

AMERICAN UNIVERSITY OF BEIRUT

THE IMPACT OF A SEVERE ECONOMIC AND FINANCIAL
CRISIS ON CONSTRUCTION
THE CASE OF LEBANON

by
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ACKNOWLEDGEMENTS

I am writing with a heart full of gratitude and dedication that comes straight from it. As I present my thesis to you on the impact of the Lebanese crises on construction, I cannot but help think of the hardships that we, the Lebanese people, have been enduring over the past years. Through these difficult times, we have proven ourselves resilient and determined in the face of adversity.

To my fellow Lebanese citizens, I dedicate this thesis to you. Your strength and unwavering spirit had inspired and will always inspire me to push forward, to persevere in my work, and strive for excellence. You have shown me what it means to face challenges head-on, to never give up hope, and to come out even stronger on the other side.

To my sister and friends who have emigrated from Lebanon, I dedicate this thesis to you as well. I know that your hearts are still here, with your families and loved ones, and that the current crisis has only made it more difficult to be away. It saddens me deeply that you have been forced to leave our beautiful Lebanon in search for better opportunities and safer environment. Your presence is sorely missed. Please know that you are not forgotten. Your resilience, strength, and perseverance are a testament to the Lebanese spirit. I hope that my work can serve as a small contribution towards helping Lebanon recover from its challenge, so that you may one-day return to a brighter, more prosperous future. Remember that Lebanon will always be your home.

Finally, I dedicate this thesis to all those who helped and supported me throughout my journey. Your encouragement and guidance have been instrumental in getting me to where I am today, and I could not have done it without you. I hope that work makes your proud, and that it serves as a reminder that even in the toughest of times, we can still find hope, resilience, and strength to persevere.

Thank you all, from the bottom of my heart

THIS PHOENIX HAS TO RISE

ABSTRACT OF THE THESIS OF

Pamela Assaad Abboud

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Title: The impact of a Severe Economic and Financial Crises on Construction Projects: The Case of Lebanon

The Lebanese crises, including economic and political instability, have had a significant impact on construction projects and contracting companies in the country. The purpose of this thesis study is to document and evaluate this impact, by examining the challenges faced by both construction projects and contracting companies in the current climate. The study adopts both qualitative and quantitative research methods, including interviews with industry professionals and surveys of construction companies. Through this research, the study aims to identify the key factors that have disrupted the conventional way of administering construction projects, to assess the impact of the financial and economic crises on both construction projects and contracting firms, and to propose potential mitigation measures sorted according to Porter's strategies (1980) to address these challenges.

In addition to the above, the study focuses on calculating the Relative Importance Index (RII) of factors causing delays for Lebanese construction crises and the effectiveness of mitigation measures adopted by practitioners amid the crises. The results of the RII analysis indicate that the most important factor causing delay during the financial and economic crises is the necessity for currency conversion for procurement purposes and the continuous fluctuation of construction materials. The study also finds that the most effective mitigation measure adopted by practitioners is to secure projects funded by

foreign currency, decrease profit margins to secure more projects and others. This study provides valuable insights for policymakers, industry professionals, and other stakeholders in the construction industry to address the challenges faced by construction projects and contracting companies in Lebanon.

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ABBREVIATIONS

BDL: Banque Du Liban

BOQ: Bill of Quantities

CEO: Chief Executive Officer

GDP: Gross Domestic Product

GNP: Gross National Product

LBP: Lebanese Pound

LOC: Letter of Credit

USD: United States Dollar

CHAPTER 1

INTRODUCTION

1.1 Background

Construction projects involve unique characteristics that make them high-risk businesses (El Sayegh & Mahmoud, 2015). Regardless of the size, type, complexity, or location of the project, risks and uncertainties are inherent in every construction project from inception to completion and even in the course of project implementation. Failure to adequately address possible risks and uncertainties throughout the project life cycle can have a detrimental impact on the project objectives of cost, time, and quality (Zou et.al, 2007). While project success is measured by product, project quality, timeliness, budget compliance, and degree of customer satisfaction (PMBOK, 2004) client satisfaction is hampered from being achieved by a lack of quality, project cost overruns, and time extensions (Rashvand et.al.2014; Sambasivan & Soon 2007; Shehu et.al, 2014). Contractors must consider the substantial risks related to economic and financial crises along with any possible fluctuations in local currency exchange rates that will affect their operations in foreign currencies particularly the need to borrow different currency funds. (Eiteman et.al, 2004).

Due to the long duration of construction, projects that span more than several years, applicable government policies and regulations may change over time, making projects susceptible to economic swings and inflation. (Tserng et.al, 2011).Particularly the risk of currency fluctuation has a detrimental effect on the construction company itself, project performance, project cost, and schedule overruns.

Changes in economic factors such as currency exchange rates can adversely affect the financial situation of construction companies. (Park et al.2011) (Schauffelberger 2003). According to (Ismail et al.,2012) financial issues faced by construction companies because of currency changes were shown to be one of the most common reasons for construction delays. One of the predominant causes of delay factor is cash problems during construction, which falls under the major area of construction financing. (Assaf et al.1995). According to Zou (2006), limited access to finance sources or unavailability of money is a risk that prevents contractors from meeting procurement criteria due to budget constraints. It has an impact on project progress since needed items are not available on time. (Zou 2006; Cagno & Micheli 2007; Osipova & Eriksson 2009).

The foreign exchange rate not only leads to delays in project completion but also contributes significantly to cost overruns in construction projects. This is because the fluctuation in exchange rates affects the prices of raw materials and equipment, which are major components of construction costs (Bin Mohamed et al.2013). As a result, construction companies experience lower profits, which can lead to poor performance and even insolvency. (Oztas, and Okmen 2004; Banaitiene et al.2011). The fluctuation in exchange rates can also impact the cost of importing materials, which further affects the overall cost of construction projects. (Sang et al.2014).

When schedule and budget are challenged, Construction companies often face disputes, arbitration, and litigation due to the effects of exchange rates. These problems can arise from issues related to project progress and cost, leading to legal conflicts and disputes. (Ismail et al.2012)

As construction projects become more complex, project owners face increased risk of potential bankruptcy or unforeseen circumstances on the part of contractors during project implementation. To mitigate this risk, contractors are typically required to provide bank securities or bonds, which act as basic financial management tools that allow project owners to transfer the risk of contractor default to the security providers. (Thommas& Pennicot, 2007). The condition to call can be used to categorize these securities. If a contractor defaults, the provider is required to pay or execute the contractual services by the security contract's requirement to call. (Barru, David J, 2005). In addition, contractors involved in any material procurement transactions often obtain commercial letters of credit as a way to minimize the risk of nonpayment, especially in international trade. This is done by involving a bank as a financially secure intermediary institution. (Jonathan J. Dunn et al. 2009). Whether securing contractors 'nonperformance, default payment in international transactions, or issuing an overdraft account all these financial instruments require to pledge collateral to secure their promise to reimburse the issuer. (Jonathan J. Dunn et al. 2009; CGAP & World Bank, 2006; Deng et al.2004)

Over the past few years, the construction industry in Lebanon has witnessed a fall in output due to the recession in the economy. Lebanon is facing unremarkable inflation and sudden changes in prices is associated with the devaluation of LBP against US Dollars. (World Bank Group, 2021). The shortage of US dollars on the market, the lack of liquidity in Lebanese pounds at commercial banks, the devaluation of the Lebanese pound, and the ability to transfer cash for imports are among the new primary issues facing local businesses. (USAID, 2021). Contractors have long suffered from

protracted payment cycles and unstable financial flows from the paralyzed Lebanese government, which owes contractors around \$600 million (Arab News,2020).

Following the currency devaluation, banks imposed informal capital controls on depositors restricting withdrawal to a few hundred USD up until accessing USD from banks or transferring it abroad became impossible. As a result, people were not able to access their deposits, and firms could not access finance for imports and sustain themselves. Banks' new policies and regulations escalated to a complicated economic system that entails a lack of liquidity and an inability to transfer funds for imports. (OXFAM,2020). As banks-imposed restrictions on the lines of credit in response to tighter liquidity, has suspended credit lines thus heaping pressure on importers who rely on such facilities to pay for goods from overseas (Reuters, 2019).

1.2 Problem Statement

Amid such dire conditions, administrating construction projects in countries such as Lebanon that have been assailed by the financial crisis is restricted by implications of maintaining the same established practices given the crises.

Limited access to funding sources in response to the suspension of the letter of credits, lending cessation, and withdrawal restrictions prevents contractors from satisfying the financial and procurement requirements. As the lines of credit are being suspended, project progress is being affected due to the unavailability of required items on time specifically when the supplier fails to complete work on the agreed schedule.

The continuing increase in the domestic exchange rate (LBP) against the foreign currency (dollar value) is further exacerbating commercial banks' payment liquidity needs.

Funding problems due to the unavailability of liquidity made it difficult for contractors to cover cash outflows at the prime level of the contractor, such as cash disbursements for direct labor, raw materials, and subcontractors and settling foreign exchange transactions. This whole disruption in project progress felt by construction projects creates a gap between construction expenditures and revenues, putting further strain on the contractor's cash flow and increasing borrowing costs.

Moreover, another critical problem that surfaces due to the exceptional economic crisis is the ability of security seekers to acquire guarantees, overdraft accounts, and letters of credit due to the reduced attractiveness of banks against collateral assets. In the aftermath of the financial crisis, the collateral framework is extended to include banks debt instruments denominated in the hard currency/ foreign currency. As the solvent institution requires the pledge of collateral, acquiring high-quality collateral such as a fixed deposit of money is restricted by the capital control imposed on depositors.

1.3 Objective

From the perspective of Lebanon's construction businesses, this research aims to document and evaluate the impact of the unprecedented economic and financial crisis along with the currency exchange risk on Lebanese contractors, with special emphasis on financial and commercial construction management and project administration implications of the financial crisis. This entails understanding how currency fluctuation risk followed by the new banking system policies, cessation of lending, and capital controls, affected the main aspect of commercial construction management in terms of implementing mechanisms for administering payment, procuring materials, and

acquiring bank securities. This study will further investigate the challenges that security seekers encounter because of changes in bank regulations and financial policies.

Based on the research background and problem statement discussed above, four research questions are proposed to achieve the research aim:

- 1- What are the economic forces of the financial crises that have restricted the conventional way of administrating construction projects?
- 2- What are the impacts of the financial and economic crises on construction project level and company level?
- 3- What are the mitigation actions that could be taken in managing the impacts of the financial and economic crises?

1.4 Significance of the study

This study will provide valuable information to professional participants as well as future foreign investors as they examine the magnitude of the problem and the harm that the financial crises and currency devaluation would cause to the construction industry and its participants. The paper provides local investors, future practitioners, and other contractors in the region who are likely to face similar financial crises with data on the most common risks affecting construction projects amid exchange rate fluctuation as it addresses the challenges faced by local contractors and provides some guidelines to mitigate the risk.

CHAPTER 2

THE IMPACT OF FINANCIAL CRISES ON CONSTRUCTION

2.1 The Importance of the Construction Sector in National Economic Development

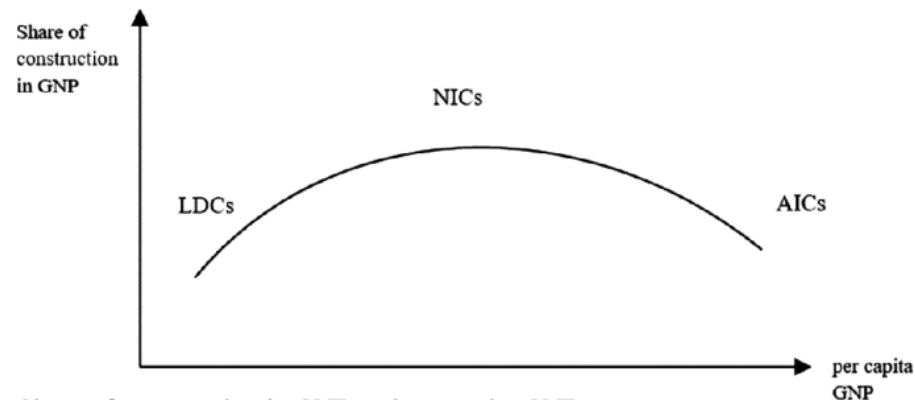
The construction sector contributes significantly to the economy, and its operations are critical to achieving national socio-economic development goals. (Anaman & Osei-Amponsah, 2017).

Many studies have been addressed in further attempts to get a clear vision of the relationship between the construction industry and economic growth. Being one of the major sources of economic growth, the government's use of construction investments to stabilize the economy demonstrates the industry's importance in the national development strategy. (Khan, 2008). The construction industry plays a vital role in both financial and employment role. (Plessis, 2007) views construction as a large sector of the economy responsible for millions of jobs and a significant proportion of GDP in most countries. When allied to other sectors and industries in materials production and distribution as well as services sectors such as transport, finance and the property market, its impact on society and the environment and its influence on the character of the world are tremendous. The construction industry, in addition to providing the primary source of employment for the workforce is linked to other sectors of the economy due to its dynamic nature (Khan, 2008; Park, 1989). (Kirmani, 1988) subsequently asserted that the vital role of the construction sector is attributable to its strong linkage with other economic industries.

(R.F. Harrod,1949) recognized in their tailored economic theory of economic growth that the net investment, defined as the change in capital stock, is necessary for a nation's economy to grow. The fixed amount of national output will alter in response to changes in the total capital stock. Investing in capital stocks is one strategy for an economy to boost production or grow. Besides investments in new factories and machinery, infrastructure, and roads, construction projects, are one example of boosting a nation's capital stock and consequently national production output level. (Giang D. T., 2011). (Turin,1973) showed that the level of construction activity and GDP per capita has a clear correlation. The share of value-added by construction as a percentage of GDP also increases as per capita GDP increases. (Turin, D. A. 1969). When the construction sector is booming, so too is the economy; when the economy is down so too is construction (LEWIS, 2008). As previously mentioned, construction is frequently viewed as a catalyst for economic progress, particularly in developing nations.

Following various findings made by (Bon, 1992) it was concluded that construction capacity to grow in developing-country is more significant than that of developed-country capacity expansion. (Bon, 1992) argued that as the country develops, both the share of construction in the total Gross National Product and the total construction output follow a U-inverted shape (Figure 1). During the early phases of growth, the share of construction production in GNP rises, but as the economy matures such as in the middle-income country; the percentage of construction output in GNP begins to drop. As a result, the volume of construction output production will decrease in the long run. For instance, when the major basic infrastructure facilities are in place and the shortage in housing is less, the necessity for additional construction

development decreases. However, construction continues to rise in developed countries, but at a slower pace than the economy.



Legend:

NDCs: Less developing countries

NICs: Newly industrialized countries; and

AICs: Advanced industrial countries

Figure 1: Bon (1992, 2000), The inverted U-shaped relationship between the share of construction in GNP and GNP per capita proposed by Bon, accessed 24 November 2022, https://link.springer.com/chapter/10.1007/978-981-13-5847-0_2/figures/2

2.2 Challenges and Complexities of Defining Project Success in Modern Construction Projects

Due to increased inherent complexity in projects and the engagement of a diverse group of stakeholders, both clients and contractors face substantial challenges in successfully executing modern construction projects (Doloi, 2009). As a result, construction project success becomes a critical concern for most nations, communities, and governments. Project success has been widely discussed in project management literature. Dissatisfaction is a common issue widely experienced by clients among construction projects and is largely attributable to project costs, delay overruns, inferior quality and low-skilled service providers including contractors and consultants. (HSE,2002). The traditional metrics of project success are no longer sufficient, rather it

is vital to emphasize client satisfaction and business performance, which has led researchers to move from project level to company level and stakeholder level when defining project success. (Chuan & SuiPheng, 2006)

The definition of project success remains complex and challenging to establish as there is no consensus among researchers regarding the critical factors that determine project success. (Zidane & Olsson, Defining project efficiency, effectiveness and efficacy, 2017). Project success criteria have been defined in variety of ways. (Serrador & Turner, 2014). Although the conventional measurement of project success has been limited to meeting the three traditional constraints, project success is also judged by whether we are actually achieving what we want to achieve (Turner & Zolin, 2012). Researchers distinguished between project management success and project success.

Project management success is the conventional judgment at project completion of whether the project is delivered on schedule, on budget, and in compliance to quality standards. (Atkinson, 1999). Whereas Project success is based on whether the project outcome meets the strategic objectives of the investing organization (Shenhar, Dvir, & Levy, 1997), client satisfaction (Yeung, Chan, & Chan, 2009), customer/users' satisfaction (Pinto & Slevin, 1988) in addition to lot of elaborated perspectives. Sections 2.2.1 and 2.2.2 highlight the concepts of both project management success and project success.

2.2.1 *Project Management Success*

As emphasized previously, much of the focus when measuring project efficiency is on the traditional three constraints: time, cost and quality. According to the famous expression by (Drucker, 2008), project management is doing things right in the most

economical way reflecting on project management success as efficiency. High efficiency is related to producing direct outputs using the minimum of resources, time, and cost to produce an outcome at project completion compliant with the required quality standards (Olsson, 2008). (Yamin, 2016) The term "project efficiency" has been defined as the degree to which a project has achieved its objectives while incurring the lowest possible costs. This means that project management as a mechanism and process exists only during project implementation and ignores the phases happening before the decision to start the project and after the end of the project. (Zidane & Olsson, 2017)

2.2.2 Project/Product Success

Construction practitioners can no longer overlook the broad picture of project success. There are well-known examples of projects that were significantly delayed and overspent at the time of completion but were afterward deemed to be extremely successful. Two examples are the Sydney Opera House and the Thames Barrier (Morris, 1987). When it comes to effectiveness, vague interpretations persist. (Zidane & Olsson, 2017). (Drucker, 2008) defines project effectiveness as “doing the right things”. According to (Samset, 1998), effectiveness measures the realization of a project’s purpose or the project’s long-term consequence. (Yammai & Sim, 2016) argued that project effectiveness was considered as the degree to which the project was capable to achieve project objectives. (Olson, Walker, Bonnerd, & Ruekert, 2001) also measures project effectiveness with the quality of the resulting product and its ultimate success in the marketplace.

Other authors considered project effectiveness in connection to the perspectives of stakeholders, primarily clients, sponsors, owners, and users (Andersen, Hussein,

Johansen, & Zidane, 2016). While the PMBOK guide emphasizes the triple constraints as a critical component for project performance, it also mentions stakeholder satisfaction as a factor that might affect project success. (PMI, A guide to the project management body of knowledge 4th edition, 2008; PMI, A guide to the project management body of knowledge 4th edition, 2008). (Baccarini, 1999), refers to project success as product success that encompasses three components: meeting the project's owner's organizational objectives (Project goal), satisfaction of users (project purpose), and satisfaction of stakeholders.

- **Project Goal:** Executives work on developing the company's strategy, vision, and mission at the strategic level. Projects are initiated to achieve strategic goals like profitability, market share, or technical improvement.
- **Project purpose:** The product or service must meet real needs (PMI,1996). Customer satisfaction indicates that a project is successful only if it meets the needs of the target user/consumer.
- **Stakeholder satisfaction:** The project entails satisfying key stakeholder's needs where they relate to project goal and purpose

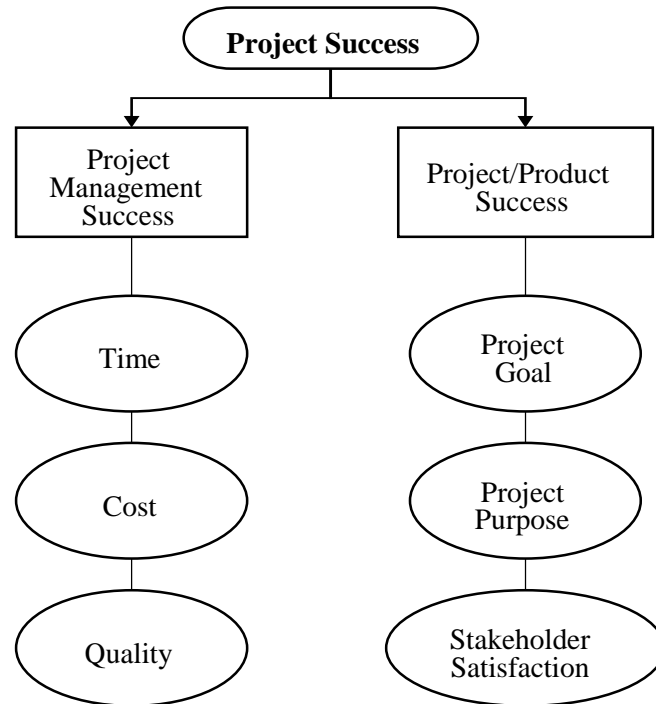


Figure 2: Project Management Success versus Project Success

2.3 Economic Risks in Construction

Risks are a threat to project success. (Barber, 2005). Failing to appropriately manage risks results in cost overruns, delays and quality issues (Thompson & Perry, 1992). Risk is an unpredictable occurrence or situation that, if it occurs, has a positive or negative impact on at least one project objective, such as time, money, scope, or quality. (PMI, A Guide to the project management body of knowledge , 2004). Risks can have a significant influence on a client's primary business as well as their satisfaction levels.

Construction is a high-risk endeavor (Zavadskas & Turskis, 2009). To be successful, the company must be dedicated to proactively and consistently managing risk throughout the project. (PMI, A Guide to the project management body of knowledge , 2004). Since risks are appraised based on their potential influence on

project objectives, there is a direct correlation between successful risk management and project success. (Baloia & Price, 2003). It has never been more crucial to use appropriate risk management approaches to control risks connected with variable construction activities for successful project implementation. (Zou, Zhang, & Wang, 2007). Risks are systematically managed, with early effective risk identification, defining sources of uncertainty, risk analysis, estimating the consequence event of the uncertain events, and risk response (Berkeley, Humphreys, & Thomas, 1991).

(El-Sayegh S. M., 2008) identifies three major risks in construction projects as shown in Figure 3:

- Internal risks: Internal risks are project-related risks that fall under the control of the project management team.
- External risks: External risks are those that are beyond the control of the project management team.

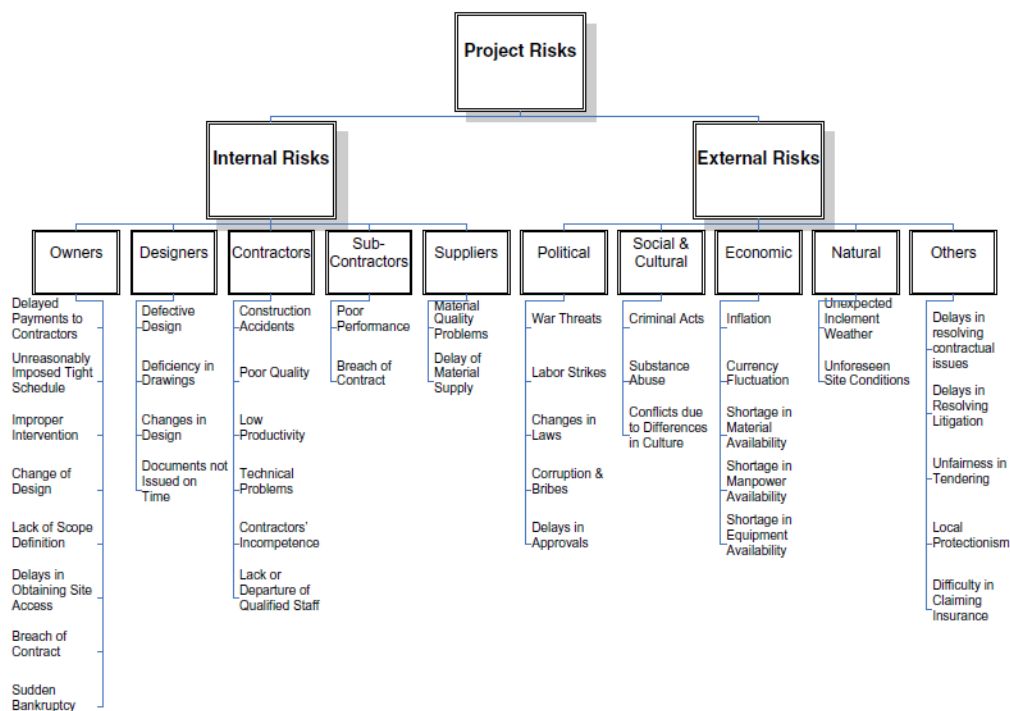


Figure 3: El Sayegh (2007), *Risk assessment and allocation in the UAE construction industry*, accessed on 8 December 2008,

Construction risks vary by country due to differences in economic, political, social, and cultural variables. The peculiarity of the construction sector in a given nation has a crucial influence on managing risk. (Andi, 2006). A local economic downturn (such as one marked by a severe decline in GNP), changes in interest rates, an increase in inflation, (Zhi, 1995), and changes in foreign exchange rates can all represent financial and economic hazards. (El-Sayegh S. M., 2008). Currency crises have large measurable costs on the economy. (Kaveri, Shivika, & Kumari, 2021). A speculative attack on a currency's foreign exchange value is known as a currency crisis, and it can either cause a fast depreciation or require the government to defend the currency by selling foreign exchange reserves or increasing domestic interest rates. (Glick & Hutchison, 2007)

The economic risk category includes various factors that can impact construction projects, such as inflation and sudden price changes that may cause an increase in prices during the construction phase. Exchange rate fluctuations also pose a risk to project profitability. Moreover, economic risks also include shortages in the supply and availability of crucial resources like materials, labor, and equipment. (El-Sayegh S. M., 2008)

2.3.1 Currency Depreciation

When an economy has a fixed exchange rate system, a currency crisis occurs when there is pressure on the economy to abandon the existing exchange rate peg or regime. A successful attack in this scenario leads to a currency devaluation, while a failed attack may result in the depletion of foreign exchange reserves or a higher

domestic interest rate to maintain the same exchange rate. Despite implementing strong policies to maintain the currency's value, a speculative attack can often lead to a significant depreciation in the exchange rate. (Glick & Hutchison, 2007).

Currency depreciation is a fall in the value of a currency in terms of its exchange rate versus other currencies. Changes in the value of a currency are conventionally assessed against the American Dollar. The official dollar price of gold has not changed since 1934, therefore although changes in currency parities are technically against gold by law, they have the same effect in practice. (Cooper , 1971).

Due to the deficit, the government is forced to borrow money or lose assets like foreign reserves in order to balance the budget. The government cannot, however, continue to spend down its reserves or take on more debt. Therefore, in the absence of fiscal reform, the government will eventually have to print money in order to finance the deficit. First-generation models indicate that the regime will ultimately come to an end because excessive money production causes inflation and is incompatible with maintaining a stable exchange rate. (Cooper , 1971).

It also sends signals of a weakly performing currency in the international market, and hence, contributes to the flight of foreign capital from the country. Hence, uncontrolled depreciation is definitely a matter of concern for countries. Government policies accordingly have to be oriented to prevent continuous fall in the value of the domestic currency in the international market. (Deb, Agrawal, & Kumari, 2021).

2.3.2 Inflation and Rise in Fuel Prices

Theoretically, an oil-importing country may experience currency depreciation when oil prices rise. (Golub, 1983). For instance, a rise in oil prices will worsen the

trade balance of an oil-importing country, necessitating real currency depreciation in order to boost the competitiveness of the nation. (Nusair & Kisswani, 2014)

However, a drop-in oil prices adversely affects the trade balance of oil-exporting countries since by falling revenues from oil exports decline. The country's foreign exchange (FX) reserves and exchange rate are thus put under pressure, which finally prompts the Central Bank to devalue the local currency in order to maintain the trade balance. Overall, a decline in oil prices may lead to currency depreciation, which has a significant impact on the macro economy through a multitude of channels. (Yildirim & Arifli, 2021)

According to (Markwardt,2009) this exchange rate response can be viewed as a sign of a currency crisis because a sharp drop in oil prices results in a collapse of oil revenues and foreign exchange reserves, which may make it difficult to maintain the fixed exchange rate and ultimately lead to a devaluation of the currency. Additionally, this shock causes inflation to rise.

According to the conventional theory, which is based on the traditional Mundell-Fleming Model, a currency depreciation boosts economic activity via expenditure-switching effects. This argument contends that it increases aggregate demand, net exports, and economic activity overall. So, according to this theory, devaluation corrects trade imbalances by raising aggregate demand, which in turn raises output. (Yildirim & Arifli, 2021)

In the field of economics, inflation is the gradual rise in the average cost of goods and services over time in a given economy. A unit of currency will purchase fewer products and services if the overall price level rises. As a result, inflation reduces the purchasing power of each unit of currency. (Kolhatkar, 2013)

A rise in the inflation rate is associated with the rise in the materials cost, where workers will also demand an increase in wages to compel the higher living cost. Stakeholders favor low inflation rates, which will allow for greater investment and profit as they will not allocate a high portion for price increase. Many construction projects in the sector experience cost overruns, which poses major issues for the stakeholders. (Olatunji, 2010)

For a variety of causes, including economic instability, increased fuel prices for transportation, or a lack of resources or raw materials, raw material prices consistently increase on a global scale. (Mohamed E. B., 2020). Earthmoving and other off-road machinery, as well as construction vehicles including concrete mixers, dump trucks, and pumpers, as well as JCBs, tower cranes, etc., are all powered by diesel. Additionally, contractors are charged fuel surcharges for the transportation of waste, equipment, delivery of goods and equipment to construction sites. The prices of many products that need gasoline to be mined, manufactured, milled, mixed, and transported during the production process also factor in diesel costs and fuel surcharges. For instance, cement, water, sand, and crushed stone are the ingredients used to produce concrete. Large volumes of diesel fuel are required for the quarrying, crushing, sorting, and delivery of aggregate and sand. It takes a lot of fuel to transport cement to a ready-mixed concrete factory (batch plant), where it is heated to an incredibly high temperature and pulverized into powder. Cement is created from limestone, which must be transported to the cement kiln. Diesel fuel is also used to transport concrete construction materials or mix the ingredients in a batch facility. (Kolhatkar, 2013). For construction projects to be completed successfully, budget estimating is essential, especially in the early stages when decisions are being made based on cost information that is already available. The

budget estimation in a construction project entails significant financial commitments from the business and has a significant impact on the stakeholders' profitability and financial security. For construction projects to be completed successfully, a viable project budget must be established. (Bayram, 2016)

2.3.3 *Labor Shortage and Employment Outlook*

The danger of exchange rate fluctuations are common factors that lead to the unstable price of materials and labor (Chua, 2003).

(Loosemore & Lee, 2003) indicates that different nationalities are commonly involved in construction projects. Unskilled employees, skilled workers, craft workers, managers, and administrative staff are just a few of the many different types of individuals who work in the construction sector (Akanni, Oke, & Omotilewa1, Implications of Rising Cost of Building Materials in Lagos State Nigeria , 2014). In the event of political turmoil, for instance, in the project's base country, wage adjustment may become a problem that construction firms have to deal with due to the fluctuations that might affect the currencies involved in the project (Mohamed, Trigunarsyah, Teo, & Kajewski, 2013)

According to (Ajibade, 2009) the depreciation in the value of the Naira affected badly the populace. (Ayodele, Ogunbode, Ariyo, & Alabi, 2011) discovered that the construction sector is suffering since many contractors are unable to estimate with accuracy the projected return on the project. In some severe circumstances, this has led to layoffs of employees and the closure of businesses. According to studies, the shortage of both competent workers and experienced managers makes it a priority to retain and

attract skilled individuals to the construction business. (Akanni, Oke, & Omotilewa1, Implications of Rising Cost of Building Materials in Lagos State Nigeria , 2014).

2.3.4 Financial Struggles of Construction Companies

Financial management is the effective control of all monetary issues associated with a project. It can be defined as the use of a company's financial resources and compasses all decisions that affects' financial health. The area includes controlling expenditure, advising on cash flow and payments. (Ashworth, 2004).

Contractor's financial management is the most important financial capability of construction organization. A significant portion of bankrupt contractors were profitable at the time of their failure but failed as a result of bad financial management. (Lacaria, 1994)

One of several performance measures for the contractors has always been their financial stability. It is used in the contractor's prequalification process. Financial standing is a key factor in contractor evaluation which includes financial stability, turnover, profit and obligations, and owned financial funds, technical ability, management capability, health and safety, and reputations. (El-khalek, Aziz, & Morgan, 2019)

Adequate financial management looks at past history of the construction firm and forecast for the future through appropriate tracking of whether the company is making money or losing money (Lacaria, 1994). Several financial parameters form the basis for effective tracking of financial management

The financial statements are the basic measurements of a company's strengths and weaknesses.

Ineffective financial management is the main cause of contractor failure. The basis for keeping track of sales, profit, and loss is provided by financial statements, income statements, and balance sheets. The most prosperous businesses carry out regular financial statements.

The cash flow plays a critical role in the financial stability of the construction company. (Lacaria, 1994)

Cash flow is another financial parameter for adequate financial management. The projection of future cash inflows and outflows is known as the cash flow. Without this estimate, a business could easily fall behind on paying its suppliers and subcontractors as a result of the owner's late payment or the contractor's inaccurate distribution of payment funds. Another factor that may prevent the contractor from paying suppliers and subcontractors is a lack of sufficient capital or operational reserves. A positive Cash Flow produced by good financial management in the construction industry should enable the contractor to avoid or significantly reduce borrowing. (Lacaria, 1994)

Due to insufficient cash flow to pay operating costs rather than ineffective management, many businesses have failed. (Huang , W., Tserng, Jaselskis, & Lee, 2014) . According to (Kishore , Abraham , & Sinfield, 2011) the complexity of the in-out-cash flow and the interdependencies between several projects are factors that contribute to the difficulty in estimating cash availability. The client's progress payment is the source of the contractor's cash inflows, while the project's operating costs including materials, labor, equipment, and subcontractor payments are where it goes out. This method is generally used when there is a sizable discrepancy between the

owner's payment and the project's expenses due to retainage, client payment delays, and credit agreements with suppliers. (Park H. S., 2006)

Construction projects must consider both time and cost implications of financial stability in terms of cash flow. If a client's payment is delayed, site work may stop, resulting in zero daily productivity. (Mohammed , Alnuaimi, & Al Tobi, 2014). (Sweis , Sweis, Abu Hammad , & Shboul, 2008) showed that the primary and most frequent reasons for delays in construction projects in Jordan are financial constraints. (Marzouk & El-Rasas, 2014) analyzed delay causes in Egyptian Construction projects and found that owner's financial problems and delay in paying for completed work are the top delay in construction project. When (Al-Kharashi , 2009) studied the causes of delay in construction projects. They concluded that the owner's lack of finance to complete the work and delay in payment is among the top of delay causes. Financial stability in terms of cash flows is the dominant factor in this regard.

A closer understanding of the relationship between the two inter-related topics of risk management and finance on construction projects, it is becoming increasingly crucial to achieve the objectives of the investor, the owner (end-user) and the construction and its supply chain. Financial risk has broadly been classified as Bankruptcy of partner, Fluctuation of inflation rate, Fluctuation of exchange rate, Rise in fuel prices, Insurance risk, currency exchange risk, Liquidity risk. Financial risk are one of the critical risk faced by any construction industry as financial failures may lead to complete closer of the company leading to huge losses and legal suits. (Kolhaktar , 2014)

2.4 The impact of Economic Financial Risks on Construction Projects

2.4.1 *Project Level*

2.4.1.1 Cost Expenditure

The total cost of construction projects includes all direct and indirect expenses involved in turning a design plan for materials and equipment into a project. This includes field labor, supervision, administration, tools, field office expenses, materials, equipment, taxes, and subcontracts. (AACE International, 2007).

- **Direct Cost:** which can be attributed to a single task of construction work
 - Materials
 - Labor
 - Sub-contractors
 - Equipment
 - Transport expenses
- **Indirect Expenses:** are those costs, which cannot be attributed to a single task of construction work.
 - Overhead costs: The itemization and calculations of overhead costs, both job site and home office
 - **Job office overhead (JOOH)** also referred to as General Conditions or Field Office Overhead: Job overhead costs are those costs at the project site, which occur specifically as a result of that particular project such as site security, engineering and shop drawings, job supervision and office personnel.
 - **General home office overhead** commonly referred to as General and Administrative (G&A) costs: Home office overhead expenses

are those incurred by the contractor in the overall management of business, associated with all costs at the home office.

- **Profit:** return on investment
- **Bonds:** Surety bonds are three-way agreements between a bidder or contractor (the principal), and a second party (the surety), to assure fulfillment of the principal's obligations (UFC, 2020).

Cost is one of the key considerations considered throughout the project management life cycle and is often seen as one of the most crucial project characteristics and a contributor toward project success. (Pakistan, itself). It is common to see a project failing to achieve its objectives in compliance with the contractual price already agreed on due to cost overruns. (Irshad, 2008). Cost overruns are explicitly defined when the final actual cost of the project exceeds the original budget estimate (Avotos, 1983). (Irshad, 2008) found that one of the top ten factors of cost overrun is fluctuation in the prices of raw materials while (El-Sayegh S. M., 2008) established that inflation and sudden changes in prices ranked as the first most significant risk in the UAE construction industry.

(Oladipo F. , 2012) revealed that inflation rate and exchange rate are the most critical macroeconomic indicators affecting the prices of construction materials in Nigeria. As this paper focuses on currency fluctuation, the following section serves as an attempt to identify major cost overruns related to currency depreciation in the construction sector.

2.4.1.2 Time

The major variables that can lead to excessive project overruns in a developing country are shortages of materials, price fluctuations, and inaccurate estimates leading to delays. (Le-Hoai, Lee, & Lee, 2008)

The financial challenges faced by construction organizations due to fluctuations in currency exchange rate is one of the main reasons for delays in construction projects according to research done in Indonesia, Thailand, Hong Kong, and Jordan. (Ismail, Ahmad, Janipha, & Ismail, 2017) (Assaf & Al-Hejji, 2006). Many large construction projects are now delayed (not only in construction stage) because of insufficient fund (Le-Hoai, Lee, & Lee, 2008). Funding problem arises due to the unavailability of money for procuring items due to budget constraints. This influences project progress due to the unavailability of required materials on time. (Zou P. X., 2006). (Cagno & Micheli, 2007) (Osipova & Eriksson , 2009) . (Zou P. X., 2006) Identified that limited access to funding sources prevents suppliers from satisfying the financial requirements and procurement requirements. (El-Sayegh, Manjikian, & Ibrahim, 2018) Identified shortage of client's funding risk as the highest risk for sustainable construction projects in the UAE. (Kaming, Olomolaiye, & Holt , 1997) recognized in a questionnaire survey for Indonesian high-rise construction projects material shortage as one of the first five causes of delay.

Delay occurs when the rise in prices of raw materials and labor costs raise in operational expenditures subsequently delaying project completion. (Xenidis & Angelides, 2007) (Dağkiran & Dikmen, 2011). From the findings presented by (Idoro & Jolaiya, 2010), the rising cost of raw materials are the leading causes of schedule overruns.

For instance, the Egyptian Federation of Construction and Building believes that the rise in the dollar rate in banks and the black market influences the price of goods are ores used in construction projects especially the imported ones needed by a contractor working on infrastructure projects such as generators, spare parts, water valves etc...

Thus, the rise in the dollar rate negatively affects the rates of implementing and delaying these projects. (El Agroudy, Mokhtar, & Shafiq, 2015). Change in currency rate risk arises due to fluctuation of currency rates whilst importing items. It also affects cost of the project due to increase in price of the items (Öztaş & Okmen, 2003) (Banaitiene, Banaitis, & Norkus, 2011) as construction projects seek materials that must be imported from other countries. In a study on delays in Pakistan construction industry, (El Agroudy, Shafiq, & Mokhtar, 2015) emphasized that the major factor causing of delay resulting in the delayed completion of the projects and time extension is the inflation of local currency. The delays if occur, jeopardize the objectives and result in extension of time which lead to extra overheads that increase the cost of the project.

2.4.1.3 Quality

Construction materials contribute significantly to the quality and cost of housing, from what is applied in the foundation to the materials for roofing and finishes. Here comes the significance of the building materials sector to the national economy of its country, as the output of construction materials determines both the rate and the quality of construction work. (Akanni P. O., 2006) (Udosen, 2010). However, as noted by (Jagboro & Owoeye, 2004) & (Aibinu & Jagboro, 2002) an increase in building material prices has multiplier effects on the sector as it causes changes in construction costs and, ultimately, the abandonment of projects. (Oladipo F. , 2012) identified additional consequences, including completion at the expense of other projects, delay in the project's progress, other valuable projects not being commissioned, rate of employment of construction workers, poor workmanship as a result of the use of low-quality local materials, and inhibited innovations in construction. Issues with a labor shortage have a major influence on the whole

workforce of the organization since they may force a project to be delayed or of poor quality.

The result of the fluctuation in construction costs is that projects are not delivered on time and within budget, to the required level of quality. As a result, conflicts between clients and contractors arise due to an increase in contract sum and most likely result in cases of project abandonment where investments are secured because the project will not be put to use when anticipated. (Akanni, Oke, & Omotilewa¹, Implications of Rising Cost of Building Materials in Lagos State Nigeria , 2014)

2.4.2 Company Level: Organizational Financial Status

Several factors are triggered by economic crises and converge to cause a decline in firms' revenue and profit levels. Both clients and contractors had expressed serious concerns about how to maintain consistent cost projections on construction projects. According to (Azhar, Farooqui, & Ahmed, Cost overrun factors in construction industry of Pakistan, 2008), the primary cause of cost overruns is that most contractors base their price quotes on projected estimates; however, due to inflation in construction costs, the initial budget figures become wholly unrealistic. When initial budget estimates turn out to be wholly unreal, (Murray M. , Rethinking construction: the egan report 1998, 2008) observed in 1998 that financial pressure on contractors will inevitably increase. He concluded that this would affect the industry and jeopardize its continued existence. This will result in a very low rate of construction profitability, a barrier to long-term healthy development. Buttressing this view, (Xiao & Proverbs, 2003) claimed that the

construction industry had performed poorly due to low and unstable rates of profitability brought on by inflation in the cost of building materials.

Also, foreign exchange fluctuations refer to the sensitivity of a firm's cash flow and the real domestic currency value of assets, liabilities, or operating income to unanticipated changes in exchange rates (Adler & Dumas, 1984). Fluctuation in the exchange currency rate can have a negative impact on the financial status of construction businesses (YngLing & Hoib, 2006). According to (Ismail, Pourrostan, Soleymanzadeh , & Ghouyouchizad, 2012) one of the main reasons for the delay in construction projects is financial difficulties faced by construction businesses caused by fluctuations in foreign currency. This in turn lead to other concerns including cost overruns, disputes, arbitration, complete abandonment, and litigation. (Mohamed, Trigunarsyah, Teo, & Kajewski, 2013) Therefore, the volatility of foreign currencies presents a significant challenge for construction businesses. (Ofori, 2000)

When a construction business gets involved in construction projects, not only the currency fluctuations are likely to jeopardize the project's finance, but also affect the firm's financial situation. The overall expenses and income for the certain project are payable in the local currency, however, the loan may be made in a foreign currency. Consequently, exchange rate depreciation could adversely affect not only the project level but the construction organizations as well. (Mohamed, Trigunarsyah, Teo, & Kajewski, 2013)

This in turn has a significant effect on the organization's fundamental financial structure, reducing its market value or profit margins or potentially disrupting any ongoing and future project (Eiteman, Stonehill , & Moffett, 2006) . FOREX risks must undoubtedly be managed since they can have a negative influence on cash flow,

jeopardize the project viability, and reduce profitability, particularly for construction companies engaged in international projects. (Xenidis & Angelides, 2007). To illustrate, if the exchange rate changes between the time the contract is signed and the delivery date, one party may lose money. The risk originates when a contract between two parties specifies exact prices for goods or services and delivery dates. (Mohamed, Trigunarsyah, Teo, & Kajewski, 2013).

2.5 Case Studies

This section reviews available literature on the causes and effect of the economic and financial crises of Nigeria and Malaysia. The following case studies are used to gather evidence on the impact of economic risks such as financial crises on construction projects and contracting companies.

2.5.1 *Nigeria*

2.5.1.1 Factors of the Nigerian Financial Crisis

The origin of the 2008 global financial crisis can be traced to the United States and was alleged to have had differing degrees of effects on various capital markets throughout the world. The sub-prime mortgage crisis and escalating house foreclosures, which started in August 2007 in the United States, were directly responsible for the economic collapse worldwide. However, a number of reasons, including the global food crisis, hurricane Katrina, and rising gasoline costs, among others, contributed to an increase in domestic unemployment in the US, which resulted in a significant number of mortgage defaults and foreclosures. With the following onset of the global financial

crisis, this event had a detrimental impact on the capital markets in the US as well as those of other nations throughout the world (Njiforti, 2015).

As a result, the Nigerian capital market was seriously hit by the crisis. (Ujunwa , Salami, & Umar, 2011) and the foreign reserves decelerated quite substantially. (Andrea & Beth, 2008)

According to (Arunma , 2016), the global financial crisis resulted in significant portfolio outflows as foreign investors left the Nigerian capital markets to address issues in their own countries.

The lack of economic diversification in Nigeria, the country's excessive reliance on crude oil exports and foreign capital inflows increased the impact of the crisis's external shock. Nigeria specifically witnessed decreased demand for its oil exports as a result of the economic downturn in her main trade partners. Thus, within four months, oil barrel had lost 50% of its peak price which caused a sharp loss in foreign exchange revenues and subsequently a reduction in government revenue. The poor pace of growth in foreign exchange reserves and the pressure from demand on the foreign exchange market caused instability and a significant depreciation in the value of the Naira. Foreign capital inflows drastically decreased over the course of the time foreign direct investment (FDI), portfolio investment, and remittances from Nigerians living abroad, while foreign trade financing declined dramatically for certain banks and almost dried up for others. (Sanusi S. , 2010)

(Soludo, 2009) summarized the impact as follows:

- A reduction in the monetization of oil earnings and a tightening of liquidity as a result of net currency outflows.

- Loan-loss provisioning because of constraints on the capital markets and a slowdown in economic activity growth.
- Domestic interest rates are rising due to liquidity concerns

2.5.1.2 Effect of the Financial Crisis on Project Level

2.5.1.2.1 Effect on Construction Costs

- **Rise in Cost of Construction Materials:**

The building materials used in a construction project are a fundamental component, and any fluctuations in their cost can significantly impact the entire project. (Musarat, Alaloul, Liew, Maqsoom, & Qureshi, 2020). Building materials alone account for 50% to 60% of project cost. (Jagboro & Owoeye, 2004). The rising cost of construction materials in Nigeria can be attributed to several factors, including the scarcity of building raw materials, fluctuations in fuel and power supply costs, fluctuations in transportation and distribution costs, import costs, high interest rates and finance costs, inflation, and primarily, fluctuations in the exchange rate of the Naira. (Ademola & Oluseyi, 2013) (Jagboro & Owoeye, 2004) (Idoro & Jolaiya, Evaluating material storage strategies and their relationship with construction project performance., 2010), (Oladipo & Oni, 2012)

- **Rise in Cost of Imported Materials:**

Devaluation of a country's currency has the effect of making its exports comparatively less costly for overseas buyers, while imported goods become relatively more expensive for local consumption. (Taye, 1999). (Aibinu & Jagboro, G. O., 2002)

highlight the fact that the majority of construction supplies and machinery used in Nigeria are still imported. Most of the construction raw materials, construction-related parts, and ingredients required to manufacture the materials are imported, with around 50% sourced from overseas (Udeh, 1991). His argument is that the depreciation of the Naira has directly impacted the prices of construction materials, as fifty percent of the materials used are imported. Cement producers would be adversely affected whenever the country's currency experiences a decline in the foreign exchange market, as a lot of foreign input, including machinery and spare parts, is used to produce cement. (Oladipo & Oni, 2012). The Nigerian industry is often described as import-dependent, and as devaluation causes imports to become more costly, its impact on the industry would be significant (Ofoegbu, 1998)

- **Scarcity of raw materials:**

According to (Ademola & Oluseyi, 2013) the ban on the importation of Portland cement into Nigeria by the government has restricted activities in the cement industry. The study reveals that although the import restrictions were intended to support local producers, these producers were unable to produce sufficient cement to meet the demand, which led to an increase in the product's price. This price increase, in turn, caused construction costs to rise, leading to the eventual abandonment of projects.

- **Rise in cost of fuel, power supply, and transportation**

The rising prices of building materials were driven by three main factors: the Naira exchange rate, fuel prices, and power supply. However, upon closer examination of the causes of these escalating prices, it becomes evident that the Naira exchange rate is the primary driving force. It is believed that this factor has a ripple effect and is

responsible for the increases in fuel and power supply costs, which are essential for the manufacturing and transportation of building materials. The exchange rate factor, which indirectly impacts fuel and transportation costs, has resulted in increased prices for locally sourced materials such as sand, granite, plaster, and timber. (Akanni, Oke, & Omotilewa, Implications of rising cost of building materials in Lagos State Nigeria, 2014)

- **Fluctuation in labor costs**

The increase in operating costs is not solely due to the significant cost implications of materials, equipment, and machinery. It is also due to the substantial number of highly skilled expatriates who work for construction contractors in Abuja, Nigeria. The study conducted interviews with construction firms that employ a considerable number of expatriates, many of whom occupy technical and managerial positions.

According to these construction firms, their operating costs have increased significantly, and there are various reasons for this. Firstly, they rely heavily on importing machinery, equipment, and supplies from abroad. Secondly, they employ a significant number of expatriate workers who are paid in dollars. The current exchange rate is quite expensive, and they are unable to access foreign exchange at the official rate, forcing them to turn to the parallel market, where the rates are much higher. All of these factors have resulted in increased expenses for the firms. (Ugwuoke & Abbott, 2018)

However, (Egwaikhide, Chete, & Falokun, 1994) argued that the depreciation of the Naira and the significant increase in inflation rates have led to a reduction in local employees' actual salaries. This is due to the fact that when domestic prices increase without a corresponding increase in the nominal wage rate, the real wage decreases.

Typically, labor tends to demand higher wages and benefits, which can increase production costs and ultimately impact market prices if these demands are met.

2.5.1.2.2 Effect on Construction Projects Work Progress

- **Delay of work progress and project delivery**

(Jagboro & Owoeye, 2004) The research found that construction materials account for approximately 80% of the construction timeline. The study also observed that the rise in the cost of construction materials in Nigeria has a ripple effect on the industry, causing delays in project progress and ultimately leading to project abandonment. The Nigerian government, both at the federal and state levels, is the largest customer of the local construction industry. The local construction industry heavily relies on the Nigerian government, accounting for approximately 60% of local construction orders.. (Ayangade , Wahab, & Alake , 2009) . The changes in price of materials and labor are not usually included in the initial costs for the projects before awarding them, as they are not often anticipated. This situation normally compels contractors to either abandon public works as a result of insufficient funds or demand additional sum for the client/government to complete the project. (Ifejika & Abubakar, 2016). Many large construction projects were delayed because of insufficient fund (Le-Hoai, Lee, & Lee, 2008). Funding problem arises due to the unavailability of money for procuring items due to budget constraints. This influences project progress due to the unavailability of required materials on time. (Zou P. X., 2006), (Cagno & Micheli, 2007), (Osipova & Eriksson , The effects of procurement procedures on joint risk management, 2009). (Zou P. X., 2006) Identified that limited access to funding sources

prevents suppliers from satisfying the financial requirements and procurement requirements.

- **Implications of payment delays**

According to (Ugwuoke & Abbott, 2018), economic crises in Abuja Nigeria have resulted in increased delays in payments to construction contractors. Interviews with industry participants highlighted that payment delays are ranked as the second most significant consequence of economic crises on construction contracts. These delays have a significant impact on project turnaround times and costs, as contractors struggle to receive payment for completed work or even to mobilize payment to start approved projects. The value of money owed to contractors has also been reduced due to the high rate of inflation and the decline in the value of the naira. Lower public resources, a common result of economic crises, exacerbate the situation. Lower public resources are frequently a result of economic crisis (OECD, 2012). Nigeria's construction industry heavily relies on the government, which accounts for over 60% of local construction orders, making the effects of economic crises particularly severe. Government funding shortages often result in postponed payments for already approved or completed construction projects. (Alake, Ayangade, & Wahab, 2009).

2.5.1.2.3 Effect on Quality of Construction Projects Implementation

- **Low-quality of materials used in construction**

According to (Oladipo & Oni, 2012) research on the cost of construction materials, the selection of materials used in every stage of construction, from foundation to roofing and finishes, has a significant impact on both the cost and quality of housing. The study found that there have been conflicts between contractors and clients over contract sum increases. Some contractors resort to using poor quality or insufficient building materials in an attempt to avoid these conflicts and remain in business. The study by (Akanni, Oke, & Omotilewa, Implications of rising cost of building materials in Lagos State Nigeria, 2014) produces results that corroborate the findings of (Oladipo & Oni, 2012). The increase in construction costs has negative consequences such as delays in project completion, budget overruns, and compromised quality. This situation often results in conflicts between clients and contractors, leading to project abandonment and lost investments. Additionally, the rising cost of construction materials affects workmanship and innovation in construction techniques. It is likely that this trend contributes to the low and unstable profitability rate of contractors, and the pressure to balance costs may result in the use of inferior workmanship that hinders advancements in construction practices

2.5.1.3 Effect of the Financial Crisis on Nigerian Contracting Companies

2.5.1.3.1 Effect on the Financial Status

- **Decline in profitability and revenue of the construction firm**

The study of (Ugwuoke & Abbott, 2018) supported by case studies and semi-structured interviews within construction contractors based in Abuja, Nigeria finds that one of the key effects of economic crises on construction industry is the decline in revenue and

profits levels. The contractors claimed that the combination of high operating costs, decline in overall demand for construction and delay in payments caused actual revenue to drop sharply to the point of drying up.

- **High Cost of Financing**

Financial institution is often at the center of systemic economic turbulences as liquidity usually dries up during downturns (Tong & Wei, 2010). Firms often had to deal with a significantly constrained resource base, often causing instability in funding and funded regimes. (Ugwuoke & Abbott, 2018)

In the beginning, devaluation will typically be accompanied by an increase in interest rates as prices increase and the real money supply declines. According to (Sanusi S. , 2010) in every economy, interest rates are the fees a borrower must pay in order to get a loan. The fact that borrowers may hesitate to borrow because the total cost of the credit as well as the credit itself may end up being too high for the borrower to afford to repay by the loan's due date. Average lending rate was decreased by the National Bank of Nigeria. A study done by (Ugwuoke & Abbott, 2018) also revealed that contractors experienced increased difficulty in accessing bank loans or other forms of credit. (Akanni, Oke, & Omotilewa, Implications of rising cost of building materials in Lagos State Nigeria, 2014) identifies the increase interest rate and cost of finance to one of the causes of construction materials price increase. A study done by (Olanrewaju & Oyewobi, Nexus of economic recession and building construction cost in Nigeria, 2019) shows that the economic recession followed by increase in interest rate in Nigeria have a strong influence on construction investment growth.

- **Claims and disputes**

According to (Hatamleh, Hiyassat, & Sweis, 2018) change in price of construction materials can have impact on clients, contractors and the project itself. Among other different stakeholders involved in the construction sector, contractors are the ones at the front line to play the largest role in implementing the project. Hence, construction contracts frequently result in claims between the parties. Delays and changes in unforeseeable circumstances can all contribute to rise in claims. (Love, Davis, Ellis, & Cheung, 2010) (Ali & Kamaruzzaman, 2010) state that a contractual claim might result from changes in prices of construction materials, an extension of time, fluctuations, expenses, or losses caused by events that impede the normal progress of the task. (Omede, 2021) pointed out in a study done in Nigeria that Claims due to materials prices will lead to a corresponding increase in the final project cost and time of construction projects

The changing dynamic in Nigeria market and the inability on the part of contractors to conduct proper cost forecast results in remarkable change in intended cost of completing and delivery public projects. Inaccurate cost forecast eventuate into shortage of funds for the completion of an on-going construction work, calling for unbudgeted expenses on the part of the client (Amusan, 2011). Subsequently, this creates contractual disputes between the client/government and the contractors such that projects are abandoned for a long time before completion.

- **Risk of bankruptcy**

According to (Olanrewaju & Idiake, 2018), the Nigerian economy, including its construction industry, was significantly impacted by the recession. The authors

identified bankruptcy as one of the three major effects of the economic recession on the Nigerian construction industry. As a result of the recession, a large number of construction companies were unable to pay their annuities and went bankrupt or became insolvent.

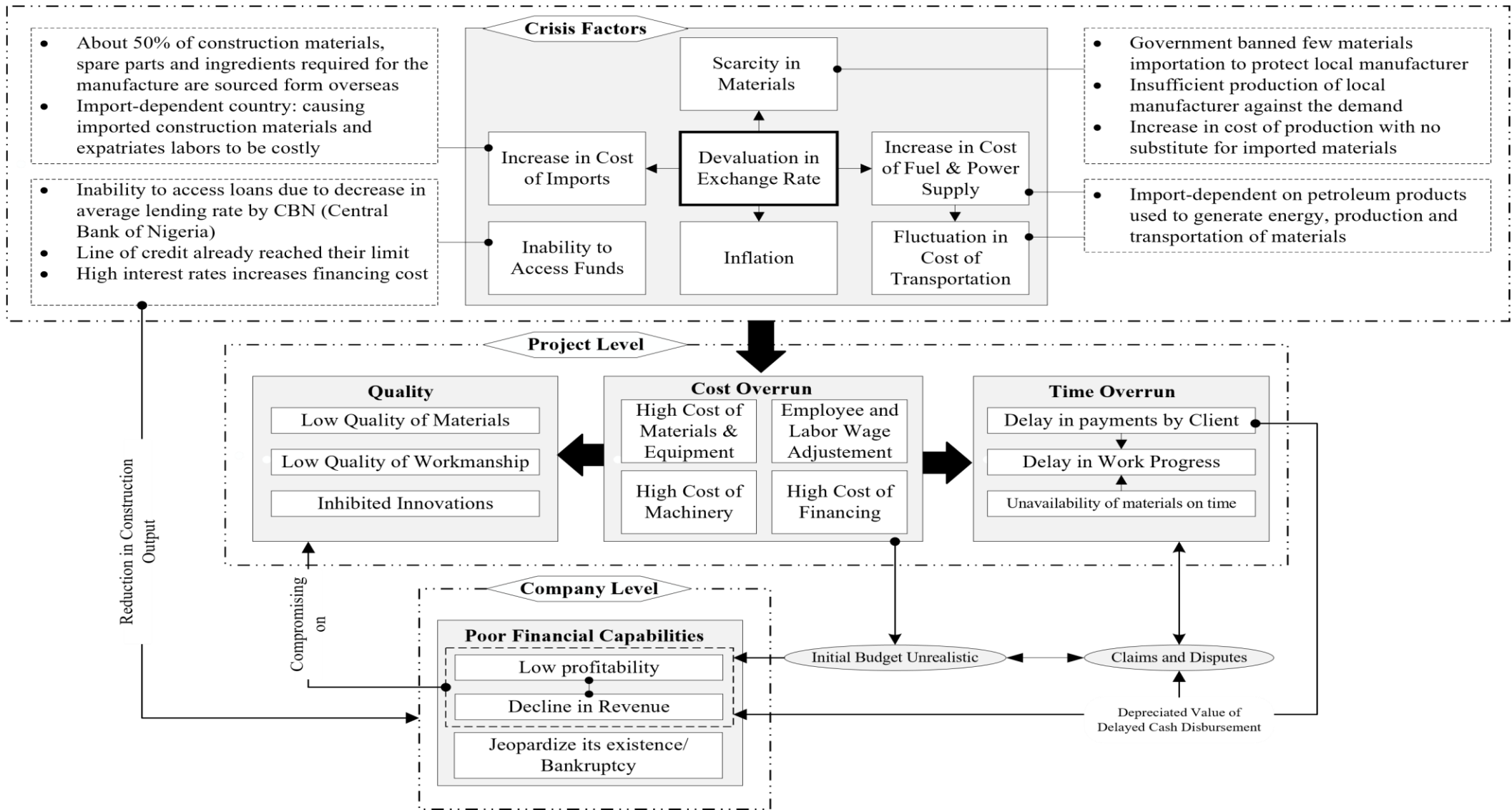


Figure 4: Understanding the root causes and effects of the financial crises in Nigerian construction industry: a comprehensive framework

2.5.2 Malaysia

2.5.2.1 Factors of the Malaysian Financial Crisis

The impact of Asian Financial Crisis (AFC) on Malaysia was huge. The stock market and the currency market nearly collapsed during the crisis. The GDP growth rate declined from 7.3% in 1997 to -7.4% in 1998 the worst downturn ever. Malaysia's economy recovered and grew yet, this growth was lower than the average rate 8.1% from 1990-1997. The economy was not restructured fast enough to achieve a high level of growth. Prior to the global financial crisis (GFC) in 2008, there were several financial structural issues facing the economy. Being an export-dependent economy, between 1991 and 1995, the total import was greater than the total exports and in 1997 net exports accounted for barely 1%. The investment as a percentage of GDP halved after the Asian financial crisis due to the decline in Foreign Direct Investment (FDI) inflows into Malaysia and never recovered to its pre-crisis level.

In addition to this, Malaysia has been always running on persistent fiscal deficit and never gotten out of it and this is due to government operating expenditure that has been rising more sharply than its revenues. Subsequently, deficit financing is not sustainable if it is done through external borrowing or printing money. (Khoon & Mah-Lui, 2010) . Beginning 1997, the Malaysian currency depreciated sharply against the US Dollars and other major currencies. (U.S Department of State, 2001). In 1998, inflation rate in Malaysia increased from 2.7% to 5.3% due to the depreciation of the ringgit around 28.2% against US Dollar during the end of the year 1997 (Islam, Abdul Ghani, Mahyudin, & Manickam, 2017). In light of the continued weak-ness of the ringgit, which

depreciated by over 44% in 1997, the authorities decided to raise interest rates and the banking system began to experience increasing non-performing loans. (EPU, 1999). Up to 2008, the financial and economic crisis worsened. Malaysia suffered from capital outflows causing big drop in funds flowing into Malaysia. This had a significant impact on the ringgit which had lost its value against the US dollars. (Ooi, 2008). This decline in the value of ringgit is primarily attributable to the declining demand in exports and capital outflows. With the slowdown of domestic economic activities, overall loan applications in the country showed a declining trend (Khoon & Mah-Lui, 2010) while the Central Bank raised interest rates gradually to control inflation.

2.5.2.2 Effect of the Financial crisis on Project Level

2.5.2.2.1 Effect on Construction Costs

According to (Lai , Aziz, & Chan, 2014) the global financial crisis (GFC) resulted in a significant rise in the prices of building materials and fuel. (Chan & Abdul-Aziz, 2017) further highlighted the market trends in Malaysia from 2004 to 2012, which showed an increase in the prices of construction materials during that period. This trend was accompanied by a shortage of workers and a construction output decline of about 1.9% in the country.

2.5.2.2.2 Effect on Construction Projects Work Progress

A study done by (Memon, Rahman, Akram, & Ali, 2014) shows that cash flow and financial difficulties faced by clients and contractors are major contributors to time overruns in the Malaysian construction industry. Financial

difficulties were ranked as the top contributor to construction time overruns based on RII (Relative Importance Index). Buttressing with other research works such as (Mahamid, 2011) mentioned that the financial status of a contractor is one of risk factors to time overrun. (Alaghbari, Kadir, Salim, & Ernaw, 2007) also identified financial problems faced by contractors as the most critical factor contributing to time overrun in construction projects.

2.5.2.3 Effect on the Financial Status

According to (Nambiar, 2009) , the impact of the crisis was felt most strongly in the manufacturing and construction sectors in the fourth quarter of 2008. The Malaysian construction industry was facing a period of stagnation where its real value of output dropped for the three consecutive years in 2004-2006. Based on a study done by (Lai , Aziz, & Chan, 2014), the global financial crises had a direct impact on the profitability of Malaysian construction companies due to sharp increase in price of material and fuel. Many construction companies suffered from cash flow problems with delayed payments from clients. The increase in the cost of raw materials led to an observed drop in profits.

2.6 Key themes

Upon conducting a comprehensive literature review for both Nigeria and Malaysia case studies, several key themes have been identified. These themes will serve as the basis for our analysis of the pilot study for the case of Lebanon, and are represented in the table below:

- Causes of the financial crises: key factors of the financial crisis
- Project Level: Cost, Time and Quality

- Company Level: Firm's financial status

Table 1: Table representing key themes forming bases of the pilot study analysis

Key Themes	Project Level					Company Level			Causes of the Financial Crises
	Cost			Time	Quality	Firm's financial status			Key factors of the financial crisis
Study Area	Increase in price of Materials	Fluctuation in Labor wages	Increase in machinery rate	Delay	Low quality	Cash-flow problems	Decline Revenue	Low profitability	
Nigeria	✓	✓ *	✓	✓	✓	-	✓	✓	Currency devaluation Decrease in GDP, Decrease capital outflows, High interest rates, Tight liquidity conditions Reduction in lending rate
Malaysia	✓	-	-	✓	-	✓	✓	✓	Increase in cost of imports Inflation High oil prices

* Increase in Labor expatriates who are paid in US Dollars

- : No studies or research related to the relevant topic have been located or identified

✓ : key impacts have been observed in the relevant country.

CHAPTER 3

PROJECT FINANCING AND THE DIFFERENT FORMS OF GUARANTEE

Surety bonds and bank guarantees are major instruments to protect the Owner of a construction project against the risk of Contractor's nonperformance. (Deng, Ding, & Tian, 2004). Contractors are required to submit bank performance securities, which serve as basic financial management instruments for project owners to shift contractor default risks to security providers. The condition to call can be used to categorize these securities. If a contractor defaults, the provider is required to pay or execute the contractual services in accordance with the security contract's requirement to call. (Thomas and Pennicott, 2007) & (Craig, 1999). Contract guarantees are issued by sureties or banks that agree to assume a contractual obligation in the event of the contractor's failure to execute. For instance, in the United States performance bonds are issued by surety companies for domestic projects. In case of a contractor's bankruptcy or failure to perform the construction contract's obligation, the surety company has the option of compensating the owner or incorporating another contractor to execute the work. (Tiong, 1992)

Construction contract bonds are often divided into two types: conditional bonds and unconditional bonds, based on whether or not the obligee must meet any conditions before claiming the bond. Despite the fact that unconditional bonds are becoming increasingly common across the world, many experts still warn contractors against the risk of presenting unconditional bonds to owners since such bonds can be called at any time without proof of the contractors' default. (Eaglestone, 1985) & (Marsh, 1994) & (He, 1999) & (Russell, 2000)

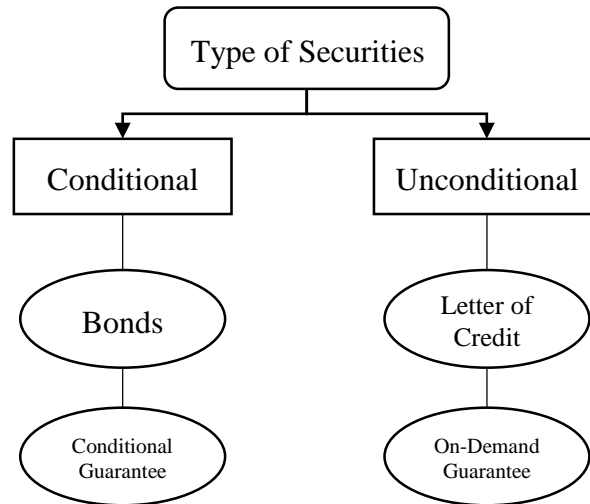


Figure 5: Different Type of Securities

3.1 Types of securities

3.1.1 Bonds

We refer to the term “bond” when a surety bond issues it, which is different from the term “guarantee” issued by a bank. Based on the Miller Act and the Little Miller Acts, the United States has a highly distinctive surety bonding system that includes a high penalty conditional bond on default, and a required surety bonding policy in public works. The low-penalty unconditional bond, on-demand bond on the other hand, is the mainstream outside of the United States. (Deng, Ding, & Tian, 2004). The maximum amount that may be claimed on a bond is limited by the penalty. According to the Miller Act, any federal project with a contract amount exceeding \$100,000 USD is obliged to have a 100% performance bond and 100% payment bond which is the highest penalty bond requirement in the world. (Winston, 1999). The duty to pay or perform for surety bonds, which are conditional, is formed by the contractor's breach of the underlying construction contract (*Thomas and Pennicott, 2007; Craig, 1999*)

Suretyship is the obligation to release payment considered as debt upon the default of the contractor. This three-party arrangement ensures project Owner (Oblige/Beneficiary) that the Contractor (Principal/Applicant) will complete the work in compliance with what it is stipulated in the underlying contract. Whenever the principal fails to execute, the beneficiary resorts to the surety company which in turn step in and not only release the payment needed for work progress but perform the work on behalf of the contractor in accordance with the contract conditions. Surety Overview itself). Following the foregoing, the principal (Contractor) is obliged to cooperate with the investigation and thus in many cases indemnify the surety company for costs associated with the determination. However, the principal is under the legal obligation to indemnify the surety for all loss incurred by the surety under the bond (Risk Management & Audit Services, n.d.). The contractor is initially subjected to a prequalification evaluation for surety bonds to ensure that the chosen contractors are capable of doing the task. The contractor's signature on a guarantee agreement absolves the guarantor of any liability for the contractor's losses if he defaults. That is why contractors are vetted based on their creditworthiness. (Russel, 1990). Surety corporations charge higher premiums than banks because they are undertaking greater responsibility: up to 100% of the project value (Huang Y.-L. , 1992). The surety premium, which is around 1% of the contract value (and normally covers 100%) for the length of the obligation, pays for prequalification services. Thus, the surety is in effect extending credit, usually unsecured, on the basis of a signature. (Russel, 1990)

3.1.2 Conditional Guarantee

For a conditional performance guarantee, the guarantor only undertakes to pay the owner up to a promised limit with the obligation to pay or perform is established by the contractor's breach of the terms and conditions of the underlying construction contract. Contract Guarantees in ICC Publication No. 325 are, in fact, strict conditional bonds mainly for bank guarantees, which demand the owner to demonstrate that the contractor is in default and the estimated loss due to this default by an acceptance either from the contractor or an arbitrament or a judicial decision.

The security provider requests a pledge of collateral from the contractor although collateral usually involves some residual risks due to the liquidity risk of real property and the volatility of the property market. The collateral can be retainage receivables, account receivables, time deposits, treasury bonds and real property. If the supplier defaults, the provider pays the Owner and liquidates the collateral as a recovery.

If the recovery exceeds the amount, the provider will reimburse the contractor for the difference.

The supplier will lose money if the recovery falls short of the payment. Conditional bank guarantees are a technique for reducing on-demand guarantee risks. Because a conditional guarantee is only payable against documents that indicate evidence of default, such as a court order and arbitration judgment there is a limited chance of fraudulent claims on the guarantee. The International Federation of Consulting Engineers (FIDIC) does not recommend on-demand bonds because they are prone to unjustified calls that tend to increase tender prices (Hillig, Dan-Asabe, Donyavi,, Dursun, & Thampuratty, 1999)

The Uniform Rules for Contract Guarantees (URCG) (1978) were developed by the International Chamber of Commerce and apply solely to guarantees whose payment obligations are activated by a breach in the underlying contract.

Article 9 of the URCG, for instance, requires the owner to back up any claims made under a performance guarantee or advance payment guarantee by a court ruling or arbitral award. Owners have naturally objected to such limitations, which have precluded the URCG from gaining widespread adoption in the worldwide banking sector. (Huang Y.-L. , 1992)

3.1.3 Unconditional Bank Guarantees

An independent guarantee undertakes to pay the beneficiary a sum of money if the principal (the debtor) fails to complete his obligations under the underlying contract. These guarantees are usually payable upon first demand by the beneficiary and are normally unconditional but do not undertake fulfillment of the debtor's obligation under the underlying contract. (Murray, D'Arcy, & Cleave, 2002). An independent guarantee is legally independent, irrevocable, and payable on demand. An independent guarantee is normally issued by a bank in favor of a creditor at the request of a principal (or an obligor). In a conventional independent guarantee (or a demand guarantee), a guarantor (or a guarantor bank) irrevocably, absolutely, and unconditionally guarantees to pay the beneficiary (or a creditor) as primary obligor (Affaki, 2011). The issuing bank will not be of further assistance in completing the project rather the beneficiary must determine independently how best to finish the job. Finally, after being required to pay on the beneficiary's demand the issuing bank will then look to its customer, the credit applicant for full reimbursement. In construction, the credit applicant is typically the

contractor, and the beneficiary is the project owner. On construction projects, this instrument provides the Owner with powerful risk management tools. The Owner may draw money without having to demonstrate or prove to the bank that the contractor is in default. The issuing bank merely has an obligation to pay the beneficiary the value of the instrument upon proper demand. The bank is not concerned with whether the parties have properly performed on the underlying contract. The URDG 758 features for the independency of the independent guarantee in Article 3 for the “independence nature” of a demand guarantee:

“A guarantee is by its nature independent of the underlying relationship and the application, and the guarantor is in no way concerned with or bound by such relationship. A reference in the guarantee to the underlying relationship for the purpose of identifying it does not change the independent nature of the guarantee. The undertaking of a guarantor to pay under the guarantee is not subject to claims or defenses arising from any relationship other than a relationship between the guarantor and the beneficiary.”

When issuing an unconditional bond, the bank tends to collect collateral, because the bond is more like a kind of bank paper that can be called at any time. In practice, in most cases, the bond will transform into a loan to the principal after a bank honors its guarantee (Deng, Ding, & Tian, 2004). The degree to which information-based contracting frictions are mitigated by collateral should depend on the underlying economic characteristics of the collateral. (Berger, Ioann, & Frame , 2016). Different collateral types may be associated with certain economic characteristics. Acceptable security interests on real property include mortgages, pledges, and collateral bonds. Mortgages are used for immovable property (e.g., real estate) and some types of

movable property (e.g., vehicles, aircraft, and boats). Pledges and collateral bonds, on the other hand, are security interests on other kinds of movable property (e.g., equipment, inventory, and accounts receivable). There are two classes of pledges: with and without transfer of possession. Pledges with transfer of possession (often referred to as “common pledges”) require the transfer of movable property to the creditor. Pledges without transfer of possession, on the other hand, are often used when the property is essential for the firm’s operations. A collateral bond (also known as a warrant) is a security issued by an authorized warehouse indicating possession of an asset and its value. By endorsing the collateral bond to a lender, the firm pledges the deposited assets to obtain secured credit. Hence, collateral bonds are similar to pledges with transfer of possession⁷. In addition to security interest on real property, Bolivian banks can also use security interest on financial assets such as bank guarantees, deposits in financial institutions, and financial securities. (Berger, Ioann, & Frame , 2016)

Types of bank guarantees are used depending on the individual phases of construction to cover the specific risks involved:

Contracting phase of a construction contract.

- Tender Bond: “A Bond in respect of a tender to secure the payment of any loss or damage suffered or incurred by the Beneficiary arising out of the failure by the Principal to enter into a Contract or provide a performance Bond or other Bond pursuant to such tender”. Article 2 of the Uniform Rules for Contract Bonds 1993 (URCB). The Beneficiary limits the number of bids to serious parties that do not withdraw from the bidding by using a tender bond (e.g. signature of a contract, cooperation in concluding the contract, and following bid

conditions). The validity of this bid bond is determined by the bid's validity period, which is typically between 90 and 180 days. (Chovancova , 2019)

- Letter of confidence. A letter of confidence is a commitment to issue a bank guarantee. It may be required by a Beneficiary before an invitation to tender. A bank usually provides a letter of confidence to issue a bid bond in the future if requested to do so by the contractor with a request to submit a bid. A letter of confidence to issue a bank guarantee protects the investor by ensuring that the bidder has sufficient funding available to secure the full completion of the works or warranty period. (Chovancova , 2019)

Pre-production phase of a construction contract.

- Advance payment guarantee: “to secure the repayment of any sum or sums advanced by the Beneficiary to the Principal under or for the purposes of the Contract, where such sum or sums is or are advanced before the carrying out of works, the performance of services or the supply or provision of any goods pursuant to such Contract.” Article 2 of the Uniform Rules for Contract Bonds 1993 (URCB). Such a guarantee is issued in the case of deposit payments and usually only 20 to 30 % of the contract is paid against such guarantee (Chovancova , 2019)

Production phase of a construction contract.

- Performance bond. A Bond to secure the performance of any Contract or Contractual Obligation. Article 2 of the Uniform Rules for Contract Bonds 1993 (URCB)

Post-production phase of a construction contract.

- Guarantee for warranty obligation. Such guarantee ensures the fulfilment of the obligation to remedy defects and incomplete work discovered during the technical warranty. The valid term of such a guarantee matches that of the technical warranty. (Chovancova , 2019)
- Retention guarantee. “A Bond to secure the payment of any sum or sums paid or released to the Principal by the Beneficiary before the date for payment or release thereof contained in the Contract”. Article 2 of the Uniform Rules for Contract Bonds 1993 (URCB)

3.1.4 Letter of Credit

In some countries, standby L/Cs are often issued by banks instead of sureties. (Kim , 2020) On-demand guarantee and letter of credit have mainly same function but different nomenclature. Banks may be prohibited by law or common practice in some countries, such as the United States, from offering guarantees to third parties, thus they issue standby L/Cs as a substitute. (Tiong, 1992)

A letter of credit or documentary credits is a pledge by a bank (issuing bank) to guarantee the beneficiary in the event of the principle defaulting on the beneficiary's claim by presenting required documents, regardless of the content of the underlying contract dispute.

There are two of credit letters. "Commercial" letters of credit and "standby" letters of credit are the two most common varieties.

Commercial letters of credit have made it easier to sell products, particularly in international operations. As a result, in the vast majority of situations, the buyer arranges for a bank to issue an irrevocable letter of credit to the seller, with the issuing bank anticipating payment if the parties comply. The bank will only pay the seller if he

or she can show the bank certain documents (for example, evidence that the products were shipped). The bank will then pursue the buyer for compensation.

Standby letter of credit, however, provide guarantee in case of nonperformance under the underlying contract. A letter of credit is referred to as a "primary" obligation. That is, the issuer's duty is contingent on the beneficiary's presentation of specific documents, not on the default itself. In truth, proof of default has no impact on a bank's commitment to a customer who has received a letter of credit. (Dunn, Knoll, & Dempsey, 2009)

Issuers often require applicants to pledge collateral to secure their promise to reimburse the issuer if the issuer has to honor the letter of credit. The customer may pledge acceptable securities accounts, as well as certificates of deposit from the bank, as collateral for a letter of credit. Although much depends on the customer's relationship with its bank, the fees for a letter of credit are typically a small percentage of the letter of credit amount, plus a nominal processing fee. (Dunn, Knoll, & Dempsey, 2009)

3.2 Costs for Bank Guarantees

The price of a bank guarantees is compositional in nature in terms of managing construction costs:

- Fee for issuing a guarantee This is a fixed portion of the price and is bound exclusively to construction contracts. In terms of costs, this is an indirect fixed cost, specifically production overheads.
- Fees for maintaining the framework on BGs: This is a fixed portion of the price and is bound to the company and to all construction projects. They provide the contractor with flexibility in issuing bank guarantees. The above-agreed framework depends on the number of sales, i.e. the size of the construction enterprise and its creditworthiness. In terms of managing costs, this is an indirect fixed cost, specifically administration overheads.

- Price for the bank guarantee. This is a variable cost item that is derived from the size of the requested guarantee with respect to the value of the construction contract, the type of guarantee, and the duration of the guarantee itself. In some construction contracts, the value of the guarantee may reach up to 100 % of the price for the construction contract. In terms of managing costs, this is an indirect variable cost, specifically production overheads. (Chovancova , 2019)

3.3 Financing Tool

3.3.1 Overdraft Accounts

Overdraft accounts are the most common type of construction finance, in which the bank extends a line of credit to the contractor (the borrower) up to a certain limit based on projected expenditures and receipts for the life of the project. This sort of borrowing is being used to bridge between a contractor's cash flow difficulties and a regular loan arrangement. The contractor must have a forecasted cash flow pattern across the project lifespan in order to determine the required bank credit. The quantity of project cash input and outflow over time determines whether the overdraft is positive or negative.

Overdraft is usually negative during the early stages of a project and becomes positive later on when the contractor receives cash in excess of costs. (Commercial)

Overdraft accounts are usually resort for borrowers that are uncertain of their exact debt financing needs over a specified period or that expect their debt financing needs to fluctuate during a specified period T. The borrower only pays interest on the amount it chooses to borrow (known as the drawdown). During the life of the facility, the borrower can normally return and then re-borrow funds as many times as it wants, as long as it does not exceed the maximum borrowing limit at any particular time.

Overdraft facilities may also include a credit enhancement requirement that the borrower keep cash or other financial assets (such as a certificate of deposit) with the lending bank for the duration of the overdraft.

The bank that provides the overdraft facility may demand the borrower to provide security or credit enhancement in exchange for the facility. This might be in the form of monetary collateral, such as a fixed deposit of money with the lender (perhaps in a foreign currency like euros or dollars). A contractual right of set-off against any of the borrower's accounts with the lender may be included in the conditions of an overdraft facility. This implies that if a borrower defaults, the lender has the authority to deduct the amount owing to it from the borrower's fixed deposit without having to go through legal channels first.

There may be fees associated with establishing an overdraft facility, in addition to the interest to be paid on money borrowed. These fees often will be charged each time a new facility is opened. Fees may include a commitment fee (charge for opening the facility) or a fee for the perfection of collateral (charge for costs of verifying the validity and adequacy of the collateral offered as security for the loan). time a new facility is opened. Fees may include a commitment fee (charge for opening the facility) or a fee for the perfection of collateral (the charge for costs of verifying the validity and adequacy of the collateral offered as security for the loan. (CGAP by Cleary, 2006)

CHAPTER 4

MITIGATION MEASURES – PORTER’S STRATEGY

In a turbulent market, companies are imposed to restructure and act swiftly to cut expenses, employment, and debt since it is impossible to secure a consistent supply of work. (Boon, 1996)

Recessions have the impact of limiting resources available to businesses in the construction industry as customers purchase less, investors cut back on lending, and competition rises (Tansey , Xianhai, & Cleland, 2013). Construction employs a variety of strategies to meet their organization's goals for survival and growth as well as to influence how their organizations interact with their surrounding business environment. Construction contractors need to use a variety of response techniques in order to survive a recession. (Lim, Oo, & Ling, 2010). Response strategies have emerged as a key framework for navigating turbulent and dynamic environments. (Ye, Shen , & Tan , 2010). According to (King & Cushman, 1997), businesses take unprecedented measures to protect their assets from further loss during an economic downturn. In order to survive in a volatile environment, senior management in the construction industry should concentrate on identifying and implementing different response methods.

According to (Jennings & Betts, 1996), difficulties with cash flow, low profit margins, difficulty finding employment, lack of experience in the firm's line of activity, and a lack of managerial experience are the most significant reasons contributing to business failure as a result of the recession. Many authors claim that a company's strategy should entail a planned series of actions intended to react to its dynamic business environment. Strategy, according to (Price & Chahal, 2006) is necessary for organizing change, whether it is motivated by a crisis or a decision. Recessions and

other external events are what trigger crisis-driven change, which forces businesses to make decisions and adopt certain reaction measures in order to ensure their survival.

4.1 Porter's Strategy

Porter's (1980, 1985) generic competitive strategies model of cost leadership, differentiation, and focus is a widely accepted typology of strategic possibilities for firms. (Tansey , Xianhai, & Cleland, A critical review of response strategies adopted by construction companies during an economic recession, 2013). Porter's model is a well-known theoretical framework among business strategies and industrial economies worldwide. One of the most significant strategic management ideas has been Porter's (1980, 1985) generic typology, which served as the foundation for a lot of strategy research in a variety of industries. The framework developed by Porter (1980, 1985) to describe these three generic competitive strategies is shown in Figure 6. It has two dimensions: strategic advantage or competitive advantage, which refers to a firm's choice of how to create competitive advantage, and strategic target or competitive scope, which refers to a firm's choice of the size of its operation. According to Porter (1980), the cost leadership strategy necessitates a vigorous pursuit of cost savings, strict cost and overhead management, and cost minimization in areas like sales force, service, and advertising.

According to Porter (1980), this strategy is centered on outperforming rivals through efficiency rather than other crucial factors like product quality and customer service. (Tansey, Spillane, & Meng, 2014).

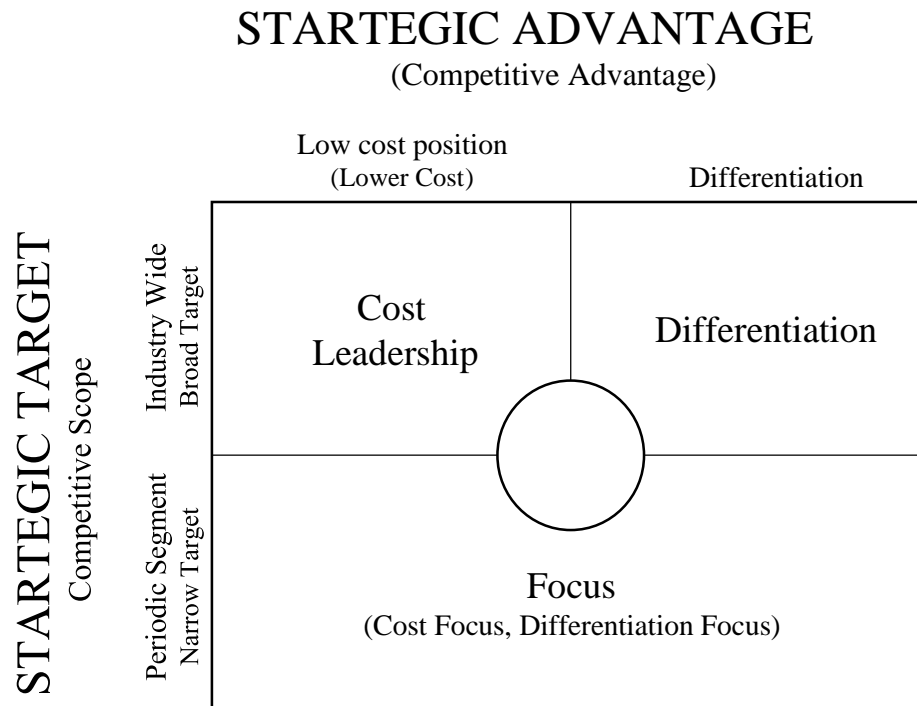


Figure 6: Porter's (1980, 1985), Three generic strategies, Academia, accessed on 11 November 2022, <<https://www.tandfonline.com.ezproxy.aub.edu.lb/doi/pdf/10.1080/01446193.2014.933856>>

According to Tansley et al. (2013), cost leadership entails reducing costs, including salaries, budgets, and employee layoffs, which tend to be used most. (Dess & Davis, 1984) highlighted various cost-leadership responses or strategies, including operating efficiency cost reductions, product and quality control, and the acquisition of raw materials. According to Porter (1980), the differentiation approach focuses on differentiating the company's product or service offerings by developing something that is viewed as unique, enabling the company to command higher pricing than the industry norm. As a result, rather than the cost minimizations associated with a cost leadership approach, the main strategic goal of differentiation is to be distinct on a number of business dimensions, which typically demands investment. Differentiation strategies are employed to offer a special product or service that stands in the face of competition.

Focus is the third basic approach, and it entails concentrating on a certain customer, market sector, or geographic market. Porter (1980) stated that the focus strategy is centered on providing a specific target with excellent service. Focus strategies include targeting either particular market segments or the entire industry. (Tansey, Spillane, & Meng, 2014).

This chapter will review and synthesis existing research on response strategies and practices adopted in the construction industry. It aims to develop a taxonomy of response strategies relative to Porter's (1980) generic strategies of cost leadership, differentiation, and focus, an to establish which generic strategy is most common during times of recession. Using the taxonomy framework, the pilot study will present and evaluate the response strategies adopted during the Lebanese unprecedented financial and economic crises.

A critical review strategy was adopted in this study in both the United Kingdom and Singapore:

In the UK research conducted by (Hillebrandt, Cannon, & Lansley, 1995) examined strategic responses of 20 UK construction firms during late 1993 and late 1994 are examined. Table 2

In Singapore, a research conducted by (Lim, Oo, & Ling, 2010)found that several response actions were adopted to confront the recession of 1997 till 2005. Table 3

Table 2: Response strategies adopted by UK's construction firms as a result of the economic recession

Response Strategies	Justification
Cost Leadership	
<u>Financial</u>	
Implement stricter financial Control	<ul style="list-style-type: none"> • Tighter cost control • Stricter cash monitoring • Planning budget and use of funds • Control over capital expenditure • Reduction in number and size of company cars
Write-down asset value	<ul style="list-style-type: none"> • Rebuild the balance sheet • Sell assets (plant, equipment, and buildings) to pay back their loans and interest on loans • Sell plant hire business and hire what they need
Disposal of business	<ul style="list-style-type: none"> • Sell the firm when all company's assets reach insignificant value
Close regional offices/Reduce number of offices	<ul style="list-style-type: none"> • Cost reduction strategy since regional offices were rented • Reduce running costs though "mothballing" of whole building
Renegotiate loan arrangements	<ul style="list-style-type: none"> • Reduce the number of lenders and negotiating with the greater freedom of action • Convince the bank to convert loans into equity
Rights issues	<ul style="list-style-type: none"> • Enhance balance sheet to expand in the future • Investors with substantial stake prefer to put funds rather than risks the loss of their business
New financing arrangements with clients	<ul style="list-style-type: none"> • Minimize stage payments • Firms require bonds from clients to protect themselves from non-payment
Provision of finance and financial packages	<ul style="list-style-type: none"> • Extending the project backwards before the construction phase by putting together financial packages and identifying potential projects and forward extension to include: equipping, furnishing, maintenance the building, structuring the management of the facility and offering different ways of managing the construction project
<u>HR/Personnel</u>	
Cuts in Dividend	<ul style="list-style-type: none"> • Reduce money outflows • Show employees that they were not the only ones to suffer in a recession
Freezing/cutting salaries of employees	<ul style="list-style-type: none"> • Reduce administrative costs
Laying-off employees	<ul style="list-style-type: none"> • Reduce administrative costs
Cutting bonuses	<ul style="list-style-type: none"> • Reduce administrative costs
Employ staff on project-by project basis	<ul style="list-style-type: none"> • Reduce administrative costs
Freezing staff recruitment	<ul style="list-style-type: none"> • Reduce administrative costs

<u>Tendering/Contracts</u>	
Lower tendering prices	<ul style="list-style-type: none"> • Maintain cash flow at satisfactory level • Retain high caliber management teams • When firms put higher mark-up, it would receive fewer contracts thus attract greatest contracts
Differentiation	
<u>Marketing</u>	
Improve marketing and advertising	<p>Firms considered marketing strategies:</p> <ul style="list-style-type: none"> • To show more technical knowledge • To broaden the existing services they offer
<u>Operational/Project Management</u>	
Improvement of quality	<ul style="list-style-type: none"> • Obtain more profitable work by projecting of the image of the company in terms of quality • Adopt quality assurance standard to obtain certain types of contract • Demonstrates that systems are in place for controlling the business and the site
Focus	
<u>Marketing</u>	
Entry into new construction markets	<ul style="list-style-type: none"> • Secure construction businesses in some foreign markets • Develop and expand overseas markets to increase overseas turnover
Diversification into core Businesses	<p>Diversification into construction-related businesses, little connection with construction and miscellaneous range of activities such as investing in property which they were constructing and land for housing</p> <ul style="list-style-type: none"> • Increase profitable growth • Increase different activities in which this might be achieved • Make good positive cash flow and increase fixed assets
<u>Tendering/Contracts</u>	
Links with other contractors/Joint venture on contracts	<ul style="list-style-type: none"> • Joint venture with other companies to undertake bigger projects and limit exposure to risk • A way of tapping into expertise and capital without necessitating a link with rivals. • Joint venture will make the operating partner wholly responsible to the client so that if the partner goes out of business there is no redress to the contractor.
Undertake smaller contracts	<ul style="list-style-type: none"> • Limit size of jobs undertaken to the level at which the failure of one project would not endanger the company • Low risk profile in what a high risk business <p>In doing so the large contractors eroded the market of the medium sized contractors.</p>

Table 3: Response strategies adopted by Singapore's construction firms as a result of the economic recession

Response Strategies	Justification
Cost Leadership	
<u>Financial</u>	
Implement stricter financial Control	Implement stricter: <ul style="list-style-type: none"> • site management to reduce material wastage • financial management on company cash flow • site procurement procedures
Write-down asset value	• Investing in machinery that has a high liquidity value
Renegotiate loan arrangements	• Negotiate alternative loan services
Rights issue	• Putting equity into projects
New financing arrangements with clients	• Forming partnership with clients • Entering into security agreements with project owners and financial institutes
<u>HR/Personnel</u>	
Freezing/cutting salaries of employees	-
Laying-off employees	-
Cutting bonuses	-
Employ staff on project-by project basis	-
Freezing staff recruitment	-
<u>Tendering/Contracts</u>	
Lower tendering prices	• Bidding for projects with tiny/zero profits • Bidding for projects below cost
Front-end tenders	• Enter into forward contracts with suppliers and subcontractors to protect the firm against cost escalation
Differentiation	
<u>Marketing</u>	
Improve marketing and advertising	• Investing into R&D to further explore business opportunities
Focus	
<u>Marketing</u>	
Entry into new construction markets	• Venturing into overseas markets
Diversification into core Businesses	• Diversifying into other construction related businesses • Diversifying into different non-construction related businesses • Specializing in a particular expertise
<u>Tendering/Contracts</u>	
Links with other contractors/Joint venture on contracts	• Joint Venture • Adopting merger and acquisition
Undertake smaller contracts	• Setting limits on project size so that any failure of one project would not endanger the firm's operation • Bidding for more projects that are within firm's resources and capabilities • Undertake short-term and fast track projects

4.2 Taxonomy of Response strategy

The proposed taxonomy in Table 4 utilizes the well-known theoretical typology of Porter's (1980) generic strategies for the classification of the response strategies.

This proposed taxonomy Table 4 can be used as a knowledge-based framework for construction companies to use to survive economic turbulence. The UK and Singapore identifies 16 out of 22 and 12 out of 22 response strategies related to cost leadership respectively.

Of the three generic strategies, cost leadership strategies are the most common used across the studies.

Table 4: Taxonomy of response strategies adopted for both UK and Singapore as a result of economic recession

	Response Strategies	UK	SG
	Cost Leadership		
	<u>Financial</u>		
1	Implement stricter financial Control	x	x
2	Write-down asset value	x	x
3	Disposal of business	x	
4	Close regional offices/Reduce number of offices	x	
5	Renegotiate loan arrangements	x	x
6	Rights issues	x	x
7	New financing arrangements with clients	x	x
8	Provision of finance and financial packages	x	
	<u>HR/Personnel</u>		
9	Cuts in Dividend	x	
10	Freezing/cutting salaries of employees	x	x
11	Laying-off employees	x	x
12	Cutting bonuses	x	x
13	Employ staff on project-by project basis	x	x
14	Freezing staff recruitment	x	x
	<u>Tendering/Contracts</u>		
15	Lower tendering prices	x	x
16	Front-end tenders	x	x
	Differentiation		
	<u>Marketing</u>		

17	Improve marketing and advertising	x	x
<i><u>Operational/Project Management</u></i>			
18	Improvement of quality	x	
Focus			
<i><u>Marketing</u></i>			
19	Entry into new construction markets	x	x
20	Diversification into core Businesses	x	x
<i><u>Tendering/Contracts</u></i>			
21	Links with other contractors/Joint venture on contracts	x	x
22	Undertake smaller contracts	x	x

Table 5: Summary table of mitigation measures responses according to Porter's strategy

	UK	SG
Cost Leadership	16	12
Differentiation	2	1
Focus	4	4
TOTAL	22	17

CHAPTER 5

LEBANON'S FINANCIAL AND ECONOMIC CRISIS OVERVIEW

After putting an end to the civil war in 1989, the government urged to respond to the economic slump with a focus on reviving the economy. Lebanon racked up a massive debt burden as it sought to repair its infrastructure through both external and domestic borrowing. As the private sector was reluctant to engage in the post-war framework, the government was forced to offer a “high-risk premia” incentive demanded by local investors to finance the reconstruction between 1993-2001. The government afterward began to tap into international capital increasing foreign debt. Amid the low-growth environment, government revenues remain flat while public expenditures rise. (Chbeir, 2019)

In fact, a nation's debt expands as a result of a fiscal deficit in a country. Additionally, interest increases debt levels, particularly if interest rates are high. Typically, in low-growth environments, government revenues do not increase significantly while public expenditure (particularly on social and/or capital investment) grows because of the necessity for more government intervention and spending to boost the economy. (Chbeir, 2019)

5.1 Source of Debt

Most of the Lebanese debt is of domestic origin. In the post-war reconstruction era, between 1993 and 2001, the Lebanese government relied heavily on domestic market borrowing and thereby amassed more local currency (LC) debt to meet its overall financing requirements. Given the risk premiums that the investors required to

support the government funding for the reconstruction operations, the majority of the local currency debt had high-interest rates. With high costs of borrowing, the overall fiscal deficit expanded rapidly over the years. (Chbeir, 2019)

From 2002 to 2008, foreign currency (FC) debt gained thrust. The Lebanese government started leveraging foreign capital markets successfully. In essence, the goal of the first Paris Donor meeting, held in February 2001, was to assist contain the nation's expanding budget imbalance and put debt on a manageable course. Yet commencing in 2009, LC debt increased again. While Lebanon has been drowning in debts, the turmoil persists. Any form of debt, whether it is local or foreign, can suppress the economy (Chbeir, 2019). The data released by the BDL indicated that Lebanon's gross public debt hit around \$100B in 2021 as the local (denominated in LBP at the official rate of 1,507) and foreign (denominated in USD) debt stood at around \$49.52B and \$39B respectively. Interesting to add that local currency debt at the market exchange rate amounts to \$8.84B thus making the total equal to \$44.89 or about 173% GDP.

The Government of Lebanon (GoL) decided on March 7, 2020, not to pay US\$1.2 billion in Eurobonds that were due on March 9. This was the country's first sovereign default in history. Since then, the government has not paid any interest or principal on its outstanding Eurobonds. (World Bank Group, 2021). It should be noted that a significant portion of the foreign debt in 2020 and 2021, specifically \$7.1 billion and \$14.24 billion, respectively, represents arrears resulting from the non-payment of principal balances, coupons, and accumulated interest on Eurobonds, which were in default. (Azzi, 2022)

Debt is crucial to the operations of any government, including Lebanon's. Fiscal policy is used as a tool for stabilization. In fact, debt accumulates as a result of a country's accumulated national fiscal deficits. The higher the interest rates, the more pronounced the impact of interest payments on debt levels, thereby exacerbating the magnitude of debt. (Chbeir, 2019)

Table 6: Local Debt and Foreign Debt as a portion of GDP

Period	Foreign Debt billions of US\$ ^[1]	Local Debt billions of US\$ ^[2]	Total Debt (billions of US\$)	GDP (billions of US\$) ^[3]	Foreign Debt to GDP	Local Debt to GDP	Total Debt to GDP
20/12/93	0.327	2.9294	3.26	\$7.94	4%	37%	41%
20/12/94	0.772	4.45368	5.23	\$9.60	8%	46%	54%
20/12/95	1.343	6.162	7.51	\$11.72	11%	53%	64%
20/12/96	1.9075	8.8641	10.77	\$13.69	14%	65%	79%
31/12/97	2.432	12.19	14.62	\$15.75	15%	77%	93%
31/12/98	4.176	12.96	17.14	\$17.25	24%	75%	99%
31/12/99	5.529	14.18	19.71	\$17.39	32%	82%	113%
31/12/00	7.1827	16.27	23.45	\$17.26	42%	94%	136%
31/12/01	9.5726	17.45	27.02	\$17.65	54%	99%	153%
30/11/02	12.7708	17.47	30.24	\$19.15	67%	91%	158%
30/11/03	15.49	15.35	30.84	\$20.08	77%	76%	154%
30/11/04	18.76	15.03	33.79	\$21.16	89%	71%	160%
30/11/05	18.89	15.45	34.34	\$21.50	88%	72%	160%
30/11/06	20.29	16.76	37.05	\$22.02	92%	76%	168%
30/11/07	21.181	17.761	38.94	\$24.83	85%	72%	157%
30/11/08	21.11	20.0431	41.15	\$29.12	72%	69%	141%
31/12/09	21.3194	22.8	44.12	\$35.40	60%	64%	125%
31/12/10	20.61	24.44	45.05	\$38.44	54%	64%	117%
31/12/11	20.9599	25.45		\$39.93	52%	64%	116%

			46.41				
31/12/12	24.3945	24.73	49.12	\$44.02	55%	56%	112%
31/12/13	26.136	27.08	53.22	\$46.88	56%	58%	114%
31/12/14	25.613	31.52	57.13	\$48.10	53%	66%	119%
31/12/15	27.088	34.26	61.35	\$49.93	54%	69%	123%
31/12/16	28.11	37.12	65.23	\$51.15	55%	73%	128%
31/12/17	30.3914	38.76	69.15	\$53.03	57%	73%	130%
31/12/18	33.49	42.24	75.73	\$54.90	61%	77%	138%
31/12/19	33.74	47.51	81.25	\$51.60	65%	92%	157%
31/12/20	36.05	20.141*	56.19	\$22.10	163%	91%	254%
31/12/21	38.51	6.267**	44.78	\$20.50	188%	31%	218%

[1] : Banque du Liban, accessed on 17/10/2022 <https://www.bdl.gov.lb/webroot/statistics/table.php?name=t531-3>

[2] : Banque du Liban, accessed on 17/10/2022 <https://www.bdl.gov.lb/webroot/statistics/table.php?name=t531-2>

[3]: World Bank, accessed on 17/10/2022 [GDP \(current US\\$\) - Lebanon | Data \(worldbank.org\)](https://data.worldbank.org/LB/GDP)

*: originally \$49.52B at the official rate of \$1507/LBP. This value is converted at the parallel market exchange rate of LBP 3,688/USD

** : originally \$49.11B at the official rate of \$1507/LBP. This value is converted at the parallel market exchange rate of LBP11,755/USD.

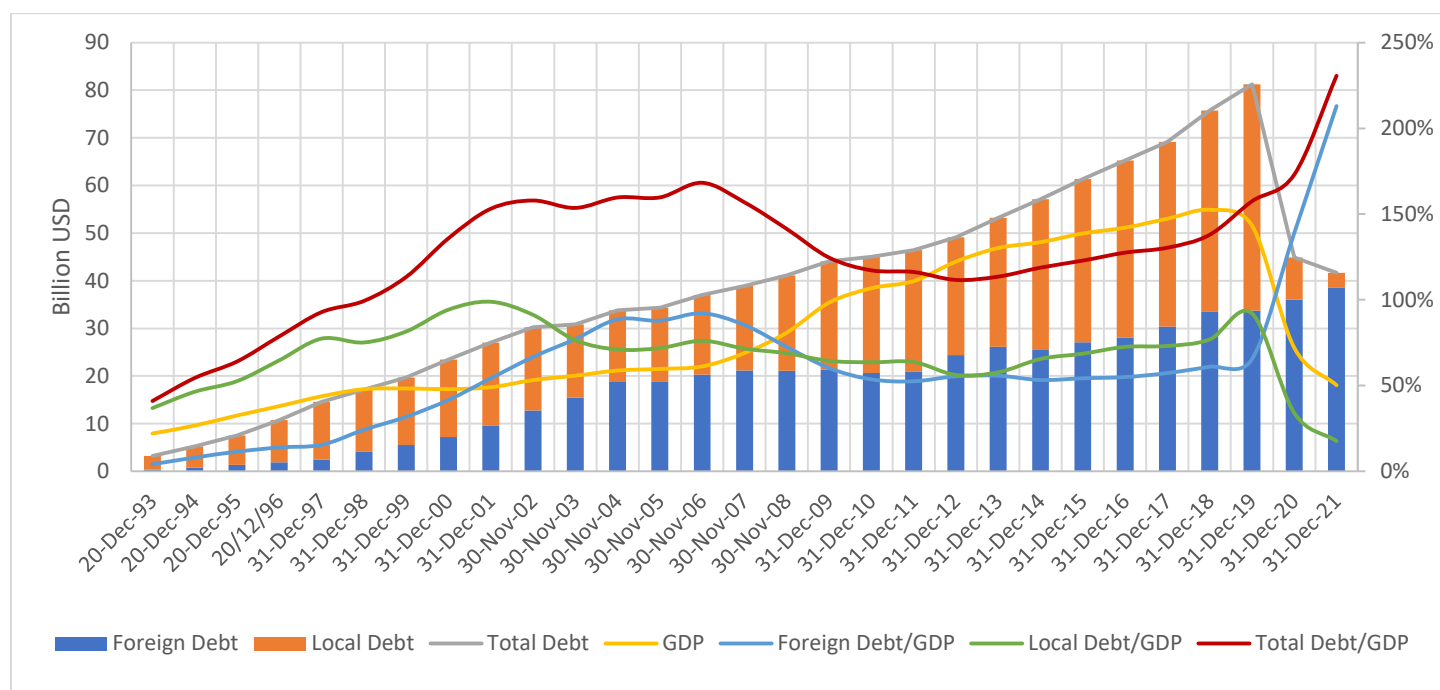


Figure 7: Local debt and foreign debt as a portion of GDP

[1] : Banque du Liban, accessed on 17/10/2022 <https://www.bdl.gov.lb/webroot/statistics/table.php?name=t531-3>

[2] : Banque du Liban, accessed on 17/10/2022 <https://www.bdl.gov.lb/webroot/statistics/table.php?name=t531-2>

[3]: World Bank, accessed on 17/10/2022 [GDP \(current US\\$\) - Lebanon | Data \(worldbank.org\)](https://data.worldbank.org/LB)

*: originally \$49.52B at the official rate of \$1507/LBP. This value is converted at the parallel market exchange rate of LBP 3,688/USD

** : originally \$49.11B at the official rate of \$1507/LBP. This value is converted at the parallel market exchange rate of LBP11,755/USD.

Lebanon for years has been on a path of debt accumulation. The situation was the result of years of excessive spending and budget deficit. According to the MoF, Figure 8 and Table 7 shows the budget expenditure for the 2019 and 2020 budgets in the share of the total expenditure. In 2019 and 2020 public wages and benefits represent 39% and 50% of total budget expenditure respectively. A substantial part of the rise in the deficit was attributable to greater spending as a result of the debt interest payment allocating a high share budget in the years 2019 and 2020. In 2019, Lebanon paid down 32% for its debt interest, and 24 % in 2020. In addition to this, the huge spending of wage scale increase adopted in the second half of 2017, resulted in a higher scale in 2019 and 2020. (IMF, 2019 ARTICLE IV CONSULTATION—PRESS RELEASE,, 2019).The significant sums sent to EDL and its massive drain on public funds have been one of the primary causes of Lebanon's budget deficits over the last decade or so. (CreditLibanais, 2016). In 2019, the nation had roughly spent 6% to invest in capital expenditures, which dropped to 2% in 2020. According to Nafez Zouk, While borrowing may be utilized to support a country's economic growth, the Lebanese government was not using its debt to expand and produce resources (particularly in generating FX currency) to pay down the debt.

Table 7: Budget expenditure breakdown for 2019 and 2020

		2019 ^[1]		2020 ^[2]	
		%Share percentage	in LBP in billion	%Share percentage	in LBP in billion
Personnel Cost	Salaries	20%	5121	26%	5130.216
	Retirement	10%	2560.5	14%	2762.424
	Social benefits	5%	1280.25	7%	1381.212
	Transfers to public institutions to cover salaries	2%	512.1	2%	394.632
	End-of-service indemnities	2%	512.1	1%	197.316
Debt Interests	Domestic interest payment	12%	3072.6	5%	986.58
	Foreign interest payments	20%	5121	19%	3749.004
Other current expenditures	Other transfers	5%	1280.25	7%	1381.212
	Goods and services	4%	1024.2	5%	986.58
	Other expenditures	3%	768.15	3%	591.948
	Exceptional expenditures	1%	256.05	1%	197.316
	Capital expenditures	6%	1536.3	2%	394.632
	Treasury advance to EDL	10%	2560.5	8%	1578.528
	Total	100%	25,605	100%	19,732

[1]: Ministry of Finance, *Budget expenditure breakdown for 2019*, accessed on 08/08/2022,

<http://www.finance.gov.lb/enus/Finance/BI/ABDP/Annual%20Budget%20Documents%20and%20Process/Citizen%20Budget%202019en.pdf>

[2] : Ministry of Finance, *Budget expenditure breakdown for 2020*, accessed on 08/08/2022

<http://www.institutdesfinances.gov.lb/publication/citizen-budget-2020/#:~:text=The%20Citizen%20Budget%202020%20is,that%20might%20affect%20their%20lives.>

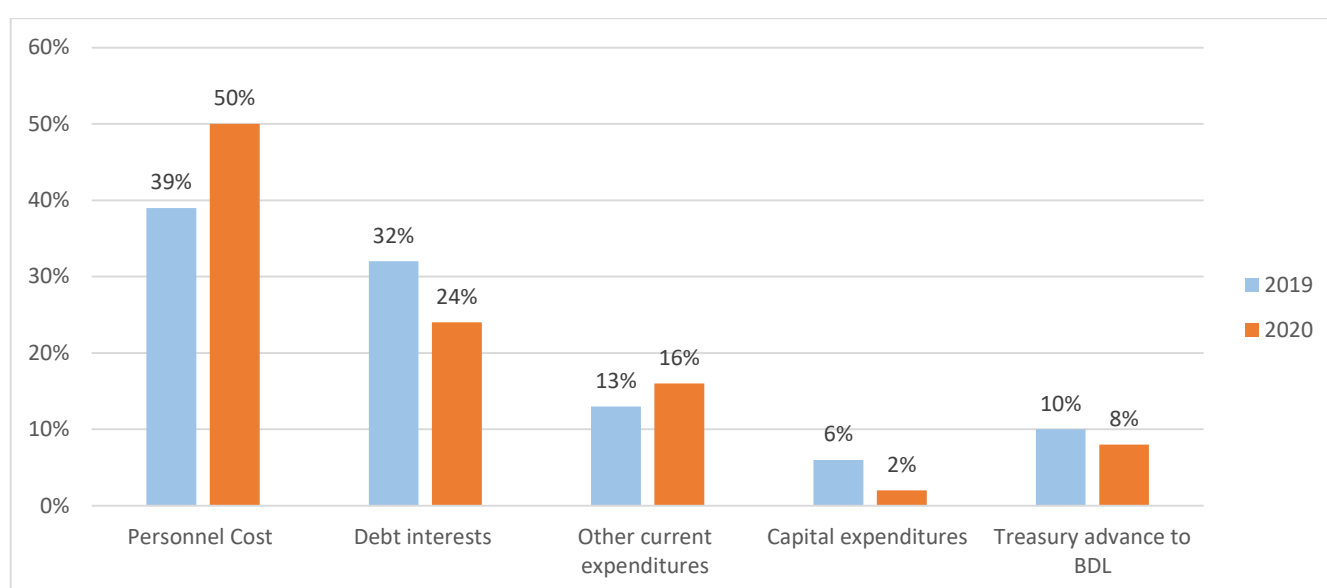


Figure 8: Budget expenditure breakdown for 2019 and 2020

[1]: Ministry of Finance, *Budget expenditure breakdown for 2019*, accessed on 08/08/2022, <http://www.finance.gov.lb/enus/Finance/BI/ABDP/Annual%20Budget%20Documents%20and%20Process/Citizen%20Budget%202019en.pdf>

[2] : Ministry of Finance, *Budget expenditure breakdown for 2020*, accessed on 08/08/2022 <http://www.institutdesfinances.gov.lb/publication/citizen-budget-2020/#:~:text=The%20Citizen%20Budget%202020%20is,that%20might%20affect%20their%20lives.>

From 1993 to 2019, when the financial and economic crisis erupted in Q4-2019, the overall fiscal balance recorded an uninterrupted deficit (World Bank Group, 2021).

Table 8: Budget Deficit from 2009 to 2022 in Billion LBP

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2021	2022
Total Revenue	8428	8414	9334	9396	9420	16,400	14,435	14,959	17,524	18,686	18,782	13,572	39,109
Total Expenditure	-11389	-11308	-11675	-13321	-13640	-21,032	-20,393	-22,412	-23,186	-23,891	-25,605	-19,759	-47,328
Fiscal Budget	-2,961	-2,894	-2,341	-3,925	-4,220	-4,632	-5,958	-7,453	-5,662	-5,205	-6,823	-6,187	-8,219

Source: Citizen Budget Law, Ministry of Finance



Figure 9: Budget Deficit

Source: Citizen Budget Law, Ministry of Finance

Referring to Figure 10, in 2020 Lebanese imports were valued around 11.3 billion dollars, and exports were around 3.5 billion dollars. Thus, the trade balance deficit was 7.8 billion dollars, which is a 50% drop from the trade balance deficit of 15.5 billion dollars in 2019.

Lebanon is paying for FX imports more than what it's making FX from exports. This will hinder the capacity to repay off the debt.

Lebanon has a fixed exchange rate pegged to dollars. In real terms, LBP is a bit too strong for what the underlying economic fundamentals are. That means the imports are cheaper. In Lebanon, it is cheaper to import than to produce and export. That is the main reason why Lebanon has been running a current account deficit imbalance for so long. Appreciation of the Lira has gone hand in hand with widening the current account deficit and balances of payments. According to Nafez Zouk, the cheapness of the import from the strong Lira has allowed Lebanon to live way beyond its means for so many years.

Table 9: The development of trade balance from 1993 to 2020

Millions of dollars			
Year	Exports	Imports	Trade Deficit
1993	452	4821	-4369
1994	572	5990	-5418
1995	825	7287	-6462
1996	1017	7554	-6537
1997	642	7455	-6813
1998	716	7060	-6344
1999	677	6207	-5530
2000	714	6228	-5514
2001	889	7291	-6402
2002	1045	6445	-5400
2003	1524	7168	-5644
2004	1747	9397	-7650
2005	1880	9340	-7460
2006	2283	9398	-7115
2007	2816	11815	-8999
2008	347	16137	-15790
2009	3484	16242	-12758
2010	4253	17964	-13711
2011	4265	276	3989
2012	448	22037	-21589
2013	3936	22020	-18084
2014	3313	21437	-18124
2015	2952	18595	-15643
2016	2977	19119	-16142
2017	2844	19582	-16738

2018	2952	19980	-17028
2019	3731	19239	-15508
2020	3544	11310	-7766

Source: Chamber of Commerce Industry and Agriculture of Beirut and Mount Lebanon, accessed 1/09/2022, https://ccib.org.lb/uploads/Foreign%20Trade%202020_1.pdf

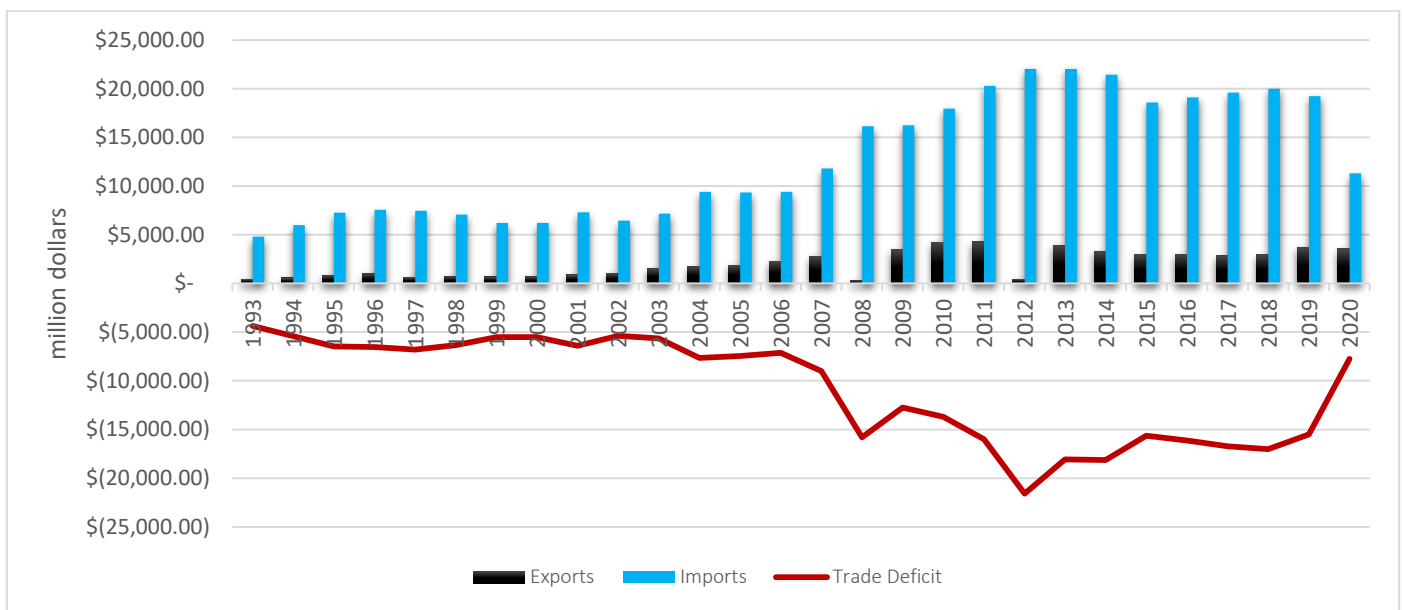


Figure 10 The development of foreign trade from 1993 to 2020

Source: Chamber of Commerce Industry and Agriculture of Beirut and Mount Lebanon, accessed 1/09/2022, https://ccib.org.lb/uploads/Foreign%20Trade%202020_1.pdf

The economy has managed to sustain enormous imbalances due to Lebanon's macro-financial structure where banks use deposit inflows from foreign investors and the

Lebanese diaspora to finance Lebanon's budget deficit. However, starting 2015 remittance inflows began to decline prompting BDL to initiate a complex financial operation. The slowdown is most likely explained by a combination of reasons, including tighter liquidity in GCC nations. Bank deposit inflows used to finance the deficit have largely dried up. (IMF, 2016 Article IV Consultation-Press Release; Staff Report;and Statement by the Executive Director for

Lebanon, 2017) Financing needs require a continued inflow of remittances and nonresident deposits, but deposit growth has slowed (IMF, 2017)

Lebanon has been dealing with several challenges associated with the domination of the Syrian crisis since 2011, along with a drop-in oil prices and subsequently, a decline in foreign financial inflows. (IMF, 2017)

5.2 The Increasing Challenging Environment

5.2.1 Syrian Crisis

As the Syrian conflict has continued to dominate Lebanon's prospects, it has proven to be extremely costly and causing the country's economic growth to decelerate. The number of Syrian refugees is estimated by the United Nations High Commission for Refugees (UNHCR) to be more than 1.4 million refugees and is considered one of the highest per capita in the world according to IMF article IV consultation 2016. While Lebanon has been accommodating massive refugee flows, GDP growth remained positive around 1-2 % in 2016 but lowered by an average of 2.6 percentage points. Authorities estimated the budget cost of \$400 million per year (IMF, 2017) and \$2.5 billion in terms of indirect costs as erosion of public services. (WB, 2013)

5.2.2 The Decline in Oil Prices:

Given the sizable government funding needs, banks have suffered from tighter liquidity due to the decline in the remittances inflows from Lebanese diaspora living in GCC countries and foreign investors. As an oil importer, Lebanon's consumption increased in response to the price drop. The decrease in imports due to decreased oil prices was offset by increasing oil consumption. Decreasing exports of products to the GCC nations, which represent 40% of Lebanon's total goods exports, have also contributed to the fiscal budget deficit, offsetting low oil imports. Tourism began to plummet sharply with the commencement of the Syrian conflict and a drop-in pricing.

Lebanon has maintained financial stability despite recurrent shocks and hurdles. Through regional and internal economic and political upheavals, a stable currency rate fixed to the dollar, remittances and deposit inflows from nonresidents and Lebanese abroad, and skilled crisis management have all contributed to maintaining confidence. (IMF, FINANCIAL SYSTEM STABILITY ASSESSMENT, 2017)

However, deposit growth has eased since 2015. Subsequent to the BDL's financial operation Y/Y change in total foreign deposits was \$7.4bn in 2017. The current slowdown in nonresident deposit growth led to decline in international reserves in the year up to May 2016, the first drop in 11 years (World Bank & IMF, 2016). The slowdown is likely explained by the aforementioned various factors including tighter liquidity conditions in GCC countries (a key source of deposits for Lebanon) and increased risk premia on Lebanese financial assets. (IMF, 2017)

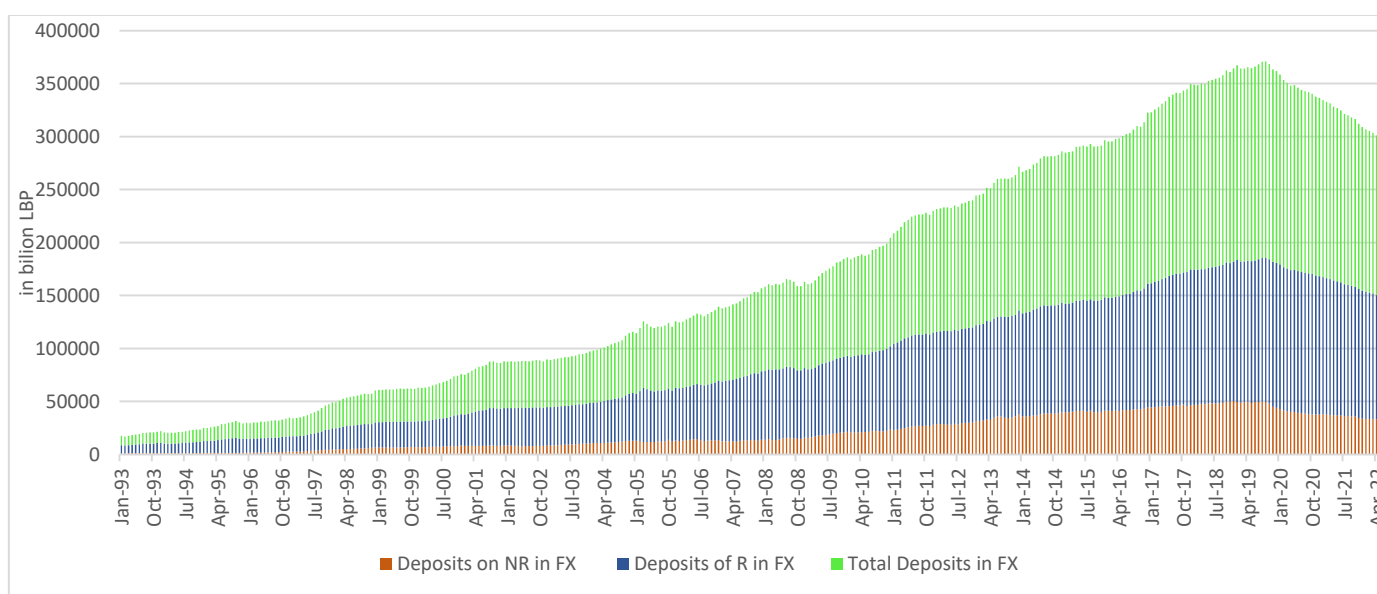


Figure 11: Foreign Assets of BDL and Commercial Banks in billion USD

Source : Banque du Liban, accessed on 03/09/2022,

<https://www.bdl.gov.lb/webroot/statistics>

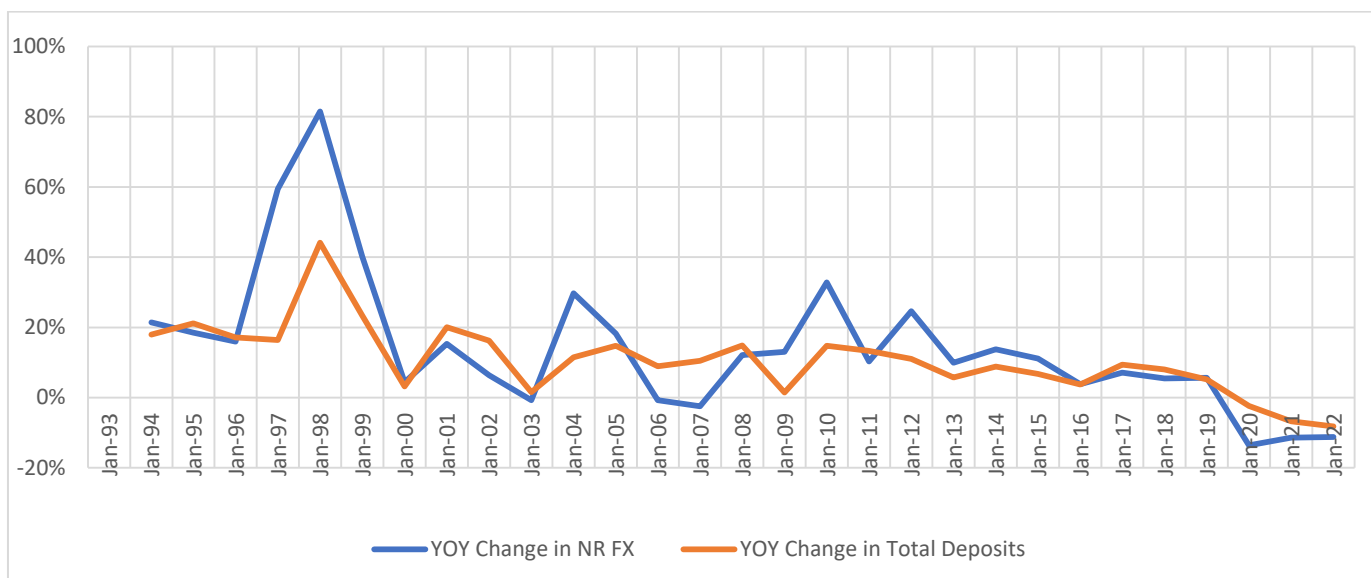


Figure 12: Change in foreign deposits

Source: Banque du Liban, accessed on 03/09/2022,

<https://www.bdl.gov.lb/webroot/statistics/>

The BdL (Banque du Liban or Central Bank) has thus acted to strengthen its reserves due to weakening deposit inflows, gross reserves decreased to \$35.1 billion in May 2016. As of May 2016, the BDL gross reserves stood at \$35.1 billion, reflecting lower foreign exchange (FX) inflows and the economy's largest FX funding needs. The BDL's financial operation consisted of the following:

In May 2016, the BdL swapped Lebanese pound (LL) government debt for the new Eurobonds with the MoF. In June, the BDL sold the newly acquired Eurobonds and FX-denominated long-term CDs to banks subsequently the FX reserves increased to \$40.6bn end of October.

Banks received large incentives for taking part in the operation. Banks were required to discount an equivalent amount of LL T-Bills or CDs to the BdL at a zero percent rate for each purchase of FX securities and share the profits equally with the BdL. For instance, a bank discounting a security with face value of LL 100 with 8

percent coupon and remaining maturity of 10 years received upfront LL 140 (that is, LL 100 principal plus an immediate income of 40, equal to half of the LL 80 it would have ultimately received (over time) if the security had been held to maturity. Banks in turn adopted various approaches to attract foreign currency. They sold Eurobonds to foreign clients at prevailing rates and drew down their own FX liquidity. Banks' internal FX liquidity position has weakened. Lower FX liquidity has led to increased FX deposit rates, narrowing the spread between LL and FX deposit rates and reducing the attractiveness of LL deposits. Moreover, since the incentives offered by banks to depositors focused on giving them one-off upfront income (instead of higher interest rates), prospects for keeping the new inflows in the system remain uncertain. (IMF, 2016 Article IV Consultation-Press Release; Staff Report; and Statement by the Executive Director for Lebanon, 2017)

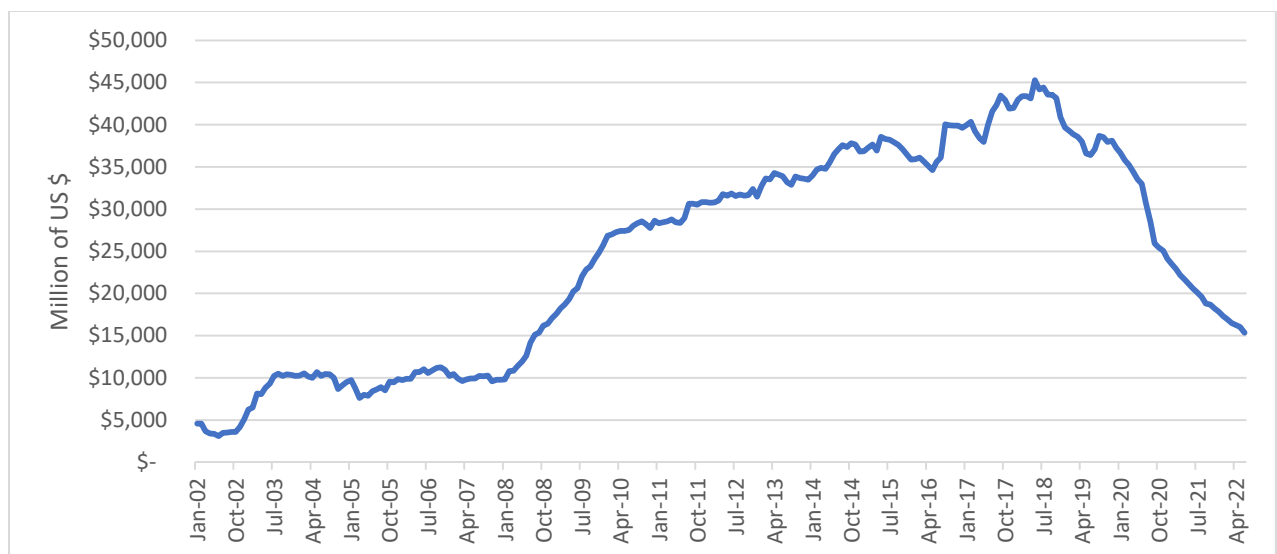


Figure 13: Banque Du Liban Foreign Reserves

Source : Banque du Liban, accessed on 03/09/2022, <https://www.bdl.gov.lb/webroot/statistics/>

Critics have called it the “Ponzi Scheme”. Banks took foreign deposits from Lebanese customers. The banks used these deposits to make their own deposits with

BDL. The BDL used these funds for government spending, such as imports and interest payments. (Rickards, 2020)

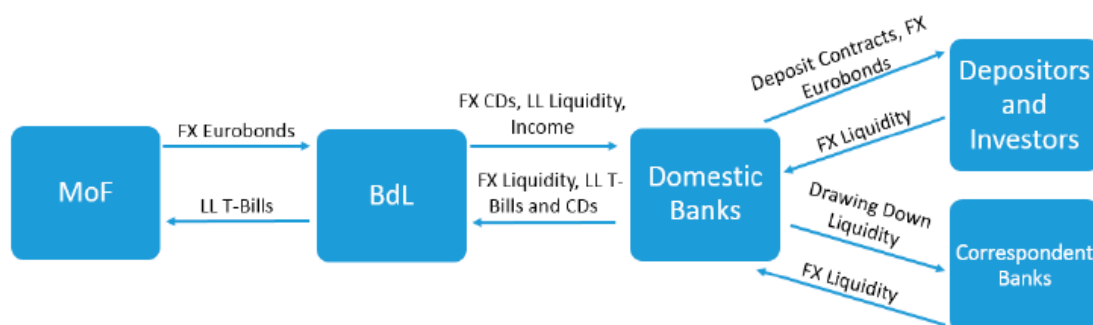


Figure 14: Banque du Liban Financial operation

Source: IMF 2016 ARTICLE IV CONSULTATION—PRESS RELEASE; STAFF REPORT; AND STATEMENT BY THE EXECUTIVE DIRECTOR FOR LEBANON,

Due to considerable capital withdrawals and a shortage of deposits, mostly from expatriates, this shortfall was made worse in 2019. The currency peg strategy has reached its breaking point as a result of this and the steadily growing trade imbalance, which is reducing foreign currency reserves. In 2019 deposits outflows amounted to \$12bn.

On the black market, the local currency, the Lebanese pound (LBP), has lost between 70 and 80 percent of its value relative to the US dollar (USD). For the first time ever, banks shut down for weeks during the revolt and implemented informal capital controls out of concern for a deposit run. People were unable to access their accounts, and businesses were unable to obtain financing to continue their imports and survive.

Lebanon had its first-ever debt default as a result of the historic crises described above. On March 9, 2020, Lebanon was required to repay a \$1.2 billion Eurobond. Additionally, \$700 million matured in April 2020 and another \$600 million did so in June 2020.

Overall, the country has missed payments totaling \$4.4 billion that were due in 2020. Even though depositors have accounts in US dollars (USD), the banking system has restricted the amount that may be withdrawn in that currency. Banks began limiting withdrawals to a few hundred dollars per month in October 2019, and since then, this limit has been progressively reduced. As of April 2020, acquiring USD through banks has become nearly impossible, and sending money overseas is also challenging. These limits, which are mostly enforced on small depositors, have been seen as a sort of de facto capital control by banks. Despite promises from the government to the contrary, many people now feel that their savings are in danger.

The current economic crisis, which has resulted in a de facto depreciation of the currency, exacerbates inequality. In reality, the USD was trading at an all-time high of over LBP 9,200 at the beginning of July 2020 and continues to be traded at over LBP 8,000 as of October 2020, proving that the official peg of \$1 equaling LBP 1,507 only exists on paper. This means the LBP has lost over 85% of its value in a matter of a few months. In addition, the consumer price index (CPI) has increased by 74%, meaning that the cost of items increased by 25% to 75% in March 2020 compared to March 2019. Due to Lebanon's reliance on imports to satisfy its needs, the depreciation of the LBP has had an impact on the importation of products and raw materials, resulting in shortages of necessities like fuel and a doubling to a tripling of market prices. (OXFAM, 2020). The following table and graph show how Lebanese central bank ends effectively fuels subsidy.

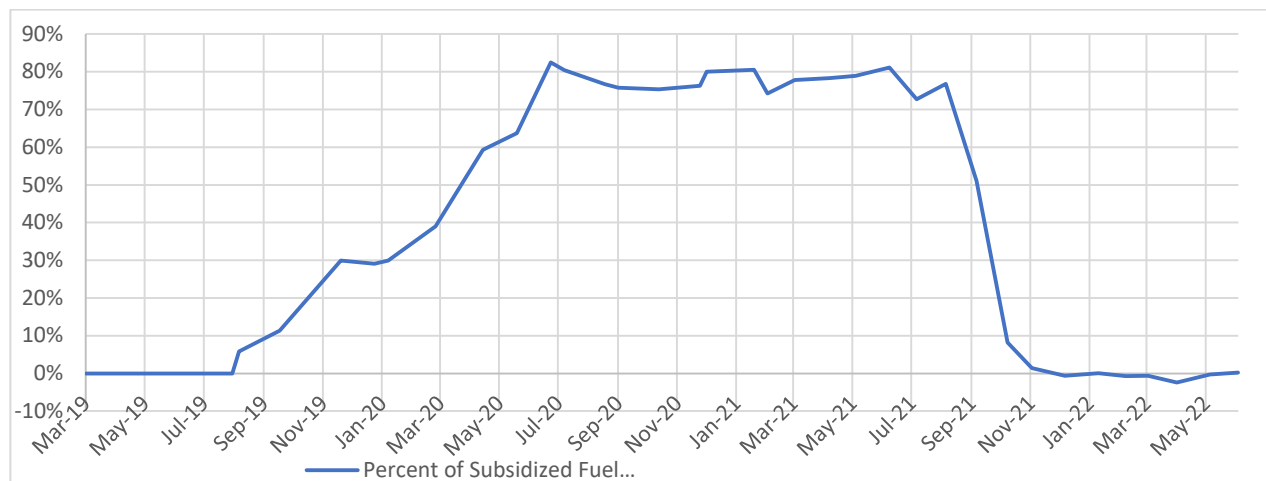


Figure 15: Percentage of subsidized fuel

Source: Ministry of Water and Energy, accessed on 9/09/2022, <https://energyandwater.gov.lb/ar/prices?type=1>

Table 10: Percent of subsidized fuel

Source: Ministry of Water and Energy, accessed on 9/09/2022, <https://energyandwater.gov.lb/ar/prices?type=1>

Date	Fuel 1000L in USD	Fuel 1000L including services in USD	Fuel in LBP	Total Cost of Fuel in LBP	Rate of conversion	Informal exchange rate	Cost of 20L Fuel in USD including fuel services	Cost of 20L Fuel in LBP	Purchase Cost of 20L in Lebanese Market	Subsidy for 20L Fuel	Subsidy percentage
Mar-19	\$565	\$610	LBP 852,000	LBP 920,000	LBP 1,507	LBP 1,507	\$12.21	LBP 18,400	\$12.21	\$0.00	0%
Apr-19	\$559	\$604	LBP 842,000	LBP 910,000	LBP 1,505	LBP 1,507	\$12.08	LBP 18,200	\$12.08	\$0.00	0%
May-19	\$585	\$630	LBP 882,000	LBP 950,000	LBP 1,507	LBP 1,507	\$12.61	LBP 19,000	\$12.61	\$0.00	0%
Jun-19	\$579	\$624	LBP 872,000	LBP 940,000	LBP 1,507	LBP 1,507	\$12.48	LBP 18,800	\$12.48	\$0.00	0%
Jul-19	\$539	\$584	LBP 812,000	LBP 880,000	LBP 1,507	LBP 1,507	\$11.68	LBP 17,600	\$11.68	\$0.00	0%
Aug-19	\$542	\$587	LBP 817,000	LBP 885,000	LBP 1,507	LBP 1,600	\$11.75	LBP 17,700	\$11.06	\$0.68	6%
Sep-19	\$529	\$574	LBP 797,000	LBP 865,000	LBP 1,507	LBP 1,700	\$11.48	LBP 17,300	\$10.18	\$1.30	11%
Nov-19	\$539	\$584	LBP 812,000	LBP 880,000	LBP 1,507	LBP 2,150	\$11.68	LBP 17,600	\$8.19	\$3.49	30%
Dec-19	\$539	\$584	LBP 812,000	LBP 880,000	LBP 1,507	LBP 2,125	\$11.68	LBP 17,600	\$8.28	\$3.40	29%
Jan-20	\$552	\$597	LBP 832,000	LBP 900,000	LBP 1,507	LBP 2,150	\$11.94	LBP 18,000	\$8.37	\$3.57	30%
Feb-20	\$469	\$514	LBP 707,000	LBP 775,000	LBP 1,507	LBP 2,470	\$10.29	LBP 15,500	\$6.28	\$4.01	39%
Apr-20	\$273	\$342	LBP 412,000	LBP 515,000	LBP 1,507	LBP 3,700	\$6.83	LBP 10,300	\$2.78	\$4.05	59%
May-20	\$210	\$289	LBP 317,000	LBP 435,000	LBP 1,507	LBP 4,150	\$5.77	LBP 8,700	\$2.10	\$3.68	64%
Jun-20	\$370	\$415	LBP 557,000	LBP 625,000	LBP 1,507	LBP 8,600	\$8.29	LBP 12,500	\$1.45	\$6.84	82%
Jul-20	\$333	\$531	LBP 502,000	LBP 800,000	LBP 1,507	LBP 7,700	\$10.62	LBP 16,000	\$2.08	\$8.54	80%
Aug-20	\$326	\$483	LBP 539,500	LBP 800,000	LBP 1,655	LBP 7,100	\$9.67	LBP 16,000	\$2.25	\$7.41	77%
Sep-20	\$305	\$464	LBP 533,000	LBP 810,000	LBP 1,748	LBP 7,200	\$9.27	LBP 16,200	\$2.25	\$7.02	76%
Oct-20	\$289	\$459	LBP 488,000	LBP 775,000	LBP 1,689	LBP 6,852	\$9.18	LBP 15,500	\$2.26	\$6.92	75%
Nov-20	\$302	\$467	LBP 498,000	LBP 770,000	LBP 1,649	LBP 6,950	\$9.34	LBP 15,400	\$2.22	\$7.12	76%

Dec-20	\$311	\$482	LBP 523,000	LBP 810,000	LBP 1,682	LBP 8,400	\$9.63	LBP 16,200	\$1.93	\$7.70	80%
Jan-21	\$367	\$576	LBP 628,000	LBP 985,000	LBP 1,711	LBP 8,800	\$11.51	LBP 19,700	\$2.24	\$9.27	81%
Feb-21	\$417	\$445	LBP 643,000	LBP 1,010,000	LBP 1,541	LBP 8,800	\$8.90	LBP 20,200	\$2.30	\$6.60	74%
Mar-21	\$466	\$494	LBP 718,000	LBP 1,085,000	LBP 1,540	LBP 9,900	\$9.88	LBP 21,700	\$2.19	\$7.69	78%
Apr-21	\$478	\$506	LBP 740,000	LBP 1,304,500	LBP 1,547	LBP 11,900	\$10.12	LBP 26,090	\$2.19	\$7.93	78%
May-21	\$478	\$506	LBP 743,000	LBP 1,335,000	LBP 1,554	LBP 12,500	\$10.11	LBP 26,700	\$2.14	\$7.98	79%
Jun-21	\$516	\$568	LBP 800,500	LBP 1,500,000	LBP 1,551	LBP 14,000	\$11.36	LBP 30,000	\$2.14	\$9.22	81%
Jul-21	\$550	\$579	LBP 2,638,000	LBP 2,775,000	LBP 4,796	LBP 17,600	\$11.57	LBP 55,500	\$3.15	\$8.42	73%
Aug-21	\$553	\$588	LBP 2,683,000	LBP 2,855,000	LBP 4,852	LBP 20,900	\$11.77	LBP 57,100	\$2.73	\$9.04	77%
Sep-21	\$540	\$560	LBP 4,758,000	LBP 4,930,000	LBP 8,811	LBP 18,000	\$11.19	LBP 98,600	\$5.48	\$5.71	51%
Oct-21	\$593	\$593	LBP 10,153,000	LBP 10,395,000	LBP 17,121	LBP 19,100	\$11.86	LBP 207,900	\$10.88	\$0.98	8%
Nov-21	\$673	\$689	LBP 13,803,000	LBP 14,125,000	LBP 20,510	LBP 20,800	\$13.77	LBP 282,500	\$13.58	\$0.19	1%
Dec-21	\$626	\$646	LBP 14,548,000	LBP 15,010,000	LBP 23,240	LBP 23,100	\$12.92	LBP 300,200	\$13.00	-\$0.08	-1%
Jan-22	\$615	\$639	LBP 18,930,000	LBP 19,655,000	LBP 30,780	LBP 30,800	\$12.77	LBP 393,100	\$12.76	\$0.01	0%
Feb-22	\$741	\$789	LBP 15,815,000	LBP 16,840,000	LBP 21,343	LBP 21,200	\$15.78	LBP 336,800	\$15.89	-\$0.11	-1%
Mar-22	\$854	\$905	LBP 17,700,000	LBP 18,750,000	LBP 20,726	LBP 20,600	\$18.09	LBP 375,000	\$18.20	-\$0.11	-1%
Apr-22	\$1,026	\$1,069	LBP 25,000,000	LBP 26,050,000	LBP 24,366	LBP 23,800	\$21.38	LBP 521,000	\$21.89	-\$0.51	-2%
May-22	\$1,057	\$1,096	LBP 28,400,000	LBP 29,450,000	LBP 26,868	LBP 26,800	\$21.92	LBP 589,000	\$21.98	-\$0.06	0%
Jun-22	\$1,071	\$1,108	LBP 29,925,000	LBP 30,950,000	LBP 27,941	LBP 28,000	\$22.15	LBP 619,000	\$22.11	\$0.05	0%

More than five currency rates had been used up until the third quarter of 2021 from the start of the current financial crisis in Lebanon in 2019-2020. Table 2 shows a few of the many exchange rates that the BDL, the monetary authority, has established through circulars:

- USD/LBP 1507.5 Official-BDL Exchange: Except for the Lebanese Government, which still converts dollars at this rate for official transactions and payments, this rate is nominally still in effect but is no longer used in the market. Economic agents' debt owed in foreign currencies is also repaid at the rate. At that rate some products and commodities were subsidized for about two years up to different calendar dates in 2021. (Fuel for EDL, gas, other fuel, diesel, medications/supplies, and wheat)
- USD/LBP Market Exchange Office fluctuating around 28,000 in December 2021: The rate of the black market, informal market, or even "illegal market" are other names for the Market/Exchange office rate. The attempts of the Lebanese authorities to prosecute currency exchangers who were using the informal rate, as well as to shut down websites and mobile applications that give information on the parallel market rate, all to no effect, have repeatedly shown the factual usage of the parallel market rate.
- USD/LBP 3900: Rate of USD Deposit Cash Withdrawals: BDL published Circular No. 151 in April 2020, requiring banks to convert dollar deposits at LBP to 3900 LBP upon depositor request over the next twelve months. Firms, colleges, and other institutions continue to utilize this rate the most in Lebanon. Additionally, until mid-2021, the basket of commodities and necessities were subsidized at this rate. It has been decided to delay the decision until the end of 2021.
- USD/LBP Sayrafa: The Lebanese pound's exchange rate to the US dollar was fixed at 12,000 LBP/USD by BDL in 2021. This rate then increased to 25,800 on August , 2022, on the "Sayrafa" currency platform. Businesses (including exporters and manufacturers) can formally buy dollars via the Sayrafa platform. The dollar rate in the market/exchange offices at the time of its inception was over 15,000LBP in 2021 and 30,000 in August 2022, which was then a record high. Medical equipment, pharmaceuticals, and certain other essential requirements' importation expenses were initially covered by the platform. Subsidies for all items but gasoline have been eliminated around the third quarter of 2021.
- USD/LBP 8000: According to BDL Circular N.601, which was published in December 2021, banks must convert dollar deposits held in USD to LBP 8,000 at the request of depositors. This circular is a continuity of circular 151 that has been revised. (Icharkieh, 2022)

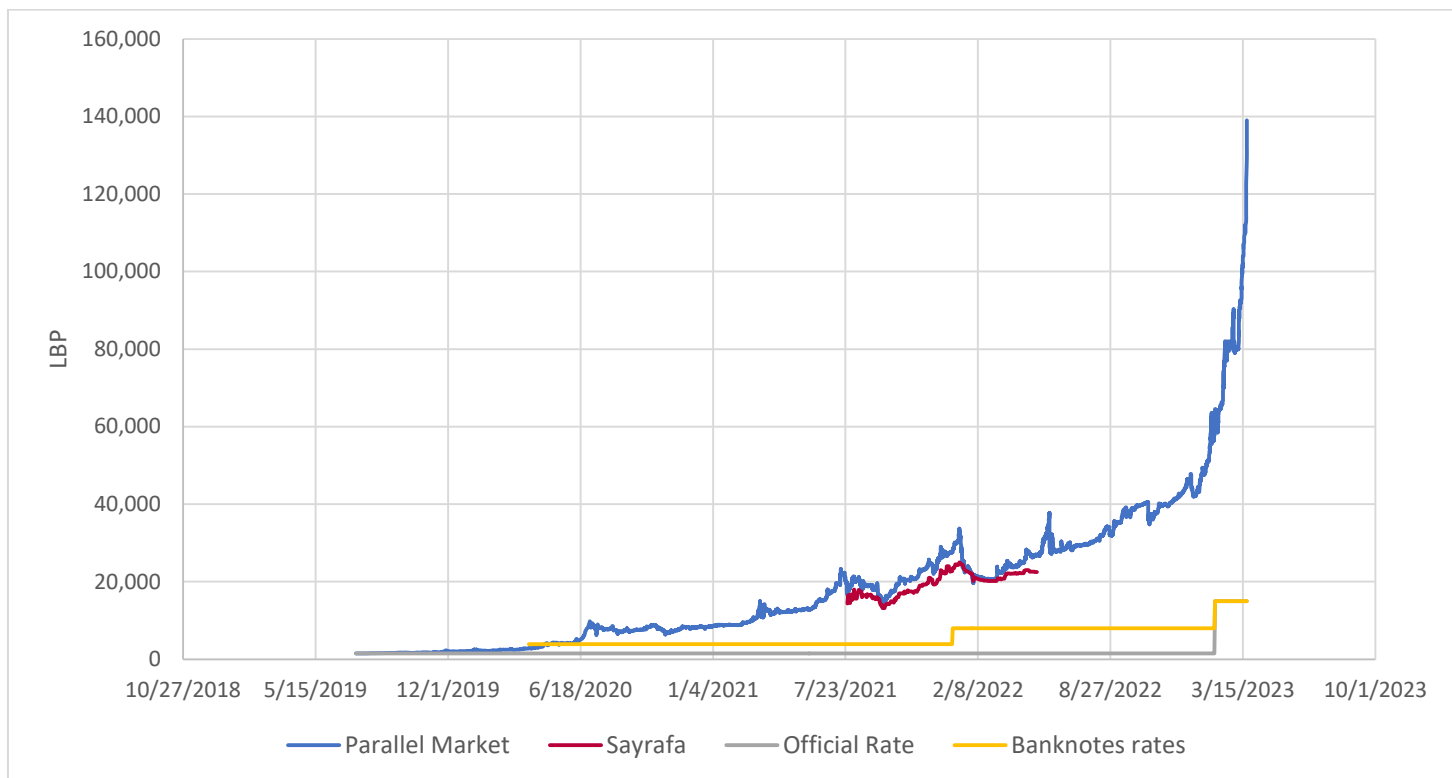


Figure 16: Currency exchange rates in Lebanon

5.3 Construction Project Status in Lebanon

5.3.1 Property Sector Market

The status of real estate has changed drastically since the onset of the economic crisis in 2019. In 2019, the market for residential construction effectively ended. Dozens of residential construction projects have also come to a complete halt. Developers were working to finish their apartment building projects so that they could sell them before 2019.

Due to the crisis, contractors immediately fell behind on the projects they had begun before 2019, some of whom halted entirely due to the increased cost of construction supplies.

To complete their project, developers had purchased construction supplies using banker checks (written in either Lebanese lira or "lollars," or deposits stuck in Lebanese banks and only withdrawable at a rate lower than that of the parallel market). However, their supplier gave up on them by returning their check and selling their supplies to a different customer who could pay with actual money (called fresh dollars).

Many of the developers thought about stopping the work, but they ultimately decided to finish it to maintain their positive market reputation. Since the market became dollarized, some buyers have been understanding and have consented to pay a portion of their payments in new dollars. In every instance, this effort ended with a lost revenue. Developers were facing clients who exchanges their fresh dollars to Lollar and pays him. The developers were not protected from this hassle by any laws.

Developers preferred not to start any new initiatives in this line. Their strategy is being impacted by price rises, delivery delays, shortages, and shifting profit margins related to the dollar exchange rate, the issue of materials supply, suspension of banks funding initiatives. Developers had to use their own funds due to insufficient investment, and the demand for projects is low. Potential clients lack confidence in the timely completion of projects, which leads to a preference for purchasing completed apartments instead. (Boudisseau, 2022)

5.3.1.1 Market Demand

The demand for real estate in Lebanon decreased in 2022 as a result of developers paying off the majority of their bank obligations, the phase-out of check payments, and the market's conversion to a completely dollarized, cash-only, new dollar market. The value of real estate sales transactions, which peaked in 2020, increased by 8% in 2021 before declining 18% annually during the first seven months of 2022. Concurrently, after increasing by 34% in 2021, the number of sales operations decreased by 15% year over year during the first seven months of 2022.

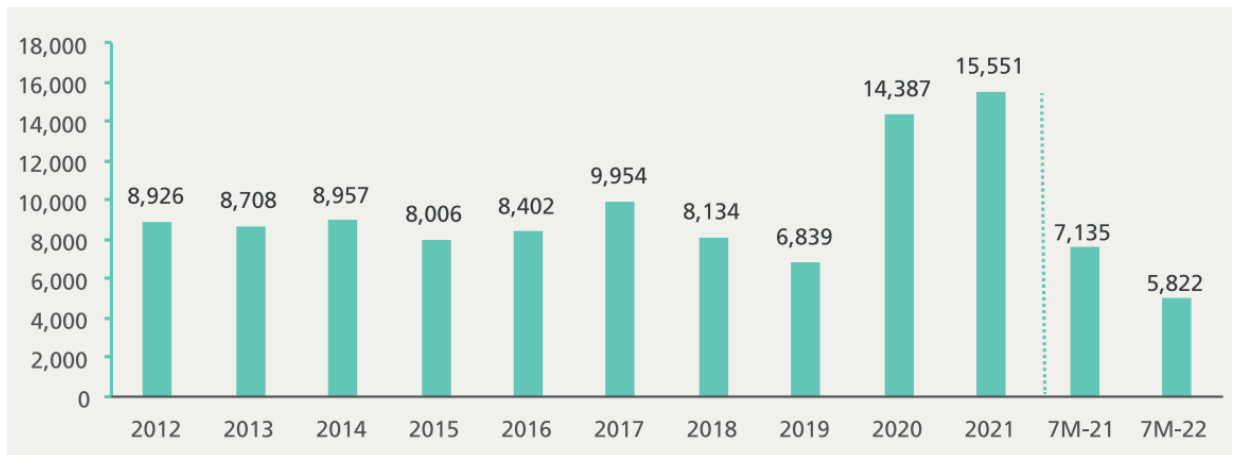


Figure 17: Property sales transactions value (US\$ Million)

Source: Order of Engineers of Beirut and Tripoli, BDL, Bank Audi's Group Research Department, <https://pwstg02.blob.core.windows.net/pwfiles/ContentFiles/13502File.pdf>

5.3.1.2 Market Supply

Construction of new residential buildings has come to a halt since the onset of the crisis, with several ongoing projects being suspended simultaneously. Only a handful of developers who have already sold all their apartments before 2019 are making an effort to complete their projects. Disruptions have been caused by restrictions on the banking industry, the devaluation of the Lebanese pound, and changes to payment methods.

However, compared to the first quarter of 2021, cement deliveries, a rudimentary measure of current construction activity, increased by 56%. This shows that there is some development-level work being done. Many building sites take their time finishing projects, mostly to reassure those who purchased off-plan. (Barakat, 2022)

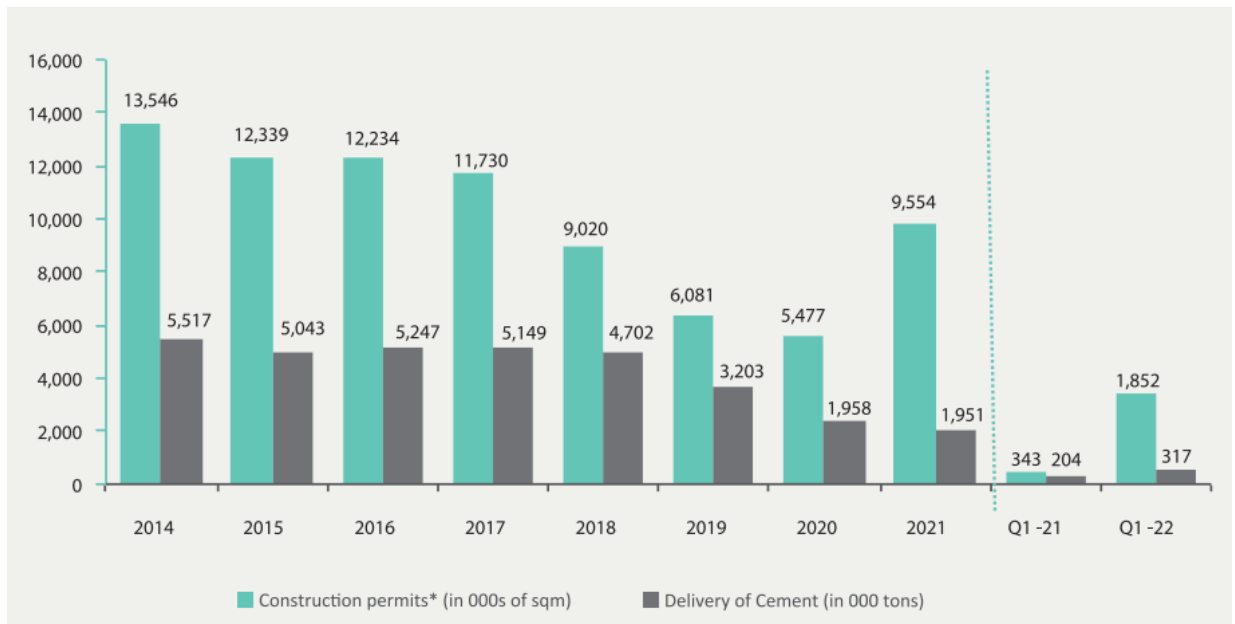


Figure 18: Construction permits and cement deliveries

Source: Order of Engineers of Beirut and Tripoli, BDL, Bank Audi's Group Research Department,
<https://pwstg02.blob.core.windows.net/pwfiles/ContentFiles/13502File.pdf>

5.4 Public Projects

Contractors have reduced the pace of work or stopped construction entirely on public projects that started before October 2019 due to the escalation of the crisis. As a result, the majority of these projects remain uncompleted contracts. The financial balance of these contracts has been lost, as the amount received by the contractors for their work is only a small fraction of the actual cost incurred. The financial imbalance is caused by the fact that the contractor is being paid a fraction of the actual cost they incurred for the work they completed. Whether the contract currency is in LBP or USD, the actual value of what is being paid to the contractor is not enough compared to the cost incurred. Contracts signed in USD are paid in LBP using an unrealistic exchange rate of 1,507 LBP. The issue of financial imbalance due to the discrepancy between actual payments and costs is not exclusive to contracts managed by the Council for Development and Reconstruction (CDR). It also affects contracts under the

management of public administrations, public institutions, municipalities, and unions of municipalities.

The implementation of the projects covered by these contracts necessitates the adjustment of their prices to restore their financial balance. It is also necessary to secure necessary credits for completion since these projects have not yet come into operation. If these projects are left in their current state, ending them will not have any effect on the service pertaining to the concerned sector.

The termination of ongoing projects funded in local currency has become necessary due to difficulties in securing the necessary funds to complete them. This is further compounded by the fact that the 2022 budget did not allocate funds for public investments. However, it should be noted that the termination of these contracts will not immediately affect the services related to the concerned sector. Hence, these contracts are obligated to complete the projects again when the necessary funds become available in the future.

The proposal for termination should not include contracts that, if terminated in their current state, may cause repercussions on public safety. These contracts must complete necessary work to ensure public safety requirements. Before termination, the issue of recovering advances given according to the contracts, which have not been fully or partially recovered, should be addressed.

Due to the collapse of the Lebanese Lira exchange rate, in cases where a contract is terminated and there are still un-recovered advances given according to the contract, the amount recovered will be less than the actual value of the same amount at the time the advance was given.

For the projects that could potentially have impact on public safety if terminated in their current state, it is necessary to complete the work that ensures the safety requirements before ending the contract. Most of the operation and maintenance contracts continued to work, despite their financial imbalance. Stopping work on these contracts would have had negative repercussions on the facilities and public services they provide. This is in contrast to construction contracts that were largely stopped due to financial difficulties. With regard to the Council for Development and Reconstruction, this is related to very important contracts entrusted to the Council by the Council of Ministers:

- Operation and maintenance contracts for Rafik el Hariri International Airport
- Operation and maintenance contract for the University City in Hadath
- Operation and maintenance contract of the University City in Tripoli
- Operation and maintenance of the central building of the ministry of Education and Higher Education
- Operation and maintenance of refinery pumping stations for sewage
- Solid waste management contracts (collection, sweeping, sorting, and treatment, sanitary landfill)

While companies under O&M contracts have persisted in fulfilling their obligations, even in the face of financial imbalances, it is necessary to address the issue of unfairness by adjusting the contract prices not only for the future but also retroactively from April 2020. A suggested method for adjusting these prices is outlined below:

$$P_o = A+B+C+D$$

A= The value of the non-adjustable portion

B= Fee for the that represents the transportation allowance

C= The value of the part that represents salaries and wages

D= The value of the portion representing spending in dollars

Thus we get the following ratios:

$$a=A/P_o, b=B/P_o, c=C/P_o, d=D/P_o$$

1- Apply the following equation (E) to adjust prices:

$$P=P_o[a+ b(T/T_o)+ c(W/W_o)+ d(D/D_o)]$$

P_o =Core value of the works

P =Adjusted value of Works

T_o =Basic value of transportation allowance

T =Adjusted value of transportation allowance

W_o =Basic of minimum wage

W =Adjusted value of minimum wage (0)

D_o =The official exchange rate for the dollar

D =The exchange rate of the dollar in the parallel market

The transportation allowance amendment is applied in two stages according to the two amendment decrees (it became 24,000LBP instead of 8,000 LBP and then 65,000 LBP)/

No decree was issued to amend the minimum wage. However, the reality is that wages in the private sector have practically been modified with the adjustment of the exchange rate of the Lebanese pound. In order to take into account this amendment, an equation was developed to simulate the change in the minimum wage with a change in the LBP exchange rate against dollars:

$$W = \alpha.D + \beta$$

W= Minimum Wage (variable)

D =Dollar exchange rate (variable)

In order to get the value of both A and B, CDR considered that the value of the minimum wage was 2,250,000 LBP when the dollar exchange rate was 22,000 LBP, while the value of the minimum wage was 675,000LBP when the dollar exchange rate was 1,507 LBP. Thus we get the following equations:

$$W= 76.83xD + 560,000$$

For operating contracts where the contractors receive their dues in bank dollars (lollar), the same equation applies, taking into account the value of the dues compared to their value if they were charged in LBP based on the official exchange rate to the dollar. It should be noted that the same equation (E) can be applied to contracts for consulting offices that supervise the implementation.

The financial imbalance discussed earlier in relation to contracts financed by local sources does not imply that contracts funded partially or entirely from external sources are exempt from challenges that hinder their successful completion, even though the extent of these challenges may be relatively smaller. The financial imbalance in locally financed contracts mentioned earlier should not imply that contracts partially or wholly financed by external sources do not face impediments in their completion, albeit to a lesser extent. In contracts with a high proportion of domestic financing, the imbalance is exacerbated because the locally funded part is paid in Lebanese pounds based on the official exchange rate, while the externally funded section is paid in fresh dollars. Even in contracts fully financed from external sources, the surge in international prices of some materials, particularly oil derivatives, as well as the cost of materials, shipping, and other factors, has affected the financial balance of the contracts,

particularly after the shock caused by the war in Ukraine in global markets. The price adjustment clauses included in most of these contracts do not accurately reflect the actual fluctuations in prices.

Although construction work stopped in October 2019, there is still an issue regarding payments to contractors and consultants who completed work and provided services before the financial crisis. These payments are either currently being received or have been received recently, and they are in Lebanese Lira . The majority of these contractors and consultants are requesting payment for their overdue services based on their current value at the time of the work. However, some are asking for payment in the currency specified in the contract, particularly for contracts that were signed in foreign currency but funded locally.

Contractors who are involved in operation and maintenance are currently experiencing difficulties in obtaining the necessary funds to pay their employees. The issue is not related to outstanding payments but rather due to restrictions imposed by the banking sector on providing liquidity to customers. Consequently, some of these companies are being forced to sell their outstanding payments in the parallel market, even if it results in a significant financial loss. Unfortunately, the CDR has not yet addressed this growing issue.

Certain contractors, particularly those in the operation and maintenance sector, are struggling to obtain the necessary funds to pay their employees due to a lack of liquidity. The CDR has stated that this issue is not connected to overdue payments, but rather due to banking sector limitations on providing liquidity to customers. Consequently, some contractors are forced to sell their outstanding payments in the

parallel market at a financial loss. Regrettably, the CDR has not yet taken steps to address this problem.

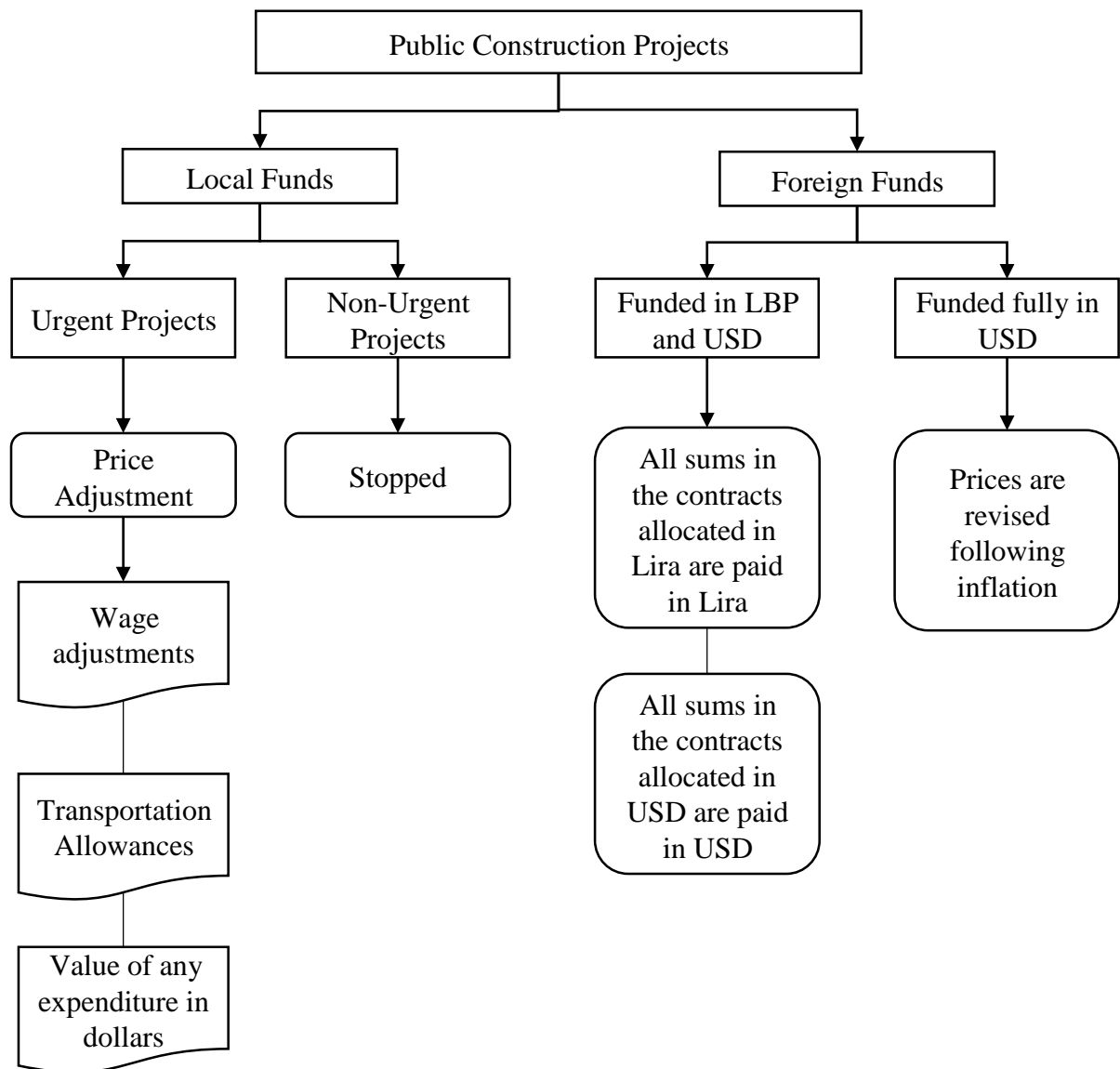


Figure 19: An Overview of Public Construction Projects: Progress Status and Price Adjustments for Various Types, <https://www.cdr.gov.lb/>

CHAPTER 6

METHODOLOGY

This chapter outlines the methodology used in this research study. It explains the selection of research method, the implementation of the selected research method, the data analysis of the qualitative and quantitative method.

The research starts with the literature review. The focus of this stage is to provide a comprehensive review of existent literature related to the research. The literature review includes various sources such as books, journals, conference proceedings and others. In addition, it includes a review on project management in general, with an emphasis on the project administration, financial and commercial management of contract administration, and project financing specifically in relation to the different forms of bank guarantees and collateral. It also comprises an analysis of two case studies, one for Nigeria and one for Malaysia, which examine the impact of their financial crises on both contracting companies and projects in each country. These case studies offer insights into how contracting firms in both nations were affected by similar financial crises. Accordingly, based on the literature review, the key terms serving as the basis for our analysis of the pilot study for the case of Lebanon were identified to tailor each of the questions addressed in the Pilot Study for the interviewees

In Chapter 4, our study delves into the response strategies employed by construction companies in both the United Kingdom and Singapore during financial crises. These response strategies are analyzed and classified based on Porter's strategy framework from 1980.

Chapter 5 of our study focuses on providing a comprehensive framework for understanding the financial crisis in Lebanon, specifically as it relates to the construction sector. The research analyzes the complex forces that led to Lebanon's financial crisis. It emphasizes a thorough and comprehensive approach to understanding the underlying causes of the financial crisis in Lebanon.

Our research approach employs a semi-structured interview method to collect qualitative data from local contracting firms. This data will be used to examine the effects of the financial and economic crises on the construction industry. By conducting a pilot research study, the study gains a deeper understanding of the challenges faced by these businesses and construction projects, and validate the findings based on the key terms identified in the literature review. The semi-structured interview method allows for flexibility and allows participants to elaborate on their experiences and perspectives, providing rich and detailed insights into the impact of the crises on the construction sector in Lebanon. Overall, this approach enables us to gain a more comprehensive understanding of the complex factors at play in the Lebanese construction industry during times of economic and financial crises.

Building on the insights gained from the pilot study, our research will utilize both the set of delay factors and mitigation measures identified in the pilot study to develop a questionnaire. This questionnaire will also help us understand the relative level of criticality/importance of each of delay factor in project performance and the rate of effectiveness of the mitigations strategies. This questionnaire will help to classify the response strategies according to Porter's strategies. Through this approach, we will explore the most common generic strategy employed by construction companies in Lebanon during times of financial and economic crises. Following the questionnaires

results, we aim to gain a deeper understanding of the most influential cause of delay in Lebanon and identify effective response strategies to mitigate the impact of these challenges.

6.1 Pilot Study Interview

The pilot study consisted of conducting interviews with two key informants, the Managing Partner and the Construction Manager of two different local construction firms. The interview questions focused on investigating the economic factors that have affected the conventional way of managing construction projects, the effects of the financial crisis on the construction industry at both the project and company level, and the survival strategies employed by local construction contracting companies during the recession period.

Each interview lasted for around 90 minutes and was tape-recorded for accurate transcription and analysis. The interviewees were contacted via phone and the interview was scheduled at a time and location convenient for them. The Managing Partner and Construction Manager of the two construction firms are represented by C.1 and C.2, respectively. The detailed information of the interviewees for this study is tabulated in Table 11.

Table 11: Key Profile of Interviewees

Interviewee	Position	Years of Experience
C.1	Managing Partner	23 years
C.2	Construction Manager	15 years

To ensure confidentiality, the names of the interviewees were not registered in our research. However, it was necessary to gather demographic information about them for the purpose of our study.

6.2 Questionnaire Survey

The purpose of the questionnaire to rank from other contractors' point of view the factors that contribute to delay of construction and the mitigation measures subsequently assesses the relative importance of the delay causes and the effectiveness of the mitigation measures. The questionnaire aims to identify and rank these factors and measures, allowing us to assess their relative importance and effectiveness in the eyes of industry professionals. This survey questionnaire was distributed to a random sample of Contractors working on local construction projects. 13 companies were outreached using either a phone call or LinkedIn with a brief research description introduction. A "Google Form" version was sent to the participant after receiving their consent of participation. The total number of received responses is 8.

Figure 20 shows the demographic information of the participants. The population of the study comprised of Project Directors, CEO, Managing Director, Construction Manager, Project Manager, Chairman, and Project Managers of local construction companies. These people were selected based on the depth of knowledge they have and their position. The years of experience of respondents centered with 5 to 15 years.

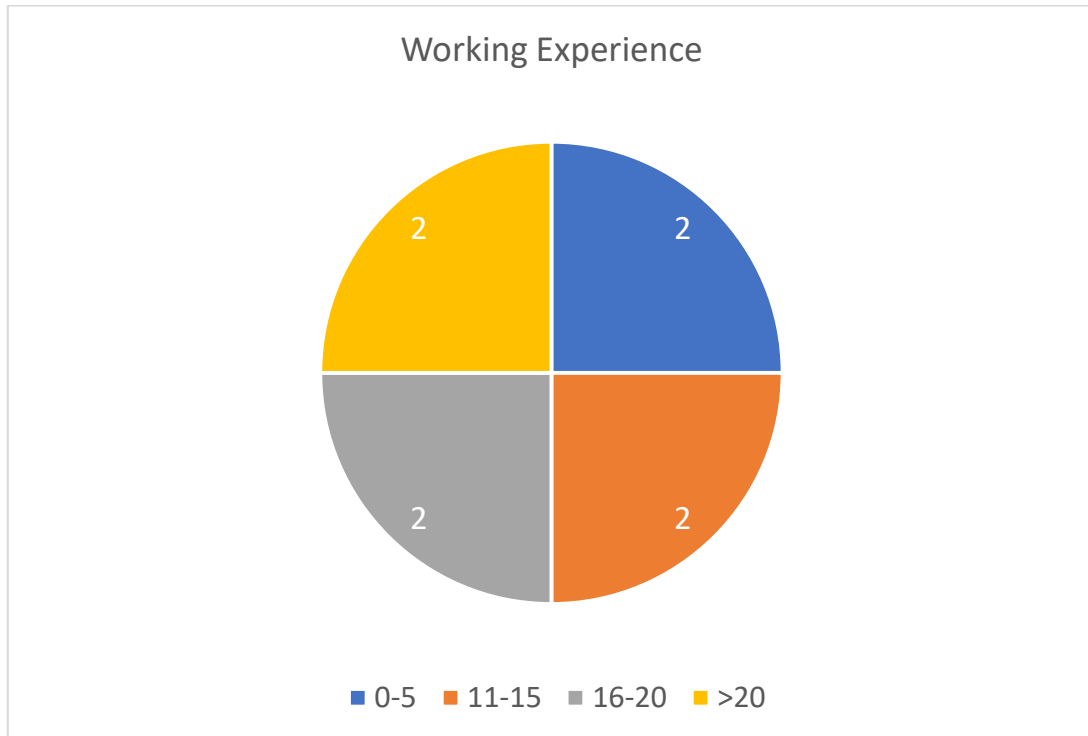


Figure 20: Participants work experience

Responses to the questionnaire were then collected and analyzed. The analysis included ranking the different causes according to the relative importance indexes.

The interview analysis will be broadly reviewed to identify the causes of delay in construction projects. This extensive review and analysis will led to the identification of 15 causes of project delays. The list of delay causes identified in

Table 15 was structured into a questionnaire. Then, the causes of delay were organized on a five-point Likert Scale, where; 1= strongly disagree, 2= disagree, 3= neutral, 4= agree and 5= strongly disagree.

The causes will all be examined and the ranking of their attributes is done using the Relative Importance Index (RII). This helped to determine the proportionate

contribution of each predictor in the formula and its incremental contribution when combined with other predictors. (Johnson & LeBreton, 2004)

The relative importance index formula was used to calculate the (RII) of the causes:

The relative importance index is given as follows: (Likert R.1993)

$$\text{Relative Importance Index: (RII)} = \frac{\sum_{i=1}^5 A_i X_i}{5 \sum X_i}$$

A_i = Constant expressing the weight given to i , x_i = variable expressing the frequency of the response for $i = 1, 2, 3, 4, 5$

The questionnaire internal consistency was tested by computing the “Coefficient of Variance” (CV) of the data returned. The coefficient of variation (CV) of the data points in a data set represents the ratio of standard deviation to the mean. It is a valuable statistic tool for comparing the degree of variation among data sets, regardless of the nature of the sets (Abdi & Williams, 2010) and can be calculated using the following Equation:

$$CV = \frac{S}{M}$$

S is the standards deviation of a data set; M is the data set’s mean.

The lesser the value of CV, the more agreement among the responses.

According to (Likert R.1993), RII is an effective tool in measuring the factors importance of the factors’ occurrence.

According to (Abdi & Williams, 2010), the mean value is interpreted as follow; the respondents agree with the statement if it is greater than three and disagree if less than that. The mean for all items is greater than three, which means that respondent’s point of view is consistent.

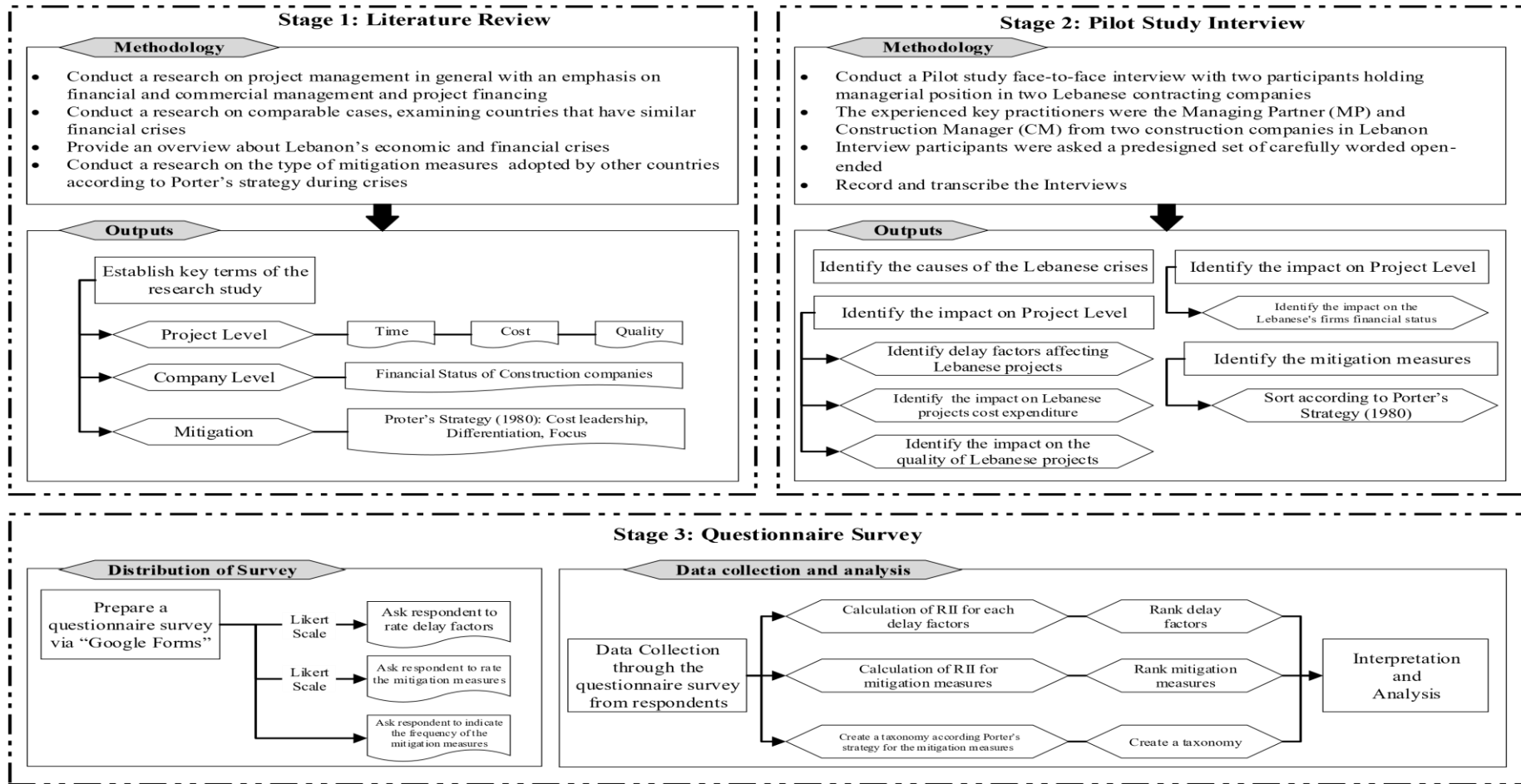


Figure 21: Research methodology

CHAPTER 7

ANALYSIS AND RESULTS OF THE INTERVIEW PILOT STUDY

7.1 Key Findings of the Study

Through the pilot study, qualitative analysis was performed to answer the following research questions:

1. What are the economic forces of the financial crises that have restricted the conventional way of administrating the construction projects?
2. What are the impacts of the financial and economic crises on both construction projects and contracting firms?
3. What are the mitigation measures that could be taken in managing the impacts of the financial and economic crises?

Several emerging themes based on recurring themes or phrases were concluded from the pilot study and are presented in Table 12 based on the analysis. Detailed explanations of the findings coupled with the themes will follow. The findings from the interviews were considered for the development of the questionnaire survey.

Table 12: Research questions and key themes

Research Questions	Key Themes
What are the economic forces of the financial crises that have restricted the conventional way of administrating the construction projects?	<u>Financial Crises:</u> <ul style="list-style-type: none">- Banking Sector- Currency- Fuel- Procurement

What are the impacts of the financial and economic crises on construction projects?	<u>Project Level</u> - Cost - Time - Quality <u>Company Level</u> - Financial Status
What are the mitigation measures that could be taken in managing the impacts of the financial and economic crises?	<u>Porter's Generic Strategy</u> - Cost Leadership - Differentiation - Focus

The interview questions were designed so that the interviewees could share information, such as:

- The challenges faced during construction project implementation amid the financial and economic crises
- The impact of the financial crisis's on Lebanese construction projects and contracting firms.
- The measures adopted to reduce the effects of the financial crises

A text search was adopted using Nvivo software to identify recurring words in the interview. Words used most frequently in this study can be seen in Figure 22. Based on the analysis performed, the key findings for Research Question 1 of the study are as follows:



Figure 22: Nvivo word cloud

7.2 Economic Forces Affecting Construction Administration

- 1- *What are the economic forces of the financial crises that have restricted the conventional way of administration construction projects*

7.2.1 Banking Sector

Lebanese Contractors rely heavily on banking sector for project financing, managing payment certificate, receivables, bid bonds, guarantees, funds, and employee's payment settlement. The hit in the banking sector altered the conventional way of administrating construction project.

Among the extracts from interviewees are the following comments:

“Our project financing and management resources were suddenly at risk overnight, resulting in a complete halt. When starting a new project that typically costs \$40 million, we rely on various resources such as engineers, laborers, fuel, materials, equipment, and most importantly, funds, which were no longer accessible. In such

cases, we usually turn to the banking industry to secure project finance resources, as we do not possess such significant funds ourselves. But now we no longer have the option of resorting to banks” (C.1)

The interviewee continued and differentiated two phases:

“In Phase 1 of the crisis, all types of financing tools, including bonds, overdrafts, loans, and Letter of credits, were suspended by banks. During Phase 2, which is around six months after the crisis, financially stable banks could only offer checks that could not be liquidated or Bank USD in checks as the best-case scenario, with no availability of cash in LBP or Dollar. Each bank's situation varied, leading to strict project-based requirements for acquiring financing, such as foreign clients or sufficient financial status. Additionally, we needed to secure dollar cash collateral to access financing in cash dollar, such as bid bonds, guarantees, overdrafts, and loans.”(C.1)

“We usually secure our funds/money in foreign bank accounts. Given the circumstances, we have been relying on these foreign accounts for project financing to ensure financial stability amidst the economic crisis,, as our local accounts are only utilized for transactional operations such as account payables and receivables within and outside the country” (C.2)

7.2.1.1 Difficulty in Project Financing

- **Overdraft accounts:**

“The funds that the company had in its overdraft account were immobilized in the bank and subjected to depreciation to Bank USD in the case of a dollar account or Lira depreciation against the dollar for a Lira account. Withdrawals of Bank USD are done in LBP based on the bank's credit rate and no longer provide an accurate

representation of the LBP's value against the dollar in the black market. In comparison to the significantly higher black market rate, Bank USD were valued at 3,900 LBP and, a few months later, had risen to 8,000 LBP/USD". (C.1)

"Prior to the financial crisis, overdraft accounts from various local banks were a common financing method for our projects. However, due to the crisis, this option was no longer available. The portion of our funds in overdraft accounts was immobilized in the banks, and we were unable to withdraw them at our discretion. While we were able to withdraw Lira from our accounts, the daily weakening of the currency made it clear that Lira accounts were no longer a suitable financing option. Furthermore, USD banknotes were also subject to depreciation under the regulations outlined in BDL circulars (C.2)

- **Cash Reserves in local bank accounts:**

"Our funds in saving accounts were blocked, and we were unable to utilize them to maintain a healthy cash flow. Furthermore, the USD reserves in banks had depleted to a level where they no longer provided an accurate representation of the actual value of the currency in the market." (C.1)

"The company is securing all the money in foreign bank accounts. However, we still encountered challenges because our local accounts were primarily utilized for operational activities such as paying our employees and receiving payments from both domestic and international clients. While we did not undergo the same level of difficulties as others, we were still impacted by the crisis.. " (C.2)

- **Payment Receivables**

"The funds previously received as Advance Payment for ongoing projects, which were initially available for purchasing steel, fuel, and other materials, have been converted

into blocked funds as they now have their own amount in banks. Despite the client having already made the project-allocated advance payment, we are facing significant challenges with ongoing projects that have reached their middle life cycle. This is due to the disparity between the depreciated worth of the funds we have received from the client and the limited access we have to the blocked funds.” (C.1)

“Our banks served as a means to manage the receivables and payment process, including the collection of funds through paper and electronic means, invoicing, and payment settlements. We were not only working on projects funded in the local currency but also on local projects funded by foreign organizations with contracts in dollars. The issue we faced was the blocked receivables from clients. As a result, we encountered difficulties in managing ongoing projects since we were unable to fund them with depreciated money, including the advance guarantee already received from clients who were considered to have paid their dues.”(C.2)

- **Short/Loans-term loans**

“When the project reached a phase where we needed to borrow 10-15% of the turnover value, bank loans were no longer an option. The reason being that banks have suspended loans, leaving us with limited financial resources to complete the project.” (C.1)

“The suspension of bank loans has resulted in a significant challenge for project financing” (C.2)

- **Letter of Credit (LOC)**

“Our exports from other countries have been halted since the banks stopped issuing letters of credit.” (C.1)

- **Bonds**

“When we attempted to secure a bid bond for a new tender project, we were informed by the bank that they are no longer issuing any bonds. As a result, we had to decide whether to hold the Client or Consultant responsible for adapting to the situation. Several months later, some local clients began to accept bank checks for bonds and guarantees that could only be used for payment in bank USD. However, foreign clients were unable to adapt to these changes. Consequently, we were forced to withdraw from foreign projects or ongoing projects. We were fortunate if we were able to secure an advance payment guarantee or performance payment guarantee at an early stage, but we were unable to obtain any more. We used to compete with 20 tenderers, but now we can only compete with a maximum of five, as the others were eliminated for not being able to obtain bid bonds ” (C.1)

“Prior to the crises, we relied on local banks to obtain bonds and guarantees. I remember issuing a performance bond for a project that was still ongoing when the crisis hit. The client became uneasy about the type of performance guarantee, as it could not be easily liquidated during the financial crises. When negotiating payment terms, we agreed to a combination of X% to be paid in cash fresh USD and Y% to be paid in US dollars checks. The client deducted a particular sum from every payment certificate in cash USD to ensure that the value equivalent to the performance guarantee was held in cash dollars. While we had the ability to obtain fresh bid bonds or performance guarantees by securing most of our funds outside of the country, we chose to leverage foreign accounts for project financing instead of resorting to that option” (C.2)

7.2.2 Currency

“We have been introduced to a new local currency, the Lollar (the Bank USD), which is not tradable internationally...We suffered from the continuous fluctuation not only of Lebanese Lira against to the dollar value but also the Bank USD, 3,900LBP/USD then 8,000LBP/USD” (C.1)

“The devaluation of the Lebanese Lira and the continuous fluctuation had an impact on tender prices, payment terms with the client and subcontractors, and even employee remuneration. Not only did the value of the dollar relative to the lira fluctuate on the black market, but the central bank also introduced new banknotes and Sayrafa.” (C.2)

7.2.3 Fuel

“Prior to the progressive lift-subsidy on fuel, we benefitted from the reduced fuel prices when buying fuel with dollars, but we also experienced a fuel supply shortfall for our machinery, plants, and generators.” (C.1)

“We witnessed scarcity of fuel. We were not able to secure fuel for our home office generators. We could barely secure fuel for our plants and equipment on site. We were taking advantage of low prices of fuel due to subsidy at the beginning of the crisis. We were able to purchase the fuel in LBP but after lift subsidy the rate of plant and machinery has progressively increased in LBP until we began to price the plant's unit rate in dollars.” (C.1)

7.2.4 Changes in Legislation

“We were unable to adapt to the sudden changes in legislations, the gradual release of BDL circulars limiting withdrawals, and the change in bank currency from 3,900 LBP to 8,000 LBP per Dollar.” (C1)

“It was hard to cope with the continuous change in withdrawal limits, bank notes withdrawal rates and the new Sayrafa platform. In order to adjust our tender prices, payments, and receivables appropriately, we had to stay up-to-date with new legislation” (C2)

7.2.5 Procurement:

Suppliers implemented the policy of using cash only for purchases, either in terms of cash USD or LBP at the daily exchange rate, due to the lack of liquidity in the market caused by banks tightened limits on local currency and the complete suspension of foreign currency.

“As it became increasingly difficult to liquidate bank checks, they became invalid. In April 2020, when the tradable value of the USD was much higher than that on the black market, banks set the rate at 3,900 LBP/USD. However, starting in December 2021, the rate increased to 8,000 LBP/USD.” (C.1)

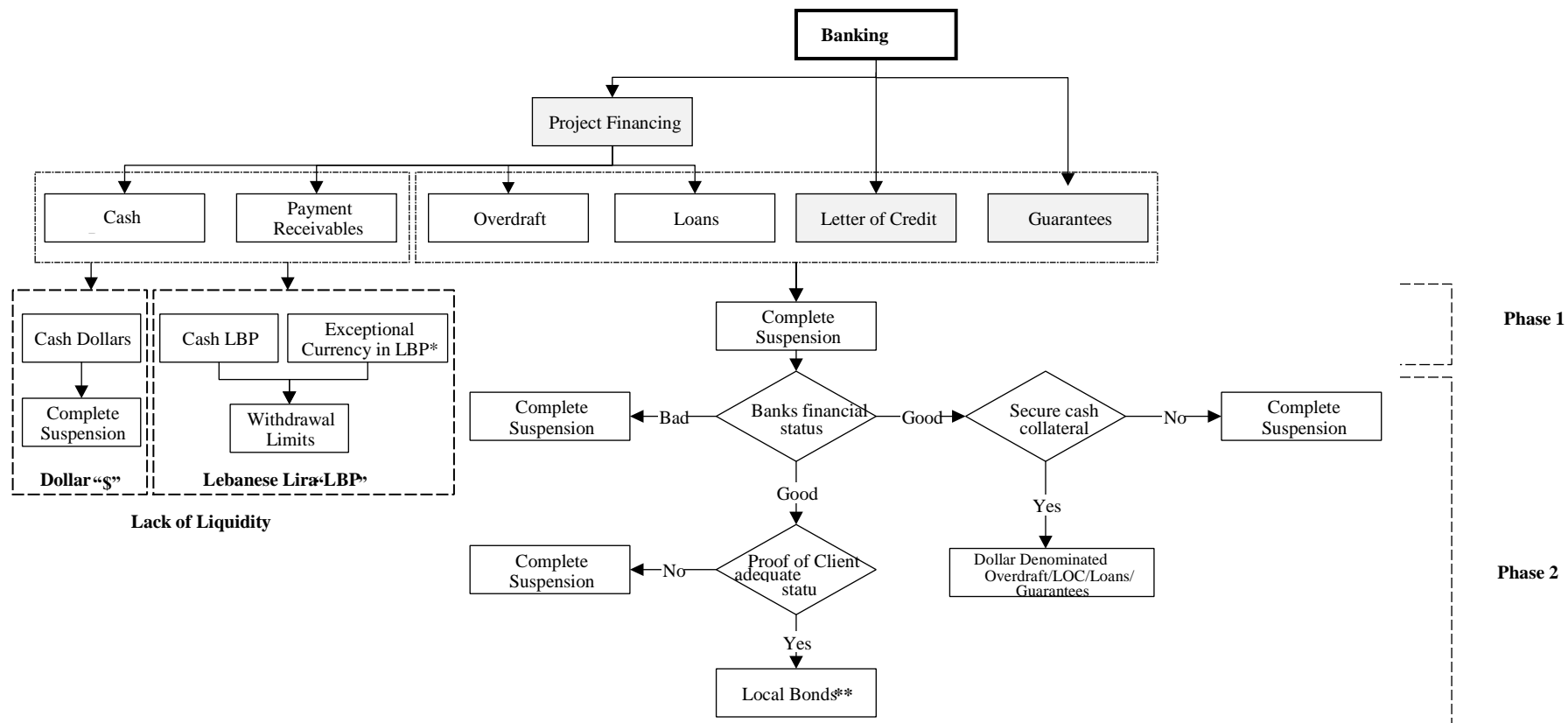
“ We faced challenges while interacting with our vendors, as they were unable to replenish their inventories due to the situation. When placing an order, the only requirement was to pay 100% of the invoice amount in cash, confirm the transaction, and wait for the order to arrive. During phase I, even though there was a shortage of

dollar liquidity in the market, suppliers showed a preference for receiving cash USD payments or LBP at the parallel exchange rate. However, they still accepted a combination of checks (which couldn't be liquidated) and cash, with the cash portion being the highest, or sometimes only checks in USD were accepted. As the situation worsened, during phase2 (six-months after the start of the crises) suppliers started demanding cash in dollars or LBP at the parallel exchange rate for procurement.(C.1)

The interviewee also mentioned that:

“The impact of foreign-funded projects was minimal, yet there were still benefits. Lebanese Law permits the use of foreign currency in Lebanese contracts. The fact that this cannot be seen in Egypt, Saudi Arabia, or Iraq indirectly benefited us as contractors. 10% of the expenses are local dependent, whereas 90% of the costs are foreign dependent. Local funded projects were denominated in 1507.5LBP/USD, where the actual value of the dollar was increasing to 3,000LBP and 5,000LBP with non-stop (dramatic devaluation). This made it impossible for locally funded projects to continue and eventually came to a full stoppage. Normally, we do not enter into local currency contracts with the private sector. Most of these projects are in the public sector. We had the opportunity, as allowed by law, to acquire our revenues for local funded projects supported by public-sector as far as work has progressed” (C.1)

“We faced a shortage of materials, especially those that were imported such as tiles, PVC, blowers, diffusers, etc. Even local supplies like cement were scarce. Compounding the issue, the Lira was depreciating every day and all materials imported from outside were priced in USD or payable in LBP at the exchange rate. This resulted in project delays, decreased profits, and ultimately, we paid the price.” (C.2)



* **Exceptional measures** concerning cash withdrawals from foreign currency bank accounts: Upon request of depositors, banks can convert dollar deposits at 3,900LBP/USD in April 2020 then 8,000LBP/USD in December 2021

** **Local Bonds** are secured without collateral

LBP Local Bonds are liquidated in LBP

USD Local Bonds are liquidated according to the exceptional currency rates

Few Clients were requesting local bonds to be factored as a condition precedent for their consent

Figure 23: Framework of the impact of disruption in banking sector on project financing

Figure 24: Key factors of the economic crises that affected the conventional way of project administration

Key Factors	Factors	Justification
<i>Banking Sector</i>	<p>Difficulty in project financing:</p> <ul style="list-style-type: none"> - Overdraft accounts - Cash Reserves in accounts - Short-term and long-term loans - Payment Receivables <p>Suspension of Letter of Credit (LOC)</p> <p>Bank's suspension in acquiring any kind of bonds</p>	<p>Phase 1: Suspension of overdraft accounts by local banks. Phase 2: Local banks offer overdraft facilities on a project basis, which can be provided in either local currency (in the form of LBP checks) or bank dollars (digital or check dollars) that cannot be liquidated Phase 2: Local banks provide fresh dollar overdraft accounts for customers that can provide collateral in the form of a pledge in fresh dollar value.</p> <p>-Money in dollar value has depreciated to Bank USD. -Inability to withdraw cash foreign from accounts.</p> <p>Phase 1: Suspension of short and long-term loans by local banks. Phase 2: Local banks offer loans in local currency (in the form of LBP check) or bank dollar (in the form of Check Dollar) are acquired on project basis: Preference for foreign client* Phase 2: Cash collateral pledge in fresh dollar needed to acquire loans in dollar.</p> <p>Difficulty has been faced by depositors in accessing their Advance Payment from local banks due to the depreciated value of the already acquired Advance Payment in USD to bank rates and LBP.</p> <p>International markets have stopped accepting Lebanese Letters of Credit (LOC), leading to a complete stoppage of imports by contractors</p> <p>Advance/Performance/Payment guarantee/Bid Bonds. - Phase 1: Inability of depositors to secure guarantees. - Phase 2: Local banks offered guarantees in the form of checks issued in Lira or bank USD that cannot be liquidated - Phase 2: Cash collateral pledge in dollar value was a condition precedent to acquire dollar denominated bonds, which was mostly required by foreign funded projects.</p>
<i>Currency</i>	Introduction of the new local currency which is not tradable internationally	The exchange rate for Bank USD was 3,900 LBP/USD from April 2020 and increased to 8,000 LBP/USD starting from December 2021. Sayrafa. Black Market USD.
	Continuous fluctuation of the currency rate	Fluctuation of the Bank USD: as per BDL circulars. Fluctuation of the LBP against the Dollar in the parallel market.
<i>Fuel</i>	Shortage and Unavailability of fuel	Shortage of fuel due to progressive lift-subsidy on fuel
<i>Changes in Legislations and policies</i>	The progressive release of new circulars by BDL	The release of BDL circulars were issued to announce the amount of withdrawal limits for depositors. Local banks have implemented new policies regarding the withdrawal of funds from foreign currency accounts,

		allowing only withdrawals in local currency at a fixed exchange rate of 3,900 LBP/USD initially and then 8,000 LBP/USD for bank USD. The release of the new “Sayrafa” platform.
<i>Procurement</i>	Shortage in materials and spare parts Change in Payment terms	Financial difficulties hindered suppliers from re-stocking as the majority of materials are imported and purchased in Cash Dollars Contractors have experienced stringent changes in payment terms with suppliers, including the requirement to secure liquid cash in USD or Lira at the parallel exchange rate only for procurement purchases. Additionally, suppliers require contractors to deposit 100% of the value of the invoice in cash before any orders are placed.

* Among the banks that provided loans, some of them refrained from lending any contracting company, except in the case of a foreign-funded projects or a proof of adequate client’s financial status

Phase1: At the beginning of the crisis

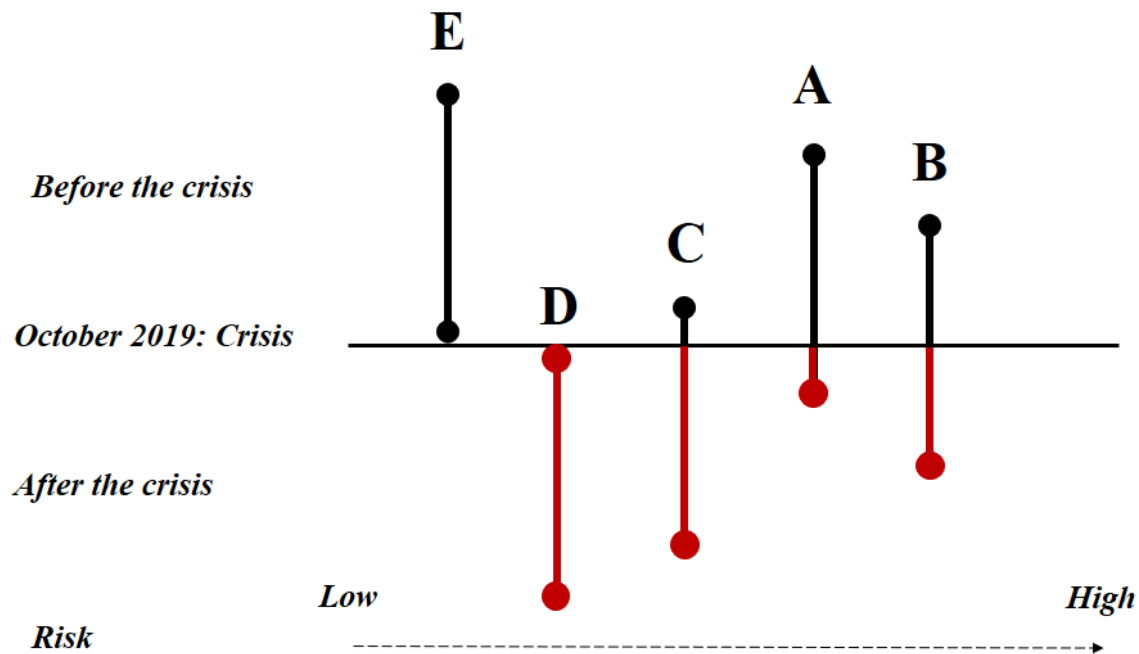
Phase 2: After six months from the beginning of the crisis

7.3 The impact of the Financial Crises on Construction

7.3.1 *Project Level*

Two factors affected the projects:

- When had the project estimation took place
- The work progress relative to the crisis



- Project portion before the crisis
- Project portion after the crisis

Project A:

“The project was already budgeted before the crisis, and only 10% of the work remained to be completed.”. (C.1)

“The project had been allocated a budget before the crisis, and 90% of the work had been completed. We had taken adequate actions to progress the work with what we have project financing in hands The negotiations between the client and contractor, as well as the contractor and subcontractor, were resolved. The projects were able to progress smoothly without significant delays since all the necessary supplies and equipment had been ordered and imported beforehand. Although we experienced a 10% loss in the value of banknotes during our initial purchases at the beginning of the crisis, the value continued to plummet, reaching a 90% loss by

2020. Therefore, projects with only 10% to 15% of progress remaining could have been finished and completed.” (C.1)

Project C:

“When the crisis occurred, a portion of the construction projects had already been completed, ranging from 10% to 15%. Before proceeding with the projects, we assessed the impact of the crisis and took measures to mitigate the risks. We discussed with the clients about adjusting the payment terms to accommodate the financial challenges posed by the crisis, and in some cases, the projects were put on hold. We converted contracts that were originally in Lebanese Pounds to US Dollars. To manage the financial risks, we opted for cash payments in either USD or LBP at the prevailing exchange rate, and avoided accepting bank credit. However, we did accept a small amount of payment in bank notes at the beginning of the projects when vendors were still accepting them..” (C.1)

Project D:

“The contractors utilized the knowledge gained from their experiences in handling project A, B, and C to effectively manage and execute project D.”(C.1)

Project B:

“Projects that were in the middle of the work progress were the most affected during the crisis. For example, if a client had signed a \$20 million contract, we would use advanced and certified payments to complete the reinforced concrete scope of the project. However, we were shocked when the remaining progress payment was received in depreciated currency. Moreover, the procurement process required cash payment, which was difficult to obtain due to blocked funds in banks.

We informed the client that we could not proceed without cash payment, but they were unable to provide it due to their own financial constraints. As a result, many projects, both private and public, were abandoned. Finding solutions for these types of projects is especially challenging, particularly in residential projects where apartments have already been sold.” (C.1)

7.3.1.1 Cost Expenditure

“Generally, the cost of BOQ item is composed of Labor, Materials, Plants and Equipment, Overhead, and profit”. (C.1)

As per the interview, the cost of labor has decreased to its previous level in comparison to the dollar rate. However, the prices of all imported products have remained the same, and they are required to pay for them in fresh USD. The only difficulty is obtaining fresh USD to purchase materials and ensuring liquidity (in either USD or LBP) to pay salaries.

7.3.1.1.1 Manpower

The manpower factor was one concern of the interviewees. He confirmed that the dollar amount of this BOQ component item decreased in dollar value but increased in local currency.

“Both skilled and unskilled labors are included in the labor force. Everything, including labor wages, became inflated in local currency. However, compared to what they received in 2019, laborers' dollar wages fell by approximately 80% in 2020. Now, in 2022, labor wages have slightly climbed to reach 30% of what they were in 2019”.
(C.1)

The labor wage market for C1 and C2 is comparable. The variances in wages in both Dollars and LBP compared to 2019 were calculated based on the information provided by C2 which included information about the earnings for all years in consideration.

Table 13: Wages of semi-skilled labors variation from 2019 till 2023

	Wages in \$		Wages in LBP	Variation of wages in Dollars compared to 2019	Variation of wages in LBP compared to 2019
				2019	
2019	\$	20.00	LBP 30,000	100%	100%
2020	\$	3.00	LBP 100,000	15%	333%
2021	\$	5.00	LBP 150,000	25%	500%
2022	\$	6.00	LBP 250,000	30%	833%
2023	\$	12.00	LBP 1,200,000	60%	4000%

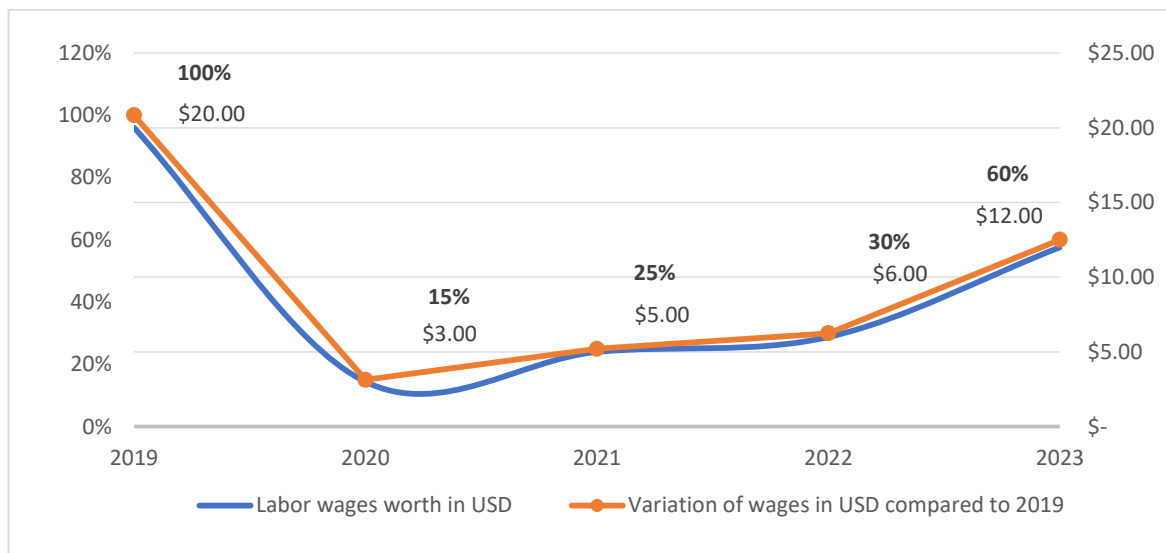


Figure 25: Variation of wages in Dollars compared to 2019

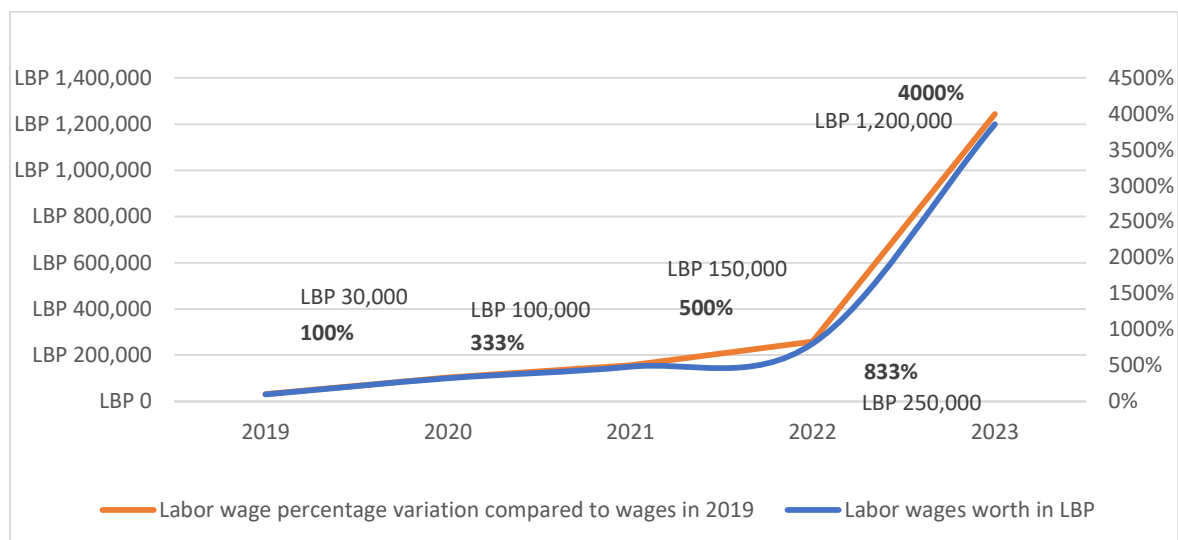


Figure 26: Variation of wages in Lebanese Lira compared to 2019

7.3.1.1.2 Materials

According to the interviewees, the main challenges when dealing with local projects that require imported materials are the shortage of materials and the lack of available funds, rather than the increase in prices. However, the prices of locally produced materials, particularly those related to fuel, were significantly impacted. During the fuel subsidy period, the prices decreased in dollar terms, but then they increased after the subsidy was lifted

“The majority of materials are imported. Regardless the local financial crisis, we experienced a rise in material prices due to Russian-Ukrainian war and the increase in fuel prices globally. Few suppliers accepted Bank USD (Lollar) at the beginning of the crisis because their commodities were already in stocks and because they had an opportunity to cover the negative account in overdraft accounts using Bank notes. However, when suppliers start running out of stocks, cash dollar or LBP at the parallel market rate was a condition precedent for every purchase. The problem was not only the increase in price of material but the shortage of either dollar or LBP liquidity to procure” (C.1)

“This differs for the case of local materials such as fuel-related materials. From 2019 to the end of 2021, when fuel was subsidized, its price in dollars was extremely low. 20L of fuel cost about \$12 to \$13 in 2019. Fuel reached \$1.93/20L in 2020 due to fuel subsidies, and following fuel subsidy-lift, it has increased and reverted to the price it was in 2019, possibly even more expensive due to inflation. This affected local fuel-related materials like cement. Before the crisis, 1 ton of cement costed 135,000 LBP equivalent to \$90 (1507.5LBP/USD). In 2020, the Ministry of Industry of Lebanon has fixed construction cement’s pricing in LBP at \$25 per ton during fuel subsidy. This affected the pricing of 1m³ of concrete. Following the fuel subsidy-lift in 2021 it has reached 3,100,000LBP/Ton equivalent to \$70/Ton which is still cheaper than the way it was in 2019.” (C.1)

- Local Materials:

Table 14: Variation of cement prices from 2019 until 2022

	2019	2020	2021	2022
Price of Cement in LBP	LBP 135,000	LBP 150,000	LBP 1,300,000	LBP 3,100,000
Price of Cement in USD	\$90.00	\$25.00	\$50.00	\$70.00
Percentage variation of cement price in LBP	100%	111%	963%	2296%
Percentage variation of cement price in USD	100%	28%	56%	78%

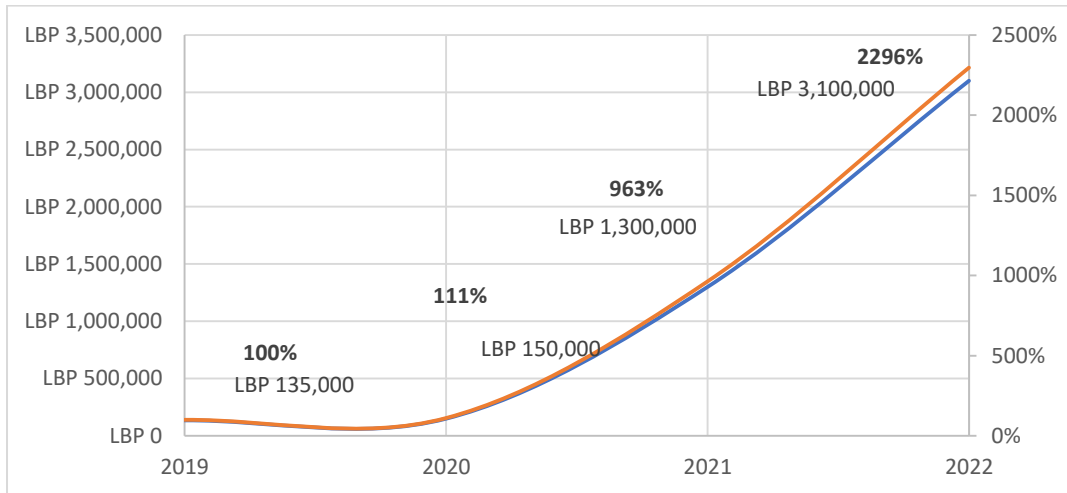


Figure 27: Variation of cement price in Dollars compared to 2019

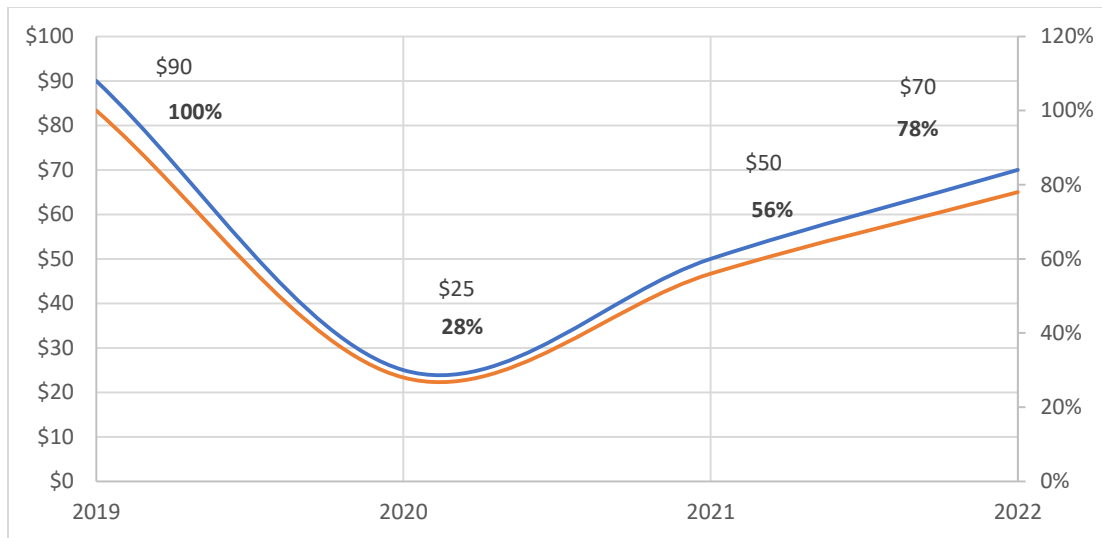


Figure 28: Variation if cement price in Lebanese Lira compared to 2021

- Imported materials:

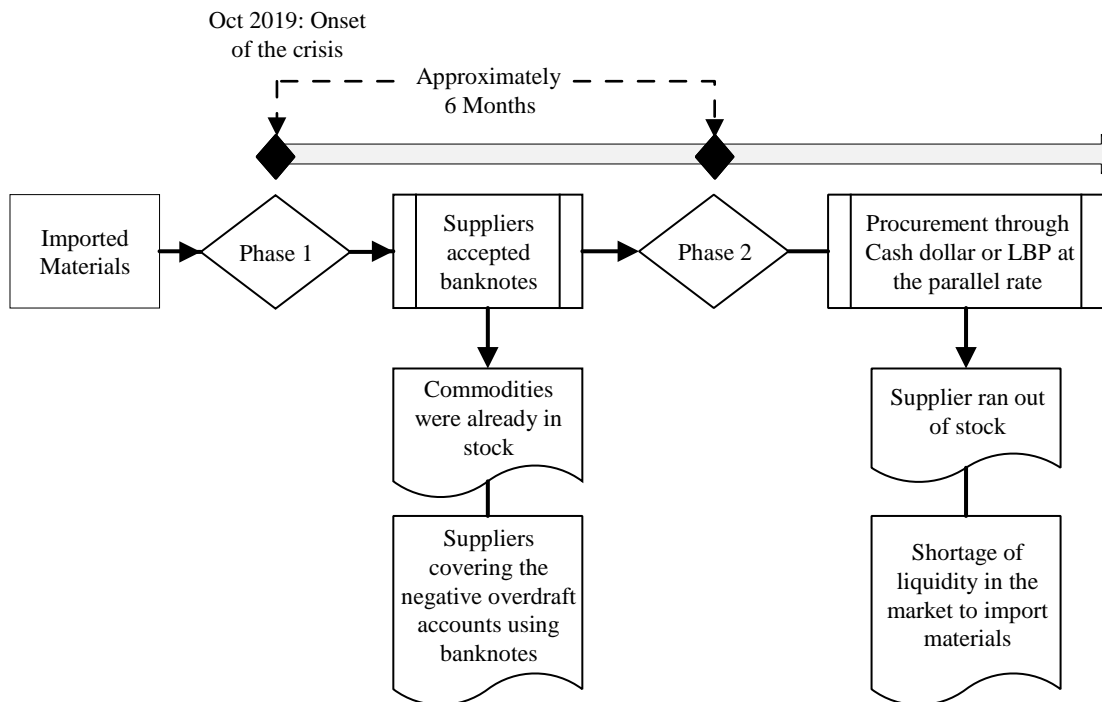


Figure 29: Phases of imported material procurement requirements during the Lebanese crisis

7.3.1.1.3 Plants and Equipment

“The rent and lease rate of machinery and equipment decreased in dollar value due to the lift subsidy from 2019 until around August 2021, when it ended, as well as the reduction in construction demand at the beginning of the financial crisis. Since then, the BOQ has fully allocated the plants and equipment unit rate as a Fresh USD amount.” (C.1)

“At the outset of the crises, negotiations with the Client started as we were not able to proceed with the original payments, we were still accepting LBP or Bank Checks from the Client during fuel subsidy as the unit rate of plant and equipment was still affordable. We were buying fuel in LBP not in USD as it was subsidized. I recall that in 2020, the price of a gasoline tank was around \$2. Following the lift on fuel subsidy, this portion was priced on fresh dollars.” (C.2)

7.3.1.1.4 Overhead

“Our overhead expenses include salaries and benefits for engineers and human resources and other expenses associated with running the company. The income of human resources decreased by 80% at the onset of the crises then increased slightly to reach 40 to 50% of what had been in 2019. There was a constant pay adjustment with portions in LBP, Banknotes and fresh USD which is least portion of all.”

“The portion of Overhead to Turnover increased significantly.” (C.1)

“Overhead mainly includes wages and employee salaries that decreased around 30%”(C.2)

7.3.1.1.5 Profit

The study's findings revealed that both construction companies interviewed in this research are affected by the financial crises and the devaluation of the Lira against the Dollars. They agreed that the financial crises affected their project level, which led to cost overruns that, in return, affected their profit margin. Among the extracts from interviews are the following comments:

“The Contractor’s need to secure projects, made the profit margin less than what it has been at the beginning of the crisis” (C.1)

“During the financial crisis, prices in LBP increased and we encountered problems with our subcontractors. Initially, they quoted their prices just to secure the job, but later on, during the construction period, they claimed that they could not continue the work due to the increase in prices, despite having signed the agreement. We faced similar challenges and tried to delay or even suspend the work, negotiate payment

terms with our subcontractors and pass on the cost increase to our client. However, this had a negative impact on our profit margin, as we experienced cost overruns.” (C.2)

“At the time when we were certified the advance payment in LBP, all materials from abroad were required to be paid in Fresh Dollars or in LBP at the daily exchange rate. This become more expensive so it affected us, delayed our project to acquire money and decreased our profit margin, we suffered” (C.2)

7.3.1.2 Time

“Due to COVID-19's lockdown and business closures, we experienced delays and disruptions in completing the construction...” (C.1)

“Also, the 4th of August explosion, contributed to delay due to damage of certain ordered materials” (C.1)

7.3.1.2.1 Causes of Delay Related to Procurement

- **Shortage in Cement**

“We used to purchase cement on the phone. Until recently, in order to purchase cement, we had to get an appointment from the bank at least 48 hours ahead , deposit the necessary funds into the supplier's account, get a receipt, and then visit the supplier to pick up the cement. However, it is not so simple; the money needs to be sent into supplier’s accounts in LBP. To get the LBP money we had to sell our dollar cash money to get the LBP depending on what is the daily exchange rate on the parallel market. As cement is necessary for various construction stages, labors may not be able to progress work without its availability” (C.1)

“Cement shortage created a significant delay. I was entitled of 7 months extension of time as the unavailability of Cement impaired both the contracting company and

sub-contractors. When cement activities were curtailed by cement businesses, cement production was not enough to cover construction demand. The action contributed to a significant rise in cost of cement in the Lebanese Lira currency and delay in work progress as we sometimes were waiting for its price to decrease before buying it at a high cost and we could no longer make it available on site at any time. Workers may spent extra time waiting for cement, which reduced productivity. As a result, the construction process slowed and project completion got delayed. ” (C.2)

- **Money conversion for procurement**

Adding to what have been said by C.1 in “Shortage of cement” emphasizing the difficulty in transferring money from USD to LBP in order to purchase cement, C.2 added the following:

“Contractors faced payment delays to suppliers owing to difficulty converting LBP to USD or vice versa. This had influence on our ability to pay suppliers and labor, causing project delays.” (C.2)

“ We also had a delay in receiving payment from the Client due to difficulties in converting LBP to USD or vice versa, which hampered our capacity to pay suppliers, causing a delay in acquiring necessary materials and subsequently a delay in the project timeline. “ (C.2)

- **Shortage of fuel**

The shortage of fuel for the operation of plants and equipment in Lebanon is a result of the central bank's restriction on the imports of subsidized fuel. It has led to a shortage

of fuel for construction plants and machinery, which in turn has slowed down the pace of construction projects.” (C.1)

“The fuel shortage hindered our ability to advance. The order for the delivery of the materials was delayed, as were the laborers' and our own on-site transportation due to shortage of fuel.” (C.2)

- **Lack of suppliers ‘stock**

“Initially, during the crisis, suppliers were accepting bank checks due to their available stock; however, after around six months, suppliers shifted to importing materials on demand and stopped stocking goods unless specifically requested and paid 100% of the invoice, leading to longer timelines and significant delays. As we were required to place our order and wait for the arrival of materials due to the lack of cash dollars needed for procurement.” (C.1)

“The reduction of supplier stocks led to a scarcity of PVC pipes, tiles, and other construction materials, ultimately causing delays in the availability of these items on site and affecting the overall construction timeline.” (C.2)

- **Unworthiness of Dollar/Lira check**

“We are investing time in searching for an alternative supplier or spending extra time and resources to arrange for a different payment method if the supplier only accepts cash or other forms of payment. This is causing a delay in the acquisition of necessary materials, equipment, or services, slowing down the construction project.” (C.2)

“When the company does not have enough cash on hand to make the payment, we postpone the payment until we can arrange for alternative financing or obtain funds from other sources. This might cause cash flow concerns and further postpone payment, resulting in project delays.” (C.2)

- **Suspension of Letter of credit :**

“The unfavorable economic circumstances, which range from currency fluctuations to a disturbed banking sector hindered project financing such as acquiring Letter of credit, bonds, guarantees thus creating difficulty in acquiring the necessary financing tools to procure and progress work. Funding problem especially acquiring cash money for procurement impacted work progress due to unavailability of required items on time”
(C.1)

7.3.1.2.2 Causes of Delay Related to Manpower

- **Emigration of employees and shortage of manpower**

“ Now, due to financial crisis we suffered from migration, ... I had a crew taking care of a project; the team members willing to leave the country surprised us.

“To replace an engineer, the company may need to invest time and resources in recruiting and hiring a new engineer. Furthermore, the new engineer will need to become acquainted with the project's specifications, requirements, and design, which may cause further delays. However this did not cause major delays as we were experiencing a significant reduction in the number of projects” (C.1)

7.3.1.2.3 Causes of Delay Related to Financing

- **Client financial difficulty and delay certifying payments**

“The economic problems and the client's financial difficulties have caused a delay in the project. The delay is due to the client's inability to provide cash money, which has made it challenging to purchase the necessary materials, including ceramic

tiles. When asked for cash, the client responded with a simple question about where to obtain the money.” (C.1)

“The local clients have been unable to certify payments due to their inability to secure liquidity for procurement or withdraw money from banks. As a result, this has caused significant delays in decision-making and a complete suspension of work. While some projects have resumed, the delay has caused disruption and uncertainty in the construction industry.” (C.2)

- **Sub-contractors’ financial difficulty**

“Even though we used to pay subcontractors on schedule, they experienced delays in the completion of their work as a result of the financial crisis. Sub-contractors also suffered from disruption with suppliers due to lack of spare parts, and materials. They were exposed to the same struggle we’ve been exposed to.” (C.1)

“Subcontractors have been significantly impacted, particularly in situations where back-to-back contracts were involved. According to our contract, we are not responsible for paying subcontractors until we receive certification of payment from the employer, commonly referred to as "Pay-when-paid." However, we have experienced delays in receiving payment from which has affected the subcontractor's work progress. As a result, their work has been comparably impacted due to the delay in payment and procurement of materials.”(C.2)

- **Price fluctuation**

“Due to the persistent devaluation of the local currency in relation to the US dollar and the frequent issuance of BDL circulars, the estimated BOQ figures became unrealistic and no longer reflected accurate values. As a result, discussions were necessary with both the client and subcontractors to modify the payment terms and resume work. This

process will need to be repeated in the event of any new policy, legislation, or significant currency fluctuations between the Lira and the US dollar" (C.2)

- **Client delay in honoring payment**

"Construction projects require a constant flow of funds to ensure that materials are procured, workers are paid, and work progresses as planned. Whenever the client does not make payments on time, this caused delays in the construction process and disrupt the work schedule." (C.1)

"We rely on timely payments from clients to manage their cash flow and keep our projects on track. When payments got delayed, it caused a chain reaction of issues, including as previously mentioned a delay in paying subcontractors, who in turn may delay work progress or halt work altogether. (C.2)

7.3.1.2.4 Causes of Delay Related to Contractual Terms

- **Client delay in making decisions**

"The Client was also in a confusion status, to whether or not the client should proceed or stop and this also created delay "(C.1)

- **Negotiations of payment terms with the Client**

"We were involved in negotiations with the client to modify the payment terms for a B-type project. To move forward with the project, we requested \$1M in bank credit and \$1M in cash. Despite multiple attempts, we were finally allowed to adjust the payment terms in order to accelerate project progress. However, unfortunately, this led to a delay in completing the project." (C.1)

Table 15: Causes of delay during the financial crises

Causes of delay		Description
Causes related to procurement		
1	Shortage in cement	<p>Cement has become scarce or unavailable locally, resulting in a significant reduction in labor productivity. This has caused extra time waiting for the cement to arrive on site, resulting in delays in the construction schedule. <i>(C.1)</i></p> <p>Shortage of cement caused a notable escalation in the cost of cement in Lebanese Lira, resulting in work progress delays due to the need to wait for a price decrease before purchasing it at a higher cost, ultimately rendering it challenging to keep the cement readily available on site <i>(C.2)</i></p>
2	Money conversion for procurement	<p>The requirement to convert currency for procurement, either from USD to LBP or vice versa, creates additional administrative tasks for the contractor:</p> <ul style="list-style-type: none"> - The process may involve waiting for a favorable exchange rate - The process of converting currency could take several hours <i>(C.1)</i> <p>Due to the need for currency conversion, payments to suppliers are often delayed, causing significant delays in the materials procurement thus delay the construction timeline <i>(C.2)</i></p>
3	Shortage of fuel	<p>Non-availability of fuel for plants and equipment hindered the operation of the machinery to progress with work <i>(C.1)</i></p> <p>The fuel shortage impeded progress as it caused delays in the delivery of materials and transportation of laborers and on-site personnel <i>(C.2)</i></p>
4	Lack of suppliers 'stock	<p>Due to lack of cash dollar in the market, suppliers were not replenishing continuously their stocks; this has restricted the availability of construction materials especially for imported materials that need time to be imported from outside the country thus extended further the lead-time to place the order and delivery. As a condition precedent, Contractors had to place 100% the value of the order as a deposit to place the order.</p> <p>Client's difficulty acquiring cash money due to financial issues led to delay in procurement and subsequently material delivery and availability on site. <i>(C.1)</i></p>
5	Unworthiness of Dollar/Lira checks	<p>Suppliers' refusal to deal with checks due to the following:</p> <ul style="list-style-type: none"> - Dollar checks can only be cashed in "bank dollars", if possible, for an unrepresented value of the dollar in the parallel market - Lira checks can only be cashed with a limited withdrawal limit <p>Banknotes were no longer a tool for procurement leading to delay in placing the order and availability of materials on site. <i>(C.2)</i></p>
6	Suspension of line of credit	Suspension of material imports <i>(C.1)</i>

Causes related to manpower	
7	<p>Emigration of employees</p> <p>Due to the collapse of Lebanon's economic status, engineers migrated in search of a better standard of living thus:</p> <ul style="list-style-type: none"> - Companies may need to invest time and resources in recruiting and hiring a replacement engineer. - The time required for the new engineer to become acquainted with the project's specifications needs may impede job progress. <i>(C.1)</i>
8	<p>Shortage of manpower</p> <p>The economic crisis and Lira depreciation made Lebanon's work market unattractive for laborer, thus not enough availability of labors to carry out the work <i>(C.1)</i></p>
Causes related to financing	
9	<p>Client financial difficulty</p> <p>Due to withdrawal limits of Lira cash money from banks and suspension of foreign cash withdrawal from banks Clients faced difficulty accessing cash money for procurement. <i>(C.1 & C.2)</i></p>
10	<p>Sub-contractors' financial difficulty</p> <p>Delay in subcontractors work progress due to financial difficulties. <i>(C.1 & C.2)</i></p>
11	<p>Price fluctuation</p> <p>There is no established exchange rate between the lira and the dollar affecting all kind of transactions in LBP. Buying imported materials with deferent currency and continuous change in fluctuating exchange rate. Due to budget constraints, the fluctuation of the lira against the dollar has caused a cost overrun, resulting in a delay in the project. As a result, contractors have had to seek additional funds to complete the project within the new budget constraints.<i>(C.2)</i></p>
12	<p>Client delay in honoring payment</p> <p>Payment delay by the Client caused disruption in Contractor's cash flow and delayed the rate of carrying out the works thus delaying in project delivery completion <i>(C.1 & C.2)</i></p>
Causes related to contractual relating	
13	<p>Client delay in making decisions</p> <p>Clients struggle to decide whether to start a project or advance work for ongoing project cases due to severe financial difficulties. <i>(C.1)</i></p>
14	<p>Negotiations of payment terms with the Client</p> <p>Due to continuous fluctuation of the local currency against the Dollar and the constant release of BDL circular has estimated BOQ figures were no longer applicable as they reflect unrealistic figures. Negotiations with the Client to adjust payment terms and subsequently with the Subcontractors were necessary for the resumption of the works. This had be be taken place for each new released policy, legislation or significant currency fluctuation of the Lira against the dollar. <i>(C.1 & C.2)</i></p>
15	<p>Subcontracts adjustments</p>

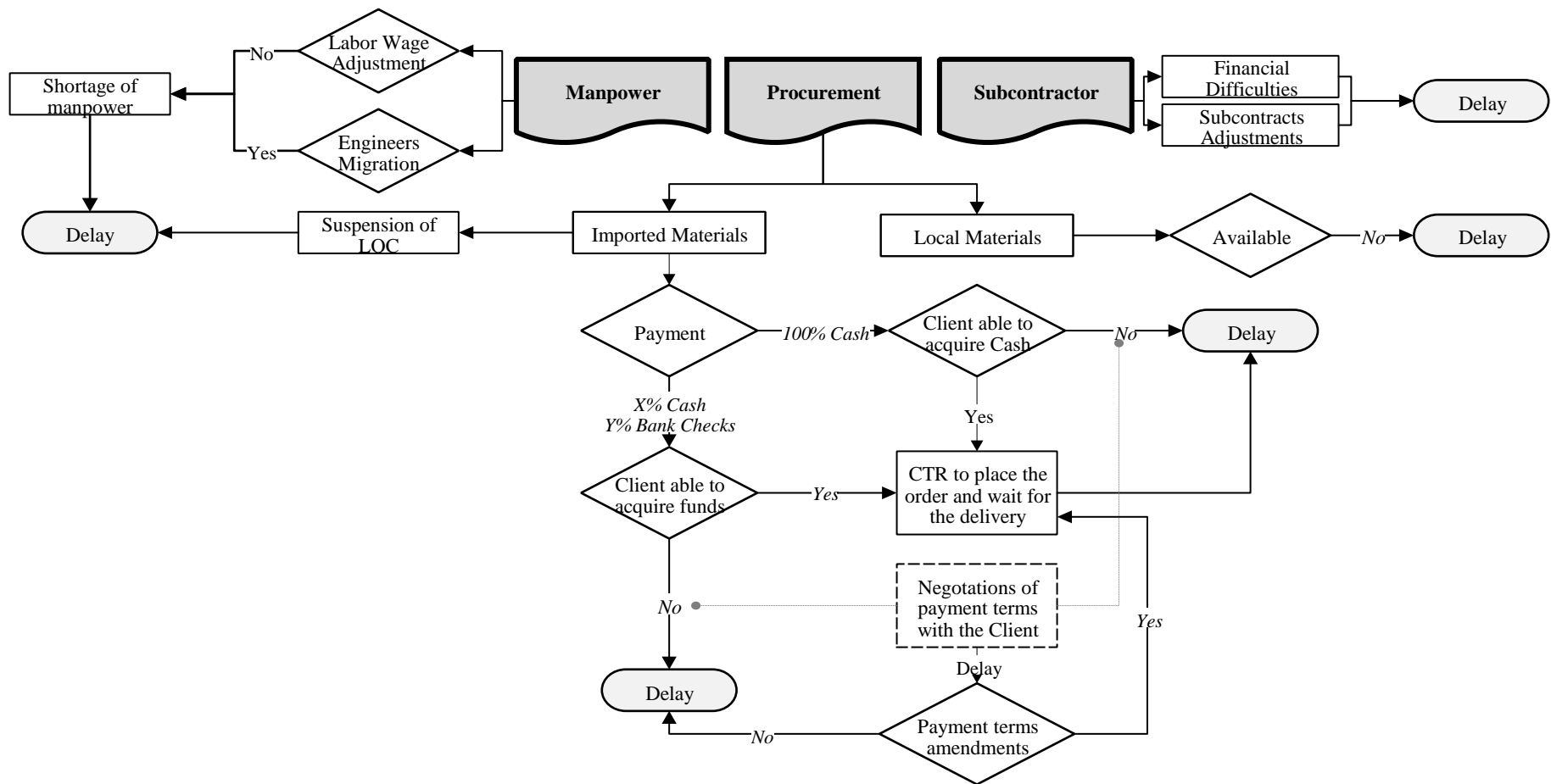


Figure 30: Factors causing delay

7.3.1.3 Quality

“There was no compromising on product quality because it goes against our culture.

However, regardless of the financial situation, if the specification allows for alternatives, we would replace imported goods with local ones.” (C.1)

“The contract document makes specific mention of the materials to be used. The specifications is part of the contract documents that stipulates the type of materials and supplies to be used. All the details were provided, either by the stipulating the brands or performance of the latter. So we must adhere to the requirements” (C.1)

“We used to resort to local materials as much as possible to levy our losses and increase the profit margin in a way not to drift away from the performance specifications” (C.2)

“Engineers who left the company resulted in a loss of experience and knowledge. Engineers with experience who have worked on projects for years in Lebanon took their knowledge and abilities with them” (C.2)

“Shortage of skilled labor during the crises led to the reliance on unskilled labor which often leads to poor quality work.” (C.2)

Table 16: Factors affecting quality of construction projects during Lebanese crises

	Factors affecting Quality	Brief
1	Reliance on local materials or lower quality allowed by the specifications	Contractor resorted to lower level quality as long as the specifications allow for this to increase the profit margin (C.1 & C.2)
2	Emigration of engineers	Loss of experience and knowledge (C.2)
3	Shortage of skilled labor	Reliance on unskilled labor (C.2)

7.3.2 Company Level

7.3.2.1 Financial status:

“The financial statement appeared unfavorable as it was prepared in LBP at the rate of 1507.5LBP/USD, which was significantly lower than the parallel market exchange rate of 10,000LBP/USD. Therefore, even though \$1,000 in cash dollars would be recorded as 1,500,000 LBP, it would be equivalent to 10,000,000 LBP (\$1,000 x 10,000LBP/USD) based on the daily parallel exchange rate, which is not permissible in an audited financial statement. Most of the transactions were conducted in LBP, where an invoice of 2,000,000 LBP equates to \$200 in the unofficial parallel market.

Consequently, the financial statement reported losses due to sales minus cost of sales. Additionally, there was a sharp decrease in turnover due to a decline in demand output in the construction projects. Overhead costs decreased somewhat in relation to the dollar, but the ratio of overhead costs to turnover increased as wages accounted for a significant portion of the overhead expenses.” (C.1)

“The decision to procure concrete in USD or LBP at the daily exchange rate plays a crucial role in determining the profit/loss of the operation. It was often possible to pay for a specific invoice in either USD or LBP at the exchange rate at the time. Thus, it was occasionally unwise to pay in dollars when paying in LBP at the current exchange rate would avoid taking a loss due to the ongoing devaluation of the pound against the dollar. For example, if 1 USD equals 10,000 LBP and 1 Ton of Cement costs 2,000,000 LBP, it was preferable to avoid buying it in USD since the USD/LBP rate might increase the next day, resulting in a loss in our deal.” (C.1)

“Our company's turnover was adversely impacted by a decrease in local construction demand, a loss of trust from foreign investors in local investment opportunities, and our

heavy reliance on foreign organizations for rehabilitation and maintenance projects”

(C.2)

“We have had to adjust our business strategy to survive the current economic challenges. While we used to secure projects worth \$20M, we now accept construction projects as low as \$2M just to improve our cash flow and turnover. Unfortunately, we were unable to negotiate changes to payment terms in some cases due to limitations in the contract conditions. Additionally, foreign clients have taken advantage of our financial difficulties to restrict project budgets, resulting in budgets lower than those of 2019.” (C.2)

“ We only utilized our overseas accounts when dealing with trusted clients and international organizations that denominate their contracts in fresh US dollars. We were unwilling to compromise on this amount in order to advance local projects, but instead used these funds wisely for foreign-funded projects, knowing that the investment would come back to us.”(C.2)

7.3.2.2 Cash flow:

“The absence of the banking sector, which impacted the flow and availability of money, had an impact on cash flow.” (C.1)

“The change in payment terms had a significant impact on our cash flow. Our usual practice was to receive an advance payment at the beginning of the project, typically 10-15% of the contract sum. However, due to a shortage of payment facilities, suppliers imposed new terms requiring us to pay 100% of the invoice amount instead of a percentage advance payment. Even if we improved the conditions of payment from the client's side by 10% to 15%, we still had to pay suppliers 100% in advance, causing a disruption in our cash inflows and outflows. Additionally, we experienced payment

delays from clients, particularly in cash payments for projects of types A, B, and C, further depleting our financial resources”. (C.1)

“The focus shifted from profit to cash flow as a key indicator of success. Even if we were only breaking even at the end of a project, it was essential to generate positive cash flow. In order to ensure the long-term viability of the company, I implemented various initiatives aimed at improving our cash position and maintaining financial stability.” (C.1)

“The company's efforts to secure money outside the country were not sufficient to overcome the disruption in cash flow caused by a significant increase in outflows due to suppliers' demand for 100% cash deposits for procurement, coupled with low inflows from the client's side...” (C.2)

7.3.2.3 Risk of insolvency:

“If we had not taken effective mitigation actions, there could have been a significant risk of insolvency.”(C.1)

Table 17: Impact of the crises on company level

Impact on company level	Brief
<i>Terrible financial statement</i>	Inaccuracy in the representation of revenues and expenditures worth on the financial statement due to continuous currency fluctuation in order to make critical management and investment decisions. (C.1)
<i>Decrease in company's turnover</i>	Drop in volume of construction activity owing to an unappealing market causing a decline in operating firm turnover and an increase in overhead/turnover ratio, which makes it more difficult for the company to pay for fixed costs and corporate overhead as there would be less revenue available to cover this. (C.1 & C.2)
<i>Disruption in company's cash flow</i>	<p>Difficulty in accessing credit:</p> <ul style="list-style-type: none"> - Firm rely highly on borrowed capital from banks to finance construction projects with little reliance on fixed assets. The difficulty of obtaining credit due to suspension of bank loans and imposed limits on cash withdrawal created cash flow problems - Inability to liquidate LBP and USD checks - Decrease volume of construction jobs <p>Delay in Client's payment:</p> <ul style="list-style-type: none"> - Increased delays in payments for executed projects due to Client financial difficulty and inability to acquire cash money - Depreciation in the of owed payments <p>Disruption in the conventional way of procurement</p> <ul style="list-style-type: none"> - Acquire 10 to 15% advance payment and pay 100% down payment for suppliers (C.1 & C.2)
<i>Limitation on profitability to extent of acquiring losses</i>	<p>Failure to achieve a desired rate of return on capital invested due to continuous depreciation of the Lira against the Dollars:</p> <ul style="list-style-type: none"> - Contractors are getting payments from the Clients via checks (at the exceptional bank rate) or LBP when all the expenditures are procured in cash dollars at the parallel market (C.1 & C.2)
<i>Risk of insolvency</i>	Construction company suffered from financial hardship which is close to bankruptcy's * (C.1)

* Due to adequate actions taken to mitigate the impact of the crisis, C.1 did not suffer from insolvency

7.4 Bonds

"We reached the stage where, with the client's consent, we could only prove a line of credit through bank checks, a company guarantee, or by simply starting the project without a bid bond." (C.1)

“Since it was too difficult to obtain new bonds, local bonds were formed. For instance, for a bid bond amounting to \$1,000,000, the amount shall be increased by a factor put in a check and accepted by the Client to be liquidated in Bank credit (3,900LBP/USD till April 2020, and 8,000LBP/USD starting December 2021) when the parallel market was way higher than that rate”(C.1)

“We were not requested to acquire collateral for non-dollar cashed bonds. However, few condition precedents were set by the banks prior to get the bonds such as good financial history with the bank, proving adequate financial status of the client preferably foreign client” (C.1)

"We instantly abandon the project for the fresh collateral case because we have to acquire cash collateral. We were already struggling with a scarcity of liquidity, so blocking them in the bank is not the best option. Additionally, we don't trust banks; we were concerned to deposit our money in banks and lose them again” (C.1)

7.5 Mitigation Measures

For the pilot study the same taxonomy framework in Chapter 4 was adopted, whereby the semi-structured interview conducted with both interviewees used the taxonomy themes to lead the interview. From the resulting interview transcripts, response strategies were identified as the result of the recent economic crisis. Using the taxonomy framework each response strategy is classified under the relevant theme as shown in Table 18 and then further classified according to Porter’s generic categories. A total of 29 response strategies were identified.

From examination of the data in Table 18 of the three generic strategies, cost leadership is the most commonly used strategy with the highest number of response strategy

accounting for 17 strategy out of 29-response strategies list. The most common ones adopted relate to financial strategies and consist of negotiation of the bid bonds with the Client when it was impossible to acquire bonds from banks, use local debt for purchase in USD, denominate hard currency in contracts, amendments of contractual provisions for the method of payment, internal financing, creation of company's own financing, claim for low advance payment for small-sized projects, and trade with bank checks as much as possible.

The second most common type of strategy is focus accounting for 8 response strategies.

The most common focus strategies are found to relate to marketing.

The thirist most common type of strategy is differentiation accounting for 5 response strategies.

Table 18: Response strategies adopted as a result of the Lebanese financial and economic crises

Strategies		Brief
Cost Leadership		
<i>Financial</i>		
1	Negotiation of the bid bond with the Client when it was impossible to acquire bonds from banks (C.1 & C.2)	<ul style="list-style-type: none"> - Local Clients adapted to amendments in contract stipulation and subsequently accepted bank checks or factored bank checks amount by digit to inflate the value - Foreign Client: Refused to embark on any project without a bid bond
2	Netting and matching (C.1 & C.2)	Paying for local expenses in the local currency and exchanging only the necessary amount of USD into local currency to cover the remaining portion of local payments. This allowed Contractors to avoid unnecessary currency conversions and minimize the impact of exchange rate fluctuations on Contractors finances
3	Denominate hard currency in contracts (C.1 & C.2)	The contractors prefer to bid on projects using hard currency such as US Dollars, which is considered stable and widely accepted in international transactions.
4	Amendments of method of payment contractual provisions (C.1 & C.2)	Requesting cash payments from clients rather than bank checks. This was done in an effort to improve cash flow and reduce delays caused by bank check processing times Receiving assets such as apartments and land property instead of cash or checks as a form of payment
5	Internal financing (Finance one project from the other)(Figure 31) (C.1 & C.2)	<p>Use part of advance payment of long-term projects to finance small sized projects</p> <p>Use the profit of short-term project to finance the ongoing long projects</p>
6	Creation of company's own financing (C.1)	<p>Partner's equity</p> <p>Use cash reserve</p> <p>Sell property and fixed assets</p>
7	Claim for low advance payment for small-sized projects (C.1)	When bidding for small-sized projects, contractors request a low advance payment from the client. This could be advantageous for contractors, as it increases the likelihood of securing the project.
8	Trade with Bank checks as much as possible (C.1 & C.2)	Decrease the pressure on liquidity usage: This way, contractors could use the checks to close negative bank accounts and alleviate their own financial burden. This allowed us to maintain our cash flow and avoid any unnecessary strain on our liquidity.
<i>HR/Personnel</i>		
9	Cut wage salaries (C.1 & C.2)	<p>Approximately 30% cut on salaries, to reduce overhead costs</p> <p>Wage formulas are based on a combination of Lebanese pounds (LBP), Lebanese dollars (Lollar), and a small portion in US dollars (USD), but there was no adjustment made to the real value of USD.</p>
10	Laying off employees (C.2)	Reduce overhead costs
11	Cut Bonuses (C.1 & C.2)	Reduce overhead costs
12	Cuts in dividend (C.1 & C.2)	Reduce overhead costs

13	Freezing staff recruitment (C.1 & C.2)	Reduce overhead costs
<i>Tendering/Contracts</i>		
14	Decrease profit margins in bid prices (C.1 & C.2)	The risk of decreasing the profit margin to secure more projects
<i>Restructuring</i>		
15	Close Regional offices	
16	Use local debt for purchases in USD (C.1)	Due to the LBP's ongoing depreciation against the USD, use LBP for recent transactions in USD payable in LBP at the daily exchange rate, and repay the loan later using when the Dollar registers a higher exchange rate.
Differentiation		
<i>HR/Personnel</i>		
17	Skillful employee retention (C.1)	Retaining employees by offering special wages to reduce the risk of losing valuable talent to competitors
18	Improve the financial statement (C.1)	Following the implementation of an accounting system change and job costing for internal company performance assessment, profits, losses payments and receivables are then readily identified (either in LBP, Lollar, Dollar)
19	Enhance a good culture among employees (C.1)	By fostering an environment of open communication and transparency, employees are less likely to become disengaged or leave the company.
20	Avoid compromising on quality (C.1 & C.2)	Sustain company's performance
<i>Marketing</i>		
21	Improve relationship with stakeholders (C.1)	
Focus		
<i>Marketing</i>		
22	Full suspension of projects funded in local currency (LBP) either with private or local sector (C.1)	Following rejection of payment and currency-related contract terms amendments
23	Secure projects outside the country (C.1 & C.2)	Acquire revenues in cash dollars Improve Company's turnover Improve the Cash flow Maintain company's sustainability
24	Secure projects funded by foreign currency (C.1 & C.2)	Bid on projects funded international organization
25	Specific selection of Clients (C.1 & C.2)	Choose clients with adequate financial status, foreign clients and/or large organizations
26	Decline projects requesting fresh bid bonds (C.1)	This require the blockage of cash dollar for acquiring dollar denominated bid bonds
<i>Tendering/Contracts</i>		
27	Enter into new core businesses (C.2)	Creating sister companies Enroll in sales sector
28	Enter into joint venture (C.1 & C.2)	
29	Secure small projects (C.1 & C.2)	Securing short-term projects of 6-7 months to enhance cash flow

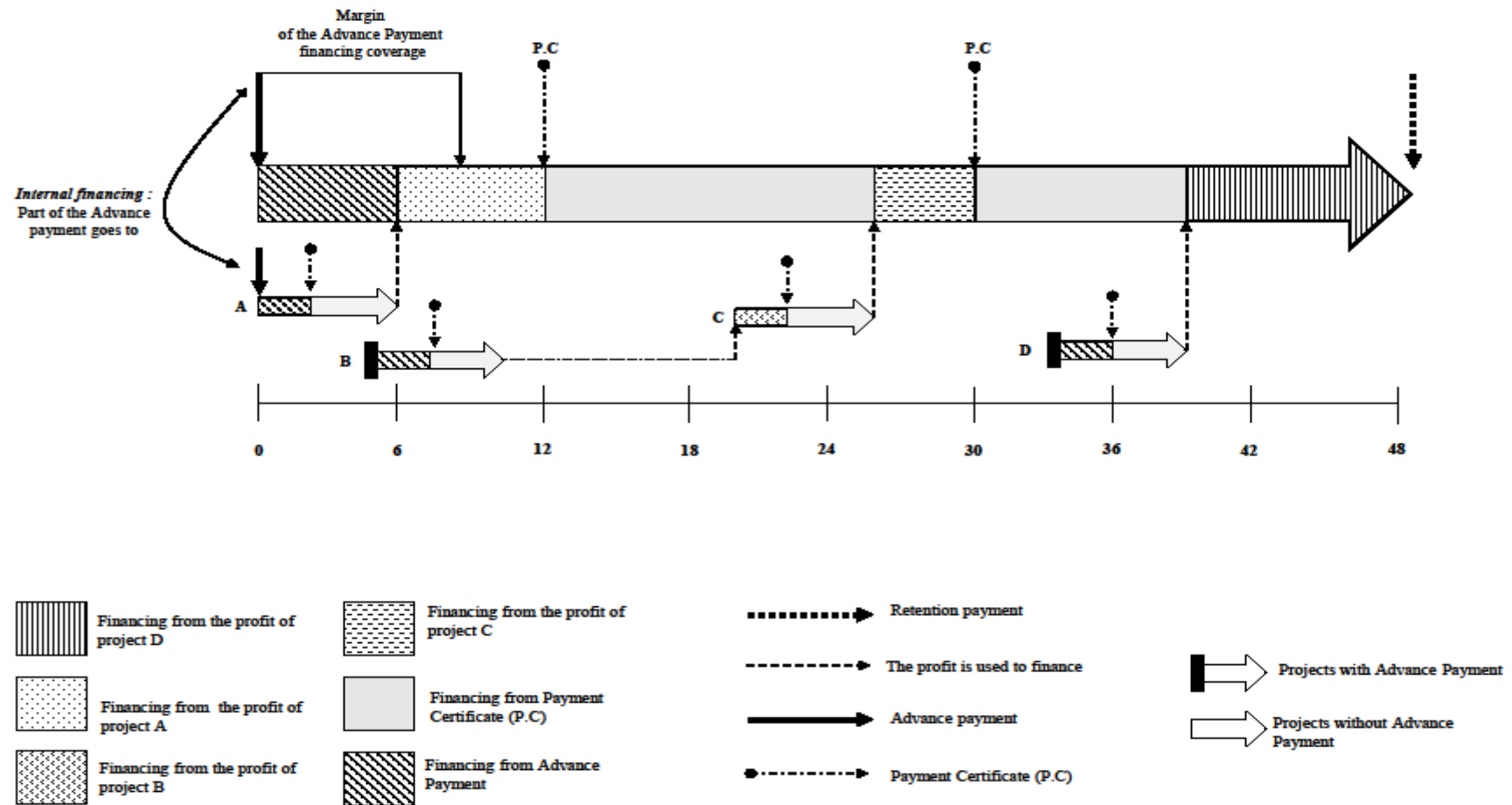


Figure 31: Mitigation measure- Internal Financing

CHAPTER 8

ANALYSIS AND RESULTS OF THE QUESTIONNAIRE SURVEY

This chapter describes the analysis and results of the questionnaire survey conducted online. The chapter consists of two main sections. The purpose of the first section is to identify from construction participants' point of view the level of impact of the factors that contribute to delay of the construction progress amid the financial and economic crises. The second section's purpose identify the level of effectiveness of the mitigation measures adopted by local contractors; subsequently create a taxonomy according to Porter's strategy (1980) to evaluate the most common strategy.

8.1 Delay

8.1.1 *Results and Discussions*

All the participants responded to the questions in total. The perspective of Contractors on the 15 identified causes of delay were analyzed based on their relative of importance index. The relative importance index and ranks factors are presented in Table 19. Table 19 shows all 15 delay factors with their RII, mean values, coefficient of variation, and rank.

Respondents ranked the necessity for currency conversion for procurement purposes, from USD either to LBP or vice versa as the most influential cause of delay with a relative importance index (RII) of 1.00. The CV of this factor is 0.227 reflecting high level of agreement among the participants. Contractors were finding it increasingly difficult to convert their local money into US dollars, which is the preferred currency for many transactions in Lebanon, as previously noted by interviewees. This created

delays in a variety of financial operations, including imports. The primary impact of the challenge in converting local currency to US dollars is the delay it causes in procurement processes. This result continues on showing the disruption that the restrictive monetary policies, shortage of dollars, and lack of liquidities has caused. Contractors had to trade their cash for dollars in order to purchase imported goods or even to exchange their Dollar for LBP in order to purchase local materials, notably cement. It's believed based on what one of the contractors had stressed on, that the unconventional payment terms, and supplier request for cash payments refusing to deal with bank notes and online payments negatively impacted the progress of the work. Thus, Contractors were no longer able to take advantage of the privilege of quick procurement and making materials available on site in a timely manner. The participants agree on the impact of the necessity of currency conversion for procurement purposes as a factor contributing significantly to project delay with CV factor of 0.27.

The second most influential cause of delay is price fluctuation with a relative importance index RII of 0.97. The CV of this factor is 0.306 reflecting high level of agreement among the participants.

Sub-contractor financial difficulty was ranked third with relative importance index of 0.94. Subcontractors were facing the same struggle as the main contractors since they were both fighting the same battle. Together with the effects of the financial crisis, one of the interviewees who participated in the interview also discussed the effects of having back-to-back contracts with subcontractors. It appears as though the main contractor's and the subcontractor must share the client's hardships. The participants agree on the impact of sub-contractor financial difficulty on project delays with a CV factor of 25%.

Respondents ranked the shortage of skilled/semi-skilled labors due to unattractive market and the Client delay in making decisions whether to start a project, advance works or suspend works as the fourth factor with a relative of importance index of 0.91. Due to unattractive market, contractors suffered from shortage of labors that were no longer willing to work for depreciated wage rates.

Respondents ranked delay in Client's difficulty accessing cash money for procurement, supplier's refusal to deal with checks payment, negotiations of payment terms with the client and shortage/unavailability of fuel the fifth most influential cause of delay with a relative importance index (RII) of 0.89. Client's difficulty accessing cash money for procurement has become a common problem, as the main factor of the financial crises is the liquidity problem faced by banks and the tightened limits on foreign currency withdrawals. The CV of this factor is 0.331 reflecting a level of agreement among the participants.

As previously mentioned by the interviewees, the majority of procured materials used for construction is imported and the necessity of the dollar currency became a condition precedent for any kind of procurement when construction companies were restricted to limited access to both foreign and domestic currency. Suppliers were no longer accepting check payments rather cash money for procuring both local and imported materials. In addition, it was emphasized in the interview that the inability of contractors to deliver materials on site in a timely manner was a major factor in timetable delays due to the difficulty in making cash money available for procurement. Shortage of fuel caused struggle for construction companies to find enough fuel to operate their machinery and transport their materials, which can cause delays in the project timeline.

The sixth most crucial factors causing delay are the decline in cement deliveries and unavailability all the time and subcontract payment term adjustment with RII of 086. It's believable that the shortage in cement is not related to the cash economy that has invaded Lebanese market. However, both interviewed contractors has raised the issue that the shortage in cement availability has significantly affected construction progress raised it. The CV factor of this factor is 34.4%

The least ranked factor by respondents was suspension of line of credit for procurement. As they rely on procurement through the already established connections with their own suppliers, this outcome can be justified. As previously mentioned in the above discussion, Contractors have been feeling several repercussions when dealing with the suppliers for procurement.

Emigration of employees leading to shortage of engineers (RII = 80%), lack of suppliers stock and the extended lead time needed to place the order (RII = 71.4%), and suspension of line of credit for procurement (RII = 80%), accounts in fact for high rate of importance as it still ranges in the 80th percentile and higher but are found to be the least factors causing delay. The participants agree , as the CV factor ranges between 30% to 40%, on the impact of the aforementioned factors on project delay.

Table 19: Rate importance index of the delay factors

Delay Factor	RII	Rank	Mean	Standard dev	CV
The necessity for currency conversion for procurement purposes, either from USD to LBP or vice versa	1.00	1.00	4.38	0.99	0.227
Continuous price fluctuation of construction materials	0.97	2.00	4.25	1.30	0.306
Subcontractors financial difficulty	0.94	3.00	4.13	1.05	0.255
Shortage of skilled/semi-skilled labors due to unattractive market	0.91	4.00	4.00	0.87	0.217
Client delay in making decisions whether to start a project, advance works or suspend works	0.91	4.00	4.00	1.32	0.331
Client's difficulty accessing cash money for procurement	0.89	5.00	3.88	1.27	0.327
Supplier's refusal to deal with checks payments (unworthiness of Dollar/Lira checks	0.89	5.00	3.88	1.17	0.301
Negotiations of payment terms with the client	0.89	5.00	3.88	1.36	0.352
Shortage and/or unavailability of fuel	0.89	5.00	3.88	0.93	0.239
The decline in cement deliveries and unavailability all the time	0.86	6.00	3.75	1.20	0.320
Subcontract payment terms adjustment	0.86	6.00	3.75	1.20	0.320
Emigration of employees leading to shortage of engineers	0.83	7.00	3.63	0.86	0.236
Client delay in honoring payment	0.83	7.00	3.63	1.41	0.389
Lack of supplier's stock and the extended lead time needed to place the order and deliver the products	0.80	8.00	3.50	1.22	0.350
Suspension of line of credit for procurement	0.80	8.00	3.50	1.12	0.319

8.2 Mitigation measures

8.2.1 Taxonomy of Porters Strategy: The case of Lebanon

From the two pilot interviews, a total of 29 response strategies adopted to survive the Lebanese economic crises were identified and classified in Table 21 using the taxonomy framework developed in Table 4.

C.3 adopted 23 strategies out of 29, C.4 adopted 19 strategies, C.5 adopted 14 strategies, C.6 adopted 23 strategies, C.7 adopted 19 strategies, C.8 adopted 26 strategies, C.9 adopted 17 strategies, and C.10 adopted 21 strategies.

As shown in the majority of the response strategies adopted for all Contractors are found to relate to cost leadership, which according to Porter's strategies involves the

pursuit of cost reduction and cost minimization. Cost leadership is the most common response used by contractors in reaction to the Lebanese economic crisis followed by focus and differentiation.

Table 20: Frequency of response strategies for each Contractor

Strategies	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10	TOTAL
TOTAL COST LEADERSHIP	14	11	3	11	13	13	11	10	83
TOTAL DIFFERENTIATION	3	3	5	4	1	4	2	5	27
TOTAL FOCUS	6	5	6	8	5	9	4	6	49
TOTAL RESPONSE STRATEGIES	23	19	14	23	19	26	17	21	

The cost leadership is the most common strategy for all companies within this generic category. According to the taxonomy, “Netting and matching” is the most strategy adopted by the Contractors with a score of 8 out of 8 Contractors. This is done by paying local expenditure using local currency and exchanging USD into local currency to pay the remaining portion of local payments. The next most common strategies under cost leadership are trading with Bank checks as much as possible, cut wage salaries, cuts in dividend, decrease profit margins in bid prices scoring 7 out of 8. Amendments of contractual provisions for the method of payment, cut Bonuses, freezing staff recruitment, and decrease tender price accounts for 6 out of 8 Contractors.

In relation to focus strategy, all companies record all 49 responses, which is less than the overall cost leadership response. In addition, each contracting company response shows a lower score than the cost leadership score. The common strategies for all companies within this generic category relate to securing projects funded by foreign currency, specific selection of clients and denomination of hard currency in contracts accounting for 8 out of 8 responses.

The next most common response strategy used under focus is entering to new core businesses and securing projects outside the country.

In terms of differentiation strategies, all companies recorded a total differentiation of 27, which is less than the overall focus response. In addition, each contracting company response shows a lower score than the focus score. The common strategies for all companies within this generic category relate to HR/Personnel, consisting of retaining skillful employee and enhance and implement good culture among employees accounting for 6 and 7 out of 8 respectively. The next most common strategies under differentiation are placing an emphasis on marketing efforts to better position the company in the market and diversification into new core businesses accounting for 5 out of 8 responses. The next most common response strategy is securing small projects recording 5 out of 8 responses.

Table 21: Taxonomy of the response strategy adopted during Lebanese economic crises

Strategies	C.3	C.4	C.5	C.6	C.7	C.8	C.9	C.10	TOTAL
<u>Cost Leadership</u>									
<i>Financial</i>									
Negotiation of the bid bond with the Client when it was impossible to acquire bonds from banks	X	X		X	X		X		5
Amendments of contractual provisions for the method of payment	X	X		X		X	X	X	6
Netting and matching by paying local expenditure using local currency and exchanging USD into local currency to pay the remaining portion of local payments	X	X	X	X	X	X	X	X	8
[Use already acquired local debt (in LBP) to purchase in USD and repay the local loan at a later stage when the Dollar reaches a higher exchange rate]					X				1
Change in accounting system to reflect accurate financial statement	X		X			X	X	X	5
Creation of company's own internal financing	X	X		X	X				4
Claim for low advance payment for small-sized projects	X					X			2
Secure money outside the country	X		X	X	X	X			5
Trade with Bank checks as much as possible	X	X		X	X	X	X	X	7
Creation of company's own financing from partner's equity, cash reserves and/or selling property and fixed assets	X	X			X	X			4

<i>HR/Personnel</i>								
Cut wage salaries	X	X		X	X	X	X	7
Laying of employees	X			X		X	X	5
Cut Bonuses		X		X	X	X	X	6
Cuts in dividend	X	X		X	X	X	X	7
Freezing staff recruitment	X	X			X	X	X	6
<i>Tendering/Contracts</i>								
Decrease profit margins in bid prices	X	X		X	X	X	X	7
<i>Restructuring</i>								
Close Regional offices					X			1
<u>Differentiation</u>								
<i>HR/Personnel</i>								
Skillful employee retention	X	X	X	X		X		6
Enhance and implement good culture among employees	X	X	X		X	X	X	7
Avoid compromising on quality			X	X		X		4
<i>Marketing</i>								
Place an emphasis on marketing efforts to better position the company in the market	X		X	X			X	5
Diversification into to new core businesses		X	X	X		X		5
<u>Focus</u>								
Claim for low advance payment for small-sized projects	X					X		2
Secure projects outside the country	X		X	X		X		5
Secure projects funded by foreign currency	X	X	X	X	X	X	X	8
Specific selection of Clients	X	X	X	X	X	X	X	8
Denominate hard currency in contracts	X	X	X	X	X	X	X	8
Decline projects requesting fresh bid bonds		X		X	X	X		4
<i>Tendering/Contracts</i>								
Enter into new core businesses		X	X	X		X		5
Enter into joint venture				X		X		2
Secure small projects	X		X	X	X	X	X	7

8.2.2 Results and Discussions

The perspective of Contractors on the 29 response strategies were analyzed based on their relative of importance index. The rate of importance index represents the perceived effectiveness of the listed mitigation measures in addressing the challenges faced during economic crises. When a specific mitigation measure has a high rate

importance index, it suggests that it was perceived to be highly effective in rectifying the impact of the Lebanese financial and economic crisis on the firms. The relative importance index and ranks factors are presented in shows the results of the 29 mitigation measures from Contractors perspective with their respective RII, mean values, coefficient of variation, and rank.

As previously mentioned, the mean value is interpreted as follow; the respondents agree with the statement if it is greater than three and disagree if less than that. The mean for all items is greater than three, which means that respondent's point of view is consistent. Also, the lesser the value of CV, the more agreement among the responses.

The calculated CV indicates that the participants collectively agreed on the frequency of the above factors as effective mitigation measures except for both close regional offices and avoid compromising on quality accounting for a CV value of respectively 0.6 and 0.53.

Respondents ranked securing projects funded in foreign currency as the most influential mitigation measure with a relative importance index of 0.925, followed by both decrease profit margins in bid prices and denominate dollar currency in contracts with RII if 0.9. The participants agree to "Securing projects funded by foreign currency" to be an effective mitigation measure with a CV factor of 10%.

According to the survey results, a significant majority of respondents (87.5%) decreased their tender prices. This decrease was directly linked to the decline in profit margins experienced by the respondents. According to the survey response, 3 out of 7 contracting companies (57%) decrease their profit margins between 20 % to 40% and 4 out of 7 (43%) decreased by their profit margins up to 20%. The decline in profitability

experienced by Lebanese contractors in construction projects can be attributed to several factors. Firstly, the industry has witnessed an increase in competition, which has led to contractors being required to lower their prices to secure contracts. This has ultimately led to lower profit margins for these businesses. Secondly, there has been a decrease in demand for construction projects in Lebanon, which has made it difficult for contractors to secure new projects. With fewer projects available, contractors are finding it more challenging to maintain profitability. Thirdly, maintaining relationships with existing clients is crucial for Lebanese contractors to secure repeat business. However, this can be challenging in a highly competitive market, and contractors may need to offer lower prices to keep clients loyal.

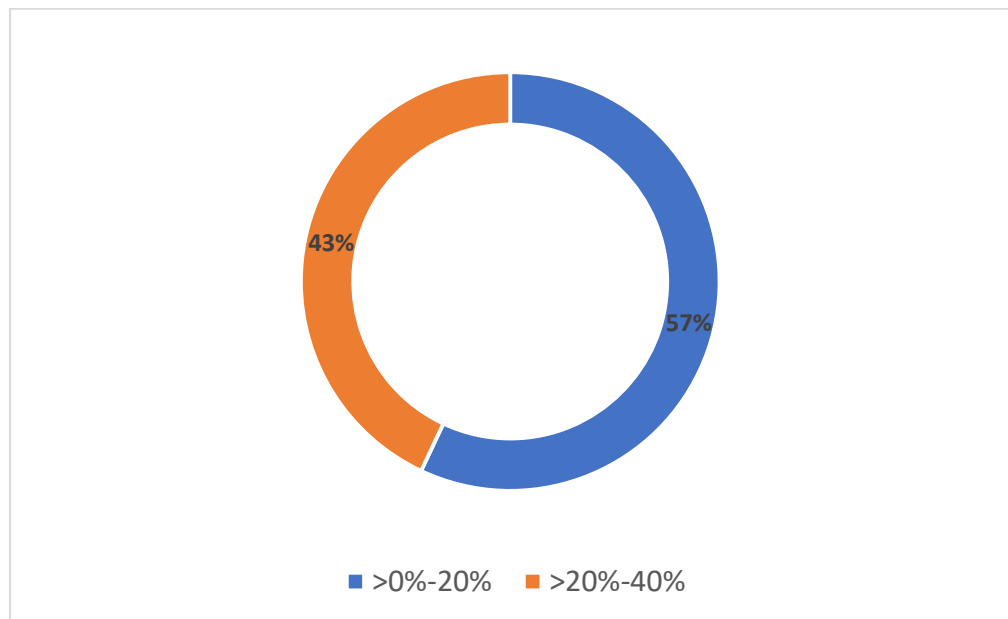


Figure 32: Declining Profitability: A Graphical Representation of the Percentage Decrease in Profit Margins

Finally, to keep their operations active and maintain a steady stream of projects, Lebanese contractors may be forced to take on projects with lower profit margins than they would prefer. This can lead to a decrease in overall profitability for the company.

The above three aforementioned mitigation measure has both high rate importance index and high frequency, which shows that these measures were perceived to be highly effective in mitigating the impact of the Lebanese economic crises and was widely adopted among the local contracting companies.

The third mitigation measures are both negotiation with the Client when it was impossible to acquire bonds from banks and choosing client with adequate financial status, foreign clients and/or large organizations with RII of 0.875 and a frequency of 5 and 8 respectively. Choose client with adequate financial status, foreign clients and/or large organizations was highly adopted and it's also considered an effective mitigation measure in addressing the challenges faced during economic crises.

At the outset of the crisis in 2019 until the end of 2021, 25% of the respondents explained that all guarantees were issued in check dollars, which cannot be liquidated in cash dollar money and whose worth does not reflect the same value as the dollar tradable in the parallel market. Following that, starting in 2022, these guarantees were granted in fresh cash dollar as recommended by the Client.

25% of the respondents said that the guarantee amount in fresh money was obtained by factoring the Lollar amount corresponding to the cash worth from banks since the fresh dollar currency was not effectively available and they were unable to acquire the dollar currency. 12.5% respondents obtained guarantees from foreign banks when they had accounts outside of the nation. 37.5% stopped any project requiring guarantees without any negotiations

The fourth mitigation measure is the amendments of client-contractor contractual provisions for the method of payment with RII of 0.85 with frequency of 6

out of 8 respondents. The participants agree on the amendments of client-contractor contractual provisions as an effective mitigation measure with a CV factor of 26%.

Among the amendments made to the contractual provisions for the method of payment, 4 contractors claimed for fresh dollars amount to cover the material costs and the adjustment in manpower wage fluctuations between 2019 and 2021.

2 out of the 8 respondents explained that between 2019 and 2021, payments terms were adjusted to cover 50% of payments in cash and 50% of payments in check. Contractors claimed for full fresh payments and converted all payments to fresh dollar currency in 2022.

2 out of 8 respondents did not negotiate payment terms with the Clients but following 2022 all payments of new contracts were claimed to be certified fresh dollars. One of the eight respondents requested a big advance payment for large projects as a method for financing their projects, which ranged from 25% to 45% of the contract price.

The fifth mitigation measure is the retention of skillful employee by offering special wage package and securing projects outside the country with an RII value of 0.825 and frequency of 6 and 5 out of 8 respondents respectively.

Among the participants that resorted to securing projects outside the country resorted to the GCC, UAE, KSA, Egypt, Cyprus, European countries, West Africa, and Cyprus.

The sixth mitigation measures are securing small projects, building good culture among employees, and securing money outside the country accounting for an RII of 0.775.

The seventh mitigation measures are diversification into new core businesses and placing marketing efforts to better position the company into the market with an RII of 0.725.

According to the survey responses, participants enter into many core businesses to increase revenues such as Energy sector, waste management and international sales such as selling merchandises.

Besides changing the accounting system to reflect accurate financial statement, the remaining factors have RII less than 60% with entering into joint venture contracts the less effective measure.

Among the less effective mitigation measure that did not show a high rate of importance are trade with bank checks as much as possible and cut wage salaries accounting for an RII of 0.6 ranking 10th among the mitigation measures. However, the respondents recorded a high frequency of 7 out of 8 respondents, which show the popularity of specific mitigation among contracting companies. Despite of the widely use of these mitigation measures, participants did not show a high rate of effectiveness in addressing these challenges faced during the crises.

Based on the survey, a small number of participants reduced their employees' salaries by 35%, 30%, 50%, and 70%. Additionally, some respondents used bank checks to compensate their staff at a rate of 3,900LBP/USD before April 2020, but this increased to 8,000LBP/USD from December 2021. However, the value of the dollar in the parallel market was considerably higher than these two figures. Some others adopted a 60% cash and 40% check approach to paying their employees.

In addition, claiming a low advance payment for small-sized projects to increase the odds of securing small projects, decline projects requesting fresh bid bonds, laying

off employees and cutting bonuses ranks 12 with an RII of 0.575. The survey participants who reported reducing their low advance payment provided the following breakdown: 12.5% of respondents claimed to have eliminated low advance payment entirely (0%), while 25% reported an advance payment range of greater than 0% to 10%. Another 25% claimed a range of greater than 10% to 25%, and a further 25% reported a range of greater than 25% to 45%. Finally, 12.5% of respondents claimed to have reduced low advance payment by more than 45%.

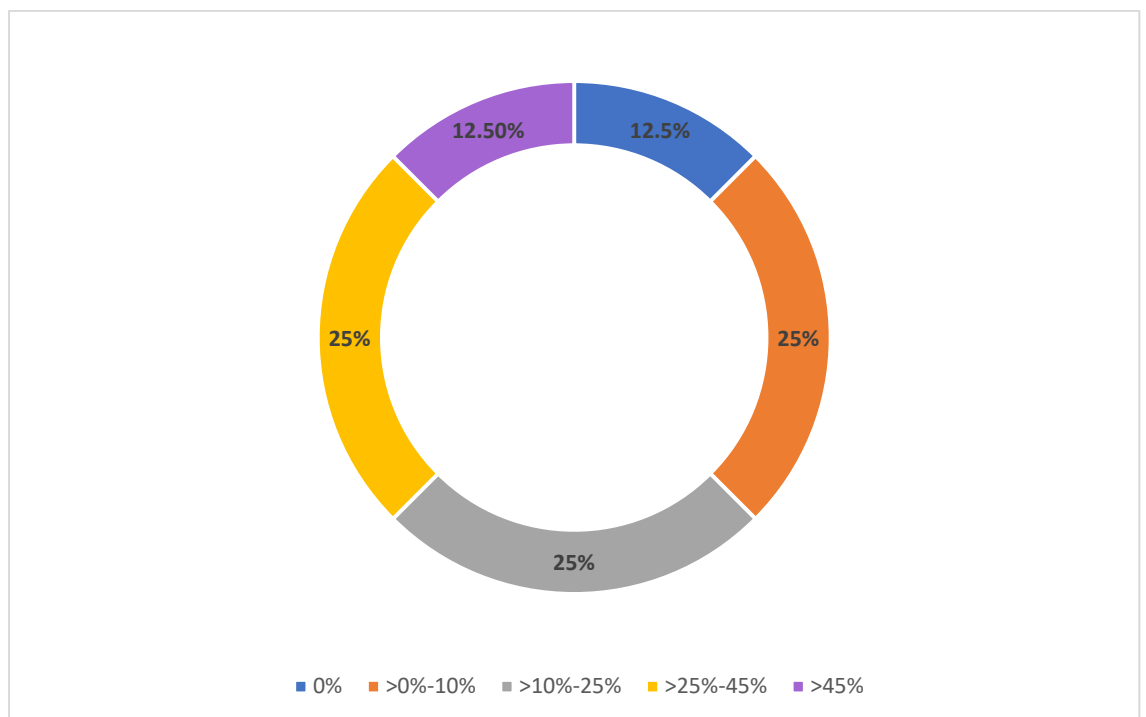


Figure 33: Survey Results: Breakdown of Low Advance Payment Reduction Among Participants

Table 22: Rate importance index of the mitigation measures adopted by the construction companies.

Mitigation Measures	RII	Rank	Mean	CV	Frequency
Secure projects funded by foreign currency	0.925	1	4.63	0.10	8
Decrease profit margins in bid prices	0.9	2	4.50	0.11	7
Dominate dollar currency in contracts	0.9	2	4.50	0.16	8
Negotiation with the client when it was impossible to acquire bonds from banks.	0.875	3	4.38	0.16	5
Choose client with adequate financial status, foreign clients and/or large organizations	0.875	3	4.38	0.11	8
Amendments of Client-Contractor contractual provisions for the method of payment	0.85	4	4.25	0.26	6
Retention of skillful employee by offering special wage package	0.825	5	4.13	0.19	6
Secure projects outside the country	0.825	5	4.13	0.33	5
Secure small projects	0.775	6	3.88	0.24	7
Build good culture among employees through attempt to wash over employees concerns	0.775	6	3.88	0.20	7
Secure money outside the country	0.775	6	3.88	0.37	5
Diversification into new core businesses	0.725	7	3.63	0.41	5
The company places an emphasis on marketing efforts to better position the company in the market	0.725	7	3.63	0.27	5
Change in accounting system to reflect accurate financial statement	0.7	8	3.50	0.43	5
Creation of company's own financing from partner's equity, cash reserves and/or selling property and fixed assets	0.65	9	3.25	0.37	4
Freezing staff recruitment	0.625	10	3.13	0.46	6
Netting and matching by paying local expenditure using local currency and exchanging USD into local currency to pay the remaining portion of local payments	0.625	10	3.13	0.41	8
Trade with bank checks as much as possible	0.6	11	3.00	0.33	7
Cut wage salaries	0.6	11	3.00	0.41	7
Avoid compromising on quality	0.6	11	3.00	0.53	4
Claim a low advance payment for small-sized projects to increase the odds of securing small projects.	0.575	12	2.88	0.41	2
Decline projects requesting fresh dollar bid bonds	0.575	12	2.88	0.41	4
Laying off employees	0.575	12	2.88	0.41	5
Cutting bonuses	0.575	12	2.88	0.41	6
Cuts in dividend	0.525	13	2.63	0.42	7
[Use already acquired local debt (in LBP) to purchase in USD and repay the local loan at a later stage when the Dollar reaches a higher exchange rate	0.5	14	2.50	0.45	1
One project is financed by another	0.45	15	2.25	0.48	4
Close regional offices/ reduce number of offices if an	0.425	16	2.13	0.60	1
Enter into joint venture on contracts]	0.4	17	2.00	0.43	2

CHAPTER 9

CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

In conclusion, the research investigates the various factors that have contributed to the unconventional way of administrating construction projects. The findings highlight several key factors that have disrupted the traditional project management practices. The first significant factor is the difficulty in project financing due to disruptions in the Lebanese banking sector. In addition to the introduction of new local currencies that are not tradable internationally accompanied by its ongoing fluctuations. Furthermore, the study points out the scarcity and unavailability of fuel, changes in legislations and policies, material shortages and change in payment terms with the suppliers.

Based on the findings of the thesis study, it can be concluded that the Lebanese financial crisis has had a significant impact on the construction industry in Lebanon. One of the most significant impacts has been on the cost of local and imported materials, manpower, plant and equipment used in construction projects.

In addition, The Lebanese financial crisis has had a significant impact on the quality of construction project implementation in Lebanon. The reliance on local materials or lower quality allowed by the specifications, the emigration of engineers, and the shortage of skilled labor have all contributed to a decrease in the overall quality of construction projects in Lebanon. It should be noted that this impact is not necessarily a low-quality implementation, but rather a lower quality than before, whenever the specifications stipulations allow for this.

The study revealed many factors that have caused delay for construction projects as a result of the severe Lebanese financial and economic crises with different degrees of impact. These causes of delay include factors related to procurement, manpower, financing and contractual issues. Fifteen factors that contribute to delay were identified through the pilot study. Of those factors, the main most important factors are the necessity for currency conversion for procurement purposes, continuous price fluctuation of construction materials, subcontractor's financial difficulty, shortage of skilled/semi-skilled labors due to unattractive market and client delay in making decision whether to start a project, advance works or suspend works.

This study critically reviewed and synthesized two studies on response strategies adopted in the construction industry. This resulted in the development of a taxonomy of response strategies to economic recessions relative to Porter's (1980) generic strategies. The taxonomy framework was also used to critically evaluate the response strategies of UK and Singapore construction contractors to the 2007 economic recession. Similarly, through a pilot study, mitigation measures adopted by construction companies to overcome the challenges of the Lebanese financial and economic crises were identified.

Subsequently, the mitigation measures were sorted under a taxonomy framework that has been developed to evaluate the response strategies adopted by the local contracting companies in addressing the challenges faced during the economic crises according to Porter's strategy.

Following the results of the survey analysis and the critical review, the majority of construction companies adopt cost leadership strategies in order to survive the Lebanese economic crises followed by focus and differentiation.

The most effective and frequently used mitigation measure is securing projects in foreign currencies and the least effective is entering in to joint venture contracts. This study contributes to knowledge and practice in the strategic construction management field by proposing a comprehensive taxonomy of response strategies that construction companies can use to survive economic turbulence. It also provides a platform for academic researchers in their future studies in the field. Researchers could examine trends in organizational restructuring and in the strategic management processes such as investigating the response strategies adopted by failed companies during the Lebanese economic crises.

The research on the impact of the Lebanese financial crisis on the construction industry can be helpful for other countries facing similar economic challenges. The findings can help other countries in identifying potential disruptions in their construction industry and take necessary measures to mitigate them. The study provides insights into the various factors that can disrupt traditional project management practices and affect project implementation. By understanding these factors, other countries can diversify their financing sources, plan for mitigation measures, and take adequate measures to overcome challenges.

The taxonomy of response strategies proposed in the study can also be helpful for other countries in developing their own response strategies to economic turbulence. Other countries can use this taxonomy as a starting point to develop their own response strategies that suit their unique circumstances.

Furthermore, the study also provides a platform for academic researchers in the field of strategic construction management to conduct future research on organizational restructuring and the strategic management processes during economic crises. This can

lead to a better understanding of the impact of economic turbulence on the construction industry and help in developing more effective response strategies.

9.2 Recommendation

Future studies could expand on the findings of this study by increasing the sample size and reaching out to a larger number of contracting companies in Lebanon. By doing so, researchers could gain a more comprehensive understanding of the challenges faced by the construction industry in Lebanon and the effectiveness of response strategies. By expanding on the financing of this study and conducting further research, we can continue to develop more effective strategies for addressing the challenges facing the construction industry in Lebanon and promote sustainable growth and development in this important sector.

The Lebanese financial crisis is taking place in a complex and rapidly changing economic and political environment. As such, it is critical that we continue to investigate the current status and impact of the crisis on construction projects and contracting companies in Lebanon. This ongoing research will be essential for investors and local companies to make informed decisions about their investments and business operations. With the ongoing economic and political uncertainty in the country, the construction industry and contracting companies are likely to continue facing a range of challenges and obstacles. Further research will help to identify the most effective strategies for responding to these challenges and promoting sustainable growth and development in this important sector. By keeping a close eye on the ongoing impact of the financial crisis on the construction industry, we can help to ensure that Lebanon's economy remains stable and resilient in the face of ongoing challenges.

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