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Editors' Note

Dear Readers, Birritu a corporate magazine of the National Bank of Ethiopia (NBE) has come up with different issues which we think are educational and informative. There are two research papers: Estimating Underlying Inflation for Ethiopia and Measurements of International Competitiveness: Lesson for Ethiopia. The first paper highlights the developments in the price inflation and the policy measures taken by the NBE. The second paper deals with external competitiveness and the lessons that can be drawn to enhance Ethiopia's export performance.

In the Miscellany part, we present you the historical account of Emperor Menelik on the possibilities of constructing railways and establishing Banks in Ethiopia. It tells about the money minted in his name to replace the Maria Theresa Thaler, the doubt and resistance of the people to accept the new currency and the subsequent proclamation ratified by the Emperor.

Have a nice reading time!

NBE, in a sphere of change

Following the two years intensive Business Process Re-engineering (BPR) study, the National Bank of Ethiopia (NBE) has restructured itself in order to discharge its duties and responsibilities in a more efficient and effective manner. Hence, inline with the study, 410 employees, including 18 Directors, 3 Deputy Directors, 3 Governors' Advisors, and 29 Chiefs (Middle level Managers) are placed in different positions.
Based on the outcome of the study, some activities which were handled in the NBE, like administering Government Accounts, are transferred to the Commercial Bank of Ethiopia in view of serving customers effectively.

The new structure of the Bank has also allowed the appointment of three Vice Governors which was previously one. In this regard, the Government of the Federal Democratic Republic of Ethiopia has appointed H.E.Ato Yemane Yoseph as Vice Governor for Corporate Services, H.E. Ato Yohannes Ayalew Vice Governor for Monetary Stability and Chief Economist, and H.E. Ato Getahun Nana Vice Governor for Financial Sector Development. Their appointments have become effective since December 10, 2009.

Estimating Underlying Inflation for Ethiopia

Muluneh Ayalew (NBE)

ABSTRACT

An attempt has been made to construct different series of core inflation. measures from an existing price data. The different price series were in turn used for regression on different monetary aggregates over different time lags. That was intended to pick the most efficient measure of core inflation In general, the existing official core inflation measurement used by the National Bank of Ethiopia is found to be more efficient than the trimmed means obtained here. The trimmed means calculated in this study are symmetric and have similar tails of $\propto$ in both ends of prices.

1. INTRODUCTION

Consumer prices have been on the rise during the past few years though they began to decline recently. The National Bank of Ethiopia has taken monetary measures targeted at curbing the price hike. In December 2009, annualized inflation came down to 8.5. This was the first single digit annualized inflation registered after the same month of 2005. For the decade before 2005, money growth remained typically at around 10 percent. In recent years, however, money growth is accelerated; the annual average growth rate of broad money, being about 20.0 percent from March 2005 to March 2009. Similarly in December 2009 broad money supply witnessed a twelve month growth rate of 20.1 percent (NBE, 2009).

Since changes in policy affect economic activity and inflation with a lag, monetary policy makers need to be forward looking. Due to the nature of the lags in the transmission mechanism, monetary policy can do little to affect economic activities and inflation in the short run, and so policy-makers are most interested in the outlook for inflation, typically over the one- to two-year horizon where monetary policy can have most of its influence. In making judgments about the outlook for inflation, policy-makers have the responsibility to employ a variety of economic models and monitor a wide range of economic variables and indicators, which potentially reveal information about the shocks affecting the economy. Inflation itself is one of the numerous variables that policy-makers monitor in order to make judgments about the outlook for inflation (Mankikar and Paisley, 2002).

The existence of a positive relationship between money and prices is well acknowledged

in the economic literature. A large consensus can be found on both the direction and the dimension of the effect of an increase in the monetary aggregate on price developments. The statement that in equilibrium monetary policy is neutral hinges on the quantity equation which in turn defines a positive 'one-to-one' relationship between monetary and price growth over a long-term horizon. The theoretical consensus on money neutrality is also supported by well documented empirical evidence, in both time-series and cross-countries analysis. The economic profession, however, highlights that, since money is not the sole cause of price developments and that a certain period of time must elapse before the 'one-to-one' relation emerges, the neutrality may not to hold over shorter time-spans (Roffia and Zaghini, 2007).

It appears that money has played a significant role in the increased inflation following the significant rise in its growth since 2005; however, the monetary factor alone does not seem to explain it. Other non-monetary factors have also contributed (IMF, 2008; Birritu, 2007/08). The significance of the role played by money implies the need for policy actions directed to it. Wolde-Rufael (2008) as well has noted the presence of unidirectional Granger causality running from money supply to inflation. The monetary policy measures to be taken should focus on the underlying measure of price levels and there is no consensus as to which measure of inflation is the best indicator for the underlying price levels. Though the term 'core inflation' is widely used by academics and central bankers, there is neither a widely accepted theoretical definition nor an agreed method of measuring it (Mankikar and Paisley, 2002). For many policymakers and analysts the core or underlying Consumer Price Index (CPI) inflation seems to be the CPI excluding food and energy. Nevertheless, there are other measures of core consumer price inflation that typically attempt to identify the underlying trend in CPI inflation by excluding certain components subject to large relative price changes (Clark, 2001).

CPI inflation often suffers from three main types of transitory disturbances: seasonal fluctuations, supply shocks, and other non-monetary factors like indirect taxes and administered prices. Due to that reason, monetary policy makers need a 'filtered' version of CPI inflation reflecting the medium and long run part of inflation. A measure of core inflation removes those fluctuations that should be disregarded for monetary policy purposes (Huwiler, 2009).

This study provides a systematic evaluation of existing core inflation measurement in Ethiopia: the exclude food prices series. Alternative core inflation candidates series would be compared to the existing core inflation used by National Bank of Ethiopia (NBE). For the purpose of evaluating the best measure of core inflation, candidate core inflation series would be regressed on different monetary aggregates of prior periods. Furthermore, different monetary aggregates are considered to test for their lagged effect on the different price series.

The paper is organized into five sections. The first being introduction, the literature is reviewed in the second section. The third section presents recent developments in money and prices in Ethiopia. The calculation of the different price series through trimmed mean, the stationarity tests for the different time series variables and the regression results is presented in the fourth section, and the fifth section concludes.

2. CONCEPT AND MEASUREMENT OF UNDERLYING INFLATION

Maintaining the purchasing power of money by focusing on inflation has been the traditional role of central banks, which over past decades has been formalized in a number of countries by instituting explicit inflation-control targets. The targeting of inflation has made the link between monetary policy and published (or headline) inflation rates more transparent to the public, thereby making central banks more accountable for their policy actions. However, the current headline or general inflation rate is not totally under the control of the central bank. Policy changes affect only underlying inflationary pressures, and hence inflation rates, slowly over extended periods of time. Moreover, various economic developments beyond the control of the central bank may generate short-run or transitory changes in the inflation rate. Therefore, policy-makers focus on the more persistent movements in inflation and these measures of the underlying trend in inflation have been referred to as underlying or core inflation (Hogan, Johnson and Laflèche, 2001).

Several techniques of filtering aggregate prices are developed to remove transitory price movements and thereby produce a measure of underlying or "core" inflation. The aggregate inflation rate π_t at a particular time could be decomposed into permanent π_t^{ρ} and non permanent (or transitory) $\pi_t^{np\rho}$ components as:

$$\pi_t = \pi^{p}_t + \pi^{np}_t$$

The permanent component π_t^{ρ} is influenced by the expectations of the economic agents about future inflation, which in turn affects policy decisions of the monetary authority and finally the developments in the monetary aggregates (Tahir, 2006). Core inflation has been defined and calculated in different ways. In the following sub-sections the views of Central Banks on core inflation and their means of calculations would be discussed.

There is no single method of measuring core inflation rather there is a list of techniques ranging from simple exclusion to complex econometric models (Tahir, 2006). Some core inflation measures, such as the CPI excluding food and energy, systematically remove from overall inflation a limited set of components suspected to be affected by large and temporary price changes. In most cases, these items are related to supply disturbances and other non-monetary factors. Other measures, such as the trimmed mean CPI proposed by Bryan and Cecchetti in 1994, remove the components experiencing large relative price changes in a given month, with the set of excluded components varying from month to month (Clark 2001). The second approach is based on the use of limited influence estimators (LIEs), particularly various trimmed means, to exclude extreme price changes (Tahir, 2006).

A measure of core inflation has two somewhat distinct uses for monetary policy purposes. One role is in setting or formulating policy. The second is in providing policy accountability. These uses also largely determine the desirable properties of a measure of core inflation (Roger, 1998).

The approaches for estimating core inflation emanating from the central-bank's view may be loosely described as various ways of eliminating or reducing different 'undesirable' effects on the measured inflation rate. Typically, measured inflation is adjusted for

highly volatile components. For instance the inflation rate relevant for monetary-policy decisions in the US excludes changes in food and energy prices while the inflation-target variable in the UK is adjusted for mortgage interest payments (Apel and Jansson, 1999). Sometimes, measured inflation is also adjusted with respect to the direct, more or less definitional, adverse effects of the central bank's own actions. In Australia, for instance, the underlying inflation series removed interest rate charges included in the CPI thereby precluding a 'mechanical' relationship between changes in monetary policy and targeted inflation (Roberts, 2005).

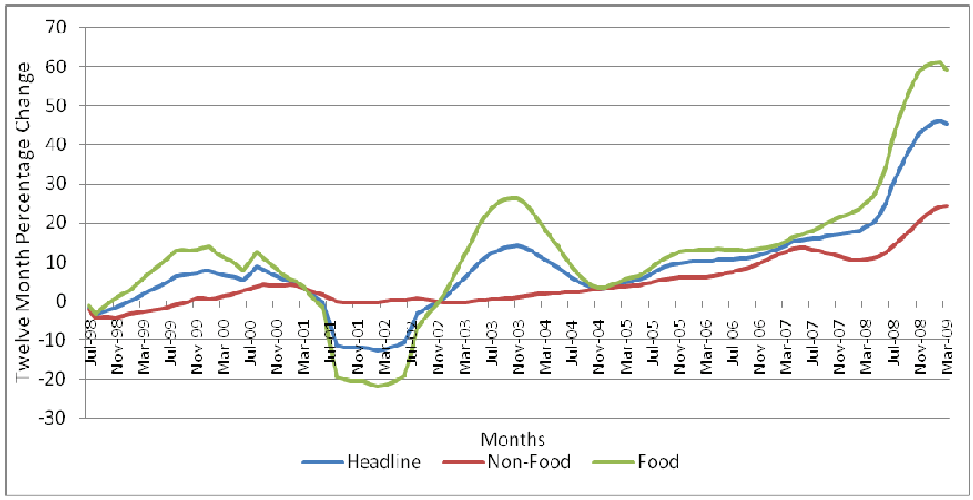
Scott Roger (1998) presented the following three properties that an effective core inflation should exhibit. First, it should be robust and unbiased. It should distinguish between persistent (expectations and demand-related) and transient (supply-related) movements in prices. In addition, the measure should not be significantly biased relative to the target measure of inflation. Second, it is important to have a measure of core inflation that is timely. In this case, significant revision over time is also equivalent to delay in its availability. Third, the measure of core inflation should have much credibility. Credibility will be enhanced if the measure is calculated externally or at least be readily verifiable externally. Credibility will also be enhanced if outside agents can reasonably easily understand the measure. As the details of the construction of the CPI (and may be the core inflation) are not widely understood, it probably is quite important that the basic approach taken to construct the measure for the latter be conveyed in a non-technical way. Even more important is that deviations of the core measure from the general inflation measure should be explained in a fairly tangible terms.

Using a US data Bryan, Cecchetti and Wiggins (1997) investigated the use of trimmed means as high-frequency estimators of inflation. They found that trimmed means produce better estimates of 'core inflation', which they defined as a long-run centered moving average of CPI and PPI inflation. The choice of how much to trim from the tails is, however, not obvious. Shortcomings that the LIEs share with the above discussed other central-bank estimates are that it is difficult to give the estimates an explicit economic content (for example, how they relate to changes in demand and supply) and that there is a risk of excluding potentially important information (Apel and Jansson, 1999).

3. PRICES AND MONETARY DEVELOPMENTS IN ETHIOPIA

3.1 Prices

As it is the case in many countries the collection and compilation of data on prices is done by the Central Statistics Agency (CSA). The CSA compiles the national as well as regional retail price indices monthly. The NBE analyzes the compiled data monthly, quarterly and annually, and the reports are published in the quarterly and annual reports of the Bank and posted on its website. The core inflation in Ethiopia excludes the food prices component from the total CPI and currently it accounts for 42.99 percent of the entire consumption basket considered in the CPI. It should, however, be noted that the expenditure weights are subject to change depending on the Household Income-Consumption Expenditure Survey to be undertaken by the CSA every five years. To calculate the monthly regional consumer price indices, the CSA uses geometric mean of prices of the specific regions. The CSA compiles the index for each month using the Laspeyres formula indicated in Appendix 1. Then NBE uses the monthly index data to compile it on monthly and quarterly basis.



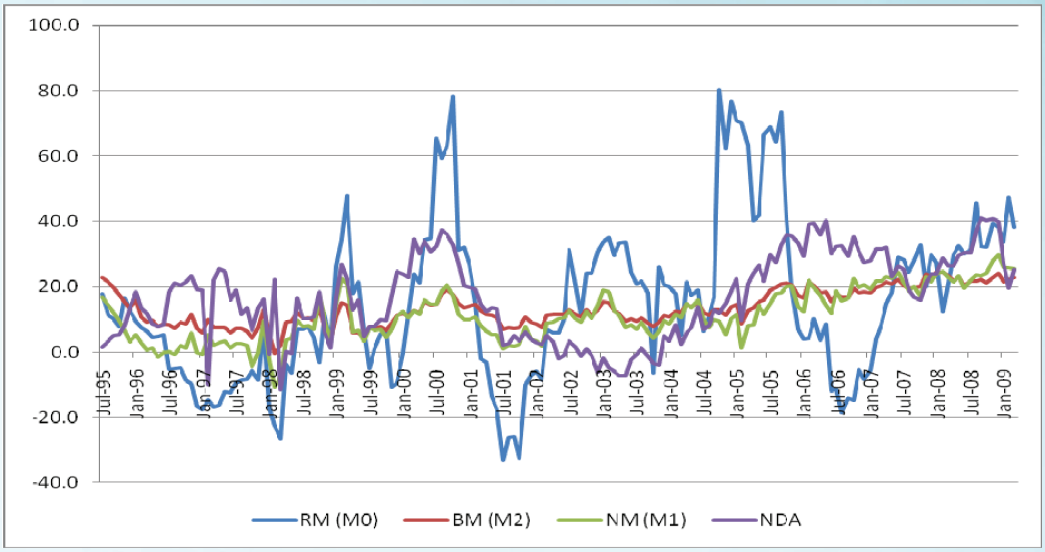
Graph 1: Annual Percentage Changes of different Price Series (July 1998 – March 2009)

In recent years, inflation in Ethiopia has become a serious problem for macroeconomic stability and the role of the central bank in stabilizing prices is wanted most. To achieve that the central bank should outline its target price and for this to be it should consider the different possible price series. At present, the National Bank of Ethiopia reports the price data in three series as: food, non-food and general inflation.

NBE considers the non-food prices as core inflation. Graph 1 shows price developments in the country based on three different series as disseminated by NBE. As can be seen from Graph 1 below that the non-food inflation series has been more stable over the period under review than the two other series. That means the severe fluctuation is more of the characteristics of the food component of the index. It can also be understood that along with other factors political stability and weather condition also affect the prices significantly. For instance, the price rise in 1999 and 2000 can at least partly be attributed to the 1998-2002 war with Eritrea and the price hike after 2005 to election related violence and war with Somalia. Similarly, the price fall in 2001/02 can at least partly be attributed to the better agricultural harvest due to weather condition and the price rise in 2003 to the bad weather condition that led to increase in food prices.

3.2 Money

Money is the cornerstone of the modern economy. It is a measure of value, a medium of exchange and a store of wealth. In addition, it is the bridge between real and nominal magnitudes, so understanding it is vital for understanding and controlling inflation (Economist, 2006). Inflation sometimes is defined informally as 'too much money chasing too few goods'. This statement captures important aspects of why money growth is related to inflation. The relationship between inflation and money growth ultimately depends on the demand for money and the supply of money. There are many different empirical measures of money, and the best measure is a matter of dispute as many researchers have come up with different variables. Still, money today generally is measured as the sum of currency and deposits in financial intermediaries that are used in exchange and also may include deposits that are close substitutes for currency or for deposits that are directly usable in exchange (Dwyer and Hafer, 1999).



Graph 2: Annual Percentage Changes of different Monetary Aggregates (July 1995 – March 2009)

As a monetary authority for the country, the National Bank of Ethiopia designs monetary policy with the intention to stabilize prices, facilitate economic growth, reduce unemployment and promote sound financial sector. The Bank uses different monetary aggregates to follow-up the impacts of its actions on the economy. The most common aggregates are: reserve money (M_0), narrow money (M_1), broad money (M_2) and the net domestic assets (NDA). The reserve money (which is also called monetary base or high-powered money) totally depends on the balance sheet of the central bank and is mainly a result of indirect instruments of monetary policy. Its main advantage with regard to monetary policy is that it can quickly be obtained before the financial statements of the other depository corporations are collected. Therefore, it has the benefit of time. It can guide the bank earlier than the other monetary aggregates can do.

Narrow money comprises current account and currency outside banks and it shows the component of money that is easily available for transaction and much ready to affect demand and then market prices. The broad money is calculated as narrow money plus savings and time deposits. That means M_2 includes some monetary liabilities that are less readily available for transactions than narrow money. The net domestic assets equals broad money less net foreign assets and it helps to determine the net effect of the money supply on domestic prices. Developments in these monetary variables over the past few years can easily be seen from Graph 2 abave.

4. DATA, METHODOLOGY AND ANALYSIS

4.1 Data

The price data used here is the annualized inflation rate of 25 commodity groups on monthly basis from July 1998 to March 2009. This commodity groups are: Beverages; Bread and Prepared Food; Coffee; Cigarettes and Tobacco; Clothing and Foot Wear; Cereals; Food Taken Away from Home; Furniture; House Rent, Construction Materials, Water, Fuel and Power; Milk and Cheese; Medical Care; Milling; Miscellaneous; Meat; Non-Food Total; Oils and Fats; Other Food Items; Pulses; Potatoes; Personal Care; Recreation, Entertainment and Education; Spices; Transport and Communication; and Vegetables, and the general (headline) inflation. In addition, there are also data on monetary aggregates of: reserve money, narrow money, broad money and the net domestic assets. All the data are obtained from National Bank of Ethiopia.

4.2 Methodology

The methodology applied here is comprised of two steps. First, a statistical technique intended to minimize the volatility of price movements in the CPI is used to calculate the trimmed mean of the general inflation series. The rationale behind the application of this statistical method is the fact that consumer price changes are proved to be highly kurtotic. Hence, the distribution of price changes deviates from normal distribution and CPI is not an efficient indicator of the inflation trend (Aghajanyan, 2004). Secondly, the trimmed means obtained are regressed on different monetary aggregates. Then the price series proved to be better described by the selected monetary aggregates would be chosen as the better candidate for core inflation.

Bryan and Cecchetti first introduced the trimmed mean CPI in 1994. It is a statistical technique of removing all large relative price changes from overall CPI inflation in each month, with the set of excluded components changing from month to month. The trimmed mean excludes the percent changes in price that rank among the smallest or largest (in numerical terms) changes for the month. Both small and large percent changes represent large price movements relative to the average for the month. The rationale for the trimmed mean is partly statistical, drawing on the historical properties of price changes in the United States and widely accepted statistics theory. In a typical month, a histogram of the price changes of the components of the CPI is somewhat wider than a bell curve, which is the shape the histogram would trace out if price changes could be described, in formal statistical terms, by the normal distribution. Statistically, then, the histogram—or the distribution of price changes—displays so-called fat tails. As a result, the average price change generally will be estimated more precisely by a trimmed mean than by a measure like the CPI, which averages across all components (Clark, 2001).

Trimmed means are calculated by trimming some part from the tails of the ordered distribution of individual price changes, and re-weighting the remainder. The rationale here is that when a substantial supply or demand shock takes place and influences the prices of some goods or services, indices of those goods or services stretch and skew the overall distribution. In this case the arithmetic mean, weighted according to consumer basket, does not show the general price trend. Therefore, the distribution has to be trimmed. Another way to explain this is that outlying individual price indices may reflect relative price changes but have no effect on inflation in the long run. If the distribution of individual price indices is skewed, then trimming will change the mean. The most important issue to be decided while applying this method is a determination of the best trim or cut-off level (Clark, 2001). That is the level of $\propto$ at which the series is going to be trimmed. It includes determining whether the trimming should be of similar levels of $\propto$ in both sides or not.

Many researchers have developed various optimization methods. Bryan, *Cecchetti* and *Wiggins* (1997) have found that trimmed means produce superior estimates of *'core inflation'* for US data on prices. Jaramillo (1998) has found that (asymmetric) trimmed means for Colombia with 12 percent trimmed from the upper and 24 percent from the lower tail exhibits substantially higher efficiency than the CPI inflation, the CPI excluding food and energy, the median and symmetric trimmed means. The Bank of England regularly calculates a 15 percent trimmed mean for publication (Aghajanyan, 2004). Wozniak (1999) calculated trimmed mean, sample mean percentile, standard deviation trimmed mean and exclusion mean based on the volatility of price changes. He found that volatility-based exclusion is most efficient for monthly and quarterly series, whereas excluding broad aggregates (food and energy) turned out optimal for annual series.

When the distribution is trimmed by ∝ percent from both tails, then the trimmed mean $x_{\alpha}(t)$ can be defined by the following equation as:

$$\left(1\Big/\sum_{t=first}^{last} w_i\right)\sum_{t=first}^{last} w_i\pi_i \qquad \text{.....(1)}$$

where the summations start with the first (ordered) price change to be included and end with the last (ordered) price change to be included and i is the set of price changes that is included in the calculation of core inflation, that is, the collection of price changes whose cumulative weights lies between $\alpha/100$ and $(1-\alpha/100)$. It should also be noted that if $\propto=0$ then the trimmed mean is actually identical with the official inflation. The statistical theory does not give any guidance for the choice of the optimal level of ∝ (Aghajanyan, 2004). The following values of ∝ have been applied in this study: 0, 5, 10, 15, 20 and 25. The steps followed in the calculation of trimmed means for the monthly inflation are shown in Appendix 2.

Two criteria should guide the choice of the best measure of core inflation: First, movements of core inflation should express inflation tendencies. A strong correlation with official inflation enables the use of core inflation as a predictor for the forecast of future inflation. Second, core inflation should display a strong relationship to monetary aggregates. This enables monetary authorities to find the measure that could be regulated by monetary policy. For policy-makers core inflation can be treated as a tool for economic policy. One of the best applications of core inflation is its use as an inflation target. While choosing an inflation target, the candidate core inflation measure should satisfy several requirements. Thus, the measure of core inflation with the best approximation to inflation trends and the strongest correlation with monetary aggregates can serve as an inflation target for monetary policy, since it is less volatile than the CPI inflation and will enable to minimize the variability of monetary policy instruments (Aghajanyan, 2004).

Hence, once we found candidates that satisfy the first criterion now we need to choose ones with the best proximity to the second, that is, the core inflation with the strongest statistical relation with the monetary aggregates. The monetary aggregates of the monetary base, narrow money, broad money and net domestic assets are chosen for analysis in this study. Needless to say, the least squares model is the great workhorse of applied econometrics. For Engle (2001) this is a natural choice, because applied econometricians are typically called upon to determine how much one variable will change in response to a change in some other variable. Here as well we use the least squares method for the evaluation of the relationship between the different candidates of core inflation measures and the different monetary aggregates.

Moreover, the equation is constructed as monetary aggregate as the only explanatory variable. This was because the issue is not on finding out what determines inflation in Ethiopia; rather it is about choosing the best indicator of core inflation from the different inflation series. It is possible to run the regression for all the price series in a similar way using monetary aggregates alone as exogenous and then to choose the better price series. This method does not rule out the influence of other factors on inflation but money is what matters most from the monetary policy perspective. In the literature, Agajanyan (2004) has used this methodology to regress different price series

on monetary aggregates using Armenian data and Shrestha (2006) has used it to evaluate different core inflation measures for Nepal.

It was also possible to use correlation rather than regression. Here we use regressions though some studies have also been conducted using correlation. The problem in correlation is that both variables are treated symmetrically: there is no distinction between the dependent and explanatory variables while in regression the dependent variable is taken to change as a result of change in the explanatory variable (Gujarati, 2004). As we are considering lagged values of money to cause present level of prices, there is no way a current price can go back and affect previous monetary levels.

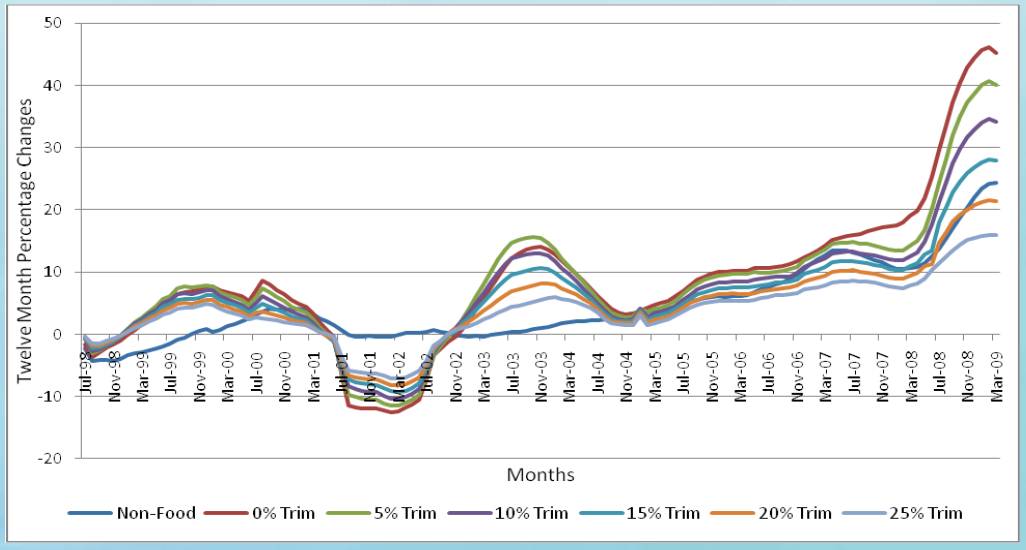
The regressions between core inflation candidates and changes of monetary aggregates will be done by the following equation:

Where $COREINF_t$ is core inflation measure for period *t*, while MV is the chosen monetary aggregate variable and the subscript m refers to the number of month lags. The monetary aggregates considered here are Reserve Money (M_0), Narrow Money (M_1), Broad Money (M_2) and the Net Domestic Assets (NDA). The chosen periods of lags are 3, 6, 12, 18, 24 and 36 months. Here it is assumed that the impact of money on inflation would be seen after a period of three to 36 months. Accordingly seven dependent variables with four independent variables at six different lag periods, a total of 168 (7 X 4 X 6 = 168) equations are regressed.

4.3 Estimation and Analysis

4.3.1 Calculation of the Core Inflation Candidates

The trimmed means of 0 percent, 5 percent, 10 percent, 15 percent, 20 percent and 25 percent trimmed means were calculated as per Equation (1) specified above. The 0 percent trimmed mean equals the general inflation itself while the 25 percent trimmed mean equals the median of the headline, that is 25 percent of the total is trimmed from both ends and remains with 50 percent cumulative weight. The trimming calculation is made using Microsoft Excel 2003. In addition, the non-food inflation reported by NBE as core inflation is also used for regression. That means totally seven types of core inflation candidates are made ready. The different trimmed mean series can be seen from Graph 3 below. From the figure it can also be observed that all the trimmed means calculated do not deviate much from the long run headline inflation and that is also one must behavior for core inflation.



Graph 3: Core Inflation Candidates Obtained (July 1998 – March 2009)

4.3.2 Unit Root Test

Cognizant of the fact that economic time series usually suffers from the problem of non-stationarity, the data on all the variables were checked for unit roots using the Augmented Dickey-Fuller test. The statistical software used for this analysis is E-views 6.0. All the core inflation candidates and the growth rates of the selected monetary aggregates were found to be stationary at level. From the price data non-food, and all the trimmed means of 5 percent, 10 percent, 15 percent, 20 percent were found to be stationary at 1 percent level of significance while the headline inflation and the 25 percent trimmed means were found to be so at 5 percent level of significance. Whereas from the growth rates of the monetary variables all were found to be stationary at 1 percent level of significance except the net domestic assets which is found to be so at 5 percent. It follows that we do not have a spurious regression problem in our analysis.

4.3.3 Equation Estimation Results

For a matter of saving space and time the regression results for the 168 equations estimated are not presented here rather some of the highlights of the models are discussed (but they can still be presented by request). The t-ratios for the monetary aggregate parameter, R^2, Adj R^2, F-Stat, Akaike info and Schwarz Criterion are discussed in the following sections.

One common behavior of all the regression parameter coefficients for all the equations with significant t-ratios is their being of positive justifying the theoretical positive relationship with inflation and growth of money. The underpinning determinants of money supply: narrow and broad money are also found to have positive and strong relationship with all the inflation series. Nevertheless, we should arrange the different inflation series by their R^2, adjusted R^2, F-statistics, Akaike info and Schwartz Criteria in their relation with monetary variables so that we can decide on the better core inflation series. It should also be noted that narrow and broad money are the key factors in determining the relationship of a given price variable with monetary factors. Based on this the result greatly supports the better efficiency of the existing NBE measure of core inflation. As can be seen from Table 1 below the non food series has the highest R^2, over all time lags. Based on the regression result the non-food series could be considered as the better of all models in terms of R^2, adjusted R^2, F-statistics, Akaike info and Schwartz Criteria. Therefore, it is statistically justifiable to conclude NBE has the better core inflation measures than symmetric trimmed means of 0, 5, 10, 15, 20 and 25 percents.

Table 1: R2 Values of the Equations for Narrow and Broad Money Regressors

Monetary Variable	3 Months	6 Months	12 Months	18 Months	24 Months	36 Months
Regressand: Headline Inflation						
M_1	0.528507	0.469529	0.334165	0.202556	0.140966	0.124078
M_2	0.474740	0.452428	0.359905	0.250697	0.237422	0.269713
Regressand: Non-Food Inflation						
M_1	0.587651	0.525237	0.475681	0.452401	0.364309	0.137629
M_2	0.679396	0.644275	0.609525	0.550919	0.438080	0.136371
Regressand: 5 Percent Trimmed Mean						
M_1	0.491381	0.444138	0.296917	0.153951	0.099644	0.136611
M_2	0.409856	0.400745	0.318592	0.206914	0.192531	0.284301
Regressand: 10 Percent Trimmed Mean						
M_1	0.501355	0.451832	0.302630	0.155198	0.098976	0.131456
M_2	0.419168	0.408149	0.324907	0.212623	0.196541	0.277334
Regressand: 15 Percent Trimmed Mean						
M_1	0.514135	0.460931	0.305858	0.153310	0.096584	0.120621
M_2	0.432986	0.416223	0.326406	0.213865	0.197822	0.263748
Regressand: 20 Percent Trimmed Mean						
M_1	0.529908	0.472147	0.306828	0.147506	0.091201	0.101743
M_2	0.451126	0.425328	0.323410	0.211757	0.197844	0.241696
Regressand: 25 Percent Trimmed Mean						
M_1	0.546403	0.480409	0.306718	0.142883	0.087934	0.076986
M_2	0.473246	0.434319	0.319033	0.209076	0.198287	0.209586

4.3.3.1 The Equation for Twenty Five percent Trimmed Mean

This inflation candidate was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. But it has also got an insignificant t-statistics on a 12, 18 and 24 months lag equation for reserve money. Net domestic assets has also got an insignificant statistical result in an 18 month lag period.

4.3.3.2 The Equation for Twenty percent Trimmed Mean

As all the other core inflation candidates examined in this paper the 20 percent trimmed mean was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. However, it has got an insignificant t-statistics on a 12, 18 and 24 months lag equation for reserve money and on 24 months lag for net domestic assets. These results are presented in Appendix 1f.

4.3.3.3 The Equation for Fifteen percent Trimmed Mean

it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. However, it has got an insignificant t-statistics on a 12, 18 and 24 months lag equation for both reserve money and net domestic assets.

4.3.3.4 The Equation for Ten percent Trimmed Mean

As all the other core inflation candidates examined in this paper the 10 percent trimmed mean was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. However, it has got an insignificant t-statistics on a 12, 18 and 24 months lag equation for reserve money and on 12 and 18 months lag for net domestic assets.

4.3.3.5 The Equation for Five percent Trimmed Mean

As all the other core inflation candidates examined in this paper the five percent trimmed mean was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. However, it has got an insignificant t-statistics on a 12, 18 and 24 months lag equation for reserve money and on 12 and 18 months lag for net domestic assets.

4.3.3.6 The Equation for Zero percent Trimmed Mean (the General Inflation Series)

As all the other core inflation candidates examined in this paper the zero percent trimmed mean which is equivalent to the general (headline) inflation was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with narrow money and broad money. However, it has got an insignificant t-statistics on a 12, 18 and 24 months lag equation for reserve money and on 18 months lag for net domestic assets.

4.3.3.7 The Equation for Non-Food Inflation (Existing Official Core Inflation Measure of Inflation)

As all the other core inflation candidates examined in this paper this inflation candidate was regressed on reserve money, narrow money, broad money and net domestic assets in six temporal models. That means it was checked in 24 equations. In all these regressions, a significant statistical result is obtained in its relationship with all the monetary variables over the entire period of lags considered but the 12 month lag equation for reserve money.

5. CONCLUDING REMARKS

The concept of underlying inflation is a critical issue for central banks in conducting the monetary policy. Unlike the headline inflation, the underlying inflation is supposed to represent persistent source of inflationary behavior. Short-term price fluctuations may misrepresent the actual inflationary trend. Some temporary events that cannot be addressed through monetary policy may cause problems in the consumer price index. Such a situation creates substantial difficulties for implementation of monetary policy. No matter what the target is, defining and measuring the core inflation determines the direction of the policy.

In this paper we tried to construct different series of prices by trimming the existing price data. Symmetric trimmed means were calculated with 0, 5, 10, 15, 20 and 25 percent cut-off on both tails of the price data. These series and the existing core inflation series of NBE were regressed on four different monetary variables over different time lags. It is found out that the existing core inflation measurement used by NBE is more efficient than the calculated trimmed means. The trimmed means calculated here are symmetric and have similar tails of $\propto$ in both ends of prices.

Nevertheless, it might still be important to consider an inflation series that excludes energy prices in addition to the food ones. There is a lack of such an inflation series in the Ethiopian case. So we couldn't check for the efficiency of this series. Recently the CSA has begun to calculate the fuel prices separately. That would greatly help in future endeavors to calculate prices excluding food and fuel prices.

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Appendices

Appendix 1: Laspeyres Formula Used by CSA to Calculate Indices
The following Laspeyres formula is used to compute the index.

$$PL = \frac{\Sigma P_n \times Q_o}{\Sigma P_n \times Q_o}$$

PL = Laspeyres Price Index
P_o = Price of given commodity in the base period
P_n = Price of a given commodity in the period for which the index is computed
Q_o = Quantity of Given commodity in the base period

Appendix 2: Steps Followed in the Calculation of Trimmed Means

Trimmed mean inflation rate for each period is calculated using the following steps.

1. *Simple periodic percentage changes in each component price index are obtained from the National Bank of Ethiopia.*
2. *The percentage changes in price are arranged from (numerically) smallest to largest, and sort the relative importance weights for each component along with the price changes. The ordered inflation rates are denoted by πi the weights for the different commodity groups are denoted by ωi where i = 1,2.3, ..., n*
3. *Obtain the cumulative sum of the arranged relative importance weights for each ordered price change i For instance, the cumulative weight associated with πi the third-ranked price change, equals $\omega_1 + \omega_2 + \omega_3$*
4. *Exclude those percent changes in price for which the cumulative weight is either less than $\propto$ percent (unusually small percentage changes) or greater than 100- $\propto$ percent (unusually large percent changes).*
5. *Multiply all the group inflation rates in the remaining (non-excluded) part of the general inflation series by respective weights.*
6. *Divide each figure obtained in Step 5 by 100.*
7. *Sum all the figures obtained in Step 6 to obtain the trimmed mean for the period under review.*

Measurements of International Competitiveness: Lessons for Ethiopia

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Abstract

The external sector of Ethiopia is characterized by persistent current account deficits due to mainly merchandise trade deficit which in turn results from steady and significant growth in import of goods while earning from export of merchandise goods remains extremely low compare to financing of import bill. On the other hand, the capital account usually records surplus due to the inflow of long-term external loan/grants disbursements and foreign direct investment which have used to finance a portion of current account gap.

The export sector has shown a great leap in foreign exchange revenue particularly since 2002/03 owing to the improvements in the international prices and increased volumes of major export items. In fact, the improvement in the global prices is higher than the increase in volumes of most key export items. Therefore, the notable increase in export revenue over the period was driven largely by the rise in world prices rather than the increase in the volumes of the exports.

In fact, export performance often refers to the relative success or failure of the efforts of a firm or nation to sell domestically produced goods and services in other nations and it depends largely on the competitiveness of the export products in the international market particularly in relation to specific export items that are important in terms of, for example, productivity, growth potential and foreign currency earning capacity, i.e., improving export performance requires enhancing competitiveness and then improve current account gap and thereby avoid losing foreign reserve and limit external debt dependency.

The concept of international competitiveness is often used in analyzing countries' macroeconomic performance. It compares, for a country and its trading partners, a number of salient economic features that can help explain international trade trends. Competitiveness is a dynamic concept, in which the relevant indicators consist of economic variables that can be changed by policy and/or economic decisions. Therefore, it is relevant for policy makers as it is based on variables that they can act upon to create the conditions conducive to economic activities and prosperity.

The main objective of this paper is, therefore, to highlight the various measures of international competitiveness particularly used in low income countries in order to draw lessons for Ethiopia. A number of indicators have been identified to assess economic performance in general and competitiveness in particular. Attempting to measure the change in competitiveness of an economy is further made complex by the diversity of measures that are available. The choice of measurements is also constrained by the availability of suitable data. Thus, no single, comprehensive measure of competitiveness can be regarded as the appropriate indicator as some measures are either clearly defective and others

are incomplete. However, measurements international competitiveness are often confined to a more restricted notion of relative competitive positions based on price or cost differentials. A narrowly defined notion of competitiveness is that of international cost and price competitiveness which measures the comparative prices or costs across countries in a common currency.

The analysis of global competitiveness is then measured in terms of real effective exchange rate (REER) derived from nominal exchange rate deflated by relative prices or cost. The REER is used primarily as tool to analyze and forecast international trade trends of a nation and is calculated so as to provide comprehensive picture of competition by exporters and local producers on domestic and foreign markets. Therefore, the REER remains to be useful tool and has been extensively publicized to analyze and evaluate a nation's global competitiveness despite the serious problems posed in its data aggregation and construction.

1. Introduction

The literature offers a wide variety of definitions on international competitiveness. One of the most straightforward definitions by the World Economic Forum is that competitiveness is the ability of a country to achieve sustained high rates of growth in GDP per capita. A similar but more detailed definition supplied by the Organization for Economic Cooperation and Development (OECD) is that competitiveness is the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the taste of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term. The International Institute for Management Development also defines competitiveness as "the ability of a nation to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people".

It is also defined as the ability of a nation to produce goods and services of international quality standards with more cost effective than other countries. To be competitive, a country must be able to charge lower prices and supply better quality of products and services than its competitors. Generally, competitiveness requires the ability of a country to operate efficiently and productively in relation to other countries while improving the living standards of its citizens.

A sustained and strong improvement in productivity has crucially determined the international competitiveness of developing countries and it can be achieved through augmenting the existing stock of physical and human capital, enabling the use of more efficient technologies and shifting resources away from traditional and low productivity sectors towards other sectors that offer a high potential for productivity growth. However, the availabilities of adequate transport and communications infrastructure and information systems have vital influences on the ability of developing countries to conduct trade and to successfully compete in foreign markets.

The World Bank views export competitiveness as an issue closely related with a country's trading environment which is affected by a series of physical and non-physical factors such as the quality of logistic service, transport infrastructure, government institutions, procedures and formalities. The World Bank indicates that export competitiveness rests on the following three complementary pillars: (a) an incentive framework, (b) a reduction of trade-related costs and (c) an overcoming of market and government failures. Key factors which affect trade-related costs include logistic and transport infrastructure as well as institutional quality.

The exchange rate policy in developing countries has been recognized as an important instrument to make domestic entrepreneurs internationally competitive and provide profit incentives for them to invest in non-traditional export sectors. A more competitive exchange rate might improve short-term export performance where as sustain improvement requires enhanced productivity and resource reallocation to more dynamic sectors, which depends on reforms to improve business environment. Foreign direct investment and domestic private investment are key factors for economic transformation, but boosting investment depends on successful implementation of structural reforms aimed at improving the business environments.

The external sector of Ethiopia is characterized by persistent current account deficits due to mainly merchandise trade deficit which usually more than offset the surpluses in service and capital accounts. The deficit in trade balance has been due to the steady and significant growth in import of goods in association with the economic recovery since 1990/91. The export earning has been extremely low compare to financing of import bill due to, among other factors, the nature and structure of the export sector and low level of productivity. On the other hand, the capital account usually records surplus due to the inflow of long-term external loan/grants disbursements, HIPC relief and foreign direct investment which have been used to finance a portion of current account gap. Generally, the development of Balance of Payments (BOP) of the country over the current economic system increasingly reflects the openness of the country's economy, its socio-economic integration with the rest of world economies and its savings-investment imbalance.

The nature and structure of Ethiopian commodity export sector reflects the country's level of economic development, its resource endowments, policies and development strategies pursued. Being underdeveloped economy that heavily depends on agriculture, the structure of Ethiopian commodity export sector has been primarily confined to export of agricultural raw commodities of which a few primary commodities have been the main contributors to the country's foreign exchange earnings. The most important aspect of the primary exports is that they have limited demand in the international market due to low price and income elasticities of demand and more vulnerable to natural disasters and adverse global price movements. As a result, the export earnings from primary commodities are more subject to instabilities which remain to be the main troublesome to boost and sustain export revenue of the country. This implies that a large reliance up on a few primary export commodities for the main source of foreign exchange earning is not a successful export strategy (See Annex 1).

Manufacturing for export in most SSA countries like Ethiopia has relied on local sources for major raw material requirements. In fact, this is to cut the costs of production so as to enable these countries to set the prices of their exports competitively in both domestic and foreign markets. In the case of Ethiopia, a few local resource base firms producing consumption goods are currently able to move in to foreign market so that the exports are very few in number or type and small in size or volume presumably due to lack of competitiveness of the products in the international market. So far, the performance of manufacturing export has generally been poor and the export earning has remained too low to maintain the variability in primary export earnings and to boost the export revenue of the country.

The small size of domestic market implies that local firms should target foreign markets in order to increase production. However, the principal role assigned to domestic manufacturing firms, particularly in the last two regimes, was to meet the demand in the domestic market in an attempt to replace imports. This strategy failed to main

tain the kind of balance between domestic and export-oriented manufacturing and is reflected in the virtual absence of much tendency towards manufacturing for export, which together with high cost of production, dampened the ambitions of domestic manufacturers to engage in production for foreign market so that out puts are targeted mainly for domestic market.

The trade liberalization measures (export tax, licensing, etc) could also be considered as the means, not the end, through which Ethiopia could increase its manufacturing exports. However, the trade reform and export performance identify low productivity as one key factor constraining local firm's capacity to participate in export markets. Low productivity has originated from import substitution policies pursued during post trade liberalization period. For instance, the use of quotas rather than tariffs shielded domestic firms from the effect of external competition, which led them to operate inefficiently and to lack of competitiveness in international markets.

The export sector has shown a great leap in foreign exchange revenue particularly since 2002/03 owing to the improvements in international prices and increased volumes of major export items. In fact, the improvement in global prices is higher than the increase in volumes of the exports. Therefore, it appears that the notable increase in export revenue over the period was driven largely by the rise in world prices rather than the increase in the volumes of key export items[1]. However, when we compare Ethiopia's export performance with respect to other countries with in Sub-Sahara Africa or low income countries, we may notice how far the achievement of the sector is lagging behind the export sectors of these countries.

In fact, export performance often refers to the relative success or failure of the efforts of a firm or nation to sell domestically produced goods and services in other nations. It depends more on the competitiveness of the export products in the international market particularly in relation to specific export items that are important in terms of, for example, productivity, growth potential and foreign currency earning. That is, improving export performance requires enhancing competitiveness and then improve current account gap and thereby avoid losing foreign reserve and limit external debt dependency.

Ethiopian export market structure also reveals that the large share of merchandise goods have market in a few foreign countries with which the country has maintained trade and investment partnership for long period. Indeed, diversifying partner countries reduces a country's dependence on a small number of export markets and hence the vulnerability to shocks within destination countries. This requires the export products to gain higher competitiveness in both of price and quality standard against competitors.

In addition, Ethiopia's exports lack the ability to optimize market opportunities in Europe and USA obtained through Everything But Arms (EBA) and Africa Growth and Opportunity Act (AGOA) initiatives respectively without tariff and quota restrictions. Despite the vast markets in Europe, Ethiopia's exports have been directed to a few countries of the continent. USA's markets also account for a relatively small share of the country's exports[2]. This implies the exports to these markets have faced non-tariff barriers including lack of quality standard for which the markets in advanced nations, particularly western European countries are advocating.

This has to call for measuring and analyzing the trend and competitive stance of the county in the global markets over time vis-à-vis other nations in low income group. In this case, various countries are increasingly evaluating their global competitiveness and conduct comparative analysis using different indicators. Some countries have also established advisory body or special government agency to handle their own global competitiveness issues[3].

[1] For instance, earning from export of coffee grew by 27% as its average unit price increased by 20.2 % while its volume rose only by 7% over the period (See Annex 1 for more)

[2] See Annex 2.

[3] Gustavo R and Charalambos G mentioned some countries like USA, Ireland, Croatia Greece, The Philippines and Tunisia.

The main objective of this paper is, therefore, to highlight the various measurements of international competitiveness together with their limitations and relationship with export performance particularly for low income countries in order to draw lessons for Ethiopia. As the measurements consist of variables that can be changed, policy makers can act upon them to create conducive conditions for economic activities and prosperity.

The rest of the paper is organized and proceeds as follow. Section two presents measurements of international competitiveness developed by different organizations to analyze the trend and competitive stance of a nation. The next section assesses the experience of some low income countries with respect to measurements of global competitiveness in order to draw lessons for Ethiopia. The last section is devoted to concluding remarks.

2. Measurements of International Competitiveness

A wide range of criteria and measures of international competitiveness of a nation have been developed by international and regional organizations and some of which have been extensively publicized to analyze the trend in international competitiveness. Most of the indicators demonstrate that competitiveness depends on various factors such as internal and external, physical and non-physical, economic, political, administration, social and educational considerations.

International competitiveness relates to an economy's ability to compete in international markets by either producing goods at a lower cost or selling goods at a lower price than competitor countries. Obviously, these two concepts are interrelated, as the lower the production costs the lower the price firms can charge for their products yet remain profitable. In the short term, competitiveness developments are often associated with the evolution of the real exchange rate as it takes in to account the movements of a nation's nominal exchange rate and the relative movements of domestic prices or cost vis-à-vis that of trade partner countries.

Thus, the real exchange rate (RER), which essentially measures the evolution of relative prices or costs denominated in a single currency, remains the most commonly used measurement of international competitiveness of a nation at different level of income. Its movement may either over or understates changes in a country's international competitiveness position, i.e., a depreciation of real exchange rate has a positive influence on export sector while the real appreciation of the local currency tends to reduce the external competitiveness of a nation.

For instance, the real exchange rate appreciates when the nominal exchange rate appreciates and/or when the domestic price level rises by more than the foreign price level i.e., when the domestic inflation is higher than foreign inflation. Therefore, a real exchange rate appreciation tends to make domestic goods more expensive at home than abroad so that it becomes difficult for export producers to sell their goods abroad but more attractive to sell their goods at home. This explains why the real exchange rate is usually used as a measure of international competitiveness. However, it should be noted that a more

competitive exchange rate might improve short-run competitiveness and hence export performance while the real exchange rate in the long run is supposed to converge to its equilibrium level so that sustain improvement in competitiveness requires enhanced productivity and resource reallocation to more dynamic sector.

A misalignment or non-equilibrium movements of a RER suggests either over-valuation or under valuation of the exchange rate of the national currency[4] and competitive stance of the economy may be jeopardized. For instance, RER misalignment in terms of real overvaluation could adversely affect export performance since real overvaluation reflects a loss in a country's competitiveness and misallocations of resources toward the non-tradable sector. More precisely, appreciation of a real exchange rate relative to its equilibrium value lowers exports and raises imports, thereby lowering net exports. Therefore, the desired level of international competitiveness has been ensured at the equilibrium level of the RER.

The real exchange rate can be computed either on a bilateral or multilateral basis. Since a country trades and competes with a number of other countries in the international markets, real effective exchange rate (REER) is constructed as a multilateral or effective RER for which economists and policymakers are more interested in analyzing competitive stance of a country. To convert a set of bilateral RER indices into a multilateral real exchange rate (REER), a weighted average of the bilateral RER indices needs to be taken. Thus, the REER is the average of bilateral RERs between a country and each of its trading partners, weighted by the respective trade shares of each partner[5].

A country's overall trade competitiveness can be assessed using Trade Competitiveness Index (TCI) as a measure of vital determinants of trade competitiveness and is defined as the intrinsic ability of the country to compete successfully in the global economy and to sustain improvements in real output and wealth. The TCI can be used not only for assessments of the competitiveness performance of a nation with respect to other countries but also to indicate some specific areas where new or revision of policy measures and/or institutional changes may be necessary. The index is usually derived from three components, each capturing different dimensions of trade competitiveness: Trade-enabling Environment Index (TEI), Productive Resource Index (PRI) and Infrastructure Index (II). The three TCI sub-components are briefly described as follow[6].

Trade-enabling Environment Index (TEI)

The TEI covers aspects related to quality of institutions and the overall macroeconomic environment and policies pertaining to trade. The significance of institutions has been noted in explaining a country's trade performance. Economies that have weak institutions (such as weak judicial systems or corrupt administrations) will find it difficult to attract capital required for production and export. In addition, countries with a complex bureaucracy and stringent licensing requirements may discourage investors from tapping available economic resources and potential.

Another dimension is the macroeconomic environment prevailing in a country. It is widely accepted that adverse macroeconomic conditions are unconducive to trade in general and growth in particular. Hence, the TEI captures, for example, whether the country has a stable exchange rate, whether it suffers from high inflation, how competitive its interest rates and real effective exchange rate are and whether its trade policy is geared to export promotion with a rational tariff regime.

Productive Resource Index (PRI)

The PRI captures the availability of direct productive inputs in a country. It consists of two sub-components: human resources – called the Labour Force Index – and other natural resources and geographical factors that affect a country's productive base – called the Geography Index. The Labour Force Index traces the availability and quality of human resources and takes into account the size, the skill level and the health status of the

4 Misalignment refers to a sustained departure of the actual RER from its long run equilibrium trend while short run fluctuation of the RER about its long run position refers to as volatility.

5 See Annex 3 for alternative definition and mathematical expression of the REER.

6 See Annex 4 for the detail structure of TCI and its sub-components of the three major indices.

labour force. The Geography Index captures factors that are relevant for the major economic sectors – agriculture and manufacturing – and therefore includes the geographical location of the country – whether it is landlocked – the existence of arable land and renewable water resources. The Labour Force Index is an important input for all economic sectors and is more directly under the control of policymakers.

Infrastructure Index (II)

This captures the physical investments necessary to carry out trade effectively. To be able to produce and export goods, a minimum physical infrastructure is needed. Reliable energy sources should be available and roads are needed to link production facilities with points of exit for goods. In addition, today's global environment has created the need for good communications. Producers need to be able to communicate quickly and effectively with their trade partners to maintain a country's competitiveness.

In this regard, it is commonly accepted that for most of developing countries unusually high transaction costs are a major source of comparative disadvantage in manufactured exports, which constitute a more "transactions-intensive" sector than primary production. The II assesses infrastructure bottlenecks and progress in infrastructure investment and policy reform to reduce these costs which are vital for trade competitiveness. As such, it encapsulates the infrastructure base required for the development of economic activities in general and internal and external trade in goods and services in particular. The sub-indices measure respectively telecommunications, energy, transport and access to information infrastructures available in a country.

Productivity is one of the driving forces of economic growth and key determinant of international competitiveness of a nation. Achieving high level of productivity change in its growth rates over competing countries makes a country to gain competitiveness at a global market. It is important particularly for small open economies aiming to provide its people with the opportunity to improve their living standards and quality of life by providing employment and raising incomes through productivity gains.

As a measure of efficiency of production, it is often expressed as the ratio of output of goods and services produced to one or some, or all of the resource inputs used in production. Thus, factors to improve productivity include greater use of improved technology and innovation, altered working practices, improved and trained workforce and resources. But, it usually refers to labour productivity which measures the quantity of output produced per worker employed. This mainly depends on human capital acquired through training and technological capability, i.e. the ability of workers to use, adapt and develop the technology significantly influences productivity level. While productivity gains are crucial for competitiveness, the process of raising productivity may differ across countries. Therefore, assessing the level and rates of growth of productivity is of paramount importance to measure the level of potential competitiveness of a country.

External sector outcomes comprises of export growth, global market share and current account development which can be used to assess a nation's global competitiveness and suggest information about the effectiveness of policies (such as trade and exchange rate policies) related to current account developments of a country. The growth in export, expansion in export market share and diversification of commodity export may indicate the ability of a country to compete in the international markets. In particular, the global market share with respect to specific foreign trading partner and the establishment of new foreign markets may result from efficiency and productivity gains and indicate the competitiveness of a nation. However, the policy environments in many of low income countries may not be appropriate to encourage and support producers of export to expand productive capacity. Moreover, the performance of export in these countries is a func

tion of exogenous factors such as violent fluctuation in world market prices of primary export commodities. Despite the constraints, these measurements of competitiveness can be used for economies at low level of income as the required data are readily available.

Export diversification refers to changes in the composition of exports or in the relative contribution of each export product to total export earnings with a view to widening the scope for products with good prospects that are not affected in the same manner by fluctuations of international prices. This entails changing the composition of exports with the purpose of increasing a country's foreign exchange earnings. It is directly related to the structure of an economy and subject to changes as development proceeds.

Diversification has a tendency to limit a country's dependency on a small number or types of export products and hence reduces its vulnerability to external shocks so that it has been the strategy of developing countries with narrow range of export of commodities as it tend to reduce unexpected decline or variability and hence uncertainty about export proceeds. Thus, the success in export diversification reflects how competitive the export products to expand and gain global market share so that it can be an indicator of international competitiveness of a nation. However, export diversification or expanding the range of goods and services for export requires investment and perhaps foreign capital and technology to flow in to a country. As part of export diversification effort, promoting tourism can also be considered as a measure of competitiveness of a given economy. This also depends mainly on the prevalence of sustained peace and stability, well developed infrastructure facilities, among other tourist attraction factors.

Similarly, current account development is another indicator of international competitiveness. In low income countries, however, it is usually influenced by such factors as trade policy, temporary shocks and lack of prompt responses to policy changes. Some of the current account transactions of these countries may be financed by long-run aid inflow and reflected in the current account development. Overvaluation of domestic currency also affects the development of current account as it makes exports uncompetitive while imports become cheaper.

The inflow of Foreign Direct Investment (FDI) to developing countries is the sources of capital and technology transfer, employment expansion, productivity gains, export promotion and expansion of foreign markets. Accordingly, many developing countries have frequently undergone through policy revision with respect to FDI so as to make their economic environment to be more conducive to boost the inflows of FDI. Thus, it is an indicator of a country's competitiveness to attract foreign investment in different sectors of its economy. FDI as a percentage of national GDP is usually used to evaluate the competitiveness of the economy vis-à-vis other economies. However, the inflow of FDI depends on such factors as the ability of a country to maintain conducive economic environment to attract FDI particularly stable macroeconomic condition, sustain peace and stability, development in infrastructures, availability of raw materials (natural resource endowments), size of domestic market, labour costs and human capital.

Business doing indicator is survey based measurement of competitiveness that takes in to account how a given economy's environment is conducive to do businesses. It is a statistical indicator; compiled by the World Bank for member countries including almost all low income countries. The statistics provide measurements of business regulations and their enforcement costs. For instance, one of the regulations measures the number

of procedures, days taken and minimum capital required to start business in a particular country. It can be used to analyze how a specific regulation enhances or constrains investment, productivity and growth. This indicator has 10 categories of regulations that are used to derive an overall evaluation of how ease the environment of a nation's economy for doing business vis-à-vis other economies (See Annex 5).

The most recent indicator on competitiveness related to trade is the Trade Performance Index (TPI) formulated by the International Trade Centre of the United Nations Conference on Trade and Development (UNCTAD) and the World Trade Organization (WTO). It is developed with the aim of assessing and monitoring the multi-faceted dimensions of export performance and competitiveness by sector and by county. The index calculates the level of competitiveness and diversification of a particular export sector using comparisons with other countries. In particular, it brings out gains and losses in world market shares and sheds light on the factors causing these changes. Moreover, it monitors the evolution of export diversification for products and markets.

This index covers a total of 184 countries and 14 export sub-sectors; it consists of 22 quantitative indicators of trade performance. For ease of reference, these indicators are presented in absolute term and , in addition, ranked among the 184 countries covered by the TPI. For each country and each sector, the TPI provides three types of indicators: a general profile, a country position for the latest available year and changes in export performance in recent years. Moreover, two composite rankings are calculated. One of these rankings refers to the overall position of a country and sector and another ranking refers to changes in performance. The composite ranking referring to the overall position is based on five criteria, namely the value of net exports, per capita exports, the world market share, the diversification of products, and the diversification of markets. The composite ranking referring to changes in performance is based on five criteria, namely the change in the world market share, the change in the cover ratio (exports divided by imports), the level of specialization in dynamic products, the change in product diversification and the change in market diversification.

There is also another survey-based competitiveness indicator – Global Competitiveness Index (GCI) – developed by World Economic Forum to identify the competitive strengths of a country and the barriers that impedes its economic progress. The GCI has three subcategories. These are basic requirements (that includes institutions, infrastructure, macro economy, and health & primary education), efficiency enhancer (higher education and training, market efficiency and technological readiness) and innovation factors (business sophistication and innovation).

The Business Competitiveness Index (BCI), also of the World Economic Forum, is used to identify, from a micro economic perspective, the competitive strengths and weakness of a country's business environment. The factors measured to determine the quality of the microeconomic business environment include: (a) freedom from corruption, (b) efficiency of legal framework, (c) quality of port infrastructure and (d) prevalence of trade barriers. The finding of the index indicates that government is in a special position to affect many aspects of the business environment and plays an important role in the creation of competitiveness.

3. Lessons Drawn

A number of literatures reveal that REER has been widely used indicator of international competitiveness in countries at all levels of income. Some research works also applied REER, among other indicators, to measure the change in international competitiveness of low income economies. The only difference across countries is the choice of REER based on consumer price, producer or wholesale price or GDP deflator or unit labour cost. Despite data problem associated with consumer price, the REER based on consumer price is commonly applied to assess the changes in international competitiveness of low income countries.

For instance, Ken M (2007) conducted analysis on international competitiveness of Namibia's economy using REER movements, among other indicators of international competitiveness. Furthermore, the misalignment of the actual REER of Namibia is examined using equilibrium REER estimated in different approaches. Similarly, REER based on consumer price and relative labour cost has been used to evaluate the international competitiveness of the economies in the CFA Frank Zone countries7. The competitiveness of Chile's economy has also been viewed using the trend of REER based on consumer price, unit labour cost, GDP deflator and wholesale price. The IMF also considers the movements of REER, among other indicators, to evaluate the competitiveness of the economies of its member countries including Ethiopian.

While REER remains a crucial and widely used indicator of international competitiveness, many of the research works and literatures have emphasized the need for this indicator to be supplemented by a range of other indicators of competitiveness.
In its measuring of African trade competitiveness, the Economic Commission for Africa (ECA) computed Trade Competitiveness Index (TCI) for 30 African selected countries including Ethiopia. A total of 31 indicators or variables for the period 1980 – 2001 in five years intervals are used to construct the three major components (indices) of TCI and each of which received equal weights which allows identification of the most competitive countries on the continent in terms of trade as well as identification of bottlenecks to improved trade performance.

In summary, the results show that Mauritius, South Africa, Namibia, Tunisia and Gabon are the most competitive African countries while the Democratic Republic of Congo, Mali, Nigeria, Burkina Faso and Sierra Leone are the least competitive. A close look at the results of the TCI shows that the key drivers for competitiveness within Africa are the trade-enabling environment in general and institutional quality in particular. The top-scoring African countries in terms of the trade-enabling environment are also the top-scoring countries in terms of overall trade competitiveness. These countries have managed to diversify the most and have the highest export shares of manufactured goods. Low scoring African countries tend to be hampered by a combination of political and institutional weaknesses.

Infrastructure is another vital factor. The poor condition of much vital infrastructure is a hindrance both to intra-African trade and to African trade with other regions of the world. Africa faces unusually high transaction costs which are often related to infrastructure. This is a major source of both comparative and competitive disadvantage in manufactured exports which are more "transactions-intensive" than primary products. Poor infrastructure tends to inhibit a country's efforts to achieve greater vertical diversification. It has long been apparent that African countries need to reduce their reliance on exports of raw materials to move up the value chain

by producing manufactured goods or processed raw materials. If Africa is to follow a development path geared toward greater global integration, the critical steps include addressing inadequate infrastructure, including energy and enhancing trade facilitation. Any moves in this direction would help to ease the flow of goods and services across the continent.

Due to lack of direct information on labour productivity, real GDP per capita is assumed to represent out put per worker or lobour productivity. But it is a proxy trend indicator of labour productivity so that it is rarely used in many of low income countries. In the case of Chile, however, the trend of labour productivity has roughly been derived using data obtained from national account and employment survey conducted every year.

Competitiveness can also be evaluated using the success in diversifying the export base particularly in low income countries such as Ethiopia where the export earning is highly dominated by a narrow range of agricultural raw commodities which are usually vulnerable to such possible risks as volatile international prices and adverse weather conditions and likely results in instabilities in the export earning. Namibia's economy has been evaluated with respect to effort exerted to diversify the export commodities. But, lacks of skilled labour, capacity in addressing export quality standards, accreditation and methodology have been mentioned to limit the export diversification efforts of the country.

With the objective of promoting private investment and the inflow of foreign capital and technology into the country, the Government of Ethiopia has issued a liberalized investment code with a package of fiscal incentives offered to both foreign and domestic investors. The government is also committed to regularly review and improve the environment so as to encourage more inflow of FDI in to the country. Accordingly, the inflow of FDI has been boosted in different sectors of the economy. But, this is nothing to indicate the extent of competitiveness of the economy's environment with respect to FDI attraction. Therefore, it becomes appropriate to measure the competitiveness of the economy with respect to FDI inflows vis-à-vis other economies from low income group. In this case, the inflow of FDI in to CFA Franc zone economies has been assessed using FDI as a percentage of GDP with respect to that in Latin America, Emerging Asia and OECD countries.

Given the unique cultural heritage, magnificent scenery, pleasant climate, rich flora and fauna, important archaeological sites, peace and stability and friendly and hospitable people of the country, Ethiopia has the potential to be one of the leading tourist destinations in Africa. Thus, the competitiveness of the economy's environment can be evaluated using the development of tourism against the economies in some neighboring countries such as Kenya and Tanzania which have benefited a lot from tourism industry. In this case, the competitiveness of Namibia's economy has been assessed with respect to the country's effort to promote its tourism industry.

The International Trade Center (ITC) calculated Trade Performance Index (TPI) for Ethiopia. Only seven export sectors are covered in the computation of TPI for the period 1995 – 1999. For further clarification, about the components and structure of TPI, the TPI for Ethiopia is presented in annex 6. Similarly, the Africa Competitiveness Report by World Economic Forum released the global competitiveness index for 2008 – 2009 for Africa and comparators by country and region. For the purpose of reference, annex 7 presents the ranks and scores of overall index (GCI) and the three sub- indices (basic requirement, efficiency enhancer and innovation factors) by country and region.

4.5 Concluding Remarks

The concept of international competitiveness is often used in analyzing countries' macroeconomic performance. It compares, for a country and its trading partners, a number of salient economic features that can help explain international trade trends. Competitiveness is a dynamic concept, in which the relevant indicators consist of policy variables that can be changed by policy and/or economic decisions. Therefore, it is relevant for policy makers as it is based on variables that they can act upon to create the conditions conducive to economic activities and prosperity.

A number of indicators have been identified to assess economic performance in general and competitiveness in particular. Attempting to measure the change in competitiveness of an economy is further made complex by the diversity of measures that are available. The choice of measurements is also constrained by the un availability of suitable data. Thus, no single, comprehensive measure of competitiveness can be regarded as the appropriate indicator as some measures are either clearly defective and others are incomplete. However, measurements international competitiveness are often confined to a more restricted notion of relative competitive positions based on price or cost differentials. A narrowly defined notion of competitiveness is that of international cost and price competitiveness which measures the comparative prices or costs across countries in a common currency.

The analysis of competitiveness is then measured in terms of real effective exchange rate (REER) derived from nominal effective exchange rate adjusted by the relevant relative prices or cost indices. The REER is used primarily as tools to analyze and forecast international trade trends of a nation and is calculated so as to provide comprehensive picture of competition by exporters and local producers on domestic and foreign markets. Analysis of a nation's global competitiveness is, therefore, conducted by comparing the movement of relative price or cost with reference to a base period, i.e., the changes, rather than levels of relative price or cost, are what generally required for analyzing trends in global competitiveness of a nation.

The REER remains to be useful tool and has been extensively employed to analyze and evaluate a nation's global competitiveness despite the serious problems posed in its construction and aggregation. Therefore, there is a need for comprehensive understanding on concepts of international competitiveness, construction of REER index and implication of its movement with respect to trend in international competitiveness to enhance policy advisory capacity. This can be achieved through the provision of short term training to pertinent body.

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Annex 1: Structure of Ethiopian Merchandise Export goods.

(Value in Mn USD, Volume in Mn Kg, Unit Price in USD/Kg and shares in %)

Commodities	2002/03		2003/04		2004/05		2005/06		2006/07		2007/08		Annual growth Rates (in %)					
	Value	Share	Value	Share	Value	Share	Value	Share	Value	Share	Value	Share						
	A		B		C		D		E		F		B/A	C/B	D/C	E/D	F/E	Average
Coffee	**165.2**	**34.7**	**223.6**	**37.2**	**335.2**	**39.6**	**354.2**	**35.4**	**424.2**	**35.8**	**524.5**	**35.8**	**35.4**	**49.9**	**5.7**	**19.8**	**23.6**	**26.9**
Volume	126.1		156.4		161.1		147.7		176.4		170.7		24.0	3.0	-8.3	19.4	-3.2	7.0
Unit Price	1.3		1.4		2.1		2.4		2.4		3.1		7.7	50.0	14.3	-	29.2	20.2
Oil Seeds	**46**	**9.7**	**83.6**	**13.9**	**125**	**14.8**	**211.4**	**21.1**	**187.4**	**15.8**	**218.8**	**14.9**	**81.7**	**49.5**	**69.1**	**-11.4**	**16.8**	**41.2**
Volume	82.8		102.8		170.8		265.6		234.9		152.1		24.2	66.1	55.5	-11.6	-35.2	19.8
Unit Price	0.56		0.8		0.7		0.8		0.8		1.4		42.9	-12.5	14.3	-	75	23.9
Leather and Leather prod.	**52.2**	**11.0**	**44.3**	**7.4**	**67.6**	**8.0**	**75**	**7.5**	**89.6**	**7.6**	**99.2**	**6.8**	**-15.1**	**52.6**	**10.9**	**19.5**	**10.7**	**15.7**
Volume	10.5		13.1		15.6		15.4		15.8		14.9		24.8	19.1	-1.3	2.6	-5.7	7.9
Unit Price	4.9		3.4		4.3		4.9		5.7		6.6		-30.6	26.5	14	16.3	15.8	8.4
Pulses	**20**	**4.2**	**26.7**	**4.4**	**35.4**	**4.2**	**36.9**	**3.7**	**70.3**	**5.9**	**143.6**	**9.8**	**33.5**	**32.6**	**4.2**	**90.5**	**104.3**	**53.0**
Volume	66.2		77.8		121.6		110.4		158.7		233		17.5	56.3	-9.2	43.8	46.8	31.0
Unit Price	0.3		0.3		0.3		0.3		0.4		0.6		-	-	0	33.3	50	16.7
Meat & Meat Prod.	**2.4**	**0.5**	**7.7**	**1.3**	**14.6**	**1.7**	**18.5**	**1.8**	**15.5**	**1.3**	**20.9**	**1.4**	**220.8**	**89.6**	**26.7**	**-16.2**	**34.8**	**71.2**
Volume	1.6		4		7.3		7.9		5.8		6.5		150	82.5	8.2	-26.6	12.1	45.2
Unit Price	1.4		1.9		2		2.3		2.6		3.2		35.7	5.3	15	13	23.1	18.4
Fruits & Veg	**9.5**	**2.0**	**7.1**	**1.2**	**16.1**	**1.9**	**13.2**	**1.3**	**16.2**	**1.4**	**12.8**	**0.9**	**-25.3**	**126.8**	**-18**	**22.7**	**-21**	**17.0**
Volume	30.2		29.4		37.9		34.8		40.9		39.9		-2.6	28.9	-8.2	17.5	-2.4	6.6
Unit Price	0.3		0.2		0.4		0.4		0.4		0.3		-33.3	100	-	-	-25	8.3
Sugar & Molasses	**17.9**	**3.8**	**10.3**	**1.7**	**0.6**	**0.1**	**0**	**-**	**0**	**-**	**0**	**-**	**-42.5**	**-94.2**				
Volume	77		16		15		0		0	-	0	-	-79.2	-6.3				
Unit Price	0.23		0.6		0.04					-		-	160.9	-93.3				
Flower		**-**	**2.3**	**0.4**	**7.8**	**0.9**	**21.7**	**2.2**	**63.6**	**5.4**	**111.7**	**7.6**		**239.1**	**178.2**	**193.1**	**75.6**	
Volume		-	0	-	2.5		6.3		13.6		22.4				152	115.9	64.7	
Unit Price		-		-	3.1		3.5		4.7		5				12.9	34.3	6.4	
Gold	**42.1**	**8.8**	**48.7**	**8.1**	**59.3**	**7.0**	**64.7**	**6.5**	**96.9**	**8.2**	**78.8**	**5.4**	**15.7**	**21.8**	**9.1**	**49.8**	**-18.7**	**15.5**
Volume	0		0.01		0.01		0		0.01		0	-		-				-
Unit Price (USD/ gr)	8.5		9.5		9.9		13		17.4			-	11.8	4.2	31.3	33.8	-100	-3.8
Live Animals	**6.1**	**1.3**	**2.1**	**0.3**	**12.8**	**1.5**	**27.6**	**2.8**	**36.8**	**3.1**	**40.9**	**2.8**	**-65.6**	**509.5**	**115.6**	**33.3**	**11.1**	**120.8**
Volume	1.6		3.1		21.2		33.2		43.7		40		93.8	583.9	56.6	31.6	-8.5	151.5
Unit Price	3.8		0.7		0.6		0.8		0.8		1		-81.6	-14.3	33.3	-	25	-7.5
Chat	**58**	**12.2**	**88**	**14.7**	**100.2**	**11.8**	**89.1**	**8.9**	**92.8**	**7.8**	**108.3**	**7.4**	**51.7**	**13.9**	**-11.1**	**4.2**	**16.7**	**15.1**
Volume	8.1		13.8		19.4		22.3		22.7		22.4		70.4	40.6	14.9	1.8	-1.3	25.3
Unit Price	7.2		6.4		5.2		4		4.1		4.8		-11.1	-18.8	-23.1	2.5	17.1	-6.7
Bees Wax	**0.6**	**0.1**	**1.5**	**0.2**	**1.1**	**0.1**	**1.4**	**0.1**	**1.8**	**0.2**	**1.8**	**0.1**	**150**	**-26.7**	**27.3**	**28.6**	**-**	**35.8**
Volume	0.2		0.6		0.4		0.3		0.4		0.4		200	-33.3	-25	33.3	-	35
Unit Price	2.8		2.6		2.9		4.3		4.4		4.4		-7.1	11.5	48.3	2.3	-	11
Others	56	11.8	54.4	9.1	71.3	8.4	86.4	8.6	90	7.6	104.4	7.1	-2.9	31.1	21.2	4.2	16	13.9
Grand total : Value	**476.3**	**100**	**600.4**	**100**	**847.2**	**100**	**1000.3**	**100**	**1185.1**	**100**	**1465.7**	**100**	**26.1**	**41.1**	**18.1**	**18.5**	**23.7**	**25.5**

Source: Ethiopian Revenue and Customs Authority

Annex 2: Structure of Ethiopia Export by Major destinations – 1997 – 2008 in percentage share

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
EU-27	44.2	47.6	36.9	37.7	27.5	32.4	25.2	35.0	34.3	35.9	35.7	34.8
Germany	20.7	24.8	17.9	19.6	6.4	10.7	10.0	12.6	14.1	13.0	10.1	10.7
Italy	7.8	6.8	6.8	6.5	9.9	9.0	6.2	6.3	5.7	6.2	6.8	5.3
France	3.2	3.6	4.7	3.0	2.8	2.6	1.5	1.9	1.9	2.7	1.5	1.5
Netherlands	1.5	1.9	1.5	2.1	1.0	0.9	1.0	3.1	3.9	4.5	6.6	7.6
Switzerland	1.6	0.6	0.9	5.9	7.5	9.4	4.2	8.8	6.8	5.7	4.9	6.3
China	0.1	0.1	0.2	0.2	1.4	1.7	1.2	2.4	8.8	7.2	5.7	5.2
India	0.3	0.1	0.4	1.7	4.0	2.1	1.4	1.6	0.9	1.0	1.3	0.9
Indonesia	0.1	0.2	0.7	1.2	0.8	0.5	0.3	0.6	0.2	0.2	0.1	0.3
Japan	11.2	12.1	13.0	11.7	8.7	8.3	7.6	10.1	7.7	8.7	6.4	3.9
Korea Rep	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.7
Malaysia	0.6	0.7	0.4	0.6	0.4	0.8	0.5	0.6	0.7	0.4	0.4	0.2
Pakistan	0.0	0.2	0.8	0.7	0.9	3.3	0.2	0.5	0.3	0.8	1.1	0.9
Israel	0.5	1.4	2.8	3.5	3.4	3.5	2.5	3.6	2.4	2.1	2.5	3.2
Jordan	1.6	0.4	0.4	0.3	0.4	0.3	0.9	0.8	0.6	0.7	0.8	1.2
Lebanon	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
S. Arabia	8.6	9.9	11.5	8.0	8.4	6.2	6.2	6.9	6.5	7.0	7.2	7.8
UAE	0.6	0.8	1.1	0.6	1.5	1.8	2.1	1.7	3.4	3.1	2.8	4.3
Yemen	1.1	1.1	1.5	1.3	1.8	1.7	2.8	2.6	2.3	2.6	2.2	1.9
USA	11.4	6.8	4.8	3.7	4.6	3.8	4.0	6.1	4.9	5.1	5.7	7.3

Source: Own computation using data from Ethiopian Revenue and Customs Authority

Annex 3: Alternative Definitions and Specification of REER

The real exchange rate (RER) is defined as the price a country relative to the price of another country; both expressed in a common currency. It is specified as:

$$RER = \frac{E_i P_i}{P} \quad \text{.....(1)}$$

Where E_i is the nominal exchange rate vis-à-vis country i measured as unit of domestic currency per unit foreign currency, P_i is the relevant price index in country i, measured in foreign currency, and P is the relevant domestic price index measured in domestic currency.

Equation (1) represents a bilateral RER, i.e., the relative prices between only two countries. To analyze competitiveness of a country vis-à-vis all trading partners, these bilateral RER are weighted and combined in to a composite index called the real effective exchange rate (REER). The choice of weights varies widely in the literature, although the bulk utilize a combination of export and import shares and some others use include the impact of third country competition.

The real effective exchange rate is a measure of relative price (cost) of a country's goods and services relative to those of other countries when both are expressed in the same currency. It can be expressed as:

$$LnREER = \sum_{i=1}^{n} w_i Ln(E_i P_i / P) \quad \text{---------- (2)}$$

Where w_i is the relative weight attached to country i (trading partner/competitor), P_i and P as defined above.

Defined in this way, the REER is nothing but a ratio of foreign to domestic prices expressed in a common numeraire. Since the REER in equation (1) measures the prices of foreign countries relative to the prices of home country, an increase in the value of REER (depreciation) implies foreign goods become more expensive relative to domestic goods and thereby improves international competitiveness.

Depending on data availability and the theoretical approach taken, the choice of price indices vary between consumer prices, export prices, producer prices, and unit labour costs have been used for computing REER. All of them have their own strength and weaknesses and it is likely that the different price indices results in different measurements of the evolution of REER. However, the most commonly used price series in constructing RER for measuring international competitiveness are consumer price indices (CPIs). These have the advantage of being timely, similarly constructed across countries, and available for a wide range of countries over a long time span. Because they capture the relative costs of a broad basket of goods and services across countries, CPI-based RER measures provide a good reflection of the purchasing power of the domestic currency. The fact that CPI baskets contain a significant nontraded component makes CPI-based RER less than ideal for assessing competitiveness.

An alternative way of defining the REER, often used in the theoretical literature is as the price of tradables relative to that of non-tradables:

$$LnREER = \sum_{i=1}^{n} w_i Ln(E_i P_i / P) \quad \text{---------- (3)}$$

Where is the price of tradables (a composite of export and imports), expressed in foreign currency and thought of as being determined in the international market and exogenously given, and is the domestic price of non-tradables.

With this definition, the REER corresponds to the ratio of the price of tradables, converted to domestic currency via the nominal exchange rate, over the price of domestic non-tradables. The main feature of this definition of REER is that it directly captures the incentives that guide resource allocation between tradables and non-tradables sectors. For instance, depreciation of REER increases a relative profitability of producing tradables, thereby inducing resources to move from non-tradables to tradables sector and demand moves from tradeable to non-tradable. The opposite effect holds when the REER appreciates.

One major disadvantage of defining the REER as the relative price of tradables to non-tradables is that it lacks a straightforward empirical counterpart. In the literature, trading partners' wholesale price indices have been argued to serve as a reasonable proxy for the price of tradables while the domestic consumer price index serves as a reasonable proxy for the domestic price of non-tradables. Since, both price indices are a mix of prices of tradables and non-tradables; they are arguably somewhat deficient for this purpose.

Although the two above definitions of the REER are conceptually quite different, they do, under certain assumptions, come close to each other. Consider the case when the real exchange rate computed based on price indices, it includes both tradable and non-tradable. Thus, REER defined as the relative price of tradable to non-tradable merely becomes a simplification of the REER defined as the price level abroad relative to the price level at home. The main difference is that the REER defined as the price level abroad relative to the price level at home reflects not only the domestic relative price of tradables to non-tradable but also the foreign relative price of tradables to non-tradables. Hence, the price level abroad relative to the price level at home generally serves as a broader and more comprehensive measure of the real exchange rate.

Annex 4: Structure and components of Trade Competitiveness Index (TCI)

1. TRADE-ENABLING INDEX (TEI)

1.1 Governance

- Corruption
- Rule of law
- Government Effectiveness
- Institutional democracy
- Institutional autocracy

1.2 Macro policy

- Real GDP per capita growth
- Inflation, consumer prices (annual %)
- Lending interest rate
- Real effective exchange rate (base 1995)

1.3 Trade Policy

- Export diversification Index
- Openness Index
- Domestic credit to private sector (% of GDP)

2. PRODUCTIVE RESOURCE INDEX (PRI)

2.1 Labour Force Index

- Labour force participation rate, total (% total population)
- School enrolment, primary (% gross)
- School enrolment, secondary (% gross)
- School enrolment, tertiary (% gross)
- Urban population (% of total population)
- Life expectancy at birth, total (years)

2.2 Geography Index

- Landlocked
- Land use, arable land (% of land area)
- Actual renewable water resources (cubic kilometers per 1,000 workers)

3. INFRASTRUCTURE INDEX (II)

3.1 Telecommunications Index

- Telephone (mainlines and mobile phone) subscribers (per 1000people)
- Telephone mainlines per 1,000 people
- Telephone average cost to US ($US per three minutes)
- Residential telephone connection charge (current USD)
- Mobile cellular connection charge (current USD)

3.2 Transport Networks Index

- Roads to total land density (road km/1,000 sq km of land area)
- Roads, paved (% of total roads)

3.3 Access to Information Index

- Personal computers (per 1,000 people)
- Internet Users (per 1,000 people)

3.4 Energy Index

- Electricity production (kWh per capita)
- Electricity consumption (kWh per capita)

Annex 5: Structure of Business Doing Indicator

No.		Countries											
		A	B	C	D	E	F	G	H	I	J	H	L
1.	**Starting a Business**												
	Procedures (number)												
	Time (days)												
	Cost (% of income per capital)												
	Min. capital (% of income per capital)												
2.	**Dealing with Licenses**												
	Procedures (number)												
	Time (days)												
	Cost (% of income per capital)												
3.	**Employing Workers**												
	Difficulty of Hiring index												
	Rigidity of Hours index												
	Difficulty of firing index												
	Rigidity of Employment index												
	Non-wage labor cost (% of salary)												
	Firing costs (weeks of wages)												
4.	**Registering property**												
	Procedures (number)												
	Time (days)												
	Cost (% of income per capital)												
5.	**Getting Credit**												
	Legal Rights index												
	Credit information index												
	Public registry coverage (% adults)												
6.	**Protecting investors**												
	Disclosure index												
	Director Liability index												
	Shareholder Suits index												
	investor Protection index												
7.	**Paying Taxes**												
	Payments (number)												
	Time (hours)												
	Profit tax (%)												
	Labor tax and contributions (%)												
	Other taxes (%)												
	Total tax rate (% profit)												
8.	**Trading Across Borders**												
	Documents for export (number)												
	Time for export (days)												
	Cost to export (US$ per container)												
	Documents for import (days)												
	Time for import (days)												
	Cost to import (US$ per container)												
9.	**Enforcing Contracts**												
	Procedures (number)												
	Time (days)												
	cost (% of debt)												
10.	**Closing a Business**												
	Time (years)												
	Cost (% of estate)												
	Recovery rate (cents on the dollar)												

Source: World Bank, Doing Business

Annex 6: Trade Performance Index for Ethiopia (1995-1999)

Indicators		Ethiopia		Fresh food		Processed food		Textile		Leather products		Non-electric machinery		Misc. Manufacturing		Minerals	
				Value	Rank (168)*	Value	Rank (141)*	Value	Rank (112)*	Value	Rank (82)*	Value	Rank (93)*	Value	Rank (122)*	Value	Rank (144)*
General Profile	G1	Value of exports ($ 000)		314,178		4,125		2,627		10,435		12,672	92	5,576		4,369	
	G2	Trend of exports (1995-1999)		0%	116	5%	72	19%	27	-19 %	82	-12 %		0 %	119	21 %	15
	G3	Share in national export		87%		1%		1%		3%		4%		2 %		1%	
	G4	Share in national import		7%		4%		2%		1%		20%	86	8 %		1%	
	G5	Average annual change in per capita export		-6%	118	-7%	118	14%	15	-15%	79	-9%		-1 %	85	99%	11
	G6	Relative unit value (world average=1)		0.4		1.7		0.9		0.8		0.6				0.9	
	G7	Average annual change in relative unit value per capita export		-17%		19%		0%		-11%		-3%	31			-7%	
Position in 1999	P1	Value of net exports ($ 000)		251,766	47	-37,179	69	-14,838	37	5,624	39	-173,971	92	-72,852	59	-1,425	71
	P2	per capita export($/inhabitant)		5.4	147	0.1	141	0.0	112	0.2	81	0.2	78	0.1	122	0.1	143
	P3	Share in world market		0.14%	74	0.0%	132	0.00%	108	0.02%	67	0.00%	91	0.00%	105	0.00%	138
	P4a	Product diversification (No of equivalent products)		2	142	4	93	2	108	4	47	2	91	1	120	2	106
	P4b	Product spread (concentration)			114		121		107		65		86		117		129
	P5a	Market diversification((No of equivalent market)		8	50	3	99	2	97	2	71	2	86	1	116	3	100
	P5b	Market spread (concentration)			65		108	%	108		69				115		121
Change 1995-1999	C1	Percentage change of world market share* p.a.		-0.02%		-0.06%		4.44 %		-0.13%		-0.10%		0.02%		0.35%	
		Sources	Competitiveness effect p.a.	0.0%	73	0.0%	91	0.23%	5	-0.09%	79	-0.14%	90	0.01%	54	0.25 %	6
			Initial geographic specialization p.a.	0.01%	78	0.02%	56	1.00%	4	0.03%	16	0.02%	27	0.10%	14	-0.01%	91
			Initial product specialization p.a.	-0.03%	133	-0.07%	123	3.13%	1	-0.09%	80	0.16%	5	-0.07%	113	0.03%	36
			Adoption p.a.	0.0%	66	0.0%	27	0.08%	5	0.02%	12	-0.13%	87	-0.02%	92	0.07%	4
	C2	Trend of import coverage by export		5%	51	-1 %	76	26%	9	-6%	54	-17%	86	-18%	116	82%	9
	C3	Matching with dynamics of world demand			67		96		112		74		11		43		78
	C4a	Change in product diversification(No of equv)			80		93		113		60		22		83		137
	C4b	Change in product spread (concentration)			80		92		112		58		24		81		138
	C5a	Change in market diversification(No of equv. Market)			15		135		107		65		20		91		43
	C5b	Change in Market spread(concentration)			15		135		111		63		21		90		45
		Current Index			91		131		112		74		93		122		140
		Change index			40		128		73		80		52		115		21

Source: ITC calculation based on COMTRADE of UNSD

*Ranking out of all exporting countries (number)

Annex 7: The Global Competitiveness Index 2008-2009: Africa and Comparators

Country/ Region	OVERALL INDEX		SUB INDEXES					
			Basic Requirements		Efficiency Enhancers		Innovation Factors	
	Rank	Score	Rank	Score	Rank	Score	Rank	Score
NORTH AFRICA								
Algeria	99	3.7	61	4.5	113	3.3	126	2.8
Egypt	81	4.0	83	4.2	88	3.7	74	3.5
Libya	91	3.9	75	4.3	114	3.3	102	3.2
Morocco	73	4.1	67	4.4	85	3.7	76	3.5
Tunisia	36	4.6	35	5.2	53	4.2	30	4.2
North Africa average		**4.0**		**4.5**		**3.6**		**3.5**
SUB-SAHARA AFRICA								
Benin	106	3.6	103	3.8	123	3.2	100	3.2
Botswana	56	4.2	53	4.6	82	3.8	98	3.2
Burkina Faso	127	3.4	126	3.4	118	3.2	95	3.3
Burundi	132	3.0	132	3.1	133	2.7	125	2.9
Cameroon	114	3.5	109	3.7	120	3.2	108	3.1
Chad	134	2.8	133	3.0	134	2.7	131	2.7
Cote d 'Ivoire	110	3.5	113	3.6	109	3.3	94	3.3
Ethiopia	121	3.4	119	3.6	121	3.2	114	3.0
Gambia, The	87	3.9	81	4.2	107	3.4	78	3.5
Ghana	102	3.6	106	3.7	95	3.5	107	3.1
Kenya	93	3.8	104	3.8	76	3.9	50	3.9
Lesotho	123	3.4	118	3.6	125	3.2	110	3.1
Madagascar	125	3.4	125	3.5	119	3.2	97	3.2
Malawi	119	3.4	127	3.4	101	3.4	101	3.2
Mali	117	3.4	118	3.6	122	3.2	99	3.2
Mauritania	131	3.1	130	3.3	130	2.9	120	2.9
Mauritius	57	4.2	50	4.7	66	4.0	69	3.6
Mozambique	130	3.1	131	3.2	129	3.1	127	2.8
Namibia	80	4.0	48	4.7	93	3.6	104	3.2
Nigeria	94	3.8	105	3.7	71	4.0	64	3.7
Senegal	96	3.7	101	3.9	96	3.5	59	3.7
South Africa	45	4.4	69	4.4	35	4.5	36	4.1
Tanzania	113	3.5	114	3.6	108	3.3	106	3.1
Uganda	128	3.3	129	3.3	106	3.4	90	3.3
Zambia	112	3.5	121	3.5	100	3.4	93	3.3
Zimbabwe	133	2.9	134	2.9	131	2.9	122	2.9
Sub-Sahara Africa average		**3.5**		**3.7**		**3.4**		**3.2**
Brazil	64	4.1	96	4.0	51	4.3	42	4.0
China	30	4.7	42	5.0	40	4.4	32	4.2
India	50	4.3	80	4.2	33	4.5	27	4.3
Russia Federation	51	4.3	56	4.5	50	4.3	73	3.6
Latin America & Caribbean		**3.9**		**4.2**		**63.8**		**3.4**
Southeast Asia average		**4.5**		**4.8**		**4.3**		**3.9**

Source: World Economic Forum

Frequently asked questions (FAQ) about the activities of the Bank

1. Does NBE provide loan?

   NBE as a central bank, does provide loan to the government and banks, not to individuals and business entities.

2. What is the current deposit interest rate?

   NBE has set the minimum saving and time deposit rates at 4%. But banks may pay higher than this rate.

   3. What is the lending rate of Banks?

   The lending rate is fully liberalised, and hence there is no lower/upper lending limit rate in the country. Each bank determines the lending rates.

4. Can any one participate in the auction of Treasury Bills?

   Yes, with the minimum amount of Birr 5000.

5. Can I get a foreign currency to pay for education, subscriptions, health, etc?

   All eligible individuals can get foreign currency from commercial banks for these and other purposes.

6. How many banks, insurance companies and microfinance (MFIs) organizations operate in Ethiopia?

   There are 12 private and 3 government-owned banks, 11 private and 1 government owned insurance companies, and 31MFIs.

7. What are the Ethiopian currency denominations?

   Ethiopia has 1, 5, 10, 50 and 100 birr notes and a 1, 5, 10, 25, 50 cents coins.

8. Which commercial bank, insurance company or MFIs is trust worthy to deal with?

   All are trust worthy and working as per the close inspection and guidance of NBE.

9. Who is illegible to engage in the business of banks, insurance and MFIs?

   Only Ethiopians can own and operate financial institutions.

10. Can I exchange foreign currency to birr in banks?

    Yes.

11. What are the major foreign currencies that the country uses?

    US Dollar, Pound Sterling and Euro are vastly used in Ethiopia. However, Banks in Ethiopia transact in Japanese Yen, Rand, Rupee, Swedish Krona, etc.

12. Is the birr vulnerable to counterfeit, as other currencies do?

    All currencies are venerable to counterfeit. Hence you need to know your currency's security features in order to combat counterfeit.

13. What should I do, If I find a counterfeit?

    You should immediately report the case to the police.

14. Can I use a credit card in Ethiopia? Which types of credit cards are used in the country?

    Yes. But only few places give credit card services for customers. Since 2006, Domestic banks have also started to issue credit cards and one can use these credit cards. In Ethiopia: American Express, Master, Visa, Diners Club and Cart Blanche, and Euro cards are used.

15. Is it possible to transact in foreign currency?

    Only certified hotels, duty free shops, immigration offices, Civil Aviation Authority, and airline ticket offices are entitled to accept payments in foreign currency.

16. Can I deposit a foreign currency in my account?

    All Ethiopian nationals living and working abroad and non-resident foreign nationals of Ethiopian origin can open fixed (time deposit), current and non-repatriable Birr accounts in commercial banks.

Core Corporate Values of the National Bank of Ethiopia

Belongingness: to the Bank.

Fidelity: devotion to duties, obligations, loyalty, adherence to truth, accurate reporting in executing the duty of the Bank.

Accountability: for result and rule of law .

Pursuit of excellence and professionalism: to achieve stakeholder's satisfaction and confidence.

Transparency: for shared knowledge information and empowerment.

Integrity: in achieving the Bank's mission honestly and objectively.

Team Spirit: fostering teamwork for synergy.

Confidentiality: in specific and identified issues.

Dynamic and adaptive: Being dynamic and adaptive through continuous learning.

Financial discipline: in executing the duties of the Bank.

ከታሪክ ማስታወሻ

ለመጀመሪያ ጊዜ ባንክ የተቋቋመው በዳግማዊ አጤ ምኒሊክ ዘመነ መንግስት በ1898 ዓ.ም ነው፡በፈረንጅ አገር ስላለው የገንዘብ መበደሪያ ቤት ጉዳይ አማካሪዎቻቸው ምኒሊክን አማከሩዋቸው፡፡ የውጭውንም ሆነ የአገር ውስጡን ንግድ ለማስፋፋት ባንክ ጠቃሚ መሆኑንና በተለይም የውጭው ንግድ ያለባንክ ሊካሄድ ያለመቻሉን ነገሩዋቸው፡፡ ምኒሊክም በአሳቡ ከተሰማሙ በኋላ ባንኩን ለማቋቋም ኃላፊነቱን ለማን እንደሚሰጥ ጠየቁ፡፡ ፈረንሳዊው ሙሴ ዳልሐርቤ ይህን ነገር ለማቋቋም ይችላልና ለእሱ ይሰጠው ተባለ፡፡ ምኒሊክም "....የፈረንሳዮችን ነገር ተውኝ፣ የባቡር ሃዲድ ከጅቡቲ እስከ አንጦጦ፣ ከዚያ እስከ ከፋና ነጭ አባይ ድረስ እንዘረጋለን ብለው ውለታን ከተዋዋልን በኋላ እንኳን ነጭ አባይ አዲስ አበባም ለመድረስ አቅቷቸዋልና እንደገና ደግሞ በዚህ ጉዳይ ከእነሱ ጋር አልዋዋልም፤ የሚሆን ከሆነ የሚሆን ሰው ፈልጉ..." አሉ፡፡

"እንግሊዞችስ?" ተባለ፡፡

"እንሞክራቸው" አሉ ምኒሊክ "እንግሊዞች የሆዳቸውን በሆዳቸው እየያዙ ተንኮል የሚወዱ ቢሆኑም አገር የማያስገፉ ውል ተደርጉ ይሰጣቸው..." አሉ፡፡

ገፅ 316-317

_____ // _____

... በነባሩ ላይ ያለው የማርትሬዚያ መልክ ተለውጦ የምኒሊክ መልክ በመተካቱም ሕዝቡ ሴላ ገንዘብ እየመሰለው አልገበያይ አለ፡፡ በምኒሊክ መልክ የታተመው አዲሱ ገንዘብ ተቀባይ በማጣቱ ዳግማዊ አጤ ምኒሊክ በ1890 ዓ.ም. ነሐሴ2 ቀን አዋጅ አወጁ፡፡

"ስገበያ መገበያየት እንዲመች ብዬ በኔ መልክና በኔ ስም ያሳተምኩት ብርና ሩብ የሴላ መንግስት ነው፤ በዚህ አልገበያይም እያልክ እርስ በርስህ ትጣላበታለህ አሉ፡፡ አልቀበልም ማለትህ ከቀድሞው ብርና ሩብ ምን የጐደለ ነገር አለና ነው? እንግዲህ በዚህ በአዲሱ ብርና ሩብ ነገር የተጣላ ሰው መቀጫህን ባንድ ብር 1 ፣ ባንድ ሩብ 5 ብር ትከፍላለህ፡፡ ከዚህ ወዲህ ይህንን የኋለኛውን ብርና ሩብ አልቀበልም የሚለውን ሰው እጁን ይዘህ አምጣልኝ፡፡ ገንዘቡን እመርቅልሃለሁ፡፡"

ገፅ 321-322

ዳግማዊ አጤ ምኒልክ በሚል ርዕስ ከታተመው
የጳውሎስ ኞኞ መፅሐፍ የተወሰደ