



**THE EFFECT OF *BIRR* DEVALUATION ON PUBLIC BUILDING CONSTRUCTION,  
CASE STUDY ON SUB-CITY OFFICE BUILDING PROJECTS IN ADDIS ABABA**

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**Ameha Zewde**

A Thesis Submitted to Addis Ababa University School of Graduate Studies in Partial Fulfillment of the Requirements for the degree Master of Engineering in Construction Technology and Management

Advisor: Abraham Assefa (PhD)

Addis Ababa University, School of Graduate Studies  
Addis Ababa Institute of Technology, School of Civil and Environmental Engineering  
(Construction Technology and Management Stream)

June 2018

## Statement of Declaration

I hereby declare that this research project, entitled “The Effect of *Birr* Devaluation on Public Building Construction, Case study on Sub-city Office Building Projects in Addis Ababa” is my original work submitted for the award of the for Master of Engineering in Construction Technology and Management degree at the Addis Ababa Institute of Technology School of Civil and Environmental Engineering of the Addis Ababa University. This research has not been presented for the award of any other degree or other similar titles in any other institution of higher learning to the best of my knowledge, and all resources used here have been accordingly acknowledged.

Ameha Zewde

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Signature

Date

Confirmed by Advisor:

Abraham Assefa (Ph.D.)

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Signature

Date

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Addis Ababa University  
Addis Ababa Institute of Technology  
School of Civil and Environmental Engineering

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A Master Thesis On  
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**BY: AMEHA ZEWDE**

June 2018

**APPROVED BY BOARD OF EXAMINERS:**

**Dr. Abraham Assefa**

**Advisor**

.....

**Signature**

.....

**Date**

.....

**Internal Examiner**

.....

**Signature**

.....

**Date**

.....

**External Examiner**

.....

**Signature**

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**Date**

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**Chairman**

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**Signature**

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**Date**

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## **ABSTRACT**

On October 2017 the Central Bank of Ethiopia devaluated *Birr* by 15% against US dollar. Since the devaluation occurred, the price of construction materials in the country has been sharply increasing. As a result, the construction sector is facing a range of obstacles. But the extent to which the impact of devaluation has on the construction industry is not a well-studied area. Initiated by this fact, this research investigates the effect of devaluation on public construction projects that were commenced before the devaluation occurred. It also focuses on how the risk was managed after devaluation took place. The research investigates the extent to which devaluation affects ongoing public construction projects regarding increasing cost, time overrun and project scope. This study contributes to the discourse by revealing the level of impact that economic decisions have in the construction industry in Ethiopia. The research uses case study approach to understand the effect of devaluation on public construction projects, more specifically on Sub-city office building construction projects. In order to measure the effect of devaluation on the projects, contract documents, monthly progress reports and material Performance of different periods concerning market prices used by the construction company are critically investigated. In conclusion, having investigated that high inflation rate, volatile market price, shortage of some materials and shortage of currency are the major effects of devaluation made on public building construction projects. This unfortunate economic event, have resulted high price escalation and delays on the projects.

**Key Words:** Devaluation effect, Uncertain financial Risk, Public construction project, Sub-city office building

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## **Acronyms and Abbreviation**

<b>CAD</b>	Cash against Document
<b>DB</b>	Design Bid
<b>DBB</b>	Design Bid Build
<b>ETB</b>	Ethiopian <i>Birr</i>
<b>FIDIC</b>	Fédération Internationale des Ingénieurs-Conseils
<b>GCC</b>	General Conditions of Contract
<b>GTP</b>	Growth and Transformation Plan
<b>IILS</b>	International Institute of Labour Society
<b>IMF</b>	International Monetary Fund
<b>LC</b>	Letter of Credit
<b>NBE</b>	National Bank of Ethiopia
<b>PLC</b>	Private Limited Company
<b>PPA</b>	Public Procurement Authority
<b>SCC</b>	Special Conditions of Contract
<b>USD</b>	United State Dollar
<b>VS.</b>	Versus
<b>WB</b>	World Bank

## CHAPTER ONE

### 1. INTRODUCTION

#### 1.1. Background

During the past decade, Ethiopia has registered an impressive economic development marked by double digit growth. Among others, remarkable growth has been registered in the Ethiopian construction sector. The construction industry has increased investment on the development and expansion of various infrastructure projects and also there are numerous mega projects which are under construction progress. Among the major developments construction of road infrastructure, real estate developments, dams, railway lines and condominium housing projects are some of the examples. According to a report by the Ministry of Urban Development and Construction, the GDP contribution of the construction industry has risen to 5.8% in 2010. The construction industry of Ethiopia has contributed much to the reduction of poverty and expansion of employment opportunities through small and medium enterprise developments and the construction of low cost houses in Addis Ababa which was subsequently replicated to other regions of Ethiopia (MoUDC, 2012). Thus, the Construction industry is making significant contributions to the socio-economic development of the country.

Beside the economic development and expansion of the construction sector, In October 2017 Ethiopian central Bank devaluated the Ethiopian *Birr* by 15 percent (The Reporter, 2017). According to the report, the devaluation was made to encourage exports, which has been stagnated for the last five years prior, owing to the *Birr*'s strong value against major currencies. This nationwide currency devaluation will expect to have impacts in all industries, particularly the construction industry. Construction companies and construction projects are highly vulnerable to financial risk of the devaluated currency due to large amount of imported materials and construction equipment they use. According to the assessment made by The Reporter (2017), there are significant increments in the price of construction materials following the devaluation of the currency, such as reinforcement bars. The increases were exhibited on both locally made as well as imported products. The increase in the price of construction materials is expected to raise the cost of both private and public building construction projects.

The devaluation will have positive as well as negative impact in the construction industry. While it may have provided an opportunity for local construction material manufacturers and suppliers to provide the construction inputs, also it may have threats for the financial capacity of clients and contractors on their performance in the industry.

According to MoUDC (2012), the construction industry is highly dependent on imported materials and since the capacity of local construction material producers is very low, it is essential to have a closer understanding of the effect of devaluation on public construction projects. It is crucial to achieve the objectives of the client, the contractor and its supply chain, especially when the projects are planned to be executed without considering such uncertain risk in the country. In such a scenario, it is understood that the different parties who entered in to the contract to execute the project, will be called to resolve the devaluation risk in terms of achieving the project's objective, which will force all the stakeholders to consider the contractual relationship they entered with a view to examine the design specification, cost over come, delay cause and claim rise upon that. This study will try to look at the level of negative impact caused on each party and will investigate if beneficiary stakeholders exit following the case.

How does the devaluation affect the projects performance which was under execution during the currency devaluating time? How do the different constructions stakeholders respond to the currency devaluation impact on the public building construction projects they are under taking? In this study these questions will be examined and the findings will be presented.

## **1.2. Statement of the problem**

- How does the new *Birr* devaluation in Ethiopia affect ongoing public Projects, particularly, Sub-city office building projects which were under execution during the currency devaluation?
- To what extent does it affect the construction stakeholders and their performance on the projects?

- How do the different stakeholders respond to manage the devaluation risk on the project? Does the devaluation of currency raise contractual claims between the construction stakeholders? How do they resolve the claims?
- How are construction stockholders responding to the exchange rate fluctuation occurring in the country and has the devaluation changed their performance in the construction industry?
- Which construction stakeholders would be negatively affected more by the devaluation and which stakeholders would be positively affected?

These are the issues this research will be trying to study.

### **1.3. Objective of the study**

Main Objective:

- ❖ The main objective of the study is to investigate the impact of *Birr* devaluation which was made by Ethiopian government on public building construction projects, with an emphasis on Sub-city office building projects in Addis Ababa.

Specific Objective

- ❖ To assess the effect of devaluation on Sub-city office building projects, in terms of cost, time and project scope.
- ❖ To study the challenges of construction stakeholders in managing the effects of devaluation on projects.
- ❖ To study how such uncertain risks (devaluation) could be managed in Sub-city Office building projects by different stakeholders.

#### **1.4. Significance of the study**

The primary objective of this thesis is to examine the effect of the devaluated *Birr* that took place on October 2017, on public building projects, particularly on Sub-city Office Building construction projects which were under execution during the devaluation occur.

Different literatures demonstrate that the new devaluation may cause huge impacts to the construction industry in the country. But the extent to which the problem and the opportunity of devaluation have on the sector is unknown. Therefore, the study will contribute to the body of discussion in evaluating the level of impact the devaluation has on the construction industry, specifically on Sub-city Office Building construction projects. It will also study how the projects have suffered and how they have responded to the devaluation.

Moreover, this research will be an important input to policy makers to consider the extent of the challenge and opportunities that devaluating currency would cause on the construction sector and their stakeholders.

#### **1.5. Scope and limitation of the study**

The research focuses on the effects of currency devaluation has on sub city office building construction projects. It also devotes its attention to uncover the level of impacts on construction stakeholders and on the contractors' performance. The issues of evaluating the positive and negative effects of currency devaluation on construction industry however are enormous and wide.

#### **1.6. Organization of the thesis**

This study will be organized into five chapters. The first chapter will deal with the Introduction, the problem and its objective. Chapter 2 will review the theoretical literature on devaluation and identifies the effects of devaluation in the performance construction industry. Chapter 3 will define the methodology and approach to be used in the research, and will present the methods for collecting and analyzing data. Chapter 4 will present the findings and results through the case study. Finally, the conclusions and recommendations from the study will discuss on Chapter 5.

## CHAPTER TWO

### 2. LITERATURE REVIEW

Countries, which went through a period of trade-balance deficit, high inflation and low competitiveness in the world market, take various policy measures as a possible remedy. Some of the measures are: exchange controls and import quotas, tariff on selected imported items, subsidizing exports, lowering the price of export through lowering the cost of production, import duties, and devaluation, etc. Devaluation is one of the possible remedial measures for such problems to boost domestic production through encouraging the export sector. This in turn increases international competitiveness of domestic firms. Many development organizations such like International Monetary Fund (IMF) and World Bank (WB) support the devaluation of currency for developing countries as a means of economic strategy for development. They also use it as a prerequisite to give financial aid and loans to their member countries.

However, taking devaluation as a solution may not be an easy task as it is not possible to apply in any circumstance to get the desired effects without some unlikely outcomes along with the favored results (Bekele, 1999). This section provides brief explanations of the effects of devaluation on the value of money, and the possible positive and negative effects of devaluation specifically to the construction sector both from theoretical and empirical perspectives.

#### 2.1. Devaluation definition

Devaluation is a policy-related activity that lessens the value of a local currency compared to foreign ones; particularly major trade partners (The Nation , 2012). Devaluation means the process under certain circumstances in which currency loses its purchasing power. Devaluation is the official alteration in the value of a currency relative to foreign currencies by a regulatory body usually by the central bank under the circumstance of fixed exchange rate. In floating exchange rate system, market forces may generate changes in the value of the currency, known as currency depreciation or appreciation.

By convention, changes in the value of a currency are measured against the American dollar, so devaluation means a reduction in the dollar price of a unit of foreign currency or, in other words, an increase in the number of units of the foreign currency that can be purchased for a dollar.

## **2.2. Devaluation background in Ethiopia context**

In Ethiopia the exchange rate policy has passed different regimes (Kassie, 2015). According to Kassie (2015), before 1992 the country was exercising a fixed exchange rate regime, in which the rate was solely determined by the government. Since 1992 the country started implementing an exchange rate policy which is more close to managed floating, where there is a government intervention whenever necessary to stabilize the foreign exchange market.

According to Michael (1996) the official exchange rate of Ethiopian currency with US dollar was 2.48 *Birr* per US dollar from July 23, 1945 to December 31, 1963. After almost two decades, that is, on 1 January 1964, the Ethiopian *Birr* was slightly devalued to 2.50 *Birr* per US dollar. In 1971 following the floating of dollar and ceasing of its convertibility to gold, the *Birr* was revalued to 2.30 *Birr* per US dollar (i.e., by 8.75%) on 21 December 1971. This rate served until 1972. Not so long after, however, the U.S dollar price again was devaluated by 10 %. The subsequent 10% devaluation of the US dollar had temporarily brought about under valuation of the *Birr*. The Ethiopian *Birr*, it was revalued to 2.07 *Birr* per US dollar in February 1973. As the price level increased and shortage of foreign exchange become acute, the real exchange rate appreciated and an alternative unofficial foreign currency market became widespread, and the unofficial exchange rates averaged about 6 to 7 *Birr* per US dollar (Taye, 1999). However, this fixed official exchange rate was left unaltered for two decades despite the floating of the major world currencies including the US dollar (1974-1991).

Then on October 1992 the transitional government of Ethiopia made a massive devaluation of the currency by 142 % from its pegged rate of 2.07 *Birr* per US dollar to 5 *Birr* per US dollar, showing the first major change on the value of *Birr* (Eshetu, 2017). According to Eshetu (2017), this measure was made for combating current account as a new economic reform program designed to stimulate the external imbalance, boost output growth in general and export growth in particular. After the devaluation in 1992 the exchange rate is changed from fixed to flexible rate

in order to control overvaluation through a gradual depreciation of domestic currency. However, during the fiscal year 2007/08 the rate of depreciation against other foreign currencies increased compared to the previous years. In the 2009/10 and September 2010/2011 the Ethiopian *Birr* was depreciated to 23.7% and 16.5% respectively against the US dollar (Genye, 2011). On September 2010, the currency devaluated by 16.7 % from a value of 13.63 to the US dollar to 16.35 was apparently to boost export performance and bring about structural change in the economy (Bienen, Ciuriak, & Nihretu, 2010). Consequently, this devaluation of the Ethiopian currency against major foreign currencies resulted in price inflation rising into the double-digits on both imported and locally manufactured goods.

After seven years, the Ethiopian’s central bank devalued *Birr* by 15 % on October 10, 2017. The *Birr* was quoted by the National Bank of Ethiopia (NBE) at a weighted average of 23.41 against the US dollar to be 26.92 *Birr* per US dollar. The central bank also announced that it has raised the main interest rate to 7 percent from 5 percent to stimulate savings as well as to counter the inflation (Aaron Maasho, 2017). According to the news report, the rate was pushed to mitigate the inflationary pressure that could arise from the devaluation. It was intended to boost exports which have stagnated the last five years owing to *Birr*’s strong value against major currencies and discouraged imports.

Table 2.1: The continuous devaluation of Ethiopian *Birr* per US dollar

Devaluation years	1945	1964	1971	1973	1992	2010	2017
<i>Birr</i> vs USD	2.48	2.50	2.30	2.07	5	16.35	26.92

### 2.3. Cause of Devaluation

Devaluation or depreciation of a country’s currency is usually triggered when the country is experiencing an adverse Balance of Payment or Balance of Trade crisis or by worsening economic conditions transmitted into the domestic economy from the foreign market. When the government devalue its currency, it is often because of the interaction of market forces and policy decisions that lead to the currency’s fixed exchange rate change. In order to sustain a fixed exchange rate, a country must dispose sufficient foreign exchange reserves, often dollars, gold and

be willing to spend them, to purchase all offers of its currency at the established exchange rate. When a country is unable to do so, then it must devalue its currency to a level that it is able and willing to support its foreign exchange reserves.

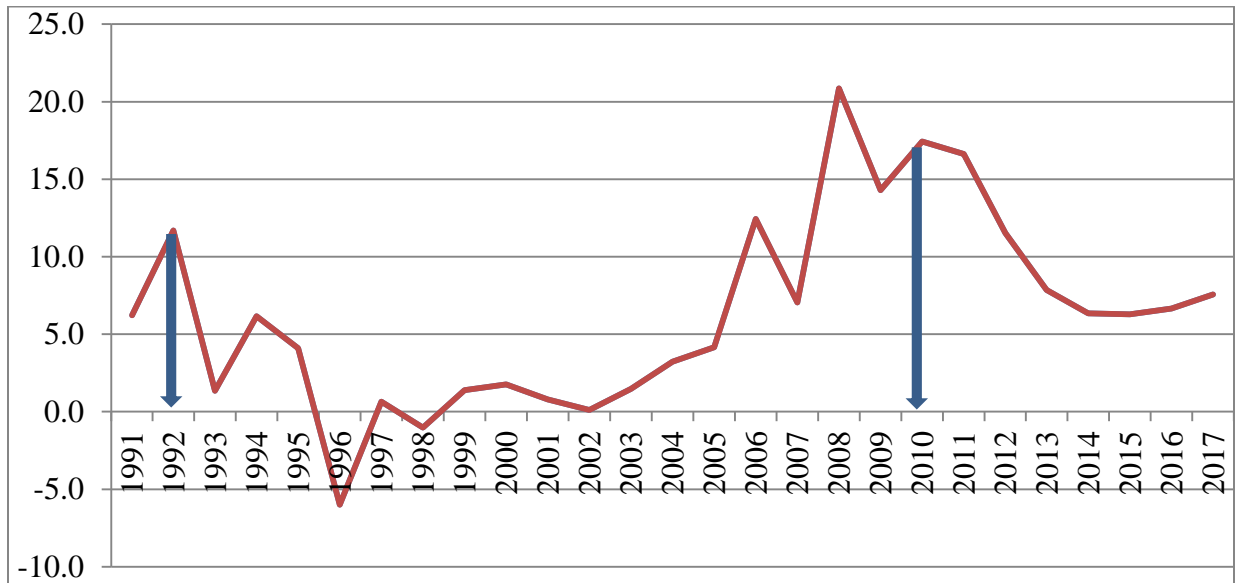
In the context of Ethiopia, the ongoing extensive investments on infrastructure have led to widening of gaps in investment and saving (17.5% of GDP in 2014/15) and in the external sector (Zerihun, Wakiaga, & Kibret, 2016). According to the report, these macro-economic imbalances have in turn led to increase in external borrowing. Consequently, the stock of external public debt has soared fivefold from USD 2.8 billion in 2008/09 to USD 19 billion in 2014/15. The sharp increase in the stock of public debt has been driven primarily by major import intensive public enterprise investments and very slow moving export performance. The report shows that these poor performance and volatility in exporting and an ever-increasing demand for imports are the main reasons behind the worsening trade-account deficit. Thus, devaluation arise, as a solution for the problem of trade deficits and the shortage of foreign exchange.

#### **2.4. Effect of Devaluation**

Devaluation makes domestic currency cheaper relative to other currencies. There are two implications of devaluation. First, devaluation makes the exports of country, relatively less expensive for foreigners. Second, the devaluation makes foreign products relatively more expensive for domestic consumers by discouraging imports. Therefore, this may contribute to decrease current trade deficit and increase trade competitiveness of the economy. In this case devaluation is an important tool to aggregate demand in the economy in an effort to fight unemployment rather than to spend too much money on currency back up. However, to achieve the desired outcomes of devaluation may not be possible without facing some negative consequences (Bekele, 1999).

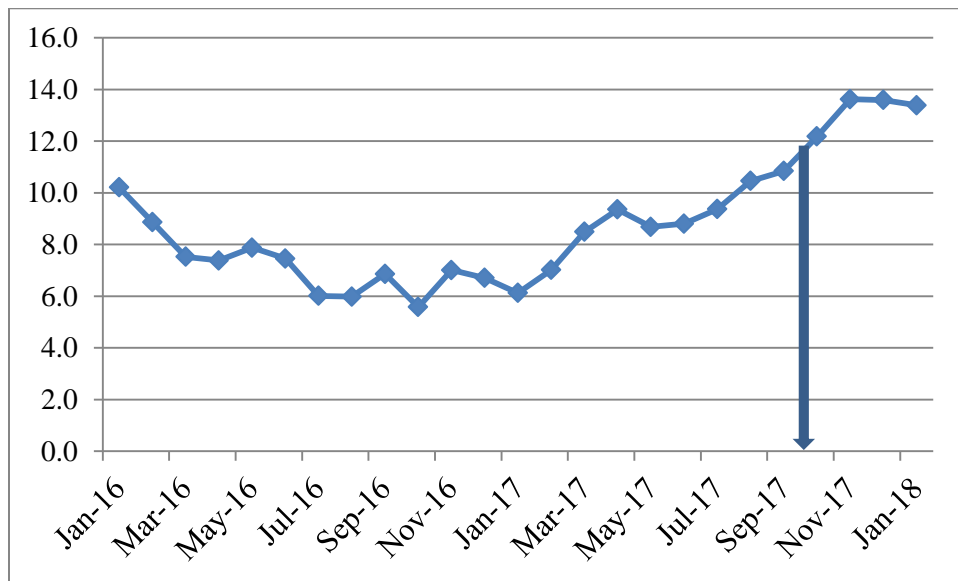
The real problem may arise if a country does not possess the capacity of production comparative to import, in which case the economy is affected by stagnation because of the overall price increase. Inflation is another problem which could rise following devaluation. In such a long devaluation period, the inflation rates increase the price of tradable imported goods in the market and it also increases the price of local manufactured goods which uses imported intermediate in-

puts. Such situation may lead to high inflationary situation. This is what has been happening in the last few months after devaluation occurred.



Source: Computed using inflation data from NBE

Figure 2.1: Inflation performance in Ethiopian (1992 to 2016)

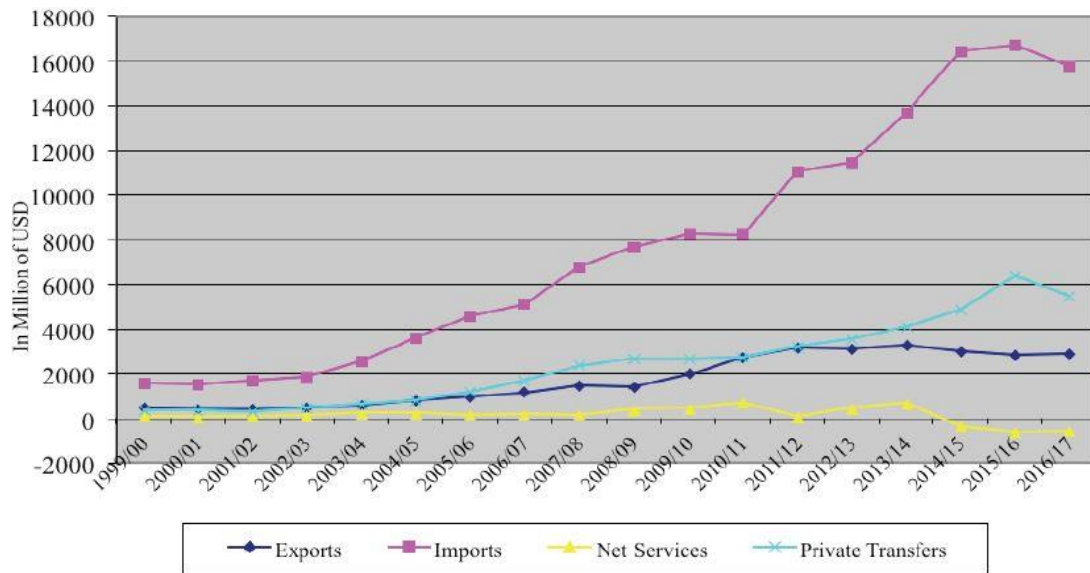


Source: Computed using inflation data from CSA

Figure 2.2: Monthly inflation performance in Ethiopia (Jan 2016 to Jan 2018)

The above figures show also inflation is sensitive to exchange rate movements in Ethiopia. Price expectation also plays its part in propagating the inflation rate in Ethiopia.

Various authors have made different arguments regarding the negative effect of devaluation both in its short and long term effect according to experiences in different developing countries. Currency devaluations in developing countries are often contractionary in the short run. Devaluations can be contractionary if the stimulus to exports is relatively weak (A. Blecker, 2007). According to (Ayen, 2014), devaluation may create contractionary effects through increasing imported prices which will reduce real wages. This is due to the increase in the price of trade goods. It has a negative effect on consumption demand in the short term. It can also reduce private consumption and loss of profit of the service sector in the short term. In addition, the increase in interest rate will decrease domestic demand, consumption and investment in the short run. According to Ayen (2014), devaluation has no significant effect on Ethiopian output in the short run, while it is contractionary in the long run. He argues that developing countries like Ethiopia depends on exports of agricultural products and the export elasticity of our production is insensitive for the change in exchange rate.



Source: NBE

Figure 2.3: Growth rates of exports and imports

Figure 2.3 illustrates the widening of both export and import value for the last ten years. The increment of import exceeds export; the import structure has also effectively increased in relative terms. In fact, imports have increased in value more than the value of exports, which contributed to the worsening of trade balance.

Table 2.2: Trends of import, export and trade balance.

	2006/2007	2011/2012	2012/2013	2013/2014	2014/2015(e)	2015/2016(p)	2016/2017(p)
Trade balance	-21.5	-17.3	-17.6	-19.0	-17.6	-17.2	-17.7
Exports of goods (f.o.b.)	7.7	7.7	6.6	6.0	4.5	4.0	3.7
Imports of goods (f.o.b.)	29.2	25.0	24.2	25.0	22.1	21.1	21.4
Services	-2.6	-2.0	1.0	1.0	-0.7	1.0	1.1
Factor income	0.2	-0.2	-0.2	-0.3	-0.5	-0.2	-0.7
Current transfers	19.2	12.4	7.6	7.4	4.1	8.0	8.1
<b>Current account balance</b>	<b>-4.7</b>	<b>-7.1</b>	<b>-9.2</b>	<b>-10.9</b>	<b>-14.6</b>	<b>-8.4</b>	<b>-9.3</b>

Source: Ethiopia Africa Economic Outline, 2016

As a result of the widening gap shown between export and import values, the lack of diversification, and shortage of foreign currency, the Ethiopian government has undertaken a continuous devaluation of its currency, *Birr*. But, the gap between export receipts and import payments has been rising following the devaluations of Ethiopian *Birr* at different times. It seems, therefore, that *Birr* devaluation has failed to narrow the gap between export receipt and import payment and even has led to further deterioration of the trade balance of Ethiopia (Eshetu, 2017).

Since it significantly affect the value of import and intermediate imported raw materials, devaluation has negative real gross domestic product in the long run. According to Eshetu (2017), although devaluation has discouraged imports and improved trade deficit, currently, the problem has continued, such that, import is near unresponsive to the devaluation of the currency and its value has increased by more than export value and this has led to further deterioration of the trade balance of Ethiopia. The previous Ethiopian devaluation has caused a chronic trade deficit although it devalued its currency which aimed to bolster the export above import (Kassie, 2015). Another study finding from Gashaw (2010), argued that *Birr* devaluation in Ethiopia did not bring a great change on the export and import industries of the country because of two reasons. One is the availability of only few types of agricultural products that can be exported from Ethiopia and the second is that exports are also affected since the purchasing cost for exportable

items increases after *Birr* is devaluated (Gashaw, 2010). He further argues that devaluation has affect the import and export firms by the decrease in the reliability of customers, requirement of large amount of capital who need a large amount of *Birr* to get a small amount of dollar, etc.

#### **2.4.1 Positive Effects of Devaluation**

- **Increase the Demands for Domestic Produced Goods**

Devaluation was expected to encourage the production of exportable commodities by shifting resources from non-tradable to tradable (Taye, 1999). Genye (2011) does a discussion on the positive effect of devaluation as it can have the expansionary effects to output and growth. Devaluation has an expansionary effect through “expenditure switching and reducing effect”. Also when there is devaluation in a country the price of imported goods will increase whereas the price of domestic goods will decrease which in turn will increase the export of goods.

- **Encourage Local Material Producers And Suppliers**

In the construction industry, devaluation provides positive effects on economic growth on construction companies that produce both in the local and foreign market. It gives an advantage for local construction material and equipment manufacturers and suppliers to grow and expand in the local market. The amount of profit gained by a local company producing in the foreign market will increase when currency is devaluated and converted to the local currency.

This increase in profit can be used for the development of research as well as innovations of new technologies. Finally the improvement and introduction of new technologies through profit will decrease their previous cost used which in turn increases output. In this context devaluation will encourage the construction industry in the developments of local investments toward material and construction equipment suppliers. Hence these developments will create more employment and supply chain in the construction industry.

- **Encourage Local Investment-led Growth**

New investment will be attracted into the construction industry, to compete and develop the capacity of local construction material production and supplies. According to Gala (2008) argu-

ment devaluation effect on investment, the increase in export sector and elastic investment responses, the economy would get into an ‘investment- led’ pattern of growth.

- **Encourage Competitive Market**

Devaluation can bring growth through improvements in price competition (Harris, 2001). According to his discussion, may have led to firms to shift resources from productivity enhancement to output expansion by the reduction in relative their price and would cause profit maximizing firms. As cost of imported goods increase people will shift to domestic goods. Thus increase opportunity to the foreign market and the increase in the consumption of domestic as a result of devaluation will reduce the cost of production (Genye, 2011). Therefore producers will provide cheaper price that can enable them to increase their profit and become competitive in the market and growth.

- **Control Economic Depreciation**

Devaluation can also be used as one means of increasing growth by stabilizing the economy by increasing exports and improving the current account as well controlling overvaluation of the exchange rate that increases import of goods (Genye, 2011).

- **Foreign Construction Companies And Practitioners**

Foreign Investors and construction companies are some of the beneficiaries of the *Birr* devaluation against the dollar; especially construction companies those who have duty free advantage and those who are seeking to make more investments (Agroudy, Shafiq, & Mkhtar, 2015). It is assumed that this matter will be reflected positively on the Ethiopian stock market, and investments will be increased in it. On the other hand, it will destroy the competitiveness of local contractors versus foreign contractor on the construction industry.

## **2.4.2 Negative Effects of Devaluation**

Devaluation of currency on the other hand has also negative impact on the growth of a country as well as in the construction industry.

- **Decrease in Construction Project Volume in the Country**

With an increased cost of doing business, there's bound to be major price fluctuations on construction input costs which will negatively affect previous projects budget. The devaluation will affect the prices of previously estimated budgets for ongoing construction projects. If this is not properly managed by the contractor, the resultant effect is an abandoned project.

For a country that is highly dependent on the non-tradable sector, devaluation can have a negative impact. The distribution of resource from the profit gained in the exporter sector to the non-exporter sector and the cost of price for imported goods used for production will not be proportional. Due to this, the non-exporter sectors as well as the total output growth will lose (Genye, 2011). For example a building designed with specification request imported materials orders will have great negative impact compared with a project which could be construct using available local building materials. The real problem questions is that of the availability of local construction materials which fits to the demand and quality standard to the industry. If that is not the case on the current situation, the quality of the project performance might be affected to shift to local material compromising the quality. The high cost variation on importable items needed in the projects can very much restrict the expansion of project volume in the country.

- **Reduction in Government Construction Projects**

Government is the highest source of construction projects and with the *Birr* devaluation, government's capital expenditure on construction projects could certainly reduce. This is going to cut across all government levels; starting from federal, down to state and local. As a result, the expected contribution from the construction industry to the GDP will certainly invariably fall as fewer construction projects will be commissioned.

- **Low Employment Outlook for Construction Professionals**

With lesser construction projects available to be undertaken by contractors as a result of the devaluation, the quantity of available jobs within the country construction space will reduce. In addition, to remain competitive, construction companies will also reduce their labor overhead in an attempt to reduce their direct cost on the projects.

Combining these two factors, the employment outlook for skilled and unskilled manpower within the country construction industry will be decrease. Further leads to the growing rate of unemployment in the economy.

- **High Costs of Doing Business**

Devaluation discourages imported building materials and equipment to domestic market, thus can affect existing imported construction material suppliers, which so far sustain the construction industry. The Ethiopian construction industry is heavily dependent on foreign importation for the raw materials and equipment they use for construction. With a devalued *Birr*, the cost of purchasing these raw materials and equipment will increase. The effect of the devaluation is already being felt by developers as the cost of construction has risen since most of the materials for construction are being imported from foreign countries such as China. This devaluation might not take into account the future of existing construction supply chain structure built through construction import goods.

- **Rise in Interest Rate and Cost of Borrowing**

Due to the capital intensive nature of the projects undertaken by construction companies, there's always the possibility of external funding from banks to finance major projects. But with the recent devaluation, there's bound to be a raise in the base lending rate making the cost of borrowing funds to escalate.

The increase in price of goods as a result of devaluation may decrease the total money in circulation (real money). Devaluation will push the interest rate up wards and decrease the aggregate demand. Construction firms that use bank loan for Construction investment will also be affected as a result of the increase in the interest rate. Therefore it will discourage the construction company's capacity to compete in the construction market financing the construction project initial startups. Especially small grade construction companies will be pushed out of competition in the construction sector.

Devaluation will tend to be initially associated with rising interest rates as the price level rises and the real supply of money falls (Bird, 2003). The increase in the depreciation of real exchange rate is one factor for the increase in the interest rate and will result in stagnancy in the economy.

Furthermore A. Blecker (2007) mentions if devaluation leads to higher domestic prices, especially countries with significant foreign-currency denominated debts will face increased debt servicing burdens as a result of devaluation.

- **High Costs of Housing and Properties**

As a result of the high costs of doing business, property developers in order to be remain profitable, will have to pass on these additional costs incurred to the market. The effect of the devaluation would have been much milder if construction materials are produced locally thereby cutting down the cost of construction and in turn making properties more affordable for the average people.

- **Delayed Implementation of Projects**

According to Agroudy, Shafiq, & Mkhtar (2015), devaluation will affect the rates of implementing the projects, especially infrastructure projects. Their study shows that The Egyptian Federation of Construction and Building Contractors see that the rise in dollar rate in banks and black market can cause an increase in the prices of goods and raw materials used in projects at a rate over 70%, especially the imported ores and materials that projects need and most of the materials needed by contracting companies which are working in water stations, networks, sanitation and power plants are imported from abroad (such as generators, valves, water pumps and spare parts). Thus, the rise in the dollar rate negatively affects the rates of implementing and delaying these projects.

- **Increase Labours Wage Index and Lower Profit**

Devaluation of currency in a country where there is a wage indexation may have contractionary effect. When the price of goods increases as a result of devaluation of currency, the real wage of labour will fall and the contractors will be forced to increase the wage rate in order to make labourers attain sustainable rate of living cost. This will decrease the profit of contractors as their cost will increase and profit reduced.

- **Reduce Investment Growth**

Currency devaluation tends to decrease consumer spending and investment in an economy due to a fall in confidence in the government or central bank's ability to maintain the exchange rate. Therefore, the expected devaluation can have a negative effect on the growth of an economy.

Also when investors expect the rise in the depreciation rate they will not be willing to invest and this will retard investment and hamper growth in the long run. An anticipated devaluation will decrease the rate of technology and discourage innovation in investment as investors expect the increase in the price of imported inputs. Whereas when companies do not expect devaluation they will fear nothing so they will invest and it will not have effect on the investment rate. This is another perspective on the negative effect of devaluation toward economic growth.

- **Can Cause Inflation**

Devaluation is inherently inflationary (Moges, 2004). Inflation is the rate of growth of the general price level of goods and services in an economy. According to Moges (2004), the impact of devaluation is transmitted to the construction industry both directly through price escalations of imports (consumer goods, fuel, raw materials and spare parts) as well as indirectly through the higher demand arising from the tradable sector. The inflationary impact of devaluation is accompanied and is further driven by output contraction.

Due to the nature of the process and the rate of return for work undertaken on construction projects, the effects of inflation can cause loss of profit to contractors and higher cost overrun to project owners. Furthermore the construction project will expose the risk of inflationary cost increases due to the factors which cause project delays (Nega, 2008).

## **2.5. Devaluation and Its Effect on the Construction Industry in Ethiopia**

The construction performance of operational investment projects contributes the lion's share of the total investment projects in the country. According to National Bank of Ethiopia (NBE) 2016/17 third quarter reports regarding job opportunity, last year the construction sector was employing more than 40 percent and more than 50 percent of permanent employment and temporary employments, respectively. The country imports quite a lot of construction materials,

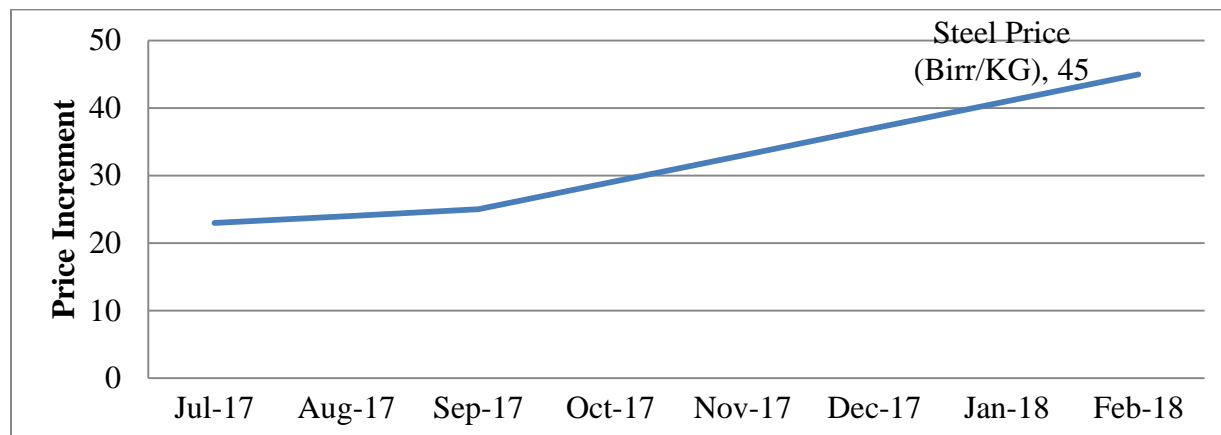
equipment and machinery for use in the construction industry, and balance of payment instability that can occur due to the devaluations in terms of trade can pose serious risks and uncertainties to projects.

Construction services were considerably slowed during the devaluation of the Ethiopian *Birr* in 1992. All construction industries suffered out of this depression and their activities dropped severely until 1994 whereby their suffering was partially relaxed when regulation for price escalation compensation in the form of price index came into force (Assefa, 2007). According to Abraham, however its effect has not been totally solved until 2000 for some projects which are still standing and not completed.

### **2.5.1 Devaluation caused price escalation on the Construction Market**

After the new currency devaluation, the prices of major construction materials are increasing. In addition to that, some construction materials showed scarcity of suppliers.

Devaluation increases the cost of imported items and raw materials. Since most construction materials are imported and the major imported items of the country are construction materials, it significantly affects the construction industry. For example, reinforcement is one of the major required materials in the construction industry of the country. There are different diameter reinforcement steel bars in Ethiopia; 6mm, 8mm, 10mm, 12mm, 14mm, 16mm, 20mm, 24mm and 32mm are more common in the market. According to The Reporter (2017), in addition to the ongoing trend of price increment of reinforced steel bars in the international market, there is an increase in the price of rebar following the current *Birr* devaluation on October 2107. As figure 2.4 shows, imported reinforcement 12mm from July to September had slight price increment in the market. Then after October following the current devaluation of the currency, the change in price is even unprecedented for the construction industry.



Source: Developed using price data from Addis Ababa city Government Public Procurement and Property Disposal Agency

Figure 2.4: Average reinforcement bar price increment (July 2017 to Feb 2018)

Table 2.3: Average reinforcement bar price prior devaluation and post devaluation period

Description	Quantity	September 2017	February 2018
Reinforcement Bar 10	KG	27.53Br	46.18 Br
Reinforcement Bar 12	KG	24.76 Br	46.37 Br
Reinforcement Bar 14	KG	25.16 Br	42.37 Br
Reinforcement Bar 16	KG	24.54 Br	46.37 Br
Reinforcement Bar 20	KG	23.53 Br	45.13 Br
Reinforcement Bar 24	KG	24.6 Br	45.13 Br

Source: Addis Ababa city Government Public Procurement and Property Disposal Agency(2018)

According to an assessment made by the Government Public Procurement and Property Disposal Agency (2018), the price of reinforcement bars, not only locally made but also that of imported ones, show a significant increment. The Table above shows that the prices of reinforcement steel bars were increased by more than 80% on average. This increase was exhibited on both locally made as well as imported products. Also the same trend is observed in the price of other construction materials such as cement, ceramics, sanitary and electrical installations, aluminum and other finishing materials. There is at least 50 percent increase in sanitary material at the retail

market. Here below shows some of sanitary fittings price increment pre-devaluation and post-devaluation periods.

Table 2.4: Average sanitary fittings price prior devaluation and post devaluation period

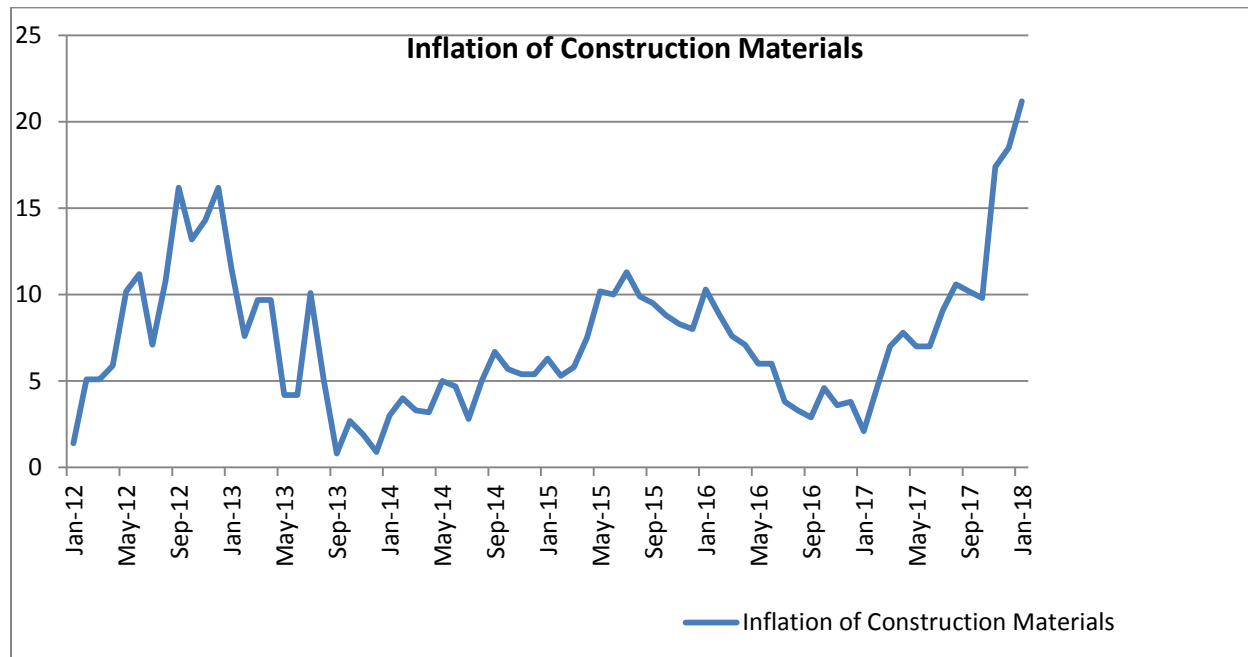
No	Items	August 2017	February 2018
1	PPR Pipes Dia. 63mm	692.95Br	1021.61Br
2	PPR Reducer Dia. 75mmx63mm	98.80 Br	224.96 Br
3	PPR Tee Dia. 75mm	180.49 Br	250.60 Br
4	PPR Elbow Dia. 75mm	151.78 Br	239.50 Br
5	PPR Normal Socket Dia 75mm	172.26 Br	224.67 Br
6	PPR Female Adapter Dia 75mm	673.81 Br	1354.36 Br
7	Clamp for PPR Dia 75mm	13.12 Br	76.27 Br

*Source: Addis Ababa city Government Public Procurement and Property Disposal Agency(2018)*

From these assessments made by the authority on material prices, we can understand that the devaluation has also created great inflation. The impact of inflation is also a source of instability and risk to construction project performances.

### 2.5.2 Devaluation effect and Construction materials inflation rate in the country

If we take monthly Construction materials price index and inflation rate for the past six years, after current devaluation the inflation rate has increased by more than 20 percent (21.2 %), reaching the highest figure in almost six years and this is understandable mainly driven by the devaluation made on October 2017.



Source: Computed using materials inflation data from Central Statistical Agency(2018)

Figure 2.5: Inflation of construction materials

Therefore it can be said the current *Birr* devaluation has consequence unexpected price escalation on the construction materials prices and the inflationary effect has caused significant burden on the construction industry of the country. Ethiopian construction sector is currently faced range of obstacles relating with the high unexpected currency devaluation. The devaluation of the local currency further amid inflation, tax increases and subsidy cuts, is likely to take its adverse effect on the sector. This shows that current devaluation of currency highly affect the construction industry in terms of high price escalation in the material cost and material shortages in the market, led to cost overrun, delay to the ongoing projects and on the overall construction project performances.

## 2.6 Devaluation effect on specific project performance and on its stakeholders

### 2.6.1 Devaluation Effect on Construction stakeholders

The main Stakeholders in the construction industry are:

**The Client:** The client is the initiator and owner of the project. Client finances the project and the significant increase of project cost by devaluation cause, will affect majorly the client. If the clients lack the financial capacity to complete the projects or delay the payment for the services made can lead to significant problem (Nega, 2008). Thus, it may lead to project termination or project delay until additional funds are found. This also could be a cause for investment risk and disinvestment in the construction industry.

**The Consultant:** According to Assefa (2007), the consultant transfers the needs of the client into realizable form and makes the study, design and possibly the supervision. The client may request for a change on project objectives and hence design change might be requested as the result of devaluation currency.

**The Contractor:** The contractor executes the project. The main project cost of a project is direct cost, related with equipment, material and labour cost of the project. Devaluation directly affects the contractor. Due to that, the Contractor may force to change construction methodology and the contractor may enter into financial crisis to execute the project. In general, for the contractor, devaluation implies loss of profits, project delay, project abandonment and terminations.

**Insurance Companies:** Banks provide the working capital contractors need to build the project. The main financial source of most contractors to obtain adequate working capital is loan from insurance companies. Insurance companies also provide bid bonds, performance bonds and payment bonds for contractor to bid and prior to award of the project contract. Insurance companies also service the liability and property insurance needs of contractors. If the construction loan taken for work capital was pre-devaluation period and was not anticipated the level of increase project cost, hence the contractor fails to recover and may get into bankruptcy before completion the project. There is also increase in interest, borrowing cost become more expensive and this decision highly affects the contractors' financial capacity for the projects. Interest rate will affect the project in terms of borrowing and debt payments (M. J. Kolhatkar, 2013).

**Suppliers:** The quality of a construction project is very dependent on the quality of the suppliers used by individual contractors. The effect of devaluated money is very low on local building material suppliers compared to imported material suppliers.

## 2.6.2 Devaluation effect on the Project Performance

### 2.6.2.1 Price variation of the project direct cost

Major direct costs of the construction projects are material cost, equipment cost and labour cost. From these direct costs, devaluation has significant impact on the material and equipment cost. Even if it has impact on the labour cost, it is not significant compared to the other.

- Material

Material Cost is the largest cost in the construction work in Ethiopia. There is a high demand for building material inputs in the construction industry. Since domestic production of such materials is limited, the majority needs to be imported from all over the world. For example, in 2014 Ethiopia imported metals, coal and asphalt worth more than USD 1.7 billion (Auke Boere, Maryn Kleingeld & Dawit Kidane, 2015). Since the devaluation lower the value of *Birr* in the world market, it will have negative effect toward the investment capacity of importers on importing construction materials, consequently could cause shortage of material in the market.

- Equipment

According to Boere, A. *etal.*(2015), in 2014, given the lack of domestically produced equipment, approximately 20% of the total value of Ethiopian imports consisted of machinery, ranging from large construction vehicles to cranes and mill equipment. The value of these imports grew to USD 2.3 billion in 2014 and has been increasing for the past five years. This large importing investment for construction equipment cost will be increasing more, thus will have a great impact on the contractors capacity and their construction method.

- Labour

Devaluation has also a great effect on the labour market. According to the report by International Institute for Labour Studies (2010), previous exchange rate depreciations, labour market adjustment has often occurred via employment, hour work and wages (International Institute for Labour Studies, 2010). Our construction sector has huge share of labour resource in the country economy and the devaluation would have a great impact on labour market for two reasons. One

is loss on the purchasing power of *Birr* will adversely affect the livelihood of the labour force and the other effect is when the volume of construction projects shrinks and construction companies suffer the problem, in return leading to the labour resource in crisis. This situation will cause increase in labour wage index as well as shrink in volume of labour resource, which increase unemployment.

#### 2.6.2.2 Delay Implementation of the project

The price level increment in construction materials and equipment will definitely affect the rates of implementation on projects, especially public projects. According to Agroudy *etal.*(2015), study shows that the effects of the devaluation Egyptian pound on Egyptian construction industry caused an increase in the prices of goods and ores used in projects at a rate over 70%, especially the imported ores and materials that projects need. Moreover, most of the materials needed by contracting companies which are working in water stations, networks, sanitation and power plants are imported from abroad (such as generators, valves, water pumps and spare parts). Thus, the rise in the dollar rate negatively affects the rates of implementing and delaying these projects.

According to Nega (2008), the effects of cost overrun are not confined to the construction industry but are reflected in the state of the overall economy of a country. Construction project delay and cost overruns prevent the planned increase in property and service production from taking place, which in return will affect the growth and development of the macro-economy.

#### 2.6.2.3 The shortage of Foreign Currency Resource under Rising Prices

Study from Agroudy *etal.*(2015), pointed out the existence of a fear of doubling prices largely due to the shortage of foreign currency resources, especially after the retreat in tourism revenues, export proceeds, remittances from the Egyptian working abroad and other foreign currency resources, which may make it difficult for importers to buy the raw materials needed for local production as well as construction projects demand. For that matter recently, the country has been facing hard currency shortage and thus importers have to wait for months to get approval for their foreign exchange application, applying through letter of credit (LC) or Cash against Document (CAD) (Bezabih, 2016). These scenarios not only cause increase the price level of project

but also cause delay due to the shortage of material demand on projects. Hard currency shortage which some relate to the economic growth the country is registering has remained a severe problem especially for the industry sector whose operation is based on imported parts or raw materials (Bezabih, 2016). Due to this factor many construction projects have been suffering because of shortage of hard currency.

## **2.7 Devaluation and Risk management in construction**

According to Mesfin (2014), risk is defined as an uncertainty that matters. This uncertainties that matter could include threats or adverse conditions which have negative effects on the achievement of objectives. Risk and uncertainty affects all the fundamental variables that determine planning, implementation, monitoring, adjustment, behavior and explain choices, and bring about decisions in the process of building construction. In construction project management, the effect of risks and uncertainties are presented on project time, quality and economy values. Devaluation is unexpected economic decision that suddenly affects all stakeholders in the construction industry. It can be seen as uncertain risk that occurs on a project which would possible influence the project time and cost overruns.

According to Firmansyah B.A. *etal.*(2006), report in order to reduce the uncertainty, planners has to make the good forecast and feasibility study and the efforts to reduce the uncertainty and increase the certainty of project successfulness is dependent on the plan. They argue that the biggest opportunity to reduce total cost of project is in the planning and feasibility study phase. Therefore, risk management is done to manage risk so that the main objectives of the project can be achieved. In dealing with risks and uncertainties management, there are some phases to be done (Bayu Aditya Firmansyah, Alin Veronika and Bambang Trigunaryah, 2006). These are

- Risk Identification: to search and find out a type of risk that could be happen;
- Risk evaluation: to the identified risks so that the impact of risks can be understood. These include Categorization, quantification and sensitivity analysis of risks and uncertainties that the project faces.

- Risk allocation: to determine who will take the responsibility of possible risks that could happen. Project risks and uncertainties allocation and distributions are those with better capacity and mechanism to handle each categorization. Risks and uncertainties allocation and distribution should be done through terms and conditions of contracts.
- Risk mitigation: is used to transform risks to other parties to whom they were allocated and perform better. So that when threats occur partially or wholly, project implementation is protected from their consequences or compensated for the consequences.

The construction projects investment risk variables that feasibility study analysis include the investment feasibility that consist of marketing aspect, technical and technological aspect, political aspect, regulation and policy aspect, social and cultural aspect, environmental and city planning aspect, financial aspect and economical aspect (Bayu Aditya Firmansyah, Alin Veronika and Bambang Trigunarsyah, 2006). Their study finding from risk probability matrix showed that the top ranks of risk variables have relation with economical aspect are financial aspect. The economic aspect and financial aspect are linked to the currency devaluation and its effect in terms of uncontrolled inflation, fluctuation in foreign currency, increase in loan interest rate, high overhead cost, exceed payback periods and etc.

These shows devaluation and inflation will cause the increasing of material price and service costs, increasing in interest rate and high overhead cost will cause increasing in expenditures that has to be paid by investors. This shows that economics is easy to change and unpredictable and therefore it is an important aspect in any project investment (Bayu Aditya Firmansyah, Alin Veronika and Bambang Trigunarsyah, 2006). Therefore, economic aspect risks associated with construction projects should clearly be identified and allocated to the responsible party through the contract conditions. Contract conditions represent the legal reference showing the relation between the contract parties.

## **2.8 Devaluation effect on different types of construction contract and project delivery methods**

### **2.8.1 Devaluation effect on different construction contracts types**

Construction contract types have direct impact on the cost estimation of construction projects. Similarly, the contract type of a project also has direct impact on compensations relating with devaluation as a risk. Lump sum contracts and unit price contracts are the two most common types in Ethiopia.

#### **2.8.1.1 Lump sum or fixed price contracts**

In lump sum contracts the owner assigns almost all of the risk to the contractor. The contractor in return can ask a higher price in order to take care of unforeseen contingencies. If the actual cost of the project is under estimated, the contractors profit will decrease by the underestimated amount. When the contract in use is lump-sum with no cost adjustments, which allocates most of the risks to the contractor, thus devaluated currency highly affects the contractor. But it may change during its execution if the contract conditions allow cost adjustment. The scenarios may have clauses for other risks beyond the control of the contract party to claim for such cost adjustments. In this scenario, the original contract price will be different than the final contract cost.

For such contract type the contractor must estimate the likely cost of the risk of sustaining a fixed-price contract and add it to the tender price in the form of a risk contingency. If it is too low, the risk of the contractor's financial losses is likely to increase. The contractor performance would be affected, such as:

- The quality of the work will be compromise
- Force subcontractors on lower subcontract prices, which in turn will further increase the risk of achieving poor-quality work in addition to the possibility of subcontractors becoming insolvent
- Delay payments to subcontractors and suppliers

- Proceed to develop a claim against the principal.

#### 2.8.1.2 Admeasurement Contract

It fixes the price to be paid for carrying out the work, before the start of the contract. Contractors must assess the quantity of the work and the level of risk involved with the work, in order to price its likely impact in the form of a risk contingency. Although contractors appear to carry considerable risk under a lump-sum contract, the contract conditions may provide relief to contractors for uncertain risks. This may trigger contractors' claims to recover such additional costs.

More over if the contractor entered into a unit priced contract which was only labour based contract, then the greater risk of devaluation of the project will be upon the shoulder of the client, since the cost overrun of all construction material is covered by the principal.

### **2.8.2 Devaluation effect on project delivery methods**

According to Mesfin (2014), Project delivery systems describe how the project participants are organized to interact, transforming the owner's goals and objectives to finished facilities. In the construction context, various project delivery methods have been developed to deal with the different ways, owners, developers, contractors, consultants and public entities view to allocate risks and benefits between the parties in the contract. It is to ensure that the form of contract and its drafting properly allocate the risks associated with the project to the party who has accepted and will be compensated for bearing the risk (Asaminew, 2013). The effect of devaluation on project stakeholders is also determined by the type of project delivery methods selected for the project. Different literatures tell that design-bid-build (DBB) & design-build (DB) are the two most common types of delivery methods used in Ethiopian construction projects, which are covered on this section.

#### 2.8.2.1 The design-bid-build (DBB) method

In Design Bid Build method, the owner will enter contracts with a designer and a contractor separately. The client financial risk associated with the construction stage is relatively low since the contractor assumes most of the risk, especially if the type of contract is lump sum. Since there

are two independent contracts that the client enters with the designer and with the contractor, the designer and contractor have no direct relationship on this project delivery method. For this reason, there is a gap on communication toward reducing the devaluation risk on the project performance as well as on the stakeholders. Hence the contractor is expected to handle the devaluation consequence based on the contract with the client. This may require a much longer time to proceed on the overall project construction phase and the contractor may entitle for time delay. There is a difficulty to optimize design change resulting in construction cost reduction in order to mitigate the devaluation effect on the project.

#### 2.8.2.2 The design-build (DB) method

Design Build method is when the owner executes a single contract with an organization that becomes responsible for both the design and the construction of the project and the need to minimize time and cost growths due to disputes between parties (Tariku, 2016). In this case, the devaluation effect can be lower in comparison with DBB method. The contractor will manage such uncertain risks better because the cost, schedule and quality can be defined at the early stage and when devaluation occur, the contractor knows the level of risk that could incurred to the project by the devaluation. Consequently, the contractor can plan to manage the risk faster using both design and construction methodologies.

### 2.8.3 Price Escalation in Construction Projects

Price Escalation refers to a provision in a contract that allows for an adjustment in price when event of an increase or decrease in certain project costs occurred. Price escalation in construction contracts are a means to cover unexpected costs resulting from fluctuations in the prices for raw materials, fuel and labour during the course of the construction project. It is also referred to as 'Rise and Fall' which indicates that if the price of certain costs fall then the contract price will be adjusted in the client's favour.

The contractor when preparing a tender estimate includes for costs of raw materials and wages and has to evaluate the appropriateness of an escalation clause to cover the risk of price fluctuations during the execution period of the contract. Major contributions to the total construction

price subject to fluctuations are cement, steel, fuel and labour costs. In devaluation time, most of construction material prices are significantly inflated in the market. Therefore price escalation clause in the construction contracts is very important, that guarantees a change in the contract price once devaluation occur which is beyond the control of either party results in an increase in the contractor's costs.

There is common approach to develop price escalation clauses which uses price indices system where the relative index value is related to a base value (=100) at a reference date.

#### **2.8.4 Provision of clauses in Standard Conditions of Contract for Price Escalation**

In construction contracts the contracting parties agree on conditions of work for the construction project to be carried out. Conditions of contract in the construction industry are prepared to be implemented according to the accepted practices. These conditions are intended to govern and regulate the obligation of each party that participates in the contract. It helps the parties to perform their part and facilitate the overall accomplishment of the projects.

After the National Bank of Ethiopia announced that *Birr* has devaluated by 15 percent effective as of October 11, 2017, it was critical to look at the effect of devaluation on a construction projects contracted before the devaluation occurred and to understand the legal basis of projects of which contracts were signed prior to the devaluation to recover from its sufferings. It is understandable that the contracts priced and signed pre devaluation period (before October 2017) have been considering the normal trend and stable economic activity in the country, which had stable construction material price in the market. But the story of the market is dramatically changed after devaluation and the inflationary rate of the construction materials price has drastically increased in the market.

Devaluation has reduced the purchasing power of *Birr* and has resulted with dramatic increase on cost of construction materials. The effect is significant especially for imported construction material items which are purchased in hard currency. It's expected to precede the price adjustment implementation and to look the availability of price adjustment provisions in the contract entered for the project. This comes to recover from the impact resulted from the introduction of the offi-

cial currency devaluation and its' consequence effect in the country, unless it has specified that no price adjustments in Special Conditions of Contract (SCC).

The Ethiopian Civil Code under articles 1767, 3186 and 3190 states that Government will protect the party who contracted with public Administrations from effects of the economic upsetting of the contract balance caused by acts of the government. Because of the implementation of devaluation measure, the cost of most construction inputs has dramatically increased on average more than about 50%. These material cost increment has great impacts on the overall project cost which are on the contract price. The devaluation measure has an effect of reducing the contract value agreed to be paid for the service of the contractor as the contract price of the projects agreed were in *Birr* currency.

Unless the devaluation measure is supplemented by a rule to protect the contractors from risk of devaluation, failure to perform contracts signed prior to the devaluation will be inevitable due to the high cost of construction inputs that are not considered in the previously agreed contract price. Therefore, proper management and intervention measure is important for an effective implementation of projects contracted before devaluation and compensating contractors for losses that arise from economic shock case caused by the devaluation measure of government.

The legal bases that enable the contractor to have compensation for the effect of devaluation made by the government policy are discussed below. The following local and international standard conditions of contract clauses are related to costs adjustment, they can consequentially alter the construction cost of projects unless and otherwise they are deleted or replaced by some other sentences in the particular condition of the contract for the specific construction projects.

- The Ethiopian Civil Code:

Article 1767 (1): Contracts made with a Public Administration

- *The court may vary a contract made with a public administration where the circumstances in which it was made have changed through an official decision in consequence of which the obligations assumed by the party who contracted with the administration have become more onerous or impossible* (Negarit Gazeta, 1960).

Article 3186: Provisions for the, variation or revision of prices.

- *The existence in the contract of a provision relating to the variation or revision of prices shall not prevent compensation being due where:*
  - (A) *Such provision has not been enforced; or*
  - (B) *It appears that the enforcement of such provision is not sufficient to remedy the effects of the economic upsetting of the contract, as in the case where there are fluctuations affecting elements other than those which have been chosen as an index in the variation clauses (Negarit Gazeta, 1960).*

Article 3190: general measures. 1. Affecting substance of contract.

- *(1) Laws, regulations, orders and other measures of general application, made by the public authorities, which directly modify the provisions of the contract or prevent the enforcement of some provisions of the contract shall enable the party having contracted with the administrative authorities to claim compensation.*
- *(2) Such compensation may not be refused unless the measure of general application has specified that no compensation shall be paid (Negarit Gazeta, 1960).*

- FIDIC Clauses:

Article 13.7: Adjustments for changes in Legislation

- *The contract price shall be adjusted to take account of any increase or decrease in cost resulting from a change in the laws of the country (including the introduction of new laws and the repeal or modification of existing laws) or in the judicial or official governmental interpretation of such laws, made after the base date, which affect the contractor in the performance of obligations under the contract (FIDIC, 2006).*

It is therefore understood that cost adjustment can be made for contracts in order to compensate the contracting parties and establish the contract balance caused by the devaluation.

## **CHAPTER THREE**

### **3. RESEARCH METHODOLOGY**

This section deals the methodology to be used in this study. Research design, type research, sampling technique, data source and collection method will be discussed in this section.

#### **3.1. Research Design**

This research will follow both primary and secondary data analysis methods which includes a combination of desk study method, select site sampling based on a criteria to include devaluation effect on the project progress. Also relevant interviews will be conduct in order to verify the re-search objective.

Document analysis is conducted to present the extent of currency devaluation impact on selected case study public construction projects in the Addis Ababa. The desk study will focus on analyzing the contractual documents and periodical data found from contractors, Material suppliers, and consultants made in the progress of the project excursion period before devaluation and post devaluation. The contract document referred to evaluate uncertain risk management method followed by the parties in the contract and from the different documents to evaluate how devaluation affected the project cost, time, resource management process as well as project objectives.

The survey study consist both qualitative and quantitative research approach, to identify the actual figures and illustrations on the devaluation effect. The interview will be conduct for different construction stakeholders.

#### **3.2. Type of Research**

Descriptive research is used to systematically explore current devaluated currency effect on the construction industry. Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation. Thus, Descriptive design enables using flexible research approach by using multiple

sources of data involving document review, interview, observation studies and case studies to use both qualitative and quantitative analysis techniques.

### **3.3. Data Collection**

The instruments used to collect the necessary information regarding evaluating the effect of devaluation will be used secondary data analysis, focus group discussion and interviews various stockholders. Document analysis instruments were also used to understand the effects of devaluation on the construction progress and evaluate how the construction stakeholders manage the risk. regard to secondary data source, relevant information will be collected different pertinent documents such as, the Contractual documents, monthly progress reports, compiled data, different time price Performa and other related literatures were thoroughly reviewed. These include reports, journals, books; websites etc. Primary Data were collected after developing interview questions, in-depth interviews will be conducted with different stakeholders related to the sample case projects.

#### **3.3.1. Case Study**

Case studies emphasize detailed contextual analysis of a limited number of events or conditions and their relationships in which, a case that serves the real purpose and objectives of the research is selected. Thus Sub-city building projects are selected to discover the effects of devaluation on the ongoing public construction projects. The Sub-city office buildings have typical design typology. Sub-city building projects have well-organized contract document. The construction works have been awarded with a competitive bid and the contractors selected for these projects are grade one contractors which have a qualified technical capacity. Therefore, it is very interesting to look the impact of devaluation on these typical office building projects.

#### **3.3.2. Desk Study**

Desk study is defined as an investigation of the available facts and figures relevant to a specific issue, often before starting a new or more detailed study. Therefore the desk study was chosen as one of the instruments to assess the practices from relevant studies, reports and documents.

### **3.4. Sampling Technique**

In order to well understand the effects of devaluated currency on Sub-city building construction projects, systematic form of sampling method is used. The sample case is selected from Sub-city building construction projects using a predetermined criterion. The criteria for selection of the sample case from sub-city building projects are;

- Sub city office building projects which were started in the last two years (2015-2017) will be select. Under Addis Ababa City Government Administration, there are total of nine Sub-city projects which are under construction. These projects were started in different times and found in different construction phases. The later started sub-city building construction projects will be more exposed to the impact of devaluation and this give a good understanding of the effects devaluation.
- Sub city projects whose construction progresses are in early stage (the project status which is below 50 percent) will be select. The projects which are in the early construction stages will help better to understand the effects devaluation has on public projects.
- Sub city projects whose construction works were under structural work phase during the devaluation period. It will be important to understand the effect of devaluation has on on-going sub-city building projects which were on structural work phases than finishing phases during devaluation occur, specially the effects of reinforcement bars market has been extremely volatile post devaluation period.

### **3.5. Data Analysis**

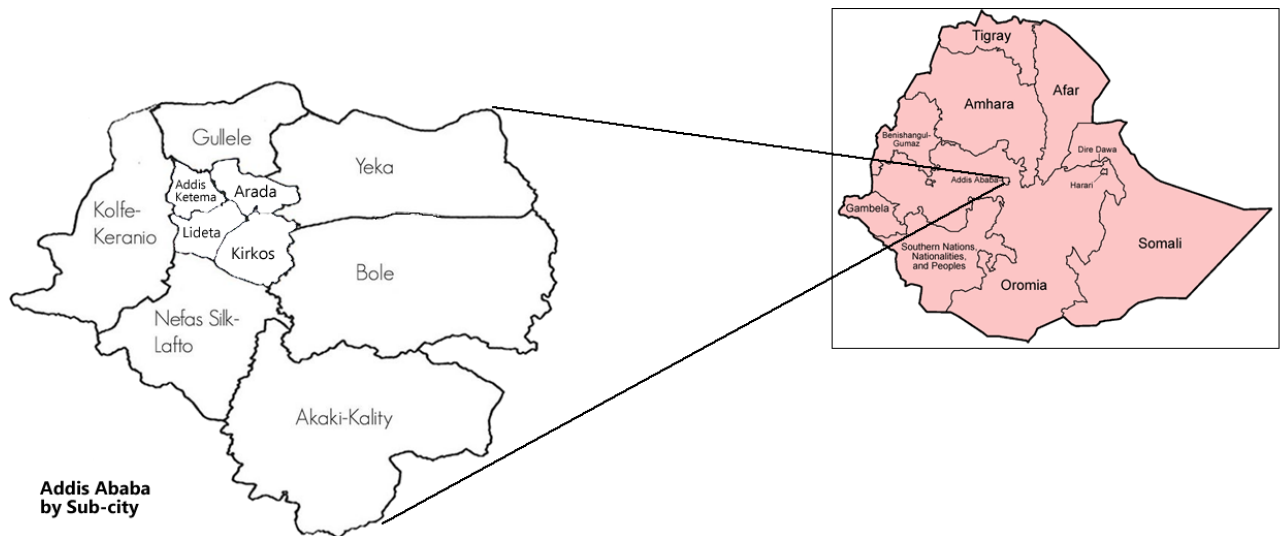
The information collected from both primary and secondary data sources through review of different documents and in depth interviews with key informants will be organize and narrate. The data analysis also will be present using tables and figures where necessary. The study findings that were extracted from different documents will analyze thematically and serve to confirm study outcomes accordingly. Based on the findings & analysis outcome, recommendations will be provide at the end.

## CHAPTER FOUR

### 4. DATA PRESENTATIONS AND ANALYSIS

#### 4.1. Background Study

Addis Ababa is the capital city of Ethiopia, located between 8055' and 9005' North Latitude and between 38040' and 38050' East Longitude. Addis Ababa is the seat of the African Union (AU) and the United Nations Economic Commissions for Africa (UNECA). Addis Ababa has a Chartered City; having three layers of Government: City Government at the top, 10 Sub City Administrations in the Middle, and 99 Kebele Administrations at the bottom.



*Source: Addis Ababa.gov.et*

Figure 4.1: Map of Addis Ababa

Addis Ababa City Administration has allocated budget towards the construction of B+G+11 office building Complex with all its site works for all Sub cities. The clients for Sub-city building projects are each individual Addis Ababa City Administration Sub Cities for their own sub city office building constructions. Under Addis Ababa City Government Administration, There are total of ten Sub-cites. Namely:

- ❖ Addis Ababa City Administration Arada sub city
- ❖ Addis Ababa City Administration Addis ketema sub city
- ❖ Addis Ababa City Administration Akaki Kality Sub-city
- ❖ Addis Ababa City Administration Gulele Sub-city
- ❖ Addis Ababa City Administration Bole Sub-city
- ❖ Addis Ababa City Administration Yeka Sub-city
- ❖ Addis Ababa City Administration Kolfe Keraniyo Sub-city
- ❖ Addis Ababa City Administration Kirkos Sub-city
- ❖ Addis Ababa City Administration Nifas Silk Lafto Sub-city
- ❖ Addis Ababa City Administration Lideta Sub-city

The main consultant for all Sub-city office building projects is Addis Ababa city Administration construction Bureau. Further MGM Consult PLC has made an agreement with City Government of Addis Ababa Construction Bureau for the design and construction supervision and quality control of the office building for the nice Sub cities office building projects whose construction work are started. Addis Ababa City Administration public construction office is responsible for the contract administrations of all the projects.

There are total of seven Grade one Contractors which are under taking the construction of Sub-city office complexes. They are Zamra Construction PLC, Rama Construction PLC, Yergalem Construction PLC, Orbit Engineering and Cons. PLC, Asmelash and Sons Cons. PLC, Afro-Tsion Construction PLC and Etete Construction PLC. Out of which, RAMA Construction PLC and Zamra Construction PLC are contracted to build two Sub-city office projects each. All of them were selected using open international tender and the least bidders were awarded for the project constructions.

The Sub-city office buildings have typical design typology for all sub-cities with some variation works. The Sub-city office building project is a B+G+11 story office building complex with site works around the building complex. The main building complex has three parts. The central building block has twelve stories above ground level and the two side wings to the left and to the right direction has eight stories above ground level. The site work includes asphalt roads, guard house, generator house and fence work for the project compound.



Figure 4.2: Typical sub-city office buildings front view (3D model)

The numbers of sub-city office building projects which are under construction are nine and only Lideta Sub-city office building project is not start yet. Out of nine sub-city office projects, five of them are already in the completion stage and four projects are in different construction stages. Yeka sub-city office project and Bole sub-city office project have already made provisionally acceptance and are being processed for final acceptance. Two sub-city projects also have made partial provisional acceptance and above 99 percent of the work is completed. All general information for all sub-city office projects are presented in table format below.

Table 4.1: General information about the sub-city office building projects

<b>General Information</b>									
<i>Sub-city Building Projects</i>	<b>Yeka</b>	<b>Bole</b>	<b>Akaki-Quality</b>	<b>Gulele</b>	<b>Addis Ketema</b>	<b>Kolfe-keraniyo</b>	<b>Kirkos</b>	<b>Arada</b>	<b>Nifas silk-Lafto</b>
<i>Owner</i>	Yeka sub-city	Bole sub-city	Akaki-Quality sub-city	Gulele sub-city	Addis Ketema sub-city	Kolfe-keraniyo sub-city	Kirkos sub-city	Arada sub-city	Nifas silk-Lafto sub-city
<i>Contractor</i>	Zamra Construction P.L.C	Rama Construction P.L.C	Yergalem Construction P.L.C	Rama Construction P.L.C	Orbit Engineering and Cons.	Zamra Construction P.L.C	Asmelash and Sons Cons. P.L.C	Afro-Tsion Construction P.L.C	Etete Construction P.L.C
<i>Main Consultant</i>	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB	CGOAA C&HDB
<i>Design &amp; Supervision</i>	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC	MGM Consult PLC
<i>Contract amount</i>	240,606,342.90br	227,128,479.18br	229,013,805.29br	202,757,736.22br	228,159,431.49br	250,476,941.40br	297,215,488.61br	290,081,891.54br	254,751,851.52br
<i>Commencement date</i>	June 5,2012	Oct. 24,2012	July 2,2012	Aug. 15,2012	Feb. 4,2013	Sept. 2015	Aug. 19,2015	Nov. 5,2015	June 5,2017
<i>Contract time</i>	558 Calendar days	558+356 (time ext.) Calendar days	558 Calendar days	558+96 (time ext.) Calendar days	558 Calendar days	730+66 (time ext.) Calendar days	730+62 (time ext.) Calendar days	730+141 (time ext.) Calendar days	720 Calendar days
<i>Proj. status (Apr, 2018)</i>	<b>100%</b>	<b>100%</b>	<b>99%</b>	<b>99.9%</b>	<b>99.9%</b>	<b>95.28%</b>	<b>91.48%</b>	<b>53.73%</b>	<b>39.16%</b>
<i>Provisional Acceptance</i>	✓	✓	–	Partially	Partially	–	–	–	–

From the above summarized data, the lowest winning contract amount of all is Bole Sub-city office building project with total amount of *Birr* 227,128,479.18 and the contractor is Rama Construction PLC. The highest winning contract amount of all sub-city projects were Kirkos sub-city project and the contractor is Asmelash and Sons Construction Plc. with a total contract amount of *Birr* 297,215,488.61. Nifas Silk Lafto Sub-city project is the late commenced project which was on June 05 2017 with total contract period of 720 calendar days and has elapsed 340 calendar days. The project completion date is on August 16 2019 and it has progressed by 39.16% so far. Kirkos, Kolfe Keraniyo and Arada Sib-city projects were commenced in 2015, on August, September and November respectively and they all had 730 original calendar days contract period but later on they all had entitled additional time extensions in different periods. Currently their project progress status is 91.48 %, 95.28% and 53.73% respectively.

Addis Ketema Sub-city building project was commenced in February 2013 and its current project status is partial provisional acceptance stage. Four of the Sub-city projects, Yeka, Akaki Kaliti, Gulele and Bole Sub-city office projects were commenced six years ago in 2012 on June, July, August and October months respectively. These four Sub-city projects had 558 calendar days original contract time but then they all entitled additional time extensions in different periods. Two of them have received provisionally acceptances and one have received partially provisional acceptance last year on 2017. All early started Sub-city projects have elapsed by more than triple from the contract time given by different reasons. The major reasons for this were unrealistic contract period specified, design changes, additional variation works, weather, plot land issues the client case and contractors own weakness etc. Lideta Sub-city Administration has commenced a bid process for the construction for Lideta Sub-city office building. Currently the design is completed and the land is prepared by the sub-city Administration office. It is expectable that the new Contract price for this project will have a significant change from the rest of the sub-city office building projects.

From all sub-city office building projects, the later start sub-city projects are Arada sub-city office project (2015) and Nifas Silk Lafto Sub-city office project (2017). Arada Sub city project status is above 50 percent (53.7%), whereas Nifas silk sub city project progressed 39.1 %. Only Nifas silk sub city project was under structural work phase during the devaluation period. Therefore, Nifas Silk Sub-city office building project is selected for detail investigation of devaluation

effect on the project progress and contractor performance. The contractor for Nifas silk sub-city building project is Etete Construction plc. The project commenced on June 05 2017, which is just four months before the *Birr* devaluation (October 10 2017). This shows that the impacts of devaluation could have made on this project progress and on the contractor's performance were not expected when the project commenced. Therefore, this study will investigate the project performance after the devaluation occurred in the last eight months (October 2017-May 2018).

#### **4.2. Nifas Silk Lafto sub-city office building project**

The project site is located in Addis Ababa Nifas Silk Lafto sub-city around Haile Garment Factory. The topography of the site has relatively gentle slope. The site is located at Easting 0470597 Northing 0987625 and Elevation 2226 m above sea level. The site is accessible with two adjacent asphalt roads along the ring road frontage running from Mekanisa to Gelan on the southern side and side road from Hana Mariyam to Jemo site.

Etete construction is the contractor who is under taking the construction work of this project. The contract signing date was on May 3, 2017 by the total bid price of 254,751,851.52 (including VAT) with a total contract period of 720 calendar days. The project commencement date was on June 5, 2017 and completion date will be on August 16, 2019.

##### **4.2.1 Contract Type and Its Basis to Address Price Adjustment For the Project**

The contract type used was the standard bidding document for the procurement of works issued by the PPA (2011). Also the contract is an admeasurement contract. In the case of an admeasurement contract, the contract for the whole works is based on the price bill of quantities submitted by the contractor. All the payments to the contractor under this contract specified to be made in Ethiopian *Birr*. The contract document states that the contract allows price adjustments under the general conditions of contract (GCC) clause 62. But also there are pre-conditions to the contractor in order to ask for price adjustments. GCC sub-Clause 62.1 says that 'Adjustments of contract prices shall be allowed after twelve months from the effective date of the Contract where it is verified that the performance of the contract requires more than 18 months. According to the contract since the contract period of this project is more than 18 months (24 months),

the contractor is allowed to request for price adjustments in relation to a particular work items under the contract after twelve months from the effective date of the contract. On June 2018 the project will be complete twelve month since the contract signed, therefore the contractor has right to ask price adjustment accordingly. Unless the contractor has provided claim for price adjustment, all prices will proceed to be firm.

The contract refers that the basis for compensation of the contract price will be depending of selected categories of contract price, shall be limited to an amount which takes account of price indices or price indicators issued by Ethiopian Central Statistical Agency or Public Procurement and Property Administration Agency. During this research work progress data collected, this mentioned Agencies have limited material price indexes and cannot help much for this specific contract project. Not only this, the contract document didn't include base price indices to be referred later when price adjustments issues rise. Therefore the contract document has gaps relating to dealing with price adjustments since it doesn't have clear basis price indices as reference and is exposed to ambiguity in the contract administration between parties. For that matter, the contract stated that if Ethiopian Central Statistical Agency or Public Procurement and Property Administration Agency are not in a position to issue current price indexes, the price information available from a renowned local producer or competent foreign institution may be used.

The Contractor is responsible to submit all supporting information and calculations necessary to determine the price adjustment to the Client for review and approval. Once the Benchmark Price indices are set and Monthly price index are provided, to determine the adjustment on each item any such price variation will be calculated in accordance with the following formula.

$$PA = [NV+A(MLI-BLI)/BLI+B(MMI-BMI)/BMI+C(MEI-BEI)/BEI+D(MFI-BFI)/BFI](BC)Q$$

Where:

PA = The amount of the Price Adjustment to be paid to, or recovered from the Contractor

NC = The fraction which represents Non Variable element of the Contract Price that if free of contract price adjustment, as specified in the Contract Bid;

A = The fraction of Contract Price subject to adjustment in accordance with movements of the selected Average Labour Category Earnings Index;

MLI = The most recently available selected Average Labour Category Earnings Index on the date on which the client representative received notification of the proposed increased price from the Contractor;

BLI = Benchmark Average Labour Category Earnings Index applicable to the Works either:

- At the bid closing date; or
- If the Contract Price has been adjusted previously, the date on which the client representative received notification from the Contractor in respect of the last adjustment to effect the current Contract Price;

B = The fraction of the Contract Price subject to adjustment in accordance with movements of the selected Material Price Index

MMI = The most recent available selected Material Price Index on the date on which the Client representative notification of the proposed increased price from the Contractor;

BMI = Benchmark selected Material Price Index applicable to the Works either:

- At the bid closing date, or
- If the Contract Price has been adjusted previously, the date on which the public body received notification from the Contractor in respect of the last adjustment to effect the current Contract Price;

C = The fraction of the Contract Price subject to adjustment in accordance with movements of the selected Equipment Price Index

MEI = The most recently available selected Equipment Price Index on the date on which the Client representative received notification of the proposed increase price from the Contractor;

BEI = Benchmark selected Equipment Price Index applicable to the Works either:

- At the bid closing date, or
- If the Contract Price has been adjusted previously, the date on which the Client representative received notification from the Contractor in respect of the last adjustment to effect the current Contract Price;

D = The fraction of the Contract Price subject to adjustment in accordance with movements of the Average Fuel Price Index;

MFI = The most recent available Average Fuel Price Index on the date on which the Client representative received notification of the proposed increased price from the Contractor;

BFI = Benchmark Average Fuel Price Index applicable to the Works either:

- At the bid closing date, or
- If the Contract Price has been adjusted previously, the date on which the Client representative received notification from the Contractor in respect of the last adjustment to effect the current Contract Price;

BC = Current Contract Price applicable to the Works

Q = Quantity;

And where:

- $NV + A + B + C + D$  are equal to 1.00

*Source: Contract agreement for the construction for Nifas Silk Lafto Sub-city Administration*

The GCC sub clause 62.14 also mentioned that the increase in the Contract Price takes effect as the new Contract Price in relation to the selected category on the first date of the next Payment Period following receipt of an application for increase provided. Since the devaluation happened before eight months ago and even though the Contractor resulted to a lot of suffering for the last eight months, the Contractor has not entitled to recover any additional costs or changes from the Client relating to the effect of devaluation had occur to the project performance. The Contractor will get adjustment only for the remaining works left after the date the new Contract Price set by the initiation of the Contractor accordingly the Contract pre-conditions. Therefore The effect of devaluation on the project cost had so far will be lied on the shoulders of the Contractor.

On the other hand the Special Conditions of Contract (SCC) under GCC 16.1 refer that ‘In case of change of laws and regulation after the deadline for submission of the bid contract price shall not be correspondingly increased or decreased and/or the delivery date be reasonably adjusted to

the extent that contractor has thereby been affected in the performance of any of its obligations under the contract.’ The GCC clause 16 briefly discussed that after the deadline for submission of the Bid, any law, regulation, ordinance order or bylaw having the force of law is enacted, promulgated, abrogated or changed in the federal democratic republic of Ethiopia where the site is located that subsequently affects the completion date and/or the contract price, then such contract price shall not be adjusted to the extent that contractor has thereby been affected in the performance of any of its obligations under the contract. Therefore according to this sub clause the contractor shall take full responsibility for the project time delay and price increase caused by the effects of devaluation on the project progress and since the Federal Democratic Republic of Ethiopia has not made enforcement law to made price increments following the devaluation. The contract further discussed that an increase or reduction in the price of raw materials necessary for the performance of the contract is not be considered as Force Majeure, which is stated under GCC sub clause 18.2(b).

Further GCC clause 77 allows the contractor to warn the consultant at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the contract price or delay the execution of the works. Also the contractor shall cooperate with the consultant in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work.

The contractor has given notices in letters to the consultant on November 11, 2018 and February 14, 2018 referring to the effect devaluation which has caused high price increments to the material price and that consequently led the contractor into bankruptcy and suffering. Further on May 30, 2018, the contractor has written a letter which proposes solution that would help their financial suffering on which they were going through. This letter specifically request to modify GCC clause 64.1 in SCC which refers that the contractor arrangements for the amount interim payments shall be the following payment should not be less than 5 percent of the contract price. Since the contractor get material supply by credits and project progress slowed down after the devaluation, they were stragglng to complete work volume that has 5% contract price value in expected planned project work schedule.

#### 4.2.2 Effects of Devaluation on Nifas Silk Lafto Building Project Performance

This Project was started on June 2017 which was four months before the devaluation occurred on October 2017. The project status report shows that it was 9 percent completion status on September 2017 before the devaluation happened. In the beginning the project was accelerated very much by more than 200 % of monthly executing progress compare to their plans compared to the master schedule. Since devaluation made, the project elapsed eight months and it is progressed to 27 percent completion to the total contract amount. The project was ahead of the schedule on the first six months even after the devaluation time. This was possible because initially they were accelerated the project significantly and even though the project monthly progress shows that they were in slowing progress the initial rate of the progress hide the later effect.

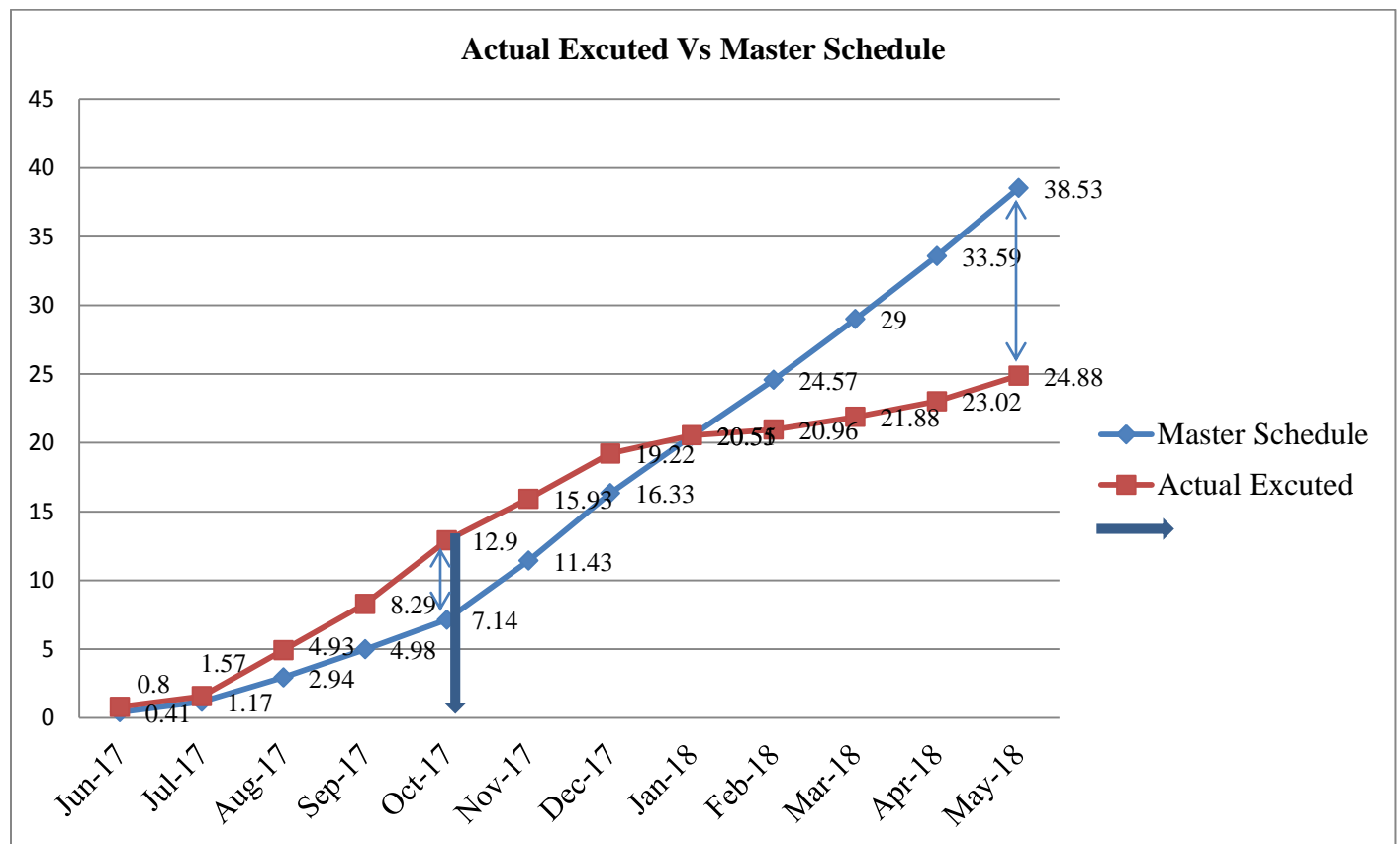


Figure 4.3: Summary of actual and planned work progress in percent

In the first four months, most of the project works were excavation work and concrete work for sub-structure works were progressed and the rate of progress were significantly high to become

ahead of planned schedule. Then next eight months, most of the project works shifted to concrete works, Block work and plastering for super structure works for Block A and for Block B the two side wings. These stages were slowed down mainly for the reasons shortage of Reinforcement Bars especially diameter 6 and 8 in the market as well as budget constraints due to the high inflation rate of construction material presented in the construction industry.

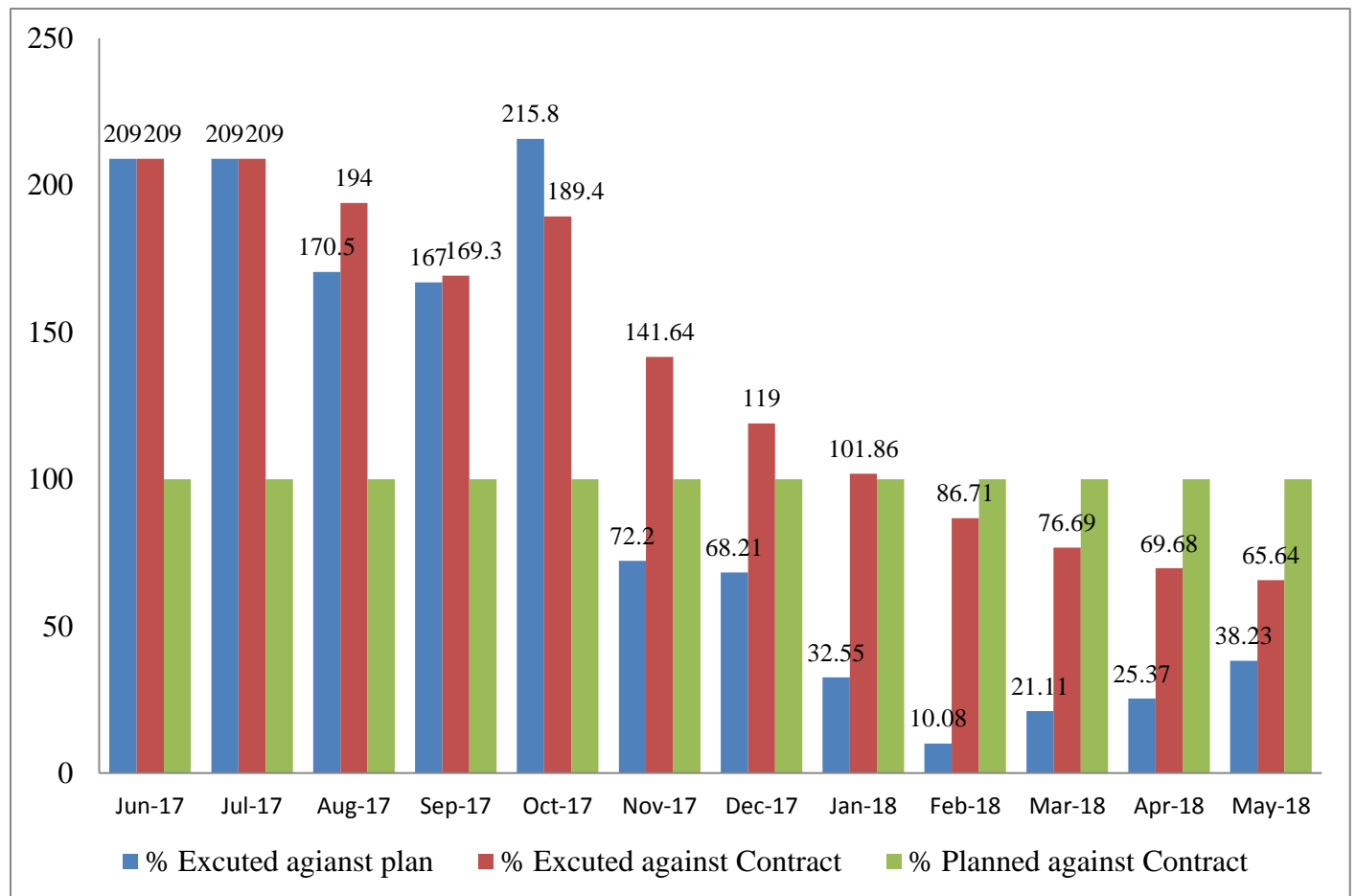


Figure 4.4: Nifas silk Lafto sub-city building project monthly performances in percentage

Figure 4.3 shows that from June 2017 to October 2017, the project performance was incredibly high and the Contractor was able to achieve twice more than ahead of planned Project schedule for this period. This shows that the Contractor was significantly accelerating the project and also the actual resources used in this time was much larger than the planned. This acceleration was made to complete the project before the Contract Completion time, which would have been a plus for the construction company.

Then the progress of the project shows a sudden down fall by November 2018 and since then the progress was significantly low. In February 2018, the project performance has reached to 10.08 % against the initial work plan for that month, which can be said the overall project progress was almost stopped on that month. The monthly reports of January and February show that there was shortage of rebar diameter 8 and 10 on site and the concrete work has been totally stopped for about six weeks. The above figure shows how gradually the overall performance of the project decrease to 65 percent on May 2018. This shows how much volatile construction material market affected the overall progress of the project construction progress.

In order to determine the effect of devaluation had on project cost, the monthly reports of the contractor project cost flows is reviewed. Each direct and indirect costs of the project in different time periods were in depth studied to understand the performance of the project progress after devaluation occurred. From the project expenses, the significant change were presented on the direct cost and specifically on the material cost of the project, The labour price were not changed that much and most of the equipment are owned by the Contractor. Therefore, the significant project cost increments are resulted from material cost of the project and they are thoroughly studied.

Material cost, for example, the Contractor entered a contract price for rebar work with 33 ETB/kg unit rate. Also the Contractor has 3 percent rebates from the total unit priced works in the contract. Therefore the actual entered unit rate for rebar work is 32.01 ETB/ kg. But on January 2018, the market price of reinforcement rebar has reached about 46 ETB, which has been doubling from the initial market prices on May 2017, the contract time. Hence, this contract rate even does not cover for the material price expense excluding other direct and indirect expenses it has. Not only rebar but all metal products in general have made a significant price change for the last eight months and still continued dramatically. Parallel to the cost effect, some items such as reinforcement bar specially the lowest diameters.

Table 4.2a: Material costs on Nifas Silk Lafto Sub-city office project (Jun 2017-Jan 2018)

No	Material Description	Unit	Initial Unit Rate	June-Sept.2017 Total Qty.		Oct.-Jan 2018 Total Amount		
				Total Qty	This Period Amount	Total Qty.	Actual unit Rate	Actual cost
1	PPC	Qtl	173.04	864.00	149,506.56	3,561.00	243.05	865,501.05
2	OPC	Qtl	233.04	7,968.24	1,856,917.98	11,074.76	303.92	3,365,841.93
3	Nail □6	Pkt	124.35	70.00	8,704.50	79.00	156.00	12,324.00
4	Nail □8	Pkt	124.35	163.00	20,269.05	219.00	156.00	34,164.00
5	Nail □9	Pkt	124.35	56.00	6,963.60	22.00	156.00	3,432.00
6	Nail □10	Pkt	124.35	331.00	41,159.85	252.00	156.00	39,312.00
7	Nail □12	Pkt	124.35	269.00	33,450.15	181.00	156.00	28,236.00
8	Re-Bar □6	Kg	27.77	15.00	-	2,053.00	67.45	138,474.85
9	Re-Bar □8	Brga	121.00	7,318.12	885,492.63	20,561.92	178.26	3,665,368.75
10	Re-Bar □10	Brga	189 .00	2,306.18	435,868.13	7,325.69	278.26	2,038,447.85
11	Re-Bar □12	Brga	227 .00	1,935.26	439,304.71	1,645.51	369.57	608,130.52
12	Re-Bar □14	Brga	370 .00	698.01	258,261.85	1,738.38	486.96	846,522.57
13	Re-Bar □16	Brga	484 .00	2,159.34	1,045,121.58	2,901.89	634.18	1,840,319.35
14	Re-Bar □20	Brga	771.00	763.68	588,793.87	1,902.64	913.04	1,737,189.78
15	Re-Bar □24	Brga	1,109.00	1,244.54	1,380,197.93	1,035.46	1,321.74	1,368,605.14
16	Sand	m3	451.09	1,174.71	834,658.15	4,375.77	500.00	2,187,884.25
17	Aggregate	m3	295.65	1,727.84	706,188.49	3,439.97	317.39	1,091,813.55
18	HCB(200mm)	Pcs	12.96	-	-	41,365.58	11.95	494,318.66
18	HCB(150mm)	Pcs	10.35	-	-	3,699.36	10.35	38,288.36
19	HCB(100mm)	Pcs	10.35	-	-	150.08	10.35	1,553.33
20	Eucalyptus 8	Pcs	58.00	1,420.00	82,360.00	1,170.00	65.00	76,050.00
21	Eucalyptus10	Pcs	58.00	4,273.00	247,834.00	4,761.00	58.00	276,138.00
22	Eucalyptus12	Pcs	88.00	3,469.00	305,272.00	1,132.00	88.00	99,616.00
23	Bl_Wire1.5	Roll	869.57	43.00	37,391.51	102.00	1,043.00	106,386.00
24	Bl_Wire2.5	Roll	869.50	48.00	41,736.00	80.00	1,043.00	83,440.00
25	Morale 4*5	Pcs	250.00	800.00	200,000.00	706.00	270.00	190,620.00
26	Ply wood	Pcs	666.00	1,149.00	765,234.00	1,224.00	700.00	856,800.00
27	Electric Wire	Roll	600.00	-	-	-	-	-
	<b>TOTAL</b>				<b>10,395,066.03</b>			<b>22,094,777.95</b>
	<b>IN %</b>							<b>0.27</b>

No	Material Description	Unit	Initial Unit Rate	Oct.-Jan 2018 Total Qty.		Feb.-May 2018 Total Amount		
				Actual unit price	Actual cost	Total Qty.	Actual unit price	Actual cost
1	PPC	Qtl	173.04	243.05	865,501.05	3,065.00	243.05	744,948.25
2	OPC	Qtl	233.04	303.92	3,365,841.93	2,926.00	340.00	994,840.00
3	Nail □6	Pkt	124.35	156.00	12,324.00	8.00	349.26	2,794.08
4	Nail □8	Pkt	124.35	156.00	34,164.00	15.00	349.26	5,238.90
5	Nail □9	Pkt	124.35	156.00	3,432.00	15.00	349.26	5,238.90
6	Nail □10	Pkt	124.35	156.00	39,312.00	15.00	349.26	5,238.90
7	Nail □12	Pkt	124.35	156.00	28,236.00	28.00	349.26	9,779.28
8	Re-Bar □6	Kg	27.77	67.45	138,474.85	-	67.45	-
9	Re-Bar □8	Brga	121.00	178.26	3,665,368.75	1,933.89	243.48	470,863.10
10	Re-Bar □10	Brga	189.00	278.26	2,038,447.85	2,352.73	417.40	982,028.10
11	Re-Bar □12	Brga	227.00	369.57	608,130.52	271.13	478.26	129,672.46
12	Re-Bar □14	Brga	370.00	486.96	846,522.57	635.43	768.50	488,330.79
13	Re-Bar □16	Brga	484.00	634.18	1,840,319.35	311.46	864.16	269,150.99
14	Re-Bar □20	Brga	771.00	913.04	1,737,189.78	78.85	1,572.00	123,950.11
15	Re-Bar □24	Brga	1,109.00	1,321.74	1,368,605.14	33.00	2,258.00	74,514.00
16	Sand	m3	451.09	500.00	2,187,884.25	931.00	500.00	465,500.00
17	Aggregate	m3	295.65	317.39	1,091,813.55	266.00	317.39	84,425.74
18	HCB(200mm)	Pcs	12.96	11.95	494,318.66	26,262.39	11.95	313,835.56
18	HCB(150mm)	Pcs	10.35	10.35	38,288.36	5,160.46	10.35	53,410.73
19	HCB(100mm)	Pcs	10.35	10.35	1,553.33	2,449.92	10.35	25,356.67
20	Eucalyptus □8	Pcs	58.00	65.00	76,050.00	-	-	-
21	Eucalyptus □10	Pcs	58.00	58.00	276,138.00	1,448.00	58.00	83,984.00
22	Eucalyptus □12	Pcs	88.00	88.00	99,616.00	170.00	88.00	14,960.00
23	Bl_Wire1.5mm	Roll	869.57	1,043.00	106,386.00	10.00	1,304.34	13,043.40
24	Bl_Wire2.5mm	Roll	869.50	1,043.00	83,440.00	10.00	1,304.34	13,043.40
25	Morale 4*5 mm	Pcs	250.00	270.00	190,620.00	94.00	270.00	25,380.00
26	Ply wood	Pcs	666.00	700.00	856,800.00	-	-	-
27	Electric Wire	Roll	600.00	-	-	-	1,150.00	100,050.00
	<b>TOTAL</b>				<b>22,094,777.95</b>			<b>5,499,577.35</b>
	<b>IN %</b>				<b>0.27</b>			<b>0.57</b>
	<b>Average %</b>							<b>0.32</b>

Table 4.2b: Material costs on Nifas Silk Lafto Sub-city office project (Oct 2017-May 2018)

The above table shows that the average material inflation for the months between Octobers 2017 and January 2018 was 27 percent more than the initial price quantity. This period executed material amount was four times larger than the material amount used on the preceding four month period. The average material inflation rate for months between February and May 2018 has increased to 57 percent compared to the original contract unit rates. During this period the project overall progress is slowed and the volume of executed work and material quantities used have reduced significantly compared to the previous four months between October 2017 to January 2018. These shows that the Contractor has reduced the overall work volume as the materials inflation rate continued increasing. The average percent increment of material expense post devaluation period on this specific project is 32 percent.

The overall executed project amount up to May 2018 is 56,193,792.60 ETB and from this amount 43,810,338.30 ETB is total expense of the project. The project execution amount from the project start to September 2107 was 18,923,990.68 ETB, this was before devaluation occurred. The total executed and total expense amount from October 1027 up to May 2018 is 37,269,801.92 ETB and 28,751,773.74 ETB respectively; this is the project progress made after devaluation.

Table 4.3: Execution amount of the project performance

I/N	Description	Total Execution Amount (Jun 2017- May 2018)	Execution Amount (Jun 2017- Sept 2017)	Execution Amount (Oct 2017 to May 2018)
1	Executed	56,193,792.60	18,923,990.68	37,269,801.92
2	Expense	43,810,338.30	15,058,564.56	28,751,773.74
3	Gross Profit	12,383,454.31	3,865,426.12	8,518,028.18
4	Gross Profit in %	22.04 %	20.43%	22.86%

The Gross Profit for the months between October and May 2018 is 22.86%. From the total project expense 28,751,773.74 ETB, 20,920,496.71 ETB is total material expense calculated based on the initial Contract Price indices. The rest 7,831,277.03 ETB is the total indirect and direct expenses other than material expenses (which includes direct manpower expense, indirect manpower expense, sub-contractors expense, equipment rent expense, fuel & lubricant expense and

other expenses). But the actual material expense calculated for the project progress made between October 2017 to May 2018 is 27,594,355.30 ETB. The calculated material expense is using the actual material indices took from this period. Therefore, the actual total expense of the project from October 2017 to May 2018 will be;

$$\begin{aligned}\text{Actual Total Expense} &= \text{Actual Material Expense} + \text{Total Indirect and Direct Expense} \\ &= 27,594,355.30 \text{ ETB} + 7,831,277.03 \text{ ETB} \\ &= 35,425,632.33 \text{ ETB}.\end{aligned}$$

$$\begin{aligned}\text{Therefore, Actual Gross Profit} &= 37,269,801.92 \text{ ETB} - 35,425,632.33 \text{ ETB} \\ &= 1,844,169.59 \text{ ETB}.\end{aligned}$$

Therefore, the Actual Gross profit of the project between October 2017 and May 2018 is 4.95% instead of earlier reported figure 22.86%. This shows the contractor has lost a gross profit by 78.35% between October 2017 and May 2018, as the result of 32 % average material inflation occur on the project.

The normal average material inflation rate progress of the country has taken from Central Statistical Agency and looking eight quarter periods before *Birr* devaluation occurred and it is 6.6%. Considering this normal expected inflation afterward would cause project cost variation by the same 6.6% rate. Therefore 26.4% price escalation has incurred on the project due to the current *Birr* devaluation cause. Therefore, 6,058,221.26 ETB (16.26%) gross profit loss for the executed project from October 2017 to May 2018 has incurred by the effects of devaluation.

As the Contractor suffered by the effect devaluation induced material price increment which result them to huge profit loss and bankruptcy, the Contractor has significantly reduced their Skilled and unskilled manpower quantity. This has been showed on the monthly progress reports of the project. For example the number of daily labours the project has on October and November was similar 124. Then on December 2017 this number suddenly fall to 37 and stayed there, whereas the planned daily labour quantities for these months were 180. Also the number of carpenters on October and November months, it was 40 and 47 respectively. Then the carpenters downsized to 7 in December 2018. After then the numbers were not showed significant change.

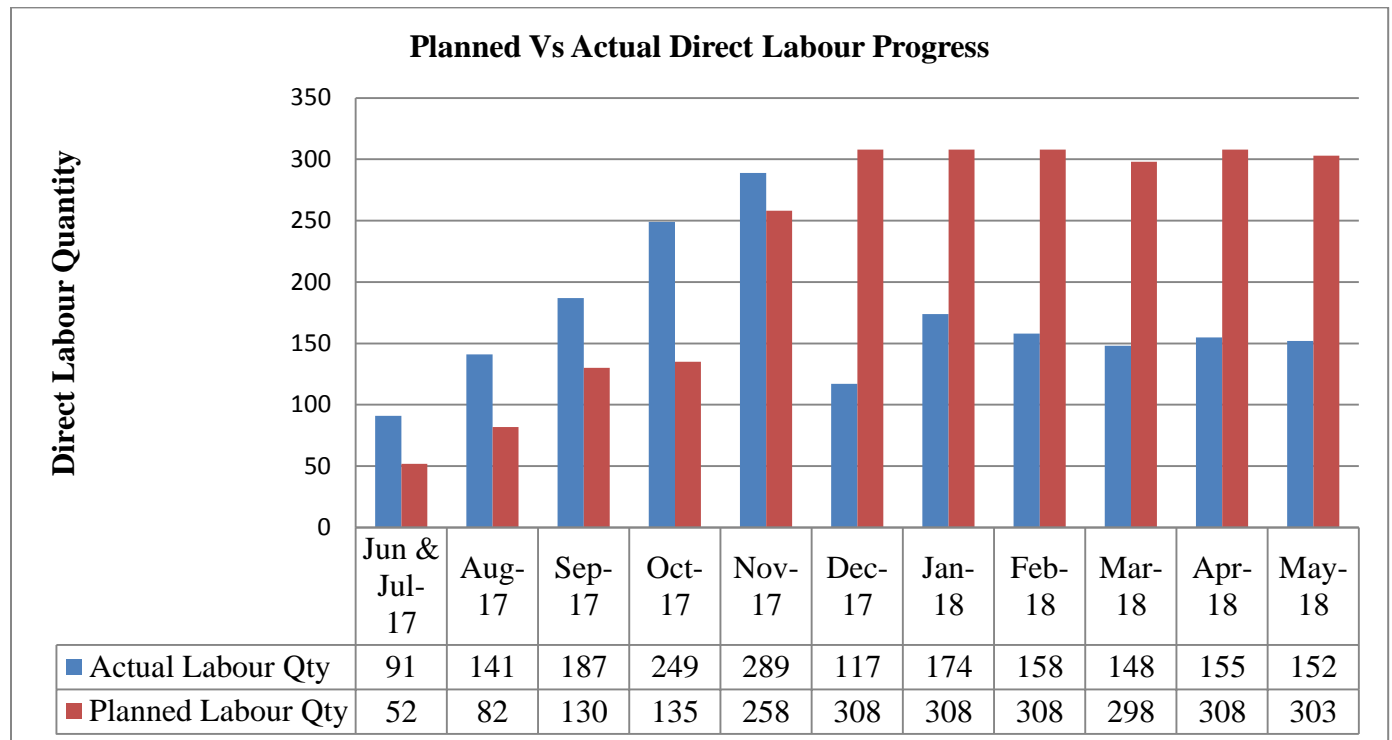


Figure 4.5: Planned vs. actual direct labour progress for the project

The figure above shows the performance of direct labour staffs from beginning June 2017 up to May 2018. The project had progressively increasing direct labour staffs from the beginning of June 2017 up to the end of November 2018, which was more than planned labour schedule. On this period the performance of the Contractor was outstanding achievement ahead of the planned contract schedule. After November 2018, the Contractor has made decisions to downsize the labour quantity by more than half percent. The performance of the Contractor was also significantly slowed down more than their initial plan. This shows the Contractor has significantly reduced the total work volume from the project schedule. This weak performance due to significant material price escalation led them to significant reduction on total labour quantity. Also the same decision was made by the Sub-contracting Contractors who are involved in this project.

The Consultant monthly progress report shows that the major reason for the weak performance of the project on these months were the shortage of Rebar that the Contractor failed to supply. This case was real in the construction industry there were shortage of reinforcement bars and the purchasing cost of the materials were significantly high in general. Also the Contractors have suffered out by it effects.

## CHAPTER FIVE

### 5. CONCLUSION AND RECOMMENDATIONS

#### 5.1. Conclusion

The National Bank of Ethiopia devaluated *Birr*, on October 2017, by 15 percent against US dollar. Since the devaluation occurred, its consequence has been shown through volatile market activities in the country; especially through on public building construction projects which has been suffering a great deal for the last eight months (Oct. 2017 – May 2018). A case study done on Sub-city office building projects, Nifas Silk Lafto sub-city office building project, showed that the devaluation and its consequences have made significant effect on the overall performance of the project.

The Nifas Silk Lafto sub-city office Project initial contract price was decided on the assumption there would be a stable economic activity in the country. The project progress was in a very good status ahead of schedule before the devaluation took place (Jun. 2017 – Sept. 2017). After the devaluation, the Contractor lost about 78.35% gross profit (Oct. 2017 – May 2018), which led them to bankruptcy. The average material price incremented against original project contract price is about 57% between February and May 2018. As the result of this unfortunate event, the contractor has been going through financial crisis following devaluation. Also the construction progress of projects has slowed down significantly. In addition, the work volume which were planned to be performed within the original schedule has reduced significantly. This also will affect the clients and the end users when the projects progression delayed.

The lack of project progress and reduction in work volume was followed by a drop in the quantity of labour. Contractors were forced to downsize their skilled and unskilled manpower by half percent. Sub-contractors have downsized their labour quantity as well.

The particular contract type entered between the construction parties has big role to play in managing the effects of devaluation. In the Nifas silk Lafto Sub-city office building project case, the contractor was entitled for price adjustment after twelve months from the effective date of the contract. However, the contractor suffered a great deal before reaching that date. Also since the

contract document didn't include base price indices, this ambiguity might cause problems later on if the parties lead to price adjustments.

The construction industry of the country is very dependent on imported items. The demand for foreign currency is very high since most of public projects require imported construction materials. Therefore the current shortage of foreign currency in the country has caused delays on construction projects. The delay caused has two components; first, the contractor could not order importable items which need to be done ahead of time. Second, there are shortages of selected materials in the market. The shortage of materials has also incurred contractors for unnecessarily high material expenses in order to deliver the project on time.

Overall devaluation has negative impacts on the construction industry of the country. The different stakeholders of the construction industry are suffering a great deal by the devaluation effect. High inflation rate, volatile market price, shortage of materials and shortage of currency are the major struggles that public construction projects are facing following current *Birr* devaluation.

## 5.2. Recommendations

- The contractor must be aware of the effect of the contract type and the effect of devaluation on the overall performance of a project. To enter in a contract type which allows Price Adjustment during new government regulations and uncertain economic activities is very important. Also, all procuring parties should have awareness how to manage the effect of devaluation.
- Including base material index in the contract document is very important. If the contract doesn't have base material price indices, it will be ambiguous when the contractor entitled for price adjustments in later project phases.
- Delay in the schedule of the project is one factor which causes more damage to the parties entered in to the contract. Thus, the contractor should work to avoid time delays at any cost. The consultant should be prepared with complete and precise design documents before the commencement of the project. They should also control the progression of the project parallel with the master schedule of the project once construction has been started.
- The Government has to introduce a system to control unfair material market pricing in the industry. The current trend which is unfair material pricing is deteriorating the construction industry. Therefore regulations and systems to create fair and healthy competition is needed.
- The Government has to encourage more the local material producers and suppliers. Government also has to attract more investors to invest in domestic material productions other than cement; the cement industry is a good example so far. Currently, the construction industry is highly dependent on importing materials. This takes the lions share in creating trade deficit in the economic activities of the country.
- The Government has to support the contractors through bulk purchase and supply of materials on a duty free basis.

- Banks have to provide financial supports for the contractors in order to support and develop competitive local contractors in the construction industry of the country.
- Banks have to provide priority for hard currency requirements of the contractor. So that it helps the contractors to complete the construction of public projects and infrastructures within the agreed contract times, without delays caused by importing construction inputs issues.

## Bibliography

- A. Blecker, R. &. (2007). The Fallacy of Composition and Contractionary Devaluations: The Output Impact of Real Exchange Rate Shocks in Developing Countries that Export Manufactures. *Cambridge Journal of Economics*.
- Aaron Maasho, J. S. (2017, December 29). <https://www.reuters.com/article>. Retrieved January 2, 2018, from <https://www.reuters.com/article>: <https://www.reuters.com/article/ethiopia-rates/update-1-ethiopia-devalues-currency-by-15-percent-to-boost-exports-idUSL8N1ML40J>
- Agroudy, N. M., Shafiq, F. A., & Mkhtar, S. (2015). The Effect of the Rise in the Dollar Rate on the Egyptian Economy. *Middle East Journal of Applied*.
- Asaminew, M. (2013). DB versus DBB Project Delivery Method in Federal Road Construction Projects. AAU.
- Assefa, A. (2007). *Construction Industry*. Addis Ababa: AAU.
- Auke Boere, Maryn Kleingeld & Dawit Kidane. (2015, November 5-6). Business Opportunities Report Construction #8. *Ethiopian Netherlands business event, Rijswijk, The Netherlands*.
- Ayen, Y. w. (2014). The effect of Currency devaluation on output" The case of Ethiopian economy. *academicJournals*.
- Bayu Aditya Firmansyah, Alin Veronika and Bambang Trigunaryah. (2006). *Risk Analysis in Feasibility Study of Building Construction Project: Case Stusy - Pt. Perusahaan Gas Negara Indonesia*. Bangkok, Thailand: The Tenth East Asia-Pacific Conference on Structural Engineering and Construction.
- Bekele, A. (1999). The Impact of Devaluation on the Ethiopian Economy. AAU.
- Bezabih, A. G. ( 2016). The role of commercial bank of Ethiopia in the mobilization of foreign currency to support fertilizer imports. AAU.
- Bienen, D., Ciuriak, D., & Nihretu, M. (2010, September 12). *Birr Devaluation - Will it correct Ethiopia's trade deficit problem?* Addis Ababa, Ethiopia: AddisFortune.
- Bird, G. &. (2003). Does Devaluation Lead to Economic Recovery or Economic Contraction? Theory and Policy with Reference to Thailand.
- Eshetu, F. (2017). *Birr devaluation and its effect on trade balance of Ethiopia: An emperical analysis*. *acaemicJournals*.

- FIDIC. (2006). *Conditions of Contract for Construction: For Building and Engineering Works designed by the Employer, Multilateral Development Bank Harmonized Edition*. Geneva, Switzer: Fédération Internationale des Ingénieurs-Conseils.
- Gala, P. (2008). Real exchange rate levels and economic development: theoretical analysis and econometric evidence. *Cambridge Journal of Economics*.
- Gashaw, T. (2010). Devaluation of *Birr* and its Impact on Firms which Operate Foreign Trade. AAU.
- Genye, T. (2011). Currency Devaluation and Economic Growth; The case of Ethiopia. *Stockholm University*.
- Harris, R. G. (2001). Is There a Case for Exchange-Rate-Induced Productivity Changes? *Revisiting the Case for Flexible Exchange Rates*. Canada: Bank of Canada.
- International Institute for Labour Studies. (2010). *Addressing European labour market and social challenges for a sustainable globalization*. European Commission and the International Labour Organization.
- Kassie, N. M. (2015). Assessment on Real Effect Exchange Rate and External Sector Development of Ethiopia. *International journal of business and economics research*.
- M. J. Kolhatkar, A. B. (2013). Financial Risks and Construction Projects. *International Journal of Application or Innovation in Engineering & Management*.
- Mesfin, A. (2014). A study on Construction Contract Risk Management Practices in Ethiopian Building Construction Projects. AAU.
- Michael, S. (1996). The effect of devaluation. AAU.
- Moges, B. D. (2004). Post-Devaluation Ethiopian Economy: From Stagflation to Stagflation. *Paper presented for the 2nd annual Conference of Ethiopian Economy*. Addis Ababa, Ethiopia.
- MoUDC. (2012). *Construction Industry Policy*. Addis Ababa: Ministry of Urban Development and Construction.
- Nega, F. (2008). Causes and Effects of Cost Overrun on Public Building Construction Projects in Ethiopia. AAU.
- Negarit Gazeta. (1960). *Civic Code of the Empire of Ethiopia*. Addis Ababa: Birhanenna Selam Printing Press.

- Tariku, R. (2016). Project Delivery Systems and Their Effect on Cost and Time Overrun on Ethiopian Road Authority Projects. *AAU*.
- Taye, H. K. (1999). The Impact of Devaluation on Macroeconomic Performance: The case of Ethiopia. *Jornal of policy Modeling*.
- The Nation . (2012, May 28). *construction-amid-devaluation*. Retrieved January 2, 2018, from [mwnation.com/construction-amid-devaluation/](http://www.mwnation.com/construction-amid-devaluation/): <http://www.mwnation.com/construction-amid-devaluation/>
- The Reporter. (2017, October). *Devaluation-Shockwaves*. Retrieved December 29, 2017, from [www.thereporterethiopia.com](https://www.thereporterethiopia.com/article/devaluation-shockwaves): <https://www.thereporterethiopia.com/article/devaluation-shockwaves>
- Zerihun, A. W., Wakiaga, J., & Kibret, H. (2016). *Ethiopia*. Addis Ababa, Ethiopia: African Economic Outlook.

## **APPENDICES**

### Appendix II: Material Indices

December

2011 = 100

## Consumer price index and inflation of construction materials in Ethiopia

Month/years	Price Index	Inflation
Dec-11	100	0
Jan-12	101.4	1.4
Feb-12	105.1	5.1
Mar-12	105.1	5.1
Apr-12	105.9	5.9
May-12	110.2	10.2
Jun-12	111.2	11.2
Jul-12	107.1	7.1
Aug-12	110.8	10.8
Sep-12	115.2	16.2
Oct-12	113.2	13.2
Nov-12	114.3	14.3
Dec-12	116.2	16.2
Jan-13	113.2	11.5
Feb-13	113.1	7.6
Mar-13	115.3	9.7
Apr-13	116.1	9.7
May-13	114.9	4.2
Jun-13	115.8	4.2
2013/14		
Jul-13	117.9	10.1
Aug-13	116.4	5.1
Sep-13	115.4	0.8
Oct-13	116.3	2.7
Nov-13	116.5	1.9
Dec-13	117.2	0.9
Jan-14	116.6	3

Feb-14	117.6	4
Mar-14	119.1	3.3
Apr-14	119.9	3.2
May-14	120.7	5
Jun-14	121.3	4.7
2014/15		
Jul-14	121.2	2.8
Aug-14	122.2	2
Sep-14	123.1	6.7
Oct-14	122.9	5.7
Nov-14	122.7	5.4
Dec-14	123.6	5.4
Jan-15	124	6.3
Feb-15	123.9	5.3
Mar-15	126	5.8
Apr-15	128.8	7.5
May-15	133	10.2
Jun-15	133.4	10
2015/16		
Jul-15	134.8	11.3
Aug-15	134.3	9.9
Sep-15	134.9	9.5
Oct-15	133.7	8.8
Nov-15	133	8.3
Dec-15	133.4	8
Jan-16	136.7	10.3
Feb-16	135	8.9
Mar-16	135.6	7.6
Apr-16	138	7.1
May-16	141	6

2016/17		
Jun-16	141.3	6
Jul-16	139.9	3.8
Aug-16	138.7	3.3
Sep-16	138.7	2.9
Oct-16	139.8	4.6
Nov-16	137.37	3.6
Dec-16	138.4	3.8
Jan-17	139.6	2.1
Feb-17	141.1	4.6
Mar-17	145.1	7
Apr-17	148.7	7.87
May-17	150.8	7
Jun-17	151.2	7
2017/18		
Jul-17	152.6	9.1
Aug-17	153.4	10.6
Sep-17	152.8	10.2
Oct-17	153.5	9.8
Nov-17	161.8	17.4
Dec-17	164	18.5
Jan-18	169.2	21.2

*Source: Central Statistical Agency*

## Reinforcement Bar Price prior devaluation and post devaluation period

		September 2017													
No	Description	Quantity	Average	Hsilu	Selam	Wulo	Tech	Maysena	Teklhyma not	Aschalew u	Messi	Gidey	Solom	Selhadin	Akaki
1	Reinforcement Bar 10	KG	27.53	30	30	26.31		30.36	25.64	25.64	31.04	31.7	27	25	30
2	Reinforcement Bar 12	KG	24.76	22.96	24.36	22.96	28.11	27.64	22.49	22.96	28.11	28.6	23.4	21.46	25.89
3	Reinforcement Bar 14	KG	25.16	23.97	21.9	23.42	29.96	29.62	23.07	22.73	29.62	23.42	23.42	29.62	23.42
4	Reinforcement Bar 16	KG	24.54	22.94	23.2	23.2	28.21	27.95	22.67	22.94	27.95	28.2	23.2	22.81	23.2
5	Reinforcement Bar 20	KG	23.53	22.61	21.93	22.61	26.32	25.31	22.71	22.71	25.98	26.7	23.3	21.26	21.93
6	Reinforcement Bar 24	KG	24.6	20.85			25.31	26.85	21.09	22.26	25.77	28.1		23.43	

*Source: Addis Ababa city Government Public Procurement and Property Disposal Agency*

		February 2018								
No	Description	Quantity	Average	shemach och	shemach och	shemach och	Teklhyma not	Megenag na	Megenag na	Megenag na
1	Reinforcement Bar 6	KG	67.45					65	70	
2	Reinforcement Bar 8	KG	46.37	47.25	45.56	48.94	43.88			
1	Reinforcement Bar 10	KG	46.18	54	43.2	44.55	46.58	45.23	45.9	44.55
2	Reinforcement Bar 12	KG	46.37	47.25	45.56	48.94	43.88	40.5		
3	Reinforcement Bar 14	KG	42.37	45.46	42.7	41.33	42.22	41.67	42.02	41.33
4	Reinforcement Bar 16	KG	46.37	47.25	45.56	48394	43.88	40.5		
5	Reinforcement Bar 20	KG	45.13				47.25	45.56	48.94	43.88
6	Reinforcement Bar 24	KG	45.13				47.25	45.56	48.94	4.88

*Source: Addis Ababa city Government Public Procurement and Property Disposal Agency*