THE IMPACT OF ZIMBABWE'S PRICE HYPERINFLATION ON REPORTED LEVELS OF NATIONAL MANUFACTURING SECTOR ACTIVITY

PURUWETI SIYAKIYA

International Institute of Social Studies of Erasmus University Rotterdam (ISS)
Email: siyakiya82@gmail.com siyakiya@yahoo.com

ABSTRACT

Zimbabwe experienced price hyperinflation as internationally defined in the period March 2007 to January 2009. This paper addresses the issue of how this hyperinflation interacted with manufacturing sector performance. Interviews with a small anonymous sample of 'survivor' manufacturers suggest that rational decisions as responses to the internal/external structural events from 2000 induced a number of actions that tended to economize on the use of Zimbabwean dollars as the highly monetized manufacturing sector was especially exposed to monetary risks, but was also well connected with the international economy and using other currencies. Though damage to the manufacturing sector continued during the hyperinflation period it did not accelerate as might have been expected. Therefore, analytically, rational decision-making by private sector manufacturers prior to the hyperinflation may have helped protect some of them from its effects but also played a role as a cause of the hyperinflation.

KEYWORDS

Effects of hyperinflation, hyperinflation, manufacturing sector.

Zimbabwe for the first time in its history experienced price hyperinflation in the 21st century. This near world record inflation rate occurred in the period March 2007 to January 2009. As published by the Zimbabwe National Statistics Agency (ZIMSTAT) formerly Central Statistics Office (CSO), hyperinflation (as defined in Cagan, 1956) started with a 50.5% month-on-month price increase in March 2007. Cagan's working definition was:

hyperinflation as beginning in the month the rise in price exceeds 50 per cent and as ending in the month before the monthly rise in prices drops below that amount and stays below for at least a year. (Cagan, 1956, p.25).

The rate continued to soar and the officially recorded monthly figure reached 2600% in July 2008. According to Hanke (2008) the unofficial rate recorded is believed to have reached a monthly level of 79.6 billion per cent in mid-November 2008 as implied by changes in stock and exchange rate. (Hanke & Kwok, 2008). The above authors used stock prices of Old Mutual that were traded at the Zimbabwe Stock Exchange between Harare and London to mirror the changes in consumer prices. The abandonment of the Zimbabwean dollar in December 2008/January 2009 meant Zimbabwe escaped being the country in the world with the highest ever inflation rate. Despite this Zimbabwe stands as the country with the second highest inflation record in world history after Hungary as depicted in Table 1.

Table 1: Highest inflation rates in history

Highest Monthly Inflation Rates in History

Country	Month with highest inflation rate	Highest monthly inflation rate	Equivalent daily inflation rate	Time required for prices to double
Hungary	July 1946	4.19×10^{16} %	207%	15.0 hours
Zimbabwe	Mid-November 2008	79,600,000,000%	98.0%	24.7 hours
Yugoslavia	January 1994	313,000,000%	64.6%	1.4 days
Germany	October 1923	29,500%	20.9%	3.7 days
Greece	October 1944	13,800%	17.9%	4.3 days
China	May 1949	2,178%	11.0%	6.7 days

Source: Hanke, 2009

Bernholz (2003) in Hanke and Kwok (2009) claimed that out of 28 hyperinflationary scenarios that occurred in the 20th century bulk of them were associated with monetary phenomenon. (Hanke & Kwok, 2009). Cagan (1956), Siklos (2000) and Clment (2005) attributed the causes of hyperinflation arising from a monetary phenomenon. Zimbabwe's hyperinflation which transpired in the 21st century is an exceptional case as it does not follow the bandwagon of printing money as its root cause but it was the other way round. The cause was from supply shocks as explained by Grossman and Horváth (2000),

"The initial supply shock should be regarded as the origin of the hyperinflation. Although we think of hyperinflation (if not all inflation) as a monetary phenomenon, where the government prints too much money, our textbooks remind us that an inflation can occur as well from a significant supply disruption, and clearly did in this case; indeed, the government could not even print money at first.". (Grossman & Horváth, 2000, p.411).

The root cause as noted by Hanke and Krus is that, "Hyperinflation is an economic malady that arises under extreme conditions: war, political mismanagement, and the transition from a command to market-based economy—to name a few. (Hanke & Krus, 2012, p.11).

In the same vein according to Makochekanwa (2007) Zimbabwe's hyperinflationary impasse was brought about by a persistent political crunch which forced the government through the central bank to entirely depend on printing more money which was not properly injected into productive sectors of the economy but into non-productive quasi fiscal activities (Makochekanwa,2007). This was a result of lack of monitoring mechanisms to find out if the money and inputs bought were used for their intended purposes. The central bank in most cases would feel that the amount of money in circulation was not enough as prices continued to rise. This is evidenced in Mhlanga and Sibanda (2013) where they found that the growth in broad money supply increased by 1393% between January 2007 and October 2007 (Mhlanga & Sibanda, 2013). Under hyperinflation people are unlikely to keep money for a long period of time hence the velocity of circulation will be very high while the quantity of physical goods will be constant if not declining.

The continual worsening of the situation made transactions in Zimbabwean dollar's fall and the government tried to maintain public sector activity by printing more money in a bid to cool down expectations with the effect that confidence fell further and the velocity of circulation increased. In the hyperinflationary environment people had no incentive to hold Zimbabwean dollars. This caused both prices and velocity of circulation to increase as more money was being printed. Kalecki (1962) states that the equation of the quantity theory of money is M*V = P*T, where M is money supply, V is the velocity of circulation, P is price level and T is volume of transaction. (Kalecki, 1962, p.276). The positive correlation between increasing money supply and increasing price level during hyperinflation was acerbated by rising velocity of circulation as people were trying by all means to minimise holding national currency.

The quantity theory of money within the context of Zimbabwe can be applied as people were trying to avoid holding Zimbabwean dollars and, as a consequence, rational decision-making meant day to day transactions forced T to go down while M and V were going up. All the pressure was now piling up on P which increased to compensate the fall in T and rise in V so that the quantity theory of money identity equation M*V = P*T was maintained. The movements of three of the four variables pushed all the strain of adjustment onto the price level, P, and price hyperinflation became cumulative. Although there was a positive correlation between movements in money supply and price level this does not prove that Zimbabwe's hyperinflation was a purely monetary phenomenon in terms of causality.

This paper aims to build on the work of researchers like Coomer, and GsTraunThaler (2011), Koech (2011), Makochekanwa (2007) and Pilossof (2009) who looked at hyperinflation, but without looking at interactions between the macro-economic quantity theory of money and micro-economic theory of the firm emphasising

rational choice and expectations. As a case study of Zimbabwe, this paper also adds to the contribution of Gumbe and Kaseke (2011) who looked at survival options for Zimbabwean manufacturing firms for the period 2005 – 2008. They did not use the quantity theory in their argument, they did not use any regression techniques and further they only looked at challenges and solutions without deeply analyzing the hyperinflationary crisis that rocked the country.

OBJECTIVES

The objectives of this paper are to investigate:

- The relationship between volume of manufacturing index (VMI) and hyperinflation using exploratory data analysis
- The tactics employed by manufacturing firms to survive hyperinflation
- The interaction between these rational responses of manufacturing firms and the hyperinflation process itself

This paper first addressed the issue of how hyperinflation interacted with manufacturing sector performance through analyzing the movement of volume of manufacturing index (VMI) and inflation rate over the period January 2000 to January 2009. After exploring the above the paper later examined the earlier structural challenges the surviving firms faced and what strategies they developed that protected them later in the hyperinflationary environment from early 2007 to January 2009. This paper's argument builds on an extensive study by Cagan (1956) found that expectations by consumers and industrialists played a significant role in causing earlier hyperinflations. It more critically explores the statement of Fischer, Sahay & Végh, (2002), though it accepts the uni-causal explanation suggested by the word 'alone' is untenable: Since 1956, the formal analysis of hyperinflations has advanced in a number of directions, each of which brought in its train a large literature. First, with the development of the theory of rational expectations, the notion that expectations alone could have caused hyperinflation became more difficult to sustain. (Fischer, Sahay & Végh, 2002, p.3).

DATA AND METHODOLOGY

This paper employs a mixed method which combines exploratory and quantitative data analysis with evidence from qualitative testimonies from semi-structured interviews. The first part uses exploratory data analysis to reveal if there is any relationship between hyperinflation and reported manufacturing activity over time. It also used quantitative analysis where regression approach was applied to explore the relationship of hyperinflation and volume of manufacturing output. The second part reports the challenges that firms in the sector claim to have faced during hyperinflation and what were their responses in attempting to mitigate them. Interviews were carried out with senior managers from 15 firms in the manufacturing sector in Harare on what challenges they faced and how they managed to survive while others collapsed before and during the hyperinflation period. This provides living experiences of the challenges that surviving firms went through as key informants and narrated through their ordeals. Semi-structured questionnaires were used so that the respondents could freely express their views and opinions through the use of open and closed questions. For ethical purposes, a letter accompanied each questionnaire which requested the co-operation and consent of the respondents, explained an offer of anonymity, plus the purpose of the research and sharing of the findings if requested.

For the part of the research where regression was used, data was collected from RBZ[1] , ZIMSTAT[2] and World Bank (WB) reports. The data collected was for monthly time series on inflation rate, VMI[3] , exports and imports for the period January 2000 to December 2013. VMI figures are based on data collected from respondents of with high likelihood that (respondents) to give wrong information or they may regard their output volumes as confidential hence this compromise the quality of statistics generated. The series for inflation are in percentages, while those for exports, imports and VMI are in United States dollars and then indexed against a baseline. The accuracy of data

is doubted since ZIMSTAT faced some challenges during and after hyperinflation (Nyoni, 2008). Exploratory data description was used to reflect upon the movements of the four variables.

DISCUSSION OF RESULTS

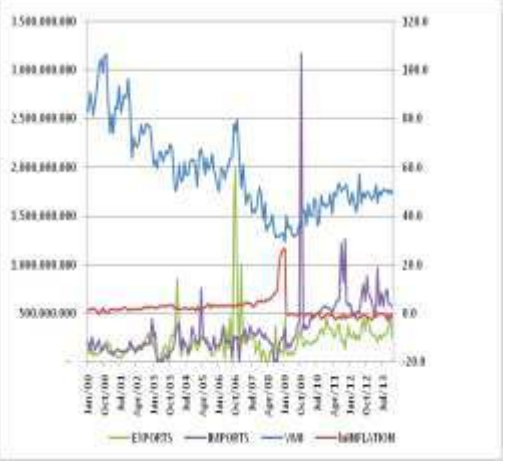
An exploratory data time series analysis of the variables

An initial visual inspection of Figure 1 shows the very volatile time series of exports, imports, inflation and VMI suggests that hyperinflation had little effect on an already deteriorating VMI. Exports and imports are measured in US dollars and calibrated on the left hand side of the figure while VMI and logged inflation indices (logged otherwise the graph would go off the scale!) are on the right hand side. The graph shows the trend so that when the rate of inflation was increasing VMI was decreasing over time until end of 2005. Exports and imports display large fluctuations with an enormous spike in exports before the hyperinflation and in imports after the hyperinflation.

In 2006, along with the spike in exports, VMI was on a rebound as it had a remarkable increase rising to 80 from around 50 as measured by the index. The increase in exports is suggested to be the main push factor behind the rise of VMI as firms were able to retain their foreign currency earnings. However the increase in exports was short lived as the RBZ introduced export surrender requirements to make sure that the government had sufficient foreign currency to buy 'essentials' such as fuel and medicines.

This appears to have had a negative impact on VMI and it declined at the hyperinflation peak to about 30 against a 2000 value of 100. But this decline was consistent with the declining trend from 2000, a critical year in Zimbabwe's history of structural change.

Figure 1: Trend of variables (01/2000 – 12/2013)



Source: Author, computed based data from ZIMSTAT Data.

There was a recovery in the VMI after the Zimbabwean government abandoned the Zimbabwean dollar and accepted use of other countries' currencies for domestic transactions in February 2009. The sector which used to be well-known for diversification in Southern Africa in the late 1970s and early 1980s, as claimed by Sachikonye (1999) is currently still weaker than in 2001 with and imports booming.

The volatility of the four time series with violent fluctuations makes them less suitable for regression analysis. The non-fluctuating needed for projecting the past into the future is not available. But the peaks and troughs of the time series do raise a number of questions that a mixture of abstract reasoning and testimonies can attempt to answer:

a. Why did the VMI start to decline rapidly after 2001?

b. Why did exports spike so dramatically immediately before the hyperinflation?

1 RBZ is Reserve Bank of Zimbabwe which is the central bank of the country.
2 ZIMSTAT is the Zimbabwe National Statistics Agency which is responsible for collecting and disseminating national statistics.
3 Volume of manufacturing index (VMI), 'is an index used to measure changes in the volume of production on a monthly basis, with its base year set at 1990 (i.e. 1990 = 100)'. It is generated by calculating the weights of physical quantities, quantity of material used, value of output produced and/ or sales deflated to real values of the consumer price index (CPI) from the eleven sub-sectors in the manufacturing sector which include food, drink, textiles, clothing, wood, paper, chemicals, non-metals, metals, transport and others. Questionnaires are sent to managers of firms in these sub-sectors and they give their monthly production figures which are then weighted, aggregated and indexed for the whole sector. The Laspeyres formula is used to calculate VMI and is shown below.

c. What is the possible causal relationship between the determinants of the VMI and the determinants of the hyperinflation?

d. Why did imports appear to rise dramatically after hyperinflation?

e. Why was recovery in the VMI so limited after the hyperinflation?

Findings from the unrestricted VAR model

After performing the Johansen test shown by Table 1 in Appendix I, it was found that the two economic variables have no long-run relationship hence the need to conduct unrestricted VAR model to check for Granger causality. Lütkepohl (2009) argues that causality is of paramount importance since it explains the link between economic variables. The results show that the first lag of VMI (VMI L1) is significant in explaining VMI. In the same vein the first lag of inflation is also significant in explaining inflation rate. The next step is to find short-run Granger causality between the two variables.

Table 2: Short-run relationship/ Granger Causality Wald tests (vargranger)

Equation	Excluded	Chi2	Dof	Prob > chi2
VMI	lnINFLATION	9.1167	3	0.028
VMI	VMI_1	1.7641	3	0.623
VMI	ALL	13.239	6	0.039
lnINFLATION	VMI	.73651	1	0.391
lnINFLATION	VMI_1	2.3887	3	0.496
lnINFLATION	ALL	2.6544	4	0.617
VMI_1	VMI	1.5e+15	1	0.000
VMI_1	lnINFLATION	6.4529	3	0.092
VMI_1	ALL	1.6e+15	4	0.000

Source: Author, computed based data from ZIMSTAT Data.

From Table 2 above the results explain that there is short-run causality running from all the lagged variables of lnINFLATION to VMI and also from all lagged values of VMI to its own lag. H0 suggests that all the coefficients associated with independent variable lnINFLATION are equal to zero meaning that lnINFLATION does not Granger cause VMI. Since the probability value (Prob > chi2) of lnINFLATION (2.8%) is less than 5% H0 is rejected in favor of H1. There is strong evidence suggesting Granger causality running from lnINFLATION to VMI. This is not the case with all the lagged variables of VMI on lnINFLATION because 39.1% is greater than 5%. When the dummy variable (D07) is included it is statistically insignificant and it's observed that it did not make much impact on VMI, VMI_1 and lnINFLATION. Since D07 = 1 represent hyperinflationary period one cannot conclude that hyperinflation contributed to the decline of VMI despite the fact that hyperinflationary period is statistically significant at 10%. The model also passed all the normality and diagnostic tests associated with the unrestricted VAR hence the model is correctly specified.

Analysis of regression results

The regression results showed that the fall in VMI was not linked to hyperinflation since a decline in VMI is observed before hyperinflation. Although the Granger causality test in general shows that inflation causes a decline in VMI this is not the case for hyperinflationary period. This is captured by the inclusion of a dummy variable where a decline in VMI in the short-run is not as a result of hyperinflation.

Structural challenges and manufacturers' rational responses before the hyperinflation

To answer these questions, the paper needs to explore the interactions between the micro-level and macro-level institutional contexts in Zimbabwe between 2000 and 2013. This exploration will use testimonies from interviews with a small number of senior managers of manufacturing firms that have survived those turbulent years to find out what tactics they used to survive.

A large majority of the interviewees expressed concern over the unavailability of credit, shortage of foreign currency and inadequacy of capital which hindered their progress. The crippled financial systems denied firms access to information and loans. The situation was worsened by increasing banks' lending rates which were beyond the reach of firms. At the peak of hyperinflation the local currency was no longer in use as it was depreciating very fast. This prompted firms to buy foreign currency from the black market.

But this problem is believed to have begun in 2000 as cited by Conway (2000) in McKinnon (1973) when financial intermediation between savers and investors was poor (Conway, 2000). Savers lost confidence in the financial sector thereby slowing down manufacturing investment in the country. Around 2000, all Zimbabwe's institutions came under pressure as 'invasions' of farms owned by 'whites' were followed by 'western' economic sanctions. The interactions of the micro-level and macro-level structural changes increased uncertainty in the manufacturing sector as foreign currency became scarce and both exports and imports fell continuously.

Severe shortage of foreign currency resulted in further strained supply of manufacturing inputs. The majority of interviewees were worried over the way price controls affected availability and supply of domestic raw materials in the domestic market. This negative supply shock of raw materials was deepened by the fact that firms could not acquire foreign currency to purchase raw materials. Therefore a 'black' market in foreign currency emerged. The black market was a major source of foreign currency which was supplied by people in the diaspora as it could not find its way into formal channels due to the central bank's repressed exchange rate. The shortage of foreign currency also meant that imports were now expensive and this had a negative impact on manufacturing firms as the sector relied on foreign imports as a significant source of raw materials.

Increasingly poor infrastructure was a structural factor weakening manufacturing in Zimbabwe. The major highways of the country were in poor state and with high volume of traffic on the roads this caused delays in movement of consignments. Power black outs and acute shortages of water hampered production and, in most cases, companies used generators which are costly as compared to electricity. Machinery used by firms was increasingly out-dated as financing for investment dried up. This meant that firms were less competitive when compared to those in the rest of the southern Africa region. The National Railways of Zimbabwe (NRZ) which was potentially cheaper than road to ferry goods was not operating efficiently.

Firms in the food and clothing sectors were becoming worried about the influx of cheap imports from China and they cited this as hampering and threatening their operations. Although the majority of Chinese products are inferior in quality compared to local products, consumers with very low cash incomes find them affordable. This gives a torrid time to local firms as their goods cannot compete with Chinese goods. High levels of corruption and weak institutions at ports of entry and within the country make it easier for inferior quality goods to infiltrate the domestic market. This resulted in closure of companies that were non-innovative and non-competitive.

The above structural and institutional challenges were piling on manufacturing firms. This is supported by findings from a study carried by Damiyano et al. (2012) which states that Zimbabwe lost approx USD 444 million worth of investment and GDP during the pre-hyperinflation period. This also gave rise to nearly 90% of the previously employed working age population being jobless and more than 400 companies closing down their operations (Damiyano et. al., 2012).

Economic theory suggests that in a bid to mitigate the challenges and lessen their impact, rational decision-makers would either go out of business or take actions to reduce use of inputs that were becoming relatively more costly. Seth and Thomas (1994) argue that in order to succeed and make profit on their investments managers of firms should decisively apply concrete actions. The above authors further claimed that only innovative firms survive

during times of crisis. A firm's success depends on the amount of resources and managerial skills available and how it combines them in an economical way.

In addition to the above Madhok (2002) also claimed that a firm's achievement is not based only on efficiency of the market but on its approaches to frugally organize activities. He further argues that firm's strength is embedded in its competency in producing unique goods or services which others cannot. It is during periods of economic instability that firms are in a dilemma of either to prioritize resource management or to organize operations in a more competitive manner. Madhok emphasized that the success of any organization hinges on the alignment of its resources, transactions and governance structure. In contrast to Seth and Thomas (1994), Madhok argued that as a way to survive firms adopted conservative strategies of which some were even costly to their normal operations and they only did this in order to protect themselves against the deteriorating local currency.

The results from the interviews suggested that during the decade many Zimbabwean manufacturing firms who did not change behavior went out of business before the hyperinflation. There is an element of paradox in the role of Zimbabwean dollars in such changes. Price inflation measured in Zimbabwean dollars was rising and its exchange rate devaluing with respect to the major trading currencies. This would suggest Zimbabwean dollars were becoming cheaper as a manufacturing 'input', but for a Zimbabwean manufacturer holding Zimbabwean dollars was becoming increasingly costly with little possibility of future increase in value. So it was rational to move Zimbabwean dollars into commodities or other currencies as rapidly as possible. In simple quantity theory of money terms where M*V = P*T (where M is the quantity of money, V is the Velocity of circulation, P is the Price level, T is the volume of Transactions), V will be increasing as manufacturers immediately dispose of Zimbabwean dollars. In addition, the structural pressures on manufacturing output will tend to reduce T. So, regardless of any government action to increase M, the rational decisions of manufacturers will tend to increase P. The impact of decisions by the manufacturing sector are significant for price inflation as the sector is relatively highly 'monetized' and exposed to monetary risks in terms of the national currency, and also well connected with the international economy and other currencies.

Manufacturers' responses in the period of hyperinflation

Thus rational choices of private sector manufacturers before the period of hyperinflation were consistent with increasing price inflation independent of government actions, other than actually reducing the money supply.

As the economy moved into hyperinflation, interviewees reported the changing managerial and reporting behaviour. They minimised the use of written forms of communication as these caused delays, and used verbal forms of communication. Information gathering became crucial for survival. In this context, Swanson argued that firms should constantly review their actions and those of competitors, government and financial institutions in anticipation of possible shocks (Swanson, 1989). Finance managers needed to understand the value of money and quickly convert Zimbabwean dollars into stable currencies or physical assets otherwise they wouldn't survive. They should also be good in money management and conduct transactions in cash payments instead of credit terms as Zimbabwean dollars increasingly lost value during the hyperinflation.

Most managers claimed that they had a torrid time in the hyperinflation period adjusting their planning process from monthly/ yearly to weekly/ daily/hourly basis to meet variations in prices, interest rates, and government regulations. They also put more emphasis on surviving instead of expanding their enterprises. Due to the process getting out of hand some managers reported that they ceased production but kept their premises open in order to keep their names recognized waiting for the economy to stabilise.

As the hyperinflation developed, the workforce found it increasingly difficult to even come to work. Interviewees reported struggling to keep their employees motivated to report for work.

Firms devised various mechanisms in order to retain their workforce. Some employers stepped up efforts in motivating their workforce through provision of transport for pick and drop service to workplace to reduce cases of absenteeism. Provision of private transport for employees was critical because public transport was unreliable due to fuel shortages and changes in fares. As cited by Swanson (1989), Zimbabwean consumers and producers faced a situation corresponding to the South American apocryphal saying that in a hyperinflation context taking a cab is cheaper as compared to a bus since for the case of a bus one can make payment at the beginning of the journey while for the taxi or cab one has to pay for it at the end of the ride. (Swanson, 1989).

Some firms paid their workers with groceries instead of cash so that they could sell them or swap them for other commodities. Due to the continual depreciation of the local currency and increase in the cost of living, firms in food and beverages manufacturing 'sold' their products to their workers at reduced prices as a way of meeting their own and their workers survival needs. Some companies went to the extent of providing free lunch to their employees as a way of making them less concerned on how to get food but focus on work.

Interviewees in clothing, food and beverages manufacturing reported discontinuation of services of middlemen by acquiring raw materials instead they source inputs directly from suppliers. This was because middlemen would increase the waiting period while the value of Zimbabwean dollars was depreciating. Another alternative which firms embarked on was to engage in barter trade to access raw materials. They developed relationships with other firms that would supply them with raw materials in exchange for their products. Due to complications that firms faced in keeping track of financial records during hyperinflation, Swanson (1989) stresses that valuation of inventory should be applied on the concept of Next In First Out (NIFO) as opposed to Last In First Out (LIFO) (Swanson, 1989).

Opportunistic behavior by employees was also cited as a major challenge that prevailed during hyperinflation. This compelled firms to employ people who could be trusted in all areas that involved handling national currency. The reason was that untrustworthy persons would convert local currency to foreign currency for personal gains as well as buying themselves assets. The other problem of employing outsiders in strategic positions was that they had good reason to divert money into speculative activities instead of using it for production purposes.

Contrasting to the tendency towards centralizing decision-making, some purchasing and financing managers were given room to make decisions independently and quickly as delay in buying raw materials and converting Zimbabwean dollars into other assets put the firm at risk. Thus networking within firms could stimulate closer cooperation between managers at all levels to circulate information more speedily. This could extend to relationships between firms in some circumstances. Decision-makers in the textile and clothing sector mentioned that they created collaborations and synergies in order to decrease the transaction costs of arm's length relationships in the face of increasing uncertainty. Given the severity of uncertainty under hyperinflation, some firms integrated their operations with buyers and suppliers as a way of reducing transaction costs. In this context, boundaries between 'formal' and 'informal' sectors became further blurred as 'informalisation' in the sense of lower visibility to the Zimbabwean State became a rational survival response. But increased cooperation may tend to reduce the rate of anticipated increase in transaction costs and shift these costs from formal contractual to informal 'good faith' arrangements with probable small net gains against expected cost increases.

Attempts to control price controls through government regulations was met with resistance. Firms seeking price increases were instructed to first seek approval from Ministry of Industry and Commerce, but, by the time approvals were given, costs of inputs had risen to make the newly approved prices unprofitable. As observed by Seth and Thomas (1994), in order to survive rational managers would avoid and evade the regulations and escalate price increases in anticipation of increasing general

price inflation in input costs and thus increasing input costs down the commodity chain (see Seth & Thomas,1994). Firms producing commodities facing price regulations where feasible shifted towards producing 'non-basic' commodities whose prices were not controlled by the state. This resulted in increasing shortages of basic commodities because firms were now avoiding government regulations by producing unrestricted commodities to cope with rising production costs. Regulations led to disappearance of controlled goods like milk, sugar, maize meal, wheat flour, cooking oil from the supermarkets' shelves and being marketed 'invisibly'.

Another reason which was highlighted as a major drawback to production by survivors was a 'brain drain'. Manufacturing firms lost more qualified and experienced personnel because salaries were not rising in line with the cost of living. Former employees migrated to South Africa and the United Kingdom, often following previously established migration chains. This would negatively affect labor productivity in Zimbabwe making survival even more challenging. More than half of the interviewees stated that to keep their operations intact they poached skilled personnel from other firms to replace gaps created by workers who left for other countries to seek better opportunities.

Manufacturing firms in the sector revealed that due to the comatose that the country was facing they had to get raw material orders from South Africa and other neighbouring countries because the local supplies were dry. The Zimbabwean case was different from what Swanson (1989) suggested for a country gripped by hyperinflation. Despite the fact that there were a lot of complications and costs associated with importing, companies found it rational to do so. Firms with sister companies in neighbouring countries were able to obtain supplies of inputs and raw materials without the need to buy foreign currency inside Zimbabwe first. But again, such decisions served to reduce the rate of increase of real input costs in terms of foreign currencies and nominal Zimbabwean dollars rather than stabilise those costs.

Thus decision-makers in manufacturing enterprises who were able to foresee the looming danger and survive took a range of rational tactical decisions that contributed to raising product prices in terms of Zimbabwean dollars. This is not to claim that rational decisions by manufacturers in Zimbabwe caused Zimbabwean hyperinflation in a uni-causal relationship. But most of these rational decisions contributed to raising prices independently of government decisions on the money supply, and the few off-setting tactics only played a weak mitigating role. Even the less rational, non-surviving manufacturers played a role in increasing prices by reducing the aggregate supply of manufactured commodities. The above discussion has been necessarily qualitative and abstract claiming an epistemological warrant appealing to logic rather than detailed evidence. This stance is due to two factors. Firstly, the interviewees were revealing aspects of their behavior that were illegal in the hyperinflation period and they need anonymised protection on ethical grounds. Secondly, the quantitative evidence has to be treated with great caution as reporting to the Zimbabwean State was undoubtedly influenced by rational calculations by manufacturers on the risks associated with full transparency in the face of an increasingly demanding regulatory regime. It is possible that the measured 'recovery' in the VMI following the acceptance of a multi-currency reality was at least partially a 'reporting' phenomenon and not fully a 'real' change.

CONCLUSION

So how can the five questions set out earlier in this paper be answered?

a. Why did the VMI decline after 2001 and before the period of hyperinflation?

There were structural pre-conditions for hyperinflation in Zimbabwe (as there were for Germany in the 1920s. Demands for remedy of colonial injustice in terms of land redistribution escalated and became real in terms of 'invasions'. But as relevant for manufacturing industry in Zimbabwe was the international response in terms of economic sanctions (again parallel with the demands on Germany for reparations in the 1920s). In order to survive these structural processes, decision-makers in manufacturing were forced to 'practice rational

economising tactics' to circumvent restrictions; tactics that would become essential once inflation started accelerating. Thus negative structural shifts in external relationships may be necessary if insufficient pre-condition for later hyperinflation with a lag of five to ten years. Thus the possibility of future hyperinflation needs to be built explicitly into policy planning when such shifts occur.

b. Why did exports spike so dramatically immediately before the hyperinflation?

In general macro-economic discussions, a dramatic increase in exports would be seen as positive. But in the Zimbabwean case, the increase in exports can be seen as a leading indicator that the economy was developing a non-sustainable fever. Rational decision-makers in manufacturing foreseeing the developing crisis sought to build up stocks of foreign exchange rather than the sustainable flows of exports. The response of the Zimbabwean State in demanding a share of the foreign exchange was therefore mis-judged in terms of trying to tap a flow rather than draw down a stock. This misrecognition had the unintended consequence of driving manufacturers into tactics that increased the de facto value of foreign exchange relative to the Zimbabwean dollar and contributed to increasing price inflation.

c. What is the possible causal relationship between the determinants of the VMI and the determinants of the hyperinflation?

The connection between the macro-economics of hyperinflation and the micro-economics of rational decision-making by the firm under conditions of great uncertainty is a central theme of this paper. The contention is that firms who survived the earlier structural challenges and hyperinflation, using similar tactics to survive both, generally made rational decisions that added positive feedback fuel to the hyperinflation rather than dampening the tendency to price increases. But these actions prevented complete collapse of the VMI even if they did not prevent price hike, while less rational decision makers went out of business and reduced aggregate supply of 'basic' manufactured commodities which also induced price hike.

d. Why did imports appear to rise dramatically after hyperinflation?

The most likely answer to this question is that recorded imports replaced unrecorded imports. Zimbabwe has long, relatively open land borders with four neighbouring countries and all four had relatively stable currencies in the period of hyperinflation. Provided fuel and foreign exchange could be obtained, it was economically rational to travel to one of these borders and purchase commodities in a neighbouring country without changing the foreign currency into rapidly depreciating Zimbabwean dollars. Once a multi-currency monetary system was instituted in Zimbabwe then the incentive to firms and individuals for such activities disappeared and 'normal' importing activities were resumed.

e. Why was recovery in the VMI so limited after the hyperinflation?

The period of hyperinflation was not a brief episode of an economic singularity, it could better be seen as a culmination of a decade of processes of structural change that not only disrupted decision making in the manufacturing sector, but right across Zimbabwean society. The end of measured hyperinflation could not be expected rapidly to reverse those processes and re-establish confidence in either State policies or open market outcomes. The echoes of hyperinflation can haunt society for decades as it has in Germany and arguably still does in Brazil and Argentina. It is also worth noting that even the limited 'real' recovery might be something of an illusion if it is merely a recovery in reporting activity.

The final conclusion of this paper is to locate the Zimbabwean hyperinflation in wider long duration, political economy analysis. The hyperinflation was not solely due to State monetary policy, was not solely due to internal Zimbabwean factors, and its cause and effects are not chronologically confined to the period of technically measured hyperinflation. Decisions in Zimbabwean manufacturing industry were unintentionally culpable in partially causing the hyperinflation process, but this culpability is understandable as a result of rational decision-making in the interest of survival.

REFERENCES

Bernholz, P. (2003) *Monetary Regimes and Inflation*, Northampton, MA.: Edward Elgar

Cagan, P. (1956). *The Monetary Dynamics of Hyperinflation*, in M Friedman (Ed), Studies in the Quantity Theory of Money, University of Chicago Press.

Clment, J. A. (2005). *Post conflict economics in sub-Saharan Africa, lessons from The Democratic Republic of the Congo* International Monetary Fund.

Conway, P. (2000). Financial repression in transition: Output reduction and hyperinflation in the former soviet economies.

Coomer, J., & GsTraunThaler, T. (2011). The hyperinflation in Zimbabwe. *Quarterly Journal of Austrian Economics, 14*(3)

Damiyano, D., Muchabaiwa, L., Mushanyuri, B., & Chikomba, C. (2012). An investigation of Zimbabwe's manufacturing sector competitiveness. *International Journal.*

Fischer, S., Sahay, R., & Végh, C. A. (2002). *Modern Hyper-and High Inflations.*

Grossman, P. Z., & Horváth, J. (2000). The dynamics of the Hungarian hyperinflation, 1945-6: A new perspective.

Gumbe, S., & Kaseke, N. (2009). Manufacturing firms and hyperinflation-survival options: The case of zimbabwe manufacturers (2005-2008). *Journal of Management and Marketing Research, 7,* 1-21.

Hanke, S. H. (2009). RIP Zimbabwe dollar. *Washington DC: Johns Hopkins University. 21*

Hanke, S. H., & Krus, N. (2012). *World hyperinflations* Cato Institute.

Hanke, S. H., & Kwok, A. K. (2009). On the measurement of Zimbabwe's hyperinflation. *Cato J., 29*, 353.

International Labour Organization (1993). *Structural Change and Adjustment in Zimbabwe*. Geneva: ILO.

Kalecki, M. (1962). A model of Hyperinflation1. *The Manchester School, 30*(3), 275-281.

Koech, J. (2011). Hyperinflation in Zimbabwe. *Annual Report,* 2-12.

Lütkepohl, H. (2009). Econometric analysis with vector autoregressive models. *Handbook of Computational Econometrics,* 281-319.

Madhok, A. (2002). Reassessing the fundamentals and beyond: Ronald Coase, the transaction cost and resource-based theories of the firm and the institutional structure of production. *Strategic Management Journal, 23*(6), 535-550.

Makochekanwa, A. (2007). A dynamic enquiry into the causes of hyperinflation in Zimbabwe. *Transport, 9*, 8.

Mhlanga, R., & Sibanda, M. (2013). An investigation of corporate financial strategies used by banking institutions during the hyper-inflationary period in Zimbabwe. *Mediterranean Journal of Social Sciences, 4*(13), 609.

Nyoni, M (2008). International Association for Research in Income and Wealth: Reviving the production of national accounts and implementing the system of national accounts (SNA2008). Retrieved from <http://*www.iariw.org/papers/2011/NyoniPaper.pdf*>

Pilossof, R. (2009). 'Dollarisation'in Zimbabwe and the death of an industry.

Sachikonye, L. M. (1999). *Restructuring or de-industrializing? Zimbabwe's textile and metal industries under adjustment* Nordic Africa Institute.

Seth, A., & Thomas, H. (1994). Theories of the firm: Implications for strategy research*. *Journal of Management Studies, 31*(2), 165-192. doi:10.1111/j.1467-6486.1994.tb00770.x

Siklos, P. (2000). Inflation and hyperinflation. *Oxford Encyclopedia of Economic History, 3*, 59-65.

Swanson, G. (1989). *The hyperinflation survival guide: Strategies for American businesses* Figgie International