials puts contractors at risk, and it is anticipated that owners will bear the increases through higher bid prices (Meyer, D.; Lenten, B., 2022). Windapo et al. (2004) argued that the excessive rise in construction materials' prices has made homeownership unaffordable in the construction market. Housing shortages as a result of this situation make it difficult for millions of middle- and low-income earners to own a residential house, especially if they cannot risk price increases when they have fixed budgets.

#### 2.5 OBJECTIVES OF THE STUDY

This study was conducted to surface the financial considerations of stakeholders in consideration of the price increase of materials used in residential construction projects. In particular, this study sought to achieve the following:

- Identify the financial considerations of stakeholders in connections to the price increase of construction materials;
- Determine if there is a significant difference in the way the stakeholders rank the identified financial considerations.

#### 2.6 SIGNIFICANCE OF THE STUDY

To the Suppliers. The study's conclusions will generally enhance their knowledge about price escalations, their causes, and their impacts on their business or work.

- To the Contractors. The findings of the study will help general contractors, independent contractors, or sub-contractors and other enterprises correctly manage their proportions on their contracts while being profitable.

- To the Construction and Engineering Industries. The findings of the study will be beneficial for them to fully inform their clients about the price escalation and to easily budget the construction materials beforehand.
- To the Homeowners. The findings of the study will help them learn more about construction material price increases and their causes, risks, and implications for future housing construction.
- To the Future Researchers. The findings of this study may serve as a guide or future reference for researchers with relevant topics to improve their research and make it more accurate.

#### 2.7 SCOPE AND LIMITATIONS

This study was focused on identifying the financial considerations of stakeholders when there is a price increase in construction materials for decent residential housing projects. In particular, this study utilized interviews and assessments with select stakeholders located in the province of Pampanga, Philippines, to achieve its objectives.

The study utilized a qualitative approach to identify specific themes based on the responses of the participants about financial considerations in constructing decent residential houses amidst rising material costs. The participants in this part came from the District 1 (Angeles, and Magalang), District 3 (San Fernando, Mexico, and Sta. Ana), and lastly District 4 (Sto. Tomas) in the province of Pampanga.

While for the quantitative approach, the participants are also from District 1 (Angeles, and Magalang), District 3 (San Fernando, Mexico, and Sta. Ana), and lastly District 4 (Sto. Tomas) in the province of Pampanga. Different participants on this part responded by ranking the established themes from the qualitative part through a quantitative measurement scale to identify which themes or financial considerations were most or least experienced by the participants in constructing their decent residential houses.

This research doesn't cover the solutions to problems caused by financial considerations or the rising cost of materials. The study was done through the utilization of questionnaires given to the participants as a survey and reference. By using their strategy, the researchers were able to know the financial considerations of stakeholders in consideration of the price increase in construction materials and if there is a significant difference in the way the stakeholders rank the identified financial considerations.



### III. METHODOLOGY

#### 3.1 RESEARCH DESIGN

This study followed a mixed-method exploratory sequential approach as its research design, as seen in Figure 1. A mixed-method exploratory sequential approach was primarily used in this study to gain a comprehensive understanding of the financial considerations of stakeholders when there is a sudden change in the cost of construction materials for decent housing projects. According to Fetters et al. (2013), this type of design allows researchers the flexibility to explore, gain information, and gain insights about a topic that is not yet well known. Furthermore, by utilizing this design (i.e., combining two approaches), robust results can be obtained and a more valid understanding of the topic can be obtained.

Based on these, there were two phases in this research that followed the stated research design. First, the study conducted interviews with selected stakeholders to determine their financial considerations. Thematic analysis was used to achieve this. Second, a follow-up survey was conducted.

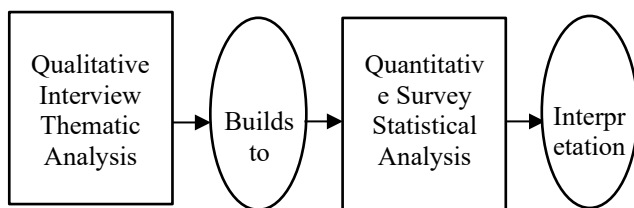


Fig.1. Exploratory sequential design (American Journal of Educational Research. 2016, 4(7), 570-577 doi:10.12691/education-4-7-10)

According to Creswell (2014) and Creswell & Plano Clark (2011), the structure of an exploratory sequential design or approach includes a qualitative section first, followed by a measurement portion to assess or amplify the qualitative results. As stated by Creswell and Plano Clark (2011), researchers first gather qualitative data for exploratory designs. Analyze the qualitative data first, and then build on it to follow up quantitatively. The construction process may entail identifying the kinds of inquiries that could be made, figuring out the elements, variables, and scales for creating theories, and designing instrument groupings or categorizations. According to Creswell & Creswell (2018), both strands received the same amount of weight.

#### 3.2 SAMPLE AND SETTING

In order to determine the participants in this study, a combination of purposive and convenience sampling techniques was used. Purposive sampling technique is a non-probabilistic sampling method where researchers usually select participants based on specific criteria and the objective of the study (Crossman, 2020). Oftentimes, this type of sampling technique is used when there is a small population, often a smaller subset of the population designed to logically represent it (McCombes, S., 2019). The total sample size for this study was 350. This sample size was derived from previous studies, such as the research study conducted by Michelle Gail Calderone last 2015, where similarly, a total of 350 students were eligible to participate in the study. As mentioned by Creswell (2018), there are no set guidelines for the number of people you should include in your research; however, some researchers believe that for the majority of studies, sample sizes more than 30 and lower than 500 are suitable. In the researcher's view, the decision to use a sample of 350 research subjects was based on the fact that a larger sample would make the study more representative and would give a more comprehensive and holistic picture of the subject being researched. The researchers used the RAOSOFT calculator to determine the exact number of respondents in this study.

They were 350 respondents in the study. The majority of them are homeowners (77.4%), followed by suppliers (14.9%), and contractors (7.7%). The respondents are relatively young, their ages range from 28 to 51 years old. Out of the total respondents, 52.6% are female, and 44.3% are holders of bachelor's degrees. For homeowners, their income group ranges from 18,200 to ₱63,700 (50.9%). For both supplier and contractor respondents, they are working in the industry between 3 years to 24 years. Almost a quarter of the respondents are from the city of San Fernando, Pampanga.

#### 3.3 RESEARCH INSTRUMENT

There are two types of instruments used in this study. For the qualitative part, a semi-structured interview was utilized where participants in this study were asked to answer one open-ended question (see Appendix A.5.1). For the quantitative part, a survey questionnaire was utilized (see Appendix A.5.3).

For the interview instrument, it was validated by Engineers with experiences in building residential houses in relation to their understanding of the cost of materials in the engineering field and a research expert with professional certification who has vast, extensive knowledge or ability based on research,

occupation, or experience in a particular area of study (see Appendix A.5.1).

The themes generated from the qualitative interview results were validated by a professor in BS Entrepreneurship and BS Economics who has the deep understanding of business necessary to be utilized for the quantitative survey questionnaire instrument (see Appendix A.5.2)

### 3.4 DATA COLLECTION

#### Phase 1:

When the interview questions have been generated and completed, the researchers seek confirmation from experts. Following validation, the researchers searched for participants. The selected participants were given a consent form on which they were informed about the purpose of the study as well as the confidentiality of their data. Upon their approval, a voice recorder was prepared to record all the answers to the participants' questions during the interview. The researchers, with the help of a research expert, analyzed the collected data for the qualitative part.

#### Phase 2:

For the survey instrument in the quantitative approach, printed questionnaires were distributed to the other set of participants to gather statistical data to support the qualitative part. The researchers analyzed the results of the mixed-method study with the validation of experts in the field of statistics or research.

### 3.5 DATA ANALYSIS

#### Phase 1:

One way to analyze qualitative data is through thematic analysis. Usually, it refers to a group of texts, such as an interview or a transcript. The researcher carefully analyses the data to find recurring themes, subjects, concepts, and patterns of meaning. The data gathered was analyzed through coding, categorization, and thematic analysis. Although there are other ways to go about doing thematic analysis, the most popular method involves six steps: familiarization, coding, generating themes, evaluating themes, defining and labeling themes, and writing up. By using this procedure, you may also prevent confirmation bias from creeping into your analysis. Virginia Braun and Victoria Clarke created this procedure initially for psychological study. Thematic analysis is a versatile tool, nevertheless, and may be used to a wide range of study types (Caufield, 2019). See Table 1 below:

Table.1. Coding, Categories, and Themes

Coding	Categorizing	Thematic Analysis
Participants' Transcribed Answers	Classifying similar though responses. Constructing a new sentence.	Theoretical sampling will be used to narrow the categories.
Assign Code for each participant. (Ex. For Supplier 1-S1, For Contractor 1-C1, and For Homeowner 1-H1.)		Categories will be integrated into a theoretical framework.

#### Phase 2:

For the quantitative part, the study will use SPSS or Statistical Package for the Social Sciences to analyze the data, it's a program application used to perform statistical analysis in various industries, such as social sciences, healthcare, and market research. It enables researchers to conduct analysis, visualize findings, and analyze data (IBM Corp., 2021). Specifically, Kruskal-Wallis H test is a rank-based nonparametric test that may be used to determine if there are statistically significant differences between two or more groups of an independent variable on a continuous or ordinal dependent variable. and was developed in 1952 by Kruskal, W.H. and Wallis, W.A.

### 3.6 ETHICAL CONSIDERATION

All the participants included in the study will be informed about the study's purpose and procedures. Respondents cannot be forced to take part in this research and the right to decline if they believe they will be harmed by the question. If this is the case, the researchers will fully comprehend and accept the respondents' decision. Rest assured that the respondents' identities will be kept anonymous for their safety and privacy, and that all data gathered will be kept strictly confidential.

## IV. RESULTS AND DISCUSSIONS

### 4.1 RESULTS AND DISCUSSIONS

#### 4.1.1 FINANCIAL CONSIDERATIONS OF STAKEHOLDERS IN CONSIDERATION OF THE PRICE INCREASE IN CONSTRUCTION MATERIALS

In this chapter, primary data collected is summarized. Whereas quantitative data collected with the help of the survey questionnaire is presented with the help of tables, graphs and brief explanations, qualitative data narrated concurrently the

data will answer the research, as discussed in the previous chapter. Where relevant, relationships are tested for significance between variables, with the help of statistical software techniques, towards providing answers to the research questions.

#### *Theme 1: Outsourcing or Increase Contract/Material Price*

By engaging a different person or business to carry out duties, offer services, or manage operations that were previously handled by company personnel, a corporation can cut expenses and improve efficiency. In other terms, outsourcing is the practice of having some work duties performed by an outside organization. Contracting out refers to the process of outsourcing company services (CFI Team, 2022).

“Contract price, wala kang magagawa e. Kung ayaw mo, wag mo... So, no choice. It’s either you stop your business or... you deal with it diba?... or so kami we can’t stop the business and deal with it.” -C1

“Ini-increase namin yung price ng construction. Ini-increase namin yung mga kontrata namin, pero never pumasok sa isip namin na dayain namin yung specs... It’s either going up or you hike the price, or you lessen the quantity.” -C1

“We increase the price of construction. We increase our contracts, but it never crossed our minds to manipulate the specifications... It’s either going up or you hike the price, or you lessen the quantity” -C1

#### *Theme 2: Cost Contingency*

According to Law Insider a cost contingency means unforeseen costs or situations which are not included in the estimate of project costs and shall not exceed 10 percent of the estimated eligible construction cost to the nearest dollar for which a grant is made under the act. Upon receipt of bids, the contingency costs shall be reduced to not more than five percent of the actual eligible construction costs as bid.

In the field of project management, a cost contingency is a sum of funds that are set aside to cover unforeseen occurrences that are not expressly anticipated in a cost estimate. The aim is to compensate for the unpredictability of risk exposure as well as the inherent uncertainty in cost and time predictions (Wigmore, 2019).

“Pero during mag-estimate ka, mamye kang uhmmm... ah... contingency factor. Material contingency na most commonly 3 to 4% makanyan... 5 to 6% actually, kung akung mag-estimate. Kasi automatic, dapat atin. Kung aku ne, kailangan

material contingency. I-anticipate mune agad na magbayu ing presyu.” -C3

“But when you're estimating, you have to include, uhh... ah... a contingency factor. Material contingency, which is commonly around 3 to 4%... actually 5 to 6%, if I were to estimate. Because it's automatic, it should be included. If it were me, I would need material contingency. I would anticipate immediately that prices will increase” -C3)

“Syempre ano... i-consider mo yung budget mo.” – H5

“of course, you need to consider your budget.” – H5)

“Tsaka dapat talagang nakaplano. Kasi hindi pwede pwede yung... lalo na ‘pag nag-increase yung... katulad ngayon, nag-increase yung construction materials... talagang binabudget naming mag- asawa kung papano namin pagagawa yung unit...” – H2

“And it really needs to be well-planned. Because it can't be just... especially when there's an increase... like now, with the increase in construction materials... my spouse and I really budget how we can have our unit built....” – H2)

#### *Theme 3: Material Contingency*

In the construction industry, a material contingency is a reserve set up by a contractor or project manager to cover unanticipated expenses for materials and supplies during a building project. A material contingency is used to protect against unanticipated price increases, delivery delays, and other circumstances that can push material expenses over the allocated sum. The amount of material contingency needed for a construction project might change based on the project's size and complexity, the materials' availability and price volatility, and the risk management plan of the contractor. According to a study by Oladiran, Ogunsanmi, & Dada, (2019), it explores the use of traditional and mathematical models to estimate material contingency allowances in construction projects.

“Actually, ang ginagawa ko po ahhh... Kung tataas siya, hindi ko siya masyadong ahh... ano ba yun... yung... rekta na... itataas talaga... Kumbaga, tataas lang ako ng pakonti-konti hanggang makuha ko yung ano talaga... yung presyo na kailangang itaas...” - S5

“Actually, what I do is... If it increases, I don't immediately... um... raise it straight... I gradually increase it... In other words, I raise it little by little until I reach the desired... the price that needs to be raised.” - S5)

“Ah, kapag ganon ahhh... Automatic mag... mag i-increase din kami, pero hindi naman up to the extent na sobrang taas... Yung sakto lang din.” -S4

(“Ah, in that case... We automatically... we also increase, but not to the extent of being too high... Just the right amount.” - S4)

#### *Theme 4: Contract Renegotiation*

The method of changing the terms and conditions of a contract between two or more parties participating in a construction project is referred to as contract renegotiation in the construction field. A new negotiation may be necessary owing to modifications in the project's scope, unanticipated events, or adjustments in the economy (Ganglmair, 2017).

According to a recent World Bank research (2004), renegotiations of 41% of infrastructure concessions in Latin America, mainly in the transportation sector, took place within two years of the contract's award.

“Normally, sa provision ng contracts sa mga contracts definition, may provision yan for escalation... Tumaas ang labor, magcompute tayu. May mga formula na kinocompute, kase may BOQ yan diba. Materials, quantity, unit price, labor, pweding itaas yun. Tumaas ang labor ng San Fernando, so pwedi tayong magcompute ng adjustment, may formula din. Tumaas yung materyales, pwede kang humingi ng escalation, kase unforseen yan e. Lahat ng contract ah. Lahat ng contract may provision or clause for escalation.” -C1

(“Normally, in the provision of contracts, there is a provision for escalation in the contracts' definition. If labor costs increase, we will compute it. There are formulas to calculate it because there is a Bill of Quantities, right? Materials, quantity, unit price, labor, those can be adjusted. If labor costs increase in San Fernando, we can calculate the adjustment, there is also a formula for that. If material costs increase, you can request escalation because it is unforeseen. All contracts have provisions or clauses for escalation.” -C1)

“Pwedi naman magchange order kung kailangan... Kasi kung ketang kontrata yu ing pisabyan presyu... tapus meg-increase bagya, pwedi ka manyad keng mikibandi consideration para change order.” -C3

(“You can actually make a change order if necessary... Because if the contract specifies a certain price... and then there's an increase, you can request additional consideration for a change order.” -C3)

#### *Theme 5: Use of Alternative Methods & Materials*

A shift ignoring the traditional hollow wall building using bricks and concrete blocks are used in a range of construction methods using different techniques and materials. Alternative building techniques benefit from being easy to implement on-site, resistant to supply chain issues, decreasing u-values, eliminating cold bridging, and boosting airtightness, reducing the environmental effect of construction materials, and producing less waste (Alternative Methods of Construction | Hodkinson Consultancy).

“Ing other option mu, mag-adjust ka kareng other finishes. Kasi pinakamagastus ken based keng experience ku, 40% ing structural eh, itang 60% ken yang architectural, electrical ampo plumbing. Pwedi mu neman papintura or patiles in the future, based ketang contract amount yu or budget yu.” -C3

(“Your other option is to adjust the other finishes. Because based on my experience, the structural work comprises around 40%, while the remaining 60% includes architectural, electrical, and plumbing works. You can consider allocating a portion of the budget for painting or tiling in the future, based on your contract amount or budget.” -C3)

“Tapos ah... Kung pwedeng gumamit ka ng ah... other option ng mas murang materyal kaysa dun sa high-end na mga... “- H5

(“Then, if possible, you can consider using alternative materials that are more cost-effective compared to the high-end ones. ... “- H5)

#### *Theme 6: Debt Financing*

Debt financing is the process through which a business sells borrowings to retail and/or institutional lenders in order to raise funds for working capital or capital expenditures. The people or organizations receiving the funds become borrowers and are assured that the loan's principal and interest will be returned back (CFI Team, 2022).

“Usually, kami ay humihingi ng tulong sa developer kung possible nilang... ipasok through loan, bank loans or Pag-IBIG, para as a resident, hindi kami magbigla na maglabas ng pera.” - H1

(“Usually, we seek assistance from the developer if it's possible for them to facilitate it through loans, such as bank loans or Pag-IBIG, so that as residents, we don't have to suddenly come up with the funds.” - H1)

“Yung iba... yung ibang mga contractor, inaano nila yung long-term payment na ano... like id divide yan, depende sa contractor kung medyo mabait.” - H4



(“Some contractors offer long-term payment options, where they divide the payments accordingly. It varies depending on the contractor, and some are more accommodating in that regard.” – H4)

*Theme 7: Use of discounts/promotions/coupons*

The use of discounts, promotions, and coupons in construction refers to offering price reductions or incentives to customers or clients. These strategies are commonly used in the construction industry to attract new customers, increase sales, and retain existing clients. Discounts or promotions may be offered on construction materials, equipment, or services. (Gupta & Cooper, 1992)

“Hininhintay namin siyang magpromotion ng 10%, kasi may mga discount yan e... May mga ano... 20% 30% ganyan kaya para mas mura naming mabili yung sa product.” - S2

(“We are waiting for them to have a 10% promotion because they usually offer discounts. There are discounts like 20% or 30%, so we can purchase the product at a lower price.” - S2)

*Theme 8: Bulk Buying*

According to Bhasic (2022), bulk purchasing is when you buy a lot of products or services at once and save money. In order to save money or obtain a better deal, it is typically carried out by enterprises or organizations. If they can locate a good offer, people might also purchase in bulk. You may obtain great deals on almost any kind of goods by purchasing in bulk.

“Ahmmm, ano ahh... mag i-stock na. ... Ahhh... Oo, nag-i-stock lang lagi.”

(“Um, well... they will start stocking up. They always keep stock available.”)

*3.1.2 STATISTICAL ANALYSIS IN THE RANKING OF DIFFERENCE ON FINANCIAL CONSIDERATIONS OF STAKEHOLDERS*

Table 3 shows the respondents' perceived median ranking of the financial considerations to be taken into account when constructing a decent residential home amidst rising material costs. For homeowners, the highest median ranks (tied in ranked 4th) were outsourcing and/or increase contract price, cost contingency, material contingency, and contract renegotiation. Debt financing and bulk buying as financial consideration were ranked last. For suppliers, cost contingency, material contingency, contract renegotiation, alternative methods and materials, and use of discounts, promotions and coupons were also ranked fourth. Debt financing were ranked last by suppliers. For contractors, highest median ranked

(ranked 2nd) was outsourcing and/or increase in contract price followed by cost contingency.

Similar to the homeowners and suppliers, contractors too, ranked debt financing the lowest as financial consideration when constructing decent residential house. It was observed that no financial considerations were ranked as first.

Descriptive statistics indicated that there were similarities and differences in the financial considerations by the respondents. For instance, homeowners prioritized and mostly considered cost contingency (median = 4) as their top priority. Cost contingency is an important aspect of budgeting for homeowners, as it helps to account for unforeseen expenses that may arise during a project, such as home renovations or repairs. It is typically expressed as a percentage of the total project cost and is set aside to cover unexpected costs.

As stated by Hwang, B. G., & Lim, E. S. J. (2013), in their study, that this study identifies important success elements for the main project participants and goals in the Singapore construction industry. Homeowners can use these factors to better manage their projects and ensure that they stay within budget. This means that homeowners wanted to keep it within their intended budget. Meanwhile, homeowners are not as concerned with buying large quantities of materials to save money. Bulk buying is not always considered by homeowners due to various factors such as storage limitations, perishability of items, and upfront costs. Other possible reason for this is that homeowners are also not typically involved in this process which might explain why bulk buying (median = 6) is least considered by them.

According to Dhar, R., & Wertenbroch, K. (2012) in their study, stated that this study investigates the impact of price promotions on consumer satisfaction. The findings suggest that while bulk buying can lead to cost savings, it may also result in lower satisfaction due to the perception of lower quality or the regret of purchasing more than needed. For suppliers, use of discounts, promotions and coupons (median = 4) and material contingency (median = 4) were the most important considerations. This indicates that suppliers often preparing for any potential disruptions in the supply chain and are looking to ways to incentivize their potential buyers as well as mitigate the impact of rising cost to their business. Materials have certain contingencies (Niranjan et.al., 2020).

An assessment by Mackey (2021) indicates that there will be an increase of between 2% and 4% to the total project costs due to supply constraints or material contingencies, as well as and

commodity price hikes. Using price adjustments restrictions to a certain range and aligning contract conditions with those of supplier contracts can also aid in structuring risk and fair allocation (Ibanez et. al., 2021). Commonly, a trading agreement with a standard price is accompanied with rebates and other retroactive reductions, thus lowering the price of the products. One of the key ways that suppliers of structural materials agree on appropriate profit margins is by dealing with retrospective discounts, tiered discounts, marketing money, rebates or discounts from manufacturers, and a variety of other pricing tactics (Hunt, 2023).

Debt financing (median = 7) on the other hand, is the least considered financial considerations by suppliers, suggesting that they do not rely on borrowing money to support their operations amidst rising costs. According to Garcia-Appendini, E., & Montoriol-Garriga, J. (2013) Debt financing is often not the preferred way for funding suppliers, as it might raise the financial risk for both the supplier and the customer. Instead, trade credit will usually be used as a simpler and less hazardous alternative. Trade credit enables suppliers to offer their clients products or services on credit with payment due later. This agreement might give suppliers a source of short-term funding while also assisting them in maintaining positive connections with their clients. These studies highlight the benefits of keeping client connections, lowering transaction costs, and offering a more flexible financing alternative as reasons why suppliers choose trade credit over debt finance. For contractors, they prioritize outsourcing (median = 2) Closure of the border and tunnels was identified as the aspect that has the greatest impact on the cost contingency amount. It was also selected by respondents as the issue that local contractors take into account first when estimating bids (Enshassi, A., & Ayyash, A. 2014), and cost contingency (median = 3).

The construction company transfers a portion of manufacturing or other business activities to an outside contractor in order to maintain the required portfolio of orders, subject to the cost reduction to establish lower prices for their products (E N Klochko, Britikova, E. A., & Kovalenko, L. V. n.d.). The least considered financing method which similar to suppliers is debt financing (median = 8), suggests that contractors are less dependent on borrowing money to finance their projects amidst rising cost of materials. Financial institutions provide the majority of funds for construction projects, with approximately 66% of the funds coming from them. This puts a heavy burden of capital costs on contractors, who are always seeking financial

alternatives to reduce their capital costs (J.H Chen and W.H Chen, 2012).

Table.2. Median Rank of Financial Considerations

Financial Considerations	Homeowners	Suppliers	Contractors
Outsourcing/ Increase Contract Price	4	4.5	2
Cost Contingency	4	4	3
Material Contingency	4	4	4
Contract Renegotiation	4	4	5
Alternative Methods and Materials	5	4	5
Debt Financing	6	7	8
Use of Discounts, Promotions, and Coupons	5	4	5
Bulk Buying	6	5	4

Since the data is not normally distributed and to determine the whether there were any statistically significant differences between the ranking of the three groups, a non-parametric method named Kruskal-Wallis H test was specifically used. The Kruskal-Wallis test results shown in Table 4 indicates that there was substantial evidence to suggest that the three groups of respondents had different financial considerations for constructing a decent residential house in the face of rising material costs. In particular, the analysis revealed that there were significant differences between the groups in terms of cost contingency (p = 0.025), debt financing (p = 0.000), outsourcing and/or contract price increase (p = 0.001), and bulk buying (p = 0.005).

Table.3. Test of Difference on Ranking the Financial Considerations

	Frequency	Percentage
Age (mean ± SD)	39.72 ± 11.63	
Type		
Homeowner	271	77.4
Supplier	52	14.9
Contractor	27	7.7
Sex		
Male	166	47.4
Female	184	52.6
Years Working* (mean ± SD)	13.86 ± 10.03	
Highest Educational Attainment		
Elementary	5	1.4
High School/ SHS	111	31.7
Vocational	63	18
Bachelor	155	44.3
Master	13	3.7
Doctorate	3	0.9
Location		
Angeles	61	17.4
Magalang	69	19.7
Mexico	68	19.4
San Fernando	86	24.6
Sta. Ana	63	18.0
Sto. Tomas	3	.9
Income Group**		
Less than ₱9,100	7	2.0
₱9,100 to ₱18,200	42	12.0
₱18,200 to ₱36,400	92	26.3
₱36,400 to ₱63,700	86	24.6
₱63,700 to ₱109,200	32	9.1
₱109,200 to ₱182,000	8	2.3
₱182,000 and up	4	1.1

Table 4. Profile of the respondents

Financial Considerations	Kruskal-Wallis <i>H</i> test	Significance
Outsourcing/ Contract Price	Increase 13.186	0.001**
Cost Contingency	7.368	0.025**
Material Contingency	0.038	0.981
Contract Renegotiation	0.294	0.863
Alternative Methods and Materials	4.644	0.098
Debt Financing	29.350	0.000**
Use of Discounts, Promotions, and Coupons	5.723	0.057
Bulk Buying	10.482	0.005**

## V. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

### 4.1 SUMMARY OF FINDINGS

The aims of this paper are to identify the financial considerations of stakeholders in consideration of the price increase in construction materials within Pampanga and to determine if there is a significant difference in the way the stakeholders rank the identified financial considerations. Listed below are the major findings in the study:

For the qualitative, a semi-structured interview was utilized and participants were asked one open ended-question. It was able to identify eight financial considerations labeled as outsourcing/increase contract price, cost contingency, material contingency, contract renegotiation, alternative methods and materials, debt financing, use of discounts, promotions, and coupons, and bulk buying using thematic analysis.

For the quantitative, a survey questionnaire was used in the study to determine how the stakeholders ranked the eight financial considerations identified using two statistical analysis methods. Using SPSS (Statistical Package for the Social Sciences), it was revealed that suppliers prioritize the use of discounts, promotions, and coupons as well as material contingency; homeowners prioritize cost contingency; and contractors prioritize outsourcing and/or raising contract prices. All three groups place debt financing at the bottom.

While using the Kruskal-Wallis test next, results shown that cost contingency, debt financing, outsourcing and/or contract price increase, and bulk buying had very low p-values indicating that there were statistically significant differences between the groups.

### 4.2 CONCLUSIONS

The study was able to identify eight financial considerations based from the interview conducted to relevant groups (i.e., homeowners, suppliers, and contractors). Using thematic analysis and through validation from experts, the eight financial considerations were labeled as outsourcing/ increase contract price, cost contingency, material contingency, contract renegotiation, alternative methods and materials, debt financing, use of discounts, promotions, and coupons, and bulk buying. In addition, when survey was conducted to determine how the groups ranked this financial consideration in the context of rising costs for constructing decent residential house, suppliers often prioritize the use of discounts, promotions, and coupons as well as material contingency, homeowners place a high priority on cost contingency. Contractors prioritize outsourcing and/or raising contract prices. All three groups place debt financing at the bottom. In terms of cost contingency, debt financing, outsourcing and/or contract price increase, and bulk buying, the test results showed that there were statistically significant differences between the groups. The significance level at which these variables varied between the groups is shown by the p-values for each one. Particularly, the financial considerations such as debt financing, outsourcing and/or contract price increase, and bulk buying had very low p-values, which provided strong support for the statistical significance of the differences between the groups.

### 4.3 RECOMMENDATIONS

Future studies should look into expanding the scope of the study by including other provinces or possible regions. This will provide a broader and deeper understanding on the financial considerations in terms of constructing decent residential house. In addition, future researchers should replicate this study by adding additional financial considerations like stopping the business operations and halting or delay the construction. These two identified themes were not considered during the conduct of this study as they were not manifested from the interviews conducted. This research can be further improved by indicating what types of contractors and suppliers are involved. This will help to evaluate the answers of the contractors and suppliers more accurately. Furthermore, this task allows the homeowners to indicate if they are just renting, living in someone else's house, or have no house at all. Likewise, the inclusion of other building types is also worth looking into. This way, broader analysis can be derived particularly if there are differences between the different types of buildings.

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