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REVIEW ARTICLE

ASSESSMENT OF THE RISK OF DEFLATION IN ZIMBABWE

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ABSTRACT

Debates have spanned over whether Zimbabwe faces disinflation or deflation. Amid global concerns on the risk of deflation in the Eurozone, this paper hypothesizes that Zimbabwe faces aggravated risk. This is due to the country's experiences with deflation for five consecutive months since February 2014 and subsequent contractions in demand for commodities and money supply. This paper's assertion ceases to be hypothetical in the midst of literature on deflation risk in the experiences of Japan, German, US, Greece, China and Hong Kong. Nonetheless, there is lack of appreciation of potential challenges in some circles of Zimbabwe and as such the paper provided insight into the causes and costs of deflation. The methodology entails the use of an Index of Deflation Vulnerability which has eleven measures compiled for the period 2006-2015. Each measure is a binary (1/0) indicator showing possible deflationary pressure from that source. The findings indicate that Zimbabwe is under high risk of deflation and aggressive action is required to avoid straying further away from price stability. It is therefore recommended that there is need to develop a macroeconomic framework which embraces the challenges of dollarization and enabling coordination of fiscal and structural policies with monetary policy

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INTRODUCTION

Despite the severity of hyperinflation leading to the abandonment of Zimbabwe's local currency, the economy has been on a pathway of recovery since the adoption of the multicurrency regime in 2009. Initially, the pace of economic growth was rather rapid but in recent times has somewhat been relatively slow and is marked by the persistence of significant economic difficulties. Over the past four quarters, Zimbabwe has experienced very low levels of inflation and this is largely attributed to dollarization. The country's 12-month inflation rate decelerated from 2.9 percent at the end of 2012 to -0.3 percent in April 2014. (IMF, 2014) Nonetheless, there has been resounding growth of global concerns over the low inflation levels faced by many countries especially in the developed world, with some fearing the potential threat of deflation. (Fleckenstein, 2013; Alstadheim, 2014; Amisano *et al.*, 2014; Calomiris, 2014; Ball, (2015); Blyth, (2015); Cogley *et al.*, 2015 and Timbeau *et al.*, 2015). According to Greenspan (2004), the optimal inflation rate should be one in which businesses and households do not consider in making their decisions. As such Ito and Mishkin (2006) allude to a range of between 0 and 3 percent as a benchmark for price stability. In an attempt to understand the different behaviours of general prices, Kai (2004) distinguishes between inflation, disinflation

and deflation and suggests that: Inflation is the sustained rise in the general price level whilst deflation refers to fall in the general level of prices and disinflation represents the gradual decline in the inflation rate which is positive. According to IMF (2003), deflation and disinflation induce related effects on activity however due to market imperfections, deflation is more harmful. In some circles of Zimbabwe, there is lack of appreciation of the threat of deflation. Although, the Ministry of Finance and Economic Development (2015) alludes to the risk of deflation, monetary authorities have suggested that the country faces price correction with limited indications of prospects of engaging the potential threats of deflation. Furthermore, Ndlovu (2014) criticizes the Minister of Finance for alluding to the notion that there is risk of deflation and thus posits that when analysts take such a stance they mislead policymakers. Nonetheless, this paper posits that the assertion that there is risk of deflation in the future is confused with deflation itself and hence Ndlovu (2014) tends to disregard taking the threat seriously which in actual effect may not be a fallacy as proposed.

This paper is motivated by lack of unanimity on characterizing the present inflation phenomenon and especially the possibility of limited oversight of its future. Furthermore, no conclusive emphatic conclusion has been made to disqualify the threat of deflation in Zimbabwe whether in the near or far future. Thus, this paper hypothesizes that Zimbabwe faces aggravated risk of deflation and hence the state of affairs requires prompt and

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serious consideration. This assertion ceases to be hypothetical in the midst of vast literature articulating on deflation risk in the Eurozone and experiences of Japan, German, US, Greece, China and Hong Kong.

Notably, the occurrences of deflation may be regarded as occasional and hence outcomes may not be easily generalized as alluded to by Bernanke, (2002). Nonetheless, deflation can subdue the outlook of growth as seen in the late 1920s and early 1930s when US policymakers worsened deflation by undermining its consequences and subsequently failing to take aggressive action. In spite of the circumstances, Poole and Wheelock (2007) suggest that keeping inflation in check should be the first priority of monetary policymakers. Zimbabwe is compounded by dollarization which highly limits the operation of monetary policy and further constraints the ability to learn from other experiences of other countries. Against this background, this paper affirms that this reinforces the necessity of assessing deflation risk in Zimbabwe as lessons from the hyperinflationary period show that the public and policymakers need to be wary about the impairments of inflation situations before allowing the economy to stray too far away from price stability. The purpose of this paper is to abate the “knowledge gap” on the phenomenon of inflation in Zimbabwe by characterizing the causes and costs of deflation and determining whether there is risk of it in the future. The rest of the paper is organized as follows: Section Two focuses on illuminating some of the causes and costs of deflation, empirical work on assessment of deflation risk and some country experiences. Section Three focuses on the methodology and Section Four centers on the analysis and discussion of results. Lastly, Section Five focuses on the conclusions and policy implications.

Literature Review

Causes of Deflation

Bordo and Firlado (2005) provide some groundwork which can be used to interpret the evidence of deflation as drawn from the historical records of many countries. Deflation is classified as “good,” “bad,” or “ugly”. The 1873-96 episode is referenced as a typical example of a “good deflation” when prices fell in many countries by about 2% per year which was followed by growth of about 2-3% per year. (Bordo *et al*, 2004). It is suggested that deflation in that period was driven by both a productivity boom and the creation of railroads across the world. Bordo *et al* (2004) suggest that the deflation experience of the United States, the United Kingdom, and Germany in the late nineteenth century featured low deflation, rapid productivity growth, and positive output growth. This is attributed to aggregate supply, aggregate demand, and money supply shocks. Deflation may be influenced by the effect of positive aggregate supply shocks if there are no counteractive effects from aggregate demand shocks. In the face of negative demand shocks deflation will be ‘bad’ in that it will be followed by negative output effects.

According to Davidson (2011), deflationists ignored some fundamentals of economic principles where they assert that given the financial crisis, price deflation was caused by massive credit contraction, and could not rise again unless

credit expanded. However, Davidson (2011) argues that the underlying factors that cause deflation, go beyond the view that “credit” is the chief source. Some these factors include: the total stock of money, the reservation demand for money, the total stock of goods, and the reservation demand for goods. These factors work their way to general prices through either demand or supply of goods and services. Notably, these factors are also influenced by other economic variables such that if the threat of deflation becomes apparent resolutions should begin by tracing the spiral that led to deflation as also alluded to by IMF (2003).

Lipton (2014) suggests that despite attempts made to manage demand, the Japanese experience indicates that deflation has been prevalent for years. According to Chiu (2003), deflation in Hong Kong was established through prices of goods and services, property prices, rent and wages. As such Lipton (2014) suggests that there are significant lessons for countries facing deflation risk. This paper suggests that even cases apart from Japan and Hong Kong may provide some insight. Lipton (2014) alludes to the notion that some economic conditions in the euro area emulate those of Japan at the onset of deflation where domestic demand was weak. This was due to the high debt levels and credit contraction. It is affirmed that being at ease with stable and positive long-term inflation expectations can be a slipup as seen in Japan where inflation expectations were encouragingly positive, but declined gradually as deflation set in. As such, without complementary fiscal and structural policies, monetary policy alone may be inadequate to assertively shift growth expectations and lift nominal spending in a manner that would stabilize inflation. Japan efforts to end deflation and revive growth were often criticized for lacking sufficient coordination between demand management and structural reforms. (Lipton, 2014). Bagus (2015) suggests that deflation may be classified as growth deflation, cash building deflation, bank credit deflation and fiat deflation. These categories form the underlying root causes of deflation and it may be apparent that some countries exhibit one or more of these forms and thus cements the notions by Bernanke (2002) that generalizations are difficult to make from country cases due to the rarity of deflation itself.

Costs of Deflation

IMF (2003) asserts that deflation can be costly and is difficult to anticipate. However, on one hand, supply shocks can lead to deflation as falling prices may be followed by increased output. On the other hand, demand shocks induce falling prices follow declining demand for goods and services and falling prices may be followed by increased output. Persistent deflation risks evolve into a deflationary spiral of declining prices, output, profits and employment. Fuhrer and Tootell (2003) suggest that transition costs are apparently arise when an economy with a positive rate of inflation moves to falling prices. Although these costs may be deemed trivial, in practice they can be large and weighty economic weakness hastens deflation. Deflation is usually triggered by a very weak economy, and the cost of such a period of economic weakness can be extremely serious. According to Akerlof *et al*. (1996) cited in Ito and Mishkin (2006), if inflation levels are too low then this tends to generate inefficiency and as such stimulating growth in the natural rate

of unemployment. This is suggested that this averts the downward adjustment of real wages to suit the decline in labour in particular areas or industries. Although this argument is criticized, the paper by Ito and Mishkin (2006) acknowledges the insights on deflation derived from the positions made. According to the Japanese experience, downward sticky wages tended to raise unemployment and hence affecting labour markets at inflation levels between 2.4 percent and 1 percent. Fuhrer and Tootell (2003) nominal wages tend not to fall as money wages are not adjusted for inflation. As such, if wages will not fall when other prices are falling in the face of economic contraction, real wages will rise and hence failure to lower real wages during times of weak labor demand may constrain employment and aggravate the contraction until wages can adjust.

Ito and Mishkin (2006) assert that deflation results in welfare distribution by transferring wealth from borrowers to lenders and furthermore leading to financial sector instability. In the advent of a lower price level, when debt is fixed in nominal terms, it raises the real burden. This concurs with IMF (2003) and hence the transfer of resources from borrowers with subsequent losses incurred due to deflation has become commonly known as debt-deflation. This concept was propounded by Fischer (1933) who regards debt deflation as a real business cycle phenomenon. Financial stability is threatened by the emergence of moral hazard because any loss in individual's net worth may stimulate carefree attitudes to acquire excessive risk and the loss of value of collateral motivates adverse selection to control cases of default. This affects the operation of capital markets. Notwithstanding this, government as a borrower is also grossly affected because of their tendency to borrow with fixed interest and as such unexpected deflation increases the real debt burden. Furthermore, this implies less tax revenues since tax brackets are not adjusted for inflation. (Ito and Mishkin, 2006).

This is consistent with the assertions by Fuhrer and Tootell (2003) that government is affected by the reduction in inflation tax and at some point the lost revenues must be recovered. In the same vein, all price changes have some costs because indexation of contracts or tax codes is not adjusted for inflation and hence may discourage investment during inflation and encourage too much investment in deflation. Financial stability may also be influenced by unanticipated price movements and in the presence of incomplete financial markets in nominal risk sharing, unanticipated price shocks (Bordo and Firlado, 2005). Literature also suggests when an economy falls into deflation this stimulates the problem of zero-bound interest rates and as such this can destabilize the economy. Rationally, lenders will not accept negative interest rates as it is better to hold on to the cash. It is affirmed that under conventional situations economic recovery is stimulated by negative or zero interest rates however, in the face of deflation, monetary policy is stifled in generating forces that will take the economy back to equilibrium rates, this renders it inefficient as the normal guides for control become irrelevant. (IMF, 2003; Ito and Mishkin, 2006) Empirical work has also suggested that deflation may not always be harmful. Bernanke and James (1991) suggest that during the Gold Standard era and the Great Depression some countries faced severe depressions because

deflation had induced some acute problems to the banking system regardless of whether it was motivated by historical or institutional causes. Nonetheless, to a larger extent empirical evidence suggests that there was no link between deflation and the great depression and this is commensurate with the outcomes of Atkeson and Kehoe (2004). On the other hand, Baba *et al* (2005) suggest that even in a deflation vested country like Japan, deflation itself was far from being a major determinant of stagnation of the economy. In this regard, it may be important to illuminate what it is exactly that is worrying about deflation if it has weak links with falling output. This is also consistent with the propositions by Bordo and Firlado (2005).

Deflation arising from productivity shocks is regarded as not being harmful to an economy as is supported by cases like China during the 1997-2003. Ito and Mishkin (2006) assert that the real value of the firm's assets increases because of productivity growth despite the fall of prices of the goods it is producing. In essence supply shocks may not abate the usefulness of monetary policy but rather supplement its role on interest rates since rising capital values would raise the natural rate of interest rates. Such a situation is likened to the experiences of the United States in the second half of 1920's unlike Japan's situation in which stagnation followed deflation. (Ito and Mishkin, 2006). On the other hand, Bordo and Firlado, (2005) further assert that deflationary environments can hinder the ability of central banks to pursue countercyclical monetary policies and this is one condition necessary for monetary policy in dollarized economies. This is cemented by Fuhrer and Tootell (2003) who suggest that the biggest long run cost of deflation are the challenges it poses on monetary policy.

Assessment of Deflation Risk

Based on the *Index of Deflation Vulnerability*, IMF (2003) suggests that there was increased risk of deflation in a number of countries. In Asia, the risk of worsening deflation was apparent for Japan, Taiwan and Hong Kong SAR. However, it is suggested that China would contain it because of its advances in growth and policy spur. In the Euro zone, the risk of deflation was considered low except for Germany which was affected by a fragile macroeconomic environment, large and growing output gap, high unemployment and constrained banking sector. IMF (2003), shares the same view as Bernanke (2002) that the US had low risk because of the decline in output gap, relief from the depreciation of the US dollar, the availability of policy stimulus, willingness by policymakers to adopt preemptory action and resilience in the financial sector. Notably, there was no evidence that there would be extensive international diffusion of deflation.

IMF (2003) computed the *Index of Deflation Vulnerability* from a set of economic and financial indicators for 35 countries for the period 1994-2002. The index is then complemented by the examining expectations augmented Phillips curves for the G-7 economies and a case of China. However, this paper is concerned with the analysis of indicators from IMF (2003). Four broad indicators are identified with subsequent variables in each case being used to assess deflation vulnerability. An examination was done to determine whether a variable was

above the predetermined threshold. A binary variable 1 is scored if the threshold is exceeded and otherwise, 0. (See Appendix A for details). The index can be normalized in two ways; equal-weighted and weighted. The latter weighs the index in favour of asset price indicators, which requires classification of countries by capital market size.

According to Baig *et al.* (2003), deflation risks in major industrial countries and regional economies motivated the concern on deflation risk in Thailand and led the Bank of Thailand to construct the Index of Deflation Vulnerability. This method yielded that deflation risk was minimal in Thailand during the period of 1996 where the index of deflation vulnerability (IDV) was recorded below 0.2%. As the crisis began to rise, the first two quarters of 1999 recorded the highest risk of deflation within the eight quarter period ending in 2000. In the years that succeeded, risk of deflation as indicated by the IDV was above the moderate rate of 0.5% in the second and third quarter of 2002. As the quarter of 2002 came to an end, the risk remained in the moderate range of 0.3% and 0.5% up until the end of the second quarter in 2003. Thailand experienced high levels of deflation risk twice. The first detection occurred in 1999-2000 due to declining general price level and asset prices, excessive output gap, real baht appreciation and contraction in credits and money. The second detection occurred in mid-2002 as a result of declining price level, real baht appreciation and low growth of money and credit expansion. (Baig *et al.*, 2003)

In a similar study, the Central Bank of Iceland (2003) constructed the Index of Vulnerability Index based on the latest data they had and it emerged as 0.27 for the equal-weighted index and as 0.19 for the weighted index. Indicators showing excess capacity in the Icelandic economy were the GDP deflator decreased by 2.1% for the four quarters between 2002-2003 and real GDP growth over the past three years was less than the annual average growth over the preceding decade. The real effective exchange rate of the króna had appreciated by much more than 4% between over the four quarters in 2002.

Husabo (2014) suggests that there were growing concerns about deflation in the Euro area because of experiences of low level inflation. This motivated the construction of an indicator aimed at capturing whether the region had countries in deflation. The deflation indicator used was composite and showed the share of price indicators that indicated falling prices, how long they have done so and to what extent further price declines are expected and estimated on a monthly basis. Notably, the deflation indicator was made up three partial indicators which must show deflation for the composite indicator to show deflation implied by the score 1. The partial indicators were broadness, persistence and expectations. The findings show that the euro area was far from deflation with the exception Greece.

IMF (2014) used a Risk Assessment Matrix to examine the possibility of deflation in Zimbabwe. This method utilizes a qualitative approach in which RAM indicates events that could substantially change alter the standard path to recovery. Notably, it was conceived that it presents scenario that were deemed most likely to happen in the view of IMF staff. Nonetheless, the position drawn on the relative likelihood of

risks listed was based on subjective assessment of the risks surrounding the baseline. These included: “low” -probability below 10 percent, “medium” -probability between 10 and 30 percent, and “high” a probability of 30 percent or more. It is suggested that the RAM is indicative of staff views on the origins of risks and general concerns.

According to IMF (2014), some of the sources of risks of deflation in Zimbabwe with medium relative likelihood include: destabilizing effects of the Indigenization and Empowerment policy, risks of financial stability owing to incomplete regulatory reforms, adverse weather conditions and high relative likelihood of occurrence was expected for fiscal underperformance and slow growth in emerging economies and developed countries. Upon realization of these risks, the net effects range between medium and high however high impact was expected from fiscal underperformance. To this effect, IMF (2014) proposes some alternative policy response.

Country experiences

America

Bordo and Firlado (2005) postulated that, during the period 1929-1933, the US consumer price index fell by 24% and this triggered a 30% decline in GDP for this period. The US Federal Reserve regarded the fall of prices as price correction of the 1920s and suitable policies were implemented. However, the price decline led to deflation since policies were mistakenly employed. The experience of bank failures recorded in 1930 was due to poor management of the financial system. During the same period, the Federal Reserve maintained the gold standard and money supply was given limited attention. By the beginning of 1931, the discount rate had fallen from 6% from the previous year to 0.5%. When bank lending ceased, there was a high rate of deflation and the interest rates had increased. In recent years, the US has not experienced deflation and this is also alluded to by Bordo and Firlado (2005). However, in 2003 inflation fell drastically and there was risk that deflation would emerge. The US became more concerned because the productivity gains were dwindling and there was no satisfaction on the state of economic recovery. Accordingly, the monetary and fiscal policies were designed to deal with deflation and there was recovery in the private sector. In 2004, the risk of deflation had somewhat disappeared. According to Elwell (2010), there are indicators that suggest that the risk of deflation in the United States was still apparent regardless of ceased economic contraction and the emergence of economic recovery. However, there was no direct evidence that a broad-based and sustained decrease in the price level is would occur. This instills the propositions by Bernanke (2002) that the US was far from any risk of deflation in the future. In recent times, Bordo (2005) asserts that concerns over low inflation and deflation in the Us is overblown as the country is far from risk as latest data justifies this.

Hong Kong

One of the major highlights in Hong Kong was that it suffered persistent deflation which was caused mainly by a drastic decline in wages, rents and property and product prices. (Chiu,

2003). Following the Asian crisis of 1997, the country faced prolonged deflation until the end of 2004. According to Bordo and Firlado, 2005 deflation was not the fundamental cause of economic difficulties but was an indication of economic meltdown. Latter (2002) pointed out that although Hong Kong was suffering asset price decreases, its financial sector remained strong. Notably, Hong Kong faced challenges in using an exchange rate policy for adjustment because of the linked rate system in which inflation in theory should have been following that of the US. Thus, the experiences of deflation indicate that this was only a theoretical phenomenon. This paper asserts that this is highly related to Zimbabwe's situation given the limitations placed by dollarization. Nonetheless, recent trends show that since 2012 Hong Kong has had changes in composite Consumer Price Index (CPI) ranging between 4-5 percent. However, despite the fact that the economy was weaker in 2014 than expected, it is unlikely to face deflation in the near future. (Bank of China-Hong Kong, 2014).

Japan

Deflation began in the early 1990's and during the period 1993-2003 the economy of Japan was stagnant with a growth rate of just above 1%. The inflation rate was negative since 1998 and the growth rate was almost zero, shrinking the GDP by 4%. Baba *et al* (2005) suggested that the retardation of economic growth in Japan was not directly linked to deflation but however, deflation was only a symptom of dormant economy as alluded to by Bordo and Firlado (2005) for Hong Kong's case. A growing output gap indicated by underutilization of capacity in the construction and manufacturing sectors applied more pressure on prices. Bank failure was noted as the sector struggled to pay back the real estate and construction companies (Gerlach and Peng, 2002). Some of the factors leading to deflation include tight monetary policy, falling asset prices, insolvency of real estate companies affected by the slump in prices, non-performing loans and imported deflation. (Taylor, 2000; Atkeson and Kehoe, 2004; Cargill and Parker, 2004 and Williams, 2009)

China

After facing a 25% inflation around the year 1994, China tightened its monetary policy in a bid to reduce the price increase. However prices began to fall around 1998, becoming severe in 2001 when deflation started to emerge. IMF (2003) asserts that excess capacity in many sectors of the economy and a significant pool of underutilized labor also fueled continued deflation. The banking system was somewhat vulnerable and this was a substantial source of uncertainty. Other factors that maintained a prolonged deflation in China were World Trade Organization (WTO) tariff cuts and lower commodity prices. Yin (2000) suggested that the most effective way to combat deflation in China was to invest in rural infrastructure to support the use of domestic appliances. Due to its strong economic growth, China generated huge productivity gains and this hindered further price decreases. By December 2002, China had managed to hold deflation and the economy stabilized. Its strategic monetary policy also played an important role administering deflation.

Beginning 2000, there have been concerns over China's possible role in global deflation. Angang (2003), Hanke (2003) Lijian and Yan (2003) and Kamin *et al* (2004) agree that China was not big enough to influence global prices through its exports as had been suggested by adherence of exporting deflation and subsequent claims by John Snow in 2002 who was the US Treasury secretary then. To date there is no empirical evidence to suggest that China is exporting deflation.

Germany

There are classic examples of countries that faced significant deflationary episodes, and Germany is no exception. From a historical view, deflation risk was associated with two common periods often alluded to in literature. Bagus (2015) asserts that around the 1930's deflation in Germany was driven by problems in bank sector which were grounded in the contraction of credit as an accumulation process. According to IMF (2003), a number of economic indicators showed that Germany was under risk of deflation in the early 2000s. Annual inflation rate was below 1% and there was a 40% decline in the equity prices 2002. Subsequently, aggregate domestic demand was falling and as well as the widening of the output gap by 2.75% of potential GDP. Just as in the 1930's, Germany's domestic credit was constrained as banks were struggling to maintain their capital and compounded by the substantial fall in asset prices. Tily (2015) suggests that the scale of the deflation in Germany must have been a consequence of the severely restrictive monetary policy.

Recently, Germany officially went into deflation in January 2015 and its current problems of sovereign debt are comparable to Greece. According to Hayward (2015), the arrival of Germany into deflation and this further exposes the Greek economy at great risk. This is largely attributed to the fall in energy prices. Since 2009, Germany had not experienced negative inflation and the overall Eurozone, went into 0.6% deflation in January 2015. This means that the real value of debt is gaining power and this may not be good for heavily indebted countries in the region. Notably, monetary authorities in German had refuted any risk of deflation prior to this occurrence.

Methodology

This paper follows the method employed by IMF (2003) to assess deflation risk in Zimbabwe. Although there are numerous ways of assessing deflation risk, some methods require lengthy yearly time series data, however the Zimbabwean context is compounded by the existence of two different currency regimes. Against this background, this paper adopts the index of risk vulnerability. Data was drawn from the Ministry of Finance and Economic development (2015), AfDB (2015) and IMF (2015). Eleven measures of deflationary pressure were compiled for the period 2006-2014 and each measure is a binary (1/0) indicator with 1 showing possible deflationary pressure from that source. This is articulated in Table 1 in Appendix A. Although the index can be normalized using equal-weighted or weighted means, this paper employs the former because the latter weighs financial and credit indicators relative to their economic importance. However, due

to data limitations and adequate classifications the weighted method is somewhat difficult to employ. Table 3 provides the classifications of deflation risks.

Analysis and Discussion of findings

This section dwells on the presentation and analysis of results.

In the same vein, the notion that Zimbabwe has no independent monetary policy, compounds an already complicated situation. In this regard fully embracing the findings of this paper, should aid to abate the inevitable costs of deflation and to eliminate the avoidable costs especially given Zimbabwe's bid to recover.

Table 1. Zimbabwe's Index of Deflation Vulnerability (IDV)

Criteria	Score
1. Whether annual inflation, measured as a change in the CPI, was less than 0.5%.	1
2. Whether annual inflation, measured as a change in the GDP deflator, was less than 0.5%.	1
3. Whether annual inflation, measured as a change in the core CPI, was less than 0.5%.	1
4. Whether the output gap had widened by more than 2 percentage points over the past 4 quarters.	1
5. Whether the current output gap was more than -2%.	1
6. Whether real GDP growth over the past three years was less than the annual average growth over the preceding decade.	0
7. Whether the broad measure of the stock market over the past three years had fallen by more than 30%.	0
8. Whether the real effective exchange rate had appreciated by more than 4% over the past four quarters.	1
9. Whether private, nominal credit growth was less than nominal GDP growth over the past four quarters.	1
10. Whether cumulative private, nominal credit growth over the past three years was less than 10%.	0
11. Whether broad money (M3) growth on a y/y basis grew slower than base money by two percentage points (or less) over the past eight quarters.	0

Source: International Monetary Fund

APPENDIX A

Table 2. Economic and financial indicators of deflation

1. Whether annual inflation, measured as a change in the CPI, was less than 0.5%.
2. Whether annual inflation, measured as a change in the GDP deflator, was less than 0.5%.
3. Whether annual inflation, measured as a change in the core CPI, was less than 0.5%.
4. Whether the output gap had widened by more than 2 percentage points over the past 4 quarters.
5. Whether the current output gap was more than -2%.
6. Whether real GDP growth over the past three years was less than the annual average growth over the preceding decade.
7. Whether the broad measure of the stock market over the past three years had fallen by more than 30%.
8. Whether the real effective exchange rate had appreciated by more than 4% over the past four quarters.
9. Whether private, nominal credit growth was less than nominal GDP growth over the past four quarters.
10. Whether cumulative private, nominal credit growth over the past three years was less than 10%.
11. Whether broad money (M3) growth on a y/y basis grew slower than base money by two percentage points (or less) over the past eight quarters.

Table 3. Deflation risk classification

Index of Deflation Vulnerability (IDV)	Deflation risk
$IDV < 0.2$	Minimum
$0.2 \leq IDV \leq 0.3$	Low
$0.3 \leq IDV \leq 0.5$	Moderate
$IDV > 0.5$	High

Source: International Monetary Fund

The IDV for Zimbabwe is 0, 64 which falls in the high risk of zone as provided by Table 3 in Appendix A. The different categories show there are 7 out of 11 potential sources of deflation that put Zimbabwe at great risk, however, growth deflation and asset prices are weak links. The findings in this paper support the assertion made that Zimbabwe faces risk of deflation. This complements the sentiments in IMF (2014) in which a subjective assessment was made but reaching the same conclusion. Amid growth of global concerns about deflation, this study poses that just as alluded to by IMF (2003), the history of deflation in the US shows that policymakers seemed reluctant to tend to the possibility of threat of deflation and this is also consistent with the traits in Germany. Furthermore, Tily (2015) suggests that the situation was worsened by restrictive monetary policy, a phenomenon strongly emphasized by literature as being detrimental. This is similar to the case of Hong Kong which had pegged its currency against the US Dollar and could not manipulate exchange policy.

Given the characterization of general behaviour of prices by Kai (2004), the findings of this paper should not be entangled in the debates of whether Zimbabwe is facing deflation or disinflation. Rather, the paper serves to shed light that whatever, the circumstances of the behaviour of present day inflation, there is high risk of deflation which requires urgent attention through prevention or reduction of its costs. The lessons from the past show that it is possible to avoid the extent of hyperinflation in Zimbabwe, however, the public and policymakers tend to discount high costs to be faced in the future by seeking comfort in present day circumstances and this placed the country among the worst hyperinflations in the history of the world.

This paper quizzes whether this should also be the same with deflation and hence the emphasis is placed on advocating for precaution or prevention rather than searching for resolutions in the advent of risk emancipation.

Table 4. Zimbabwe's Index of Deflation Vulnerability

Criteria	Score	Analysis
1. Whether annual inflation, measured as a change in the CPI, was less than 0.5%.	1	Inflation was -0.2%
2. Whether annual inflation, measured as a change in the GDP deflator, was less than 0.5%.	1	Inflation using GDP deflator was about -1.8%
3. Whether annual inflation, measured as a change in the core CPI, was less than 0.5%.	1	Non-food inflation -0.4%
4. Whether the output gap had widened by more than 2 percentage points over the past 4 quarters.	1	Output gap for 2014 was 5%
5. Whether the current output gap was more than -2%.	1	The trend presented a positive widening output gap
6. Whether real GDP growth over the past three years was less than the annual average growth over the preceding decade.	0	Real GDP (average for 3yrs) 3.6%
7. Whether the broad measure of the stock market over the past three years had fallen by more than 30%.	0	Real GDP (average for 10yrs) 2.51%
8. Whether the real effective exchange rate had appreciated by more than 4% over the past four quarters.	0	Market capitalization growth was about 17%
9. Whether private, nominal credit growth was less than nominal GDP growth over the past four quarters.	1	Effective exchange rate fell from approximately 80% in October 2013 to around 70% in August 2014
10. Whether cumulative private, nominal credit growth over the past three years was less than 10%.	1	Private nominal credit growth: -2.9%
11. Whether broad money (M3) growth on a y/y basis grew slower than base money by two percentage points (or less) over the past eight quarters.	0	Nominal GDP growth: 3.9%
	0	Cumulative nominal credit growth approximately 31%
	0	Monetary base average growth rate was approximately 1.5%
	0	Broad money average growth rate: 4%

Source: IMF, ZimStat, RBZ, Ministry of Finance and Economic Development, AfDB and Authors' calculations

To some extent it reinforces economic theory that has sought to categorize deflation as done by Bordo and Firlado (2005) and this paper asserts that in the event that Zimbabwe enters deflation it is likely to be not "bad" but "ugly." Theory postulates that aggregate supply, aggregate demand and money supply shocks may induce deflation. RBZ (2015) acknowledges the decline in aggregate demand and falling global prices and this may be linked to deflation experiences in Japan which faced competition from emerging economies further depressing its aggregate demand. As indicated by the results falling inflation levels are a potential source of deflation. Ideally, lower prices should motivate people to buy more however, the country is challenged by lack of competitiveness and hence even under that environment imports are still cheaper where is the country's export capacity is highly limited. Government is heavily compromised by inflation tax as it loses real tax revenue. Notwithstanding this, its high fiscal underperformance aggravates the problem. When Germany fell into depression, concerns were that because of its size it would affect the euro against the backdrop of high debt levels in countries like Greece, this means the real value of debt increases with deflation. In the absence of a deflationary spiral, the government of Zimbabwe is stifled by high fiscal unsustainability.

Evidence suggests that credit contraction is a weak source of deflation. However, any increase in non-performing loans could turn fortunes over. This shows that the experience of Germany and Japan may somewhat be of little relevance to Zimbabwe. Because Zimbabwe is dollarized, monetary policy is highly restricted and yet a precondition of sustainable dollarization is the ability to use counter cyclical monetary policy. Were conventional methods cannot be used output and employment may be used to fine-tune the economy. Nonetheless, the present state of the economy shows dwindling prospects in this respect. Furthermore, historical experiences between fiscal and monetary policies have showed major inadequacies and hence this paper asserts that there are limited viable options to controlling the output gap which may go out of hand in the future.

The implied real effective exchange rate poses further challenges as the declining index shows appreciation. This is likely to exacerbate the trade deficit which is already one of the country's problematic areas. Furthermore, the absence of an exchange rate policy compounds the situation in ways similar to Hong Kong if not more. A systematic view of the potential sources of deflation warrants immediate review of Zimbabwe's price stability. Bearing in mind that there are transaction costs incurred by the public government and businesses each time economy moves in-between inflation extremes. It would not be surprising that many indigenous people are not knowledgeable about sustainable business strategies that best suit a deflationary environment. Given the relative likelihood of occurrence, this paper asserts that confusion will be a likely consequence. Some members of the public think that deflation is a good thing because of falling prices and hence they attach declining values to collateral. This stimulates moral hazard as people tend to excessively borrow. However, lenders are likely to employ adverse selection to control cases of defaults. In the presence of market imperfections the likelihood of financial instability is high. Furthermore, there is transfer of wealth from borrowers to lenders as it becomes costly to return loans. In the same vein their realization of zero bound interest rates makes it difficult for monetary authorities to return to equilibrium especially in dollarized economies.

Conclusion and Policy implications

The purpose of this paper was to elucidate on whether global concerns of deflation should be taken seriously in the Zimbabwean context. Nonetheless, the paper fails to reject the hypothesis that Zimbabwe faces aggravated deflation risk. Although various methods are used to assess deflation risk, the differences in monetary regimes pose a great challenge in assessing inflation history in Zimbabwe. The findings suggest that precaution and prevention should be a priority amid the realization that risk is high indeed. If history is by any means of material value to present day phenomenon then the lessons from the hyperinflationary era warrant serious policy reforms.

This paper posits that one of the major challenges is viewing causes of deflation in isolation and yet the economy requires a systematic view. In this regard, this paper calls for propagation into setting a macroeconomic framework that can withstand the limitations of dollarization as well as enabling coordination of fiscal, structural and monetary policies to abate the risk of deflation.

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