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Research Paper

Capital flows and current account dynamics in Zimbabwe

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Abstract. This paper analysed capital flows and current account dynamics in Zimbabwe. The main objective of the paper was to determine whether Zimbabwe's current account deficit is sustainable or not and assess how capital flows affected current account dynamics. The study applied the intertemporal balance model developed by Liu and Tanner (1996) to assess sustainability of the current account deficit. Granger Causality Tests were also applied on the current and capital account balance and the respective sub-components. The results indicate that the current account deficits violated the intertemporal budget constraint implying that Zimbabwe's current account deficits were not sustainable. Exports and imports of goods and services were, however, co-integrated but the Wald Coefficient Restriction tests results indicated that the current account deficits followed an explosive path. The ECM model, however, indicated that 3% of the errors were corrected in the next period. The Granger Causality Test results indicated a unidirectional causality from current account to the capital account deficit implying the existence of underlying challenges in the economy. No causality was found between FDI and the current account deficit. The results, however, indicated a unidirectional causality from current account deficit to both short term and long term debt implying that the country was financing its deficits by accumulating debt. The study, however, found no evidence of speculative investment. As such, there is no basis for capital controls. The paper recommended that the composition of capital inflows needs to move from short debt to long term debt or preferably FDI to make the current account balance sustainable.

Keywords: Current account sustainability, capital flows, current account deficit.

INTRODUCTION

Capital flows and current and account dynamics have become topical issues in both policy debate and in the academia in the recent years. This is largely due to the fact that following the collapse of the Bretton Woods system, there was a gradual removal of trade barriers and increased freedom of international capital flows making it easier for countries to engage in international trade and borrow or lend across borders (Kaminsky et al., 1998). During the same period, however, there was high incidence of currency crises across different regions. This is largely because increasing current account deficits have often resulted in deep financial crises in many countries (Cecen and Xiao, 2012). According to Edwards (2002), currency crises of the 1990s shocked investors, the academia, international civil servants and policy makers and instigated increased attention to the analysis of capital flows and current account dynamics in many countries across the globe.

Analysis of current account dynamics typically involves assessing whether the debtor country is solvent and whether the current account balance is sustainable or not. The major concern in world capital markets is the ability of debtor countries to continue to run current account deficits. Persistent current account deficits generally lead to a rise in a country's net external indebtedness and a growing risk premium on its debt. In

addition, if foreign capital inflows cannot fully offset the current account deficit, this triggers wide swings in interest rates, exchange rates, and other economic variables resulting in economic instability. Moreover, reversal of capital inflows can plunge the balance of payment position into a huge deficit with potentially huge macroeconomic costs.

It is often difficult to distinguish between current account deficits which are a consequence of growth inducing capital inflows and current account deficits that are due to debt accumulation. Most developing economies experience large current account deficits which are a result of structural bottlenecks which lead to pronounced supply side gaps in the economy. The current account deficits are usually financed through foreign aid, foreign borrowing, and foreign direct investment (FDI). However, there can be consequences when the amount a country spends on imports is persistently and extensively different from the amount generated through export receipts.

High and persistent current account deficits can also be outcomes of speculative-led economic growth induced by high capital inflows (Onaran, 2006). The liberalization of financial markets stimulates speculative investments and deters the financially hedged investments, by increasing interest rates and creates a speculative-led economic development-growth (Grabel, 1995). An upsurge in capital inflows increases demand for financial assets and hence leads to real exchange rate appreciation. Real exchange rate appreciation makes imported goods cheaper and exports more expensive. This would gradually make a country to become dependent on cheap imports, thus exacerbating the current account deficit.

Capital inflows and speculative-led economic growth are also sustained by the possibility of financial arbitrage revenues, mainly from interest and exchange rate gains. However, the challenge with speculative capital inflows is that there are prone to reversals and sudden stops. Reversal or sudden stops in capital flows forces current account imbalances to adjust. During the adjustment period, economic growth decreases dramatically due to import dependency of growth.

The size of the current account deficit, however, does not matter. The financing part is what makes a country to have a huge current account deficit. If the foreign capital inflows are used to build productive capacity in the economy, this can increase economic growth and make the country's current account deficit sustainable. The key characteristic of the current account deficits is not necessarily their size but whether they are sustainability or not.

The composition of capital inflows required to finance a current account deficit is also an important element of sustainability of the current account deficit. Current account deficits financed through FDI are considered more sustainable than those financed from debt creating capital flows. In the same vein, FDI investment inflows are more preferable to portfolio investment inflows as the latter is subject to reversals and sudden stops.

Overview of Zimbabwe's current account developments

Zimbabwe has been running current account deficits since the early 1990s except for 1999 when a surplus was registered. From the year 2000, however, the current account deficits worsened reaching a peak of US$2.7 billion or 33% as a ratio of GDP in 2011 (RBZ, 2012). The persistent current account deficits were largely explained by strong import growth against a background of weak export performance.

Zimbabwe's precarious external sector position was a culmination of a decade long economic downturn experienced between 1999 and 2008. The economic downturn severely reduced the country's productive capacity and affected export performance. The country's economic base started shrinking from the year 2000 following the land reform programme which saw the government repossessing white owned farms and reallocating it to the black majority. The land reform programme was characterized by political violence which severely disturbed farming operations resulting in poor agriculture output. The poor agriculture output had a ripple effect on the manufacturing sector given its dependency on agriculture production. As a result, the whole economy was plunged into a downward spiral resulting in high unemployment, escalating inflation, increasing poverty levels and social unrest.

The economic decline experienced between 1999 and 2008, resulted in shortages of basic commodities causing an escalation of the country's import bill to about US$8.1 billion in 2011 compared to exports of US$4.5 billion over the same period. Higher food and fuel prices in 2008, and increases in volumes of donor-financed humanitarian aid, led to a significant rise in imports. Moreover, the tentative 2009 recovery increased the demand for imports, boosted by public spending and the expansion of credit to the private sector mainly from off shore credit lines. In addition, the high propensity to import was also attributed to supply gaps in the economy, given that the economy was coming from a more than decade long economic crisis.

On the contrary, the export performance was subdued due to low industrial capacity utilization as a result of the unfavourable macroeconomic environment. Agriculture output declined substantially following the fast track land reform programme enunciated by government as well as the unstable political environment from the year 2000. Moreover, the over reliance on a few commodities such as gold, diamond, copper, platinum, tobacco, and sugar exposed the country to external sector vulnerabilities as a result of the high incidence of global financial crisis. These commodities were susceptible to high price

volatility which adversely affected the country's export earnings. Investment in key export sectors was also handicapped by inadequate infrastructure, high operational costs exacerbated by wage pressures, and the poor business climate. As a result, agriculture's share in exports declined substantially following the land reform programme.

Against this backdrop, the country's current account deficit became precarious hence the growing concerns over its long run sustainability. From 1999, the current account deficit to gross domestic product (GDP) ratio was deteriorating. Since the year 2004, the current account deficit to GDP ratio was above the Southern Africa Development Community (SADC) macroeconomic convergence target of at most 9%. In 2013, the current account deficit to GDP ratio increased to a peak of 28.1%.

The capital account registered surpluses, but this has mainly been driven by debt creating short term capital inflows with subdued FDI inflows on account of the unfavourable business operating environment. As such, the country faced significant capital account vulnerabilities as it was not sustainable to continue to finance the current account deficits mainly through short term capital flows given that they are subject to sudden stops and reversal. Moreover, the country can not continue to borrow in perpetuity because lenders can start to question the ability of the country to service its debt obligation.

Although the capital account enjoyed surpluses over the years, this could not sufficiently offset the current account deficits. As a result, the overall balance of payment position was in deficit and was financed through external borrowing, including borrowing from the IMF Exogenous Shocks Facility (ESF) window for balance of payment purposes. This was the country's external debt position growing rapidly over the years. In 2008, the debt to GDP ratio reached a peak of 141.7%. This implies that continuing to run current account deficits presented serious challenges to the economy since there is a limit to the extend to which the country can borrow.

The country also witnessed a general shift in the composition of public debt from long term debt to short term debt thus expositing the country to refinancing challenges. The composition of public debt increased sharply from 2000 as government tried to steer the economy through more domestic borrowing against the imposition of economic sanctions on the country. Domestic debt, however, declined progressively due to erosion of the value of the Zimbabwean dollar as a result of an escalation in inflation levels. Inflation reached a peak of more than 231 million percent in July 2008, resulted in investors resisting long term Government paper in preference for short term and high rewarding treasury bills. Steadily, the debt portfolio structure began to move towards the shorter end of the market, exposing Government to refinancing risk. By 2006, the debt portfolio was 99% short term and 1% long term, compared to 96% long term recorded in 1990 (RBZ, 2009).

The country also witnessed an increase in net errors and omission implying that there were some significant transactions which were not accounted for in the country's balance of payment statistics. For instance in 2010 and 2011, the country's net errors and omissions increased to nearly US$1 billion. It is possible that the huge current account deficit could have been financed by transactions which were not accounted for as reflected in the huge errors and omissions. The errors and omissions were attributed to revenue from smuggled minerals, understatement of remittances, under invoicing of exports as well as over invoicing of imports, among other things. These transactions cannot be traced, but they still reflected in the form of an increase in errors and omissions in the balance of payment statistics.

The adverse external sector developments which obtained in the economy in the recent years led to the growing concern over the ability of the country to persistently run current account deficits without necessarily destabilizing the economy. Given the huge external debt overhang resulting from running current account deficits, the concern was that the country may not be in a position to bridge the saving-investment gap by attracting foreign capital inflows. This was in light of negative repercussions of the rising external debt resulting from off shore borrowing to finance current account deficits. Large current account deficits and rising indebtedness can potentially make a country vulnerable to adverse external shocks, including a change in sentiment on the part of foreign creditors.

The country's case, however, is a bit complex in the sense that the country does not have a domestic currency of its own and, therefore, the issue of exchange rate falls out of question. If the country had a currency of its own, any adverse developments on the external sector would result in currency depreciation and economic instability. Under the dollarization phase, the country has limited mechanisms to manage the external sector since the option of devaluation to make exports competitive is not feasible. The problems associated with the current account deficit are, therefore, likely to reflect in the country's levels of liquidity since money supply in the economy is a function of the external sector performance.

If the current account deficit continues to be financed through borrowing, the country's indebtedness to the rest of the world would also increase. Currently, the country's external debt position is estimated at US$10.7 billion, (RBZ, 2012). The persistent current account deficits will eventually affect the country's ability to generate employment and this will negatively affect economic performance. The country's current account balance is thus an important barometer for macroeconomic performance given that it is closely related to components of national savings and investment, the fiscal balance as

well as private savings.

The aim of this paper is to shed light on the long run dynamics of the current account deficits in Zimbabwe. More specifically, the study assesses the long run sustainability of Zimbabwe's current account deficits. In order to assess how the capital flows affect the current account dynamics in Zimbabwe, the paper also analyses the causal relationship between capital flows and the current account deficits. This is particularly important since the sustainability of the current account deficit is closely related to the composition of capital inflows required to finance the current account deficit.

When a country runs persistent current account deficits, questions are often raised on the ability of a country to generate future current account surpluses in order to amortize external debt created by past current account deficits. The major concerns is that the country could be on a path to insolvency, building up excessive net foreign debt, raising the prospects of default or a sharp reversal in capital flows, which might need an abrupt and costly adjustment. This is largely because at a given point in time, a combination of the inability to earn sufficient foreign capital, an increase in foreign debt and the recurrent current account deficits might cause lenders to question the ability of the country to service and repay its debt. The question that is of major concern is whether the country's current account deficit is sustainable or not. At the same time, the nature of capital flows is important to the extent that it affects the country's solvency problem. This is because capital flows are subject to sudden stops or reversals and this may have far reaching effects on the sustainability of the current account deficit.

A current account deficit can be a result of structural challenges in the economy which can have a toll on economic growth if not addressed. In addition, a current account deficit can be induced by speculative-led economic growth which exposes the economy directly to unproductive profit seeking investments. Reversal in capital flows forces current account imbalances to adjust. During the adjustment period of current account imbalances, economic growth rate decreases dramatically due to the import dependency of growth.

Given Zimbabwe's continued widening current account deficit and the recent surge in debt creating capital inflows, it would be interesting to also investigate the current account dynamics in Zimbabwe. The main concern is whether Zimbabwe would be able to generate future current account surpluses sufficient enough to amortize the external debt being created by the present current account deficits, how Zimbabwe's current account balance was affected by behaviour of the capital flows, and whether the deficits were induced by speculative capital inflows or not?

These key questions are very critical in the assessment of the country's current account sustainability and to enable the government to determine whether to take appropriate steps to ensure that the country moves towards a sustainable path in which the current account deficit is not so large that it will lead to an excessive build-up in foreign indebtedness. In addition, it provide the basis for capital controls in order to deal with speculative-led capital investment which are subject to reversals and sudden stops as these can potentially destabilize the economy and lead to a currency crisis.

Theoretical review of current account dynamics

The literature on current account dynamics is quite broad and mainly divided between two major theoretical conceptions, notably the current account oriented view and capital account oriented view. The current account oriented view's theoretical foundation is based on the Keynesian approach to balance of payment whilst the capital account oriented view is based on the monetary approach to balance of payment. Each of the two approaches provides distinct explanations on how the current account could lead to either an equilibrium or disequilibrium of the balance of payments account.

The current account oriented view assumes that the goods account is the most important determinant of the current account imbalances. The theory emphasizes how expenditure on domestic goods changes relative to domestic output. In other words, the balance of trade is viewed as the difference between what the economy produces and what it consumes or absorbs in the domestic economy (Melvin, 1992). This school of thought assumes a world without capital flows. This approach argues that high and persistent current account deficits are a result of some structural vulnerabilities of the domestic economy emanating from trade deficits, budget deficits, and the saving-investment gap.

The capital account oriented view represented a major paradigm shift in macroeconomic thinking as current account dynamics began to be viewed more as a monetary phenomenon. This was due to the growing importance of capital flows as economies were becoming more open particularly in the 1980s. The capital account oriented view asserts that high and persistent current account deficits are the main outcomes of speculative-led economic growth and current account deficits which are induced by high capital inflows (Onaran, 2006). Capital flows are thus important determinants of the current account dynamics. The current account balance is seen as a function of domestic saving and investment decisions of the forward-looking optimizing agents. This contrasts with the Keynesian approach which emphasized demand for exports and imports. Periods of large capital inflows are generally accompanied by increased rates of investment. If international capital inflows are used to finance investment, this may contribute to an increase in the current account deficit.

According to the monetary theory, the balance of payments imbalances arise when there is no equality

between the demand and supply of money in the economy. An excess of money supply results in increased outflows of money to other countries. In the same vein, excess demand for money is catered for by inflows of money from other countries. The balance of payment equilibrium is achieved through the inflows and outflows of money in the economy. This approach explains the elimination of payments disequilibrium in terms of factors bringing the demand and supply of money into equality. It treats the supply of money as endogenous by assuming a feedback mechanism from the balance of payments through movements in international reserves to changes in the liabilities of the central bank and government.

The fundamental difference between the Keynesian and monetary approach is that the later concentrates on the money account whilst the former focuses on the balance of trade. It is argued that prices, rate of interests, levels of income, exchange rates and the supply of money have a direct impact on the balance of trade. What happens in the balance of trade then determines the behaviour of the overall balance of payments. This means that it's the real variables which determine the overall payment imbalances (Wanniski, 1975). The Keynesian approach focuses on the real factors which are considered autonomous. The monetary approach, however, posits that the disequilibrium is due to disequilibrium in money supply factors. In other words, the money account is autonomous and the real account is the accommodating account. However, both approaches are relevant for a complete understanding of current account dynamics in an economy. Whilst the trade balance is considered as the most important in the current account approach since economic policies can directly influence its performance, the capital oriented view remains a key component to explain the current account dynamics given its growing influence as well as its impact on monetary policy.

Causality between current account and capital account

There is no straight forward answer to the issue of causality between current and capital account balances. However, the explanation mainly revolves around the theoretical dichotomy between the current account oriented view and capital account oriented view. According to the current account oriented view, the problem of high and persistent current account deficits is attributed to the existence of some structural bottlenecks in the domestic economy, typified by trade deficits, budget deficits, and saving-investment gap. On the other hand, the capital account oriented view argues that high and persistent current account deficits are just a reflection of massive capital inflows into the domestic economy which manifest in the form of a high financial account surplus. The surplus status of the financial account is what ultimately enables a country to attain current account sustainability.

A number of studies have tried to analyze the direction of causal relationship between the current and capital account balances. Some of these studies found unidirectional causality which runs from capital account to current account or vice versa whilst others found bidirectional causality. Other studies found no causality between the current and capital account balances. Morande (1988) established that there is a unidirectional causality from capital account to current account for Chile. Forogue and Veloce (1990) found a bidirectional causality between the financial and the current accounts for Canada. Fry et al. (1995), however, found that some developing countries have unidirectional, bidirectional whilst others do not have causality between the capital and the current accounts. However, in Argentina, Mexico, Philippines and Thailand, financial inflows were found to Granger-cause current account deficits.

Guerin (2003) suggested that the causality is mainly from current account to net capital inflows in developed countries and from net capital inflows to current account in developing countries. Yan (2007) also finds that there are different causal relationship between the current account and the financial account components of FDI, portfolio investment and other investment between countries. He attributed this to the level of sophistication in the financial system in terms of absorbing the foreign capital inflows, the 'pull' or 'push' factors behind the capital inflows and the adjustment process of the current account reversals which are abrupt for developing countries and rather moderate for the developed world.

The findings of Yan and Yang (2009) are also in line with Chinn and Prasad (2003), who found that the depth and sophistication of the financial system has an impact on current account in developing countries whilst in the developed world no significant impact is evidenced. This implies that capital inflows to an unsophisticated, shallow financial market in a developing country can potentially lead to current account deterioration.

The direction of causality can also be explained in terms of the savings and investment gap. Current account imbalances are caused by a mismatch between savings and investment. Large private capital inflows can influence the behaviour of the current account through their effect on savings and investments. Periods of high capital inflows are generally accompanied by increased rates of investment. According to the intertemporal current account balance model, advocated by Obstfeld and Rogoff (1996) among others, capital flows to finance the current account deficit, which by definition is the negative difference between domestic savings and investments. This is how current account causes financial inflows.

The direction of causality remains important in the determination of sustainability as this can point to the

source of the problem in the economy. If the causality is from the current to the capital account, this implies that the country has some underlying structural challenges which are reflected either in the large fiscal deficit and the trade deficit. However, it is less problematic if it is from the capital to the current account particularly when it is driven by an increase in foreign direct investment. Notwithstanding this, the nature of the capital inflows is also paramount. In instances where the current account deficit is a result of hot money which comes in the form of short term debt or portfolio investment which can reverse abruptly, there is a danger of destabilising the economy as a sharp and costly adjustment will be required either in the form of exchange rate devaluation or reduction in absorption. This can weigh down on economic activity. Countries may be tempted to intervene in the event of a surge in capital flows, especially those driven by speculative motives to make quick returns before reversing within a short time frame. As such, the concept of causality forms the basis for determining whether to implement capital controls or not.

The concept of sustainability is now a hot topic in policy discourse. Several authors have come up with different measures of sustainability. Mann (1999) defines current account deficit as being sustainable when continuation of the current policy stance will not require a drastic shift or sudden stop such as sudden tightening of monetary or fiscal policy resulting in sharp increases in interest rates, a sudden depletion of reserves, or an exchange rate collapse. Milesi-Ferretti and Razin (1996) argued that the "sustainable" level of the current account is that level consistent with solvency. Solvency is defined theoretically in relation to an economy's present value budget constraint. An economy is said to be solvent if the Present Discounted Value (PDV) of future trade surpluses is equal to the current external imbalances (Milesi-Ferretti and Razin, ibid).

There are several approaches to determine whether a particular current account position is sustainable or not. The most notable approaches include the accounting, elasticity approach, absorption, structural, and the intertemporal solvency approach.

Accounting approach

The accounting approach defines a sustainable current account as one that does not generate increases in the debt-to-GDP ratio over an extended period of time (Opoku-Afari, 2007). The sustainability condition in this approach is specified as follows:

$$\Delta d_t = \left(\frac{1+i_t}{1+g_t}\right) d_{t-1} - (x-m)_t = 0 \quad (1)$$

Where d_t is the external debt-to-GDP ratio, i_t is the interest rate, g_t is the GDP growth rate and $(x-m)_t$ is the trade balance-to-GDP ratio. When a trade balance obtains, the change in the stock of external debt is determined by the difference between i_t and g_t. With an unchanging stock of debt, the external debt-to-GDP ratio remains constant and the trade balance and current account are sustainable. In the real world, however, there is seldom an exact equality between i_t and g_t. If the interest rate falls below GDP growth, the trade deficits can continue to exist forever without an increase in the ratio of debt to GDP. A deficit is not sustainable when the economy's growth rate falls below the ruling interest rate. In such an instance, the trade surplus is required to offset an increase in the debt stock arising from this unfavourable discrepancy.

The major drawback of the accounting approach is that it makes assumptions about debt being able to grow at the rate of GDP in order to maintain a constant debt-to-GDP ratio. This does not explain the role that lenders play in deciding whether a country's external position and associated policies is sustainable or not. For a country like Zimbabwe which is unable to borrow from the multilateral lending institutions such as the IMF, WB, and AfDB, focusing on the debt to GDP ratio would be quite misleading.

Elasticity approach

The elasticity approach to the balance of payments is a partial equilibrium model that looks at the effects of changes in the exchange rate on both the current and capital account. The model emphasizes the role of exchange rate and trade flows on current account adjustments and it is widely applied to evaluate the impact on currency.

The major weakness of the elasticity approach is that it disregards the feedback effects of macroeconomic factors such as domestic economic activity, wages and prices, and interest rates on the balance of payments. By limiting its focus on the direct linkages between exchange rates and the balance of payments, the elasticity approach disregards the analysis of the exchange rate adjustment process on the simultaneous pursuit of policy objectives for the balance of external payments and internal economic activity. In the case of Zimbabwe, the elasticity approach would be inapplicable given that there is no exchange rate under the current multiple currency system.

Absorption approach

According to the absorption approach, a current account deficit is a condition where absorption exceeds income while a surplus exists when absorption is less than income or exports exceed imports. A current account is in surplus when production exceeds spending, or exports exceed imports. It is in deficit when spending is larger than production or imports exceed exports.

The drawback of the absorption approach is that does it not sufficiently consider the monetary aspect, in particular the money markets and inflationary effect of devaluation. Moreover, a reduction in absorption or an increase in income does not always guarantee the elimination of deficits. The absence of an active money market and lack of monetary policy autonomy as a result of the multiple currency system make it difficult to apply this model to the Zimbabwean scenario.

Structural approach

The structural approach consists of mainly three steps. The first step involves estimation of an econometric model that relates current account to its medium term fundamentals. In other words, the significant coefficients will be interpreted as important values for the current account to be on a sustainable path. The second step involves calculation of the current account norm by multiplying the coefficients obtained from the current account model with the medium term fundamental values. In the last step, the actual current account is compared to the current account norm. When the actual current account deficit is greater than the norm, this implies that the current account deficit is unsustainable; whilst if the deficit is smaller than the norm, it means that the current account deficit is sustainable.

The theoretical basis for the structural approach is the savings-investment model. According to this approach, the current account balance is defined and derived from the national account identity. The current account deficits could arise from dis-saving from both the private and public as well as from higher investments. The saving-investment model is specified in the following general function:

$$Y_t = \alpha_0 + \alpha_i Z_{it} + \mu_t \quad (2)$$

Where the dependent variable Y_t denotes the current account deficit expressed as a ratio of GDP, Z is the vector of the explanatory variables which include the fiscal balance, openness of trade, terms of trade, Real Effective Exchange Rate (REER), dependency ratio, and GDP growth.

This model is quite plausible in the assessment of current account sustainability in that it generally looks at all the factors that affect a country's external imbalance. However, calculation of the norm is usually a challenge in developing countries because of lack of information on some of the key variables. Moreover, it is also a challenge to apply the same model in dollarized economies as calculation of variables such as the REER is not feasible.

Intertemporal approach

The intertemporal approach to current account sustainability analysis was motivated by the critique of econometric policy evaluation (Lucas, 1976). He argued that economic models based on decisions made by forward-looking economic agents were more reliable compared to models that are based on ad hoc econometric specifications. The intertemporal approach was popularized by papers written by Obstfeld (1982) and Razin (1983), among others.

Further impetus to develop the intertemporal model was due to the substantial current account deficits that were experienced as a result of sharp world oil price increases in 1973, 1974, 1979 and 1980. The divergent patterns of current account adjustment by industrialized and developing countries raised the inherently intertemporal problem of characterizing the optimal dynamic response to external shocks. Neither the classical monetary models nor the Keynesian models had offered reliable guidance on this question.

The intertemporal approach extends the absorption approach to balance of payments through its recognition that private saving and investment decisions, and even government decisions, result from forward-looking calculations based on expectations of future productivity growth, government spending demands, real interest rates, and so on. The model achieves a synthesis of the absorption and elasticity's view by accounting for the macroeconomic determinants of relative prices and by analyzing the impact of current and future prices on saving and investment.

Liu and Tanner (1996) conjectured that for a sustainable current account to be sustainable, the present value of the expected stock of debt should be zero. This is the transversality condition of the optimal control problem faced by an open economy in the long run. This implies that the current account deficit is sustainable when the current account series is a stationary process.

Empirical studies on current account sustainability

There are various studies on current account sustainability in different countries across the globe. Trehan and Walsh (1991) tested the sustainability of the current account deficit in the United States using annual data for the foreign debt for the period spanning from 1946 to1987. They observed that the current account balance was sustainable. The solvency of Canada, Germany, France, Italy, Japan, the United Kingdom, and the United States of America (USA) was also tested using quarterly data spanning from 1970 to the early 1990s (Liu and Tanner, 1996). Their study found that the intertemporal solvency condition was satisfied for the United States, Germany, and Japan and it was violated for the rest of the countries.

Aziz et al. (2000) studied the macroeconomic and financial conditions common to financial crises in the period from 1975 to 1997. Their study established that a

large external deficit, which is also accompanied by a fiscal deficit, is closely linked not only to balance of payment crises, but to banking crises as well. Bruggermann and Linne (2002) estimated an early warning indicator for new European Union member countries as well as Russia and Turkey. The current account was not explicitly used as an explanatory variable, but they found that variables closely linked to it such as import and export growth and external debt, and fiscal deficit, have a strong predictive power. Edwards (2004) established that the probability of experiencing an abrupt current account reversal is linked to the size of the current accounts deficit and the level of external debt.

Husted (1992) and Taylor (2002) have shown that the long-run intertemporal budget constraint or typically the solvency constraint implies a stationary current account. The time series of current account imbalances as a ratio of GDP were mostly constructed and subjected to unit root testing by means of Augmented Dickey-Fuller (ADF) tests.

Baharumshah and Lau (2004) investigated the statistical properties of current account in Indonesia, Korea, Malaysia, the Philippines and Thailand utilizing data from 1976 to 2001. The sample period was split into the pre-crisis period between 1976 and 1996 and post-crisis period between 1997 and 2001. Univariate unit root tests indicated that current account deficit to GDP ratio followed a non-stationary process under both eras. However, after using more sophisticated panel techniques, it was shown that the current account displayed the mean-reversion properties in all the sampling periods, an indication that the empirical evidence supports the modern intertemporal approach to current account sustainability.

In South Africa, Searle and Mama (2010) analysed the sustainability of South Africa's current account deficits by means of a test of the country's intertemporal budget constraint (IBC) in the context of a co integration analysis. They found initially that the current account was unsustainable but the finding of an unsustainable current account position was reversed after controlling for structural breaks in 1994 and 2003. It was concluded, therefore, that South African's current account deficit was sustainable.

Causal relationship between current account and capital flows were also analyzed by several studies. Fry et al. (1995), used annual data from 1970 to 1992 for developing countries and found that 17 countries had capital accounts that granger caused current account, 12 countries with current account that granger caused capital account, and 21 countries that displayed no causal relationship between the two accounts. Faroque and Veloce (1990) analysed the causal relationship between current account and capital account balances of Canada the period for 1961 to 1984. They found a feed back relation between current account and long term capital account.

A study by Bosworth and Collins (1999) examined the relationship between capital flows and current account developments in developing countries. They used panel data for 58 countries over 17 years from 1979 to 1995 to analyse the effect of capital flows on investment and savings and the current account. They observed that a large proportion of capital flows to the developing countries was used to finance current account deficits. The capital flows were primarily used to finance investment as opposed to consumption. When they analyzed the different types of capital flows, they found that FDI had highly beneficial effects on investment, while portfolio investment flows had no impact.

The empirical studies clearly demonstrate the relevance of the IBC in the analysis of the sustainability of current account deficits. In addition, the studies amply show how the different forms of capital flows influenced the current account dynamics in different regions across the globe. Given Zimbabwe's continued widening current account deficit and the recent surge in debt creating capital inflows, it would be interesting to also investigate the current account dynamics in Zimbabwe. In addition, it is also necessary to understand how the capital flows affect the behavior of the current account. This is important to determine whether the country is sustainable or not so that changes can be initiated timely without rendering costly adjustment on the economy.

METHODOLOGY

To assess sustainability of the current account deficit, a model derived from the intertemporal balance model developed by Liu and Tanner (1996) is adopted. As estimation procedures, the Augmented Dick Fuller Test (ADF), Dickey-Fuller Generalized Least Square (DF GLS), the semi-parametric Phillips-Perron test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test are used. In addition, the Error Correction Model (ECM) developed by Engel and Granger is adopted. The advantage of the intertemporal balance model is that it achieves a synthesis of the absorption and elasticity's view by accounting for the macroeconomic determinants of relative prices and by analyzing the impact of current and future prices on saving and investment. Whilst the structural approach is equally plausible, the major draw back in the case of Zimbabwe is that lack of information on some of the variables makes it inapplicable to Zimbabwe. For instance, in the absence of domestic currency, it is not possible to calculate the Real Effective Exchange Rates (REER) for the country. As such, the intertemporal approach becomes the only feasible methodology for assessing sustainability of Zimbabwe's current account deficit.

According to the intertemporal model, the country's budget constraint for each period is expressed as follows:

$$X_t - M_t + rB_{t-1} = B_t - B_{t-1} + v_t \quad (3)$$

Where M_t and X_t denote imports and exports of goods services in each period, that is, period t, B_t represented the stock of foreign debt in period t, and r_t is the world interest rate in period t. The interest rate is assumed to be stationary with mean r_t ($r_t = r + v_t$), v_t being a random error with a zero mean). The forward iteration of equation 4 produces the following expression:

$$(1+r)B_{t-1} = \sum_{k=0}^{\infty} \frac{M_{t+k} - X_{t+k}}{(1+r)^k} + \lim_{k\to\infty} \frac{B_{t+1}}{(1+r)^k} + \sum_{k=0}^{\infty} \frac{v_{t+k}}{(1+r)^k} \quad (4)$$

Assuming that exports and imports are integrated of order one, that is, I(1) and taking expected values, (5) may be written as:

$$CA_t = \theta + \lim_{i\to\infty} E_t \left[\frac{rB_{t+k}}{(1+r)^k} \right] + \omega_t \quad (5)$$

Where: θ and ω_t represents a constant and a stationary error term, respectively. A sufficient condition for equation 6 to hold, the second term (long run budget constraint) on the right-hand side is equal to zero. Hence, for a sustainable current account, the present value of the expected stock of debt should be zero. This is the transversality condition of the optimal control problem faced by an open economy in the long run. Hence sustainability implies that the current account deficit is sustainable when the current account series is a stationary process.

As Trehan and Walsh (1991) stated, current account stationarity is a sufficient condition to achieve the intertemporal budget constraint (IBC) condition. Therefore the model permits application of unit-root tests to check the intertemporal budget constraint (IBC) stationarity condition in current account.

Typically, the current account stationarity is critical in determining the validity of the intertemporal model of the current account. The intertemporal approach assumes perfect capital mobility which results in smooth consumption. This allows the model to predict whether the current account will be a stationary process, notwithstanding shocks in the economy. If the current account deficit follows a stationary process, it means that the country is solvent.

Estimation procedures

Stationarity of the current account is tested using the Augmented Dick Fuller Test (ADF) unit root test procedure. Assuming that the data have an Auto Regressive Moving Average (ARMA) structure, the model of univariate Dickey Fuller unit-root test in AR (p) can be written as:

$$\Delta CA_t = \alpha + \rho CA_{t-1} + \sum_{j=1}^{w} \beta \Delta CA_{t-j} + \varepsilon \quad (6)$$

Where α, ρ and β are constant and the white noise is indicated by ε. CA_t denotes the current account to GDP ratio (CA_t/GDP_t), and Δ is the first differenced operator.

If the current account deficit is stationary, it implies that the current account deficit does not violate the IBC, implying that the country is solvent. The requirement for solvency to be attained is that the current account deficit must be mean-reverting or follow a stationary process. The unit root tests are conducted first using the Augmented Dickey-Fuller (ADF) test based on the null hypothesis that a unit root exists in the time series.

Given that the ADF test is unable to discriminate clearly between non-stationary and stationary series with a higher degree of autocorrelation and is sensitive to breaks, other second generation stationarity tests are applied, notably the Dickey-Fuller Generalized Least Square (DF GLS), the semi-parametric Phillips-Perron test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test of Kwiatkowski et al. (1992).

Co-integration analysis

To ensure the robustness of our results, the co integration techniques of Johansen (1988) and Johansen-Juselius (1990, 1992) are used to determine whether there is a long run relationship between exports and imports of goods and services. This is important to investigate whether there is any theoretical reason to support the relationship between exports of goods and services and imports of goods and services. This is because, whilst one series may be non-stationary, a combination of the two series might indicate a long run relationship, implying that they are a stationary process.

Error correction model

When the exports and imports of goods and services are found to be co integrated, an Error Correction Model is estimated to determine the adjustment in the following period. The Error Correction Model (ECM) by Engel and Granger (1987) is a means of reconciling the short-run behaviour of an economic variable with its long-run behaviour. The error correction model is specified as:

$$\Delta X_t = \beta_0 + \beta_1 \Delta M_t + \beta_2 \varepsilon_{t-1} + \mu_t \quad (7)$$

Where X_t and M_t are exports and imports of goods and services, μ_t is the error term and ε_{t-1} is the error correction component of the model and measure the speed at which prior deviations from equilibrium are corrected.

Errors and omissions

To assess the implications of the huge net error and

omissions, the errors and omissions will be added to the current account balance assuming that these are transactions which are also financing the current account deficit. The current account deficit will therefore reduce when the net errors and omissions are added. The sustainability of the current account deficit will also be assessed as above after adding the errors and omissions to the current account and the results are compared with the first scenario.

Causality test between current and capital account balance

To test for causality between the capital and current account, the following model developed by Engle and Granger, (1987) is used.

$$CA_t = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} KA_{t-i} + \varepsilon_{1t}$$

$$KA_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} KA_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + \varepsilon_{2t} \quad (8)$$

Where CA is the current account balance, KA is the capital account balance, β and ε represents the coefficients and the error terms, respectively.

Causality tests between subaccounts of capital account and current account balance

Capital flows are composed of three types of investments, which are foreign direct investments (FDI), portfolio investments (PI) and other investments (OI). Equations 10, 11, and 12 illustrate possible causal relationships between various types of capital flows and current account balances.

$$CA_t = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} FDI_{t-i} + \varepsilon_{1t}$$

$$FDI_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} FDI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + \varepsilon_{2t} \quad (9)$$

$$CA_t = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} PI_{t-i} + \varepsilon_{1t}$$

$$PI_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} PI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + \varepsilon_{2t} \quad (10)$$

$$CA_t = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} OI_{t-i} + \varepsilon_{1t}$$

$$OI_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} OI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + \varepsilon_{2t} \quad (11)$$

Where FDI is foreign direct investment, PI is portfolio investment and OI is other investments which are debt creating short and long term capital flows.

Causality tests between subaccounts of current account and capital balance

Causal relationship between subaccounts of current account balance and capital account is also quite important. As asserted previously current account balance is composed of three major accounts which are goods and services balance (GS), income balance (INC) and finally current transfers balance (CT).

$$KA_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} KA_{t-i} + \sum_{i=1}^{L} \beta_{5i} GS_{t-i} + \varepsilon_{2t}$$

$$GS_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} GS_{t-i} + \sum_{i=1}^{L} \beta_{5i} KA_{t-i} + \varepsilon_{2t} \quad (12)$$

$$KA_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} KA_{t-i} + \sum_{i=1}^{L} \beta_{5i} INC_{t-i} + \varepsilon_{2t}$$

$$INC_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} INC_{t-i} + \sum_{i=1}^{L} \beta_{5i} KA_{t-i} + \varepsilon_{2t} \quad (13)$$

$$KA_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} KA_{t-i} + \sum_{i=1}^{L} \beta_{5i} CT_{t-i} + \varepsilon_{2t}$$

$$CT_t = \beta_3 + \sum_{i=1}^{L} \beta_{4i} CT_{t-i} + \sum_{i=1}^{L} \beta_{5i} KA_{t-i} + \varepsilon_{2t} \quad (14)$$

Where GS are goods and services, INC is the net income from abroad and CT is current transfers.

Stability tests

A series of data can often contain a structural break, due to a change in policy or sudden shock to the economy. For instance, it is important to check for structural breaks in the economy particularly in 2009, following the official adoption of the multiple currencies in lieu of the local currency. In order to test for a structural break, the Chow test is used.

Data sources

For this study, annual data on balance of payment trends for Zimbabwe from 1990 to 2013, obtained from the Reserve bank of Zimbabwe data base is used. This period covers a relatively stable period from 1990 to 1999, the crisis era starting from 2000 to 2008 as well as the dollarization phase from 2009 to 2013.

RESULTS AND DISCUSSION

As shown in Table 1, the average current account balance

Table 1. Descriptive statistics of the variables.

Parameter	CA_NET	CA_GDPR	EXPORTS	IMPORTS	KA	ERR_OMN
Mean	-831.4792	-0.101667	2186.879	2765.838	315.1833	137.1118
Median	-366.4500	-0.061000	1859.000	1977.550	174.3500	87.90000
Maximum	27.70000	0.005000	4416.300	7562.000	2208.200	930.5000
Minimum	-3703.000	-0.299000	1530.000	1511.000	-403.4000	-1361.800
Std. Dev.	1040.791	0.089925	784.5720	1827.931	587.5841	447.8683
Skewness	-1.841407	-0.975480	1.609408	1.775954	1.610241	-1.132279
Kurtosis	5.035334	2.652192	4.488926	4.576397	5.836531	6.673764
Jarque-Bera	17.70570	3.927212	12.57768	15.10108	18.41741	18.62477
Probability	0.000143	0.140351	0.001857	0.000526	0.000100	0.000090
Sum	-19955.50	-2.440000	52485.10	66380.10	7564.400	3290.683
Sum Sq. Dev.	24914645	0.185989	14157723	76850641	7940866.	4613478.
Observations	24	24	24	24	24	24

Source: Researcher's own computations using e-views.

Table 2. Chow breakpoint test.

F-statistic	1.976944	Probability	0.165968
Log likelihood ratio	4.348113	Probability	0.113715

Source: Researcher's own computations.

(CA) has mostly remained in the negative territory for almost the entre period under analysis. This indicates that the deficits have been a persistent feature in the Zimbabwean economy. The average current account deficit as a ratio to GDP is also above 10% of GDP. This is not only on the high side but it is also above the SADC maximum threshold of 9%. Looking at the average exports and imports, the results also indicate that imports have always exceeded exports.

The average capital account was in surplus for the period in question, although it was not sufficient to fully extinguish the trade deficit, hence the negative balance of payment position. The balance of payment deficit created the need for borrowing implying that the country was accumulating external debt. It is also worrisome that the country's net errors and omissions have been very high implying that there could be some serious challenges in the compilation of balance of payments statistics, thus making the analysis of the current account sustainability a bit more complex. It is possible given the huge net errors and omissions that the current account deficit may appear to be unsustainable where as in reality the current account deficit is actually sustainable.

The Chow test

The study tested for structural breaks using the chow test. A series of data can often contain a structural break, due to a change in policy or sudden shock to the economy. This leads to some forecasting errors and hence unreliable model in general. The Chow test results are depicted in Table 2.

According to the results of the Chow test, we fail to reject the null hypothesis that there is no structural break in the data since the p-value is above 5%.

Augmented Dickey-Fuller (ADF) unit root tests

The unit root tests were conducted using the Augmented Dickey-Fuller (ADF) test based on the null hypothesis that a unit root exists in the time series. The unit-root tests were initially performed in levels and then after first differencing. The test results are presented in Table 3.

From the above results, the critical value for the current account to GDP ratio is less than the t-statistic in levels. This means that the null hypothesis of a unit root is not rejected, implying that the current account deficit was non stationary. This also indicates that the current account deficit violated the intertemporal budget constraint suggesting that it is not sustainable. The solvency constraint of the intertemporal model requires that the current account should be a stationary variable or mean-reverting. However after first differencing, the variables became stationary implying that the variables are integrated of order one, that is, I(1).

The results above also indicated that exports and imports of goods and services were both non stationary in levels but stationary after first differencing, implying that they are integrated of order one, that is, I(1).

However, the ADF test is unable to discriminate clearly

Table 3. Unit root test results.

Variables	ADF test				Inference
	Level		First diff		
	Intercept	Intercept and trend	Intercept	Intercept and trend	
CA_GDP Ratio	1.5297 (0.9987)	-0.5615 (0.9708)	-7.0932*** (0.0000)	-3.8287** (0.0407)	I(1)
Exports (G&S)	-1.6250 (0.4520)	-1.5548 (0.7743)	-4.4239*** (0.0025)	-4.4744*** (0.0099)	I(1)
Imports (G&S)	0.5329 (0.9841)	-0.5754 (0.9709)	-3.3575** (0.0243)	-3.6225** (0.0510)	I(1)

Source: Researcher's own computations. Figures in parenthesis are probabilities found from the critical values by MacKinnon (1996) Maximum lag length; *indicates stationarity at 10%, ** indicates stationarity at 5%, *** indicates stationarity at 1%.

Table 4. Unit root test results (second generation stationarity tests).

Variables	DF GLS		PP test		KPSS test	
	Level	First diff	Level	First diff	Level	First diff
CA_GDP Ratio	0.1701	-6.6691***	-2.8876 (0.1840)	-13.3624*** (0.0000)	0.5249	0.2531***

Source: Researcher's own computations. Figures in parenthesis are probabilities found from the critical values by MacKinnon (1996) Maximum lag length; *indicates stationarity at 10%, ** indicates stationarity at 5%, *** indicates stationarity at 1%.

between non-stationary and stationary series with a higher degree of autocorrelation and is sensitive to breaks. It has been proved, using Monte Carlo simulation that the power of the ADF test is very low (Destaings et al., 2013). Moreover, the test cannot distinguish between unit root and near unit root stationary processes. As such, the study also used other second generation stationarity tests, notably the Dickey-Fuller Generalized Least Square (DF GLS), the semi-parametric Phillips-Perron test and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test of Kwiatkowski et al. (1992). The results of these tests are presented in Table 4.

The results of the PP test also confirmed that the current account to GDP ratio is non stationary in levels implying that the current account deficit was not sustainable. In addition, the DF GLS and the KPSS overwhelmingly indicated that the current account deficit is non stationary in levels. However, all these methods indicated that the current account to GDP ratio was stationary after first differencing. More explicitly, the above results suggest that the current account deficit in Zimbabwe was not sustainable.

Johansen Co-integration tests

Since the unit root tests results from the above analysis indicated that exports and imports of goods and services were integrated of order one, that is, I(1) for the period under analysis, the next stage of the analysis was to formulate sustainability tests, which rely on co integration analysis of imports and exports of goods and services. The exports and imports of goods and services series may individually follow a non-stationary process, a combination of the two series may yield a stationary series implying that there is a long run relationship between the two variables.

The co integration techniques of Johansen (1988) and Johansen-Juselius (1990, 1992) are used to determine whether there is a long run relationship between exports and imports of goods and services. The advantage of this over other techniques is that it does not suffer from a normalization problem (Gonzalo, 1994). The superiority of the Johansen estimation has been shown by Phillips (1991) in terms of symmetry, unbiasedness and efficiency property. The determination of the number of co integrating vectors is based on the use of two test statistics, namely the trace test and the maximum eigen value test. This procedure begins with the determination of lag length of the vector autoregressive system using the Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The results of the co integration tests are described in Tables 5 and 6.

Co integration tests between exports and imports of goods and services were carried out using Johansen Techniques. According to the results from Table 5, the trace statistic of 16.71557 considerably exceeded the critical value of 15.49475 and so the null hypothesis of no co integrating vectors is rejected. The trace statistic of 1.236815 is less than the critical value of 3.841466 and, therefore, we do not reject the null hypothesis of at most one co integrating vectors at the 5% level. From Table 6,

Table 5. Unrestricted co-integration rank test (trace).

Hypothesized no. of CE(s)	Eigen value	Trace statistic	0.05 critical value	Prob.**
None *	0.505189	16.71557	15.49471	0.0326
At most 1	0.054668	1.236815	3.841466	0.2661

Source: Researcher's own computations. Trace test indicates 1 co integrating equation(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values.

Table 6. Unrestricted co-integration rank test (Maximum Eigen value).

Hypothesized no. of CE(s)	Eigen value	Max-Eigen statistic	0.05 critical value	Prob.**
None *	0.505189	15.47875	14.26460	0.0320
At most 1	0.054668	1.236815	3.841466	0.2661

Source: Researcher's own computations. Max-Eigen value test indicates 1 co-integrating equation(s) at the 0.05 level. * denotes rejection of the hypothesis at the 0.05 level. **MacKinnon-Haug-Michelis (1999) p-values

the maximum eigen value statistic of 15.47875 also exceeded the critical value of 14.26460 and the null hypothesis of no co integrating vectors is rejected. The maximum eigen value statistic of 1.236815 is less than the critical value of 3.841466 and the null hypothesis of at most one co integrating vectors at 5% level is not rejected.

These results amply reject the null hypothesis of no long-run equilibrium between exports and imports of goods and services. This implies that while in the short run the current account deficit was unsustainable, it would eventually become sustainable in the long run. This suggests that the intertemporal budget constraint exists. The challenge is how to obtain the amount of adjustments needed to correct or make the current account deficit sustainable in the long run in terms of the exchange rate adjustment or reduction of import absorption.

Given that the country is dollarized, it would not be feasible to effect the adjustment required through exchange rate devaluation. The adjustment will be a reduction in the absorption. At some point in time, the country will need to pay the debt arising from the current account deficit. High levels of current account deficits imply accumulation of external debt which needs to be repaid at some pint in time. The no ponzi condition implies that the country cannot live with indebtedness in perpetuity. The country will need to results the imports or increase competitiveness to make local products more attractive to the people.

The presence of a co-integration relationship between imports and exports of goods and services is a necessary condition to sustain the foreign deficit, it is not a sufficient condition to be fully certain that the country is sustainable or not.

The study proceeds to check the slope coefficients of the co integration equation between export and import of goods and services. If both exports and imports series are integrated of order one, that is, I(1), a regression test is also conducted to test the null hypothesis that β = 1 against the one-sided alternative that β < 1. If there is a long-run relationship, errors have tendency to disappear and return to zero, that is, they are I(0). Husted (1992) derived a test model by formulating hypotheses from equation 3. Since equation 3 must hold in every time period, the period by period budget constraint can be combined to form the country's IBC which states that the amount a country borrows (lends) in the international market should be equal to the present value of the future trade surpluses (deficits). This can be represented as follows:

$$X_t = \alpha + \beta * M_t + \mu_t \quad (15)$$

$$\Delta LOG(X_t) = \alpha + \beta * \Delta LOG(M_t) + \mu_t \quad (16)$$

Where X_t represents exports of goods and services and M_t represents imports of goods and services and μ_t is the error term.

If exports and imports of goods and services are co integrated, then β = 1 and the strong form of sustainability is satisfied. If β = 1 and exports and imports of goods and services are not co integrated, then the weak form sustainability is satisfied. If 0 < β < 1, then the process has an explosive root and this signals an unsustainable current account position. If β = 0, then the process is non-stationary. The results of the co integration equation are indicated in Table 7.

Rejecting the null hypothesis that β = 1 for the alternate β < 1 would be evidence that the growth in international indebtedness may not be sustainable. The estimated value of the coefficient is β = 0.690047. The p values at β = 1 and β = 0 are all above 0.05 implying that the Wald Coefficient Restriction tests overwhelmingly rejects the null of β = 1 and β = 0 in both cases. Since β lies between 0 and 1, it implies that the process follows an

Table 7. Wald coefficient restriction tests.

Restriction	F statistic	P value
β = 1	0.2181	0.6453
β = 0	3.7256	0.0672

Source: Researcher's own computations

Table 8. Results of the ECM (DLOG (EXPORTS_GS).

Variable	Model
C	0.010151 (0.7480)*
DLOG(IMPORTS_GS)	0.396759 (0.0704)*
RESID01(-1)	-0.030223 (0.0512)**
R-squared	0.567062
Durbin-Watson Statistic	1.909348

Source: Researcher's own computations. Figures in parenthesis are p values; *indicates significant at 10%, ** significant at 5%, *** significant at 1%.

explosive path.

However, the residuals from the co-integration regression are stationary at the 5% level using the ADF test. Despite the fact that the residuals from the regression are stationary, the coefficient is not unitary to conclude that the current account deficit was sustainable. More explicitly, the above results suggest that the current account deficits are not sustainable.

Error correction model

The Error Correction Model (ECM) by Engel and Granger (1987) is a means of reconciling the short-run behaviour of an economic variable with its long-run behaviour. If two variables are co integrated, then Equation 15 in the previous section can be expressed as an ECM as follows:

$$\Delta X_t = \beta_0 + \beta_1 \Delta M_t + \beta_2 \varepsilon_{t-1} + \mu_t \quad (17)$$

Where Δ denotes the first difference operator, ε_t is a random error and

$$\mu_{t-1} = X_{t-1} - \beta_1 - \beta_2 M_{t-1} \quad (18)$$

The results from the error correction model (Table 8) show that the coefficient of the residual has a negative sign as expected and is also significant at 5%. The DW statistic is close to 2, implying that the model does not suffer from serial correlation. The residual coefficient (RESID01) has a negative sign as expected and indicates that about 3% of the disequilibrium is corrected in the next period.

Errors and omissions

One of the major challenges observed in the country's balance of payments statistics was the escalation of the errors and omissions in the recent years. It is assumed that the errors and omission constitutes those transactions which are not covered in balance of payment statistics because the information is difficult to collect such as remittances which are coming into the country through informal channels, the smuggling of minerals and the under valuation of imports in order to avoid payment of import duties.

If these transactions are known, the current account deficit which appears to be unsustainable might end up becoming sustainable. As such, there is need to analysis the effect of errors and omissions on current account sustainability. To assess the implications of the huge net error and omissions, it is assumed that if these transactions are reflected on the balance of payments statistics, these would result in a lower current account deficit in the event of a positive net errors and omission and high current account deficit in the event of a negative net errors and omissions. Since the average errors and omission for the period were positive, it means the current account deficit would reduce when the net errors and omissions are added.

The result of the unit root test (Table 9) after taking into account the errors and omission amply demonstrate the fact that the current account deficit remains non stationary thus confirming the results obtained in the earlier analysis. This implies that sustainability of the current account deficit is not affected by the presence of the huge errors and omissions in the data used in this study. This underscores the need to unpack whether the behavior of capital flows has an influence on the current account deficit.

Granger causality analysis

Here, causal relations between current account and capital account balances and between sub-accounts of those major accounts are explored by performing Granger Causality Tests at the optimal lag. According to Granger Causality Test, there are two hypotheses to be tested. The null hypothesis states that CA does not granger cause KA against the alternative that KA does not Granger Cause of CA.

According to granger causality test results in Table 10, the p-value of 0.01785 is below 5% implying that we reject the null hypothesis that current account deficit does not granger cause capital account surplus. This means that a unidirectional relation is found between current account and capital account series at 5% significance level, implying that the current account deficit granger causes the capital account. As asserted in literature review, a current account deficit which granger causes a positive capital account balance as in the above case reflects underlying structural challenges in the economy.

This is particularly the case in this instance where the current account deficit induces capital inflows into the

Table 9. Unit root test results.

Variable	ADF test			
	Level		First Diff	
	Intercept	Intercept and trend	Intercept	Intercept and Trend
CA_GDP ratio	-1.968733 (0.2974)	-2.70207 (0.2446)	-6.099721*** (0.0001)	-6.062348*** (0.0003)

Source: Researcher's own computations.Figures in parenthesis are probabilities found from the critical values by MacKinnon (1996) Maximum lag length; *indicates stationarity at 10%, ** indicates stationarity at 5%, *** indicates stationarity at 1%.

Table 10. Pairwise Granger causality tests results.

Null hypothesis	F-statistic	Probability
CA_NET does not Granger Cause KA_NET	5.43759	0.01785**
KA does not Granger Cause CA_NET	1.23965	0.37400
IMPORTS does not Granger Cause KA_NET	3.94471	0.04226**
KA_NET does not Granger Cause IMPORTS	0.68569	0.64782
FDI_IN does not Granger Cause CA_NET	0.99806	0.47573
CA_NET does not Granger Cause FDI_IN	0.58647	0.71146
PTFLIO_IN does not Granger Cause CA_NET	8.55576	0.00454***
CA_NET does not Granger Cause PTFLIO_IN	1.09446	0.43204
LTC_IN does not Granger Cause CA_NET	0.94450	0.50191
CA_NET does not Granger Cause LTC_IN	3.79229	0.04665**
STC_IN does not Granger Cause CA_NET	1.51783	0.28532
CA_NET does not Granger Cause STC_IN	2.72194	0.10035*
IMPORTS does not Granger Cause FDI_IN	3.15039	0.07266*
FDI_IN does not Granger Cause IMPORTS	1.67953	0.24490
IMPORTS does not Granger Cause PTFLIO_IN	1.62373	0.25805
PTFLIO_IN does not Granger Cause IMPORTS	8.16627	0.00527***
IMPORTS does not Granger Cause LTC_IN	7.94415	0.00574***
LTC_IN does not Granger Cause IMPORTS	0.98758	0.48075
IMPORTS does not Granger Cause STC_IN	1.16957	0.04009**
STC_IN does not Granger Cause IMPORTS	5.01437	0.02240**
KA does not Granger Cause EXPORTS	1.11046	0.35216
EXPORTS does not Granger Cause KA	1.39361	0.27514

Source: Researcher's own computations

country. However, the results are not sufficient to determine whether the capital flows are good for the economy or not and whether the current account balances will be sustainable in future or not. There is, therefore, need for further analysis of the causal relations of the sub-accounts of both the current and the capital accounts. The results of the Granger Causality Tests are shown in Table 10.

The causal relationship between subaccounts of both the current and capital account balances was also analysed using the same procedure as above. From the literature review, it was highlighted that the capital account consists of foreign direct investments (FDI), portfolio investments (PI) and other investments (OI),

namely short term debt and long term debt. On the other hand, the subaccounts of the current account are mainly, the trade balance between exports and imports of goods and services (GS), current transfers (CT) and net factor income from abroad (INC).

The results from the table also indicated a unidirectional causality between imports and the capital account. The p-value is less than 5% implying that we reject the null hypothesis that imports do not granger cause capital account surplus. In other words, the direction of causality is from imports to capital inflows. This confirms the above results that the trade balance is the one that is inducing the capital inflows reflecting the underlying structural challenges in the economy.

The results, however, indicate that there is no causality between FDI and the current account deficit. This presents some challenges to the economy in the sense that FDI is important for sustainable economic growth. A current account deficit may be unsustainable in the short run but if it is financed from inflows of FDI, it will make the current account deficit sustainable as the economy grows and builds capacity.

The results also indicate a unidirectional causality from portfolio investment to current account deficit. The challenge with this result is that portfolio investment is volatile and subject to sudden stops and reversals. This can potentially destabilise the country as the economy is exposed to external shocks.

A unidirectional causality is observed from current account deficit to both long term capital and short term capital at 5 and 10% level of significance, respectively. This implies that the current account deficits are mainly being financed from debt creating flows as opposed to the much preferred FDI. This implies that the country is accumulating foreign debt. The challenge with this kind of scenario is that the country cannot continuously borrow in the long run in the event that the current account deficit does not retreat. There is a limit to which the country can borrow. In other works, the country will need to make an adjustment such as devaluation of the exchange rate or reducing absorption in order to curtail the import demand to be come sustainable.

There is, however, bidirectional causality between short term capital flows and imports. Given that there is bidirectional causality between short term capital flows and imports and the fact that it is the capital account which granger causes the current account, it cannot be concluded, therefore, that the current account deficit is induced by speculative-led investment. As such, there is no basis for exchange controls and in particular capital controls in order to limit the speculative capital inflows. Given the liquidity challenges in the economy, any attempt to limit the capital inflows would further exacerbate these liquidity challenges.

CONCLUSION

From the above results, it can generally be concluded that the country's current account balance has been following an unsustainable path. This is largely because, the current account deficits violets the country's IBC. The other challenge that is clear from the obtained results is that the current account deficits are mainly driven by debt creating capital flows compared to non debt-creating foreign direct investment. This implies that if the country continues to run current account deficits, it will be forced in future to make a painful adjustment such as reducing the absorption and this will be too costly for the economy as the economy will slow down. In addition, the persistent current account deficits will further strain the liquidity situation in the economy.

The study amply demonstrated that Zimbabwe violates its long run IBC implying that the country's current account deficits are not sustainable. The results of the ADF test indicated that the current account deficit to GDP ratio is a non-stationary series implying that the current account deficit follows an unsustainable path. These results were also confirmed by the DF GLS, PP test, and KPSS tests.

Whilst co-integration results indicated that there is a long run relationship between the exports and imports of goods and services, the Wald Coefficient Restriction test on the co integration equation produced contrary results to this. The results indicated that the current account deficit follows an explosive process implying that it is unsustainable. The error correction model indicated that an adjustment of 3% is required to make the current account sustainable.

The study also analyzed the effect of errors and omission on current account sustainability. The study ruled out the possibility of the current account becoming sustainable if the errors and omissions are reduced. The grander causality tests also produced interesting results. The study established that the current account deficits granger causes the capital flows. The current account deficit reflects the underlying challenges in the economy typified by pronounced supply gaps as a result of widespread company closers due to viability challenges and lack of competitiveness. These adverse external sector developments also exacerbate the liquidity challenges in the economy weighing down the country's growth prospects.

The study also established that the capital inflows are not due to speculative investment which can be detrimental to the economy in the event of reversal or sudden stops. This is quite plausible given the country risk and uncertainty in the economy at the moment. This implies that there is no basis at the moment to consider strengthening capital controls to prevent an upsurge in capital inflows driven by speculative motive. However, there is basis to encourage off shore loans which are on long term basis as these encourage investment in plant and machinery.

RECOMMENDATIONS

Given the unsustainable current account deficit, and the

attendant liquidity challenges obtaining in the economy, there is need for active policies aimed at easing pressure on the current account. One of the policy options would have been to devalue the currency in order to discourage the high import demand and to promote exports. However, this option is no longer feasible given that the country is now in a de facto dollarization. Moreover, the manufacturing sector has shrunk such that there is very limited scope for export growth. Whilst the country is receiving a significant amount of capital flows, this is more of short term debt which is not conducive to sustainable economic growth. Besides, the country cannot continue to borrow indefinitely into the distant future as these is a limit to which the country can borrow. However, since the current account deficit reflects the structural challenges in the economy, there is need to address the structural bottlenecks in the economy.

One important area the government needs to focus on is to increase FDI which is more long term and conducive to sustainable economic growth. Thus the country needs to revisit its investment laws to make the country a better investment destination. Once the country is able to attract more FDI, this will be a springboard to sustainable economic growth. An increase in FDI will result in increased output and a reduction in supply gaps in the economy thereby lessening our import dependency. The country will also be able to honor the international obligation thus putting the country back on the investment map.

In addition, the country needs to ensure that the offshore loans are on a long term basis compared to the short term loans. This is largely because the long term loans encourage investment in plant and machinery. The increase in investment in plant and machinery not only helps build capacity in the economy, but is critical to help companies improve their competitiveness by using modern production techniques. The other important area of focus will be the budget performance. The current account deficit was also attributed to the underlying challenges in the economy including the budget deficit experienced over the crisis period. As such, there is need to reduce the fiscal slippages in order to lessen the need for borrowing especially for recurrent expenditure. This is particularly important given that the country is already grappling with a huge debt overhang.

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