



**AN EMPIRICAL ASSESSMENT OF BINDING CONSTRAINTS TO ZIMBABWE'S
GROWTH DYNAMICS**

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ABSTRACT

This paper provides an analysis of the growth diagnostic for Zimbabwe using the framework proposed by Hausman and Velasco (2004). An econometric approach is also applied to assess the sources of economic growth during the period 1980 to 2014. The results suggest a significant decline in productivity and capital stock during the period from 2000 to 2008. The contribution of capital to economic growth was, on average, negative between 1990 and 2008, largely reflecting a contraction of gross fixed capital formation. Labour force participation has remained fairly static, which implies that it might not have been a binding constraint to Zimbabwe's growth. The subdued growth rates for Zimbabwe have, therefore, mainly been attributed to decline in the capital stock and productivity. As such, addressing capital and productivity constraints is critical in jump-starting the economy into a positive growth trajectory. There is, however, need for a clear-cut transition from igniting growth to sustaining it into the foreseeable future. This requires government to put in place appropriate contingency plans to respond to external shocks that have the potential of throwing economic growth in disarray.

Keywords: Growth Diagnostic, Macroeconomic shocks, Cobb Douglas, Regression Analysis

JEL Classification: H63, H62, E62

Disclaimer: The views and conclusions expressed in this paper are those of the authors and do not necessarily reflect the official position of the Reserve Bank of Zimbabwe. For more information concerning the paper do not hesitate to contact the Director, Economic Research, Simon. Nyarota, email address: snyarota@rbz.co.zw

SECTION ONE: INTRODUCTION

The nature and causes of sustained long-run economic growth have always stimulated intense debate by both economists and policymakers the world over. The scholarly debate about the set of policies needed to promote sustainable economic growth is of particular importance for developing countries and countries in transition. In recent decades, a large literature emerged that intends to explain the underlying mechanisms of sustained economic growth and to assist policymakers in choosing the right policies and reforms. While this strand of the literature has advanced understanding of the nature of economic growth and the set of ingredients needed for sustained economic growth, most of the prescriptions of this literature have remained extremely general. The one size fits all approach, which is exemplified by the Washington Consensus, typically leads to a situation where policymakers are faced with a long list of needed reforms. In practice, however, only a few reforms can feasibly be implemented.

In light of these challenges, this paper attempts to assess the binding constraints to Zimbabwe's sustained growth using the growth diagnostic framework by Hausmann, Rodrik and Velasco (2008). The growth diagnostics framework attempts to identify the most binding constraints to economic growth, thus allowing policymakers to prioritize those reforms that relax the binding constraints. By definition, relaxing a binding constraint will raise growth, whereas relaxing a non-binding constraint will not. The analysis is particularly important to Zimbabwe which has been experiencing subdued and unstable economic growth rates since 1980, when the country attained its independence. The World Bank (2000) estimates that an annual average growth rate of about 7 percent, and a better distribution of income, would be needed to achieve the Millennium Development Goals (MDGs) of halving the incidence of severe poverty by 2015.

On the background of negative economic growth rates experienced by the country from 2000 to 2008, there has been renewed debate since the adoption of multicurrency system in 2009 on the long run determinants of economic growth. Although Government came up with various economic reforms and blue prints aimed at fostering sustainable economic growth, these have not been very successful. Notable among the reforms include the Economic Structural Adjustment Programme of 1991 to 1995; Zimbabwe Programme of Economic and Social Transformation, 1997; National Economic Recovery Plan, 2003; Macro-Economic Policy Framework 2005; and Short Term Economic Recovery Plan, 2009, among others.

In 2013, government came up with another economic blue print, the Zimbabwe Agenda for Sustainable Socio-Economic Transformation (ZimAsset). This policy document was crafted with the objective of achieving sustainable development and social equity anchored on indigenization, empowerment and employment creation, largely propelled by the judicious exploitation of the country's abundant human and natural resources. Although the blue print is well structured, its success depends on buy in from all stakeholders, leading to successful implementation of the various programmes contained in the document. The policy aimed to achieve annual growth rates of 7% in the medium term which is in line with the World Bank recommendation to achieve MDGs.

As pointed by Easterly (2001) most policy reforms and aid interventions that followed the logic of a big push in public investment did not support sustained economic inclusive growth. Similarly, structural reforms based on the so-called Washington Consensus set of economic policy reforms across the board (Williamson 1990) mostly failed to yield sustained growth (Rodrik 2007: 86). Nevertheless, for ZimAsset to succeed, there is need for government to identify the major binding constraints to sustainable economic growth. In addition, there is need for crafting of well sequenced policies to address the identified binding constraints and structural rigidities in order to unlock the country's growth potential.

Accordingly, this paper provides an analysis of the growth diagnostic for Zimbabwe using historical information to identify binding constraint to sustainable economic growth. The approach entails using an analytical framework to identify the most binding constraints that hamper economic growth at a specific point in time. The results from the analysis will allow policymakers to creatively develop policy designs which address the most binding constraint while taking into account economic, political and social context. The growth diagnostics analysis will also enable authorities to properly sequence and prioritise policy reforms under ZimAsset for sustainable growth and development.

This study is organized as follows. The next section discusses and analyses Zimbabwe's growth performance since attainment of independence in 1980. Section three discusses both the theoretical and empirical literature on growth dynamics and some common pitfalls of the literature. Section four discusses the methodology of the study. Section five presents and

analyses the empirical results, while section six concludes and offers policy recommendations on various constraints to Zimbabwe's economic growth.

SECTION TWO: OVERVIEW OF ZIMBABWE'S GROWTH DYNAMICS

This section provides some stylized facts about growth performance in Zimbabwe during the period 1980 to 2014. Zimbabwe's annual economic growth rate averaged around 2.2% from 1980 to 2014, weighed down by the decline in economic activity from 1998 to 2008, with annual growth averaging -7% over the crisis period. Between 2009 and 2012, the economy has been on the rebound, registering significant growths averaging 10.5% per annum. Economic growth, however, decelerated to less than 5% in 2013 and 2014.

An analysis of the sources of growth in Zimbabwe, shows that growth from 1980 to 1998 was driven mainly by investment in human capital. The diversification of the economic base from agriculture to secondary and tertiary sectors has been an important source of total factor productivity in the economy. Trade liberalisation has also been an important source of growth by promoting the competitiveness of the country's domestic products. The increase in human capital and the corresponding rising skills levels fostered productivity in the labour intensive manufacturing sub-industries and agriculture sectors of the economy, thereby driving growth. Human capital grew on the back of increased government spending on education and a favourable return to education.

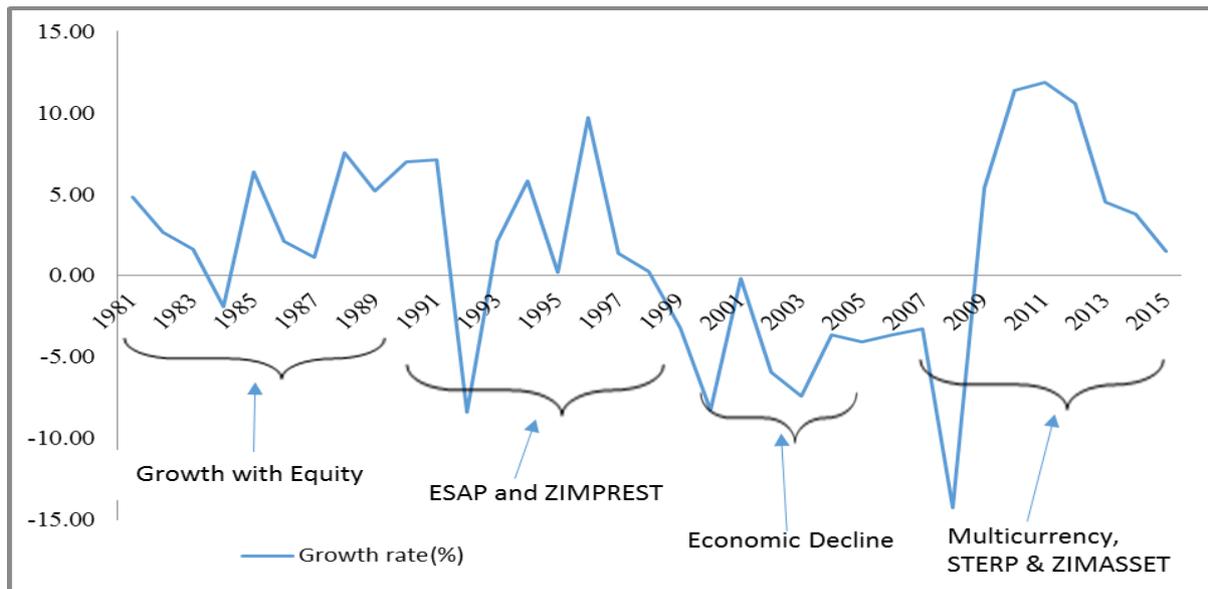
The impressive growth in the economy since the adoption of the multicurrency system in 2009, was driven by capital accumulation driven by investment in infrastructure, new projects and expansion investments in mining. The discovery of diamonds, the expansion of PGMs and resuscitation of gold and nickel mines in the country have seen the economy expanding. Reflecting this, mining contribution to GDP increased from 3.8% in 2007 to 11% in 2012. It is against this background, that the country's growth dynamics has become highly sensitive to movements in the international mineral commodity prices. The investment in mining has been mainly from foreign direct investment. Productivity gains have also played a big part since 2009. The stable macroeconomic environment since 2009 has engendered a conducive platform to enhance total factor productivity.

The rapid expansion in services such as tourism, financial and distribution have also been important sources of growth. Over 60% of the country's labour force are in the services sector. The recent growth in the economy has been supported mainly by the highly capital intensive mining sector. This means that growth has been less on employment creation and therefore with minimal poverty reduction effects.

Zimbabwe's Economic Developments (1961-2015)

Prior to the attainment of independence in 1980, the country adopted inward-looking economic policies by implementing import substitution industrialization policies which succeeded in promoting investment in agriculture and manufacturing sectors. The import substitution strategy was meant to counter the adverse effects of economic sanctions imposed on the Rhodesian Government. The economy grew by an average of 6.9 percent between 1961 and 1972. This growth momentum slowed to an average of 0.21% between 1973 and 1979, a period which coincided with the peak of the country's liberation war. Following the attainment of independence in 1980, the Government adopted a socialist ideology by instituting structural and re-distributive fiscal policies that sought to address pre-independence inequalities. The lifting of economic sanctions, coupled with favourable domestic and external conditions boosted aggregate demand leading to an average growth of 4.4% between 1980 and 1997. The 1998-2008 decade, however, saw the country experiencing a sustained decline in economic activity, in large part, due to disruptions of farming activity during the land reform programme, intermittent droughts, loss of international financial support, capital flight and low investment. Figure 1 below shows the trend in Zimbabwe's annual GDP growth from 1981 to 2015 under various economic blue prints.

Figure 1: Zimbabwe's Annual Real GDP Growth (1981-2015)

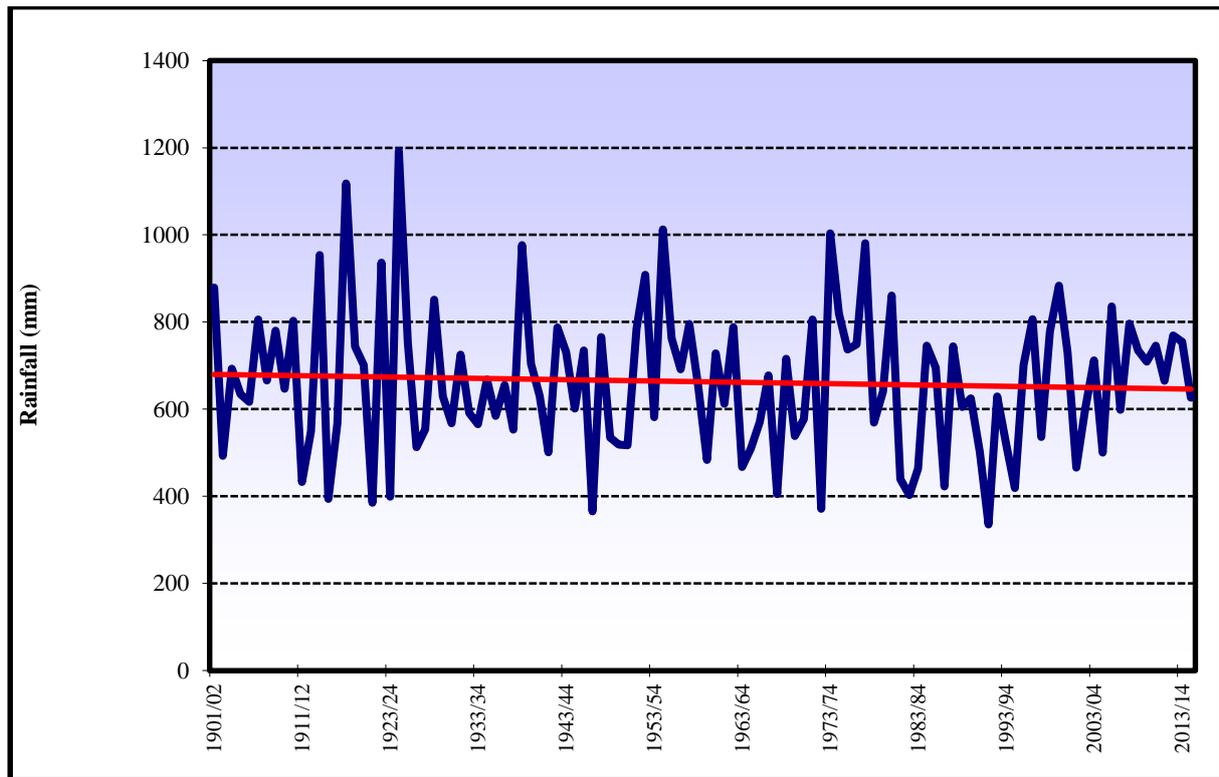


Source: ZIMSTAT and RBZ (2015)

As shown in Figure 1, economic growth, however, rebounded following the adoption of the multiple currency system in February 2009. The country's real GDP growth increased from 5.7 percent in 2009 to 10.6% in 2012, largely due to a relatively stable macroeconomic environment. Notwithstanding these relatively high growth rates, sustaining the growth momentum for the long-term is arguably the most important challenge for Zimbabwe. Recent developments point to a deceleration in economic growth rates as shown by a slowdown in real GDP growth from 10.6% in 2012 to 4.5% in 2013 and a further slowdown to 3.8% in 2014.

While the demand-side of the economy was the main driver of economic growth, the supply-side remained constrained with relatively low levels of investment to expand or at least maintain the existing capital stock. Moreover, the growth momentum has over the years been weighed down by severe droughts, notably, the 1983/84, 1986/87, 1991/92 2001/02, and 2007/08 agricultural seasons. In this regard, frequent droughts have grown to be a major impediment to the country's growth potential. Figure 2 below, shows the rainfall pattern in Zimbabwe from 1901 to 2015.

Figure 2: Rainfall in millimeters (mm) (1901 to 2015)



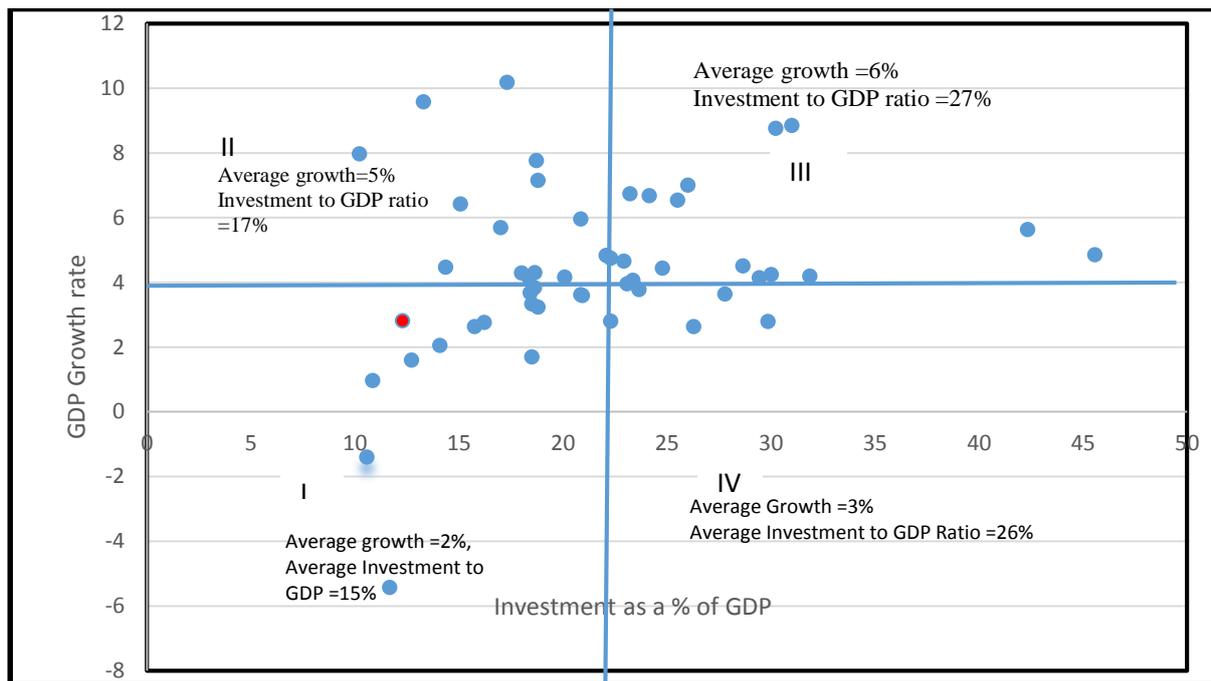
Source: Meteorological Office, 2015

As shown in Figure 2, Zimbabwe usually experiences erratic rainfall or drought nearly after every three years. As a result, the susceptibility of the agricultural sector to adverse weather conditions undermines the country's ability to achieve the envisaged sustainable growth rate of at least 7 percent. Given the centrality of agriculture in the economy, structural reforms should be undertaken in the agricultural sector to mitigate the adverse effects of droughts through the development of reliable and efficient irrigation systems.

Comparison of Zimbabwe growth performance with African Countries

Zimbabwe growth performance remains weak, when compared to other African countries. Specifically, Zimbabwe's growth performance falls on the lower quadrant of the growth-investment Cartesian plane for the period 2000 to 2014, compared to other countries in the developing economies. Figure 3 below shows the position of Zimbabwe in the economic growth rate-investment Cartesian plane for African countries.

Figure 3: Investment-Growth Cartesian Plane for African Countries



Source: World Bank Database, (2015)

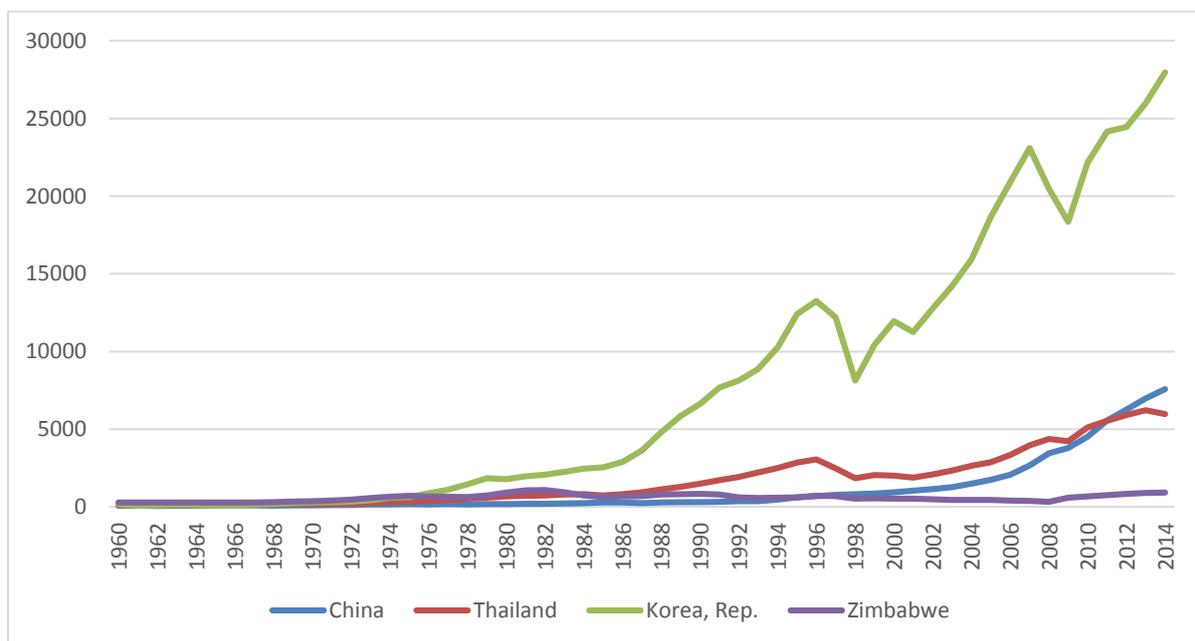
As shown in Figure 3, the two lines in the graph divide the African countries into four groups: first quadrant (I), countries with below-average both growth rates and investment shares; second quadrant (II), countries with growth rate above the average but investment share below average; third quadrant (III), countries with both growth rate and investment share above the average; and fourth quadrant (IV), countries with growth rate below the average but investment share above the average. Countries in quadrant III are the high flyers and these include Cape Verde, Uganda, Ghana, Zambia and Ethiopia. As a result of significant economic growth Ghana and Zambia, have recently, moved from a lower income countries category to lower middle income country category.

The growth diagnostics methodology, as conceived initially by its proponents, should apply only to the countries in quadrant 1, that is, countries with both investment share and growth rate below the mean. The purpose of this paper is, therefore, to identify why Zimbabwe lies in this quadrant and consequently, propose policies that can enable the country to migrate to quadrant III (high investment share and growth rate).

Comparison of Zimbabwe's per-capita income with other countries

Against the background of reduced investment and economic growth in 2000s, various social and economic indicators pointed to an increase in the incidence of poverty during this period. The country's real GDP per capita income declined from US\$838 in 1990 to US\$415 in 2006 and to an estimated US\$397 in 2008 (World Bank, 2015). Figure 4 below compares Zimbabwe's average GDP per capita with selected developing countries and emerging market economies.

Figure 4: Average per Capita Income - Selected Countries

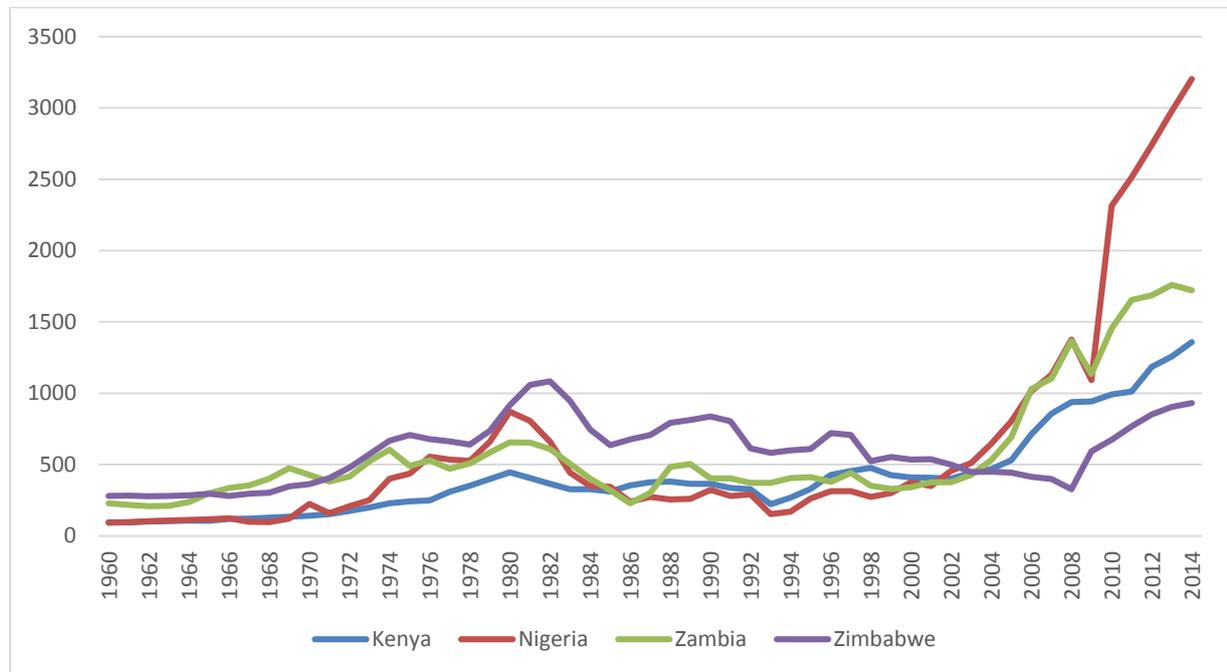


Source: World Development Indicators (2015)

As illustrated in Figure 4 above, South Korea and China started at more or less the same level of development as Zimbabwe, when comparing their per capita incomes. Zimbabwe's per capita income was three times that of China in 1979. The Chinese per capita income, however, reached US\$5 430 in 2011, almost seven times that of Zimbabwe, at US\$776 in the same year. During periods when other developing and emerging market economies were registering growths in per capita income, Zimbabwe was left behind as it grappled with an economic crisis. Moreover, Zimbabwe's per capita income was above most of its African regional comparators in 1998. However, the country's income precipitated below comparable African countries over the period 1998 to 2008. Worryingly, Zimbabwe is one of the few countries that have experienced a decline in per capita income in the last two decades. Figure 5 shows

developments in per capita income for selected regional countries with almost similar incomes with Zimbabwe in 1998.

Figure 5: GDP per Capita Income - Selected Countries

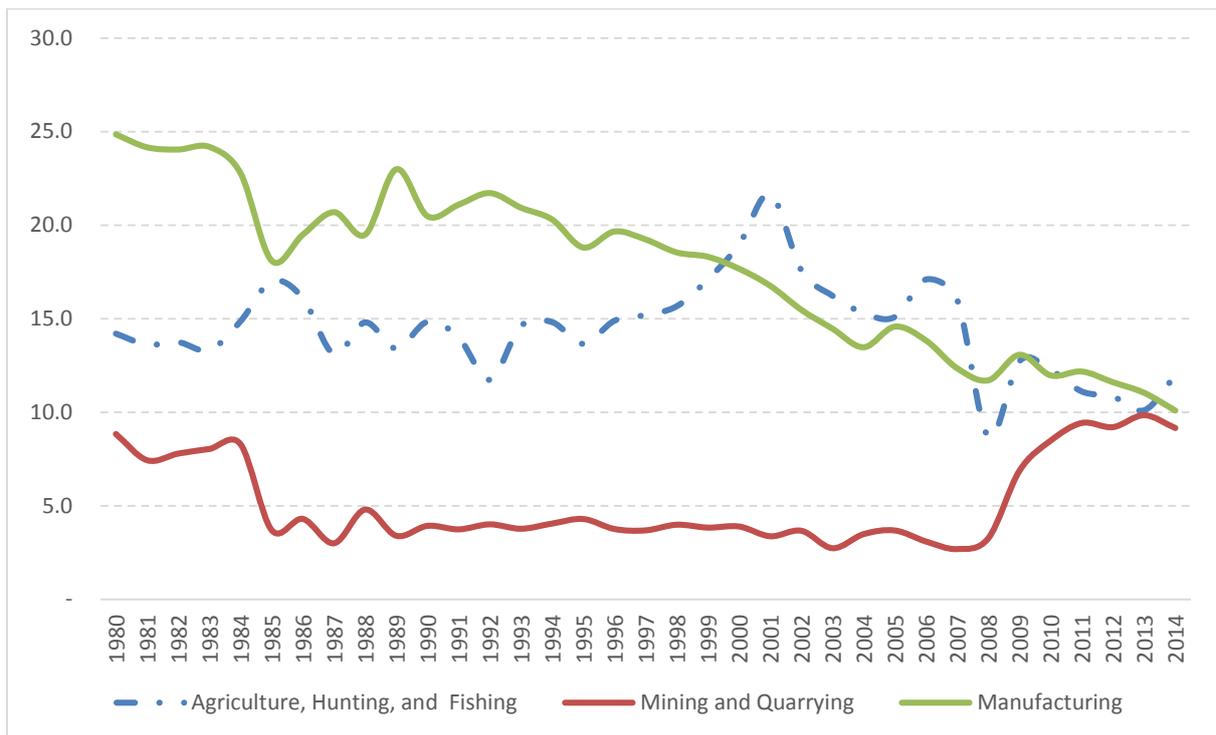


Source: World Development Indicators (2015)

Zimbabwe's Economic Structure

Zimbabwe witnessed a general transition in its economic growth structure from an agriculture and manufacturing led economy prior to independence to a diversified economy from the 1990s. In 1981, the manufacturing sector contributed 24% to the country's GDP. The agriculture and manufacturing sectors were also the most significant contributors to employment. The contribution of the manufacturing sector to GDP average 22% between 1980 and 1990, followed by agriculture at 16 percent. The strong performance of the sector provided both backward and forward linkages with the other two productive sectors of the economy namely agriculture and mining, which were critical in ensuring robust and sustained economic growth rates. The contribution of the manufacturing sector, however, declined progressively from about 22% in 1991 to an estimated 10% in 2014. Figure 6 below shows the sectoral contribution to GDP from 1980 to 2014

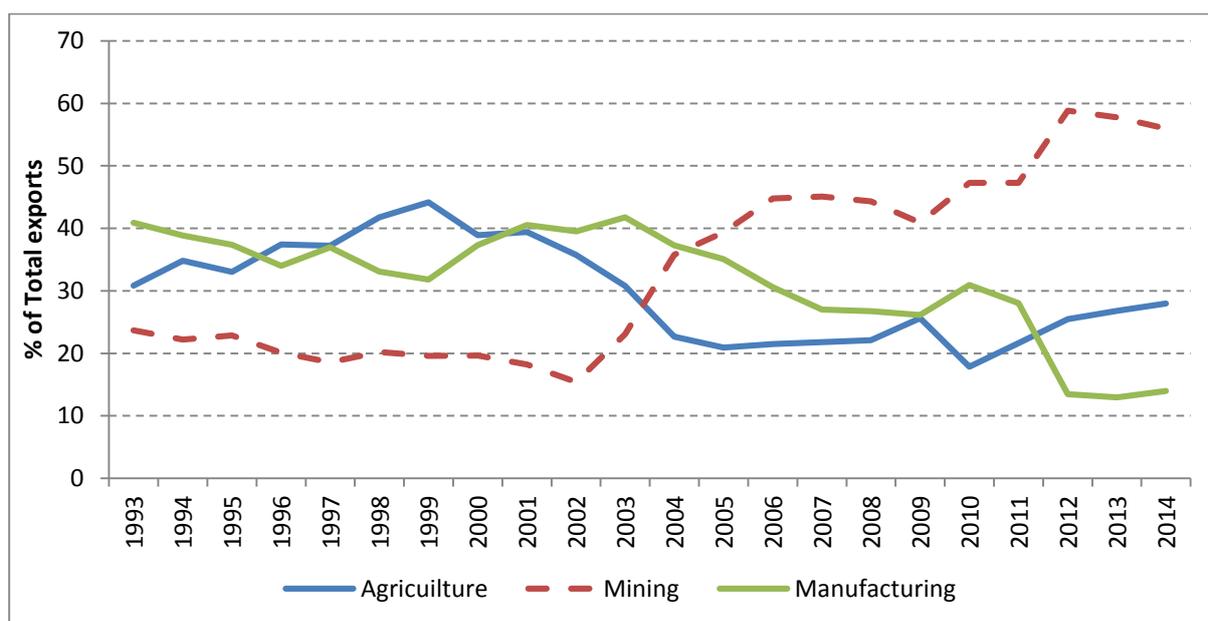
Figure 6: Sectoral Contribution to GDP (1980 to 2014)



Source: ZIMSTAT, Ministry of Finance, RBZ

The decline of the importance of manufacturing sector in the Zimbabwe’s economy can also be inferred from an analysis of the share of manufacturing value-added (MVA) growth. The growth in MVA progressively declined in the past three decades from an average of 3.6% during the first decade after independence to an average of -7.2% during the 1997-2008 period. The country also witnessed a gradual decline in the share of manufactured exports as a percentage of total exports and a noticeable dominance of mining exports in terms of shares to total exports. Figure 7 below shows the evolution of Zimbabwe’s exports from 1993 to 2014.

Figure 7: Evolution in Composition of Zimbabwe's Exports



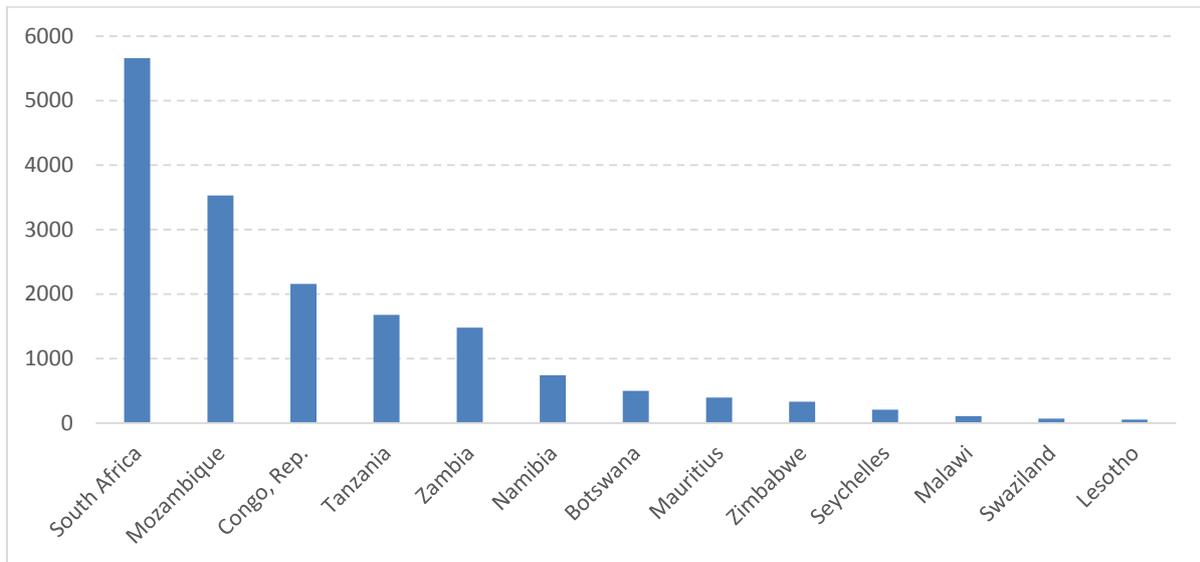
Source: Reserve Bank of Zimbabwe

As shown in Figure 7, the rapid decline in the manufacturing sector's share of total exports is due to closure of companies, mainly attributed to high cost of finance, lack of competitiveness emanating from continued use of antiquated plant and machinery and high utility charges, among other factors.

Domestic Savings and Investment Rates

Domestic savings and investment rates in Zimbabwe have, over the years, remained relatively low compared to other developing economies. In addition to low levels of domestic savings and investment, capital flows to Zimbabwe have been subdued compared to regional economies. Figure 8 below compares FDI inflows to Zimbabwe and other SADC countries for the period 2009-2014.

Figure 8: Average FDI Inflows, US\$m (2009-2014)



Source: UNCTAD (2015)

The difficulty in attracting significant international capital flows reflects macroeconomic or political risk as the underlying binding constraint to a country's growth prospects. Empirical evidence shows that countries that have exhibited stable macroeconomic and political stability have also achieved higher FDI growth. In addition, Zimbabwe ranks very low in terms of doing business indicators and property rights. In 2016, the country was ranked number 155 out of 189 nations in terms of doing business indicators, with a ranking of 1 being considered the most conducive environment for doing business. Table 1 below compares Zimbabwe's Doing Business Rankings to other SADC counties.

Table 1: Doing Business Rankings 2016 for SADC Countries

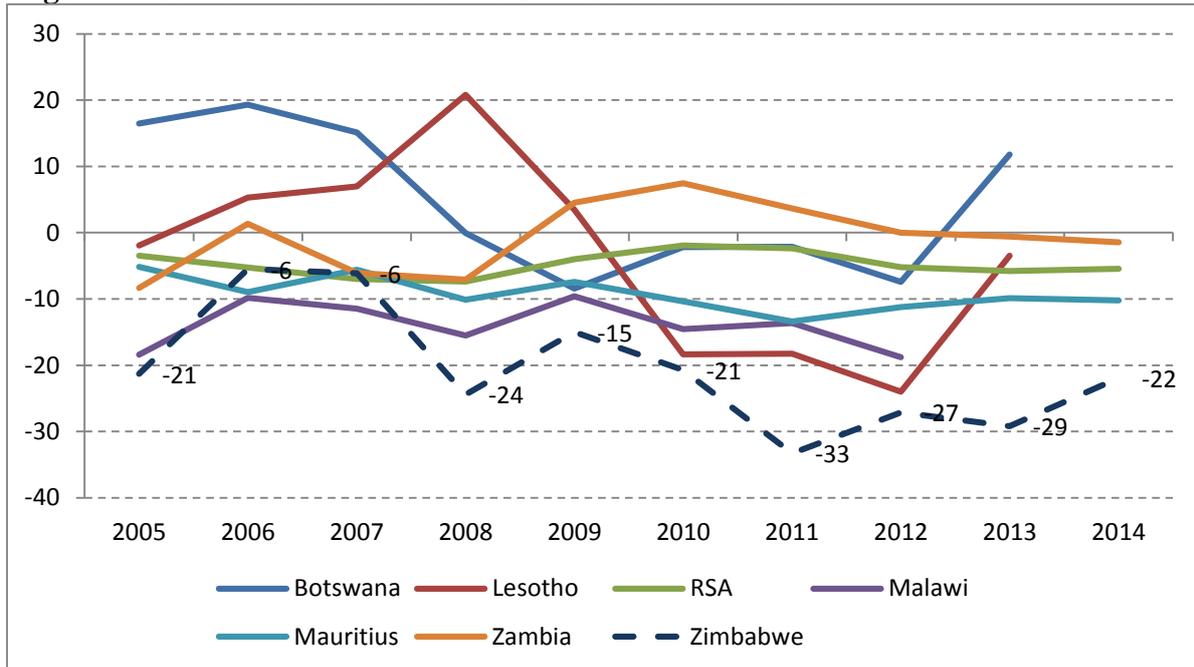
Economy	Ease of Doing Business Rank	Starting a Business	Getting Electricity	Getting Credit	Protecting of minority Investors	Enforcing Contracts	Resolving Insolvency
Mauritius	32	37	41	42	29	27	39
Botswana	72	143	122	70	81	128	56
South Africa	73	120	168	59	14	130	41
Seychelles	95	131	139	109	105	138	63
Zambia	97	78	123	19	88	134	147
Namibia	101	164	76	59	66	103	97
Swaziland	105	156	155	70	134	175	96
Lesotho	114	112	147	152	99	85	117
Mozambique	133	124	164	152	99	184	66
Tanzania	139	129	83	152	122	64	99
Malawi	141	161	175	152	115	147	164
Zimbabwe	155	182	161	79	81	166	152
Angola	181	141	166	181	66	185	189
Congo, Rep.	184	89	174	133	174	165	189

Source: World Bank, 2015

The poor rankings for Zimbabwe as shown in Table 1, stem from the high perceived political and economic risk the country is associated with. According to the Fraser Institute's 2012 Mining Survey Report, some countries in the SADC region notably, Zimbabwe, Madagascar and Democratic Republic of Congo (DRC) are classified among the top ten jurisdictions considered to have high levels of corruption. As a result, the country has failed to attract long-term private investment flows, particularly FDI. While these rankings should be interpreted with caution as they are subjective and hence might not capture the full picture or might be manipulated by governments in order to improve the ranking, the country should reform its institutional frameworks that focus on such indicators.

The low rate of domestic savings explains why the country's trade and current account deficits have been high, a reflection that the country is borrowing heavily from abroad to help sustain the current investment rates. The current account deficit as a percentage of GDP deteriorated from 5% in 2006 to 22% in 2014. Indications are that the current account deficit will remain elevated. The current account deficit was unfavorable compared to other countries in the region as illustrated in Figure 9 below.

Figure 9: Current Account Balance/GDP Selected Countries



Source: World Development Indicators (2015)

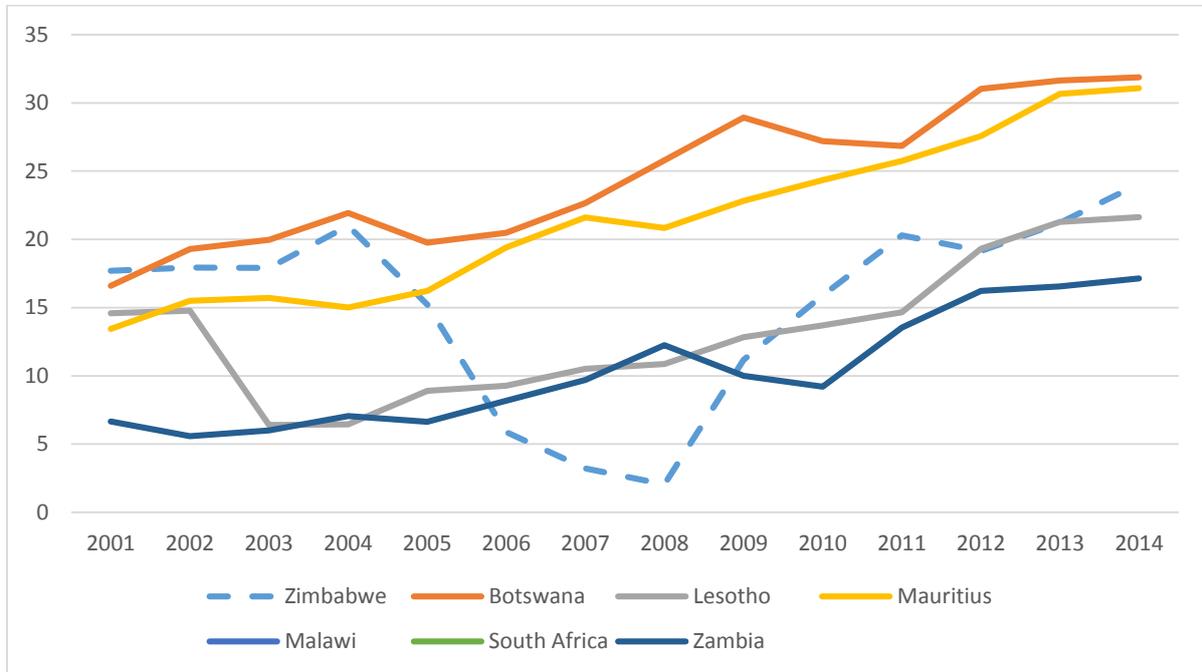
While domestic savings rates in Zimbabwe are low, they may not be the chief binding constraint. Under normal circumstances, inadequate financing due to low domestic savings would lead to relatively high interest rates on deposit, driven by bank competition for deposits in order to fund profitable investment projects. Nevertheless, the banking sector is characterized by wide ranging interest spreads owing to the different costs and lending rates charged by banks. The spread between lending and deposit rates have remained relatively high in Zimbabwe. The high lending rates continue to adversely affect the productive sectors of the economy as most economic agents have been failing to access cheaper funds or when they access the loans, they have been rendered high cost producers thus reducing their competitiveness on both the local and international markets.

Financial Intermediation and Credit Risk Perceptions

At aggregate level, Zimbabwean banks appear to be adequately capitalized, compared to other countries in the region, implying that financial intermediation may not be a binding constraint to the country's growth dynamics. Domestic credit to private sector also compares favourably to regional economies, implying that it has not been a major binding constraint to growth.

Figure 10 below shows the trend in domestic credit to private sector as percentage of GDP for selected countries in the SADC region.

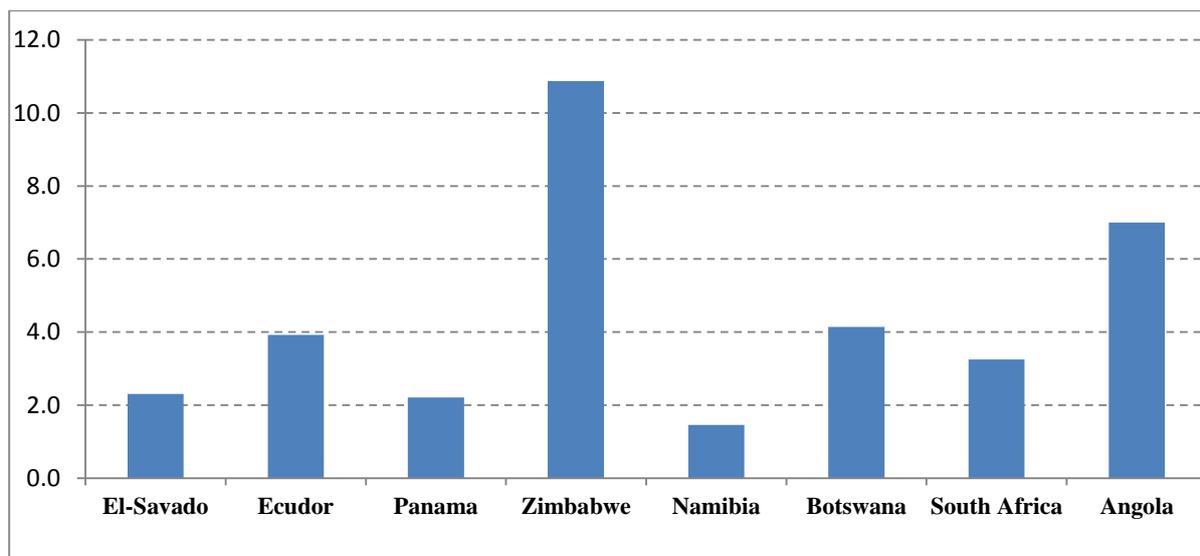
Figure 10: Domestic Credit to Private Sector (% of GDP)



Source: World Development Indicators (2015)

Credit risk perceptions are, however, high as reflected by high lending rates, which suppress capital accumulation and thus economic growth among the group of comparable countries. At the same time, the percentage of non-performing loans (NPLs) in Zimbabwe is among the highest in the comparable group. Figure 11 below shows the average non-performing loans for Zimbabwe, compared to a selected group of countries with almost similar characteristics.

Figure 11: Non-Performing Loans (% of Total Loans)

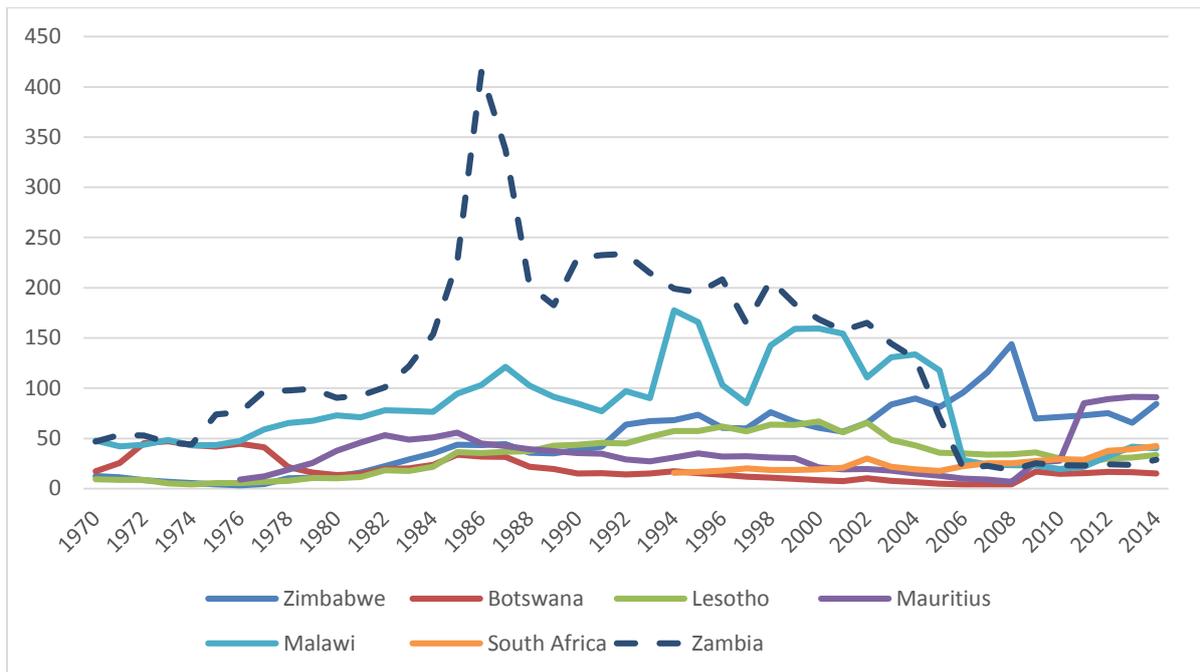


Source: World Development Indicators (2015)

Macroeconomic Risks

The adoption of the multi-currency regime reduced macroeconomics risks, such as a high budget deficit, high sovereign debt levels and high inflation rates. The country however, remains saddled with external payment arrears estimated at 39% of GDP as at December 2014. The high external payment arrears, therefore, remain a major binding constraint to the country growth prospects.

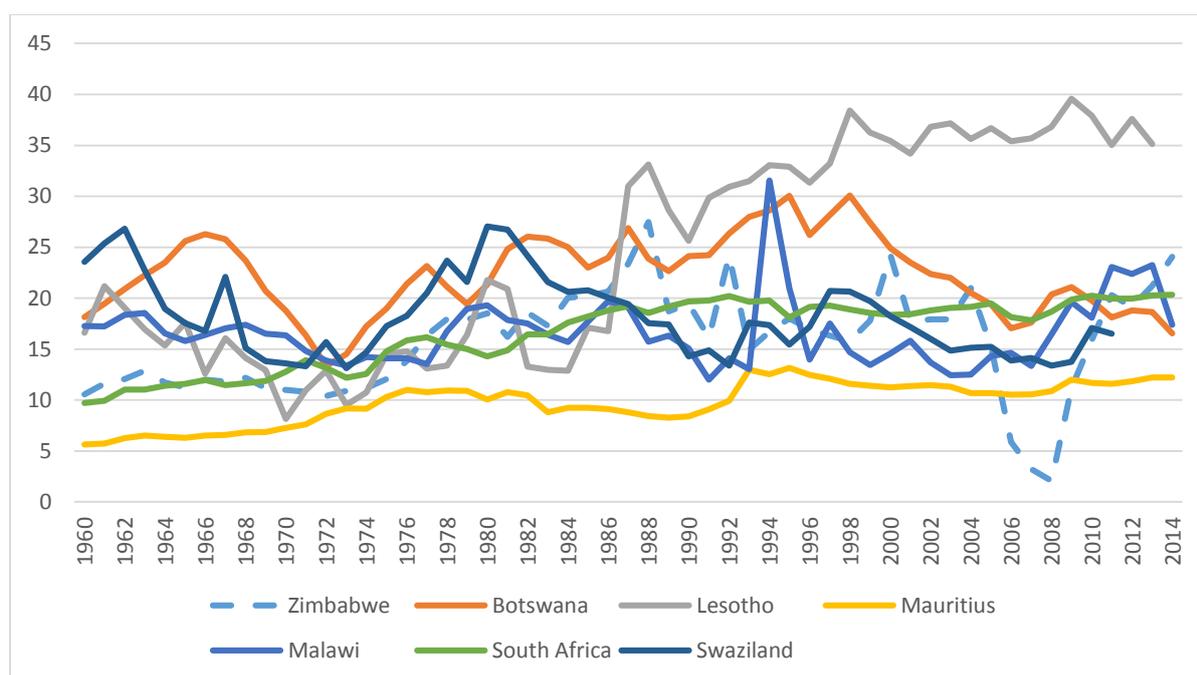
Figure 12: External Debt Stock (% of Gross National Income)



Source: World Development Indicators (2014)

The country is, however, gradually reverting to fiscal solvency as shown by the general decline in the external debt indicators, which is gravitating towards sustainable levels. Similarly, the share of government consumption in GDP for Zimbabwe has traditionally been comparable to other regional economies, despite a sharp fall in 2008 at the height of the hyperinflation. Government consumption increased in 2009 but remain within the regional average. Nevertheless, the fact that growth rate improved following the improvement in the fiscal balance suggests that the macroeconomic risk associated with fiscal imbalances is not a binding constraint.

Figure 13: General Government Consumption (% of GDP)



Source: World Development Indicators (2015)

Cost of electricity

A 2014 study by the Zimbabwe Economic Policy and Research Analysis Unit (ZEPARU) showed that companies in Botswana, Mozambique, South Africa and Zambia pay an average of 8.30 US cents per kWh, while Zimbabwean companies pay about 50% more, at 12.72 US cents for electricity. Table 2 shows comparison of electricity tariffs in Zimbabwe against selected regional countries in 2014.

Table 2: Commercial and Industrial Electricity Tariffs

Country/Demand	Commercial (kWh) per Month				Industrial (kWh)/month	
	450	900	2 500	5 000	10 KVA	100 KVA
	Tariffs					
Zimbabwe	12.72	12.72	12.72	12.72	9.83	9.83
Mozambique	9.00	8.00	7.30	7.30	4.70	5.10
South Africa	11.40	7.70	4.70	4.70	2.70	2.70
Zambia	5.10	4.40	3.80	3.80	2.30	2.50
Botswana	7.70	7.20	6.80	6.80	3.30	4.00

Source: ZEPARU, 2014

In addition, Zimbabwe also faces power shortages, which cause frequent power outages and crippling load shedding mechanisms, which contribute to higher costs of production and, therefore, loss of competitiveness.

SECTION THREE: LITERATURE REVIEW

There is an extensive theoretical and applied literature on economic growth and development, providing advice and guidance on how to promote economic growth. Most of the literature, however, is ignoring country specific circumstances or institutions. A typical reform package prescription, is the Washington Consensus, are usually based on cross-country growth regressions, growth accounting exercises or international benchmarking. The endogenous growth model and growth diagnostic framework have been proposed to address this shortcoming.

The research on economic growth was popularised by Neoclassical economists in the 1950s. including - Solow (1956) and Swan (1956) which forms the basis of what is known as the new growth theories. The new growth theories identify technological progress as the principal and lasting source of growth given that the law of diminishing returns over time eliminates any growth that emanates from physical accumulation. The modelling framework assumes a typical Cobb- Douglas function given by -:

$$Y = F(K, L, A) \tag{1}$$

Where K is capital

L is labour and

A is technological progress.

Additional assumptions in the modelling framework is that of constant returns to scale and law of diminishing returns to capital. Technical progress is also assumed exogenous and, capital and labour are substitutable. This results in a typical - Cobb-Douglas function defined as:

$$Y = AK^\lambda L^{1-\lambda} \tag{2}$$

Where

λ is the proportion of national income for owners of capital,

$1 - \lambda$ is the proportion of national income going to workers. In order to account for unemployment, equation 2 is defined in terms of output per capita. Manipulating equation 2 by taking into account skills levels in labour force, that is where labour L is separated into the total

number of workers N and skill quality β , then output per worker can be obtained by dividing equation 2 by N , giving

$$y = Ak^\lambda\beta^{1-\lambda} \quad (3)$$

Where

y is output per worker; and

k is capital per worker.

This equation identifies sources of growth in output per worker. In other words, policymakers can increase output per worker by increasing all or either investment in physical capital, or the amount of skilled labour in the economy through education or technological progress. Equation 3 provides the basis for the endogenous growth models and assumes increasing returns to capital.

The endogenous growth models identify the rate of accumulation of physical and human capital, and technological progress as determinants of long-run economic growth (Arrow, 1962). Investment in education may not only make contribution contributes to growth via improvements in the quality of the workforce, as well as innovation driven through research and development.

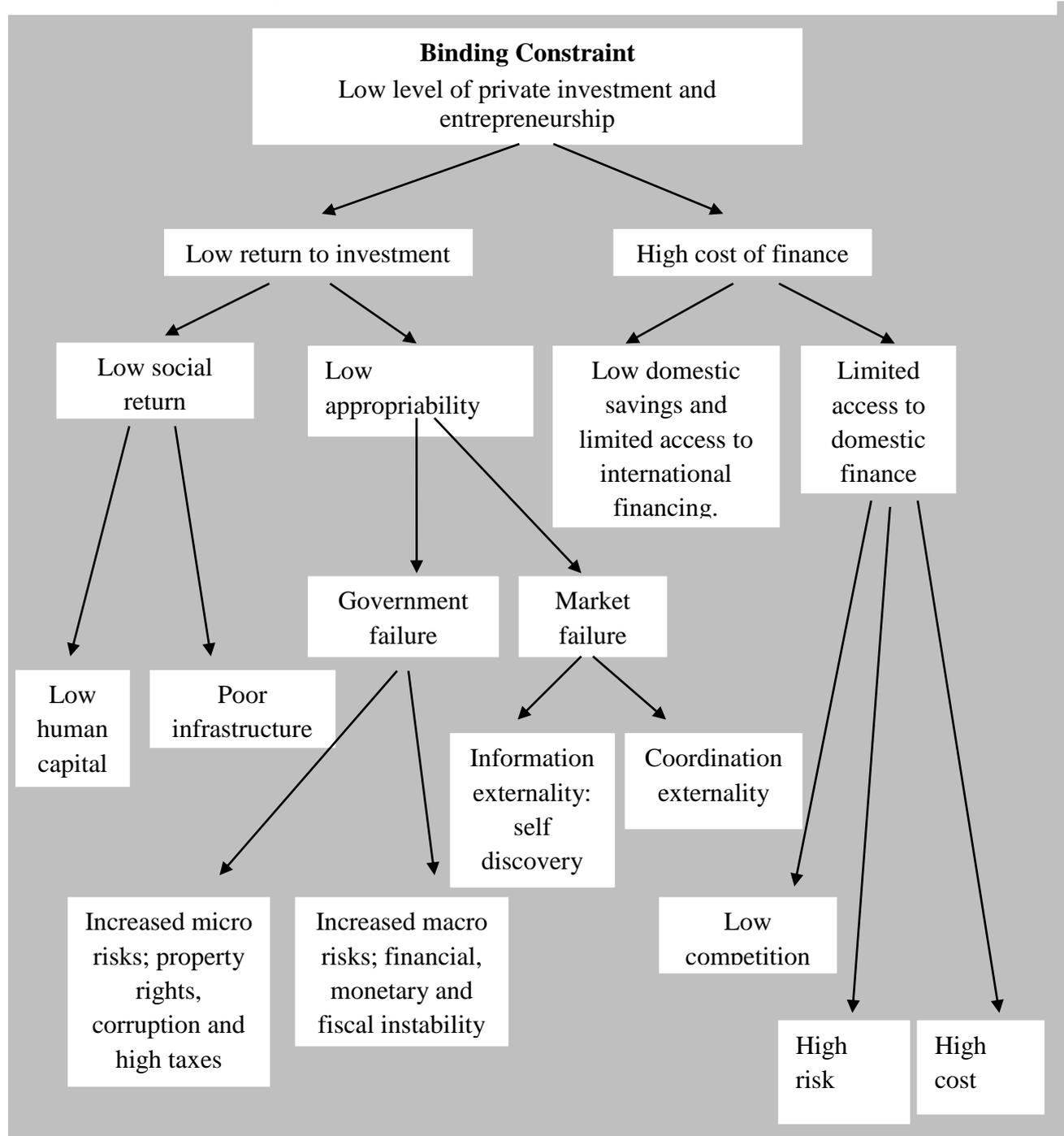
The growth diagnostics approach provides a framework to analyse what may be constraining a country's growth. According to the growth diagnostic approach economic growth is a result of an optimization process under constraints, and attempts to identify the factors that are the most binding. Only slackening of the binding constraints and not all constraints will result in an improvement in GDP growth rate. It assumes a simple growth model whose production function depends on factors such as physical and human capital, governance, institutions, infrastructure, and geography.

To date, the growth diagnostics framework developed by Hausmann, Rodrik and Velasco (2008) is the widely used growth framework that is based on economic theory and takes into account the country-specific context. The growth diagnostics framework uses a standard endogenous growth model and assumes that growth can be held back by a wide variety of constraints. These constraints include poorly developed infrastructure, corruption, lack of human capital, poorly functioning credit markets or political instability. Following

Hirschman's (1958) idea of unbalanced growth most of these constraints are not binding, and only a relaxation of the binding constraints will increase economic growth. Identification of those constraints can, therefore, assist policy makers to come up with a focused development strategy in the presence of limited resources.

Hausmann et al. (2005) propose a methodology based on a decision tree where low levels of private investment and entrepreneurship are the principal problem. Figure 14 below shows the growth diagnostic decision tree as proposed by Hausmann et al. (2005)

Figure 14: Growth Diagnostics Decision Tree



Source: Hausman and Velasco (2004)

At the apex of the decision tree is the assertion that most binding constraints to growth in developing countries is the low level of private investment and entrepreneurship. Each level provides insight into the kind of signal the economy would likely emit if the element in question is the most binding constraint. The main argument is that a growth strategy focused on alleviating the identified constraints would in principle have the greatest impact on private

sector investment, productivity and consequently growth, than the traditional approach of a long list of reforms intended to remove all distortions at the same time.

A low level of economic growth can either be due to a low social return or a low appropriability of private investment as companies channel less of their profits towards expansion of the company. These two factors combined or individually can explain the minimal level of return to economic activity, which implies a low demand for investment and consequently a low rate of economic growth in a particular setting. Anything that may prevent investors from maximizing the benefits of their activities limits their propensity to engage in profitable activities, resulting in low appropriability. The problems of low appropriability are generally caused by either market failures or government failures. Market failure arises when the market is unable to produce efficient and socially desirable outcomes. In such circumstances there is a need for government intervention for corrective measures.

Within the framework, government failure can be the result of either poor microeconomic or macroeconomic conditions. Microeconomic conditions encompass problems such as high levels of corruption, an inadequate legal and judicial framework to protect private property rights and enforce contracts, or high taxes. Poor macroeconomic conditions can also be due to financial, monetary or fiscal instability. The problem with government failures (both micro and macro risks) is that they reflect uncertainty in the social returns of private investments and/or high risk of expropriation of private capital. When these risks are high, the demand for private investment is likely to be low, thus causing a low level of economic growth.

Following Hausman and Velasco (2004), several empirical studies were undertaken to assess the binding constraints using the growth diagnostic framework. This review will be limited to African countries that have applied the growth diagnostics framework. As part of its first step in developing a Joint Country Action Plan (JCAP) between Government of Tanzania and US under the Partnership for Growth (PFG) a Growth Diagnostic was undertaken in 2011 (Government of Tanzania, 2011). The study concluded that lack of key infrastructure, particularly reliable and adequate supply of electrical power was the biggest binding constraint to growth in Tanzania. An inadequate rural road network was also found to be a critical binding constraint, particularly for connecting high potential agricultural production areas to markets. Lack of appropriability of returns, particularly with regards to access to secure land rights was

found to be one of the biggest constraints. Other notable binding constraints included lack of vocational, technical, and professional skills, lack of access to finance and relatively low quality regulation of business and trade.

Lea and Hanmer (2009) undertook a growth diagnostics study to identify the most binding constraints to private-sector growth in Malawi. They identified regime of exchange rate management as the biggest binding constraint to growth in Malawi. An overvalued exchange rate due to huge aid flows had negatively affected the country's export competitiveness.

World Bank (2009) also carried out a growth diagnostic analysis for South Sudan and concluded that the main binding constraints were lack of key infrastructure, government failures which include multiple taxes and lack of coordination, lack of access to credit and general uncertainty over the future of the country. Abdi and Aragie (2012), utilised the growth diagnostic framework to assess the binding constraints to the Horn of Africa countries⁵. The study showed that limited access to finance (from both domestic and external sources), low domestic savings, weak infrastructure, and inadequate human capital were the significant constraints on economic growth in the sub-region.

Ianchovichina and Lundstrom (2008), in their study in Zambia growth diagnostics concluded that coordination failures, high indirect costs mostly attributable to infrastructure such as energy and transport and real appreciation of the Kwacha were the main binding constraints to sustained growth.

Government of Liberia in partnership with the US Government in 2013 undertook a growth diagnostic exercise for Liberia. They observed that they are two binding constraints to Liberia's growth and these are reliable and affordable supply of electricity and the lack of good road network. Fedderke (2000) in the study on economic growth dynamics for South Africa for the period 1970 to 2000 found out that the main binding constraints to growth included uncertainty, declining human capital accumulation and declining investment rate.

⁵ Horn of Africa include Djibouti, Eritrea, Ethiopia, Kenya, Somalia, South Sudan, Sudan, and Uganda.

The empirical review of the growth diagnostic framework in Africa shows that the tool has gained significance in analysing economic growth issues as well as proffering recommendations for developing countries. In most countries the growth diagnostic studies have been championed by multilateral institutions such as the World Bank, African Development Bank as well as partnership arrangements with developed countries such as the US. In Zimbabwe, no proper growth diagnostic studies have been undertaken. Closer studies to this have been the growth accounting studies by ZEPARU and World Bank as well as the cost drivers study by ZEPARU in 2014. This paper, therefore forms a first attempt to growth diagnostic studies on Zimbabwe.

SECTION FOUR: RESEACH METHODOLOGY

The current application of growth diagnostic studies use the three basic methodologies which are country growth regressions, growth accounting and international benchmarks. In this regard, this growth diagnostic analysis was undertaken using a combination of econometric, graphical and diagnostic techniques as espoused by Hausmann et al, (2004). The Growth Diagnostic framework was also conducted using cross-country comparisons on growth performance and international rankings. The data is scrutinized with the aim of finding the most binding constraint to economic growth, following the forks of a decision tree.

Sources of Growth for Zimbabwe

The decomposition of the growth drivers was undertaken to infer the contribution of the growth of capital, employment and total factor productivity (TFP) into the growth dynamics. The analysis is undertaken using the following Cobb-Douglas aggregate production function:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad (4)$$

Where A_t , K_t and L_t are Total Factor Productivity (TFP), capital stock, and employment, respectively, and α is the income share of capital. A capital share of 0.35 was assumed, consistent with the estimated capital share for most developing economies.

An increase in TFP, which is also generally known as the rate of technological progress, represents the residual part of growth unexplained by capital and employment growth. This

residual can be interpreted as the disembodied technical progress, improved resource allocation, changes in human capital and other qualitative factors related to capital or labour, or more productive use of inputs as a result of reforms.

Econometric Analysis

The paper also utilizes econometric techniques to identify the historical key drivers of growth in Zimbabwe over the period from 1980 to 2000, using the following regression equation:

$$PCI_t = \alpha_t + \beta_1 GC_t + \beta_2 DS_t + \beta_3 DI_t + \beta_4 OPEN_t + \beta_5 CPS_t + \varepsilon_t$$

Where:

PCI is the per capita income growth;

GS is Government Consumption as percentage of GDP;

DS is Domestic Savings as percentage of GDP;

DI is Domestic Investment percentage of GDP;

OPEN is External Risk Premium;

CPS is Credit to the Private Sector; and

ε_t is the error term.

The period 1980 to 2000 was chosen to avoid the risk of parameter instability from including variables under the crisis period 2001 to 2008, as well as a structural break caused by the adoption of the multicurrency regime in 2009. The aim is to identify key variables that were significant contributors to economic growth in the economy during periods of economic stability. Moreover, the variables used in this paper are standard variables found to be statistically significant drivers of economic growth in previous empirically literature (Checharita and Rother (2010), Panizza and Presbetero, 2013, Wright and Grenade, 2014).

Domestic investment is expected to positively impact on economic growth in the economy. Government consumption can either stimulate or stifle growth. Government programs provide valuable "public goods" such as education and infrastructure. Increases in government spending also bolster economic growth by stimulating household consumption through incomes to individuals (wages and salaries) in pursuing its projects. The increase in government consumption can, however, crowd out private consumption, impacting negatively

on growth. Increase in investment increases level of production and productivity. Thus in the long run it leads to efficient utilisation of resources leading to increased output in the economy. Savings are crucial as they provide a pool of funds to support investment for sustained growth and therefore is expected to impact on growth. Openness to trade has a positive contribution to economic growth as it leads to technological developments through the search for more efficient production methods by domestic firms. It also contributes to an optimal allocation of resources which leads to an increase in total factor productivity.

SECTION FIVE: RESULTS AND ANALYSIS

The analysis in this section starts by assessing the contributions of labour, capital and productivity to economic growth over the study period using the Cobb Douglas production function. The results are analysed in terms of average growth rates experienced during different phases of economic development that the Zimbabwean economy went through. The contribution to average growth rates were computed during the Economic Structural Adjustment Programme (ESAP), ZIMPRESET, land reform programme, hyperinflation and multicurrency regime. The results are shown in Table 3 below.

Table 3: Contributions to Average GDP Growth (1991-2014)

	1990-95	1996-00	2001-05	2006-08	2009-14
Average Growth	0.36	2.41	-7.19	-8.26	7.9
Total Factor Productivity	-1.71	1.01	-12.42	-5.76	-3.30
Capital	0.07	-0.68	-1.56	-2.34	9.80
Employment	2.00	2.08	6.78	-0.16	1.40
<i>Working-Age Population</i>	<i>1.84</i>	<i>1.67</i>	<i>2.30</i>	<i>-0.01</i>	<i>1.3</i>
<i>Labour Force Participation</i>	<i>0.07</i>	<i>0.19</i>	<i>1.99</i>	<i>-0.05</i>	<i>0.0</i>
<i>Employment Rate</i>	<i>0.09</i>	<i>0.11</i>	<i>2.21</i>	<i>-0.10</i>	<i>0.1</i>
Memo Item					
Gross Investment Rate	22.5	14.2	8.6	3.5	17.0

Source: RBZ Calculations Using World Bank Database and ZIMSTAT (2014)

As shown in Table 3, significant decline in productivity and capital stock was recorded during the period from 2000 to 2008. The contribution of capital to economic growth was, on average, negative between 1990 and 2008, largely reflecting a contraction of gross fixed capital formation during that period. Labour force participation has, however, remained fairly static, which implies that it may not been a binding constraint to Zimbabwe's growth. The contribution of total factor productivity (TFP), captures all the residual variables that can influence growth, has also been largely negative and significantly improved during the recovery period.

The investment rate has also been very low, compared to the benchmark of at least 25 percent recommended by the Growth Commission Report (2008) for developing countries to achieve rapid growth. Zimbabwe's investment rate for the period under review was highest between 1991 and 1995, at 22.5 percent and lowest between 2006 and 2008, at 3.5 percent of GDP. The subdued growth rates for Zimbabwe have, therefore, mainly been attributed to decline in the capital stock and productivity. These two factors can, therefore, be regarded as major binding constraints to Zimbabwe's growth potential and require appropriate policy interventions to address them. The low levels of total factor productivity stems from the continued use of antiquated plant and machinery which leads to lack of process innovation rather than product

innovation. Lack of process innovation is a result of failure to introduce a new or significantly improved production or delivery method as a result of lack of capital.

Empirical evidence show that TFP growth can be influenced positively by good quality institutions, improvement in human capital development, a favourable macroeconomic policy environment, trade liberalization, and economic transformation from agriculture to manufacturing and services. As noted by Bosworth and Collins (2003), robust institutions, result in improved law and order, bureaucratic quality, less corruption, lower risks of expropriation, and upholding of government contracts. In addition, robust institutions result in better delivery of basic health care, education, and other high-priority social services, in order to foster sustainable long term development.

This evidence is further supported by the fact that the private investment to GDP ratio has been relatively low in Zimbabwe compared to other economies. Low rates of private investment and low capital accumulation can, therefore, be considered as serious impediments to sustainable economic growth. An analysis of comparable countries that have maintained sustained economic growth rates shows significant increases in capital growth and TFP.

The foregoing analysis suggests that the major binding constraints for Zimbabwe are inadequate capital and low productivity. These constraints are also identified in Rodrik (2010) as part of the High-Ranking Growth Diagnostics tree. Recent empirical research on growth diagnostics in developing countries has drawn attention to the capital-driven vs. productivity-driven growth patterns. The theoretical lessons of the basic growth framework by Solow (1956) suggest that output growth rooted in the accumulation of physical capital alone cannot be sustained in the long run.

Higher levels of physical capital require higher investment to maintain the already existing capital stock. As the returns to physical capital diminish, more of the additional output must be devoted to replacing the depreciated capital. The initial growth rate, driven by capital accumulation will, therefore, decline and eventually go to zero, unless supplemented by TFP growth.

Empirical Results

The results from an econometric analysis of the historical drivers of economic growth in Zimbabwe are shown in Table 4 below.

Table 4: Drivers of Growth in Zimbabwe (1980-2000)

Variable	Coefficient
Constant	0.2781 (0.6197)
Domestic Savings	0.9938*** (0.0003)
Government Consumption	-0.7008*** (0.0110)
Domestic Investment	0.0805*** (0.0437)
Openness	-0.1185*** (0.0210)
Credit To Private Sector	0.4223*** (0.0080)
Lagged Growth Rate	0.4414*** (0.0231)
Autoregressive lag AR(1)	-0.6836*** (0.0019)
Diagnostics	
R-Squared	0.7850
DW- Statistic	2.0199
Prob(F-Statistic)	0.0014

Note: the figures in parenthesis are probability values, * represent significance at 10%, **, significance at 5% and ***, significance at 1%.

The econometric model results shown in Table 4 indicates that domestic savings, domestic investment and credit to private sector growth have positive and statistically significant impact on growth while Government consumption and external risk premium have negative and significant impact on the growth. The negative coefficient on changes in government consumption suggest that government was pursuing counter-cyclical fiscal policy, by increasing consumption in response to lower growth and reducing it in response to higher growth. The negative sign on openness reflects the role played by the country risk premium on reducing the country's growth prospects. High risk premium implied higher cost of financing, which discouraged investment in the domestic economy. These results are consistent with findings of the literature on cross-country growth analysis which find a positive effect of credit

to private sector on growth (e.g., Levine, Loayza, and Beck, 2000). The results are also consistent with Barro (1999) who finds that growth is inversely related to government consumption.

SECTION SIX: CONCLUSION AND POLICY RECOMMENDATIONS

The paper provided an analysis of growth diagnostic for Zimbabwe for a period 1980 to 2014. The analysis was undertaken with a view to find the most binding constraint to the country's economic growth prospects. The growth diagnostic analysis provides a useful framework to identify strategic policy choices that successfully kick-start economic growth and thereby alleviate poverty. The results of the analysis suggest that average real GDP growth during 1980-2014 was driven primarily by factor accumulation with little or no role for TFP. The recent pickup in growth (during 2009-2014, relative to 1990-96) was made possible by an improvement in capital accumulation.

Nonetheless, the growth rates required for the country to significantly lower poverty, are high relative to past performance, and would need a significant boost in TFP growth. In addition, investment to GDP ratios, which remain low compared to the group of comparable developing economies in the world, would need to be boosted. Also, efforts to resolve the country adverse international image will be critical to put the country on the path of sustainable growth.

The implication from the analysis is the need for Government to place emphasis on identifying sectors where the country has comparative advantage and removing impediments to investments in such sectors. Government support is also critical to protect and nurture investments in such sectors. Zimbabwe needs a comprehensive development framework underpinned by effective development plans and policies, including industrial and other sectoral policies. Historical evidence shows that all countries that have successfully transformed from agrarian economies to modern advanced economies had governments that played a proactive role in assisting individual firms to grow.

The critical strategy for growth and development is to identify the appropriate sectors in which the country enjoys comparative advantage, emanating from factor endowments. The country is endowed with natural resources, mineral resources and a cheap and skilled labour force. As

such, it is important for government and private sector to identify industries whose production processes require the extensive use of the country's abundant resources.

In this regard, agricultural development is crucial for providing throughput and market for industrial products. Thus, government and private sector should priorities boosting productivity in the agricultural sector by investing in agricultural research and irrigation to increase productivity. These measures must be accompanied by policies to expand non-agricultural employment through rural industrialization in food processing and packaging. Liberal foreign investment policies are also critical to enable the country to compete for FDI with other countries in SADC and outside the region.

Moreover, Zimbabwe can learn from the experiences of some economies in the world which achieved sustained average annual growth rates of about of more than 7%, continuously for 25 years or more and became modern industrialized economies in the post-World War II. Among these countries include, South Korea, Thailand, Taiwan and China. These countries started at the same level of development as Zimbabwe, when comparing their per capita incomes. Accordingly, creation of conditions for rejuvenating sectors that used to be competitive and growing dynamically will enable the country to realise sustained growth rates in the medium to long-term.

The binding constrains identified in this paper notably, capital and productivity constraints, requires authorities to come up with policies that enhance the capital levels and productivity in the country. Nevertheless, the inability of the country to borrow externally, in the short term, implies that attraction of foreign investment inflows remain the feasible source of capital to stimulate the economy and boost aggregate demand. As such, authorities need to remove impediments to attraction of foreign investments in the country. On productivity, there is need to invest heavily on research and development to boost both process and product innovation in the country's industry. A combination of these policies will enhance the country's competitiveness and boost the export base, liquidity and ultimately economic growth.

The banking sector needs to institute policies that enhance the savings culture by encouraging banks to come up with innovative financial products that offers reasonable returns to potential investors. This will encourage those with surplus funds to lodge them with the banks so that

they can in turn be deployed to deficit productive units of the economy. According to the Growth Commission report, 2008, countries such as Singapore or Malaysia adopted mandatory savings schemes to boost investment and economic growth, which resulted in higher savings rate in these countries.

Government has already made a broad step to resolve outstanding external payment arrears to international financial institutions and will in due course resolve outstanding arrears to other multilateral and bilateral creditors. The successful resolution of external payment arrears would enable the government and private sector to access new funding necessary for infrastructure and energy development, which are critical enablers to rejuvenate the economy and replacement and upgrading of obsolete plant and equipment in the industry. Moreover, the resolution of external payment arrears will reduce the credit risk premium, thereby, reducing the overall cost of financing for offshore credit accessed by the private sector. There is, also need to strengthen institutions in order to eliminate unnecessary bureaucratic procedures, corrupt practices and corporate governance practices. This is important to restore creditors, investors and donors confidence in the public service delivery system and to attract FDI.

Overall, addressing the binding constraints identified in this study, will be critical in jump-starting the economy into a growth trajectory. There is, however, need for a clear-cut transition from igniting growth to sustaining it into the foreseeable future. This requires authorities to put in place appropriate contingency plans to respond to external shocks that have the potential of throwing economic growth in disarray. The key ingredients for sustainable economic growth as noted by the Growth Commission Report (2008) are the need to ensure openness, macroeconomic stability, high rates of savings and investment, market mechanisms and commitment by all economic agents. The growth therapeutics for Zimbabwe should, therefore ensure that these ingredients are satisfied.

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