Xiamen University

From the SelectedWorks of Yagoub Elryah (PhD)

Summer April 6, 2014

AN ANALYSIS OF THE LINKAGE BETWEEN INFLATION RATE, FOREIGN DEBT, UNEMPLOYMENT AND ECONOMIC GROWTH IN SUDAN

Yagoub Elryah, Dr., Xiamen University

Available at: https://works.bepress.com/yagoub_elryah/34/
AN ANALYSIS OF THE LINKAGE BETWEEN INFLATION RATE, FOREIGN DEBT, UNEMPLOYMENT AND ECONOMIC GROWTH IN SUDAN.

YAGOUB ELRYAH

PhD Candidate School of Southeast Asian Studies, Faculty of International Relations, Xiamen University, China. No.422 Simingnan Lu, Xiamen, 361005, P. R. China, Xiamen, Fujian, Xiamen.

Accepted: 07 JULY, 2014.

ABSTRACT

After secession of South Sudan, Sudan economy was decline due to losing of oil revenue. The government introduced the austerity measures and fault to recover the economy. The inflation was risen, the unemployment increased among Sudanese. The aim of this article was to analyze the relationship between inflation, unemployment, external debt and economic growth in Sudan. We considered Unit root technique (Augmented Dickey - Fuller Test) to find out long run equilibrium among using time series between 1980 and 2013. We show that all two public debts and unemployment have a direct and significant influence on economic growth. It was also found the GDP growth and imports of goods and services have significant long run impact on inflation in Sudan.

KEYWORDS: Economic growth, external debt, inflation, unemployment, unit root, Sudan.

*Corresponding Author. Email: yagoobelryah@hotmail.com Phone: +86 15860740680
INTRODUCTION

BACKGROUND OF THE STUDY

In Sudan, poverty, inflation rates, external debts, and unemployment have been increasing significantly for last ten years. For instance, it is documented that the poverty separate among Sudanese, the inflation rates rises from 4.2% in 2009 to 44.4 in 2014, the external debt increased from USD21bn in 2012 to USD42bn in 2014, while unemployment received 25% in 2013.

In numerous studies authors have highlighted the important link that exists between inflation rates, external debt, unemployment, and economic growth. There is a large body of empirical literature on the relation between unemployment, hyperinflation, external debts and economic growth. However, Sudan is dependent on agriculture and formal sectors; the unemployment rate has been above 10%. The situation got worse after south Sudan independence, unemployment rose from 12.0% in 2011 [1] to 18.3% in 2013 [2].

The IMF adjustment implemented by Sudan government had reduced economic and financial potential [3]. The economic growth of Sudan declined following the secession of South Sudan in 2011. Thus, the unemployment rate rose to 18.7% in 2009-2010 compared with 16.7% in 2008 [4]. By early 2012, most of the macroeconomic indicators were affected by losing of oil revenues, for example during the period 2008-2010, real GDP growth averaged 5.4%, compared with a growth rate of 2.8% in 2011. Real GDP is projected to contract by -7.35 in 2012. Also the consumer price index was increased from 20.3% in 2011 to 36.5 in 2013 and its rate kept raising until April 2014, more than 44.4% according to the estimates, increasing deficits in the balance of payments and other macroeconomic issues [5]. While the official exchange rates of local currency versus US$ increased from US$2.23 in 2006 to US$4.95 in 2013, the exchange rates in black market reached US$7.8 and US$9.6 in 2013 and 2014 respectively [6].

Since 2011, Sudan’s growth record underscores that high and persistent inflation and increase of unemployment is harmful to economic growth. Periods of high inflation have coincided with low growth spells, while high growth episodes tend to be associated with a low inflation environment.

The researcher conducted this study to find out the relations between inflation, unemployment rate, external debt and economic growth in the Sudan. Thus, regarding the framework of macroeconomics indicators, the research work conducted for the recent macroeconomics level in Sudan, which has declined since 2011, the value of the Sudanese Pound against the dollar has deteriorated drastically, while the balance of payment deficit has even widened, the inflation rates rose steadily to around 44.4%, and the public debt remains high at USD$ 0 billion.

The purpose of this study is to explore the relationship between inflation, unemployment, external debt; economic growth, and government policy, two important issues need to be addressed. First, given the complexities of the internal and external challenges, we consider the following questions:

1. What is the best strategy to recover the economy?
2. How we bridging the gap of food insecurity?
3. What Sudan can do in order to exempt from its foreign debts? And,
4. How Sudan adapt effective economic policies to achieve full employment?

Secondly, what type of regression framework is appropriate to test for and assess the significance of any potential interrelationships between this measure of external debt, inflation, unemployment and economic growth?
AN ANALYSIS OF THE LINKAGE BETWEEN INFLATION RATE, FOREIGN DEBT, UNEMPLOYMENT AND ECONOMIC GROWTH IN SUDAN.

PROBLEM STATEMENT

It is clear that the phenomenon of external debt, inflation, unemployment were threats to all countries. In Sudan, the foreign debts, inflation, unemployment problems have increasingly after secession of South Sudan. The Sudan economy was declined, the dispute between Sudan and South Sudan on public debts remains and solved yet. On and other hand, the inflation increased and showing a double digit figures during 2010 and 2013.

From the table 1 below the economic growth was decreased from -3.3% to -10.1% in the year of followed the secession of South Sudan, the inflation risen from 18.8% in 2010 to 44.4% in 2013, while unemployment increased from 14.8% in 2012 to 25.3% in 2013, and the external debt, which amounted to 38 $ billion by 2010 to 42.6 bn in 2013.

Table 1: Economic Indicators 2009-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic Growth (%)</td>
<td>3.2</td>
<td>3.5</td>
<td>-3.3</td>
<td>-10.1</td>
<td>-9.2</td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>14.8</td>
<td>14.8</td>
<td>14.8</td>
<td>14.8</td>
<td>25.3</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>4.2</td>
<td>18.8</td>
<td>18</td>
<td>36.9</td>
<td>44.4</td>
</tr>
<tr>
<td>External debt (Billion)</td>
<td>21.1</td>
<td>38</td>
<td>21.1</td>
<td>21.8</td>
<td>42.6</td>
</tr>
</tbody>
</table>

Source: Sudan Statistics bureau reports 2014

In view of the above, it is clear that the Sudan still face hyperinflation, high cost of foreign grants on ability of the productive sectors to generate employment in the face of falling GPD growth.

Figure 1: Economic Indicators 2009-2013

Source: Sudan Statistics bureau reports, 2014.
RESEARCH OBJECTIVES

This study is planned to pursue the following objectives:

- To investigate empirically the relationship between external debt, inflation, unemployment and economic growth in Sudan using time series macroeconomic data.
- To determine whether external debt, inflation and unemployment have significant positive effect on the economic growth and their causality using annual data of Sudanese Economy over the period 1999 to 2013.

ORGANIZATION OF THE STUDY

The balance of this paper is organized as follows: Section 2 presents the theoretical and empirical on the relationship between external debt, inflation rate, unemployment and economic growth. Review of literature is given in section 3. Section 4 explores the methodology used. Section 5 presents the empirical analyses and results. The last Section concludes.

RELATED LITERATURE REVIEW

THEORETICAL LITERATURE

The objective of this study is to reveal how economic growth has been established, and what the inflation rate to be targeted. The research question is reflected by hypotheses: what are the relationship between inflation, unemployment rate, external debts and Economic growth? To answer this question, the hypotheses are created as follows:

![Diagram of Methodology Framework](https://via.placeholder.com/150)

*Figure 2: Methodology Framework*

The conceptual framework above summarizes the relationship between dependent and independent variables that are used as the fundamental basis for the study.
LITERATURE REVIEW

There are many studies which address the relationship between the inflation rates, unemployment rates, external debt and economic growth among least and developing countries. However, it is interesting that so few studies have addressed issues related to inflation, unemployment, external debt and economic growth in Sudan.

Several recent studies such as [7]; [8]; [9] have tested the impacts of economic indicators and found support for the negative linkage between inflation, external debt in different way and by including different measures of economic factors. [7] Studied the success of economic policies of selected countries of North Africa - Egypt, Sudan and Morocco. He compared some macroeconomic indicators such as gross domestic product growth rate, the share of current account deficit to gross domestic product, inflation rate and the unemployment rate from 2007 to 2012. He found that Sudan during the 2007 to 2010 reached a satisfactory rate of GDP growth, while in 2011; there was a decline in GDP growth as a result of losing 75% of revenues from oil exports.

For instance [8] [10] have studied the relationship between unemployment and economic growth in Jordan and some Arab countries. Their results revealed that the size of labor employment as a human force associated with the extent of success factors related to economic growth.

In his paper [11] examined the economic impact of Southern Sudan secession on the economy of both the Sudan and South Sudan. He found that the economy of the Sudan has been badly affected by the Southern Sudan secession. He also found the value of the Sudanese Pound against the dollar has deteriorated drastically, while the inflation rates rise steadily to around 28%. In contrast, the public debt still remains high at 38 billion dollar, with the two parties yet to reach to an agreement over debt apportionment issue.

In their study [12] investigated the causes of Sudan’s recent economic decline, they found that the historical path of Sudan’s economy fluctuated between the cases of stability and instability, this is mainly due to the disruption of economic policies and developmental programs on one hand, and political instability on the other hand.

RESEARCH METHODOLOGY

SOURCES OF DATA COLLECTION

The study used time series data for the entire period of 1980-2013. This period witnessed a lot of policy changes. The secondary data was sourced from World Bank, IMF, and Central Bank of Sudan publications as well as other relevant journals. The methodology used in this study is similar to the methodology adopted by [13] and [14].

MODEL

The model below explores the impacts of inflation rates, unemployment, and external debt on Sudanese economy. The data used in this study gathered from the World Development Indicators and International Monetary Fund (IMF). A simple origin destination model between unemployment (U/L), net external debt (NED), inflation rate (CPI) and economic growth (proxy to economic performance) can be written as follows:

\[ \ln GDP_t = \alpha_0 + \alpha_1 \ln CPI_t + \alpha_2 \ln U/L_t + \alpha_3 \ln NED_t + \epsilon_t \]

Where:
- \( \ln GDP \) = natural log of real output
- \( \ln CPI \) = natural log of consumer Price Index
- \( \ln U/L \) = natural log of unemployment rate
- \( \ln NED \) = natural log of net external debt
PRESENTATION AND DISCUSSION RESULTS

EMPIRICAL RESULTS

DISCUSSION OF RESULTS

Unit Root Test

Table 2 presents summary statistics of unit root:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln GDP</td>
<td>37.2</td>
<td>0.45</td>
<td>35.42</td>
<td>36.82</td>
</tr>
<tr>
<td>ln CPI</td>
<td>28.7</td>
<td>0.32</td>
<td>27.21</td>
<td>29.12</td>
</tr>
<tr>
<td>ln U/L</td>
<td>22.4</td>
<td>1.28</td>
<td>17.67</td>
<td>19.24</td>
</tr>
<tr>
<td>ln NED</td>
<td>45.2</td>
<td>0.13</td>
<td>40.63</td>
<td>41.71</td>
</tr>
</tbody>
</table>

Table 3: Unit Root Tests

<table>
<thead>
<tr>
<th>Variables</th>
<th>ADF</th>
<th>Variables</th>
<th>ADF</th>
</tr>
</thead>
<tbody>
<tr>
<td>ln GDP</td>
<td>-0.87</td>
<td>Δln GDP</td>
<td>-4.025</td>
</tr>
<tr>
<td>(-6.32)</td>
<td></td>
<td>(-3.102)</td>
<td></td>
</tr>
<tr>
<td>ln CPI</td>
<td>-3.615</td>
<td>Δ ln CPI</td>
<td>-4.001</td>
</tr>
<tr>
<td>(-2.72)</td>
<td></td>
<td>(-2.72)</td>
<td></td>
</tr>
<tr>
<td>ln U/L</td>
<td>-6.301</td>
<td>Δ ln U/L</td>
<td>-6.472</td>
</tr>
<tr>
<td>(-4.21)</td>
<td></td>
<td>(-3.11)</td>
<td></td>
</tr>
<tr>
<td>ln NED</td>
<td>-2.78</td>
<td>Δ ln NED</td>
<td>-5.731</td>
</tr>
<tr>
<td>(-3.25)</td>
<td></td>
<td>(-2.85)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows the unit root results, we considered the standard Augmented Dickey – Fuller (ADF) test, which was performed using a statistical package known as Eviews 6.0. The above results showed consistent results by rejecting the null hypotheses of unit root (H01 and H02: a unit root) while the H03 hypothesis was accepted because ADF statistic less than the critical value at 5% and 10% respectively.

The table also shows the relationship between GDP and CPI significance at the level 5% and 10%. Which refers to GDP is benefit to CPI and unemployment. The major findings suggest the need for Sudan to formulate policies to increase the income especially after lost 75% of oil revenues, so as to concentrate its efforts on agricultural and industrial sectors to reduce the . Also the tangible elements of the monetary and physical policies are more influential on overall macroeconomics indicators which can be more easily modifiable or renewable than intangibles.
CONCLUSION

The present study is an attempt to explore the relationship between inflation rate, external debt, unemployment and economic growth in Sudan. We used Time series data for the period of 1983-2012 for the analysis. This current study proposed and tested a model of relationships between inflation, external debts, unemployment and economic growth; we applied Johansen co-integration technique to find out long run equilibrium among macroeconomic indicators? We concluded that the inflation and unemployment have a direct and significant influence on economic growth. While the GDP growth and imports of goods and services have significant long run impact on inflation in Sudan.

Finally, the relationship between inflation and exchange rates has increased dramatically due to loss the oil revenues impact in Sudan economy. Hopefully, it suggests that the policy makers have to pay attention to impacts of inflation, unemployment and foreign debt on economic growth. In order to develop relationship between inflation, unemployment and foreign debt on economic growth, it is necessary that economic policies should be focused on reviving the productive sectors, especially agricultural sector which is suffered from pore policies and government committed during the period of oil production.

In summary, the results of this paper have shown that tangible elements of the monetary and physical policies are more influential on overall macroeconomics indicators which can be more easily modifiable or renewable than intangibles. Therefore, it is suggested that policy makers should pay particular attention to the impacts of monetary policy on households.

ACKNOWLEDGEMENT

I am pleased to express my gratitude to Xiamen University for allowing and providing me the great opportunity to do this research work. The author wants to thank the reviewers for the time they spent and their valued comments.

REFERENCES


