Global and African Economic Prospects and Implications for African Trade, Trade Finance and Economic Integration


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Global and African Economic Prospects and Implications for African Trade, Trade Finance and Economic Integration

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I. Introduction

1.1 The Global Economic Crisis

The global economic crisis began to unfold following the financial crisis that has swept across the developed countries. Over the past few years banks and other financial institutions in the US and elsewhere were lending more widely to individuals with low credit rating. Cheap credit and lax selection enabled many to obtain housing loans, which was not possible earlier. The increased demand for property fuelled steep rise in prices in housing sectors, leading to price bubble (IFRC, 2008). Consequently there was growth in trading of Mortgage Based Securities (MBSs). The financial innovation of MBS led to derivatives named ‘Collateralized Debt Obligations’ (CDOs). As subprime borrowers began to default, CDOs took the first hit. The resulting loss of confidence among investors led to fire sale of assets (Haile Kibret, 2009). Lending institutions, thus, found themselves with loan assets worth far less than first anticipated. When interest rates rose by 1% to over 5% in the US, it led to increase in default rates, particularly in subprime loans. The extent of loss that such institutions suffered was not clearly known. This has raised suspicion among lending institutions, leading them into refusing to lend to one another. This has come to be known as ‘credit crunch’, and it further raised the cost of credit. As a result of those series of events, some of the biggest financial institutions of the world collapsed—eg. Lehman Brothers in the US; or had to be rescued (nationalized) by governments—eg. AIG, Fannie Mae and Freddie Mac in the US and Northern Rock in UK (IFRC, 2008.).

Lending institutions, having heavily hit by the credit crunch, adopted a more stringent approach in lending to individuals and companies. This has made access to credit much difficult and resulted in sharp decline in consumer spending. This, coupled with rising global prices (both food and commodities) has pushed many developed counties into recession (IFRC, n.d.), setting on the global crisis which we are attempting to understand its effect on Africa in this paper. The global implication of these set of events could be gleaned from Table 1, the recent IMF projection of the world economic outlook. According to this projection, world output growth is projected to fall to $\frac{1}{2}$ percent in 2009, its lowest rate since World War II (See Table 1). Despite wide-ranging policy actions, financial strains remain acute, pulling down the real economy. A sustained economic recovery will not be

\[1\] I am grateful to two former students of mine and now colleagues and friends, Daniel Zerfu and Kibrom Tafere, for their excellent assistance in the course of writing this paper. Any errors are mine.
possible, the IMF contends, until the financial sector’s functionality is restored and credit markets are unclogged (IMF, WEO, Jan, 2009). We note in Table 1 that Africa’s growth forecast is revised down to about 3.5, from its October, 2008 forecast of about 5 percent.

According to McCulloch (2008) although much attention has been focussed on the problems in the subprime mortgage market in the US as the trigger of the current crisis, McCulloch (2008) argues that it is important to recognise that the origin of the crisis lies in the interaction between at least three factors:

1. The extraordinary accumulation of reserves in surplus countries (notably China and the Middle East) – mirrored by huge US fiscal and current account deficits. In effect, excessive saving in a set of developing countries has funded excessive consumption in the world’s richest economies.

2. The application of expansionary monetary policies in the OECD, giving rise to low interest rates, helped to create the housing market bubble which has now burst.

3. Financial innovation in developed countries, in the form of securitised mortgages, expanded leverage, and poorly regulated derivative instruments, which allowed some major financial institutions to become dangerously exposed.

While these three factors have played an important role in making the financial system more susceptible to crisis, for many developing countries the seven year period prior to the crisis was one of rapid growth, rising commodity prices, an improved macroeconomic situation and, critically, reduced poverty. The current policy dilemma is how to facilitate a rapid return to this relatively favourable growth pattern, whilst changing global financial governance to minimise susceptibility to crises. (McCulloch, 2008). If we see Africa, for instance this promising growth renewal could be gleaned from the following indicators discussed in the next sub-section.
<table>
<thead>
<tr>
<th>Table 1.1. Overview of the World Economic Outlook Projections</th>
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<tr>
<td>(Percent change, unless otherwise noted)</td>
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<td></td>
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<tr>
<td>World output&lt;sup&gt;1&lt;/sup&gt;</td>
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<tr>
<td>Advanced economies</td>
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<td>United States</td>
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<tr>
<td>Euro area</td>
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<tr>
<td>Germany</td>
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<td>France</td>
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<td>Italy</td>
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<td>Spain</td>
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<td>Japan</td>
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<tr>
<td>United Kingdom</td>
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<tr>
<td>Canada</td>
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<tr>
<td>Other advanced economies</td>
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<tr>
<td>Newly industrialized Asian economies</td>
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<tr>
<td>Emerging and developing economies&lt;sup&gt;2&lt;/sup&gt;</td>
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<tr>
<td>Africa</td>
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<tr>
<td>Sub-Saharan Africa</td>
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<tr>
<td>Central and eastern Europe</td>
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<td>Commonwealth of Independent States</td>
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<tr>
<td>Russia</td>
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<td>Excluding Russia</td>
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<tr>
<td>Developing Asia</td>
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<td>China</td>
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<td>India</td>
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<td>ASEAN-5</td>
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<tr>
<td>Middle East</td>
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<td>Western Hemisphere</td>
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<td>Brazil</td>
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<td>Mexico</td>
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<td>Memorandum</td>
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<td>European Union</td>
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<tr>
<td>World growth based on market exchange rates</td>
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<tr>
<td>World trade volume (goods and services)</td>
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<td>Imports</td>
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<tr>
<td>Emerging and developing economies</td>
</tr>
<tr>
<td>Exports</td>
</tr>
<tr>
<td>Emerging and developing economies</td>
</tr>
<tr>
<td>Commodity prices (U.S. dollars)</td>
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<tr>
<td>Oil&lt;sup&gt;3&lt;/sup&gt;</td>
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<tr>
<td>Nonfuel (average based on world commodity export weights)</td>
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<tr>
<td>Consumer prices</td>
</tr>
<tr>
<td>Emerging and developing economies&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>London interbank offered rate (percent)&lt;sup&gt;4&lt;/sup&gt;</td>
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<tr>
<td>On U.S. dollar deposits</td>
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<tr>
<td>On euro deposits</td>
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<tr>
<td>On Japanese yen deposits</td>
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Note: Real effective exchange rates are assumed to remain constant at the levels prevailing during December 08, 2008–January 09, 2009. Country weights used to construct aggregate growth rates for groups of countries were revised.

<sup>1</sup>The quantity estimates and projections account for 96 percent of the world purchasing-power parity weights.

<sup>2</sup>The quantity estimates and projections account for approximately 76 percent of the emerging and developing economies.

<sup>3</sup>Sample average of prices of U.K. Brent, Dubai, and West Texas Intermediate crude oil. The average price of oil in U.S. dollars per barrel was $77.63 in 2008; the assumed price based on futures markets was $50.00 in 2009 and $60.00 in 2010.

<sup>4</sup>Three-month rate for the United States and Japan; three-month rate for the euro area.
1.2 Recent Economic Performance of the African External Sector

Africa has enjoyed continuous and relatively higher growth rates over the past few years compared to the decades before. The African growth rate averaged 6.5% per annum between 2003 and 2008 (IMF, WEFS- April 2008) and has been higher than the global average growth rate of around 4% for the most part (Holmqvist, 2008). This growth performance could partly be attributed to the relatively better political and economic environment in the continent. The growth was mainly driven by improved export performance and rising investment. The substantial increase in Africa’s exports is mainly fuelled by rise in commodity prices in recent years. The years between 2003 and 2008 also saw Africa enjoy considerable gain in terms of trade. Over this period, Africa’s terms of trade improved by 7.8%, mainly due to gains by oil exporting countries, which amounts to 16.9%. The gain to non-oil exporters, however, has been very low at just a meagre 1.1% (IMF, WEFS- April 2008). Over the same period, exports grew by 36.7% (IMF, WEFS- April 2008). Due to this fast growth in exports, export earnings of the continent recorded a fast increase from about US$ 130 billion in 2001 to about US$ 380 billion in 2007 (Holmqvist, 2008).

Another important dimension of Africa’s external sector relates to capital inflows. Capital inflows into Africa mainly take the form of official development assistance, private capital inflows (foreign direct investment (FDI), portfolio and loan flows) and private transfers. Between 2000 and 2007 private capital inflows into sub-Saharan Africa countries increased five-fold from US$ 11 billion in 2000 to US$ 53 billion in 2007 (IMF, WEFS- April 2008). One of the reasons for the rise in private capital flows to Africa was that the risks in Africa were somewhat uncorrelated with the risks In the US and Europe, so there might be a possibility for portfolio diversification into Africa (Devarajan, 2008a). Over this eight years period the share of portfolio and loan flows has grown substantially while FDI remained stable at about US$ 15-21 billion. In recent years portfolio flows have grown into pole position in their weight in private capital inflows reaching US$ 23 billion (43%) in 2006. In 2006, private capital flows into sub-Saharan Africa exceeded official aid for the first time. The bulk of these flows went to a few resource (mineral) rich countries such as South Africa and Nigeria, however. Improved risk rating and higher return have also seen countries such as Kenya, Tanzania, Uganda, and Zambia attract increased portfolio inflows (IMF, WEFS- April 2008). The ability of some countries to tap up international capital markets (Gabon, Ghana, and Seychelles have recently issued bonds internationally) also a witness to the rising interest in Africa in terms of private capital flows (Deléchat et al, 2008).

Rising portfolio flows into a small group of African countries with more developed financial markets suggest that these countries are transitioning to emerging market status. In fact, many African countries compare favourably against East Asian countries of the 1980’s (Deléchat et al, 2008). Capital inflows to Africa have been largely volatile, measured as a
ratio of standard deviation of cash inflows to their mean, however. As can be seen from Table 3, private loan flows have been the most volatile and FDI the least volatile.

### Table 3: Volatility of private capital flows, 2000-2007

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Volatility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total inflows</td>
<td>4.9</td>
<td>8.7</td>
<td>1.8</td>
</tr>
<tr>
<td>FDI</td>
<td>12.7</td>
<td>7.0</td>
<td>0.6</td>
</tr>
<tr>
<td>Portfolio</td>
<td>0.2</td>
<td>0.9</td>
<td>3.8</td>
</tr>
<tr>
<td>Private debt</td>
<td>0.2</td>
<td>2.8</td>
<td>13.0</td>
</tr>
</tbody>
</table>

Source: IMF, WEFS- April 2008

It is also important to understand whether the private capital inflows to Africa are temporary or permanent. This requires studying the factors that are in play in the recent episode of capital inflows in Africa. A publication by Goldman Sachs (2008) notes that investors’ interest in Africa is driven by strong macroeconomic performance, improved governance and a more stable political landscape, debt relief, and rising commodity prices that have led to improved external and fiscal balance and expectations of exchange rate appreciation. The second set of factors responsible for growth in private capital inflows to Africa are domestic pull factors such as improved capital market infrastructure, market size, and business environment. The third factor that has contributed to the rise in private capital inflows to Africa is the increasing interest of emerging markets, especially China and India, to secure natural resources to feed their growing economies (IMF, WEFS- April 2008).

For low-income countries in the region, Official Development Assistance, ODA, (Aid) accounts for almost two-thirds of all external financing on average. Although aid to Africa has risen, new aid has been largely debt relief. Overall, aid flows from DAC and multilateral donors to the region climbed to $40 billion in 2006. The expansion in net ODA, excluding debt relief and humanitarian assistance, has been limited, however, accounting for less than a third of the expansion in ODA to the region in 2006 (OECD, 2008). To meet their pledged increase to Sub-Saharan Africa of $50 billion (in real terms) by 2010, ODA donors would have to increase the flow of aid to the region by an average annual rate of 18 percent over the balance of the decade (in real terms), well above the 9 percent rate observed in 2002–06 (World Bank, GDF, 2008). This might be a trying commitment to donors in the current global economic environment.

Finally, an important feature of the African external sector relates to remittance and tourism. International remittances flowing into developing countries are getting increasing attention due to the fast increase in their volume. Estimates indicate that remittances to developing countries have amounted to about 75% of the total global remittance flows in 2007 (Anyanwu and Erhijakpor, n.d). Though different sources indicate different figures and figures are subject to revisions, studies indicate remittance flows to developing countries have been significant reaching US$ 265 billion in 2007 and were estimated at about US$ 283

The remittance flows to Africa as a percentage of total flows to developing countries are not significant, standing at just 7% both in 2007 and 2008 according to Ratha et al. (2008) or at 11% in 2007 according to Anyanwu and Efihijakpor (n.d). According to the latter remittance flows into Africa averaged US$ 18.3 billion between 2000 and 2007. The growth in volume of remittances was also significant- from US$ 11.2 billion in 2000 to US$ 27 billion in 2007. The major sources of remittances to sub-Saharan Africa, as % of remittance flows in 2008, are Western Europe (44%) and USA (31%). Remittances from other developing countries, intra-Africa trade being the most important one, are also significant (10%) (Ratha et al, 2008).

In addition to these flows international tourism receipts are becoming important revenue for Sub-Saharan African (SSA) countries, on average accounting for about 4 percent of GDP for 29 popular Africa tourist destinations. Tourism is also an important growth-driver for economies such as Cape Verde, Mauritius, Namibia, Kenya, Seychelles, Tanzania, and Uganda, to name a few (TDIC, n.d.).

In sum, the last five years saw a significant improvement in growth and growth prospects of Africa. However, this optimistic scenario is clouded by the possible impact of the global economic crisis. For Africa the task of coping with the global crisis is daunting, especially when seen in the context of limited fiscal and monetary space countries in Africa have to deal with such crisis. Notwithstanding the latter, it is imperative to identify the channels through which the effect of the crisis could be transmitted to Africa and what the impact of the crisis will be so as to suggest possible response to it.

Although it is difficult to find an exhaustive account of the impact of the current crisis on Africa, there are a number of attempts to sketch the channels through which the crisis may affect Africa and a possible impact of that on the countries in the continent. Such an effort is noted at IMF, the World Bank, the African Development Bank and the Institute of Development Studies (IDS) in UK, among others. For instance, IDS invited key thinkers, academics and policymakers in 19 developing countries to present a brief ‘snapshot’ of the financial crisis from their own country’s viewpoint. Respondents identified seven channels through which the crisis is affecting developing countries. Table 4 shows a summary of these channels (McCulloch, 2008). We will be using these identified channels to outline the possible impact of the crisis on Africa.

<table>
<thead>
<tr>
<th>Table 4: Channels through which the Global Crisis Affects Developing Countries</th>
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<tbody>
<tr>
<td><strong>Exports</strong></td>
</tr>
<tr>
<td>Export growth is already slowing markedly in several developing countries.</td>
</tr>
<tr>
<td><strong>Foreign Investment:</strong></td>
</tr>
<tr>
<td>Both portfolio and direct foreign investment have dropped dramatically in several countries as investors shy away from markets that are perceived to be riskier.</td>
</tr>
</tbody>
</table>
Sudden withdrawal of foreign capital from several developing countries has caused dramatic falls in their exchange rates. Companies and governments with substantial foreign-currency denominated debts may contract or even collapse as a result.

As foreign investors have withdrawn, risk premiums and interest rates have risen for developing countries on global capital markets.

A key concern for some countries (e.g. Philippines, Ethiopia) is the decline in remittances from workers in recession-affected rich countries.

Many countries expect that aid from rich countries will decline as governments reassess their priorities. This could have particularly negative consequences for Africa.

Ultimately the crisis will reduce growth in most developing countries endangering the achievement of the Millennium Development Goals.

II. The Global Crisis and Its Impact on Africa

The effects of the global crisis on Africa could be seen from two angels: direct effect— which derives directly from the financial crisis and indirect effect— which results from the slowdown of global economic activities in response to the financial crisis (Wolff, 2008).

There is no consensus among writers on whether the financial crisis has direct effects in Africa or not. Some indicate that Africa had initially appeared insulated from the financial crisis due to the fact that its financial systems are not well developed and are weakly integrated to global financial systems (see Mohohlo, 2009; Holmqvist, 2008) and due to relatively sound macroeconomic management in recent years (IMF, WEO- January 2009). Many still continue to think that the poor level of development of African financial systems shields the continent from direct effects of the financial crisis (see Kato, 2009; Wolff, 2008; Devarajan, 2008a), this position, however, is increasingly being questioned.

2.1 The Direct Impacts

Although sometimes difficult to make a strict classification of indirect and direct effects (e.g. the effect on exchange rate), the direct effects of the crisis in Africa could be reflected at least in one of the following ways.

A) Weakening of local investor confidence in equities and bonds on African stock exchange— the price-earnings ratios for many African stock markets were above their sectoral equivalents in mature markets in 2007 (Maimbo, 2008). Accordingly, there are expectations that investors wary of the markets in developed countries will seek opportunities in Africa (see Devarajan, 2008a). These expectations, are, however, misplaced (Maimbo, 2008). Share prices in African countries with better financial systems have plummeted in 2008 following the global trend (Coleman, 2008). In South Africa, Kenya,
Ghana, Tanzania, Egypt and Uganda stock markets have been bearish, as can be seen from Figure 1 below (see also Maimbo, 2008; Kesekende, 2008). Between November 2007 and November 2008, sub-Saharan capital markets have fallen by 30-40%. Over the same period Johannesburg Stock Exchange, Nigerian Stock Exchange and Kenyan Stock Exchange shed 37.3%, 28.1% and 28.7% of their value respectively (Coleman, 2008, Kasekende, 2008).

According to Kasekende (2008) although African banks do not have complex derivative instruments nor do they rely excessively on foreign borrowing, high levels of foreign ownership indicates potential contagion channel. He noted that small market size implies that even limited withdrawals could be significant. This could be exacerbated by the recent declining trend of lending by foreign banks to African private banks (see Kasekende, 2008).

In sum, the discontent with the recent financial crisis in Africa is massive, as is noted by Maimbo, in that the crisis has come at a time when African stock markets were displaying resurgence and an energy that had not been seen for years (Maimbo, 2008).

**Figure 1: Recent Trend of Stock Market Indices in Selected Countries**

<table>
<thead>
<tr>
<th>Country</th>
<th>Index</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>the NGSE Index</td>
<td><a href="http://www.Bloomberg.com">Bloomberg</a>.</td>
</tr>
</tbody>
</table>

**B) Slowdown in Private Sector Lending**— Adoption of conservative credit appraisals processes and procedures by international financial institutions will put finances in the continent under tremendous pressure. Foreign exchange constraints may thus persist for a
while. A reluctance to lend will make it difficult to find trade financing harder (Maimbo, 2008). Another concern of the crisis is its impact on the sources of long term funding (Maimbo, 2008; Wolff, 2008). The Ethiopian Electric Power Corporation, for example, has indicated that its investment plans will be severely affected due to the crisis (McCulloch, 2008b). Where credit is still available, banks have already started to raise the cost of long term finance (Maimbo, 2008; Wolff, 2008). Ghana, for instance, was planning on issuing a US$ 300 million sovereign bond, but substantial increase in interest spreads led to postponement of the proposal (Devarajan, 2008a). Shortening the tenure of such loans is equally likely. This is disappointing after recent years when funds were starting to enter African markets looking for both equity and portfolio investment (Maimbo, 2008).

C) Increased Role of Governments in the Financial System and Beyond— there is a close association between government participation and lower levels of financial development, less credit to the private sector, wider intermediation spreads, greater credit concentration, slower economic growth and recurrent fiscal drains (Maimbo, 2008). If government interventions, if any, in the financial institutions are not seen as short term remedial measures, it may have unintended consequences of 1970s and 1980s (Maimbo, 2008). Related to this, the current industrial countries governments’ practice of bailing out the financial sector, Keynesian policy of ‘stimulation package’ turns the hitherto policy advise of International financial institutions such as the World Bank and the IMF in Africa in its head. Notwithstanding the positive outcome of this phenomenon in African policy circle, it may have the unintended risk of throwing the baby with the bathwater in terms of prudent macro policy and sensible liberalization.

2.2 The Indirect Impacts of the Global Crisis with Simulation Results from A Global Macroeconometric Model

Though there appeared to be no consensus on whether the global financial crisis affects Africa directly, a number of experts agree that it has significant indirect effects. In fact such indirect effects could be more important than the direct ones. As the financial crisis has already developed into full blown economic crisis, Africa can no longer be considered safe from the effect of the crisis. In fact, many countries have already started feeling the effect of the crisis. In this section we have attempted to combine the global view about the issues with our model simulation results to highlight the channels of the impact as well as the magnitude of the impact on Africa. Before going to that issue, however, we have briefly offered an outline of the model used for the analysis in the next subsection.

2.2.1 The Global African Macroeconometric Model (AfriMod)
We have used a Global African Macroeconomic Model, AfriMod (see Alemayehu 2002, 2008a\(^2\)) for forecasting and simulating the impact of major global economic trends noted above on Africa. The model could also be used for preparation of economic outlook about Africa, for analysing the impact of the global economy on African trade, finance, as well as the macroeconomic implications of such external shocks. The model is similar to other applied global models such as IMF’s Multimod (Multi-country Econometric Model) and the World Bank’s Bank-GEM (Bank General Equilibrium Model) and OECD’s Interlink, among others, which are used as one of the tools for writing global and regional economic outlooks (see Alemayehu 2008b). It differs from them in rooting its specification on African macroeconomic reality.

The specification of this African based global (or North-South) model outlined in detail in Appendix I is based on the theoretical North-South models of Taylor (1981, 1983, 1991), Darity and FitzGerald (1982), Kanbur and Vines (1986), Murshed (1990) and Vos (1994) as well as the theoretical-cum-empirical models of Marquez and Pauly (1987), Masson et al (1990) and Alemayehu (2002)\(^3\). The model attempts to combine a Kaleckian/Keynesian North (OECD Countries), a Lewis type economy for the South (Developing Countries), an oil producing and supplying region (representing the OPEC countries) and an international banking sector. The North and OPEC are modelled in a very limited fashion, with an attempt to develop and elaborate upon the modelling of Africa taken as the prime objective. The African part of the model is divided into three regions (North, West &Central and South&Eastern Africa). All parameters of the model, with the exception of some ratios, are econometrically estimated using panel co-integration and Error-correction modelling approach.

The modelling of the OECD countries, adopted in this study, is not an elaborated one. There are two main reasons for this. First, the focus of the study is mainly on the modelling of Africa. Second, if need be, an elaborated model of the South, developed in this study, may be combined with the existing models such as the IMF’s Multimod, the World Banks Bank-GEM or the OECD’s Interlink, which have an elaborated model of the OECD countries. Notwithstanding the existence of a number of such models, we have specified a less elaborated model of North in the current model, however. The use of this, less elaborated, model for the North has three desirable consequences. First, it allows one to specify the North along theoretical lines, which are best suited to depict Africa. Second, incorporation of this, less well-elaborated, model for the North allows one to understand the relevant interaction of the two regions and, hence, subsequent feedback effects of the North on the South. Third, this formulation allows an easy link with other global models that have an elaborated model of the North in the future. The North is assumed to be an economy with excess capacity, with output taken as being demand determined, along Keynesian/Kaleckian lines. The demand component comprises a simple consumption function that depends on income, an investment function, which depends on income and world interest rate and exports and imports. By making the two regions, OPEC and the South, part of the

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\(^2\) The Trade, Finance and Economic Development (TFED) division of the Economic Commission for Africa in collaboration with the author was in the process of developing this global econometric model for use at ECA. However, following the departure of the director Hakim Ben Hammuda in 2007, no one seems to use it.

\(^3\) See Alemayehu et al (2008a) for a survey of Global models and their relevance for Africa.
destination and source for exports and imports of the North, a trade and financial (Aid, FDI as well as Bank flows) linkage among the three regions is established in the model.

The South is divided into two regions, comprising Other South (OT) and Africa (A). The latter, in turn, is further divided into three sub-regions, based on the UNECA classification. These are East & Southern Africa (ESA), North Africa (NA) and West & Central Africa (WCA). The rest of the world, excluding the North, and Other South categories are, on the whole, assumed to be exogenous to the model (see Appendix I for detail). Unlike the North, Africa is assumed to be a supply constrained economy. Official and FDI flows are modelled to flow from the North to South using standard econometric results about their determinants. The private capital is modelled based on credit rationing hypothesis where Africa is assumed to be the least preferred destination. We also modelled the macroeconomic impact of external inflows on Africa through the government’s fiscal response and through real exchange rate effect (or what is called the Dutch Disease effect). The latter is in turn modelled to determine the level of exports from Africa.

The model has also a global commodity block which has four commodity categories (i=1...4) consisting of food, beverage, agricultural raw material, and, metals, ores and minerals. This distinction is found to be empirically important for Africa. The global commodity market for each commodity category is modelled to clear for price, following global demand and supply. The price derived in this market, through real exchange rate, in turn, determines the supply of exports from Africa. Moreover, supply from Africa is modelled to have an effect on global supply. Thus, the global commodity market and African supply are dynamically linked.

The model has 316 equations of which 256 are endogenous and 60 are exogenous. Detail specification of the model are given in Appendix I. An Excel and Eviews version of the model could also be obtained from the author on request. We have used this model to examine the implication of the current global crisis on Africa in the next section.

### 2.2.2 Indirect Impacts Including Model Simulation Results

In this section we have attempted to evaluate the quantitative dimension of the impact of the global crisis using the available literature on the issue and the global African macro econometric model briefly outlined above. Using this approach we have attempted to examine the implication of the following five scenarios that are related to the global crisis:

i. **The growth slow-down in industrial countries and evolution of global interest rate in the course of this crisis.** These two events figure prominently in affecting the global commodity market upon which African countries depend for more than half of their GDP. This aspect is adequately modelled in the AFRIMOD. Using IMF’s economic outlook (IMF, Jan 29, 2009) the advanced economies are expected to grow at -2.0% in 2009 and at 1.1% in 2010. Similarly, the London interbank offer rate (LIBOR) is expected to be 2.2 and 2.7 in 2009 and 2010 respectively for Euro deposits (and 1.3 and 2.9 for US dollar deposit), respectively. We have simulated below the effect of these changes.

ii. **Possible decline in official development assistance that may result from the slowdown in economic growth in industrialized countries.** The crisis may entails a
decline in official capital flows. Thus we have assumed AID to decline by 8% each in 2009 and 2010 from its current level of about $40 bln, following OECD forecast in April, 2008.

iii. Another possible effect of the crisis is a decline in private capital flows to Africa in general and that of foreign direct investment (FDI) in particular. Thus, our third simulation is to see the effect of this phenomenon. Both FDI and private capital flows are assumed to decline by 20% in 2009 and 2010 each following UNCTAD’s forecast. Similarly, World Bank estimated a decline in remittance to Africa in the range of 1 to 7%. Although we have not simulated this effect, it might have similar effect to AID or private capital flows. We have attempted to highlight the effect of a decline in remittance based on available (none-model) information on the issue.

iv. The fourth scenario examined is the impact of change in oil prices. The effect oil price have an asymmetric effect on oil importers and exporters. We have examined that in this exercise. According to the latest IMF Economic outlook (Jan, 2009) the oil price is expected to decline by 48.5% in 2009 (from about $97 in 2008) and to increase by 20% in 2010.

v. Although we have discussed individually these scenarios, all of these events do take place simultaneously. Thus, in our simulation, we have introduced all the above shocks simultaneously in the model so as to see the combined effect of all, which is the closer scenario to the reality. The discussion below is thus based on this combined effect.

<table>
<thead>
<tr>
<th>Simulate Global Shocks</th>
<th>Forecast, World Economic Outlook, Jan 29, 2009</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Growth in Advance Countries</td>
<td>-2.0%</td>
<td>IMF forecast</td>
</tr>
<tr>
<td>2. London Inter Bank Rate (LIBOR)</td>
<td>1.65%</td>
<td>Simple average</td>
</tr>
<tr>
<td>2.1 Euro Deposit</td>
<td>2.2%</td>
<td>IMF forecast</td>
</tr>
<tr>
<td>2.2 US Dollar Deposit</td>
<td>1.3%</td>
<td>IMF forecast</td>
</tr>
<tr>
<td>3. Official Development Assistance (AID)</td>
<td>-8%</td>
<td>40bln OECD forecast</td>
</tr>
<tr>
<td>4. Remittance</td>
<td>Estimated 40bln 2008</td>
<td></td>
</tr>
<tr>
<td>4.1 North Africa</td>
<td>-7%</td>
<td>20bln World Bank</td>
</tr>
<tr>
<td>4.2 Sub-Saharan Africa</td>
<td>-1%</td>
<td>20bln World Bank</td>
</tr>
<tr>
<td>5. Private Capital Flows</td>
<td></td>
<td>50bln</td>
</tr>
<tr>
<td>5.1 FDI Flows</td>
<td>-20%</td>
<td>20 bln UNCTAD forecast</td>
</tr>
<tr>
<td>5.2 Other Private Capital Flows</td>
<td>-20%</td>
<td>UNCTAD forecast</td>
</tr>
<tr>
<td>6. Oil Price</td>
<td>-48.5%</td>
<td>IMF forecast</td>
</tr>
<tr>
<td>7 Combined Effect</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We have carried out the exogenous shocks simulation exercise using the information summarized above for the year 2009 and 2010. Although the model is capable of projecting three to five years ahead, it is not wise to do so more than two years in a turbulent global economic environment such as the one we found ourselves. As can be gleaned from the gap between the November and January forecast of the IMF’s global economic outlook, forecasting a year ahead is an heroic effort. Notwithstanding that, the forecasts and
simulation results will give us the best available quantitative estimates of the likely quantitative effect of the crisis on Africa. This, combined with expert opinion could be helpful in designing appropriate policy response which I have attempted to give a general direction about in the next sections.

I. **OECD Growth Slowdown and Change in World Interest Rate**

As noted above, due to the broad based booming commodity prices, sub-Saharan African countries registered buoyant growth. At the same time, investment in the commodities sector has accelerated after long periods of lacklustre performance (Helbling et al, 2008). Following the financial turmoil and economic slowdown across the world, however, demand for African products are showing signs of decline. The major importers of African products are European Union (33%) the United States (24%) and Asia (16%). Import volume to these regions is expected to fall by about 5% in EU and Asia and by about 2% in the US in 2009. Japan is set to experience the largest imports contraction of about 7% (Sayeh, 2009). Moreover, one of the reasons for sharp increase in demand for African exports being growth in demand from emerging markets— especially China and India, the decline in growth in those countries may lead to fall in demand for African products (Holmqvist, 2008).

Commodity prices are also declining—especially oil and metals have lost over 65% and 30% of their value, respectively, since mid 2008. Cocoa and coffee also, though relatively small, have experienced a decline in price of about 23% since October 2008 (Sayeh, 2009). The decline in commodity prices combined with global fall in demand for African products signals the looming of difficult times ahead for Africa.

Despite the commendable export performance, the high commodity concentration in African exports has subjected the continent to price volatilities (IMF, WEO- January 2009). This can be seen by the steep decline in commodity prices (oil, minerals, and metals) following the global economic crisis (Sayeh, 2009). On average, Africa has benefitted from improved terms of trade over the last years due to booming commodity prices— especially oil and minerals. Within the continent, the effect appears to be symmetric between importers and exporters of those products. As commodity prices crumbled since mid 2008, countries that have enjoyed the benefits of rise in the prices of oil and metals are suffering the most while the net importers of those commodities will gain from the decline in prices (Holmqvist, 2008). In 2009, on average, Africa will suffer terms of trade deterioration of -3.2% (WEO, 2009).

An estimated 80% of the region’s exports are primary or semi-processed commodities. Commodity price is also susceptible to change in the world interest rate as speculators do substitute commodities for financial assets depending on prevailing world interest rate (see Alemayehu 2002). Our model simulation shows a contraction of exports by about 8 percent.

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4 In the final months of 2008, global output and trade plummeted substantially. The annualized three-month global industrial production growth rate declined by over 10% (IMF-WEO, January 2009).
Revenue from tourism is also a key area of concern (McCulloch, 2008a). The full effect of the financial crisis on Africa tourism remains to be seen in 2009. However, the growth rate of international arrivals to sub-Saharan Africa has already slowed down to 4.2% in 2008 compared to 7.5% in 2007 (UNWTO World Tourism Barometer, January 2009 cited in TDIC, n.d). A rough estimate shows that between 2006 and 2007 tourism receipts increased by about US$ 1.3 billion, while between 2007 and 2008 they increased by only US$ 0.8 billion. The prospects for 2009 look even grimmer. The UNWTO expects international tourism to stagnate or even decline slightly by 1 to 2%. This forecast is, however, subject to a high degree of uncertainty and much will depend on evolving economic conditions. For small economies relying on tourism such as Seychelles, Cape Verde, Mauritius and Gambia the effect could be strong. Countries with relatively large economies are also feeling the heat with tourism earnings in Kenya, for example having declined sharply (McCulloch, 2008a).

It may be too early to make full assessment of the crisis on African countries. The slowdown in growth could be more, or for longer than expected, pulling commodity prices down even further than projected (Sayeh, 2009). Moreover, the decline in demand for African exports and the fall in price thereof may have long term repercussion in some countries. In Ghana, for example, officials made macroeconomic projections into the future based on high revenue expectations driven by high oil prices as the country expects to begin exporting crude oil very soon (Aryeetey and Ackah, 2008). Some countries are already feeling the heat with Kenya and Ethiopia, for example, experiencing fall in demand for cut flowers from Europe. Moreover, as export revenue decreases, countries could be put under serious
balance of payments stress (Mohohlo, 2009; Holmqvist, 2008). The associated decline in tax revenue also puts fiscal pressure on governments (Wolff, 2008).

II. **Cut down on Official Development Assistance (foreign aid)**

Approximately, US$ 40 billion official development assistance (ODA) flows (net) into Africa annually. Though it had declined in the 1990s, it has increased since 2000 (Holmqvist, 2008). ODA to Africa exhibit a pro-cyclical nature in two ways: first, on aggregate donors tend to reduce aid flows in recession and second, individual recipient countries in crisis fail to meet conditionality related to economic policies required by donors (Holmqvist, 2008). Devarajan (2008b) notes that two things need to happen for the crisis to lead to a significant reduction in foreign aid to Africa. First, the financial crisis has to lead to a major recession in donor countries, which it does now. Second, the recession leads to such fiscal constraints that foreign aid is cut.

How much the recession will impact on ODA flows to Africa is not yet clear. However, many point that the crisis could cause donors to reduce their aid to Africa (Kato, 2009; McCulloch, 2008a). In the 2002 Monterrey Consensus on Financing for Development developed countries were urged to raise ODA to developing countries to 0.7% of their GNP. In 2005, at Gleneagles, the EU set a target of 0.51% of GNI in aid by 2010 and 0.7% by 2015. Even before the crisis, donors were not on track to achieve their targets. Now with the large fiscal costs of rescuing their economies, pressure will be placed on these aid commitments (McCulloch, 2008a). Thus, one won’t be at fault at assuming that the G8 will not be honouring their commitment to double aid flows to Africa by 2010 (Holmqvist, 2008). In fact, recent estimates put a possible cut down of about 8% in 2009 and 2010, which we have attempted to analyse using our model.

III. **Cut down in Private Capital Flows, Including FDI and Remittance**

Africa has registered the fastest growth of private flows over past four years, as we noted above. Following the financial crisis, however, there is fear of private capital flows reversal (Devarajan, 2009a; Sayeh, 2009). The World Bank expects a halving of net private capital flows to developing countries in the year 2009. Mobilizing capital for development will thus be very difficult (Wolff, 2008). If capital flows were to slow down, they could have both short-term and medium-term effects. In the short-term countries that are financing huge current account deficits (such as South Africa) will have to contract their current account deficit. In the medium-term the much need infrastructural projects in Africa that were being financed by such flows will be interrupted (Devarajan, 2008a). The reversal of financial flows may put severe pressures on the balance of payments in many countries (Sayeh, 2009).

There are different explanations to the likely reversal of financial flows into Africa. First, since the economic slowdown affects the quality of the credit portfolios of financial
institutions it may impose losses on other financial assets, such as deposits with troubled foreign correspondent banks, or capital repatriation by troubled parent banks— which are often foreign owned (Kato, 2009). And second, due to the financial crisis in developed countries, there is lower tolerance to risk, as reflected in sharply rising rates for credit. This is bringing lending to a halt and pushing many who have invested in emerging countries to sell their assets to raise liquidity (Wolff, 2008). This is not exhaustive list of explanations but sure to have a strong effect on Africa.

The effect of the crisis on FDI is also another area of concern. Due to lack of finance, FDI projects currently being implemented have been delayed or cancelled altogether. New FDI will decline, portfolio investments will become rare, and long-gestation projection will be left incomplete due to lack of financing as lenders stop providing finance (Wolff, 2008). Furthermore, international investors are likely to delay their commitment to commercial projects in Africa (Aryeetey and Ackah, 2008).

A related issue to inflow of capital to Africa is remittance. Remittances to Africa have been rising steadily. Its importance in terms of size to Africa is becoming equivalent to FDI. As a flow it appears less volatile. However, it is likely to be affected if there is drastic worsening of US, European and South African labour markets (Holmqvist, 2008). Countries with high dependency on remittances (measured as % of export earnings) such as Lesotho (60%), Uganda (40%), Senegal, Guinea-Bissau, Togo, Benin, Burkina Faso (15-25%) are likely to be hit the most (Holmqvist, 2008). Within Africa, Northern Africa could be the region that suffers the most, with remittance flows expected to fall by 7% while in sub-Saharan Africa flows are expected to fall by 1% in 2009 according to the latest World Bank estimate (Ratha et al, 2008).

According to Ratha et al. (2008), the deceleration in remittances is expected to be sharp in 2009. Remittances are, however, unlikely to fall as much as private flows and official aid. Ratha et al. (2008) noted that there is uncertainty regarding the magnitude of the fall in remittances due to the crisis. The uncertainty arises from: (1) the economic slowdown in high-income OECD countries (which account for two-third of the remittance flows to developing countries); (2) the impact of a fall in oil prices on the economies of Gulf Cooperation Countries (a major destination of migrants from developing countries in South Asia and the Middle East and North Africa); (3) uncertainty about exchange rates; and (4) the effect of the financial crisis on developing countries. Uy (2008) offers a, somewhat, counter argument to the one offered above. While the recession in sending countries could hurt the capacity of migrants to send money home, the counter cyclical nature of remittance flows to recipient countries is equally important. Remittances to Africa, in the past, tend to rise when the receiving country experiences adverse effects. And it is too early to determine which factor dominates.

2.3 The Combined Effect of The Crisis: Growth Slow-down and Macroeconomic Instability
2.3.1 Economic slow-down

The combined effect of all the above mechanisms on African economies could be reflected in reduced economic growth after a period that saw the continent register sustained growth. The decline in economic activities (production) is mainly an outcome of the global decline in demand for African products, mainly commodities. Coupled with this fall in global demand is decline in price of commodities, especially oil, solid minerals and agricultural products, giving rise to sharp decline in domestic income and to decline in domestic demand. These twin pressures on the already weak economies will lead to sharp contraction of production. Falling export earnings and decline in government tax revenue will worsen fiscal posture and external balance (Ajakaiye et al, 2008). Similarly, in their comprehensive study of growth in Africa, Ndulu et al (2007) concluded that, among other factors, growth of Africa’s trading partners’ economies is an important factor in deriving growth in Africa through its effect of facilitating trade and capital flows to Africa. IMF’s estimates of the magnitude of this association show that for every one percentage point decline in world growth Africa’s GDP would be contracted by 0.5 percentage point (IMF, 2008a). Although uncertainties in the magnitudes of the global economic slowdown and the resultant risk factors made forecasting economic variables a precarious business, and that forecasts tend to be outdated faster than is the usual cases, African growth is expected to slow down to about 3% as can be read from Table 7. This makes the task of poverty reduction of governments in developing countries more difficult. Using the World Bank estimates that a 1% decline in growth brings about 20 million people under the poverty line (Mohohlo 2009), the recent IMF’s revision of Africa’s growth forecast for 2009 from the 5% level in October 2008 forecast to 3% in January 2009 forecast (see Table 7) entails bringing additional 40 million people in Africa below poverty line. ..

Table 7: Africa’s Real GDP Growth Forecast

<table>
<thead>
<tr>
<th>Africa: Real GDP Growth Rate Forecasts</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Bank Forecast</td>
<td>5.4</td>
<td>4.6</td>
<td>5.8</td>
</tr>
<tr>
<td>IMF Forecast</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>October, 2008</td>
<td>5.9</td>
<td>6</td>
<td>..</td>
</tr>
<tr>
<td>November, 2008</td>
<td>5.2</td>
<td>4.7</td>
<td>5.4</td>
</tr>
<tr>
<td>January, 2009</td>
<td>5.2</td>
<td>3.4</td>
<td>4.9</td>
</tr>
</tbody>
</table>


Note from Table 7 that the projected growth rate is much lower than the 2007 observed growth rate of 6.5% (See IMF, 2008b; IMF, 2008c; and IMF, 2009). Given the African economies did not well recover from the food and oil price shocks of the 2008 that led to
high inflation and expanding current account deficit, the global financial crisis may hit Africa even harder than what IMF forecasts if capital flows dried up further.

To see the magnitude of this crisis we have presented in Tables 8 and 9 the result of our own simulation exercise that takes all the external shocks summarized in Table 5 on board. Accordingly, the Global crisis entails a contraction of real GDP in Africa by about 2.7% (the Sub-Saharan figure being about 1.4%) from what would have been without the crisis. Similarly, exports may contract by about 4 and 3.6% in 2009 and 2010, respectively (the Sub-Saharan African figure being 8 and 7%) from what would have happened without the crisis. The crisis will also have a detrimental effect on saving and investment as well as public spending as can be read from Tables 8 and 9 (see the Table 8 and 9 for details).

Table 8: The Impact of the Global Crisis on Africa: Simulation Results (Deviation from base-run in %)

<table>
<thead>
<tr>
<th></th>
<th>Sub-Saharan Africa</th>
<th>All Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009</td>
<td>2010</td>
</tr>
<tr>
<td>GDP</td>
<td>-2.71</td>
<td>-2.55</td>
</tr>
<tr>
<td>Government Spending</td>
<td>-9.02</td>
<td>-8.88</td>
</tr>
<tr>
<td>Private Investment</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Private Saving</td>
<td>-0.29</td>
<td>-0.31</td>
</tr>
<tr>
<td>Total Export</td>
<td>-8.17</td>
<td>-7.27</td>
</tr>
<tr>
<td>Export Agricultural Raw Material</td>
<td>-5.24</td>
<td>-6.03</td>
</tr>
<tr>
<td>Beverage</td>
<td>-2.54</td>
<td>-2.73</td>
</tr>
<tr>
<td>Food Export</td>
<td>-2.04</td>
<td>-2.30</td>
</tr>
<tr>
<td>Mineral and Metal Exports</td>
<td>-1.50</td>
<td>-1.59</td>
</tr>
</tbody>
</table>

Source: AfriMOD Simulation

Table 9: The Impact of the Global Crisis on Africa: Simulation Results (Deviation from base-run in %)

<table>
<thead>
<tr>
<th></th>
<th>East and Southern Africa</th>
<th>North Africa</th>
<th>West and Central Africa</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2009</td>
<td>2010</td>
<td>2009</td>
</tr>
<tr>
<td>GDP (real GDP level)</td>
<td>-1.86</td>
<td>-2.49</td>
<td>-0.03</td>
</tr>
<tr>
<td>Government Spending</td>
<td>-7.93</td>
<td>-7.96</td>
<td>-0.54</td>
</tr>
<tr>
<td>Private Investment</td>
<td>0.00</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Private Saving</td>
<td>0.00</td>
<td>0.00</td>
<td>0.02</td>
</tr>
<tr>
<td>Total Export</td>
<td>-3.37</td>
<td>-4.36</td>
<td>0.01</td>
</tr>
<tr>
<td>Export Agricultural Raw Material</td>
<td>-7.33</td>
<td>-8.41</td>
<td>0.10</td>
</tr>
<tr>
<td>Beverage</td>
<td>-2.97</td>
<td>-3.32</td>
<td>NA</td>
</tr>
<tr>
<td>Food Export</td>
<td>-5.31</td>
<td>-6.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>Mineral and Metal Exports</td>
<td>-1.64</td>
<td>-1.89</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Source: AfriMOD Simulation

The information on Tables 8 and 9 also shows that the impact of the crisis may have different impact across countries in Africa as can be read from the variation of the impact of the same external shock on three regions in Africa that we have in the model. We found for instance that the impact is sever in West Africa, followed by East and Southern Africa and
North Africa. This variation is the result of the variation of the structural of the external sector (composition of export commodities, nature of capital flows and macroeconomic response) and macroeconomic posture in each of regions which is empirically captured in the model.

One important aspect that we noted in the course our simulation exercise is the fact that the impact of the crisis would have been much higher than what is depicted in Tables 8 and 9 had it not been for real exchange depreciation (and the positive and negative response of exports and imports, respectively) to that owing to the predicted slow down in inflation in Africa during the period of the crisis. The implication of this regional level contraction in African economies for individual countries need not be underestimated (see Box 1 for country examples). For instance, following the crisis, in Angola, given that the economy depends heavily on the oil sector, assuming oil prices of around US$ 40 per barrel, the decline in nominal GDP for 2009 will be around 23% (Devarajan, 2009b). This indicates that the coming years may be difficult for African economies.

2.3.2 Macroeconomic Instability and Macroeconomic Management

Apart from the growth slowdown and its detrimental effect on poverty reduction, the possibility of macroeconomic instability and the required macroeconomic management could be another major challenge that may result from the crisis.

In 2008 African inflation rate accelerated from around 9% to 15% (IMF, 2008d). This is mainly the result of the oil and food price shocks along with the demand pressure due to expansion of public investment (World Bank, 2009). The inflation rate is expected to fall down to around 9.5% in 2009 due to the declining food and oil prices (IMF, 2008b). However, there is a risk of rising inflation in cases where there would be recourse to domestic financing of deficits in the face of limited foreign capital inflow following the crisis.

IMF (2009) noted that the current account balance for the non oil exporting African countries is projected to deteriorate on average from about 5% of GDP in 2007 to about 5.75% in 2008 and 6.25% in 2009. In the case of oil exporting African countries, their current account balances are projected to record surplus of around 8% in 2009 (IMF, 2008b). Given the sharp decline in the price of oil since the IMF’s October 2008 projection, the prospect of oil exporting countries in registering current account surplus may be slim. The deterioration of the current account balances of the non oil exporting countries may also be larger than the October 2008 forecast as the prices of primary commodities exhibited a downward spiral as growth in China and India, which partly led to higher export prices, slows down. This would put on major macroeconomic balances.

Sudden withdrawal of foreign capital from several countries has caused dramatic falls in exchange rate. The Rand has lost 35 percent of its value between mid-September and mid-
October, 2008. Similar fall in the value of local currency vis-a-vis the US dollar is observed in Nigeria, Egypt, among others, as can be read from Figure 2 below. This may lead to the collapse of companies or governments with substantial foreign currency denominated debts. Moreover, as foreign investors withdraw, risk premiums and interest rates have risen for developing countries on global capital markets (IDS, 2008). This again put a strain on major macroeconomic balances.

Figure 2: Evolution Exchange Rate in Selected Countries following the Global Crisis

The slowdown in trade is reducing government revenue, thereby worsening the fiscal position of many countries. During the last few years, high energy and food costs have depleted public budgets and reduced fiscal space (Wolff, 2008). Fewer resources would mean that African governments would be unable to meet the heightened expectations of their populations for progress in reducing poverty and investing in infrastructure (Kato, 2009). For 2009, IMF expects major deterioration in both fiscal and external accounts of sub-Saharan Africa. It is projected that overall fiscal balance will deteriorate by as much as 6% - to a deficit of about 4% of GDP (Kato, 2009). The current account deficit is also projected to widen by more than 4% of GDP – to about 6.7% (Kato, 2009). Our simulation result also supports this trend as can be read form Tables 8 and 9.
The combined effect of the stress on major macro balances noted above, points to the macroeconomic challenges of the crisis outlined above. This in turn means the development costs to Africa countries of the economic crisis will be higher as the scope and fiscal space for short-term policy responses are very limited and safety nets for the poor are less available (Wolff, 2008).

**Box 1: Sample of Country Effects of the Global Crisis**

*Extract from Kasekende (2008)*

**Egypt**

- The stock price index CASE 30 more than halved since the global financial crisis unfolded: it fell by 57% from 31 July-2 Dec. 2008.
- The Crisis is now affecting growth performance and undermining growth outlook: growth projections revised growth from 7.2% to around 6% in 2008 and 6% in 2009.
- Job creation slowed down: 180,000 jobs created in 3Q 2008 compared to 200,000 same period in 2007.
- The Suez Canal revenue was US$467.5 mil in October, down from $469.6 million in September. The lowest monthly revenue since April 2008.
- Tourism booking indicators for winter season are down by 40 percent compared to the same period of last year.
- Trade affected: Government reported a US$2.2bn loss in exports and a fall in imports by $4.3 billion, which is synonymous a sharp decline in the trade balance deficit.
- But inflation pressure receding and banking sector been insulated thanks to the very low loan-to-deposit ratio and a small total mortgage exposure.
- Government announced a fiscal stimulus package, including new investments worth about USD 1.2 billion.

**South Africa**

- According to the SARB, South African financial sector remains broadly robust and stable.
- The banking system is not dependent on foreign lines of credit.
- The Central Bank has not yet has to make any special liquidity provision.
- The domestic interbank market remains fully functional.
- But the South Africa’s JSE All Share Index has fallen by about 28% from end of July to 2 December 2008.
Similarly, the Rand has depreciated against US$ by 28% from 31 July 2008 to 2 December 2008.

High structural current account deficit compared with most other emerging economies (-7.3% of GDP in 2007; -7.7% in 2008) financed mainly by potentially volatile portfolio inflows.

Risk of inflation

The mining sector already adversely affected by contraction of metal demand due to economic downturn in developed and emerging market.

Manufacturing, which makes up 16% of the economy, contracted for a sixth straight month in October.

Gross domestic product fell an annualized 1.8 percent in the final three months of last year compared with the third quarter.

Due to credit squeeze, new vehicle sales in October fell to their worst level of 2008 and 31 percent down on the same month in 2007.

Significant potential job losses

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**Kenya**

- The stock market has experienced some volatility since June 2008.
- The Kenyan shilling depreciated by about 17% between 31 July to 2 December 2008.
- GDP growth set to soften considerably from 7% in 2007 to 4% in 2008.
- Inflationary pressures remain significant: month on month overall inflation rate rose from 28.4% in October 2008 to 29.4% in November.
- The Crisis having a negative effect on two of Kenya’s key foreign-exchange earners: the tourism and horticulture sectors.
- Kenya has experienced growth on the domestic bond market, whose turnover has increased from Kshs 34.1 billion in 2004 to 84.9 billion in 2007.
- However, the global financial crisis makes it difficult for the government to implement its plan to float a US$500 million infrastructure Eurobond.

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**Nigeria**

- The Nigeria Stock Exchange (NSE) has suffered a major setback, with the all-share index declining 45.3% from March 5, 2008.
Decline in the price of oil is creating challenges for public finance

Government expects oil production to drop from 2.45 million barrels a day in 2008 to 2.29 million barrels in 2009. Crude accounts for 80% of government revenue and 90% of exports.

The central bank is restricting the sale of USD to preserve foreign-currency reserves amid dwindling export earnings

International hedge funds managers have already taken as much as USD 10 billion out of the country

Nigerian banks are seeing their credit lines shrink rapidly (e.g., letters of credit)

Fund-raising for new initiatives such as the Nigeria Infrastructure Fund are facing difficulties

III. By way of Conclusion: The Implications for Afreximbank

IMF argues that African economies are better prepared now than in the 1970s in dealing with the global crisis such as the current one owing to their remarkable growth since the mid 1990s and good policy stance in terms of macroeconomic stability. However, the economies are in a weaker position than most other regions because of their level of poverty and their reliance on commodity exports (IMF, 2009). As a result, the recent achievements based on generally more appropriate and prudent policies are at risk (Wolff, 2008). Expansionary fiscal policy may not be applicable for many of the African economies due to their weak fiscal stance. Rather, in some of African economies fiscal restraints may be needed to curtail import demand and manage the foreign exchange constraint. IMF suggests real exchange rate depreciation to preserve macroeconomic stability in countries where there is terms of trade deterioration. In countries with flexible exchange rate regime nominal exchange rate should depreciate along with tight fiscal and monetary policies to avoid a devaluation-inflation spiral. However, though these measures help in preserving macroeconomic stability, the adverse effect of the crisis would remain to depress growth prospects.

The current financial crisis and the ensuing economic crisis require policy makers in Africa to take actions to mitigate their effects. There is, however, no single recipe for all African countries, as circumstances differ across countries. The important priority must be to protect the hard-won improvements in economic fundamentals—more sustainable debt levels, lower inflation, liberalized trade and structural reforms— that enabled the first period of sustained growth in the region in decades (Kato, 2009).
Wolff (2008) indicates that policy actions to safeguard financial systems are also crucial in Africa. While the precise measures could vary from one country to the other, they should include the strengthening of crisis management systems and contingency planning, the enhancement of oversight of banks’ liquidity management and the improvement of risk management to enable the likely rise in non-performing loans to be addressed. Temporary credit guarantees may be necessary to ensure the normal flow of credit, and authorities must be ready to recapitalize banking systems if necessary (see also Kato, 2009).

The welfare effect of the crisis is also substantial. Since the scope for bail-outs and deficit spending programs in Africa is very limited, the required fiscal stimuli must be attained by (1) redirecting public expenditures from across-the-board food and fuel subsidies to targeted cash transfers to prevent food and hunger crisis, and (2) stepping up public investment in infrastructure with donor support (Wolff, 2008).

Given the economic scenario outlined thus far and the nature of macroeconomic policy response expected form African countries, the strategic direction for Afreximbank need to be articulated along the following seven policy directions. These seven corporate policy directions, however, need to be pursued in tandem with the macro policy direction that we noted above to cope with the crisis.

The first important point for the Afreximbank is to re-evaluate the context in which its third strategic plan is formulated. The third strategic plan has assumed a global growth of 4%, a 2.7% growth in the advanced economies, a 6% GDP growth in Africa, about 7% growth in African exports as well as stronger growth in prices of commodities and capital flows to the region. As the discussion in this paper shows these optimistic prospects are revised significantly downward by more than half in most cases. This requires re-evaluation of the Bank’s targets for the 2008-11 period.

The second policy direction for Afreximbank relates to the alignment of its strategy towards the expected policy direction in Africa that may come in response to the crisis. In general, the policy response to the crisis in Africa will focus on domestic resource mobilization, prudent macroeconomic management, enhancing regional integration through intra-Africa trade and finance as well as exploiting non-traditional source of finance and market such as the emerging economies. Thus, Afreximbank’s strategy needs to be retooled to facilitate these policy responses in individual countries in Africa giving priority to larger economies and significant clients of the bank.

Third, given the global crisis, it is expected that African countries will find it difficult to get trade finance at reasonable cost. This gives Afreximbank the opportunity to show countries in Africa that it has a facility to deal with such crisis. It should be noted that crisis such as the current one could sometimes offer opportunities to establish ties with potential clients. Provision of its services at this time is a long term investment ‘on good will’ or branding of the bank in the African countries. One policy direction to realize this for Afreximbank is
carrying out an inventory of trade finance in Africa by source and their potential difficulties owing to the crisis with the aim of fill the gap that may arise due to the global crisis.

Fourth, one possible direction for African countries in dealing with crisis may related to find solution in terms of market and trade finance form emerging economies such as Brazil, Russia, India and China, in particular from the latter two. There is a possibility of Chinese and Indian Exim banks to be active in the continent in the coming few years. Afreximbank need to design a strategy to deal with these actors, both at competitive and cooperative framework, having its competitive advantage of market knowledge and market presence.

Five, part of the Afreximbank’s strategy may need to take a concerted effort at dissemination of information about Afreximbank in the provision of trade finance and related financing schemes. One strategy to do this is expansion of its regional and country programs by re-packaging them as ‘Global Crisis facility’. In line with this, the Bank’s two strategic programs (Dual Recourse and Non-Dual Recourse) may also need to be retooled or re-packaged by taking this global economic crisis and its impact on Africa on board.

Six, an important strategy for Afreximbank, in particular in the long run relates to strengthening of Intra-Africa trade, say through infrastructure financing, help in diversification of Africa exports, and stabilization of commodity markets, say, through encouraging the Pan African Commodity Exchange and derivative markets. This strategy need to also inform the Banks operation as part of its long term strategy. Deepening regional integration to boost domestic market (including investment in infrastructure, intra-Africa trade) as well as encouraging potential African based funds such as the Pan African Infrastructure fund of South Africa and African Finance Corporation schemes of the government of Nigeria need to be emphasized more than ever.

Finally, perhaps related to the last point raised, some initiatives are put forward by the IFIs to assist the African countries in managing the crisis. IMF and AfDB are providing emergency lending for countries in need of urgent liquidity. World Bank is proposing for the developed countries to pledge 0.7% of their stimulus packages to assist developing countries. The World Bank also plans to expand financing possibilities significantly to relieve developing countries from the foreign exchange constraints. Afreximbank can also embark on similar initiative that it can implement by itself, in partnership with the above IFS as well as with emerging economies governments and their EXIM banks. This strategy could also be viewed as a strategy of diversifying the Afreximbank’s source of resources to cope with problem of concentration of resource base in terms of the current share holders as well as in terms of coping with global crisis such as the current one that may affect its sources of resources.

It is hoped that the above strategies will be helpful in making Afreximbank a successful bank. However, as events are unfolding quite rapidly in the global economy, frequent evaluation and revision of strategies need to be part of the strategy.
References

Ajakaiye, Olu, Felix N’Zue and Damiano Manda Kulundu (November 12, 2008), The Impact of the Global Financial Crisis on Developing Countries: Impact on African Economies and Possible Responses, Sussex.
Aryeetey, Earnest and Charles Ackah (November 12, 2008), The Impact of the Global Financial Crisis on Developing Countries: The Global Credit Crunch – Implications for Ghana, Institute of Development Studies, Sussex.
Deléchat, Corinne, Arto Kovanen, and John Wakeman-Linn (March 22, 2008), Sub-Saharan Africa: Private Capital Fueling Growth, IMF Survey Magazine: Countries and Regions, International Monetary Fund.
Holmqvist, Göran (October 10, 2008), How is Africa affected by the financial crisis – and by global recession?
IDS (November 12, 2008), Summary: The Impact of the Global Financial Crisis on Developing Countries, Institute of Development Studies (IDS), Sussex.
IMF (2008), World Economic and Financial Surveys: Regional Economic Outlook- Sub-Saharan Africa (Washington: IMF)
Appendix

The Theoretical Structure of the African Global Econometric Model (AfriMod)

GLOSSARY OF SYMBOLS USED

* N indicates North; S indicates South, A Africa (EA East Africa; SA Southern Africa, NA North Africa and WC West and Central Africa) and OT indicates Other South (excluding Africa)

- $\lambda$ Debt Service ratio
- $\alpha$ output elasticity
- $\tau$ Mark-up rate in North (Price)
- $\delta_{AP}$, $\delta_{AG}$ Output-capital ratio of the private & public sector, respectively
- $\Delta B_A$ Net commercial bank credit flow to Africa
- $\Delta B_S$ Net commercial bank credit flow to the South ($=\Delta B_A + \Delta B_{OT}$)
- $\Delta B_{pN}$ North private sector demand for bank credit
- $\Delta B_{OT}$ Net commercial bank credit flow to other (non African) South
- $\Delta B_{N,SpN}$ Net commercial bank credit flow to South and North's private sector
- $\Delta D_{C_N}$ Northern government debt (flow)
- $\Delta F_A$ Foreign inflows (net of commercial bank lending and FDI) to Africa
- $\Delta F_{Ag}$ Foreign inflow to the public sector of Africa
- $\Delta F_{Ap}$ Foreign inflow to the private sector of Africa
- $\Delta F_{OT}$ Foreign inflows (net of commercial bank lending and FDI) to Other (non Africa) South
- $\Delta F_{S}$ Foreign inflows (net of commercial bank lending and FDI) to South
- $\Delta J_{O,A,OT,N}$ Flow of saving deposit in international banks by OPEC, Africa, Other South and North
- $\eta$ an index of relative debt service ratio that shows solvency position
- $\mu_S$ Bank mark-up rate over world interest rate on Southern borrowers
- $b_N$ The labour output ratio in North
- $C_N$ Real consumption in North
- $C_P$ Real private consumption in Africa
- $COIL_A$ Real consumption of oil in Africa
- $COIL_N$ Real consumption of oil in North
- $D_{C_N}$ Northern government outstanding debt
- $DEF_{N}$ Deficit in North
- $Dev$ Devaluation
- $Div$ Diversification index
- $e$ Nominal exchange rate (Africa)
- $DSR_{OT,A}$ Debt Service ratio of other South and Africa respectively
- $EXCAPE$ Excess capacity in North
- $EZ$ Exchange rate fundamentals such as macroeconomic balance.
- $F_A$ Stock of Foreign inflows (net of commercial bank lending and FDI) to Africa
- $FDI_{S}$, $FDI_{A,OT}$ Direct foreign investment, FDI to South, Africa, and Other South
- $F_{OT}$ Stock of Foreign inflows (net of commercial bank lending and FDI) to Other (non Africa) South
- $fpS$ Factor payments for South
- $F_S$ Stock of Foreign inflows (net of commercial bank lending and FDI) to South
- $G_A$ Government consumption expenditure in Africa
- $GDP_{min}$ GDP in mining sector
- $G_N$ Government expenditure in North
$H^d_{Ni}$ Commodity Stock demand (North)
$H^s_{Ni}$ Commodity Stock supply (North)
$I_{A,Ag,Ap}$ Real investment in Africa, Africa public sector and private sector, respectively
$I_N$ Real investment in North
$I_S$ Real investment in South
$Q_S$ Real GDP in South
$i_w$ World interest rate
$i_{w*}$ World interest rate on concessional
Inst Institutional condition indicators
$J_{O,A,OT,N}$ Saving deposit in international banks by OPEC, Africa Other South and North
$K_A$ Real capital stock in Africa
$L_A$ Labour
Macro Macroeconomic environment
$M_{Inot}$ Mining value added in Other South
$MM^{fg}_{OPEC,A}$ Real import of manufactured goods by OPEC and Africa, respectively.
$M_{Ni}, M_{OT}, M_{A}$ Import of North and other South respectively
$m_{oil}$ Import propensity of oil consumption in North
$m_{Ns}$ Import propensity of oil consumption in South
$m_{openc}$ Import propensity of OPEC for Northern goods
$MO_{Ni,OT}^{fg}$ Real import of Oil by North, and Other South (OT) respectively
$MR_{Ni}$ Import of primary commodities by North from Africa $i=1...4$
MUP Manufactured unit price index
othDSi Other debt service component (discrepancy)
otGRA Other government revenue
otMN, otMOPEC Other imports of North, and OPEC, respectively
otXN, otXA Other exports of North, and Africa
$P_{coal}$ Price of coal
$PM^{fg}_{N}$ Price of Manufactured goods of North which could be a proxy for $PQ_N$
$P_{oil}$ Price of oil
Politics a dummy, which has a value of 1 when a country is conflict-prone (used as a proxy for political or governance problems) and zero otherwise,
$PQA$ Domestic price in Africa
$PQ_N$ Domestic price in the North which could be approximated by $PM^{fg}_{N}$
$PR_i$ Export price of primary commodities from Africa
$Prin_{Ai}$ Principal payment by Africa
$q$ Rate of capacity utilization
$Q_{Ni}, Q_{OT}, Q_A$ Real output in North, other South and Africa, respectively
$Q_{OILN}$ Real output of oil in North
$\dot{Q}$ Real growth rate of African output
$Q^{dd}_A$ Real aggregate demand in Africa
$r_A$ Real interest rate, nominal interest less inflation (growth of $P_Q$), (in Africa)
RER Real exchange rate
Rimit Remittance
$S_{Ag}, S_{Ap}$ Saving of Africa, public and private, respectively
$S_{Ni}, S_{Ap}, S_{A,sp}$ Saving of North & Africa (total, public and private), respectively
$t_{oil}$ Tax rate in North
$T_A, T^{d,lex}_{A}$ Total revenue, Direct and indirect tax revenue, respectively in Africa
$TPF(A)$ Total Factor Productivity or the Solow residual
ToT Terms of Trade which is defined as $P_{R}/PQ_A$
$w_N$ Wage rate in North
$X_{ss}^{Si}$ Real global supply of primary commodities from South
$X_N$ Export of the North
$X_A$ Real Export of Africa (total)
$X_{Oil}A$ Real export of oil by Africa (total)
XOil\textsubscript{NA}, XOil\textsubscript{WC} Real export of oil by North Africa and West and Central Africa, receptively
XR\textsubscript{Ai}, XR\textsubscript{OTi} Real export Supply of primary commodities from Africa, and Other South, respectively.
X\textsubscript{Si} Global demand for primary commodities from South
Y\textsubscript{OT, A} Real percapita income of other South and Africa respectively
Z\textsubscript{Ag} is the sum of, Z\textsubscript{B} and, Z\textsubscript{pr} Total resource transfer from the banking and the private section to the public sector in Africa
Z\textsubscript{B} Public borrowing from banks
Z\textsubscript{pr} Resource transfer from private to the public sector
Zf Financial sector development
The Structure of African Global Macroeconometric Model [AFRIMOD]

The North: The Industrialized Countries

The Major Macro Aggregates Sub-bloc

\[ P_{QN} Q_N = P_{QN} C_N + P_{QN} I_N + G_N + X_N - M_N \]  
\[ C_N = a_2 + b_2 Q_N \]  
\[ I_N = a_3 + b_3 Q_N - c_3 i_w - d_4 EXCAP \]  
\[ X_N = PM \frac{fs}{N} (MM^{fs}_{OPEC} + MM^{fs}_A + MM^{fs}_{OTD}) + otX_N \]  
\[ M_N = MR^s_{N} (P_{Ri}) + P_{oil} (MO^Q_{N} + XOil_{NA} + XOil_{WC}) + otM_N \]  
\[ PM^{fs}_N = a_e + b_e P_{oil} + c_e w_{N} + d_e P_{R} - e_e EXCAP \]  
\[ S_N = s_N \left[ \tau (w_{N} i_N + P_{oil} m_{N}) Q_N P_{N} \right] + (1 + \mu_i) i_w B_S + i_w F_S + i_w (DC_N - J_N - J_{OT}) + fp_S \]  
\[ fp_S = a_e FDI_{OT} + b_e FDI_{EA} + c_e FDI_{WC} + d_e FDI_{SA} \]  
\[ C_{oil} = a_y - b_y P_{oil} + c_y P_{coal} + d_y Q_N \]  
\[ MO^Q_{oil} = (C_{oil} - Q_{oil}) - XO_{NA} - XO_{WC} \]

The Official Capital Flows and FDI Sub-bloc

The Official Capital Flows Sub-bloc

\[ DEF_N = \Delta DC_N = G_N + i_q DC_N + (NQ_{N} Q_{N}) \]  
\[ \Delta F_A = a_{12} + b_{12} \left( \frac{M_A}{M_{OT}} \right) + c_{12} \left( \frac{FDI_A}{FDI_{OT}} \right) + d_{12} Politics + e_{12} \left( \frac{Y^P_{A}}{Y^P_{OT}} \right) + f_{12} \left( \frac{DSR_A}{DSR_{OT}} \right) \]

The Foreign Direct Investment Sub-bloc

\[ FDI_A = a_{13} + b_{13} \left( \frac{Q_A}{Q_{OT}} \right) + c_{13} \left( \frac{MIN_A}{MIN_{OT}} \right) + d_{13} Politics + e_{13} (FDI_A)_{t-1} \]

The Commodity Sub-bloc

\[ X_{i} \frac{dd}{} = a_{14} + b_{14} Q_N - c_{14} i_w - d_{14} (P_{R} - P_{QN}) \]  
\[ P_{R} = a_{14} + b_{14} Q_N - c_{14} i_w + d_{14} P_{QN} - e_{14} X_{i} \frac{dd}{} \]  
\[ X_{i} \frac{ss}{} = a_{15} + b_{15} (\frac{P_{R}}{PQ_S})_{t-1} + c_{15} (\frac{I}{Q_S})_{t-i} \]  
\[ X_{i} \frac{dd}{} = X_{i} \frac{ss}{} \]

Where:  \( k \)  is the number of lag periods and  \( i \)  stands for commodity  \( i \)
The South: Africa

**The Major Macro Aggregate Sub-bloc**

\[ Q_A = A\left[\beta_L L_A^{-\alpha} + \beta_K K_A^{-\alpha}\right]^{1/\alpha} \]  
\[ A(TFP) = a_{17a} + b_{17a} D_i + c_{17a} R & D + d_{17a} Z_i \]  
\[ Div = a_{17b} + b_{17b} Q_A + c_{17b} Macro + d_{17b} Inst \]  
\[ Q_A^{dd} = C_p + I_A + G_A + X_A - M_A \]

\[ L_A^d = A^{-\alpha/\sigma} (\beta_L)\delta (Q_A) \left( \frac{W}{P_{QA}} \right)^\sigma \]

where \( \sigma = \frac{1}{1+\alpha} \)

\[ K = A^{-\alpha/\sigma} (\beta_K)\; Q_A \left( \frac{P_k}{P_{QA}} \right)^\sigma \]

From this we get:

\[ \frac{\Delta K_{AP}}{K_{-1}} = \frac{I_{Ap}}{K_{-1}} = \hat{Q}_A - \sigma(\hat{\beta}_k - \hat{P}_{QA}) + \sigma \]

\[ \frac{I_{Ap}}{K_{-1}} = \hat{Q}_A - \sigma(\hat{\beta}_k - \hat{P}_{QA}) + \delta + \alpha \left( \frac{\pi}{K} \right)_{-1} + \mu(q - 1) + \eta \hat{M}_{Mg} + b \hat{M} \]

Where we used the fact that \( p_k = (r+d+r)\; p_i = P_{mg} \).

\[ M_A = X_A + \Delta F_A + \Delta B_A + FDI_A + i_w J_s + \text{Rimt} - \Delta J_A - (1+\mu) i_w B_A - i_w F_A - k_b FDI \]

Where \( k_b = b, c, d \) and \( e \) as specified in equation 8

\[ C_{P_A} = a_{21} + b_{21} (Q_A - T_A) + c_{21} (r_A) + d_{21} W_A + e_{21} (\Delta F_A + \text{Rimt}) \]

\[ C_{oil_A} = a_{21} + b_{21} P_{oil} + c_{21} (\Delta F_A + \text{Rimt}) + d_{21} Q_A \]

\[ MM_{A} = a_{22} + b_{22} \; PM_{N} + c_{22} Q_A + d_{22} (\Delta F_A + \text{Rimt}) \]

\[ XOil_{A} = a_{23} + b_{23} P_{oil} + c_{23} FDI_{A,t-1} + d_{23} Q_N \]

**The Fiscal Response Sub-bloc**

\[ T_A^{d} = a_{24} + b_{24} Q_A + c_{24} \Delta F_A \]

\[ T_{sex} = a_{25} + b_{25} C_p + c_{25} (X + M)_A + d_{25} \Delta F_A \]

\[ T_A = T_A^{d} + T_{sex} + \text{otGR}_A \]

\[ G_A = a_{27} + b_{27} T_A + c_{27} \Delta F_A + d_{27} G_A (-1) \]

\[ S_{Ag} = T_A + \text{otGR}_A - G_A \]

\[ S_{Ap} = a_{29} + b_{29} Q_A \]

\[ S_A = S_{Ag} + S_{Ap} \]

\[ \Delta F_A = \Delta F_{Ag} + \Delta F_{Ap} \]
The Commodity Export Supply Sub-bloc

\[ X_{RA_i} = a_{33} + b_{33} \left( \frac{e_{P_{R_i}}}{P_{Q_{A}}} \right)_{i-k} + c_{33} I_{A_{1-k}} \]  

[33]

The 'Dutch Disease' Sub-bloc

\[ P_{Q_A} = a_{34} + b_{34} \Delta F_A + c_{34} MUP + d_{34} (Q_{A}^{dd} - Q_A) \]  

[34]

\[ e_A = a_{35} + b_{35} \hat{Q}_A + c_{35} (G_A) + d_{35} Dev + e_{35} (ToT) + f_{35} (\Delta F_A) + g_{35} e_{A_{1-t}} \]  

[35a]

Where: \( \hat{Q}_A \) is GDP growth assumed to show technological change; \( G \) government consumption expenditure assumed to show governments spending on the non-traded sector; \( Dev \) is nominal devaluation; \( ToT \) \( (=P_{R/P_{Q_A}}) \) is terms of trade; \( \Delta F \) foreign inflow. The constant term \( (a_{35}) \) captures, among other things, the impact of the variation of macroeconomic policy from its sustainable level.

\[ RER_{A_i} = \frac{e_{P_{R_i}}}{P_{Q_A}} \quad i = 1,4, \text{ for the four commodity categories} \]  

[35b]

Major Oil Exporting Countries (OPEC)

\[ Q_{OPEC} = m_{N_o} Q_{N} + m_{S_o} Q_{S} \]  

[36]

\[ MO_{Oil} = Q_{OPEC} - MO_{N}^{Oil} - C_{oilA} \]  

[37]

\[ MM_{OPEC} = m_{OPEC, Oil} Q_{OPEC} \]  

[38]

\[ \Delta I_{OPEC} = P_{oil} Q_{OPEC} - (PM_{N}^{fe} MM_{OPEC}^{fe}) - otM_{OPEC} + i_{w} J_{O} \]  

[39]

International Banking

\[ \Delta B_{i+px} = \Delta I_{OT} + \Delta I_{N} + \Delta I_{OPEC} + \Delta I_{A} - \Delta DC_{N} \]  

[40]

\[ \Delta I_{N} = a_{41} + b_{41} J_{N} + c_{41} (i_{w} - r_{N})_{i-1} \]  

[41]

\[ \Delta I_{A} = a_{42} + b_{42} J_{A_{1-t}} \]  

[42]

\[ \Delta B_{pN}^{a} = a_{43} + b_{43} J_{N} \]  

[43]

\[ \Delta B_{S} = \Delta B_{N}^{a+px} - \Delta B_{pN}^{d} \]  

[44]

Where: \( \Delta B_{S} - \Delta B_{OT} = \Delta B_{A} \leq \Delta B_{A} \), \( \Delta B_{A} \) is historically determined maximum

\[ \Delta B_{A_{i}} = \eta_{i} \Delta B_{S} \]  

[45]

\[ \eta_{i} = \left( \frac{\lambda^{*}_{i}}{\lambda_{i}} \right) \]  

[46]

\[ \lambda_{i} = \frac{i_{w} (1 + \mu_{S}) B_{A_{i}} + i_{w}. F_{A} + Pr in_{A_{i}} + otDS_{i}}{X_{A_{i}}} \]  

[47]

Where: \( \lambda^{*}_{i} \) is exogenously determined maximum debt service ratio (formulated by suppliers)

\( \lambda_{i} \) Debt service ratio of the \( i^{th} \) risk group (region) in Africa. The sum in \( \eta \) of Eq. 46 over \( n \) adds to 1.
**Identities Used**

\[ XR_{Ai} = XR_{ESi} + XR_{NAi} + X_{WCi} \quad \text{Where } i = 1...4, \text{the four commodities} \quad [48] \]

\[ X_{Ai} = \sum_{i=1}^{4} XR_{Ai} PR_i + otX_A + P_{oil} XOil_A \quad [49] \]

\[ X_{i}^{ss} = XR_{Ai} + XR_{OTi} \quad [50] \]

\[ \Delta J_A = \Delta J_{ES} + \Delta J_{NA} + \Delta J_{WC} \quad [51] \]

\[ PQ_{A}Q_A = PQ_{ES}Q_{ES} + PQ_{NA}Q_{NA} + PQ_{WC}Q_{WC} \quad [52] \]