



## The Impact of Dollarization Policy on Zimbabwe Exports: A Gravity Model Approach

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### ABSTRACT

This paper investigates the impact of dollarization policy on Zimbabwe exports over a period of 20 years. The study used panel data for 50 Zimbabwe potential historical trading partners. Random effects model (REM) was applied to estimate the gravity model equation. Panel feasible generalized least squares (FGLS) regression technique corrected for heteroskedasticity and contemporaneous correlation across panels was applied to probe factors that drive Zimbabwe export flows. The results provide insights on the impact of dollarization policy, GDP, bilateral exchange rate, SADC membership status and population on Zimbabwe exports. If monetary authorities involuntarily re-dollarize the economy owing to monetary autonomy erosion, emphasis should be directed towards internal devaluation which could be attained by measures intended to exert downward pressure on domestic costs, wages and prices to recuperate export competitiveness. Further, government has to create an environment that encourage foreign direct investment inflows to ease liquidity challenges probable to be experienced under dollarization regime. Nevertheless, macroeconomic fundamentals ought to be addressed with action to spur economic growth. Sufficient resources should be channelled towards increasing the country's productive capacity, and this can enhance country's ability to supply export products to the international market, and curb import growth.

**Keywords:** Dollarization Policy, Gravity Model, Zimbabwe

**JEL Classifications:** F60, F63, 63

### 1. INTRODUCTION

The evolution of Zimbabwe macroeconomic performance is highly related to the performance of the external sector. Zimbabwe is primarily dependent on natural resource sector's exports, particularly minerals and agriculture. Zimbabwe's the major export minerals are diamonds, platinum, nickel ores and gold (ZimTrade, 2015). The agricultural export-based commodities are tobacco, cotton, sugar and horticulture. Tobacco is the dominant cash crop in agriculture (Researve Bank of Zimbabwe, 2015a). However, other sectors of the economy, such as manufacturing and tourism contributes to Zimbabwe export earnings and overall

economic growth. The liberal reforms of the 1990s soon got into conflict with the antimarket land expropriation programme introduced in 2000. The programme was meant to address the skewed land distribution between black and white farmers, but this quickly closed up the economy (Buigut, 2015). Soon major drops in agricultural production, productivity, and overall economic growth besieged the economy, culminating in hyperinflation of about 231 million witnessed by 2008 (Koech, 2011). This general economic failure and loss of value of the Zimbabwean dollar led to the dollarization of the Zimbabwean economy in March 2009 (Buigut, 2015). The United States dollar was adopted as the economy's anchor currency (Reserve Bank of Zimbabwe, 2015b).

## 2. LITERATURE REVIEW

### 2.1. Hyperinflation and Dollarization of Zimbabwean Economy

Since 1980, the gap between exports and imports was very close, and even after the introduction of Economic Structural Adjustment programme (SAP) it remained unchanged. The introduction of Land reform programme contributed to the widening gap between exports and imports from 2000 to 2008. The period of low negative and high positive growth rates has been replaced with persistent recessions since 2000 when the country embarked on the fast track land reform programme. This programme has faced several problems, among them resources to finance the programme (Scoones, 2011). It has scared away investors, and strained relations with the western world and international institutions such as the World Bank (WB) and International Monetary Fund (IMF) (UNDP, 2009). It has become more difficult or impossible to raise new capital to stimulate economic growth. As a result, high unsustainable fiscal deficits stimulated inflation leading to hyper-inflation. Agricultural production and economic growth both tumbled.

A radical shift in the agrarian structure emerges as the large scale commercial farming declines replaced with the small holder farming sector characterized with low levels of capitalization (Scoones, 2011). The Land acquisition severely destabilized agricultural production affecting the overall economic performance. Inflation went up by 4.8% on average from 2000 to 2005 and then further increased to 80% by 2008 as measured by Gross domestic product deflator, which is the broadest measure of inflation (Gstraunthaler, 2011). This shrinkage was induced by the decline in agricultural production which was a major source of raw materials in the manufacturing sector (Saungweme, 2012). The quasi fiscal activities of the Reserve Bank of Zimbabwe (RBZ) also contributed to negative economic growth (World Bank, 2016). They culminated to hyperinflation, high exchange rate volatility and currency crisis in 2008 (Gstraunthaler, 2011). The nominal exchange rate was generally stable before the year 2000. However, in 2000-2008 the nominal exchange rate greatly depreciated escorted by high inflation levels. The harsh economic environment led to the full dollarization of the Zimbabwean economy by March 2009. But before the introduction of dollarization in Zimbabwe, however, they were major debates regarding this policy on whether to adopt it or not. It is defined by the Reserve Bank of Zimbabwe (2015) as the official use of foreign currency (currencies) on all transactions, except the need for coins. The foldup of major agricultural activities post land reform programme in 2000, trade and current account deficits increased, and worsened by the year 2008 as the country was relying mainly on imports.

Zimbabwe unilaterally abandoned its local currency and adopted a basket of currencies in 2009. The currencies adopted initially were the US dollar, Euro, UK Sterling pound, South African Rand and Botswana Pula. The introduction of dollarization regime anchored on the USD dramatically stabilized the economy with resumption of growth. The real average gross domestic product (GDP) growth rate was 8.5% during the 2009-2013. The recovery was temporary, so that by 2012 economic growth declined drastically due to

However, in 2014 the Reserve Bank of Zimbabwe introduced bond coins to alleviate change shortages in an economy that was predominantly using the United States dollar as its anchor currency. These major structural shifts have caused major internal and external imbalances as reflected in uneven and sluggish economic performance since independence, deteriorating internal and external positions (Reserve Bank of Zimbabwe, 2015b). Zimbabwe's current account deficit went up from an average of about 5% of GDP in the mid-2000s to an average of 22% in the past decade (World Bank, 2016). The current account deficits have reflected a real overvalued Zimbabwean dollar up until 2009, then an overvalued US dollar and then recently overvalued bond note (Reserve Bank of Zimbabwe, 2017). Overvalued currencies have caused loss of the country's external competitiveness on the international markets. South Africa remains Zimbabwe's major trading partner both in terms of imports and exports (Reserve Bank of Zimbabwe, 2014).

The Rand/US\$ exchange rate has become the key driver of the country's external position. The US dollar has continued to appreciate against the South African Rand negatively affecting exports which are priced in US dollars and encouraging imports (Reserve Bank of Zimbabwe, 2015b). This has resulted in accumulating trade and current account deficits, and escalating debt building up (Reserve Bank of Zimbabwe, 2015a). While the structure of the economy has greatly transformed as a result of the introduction of several micro and macroeconomic policy changes, Zimbabwe is still confronted with series of economic challenges post-independence. Maintaining internal and external balance has been a major challenge. The imbalances can be conceptualized as slow GDP growth, high inflation levels, overvalued Zimbabwean dollar, foreign exchange shortages and balance of payments (BOP) deficits (World Bank, 2016). Even after the introduction of dollarization regime to stop rampant inflation that had besieged the economy in 2008, internal imbalances have continued to show low GDP growth, Liquidity problems and cash shortages among others. External imbalances have shown foreign exchange shortages, emergency of black market, trade and current account deficits and balance of payments deficits. Further, post dollarization regime, the introduction of local currency in 2019 did little to solve the economic challenges affecting the economy. The exchange rate continues on a depreciating path reigniting debate among policy makers about specific policy interventions that need to be undertaken, to put back the economy on a recovery trajectory path. The high degree of currency substitution has imposed constraint on government's capability to manage macroeconomic conditions. The real danger is the actual loss of monetary autonomy if the local currency is officially removed from the local financial system. Thus, the study sort to examine the impact of dollarization policy on Zimbabwe exports using a gravity model approach. And to test the hypothesis that dollarization negatively affect export flows. The rest of the paper is organized as follows. Section 2 gives background on the origin of hyperinflation and the dollarization of the Zimbabwe economy. Section 3 reviews literature on economic causes, costs, benefits and impact of dollarization on trade. Section 4 describes the empirical methodology and the data. Section 5 presents and discusses results and policy implications, and section 6 concludes the study.

tight liquidity conditions which affected aggregate demand in the economy exacerbated by weak external sector competitiveness (RBZ 2015a). The deficits of trade and current account remained very high in the year 2014 (ADBG, 2014). The trade and current deficits went up from 24% of GDP in 2012, to 28% of GDP in 2013 and 25 % of GDP in 2014 (RBZ, 2014; ZEPARU, 2015). The World Economic Forum's Global Competitiveness index ranked Zimbabwe number 124 out of 144 countries far below most of its regional competitors (RBZ, 2015b). It indicated that Zimbabwe's exports were relatively uncompetitive in the world market. RBZ attributed the weak international competitiveness on the overvalued exchange rate of the USD which was the dominant currency in both public and private sector transactions. The appreciation of the dollar created a strong appetite for imports causing chronic trade and current account deficits. In the recent past, there has been an increase in calls in some quarters to re-dollarize the economy as the exchange rate continues on a depreciating path. The high degree of currency substitution post dollarization regime has become the virus that threatens to obliterate the role of recently introduced local currency in the domestic financial system. The depreciation of the exchange rate and Inflation upsurge led citizens to pursue alternative stores of value which in this case the US dollar. The high degree of currency substitution that has now occurred, has reflected market pressures and preferences at play. This have imposed constraint on government's capacity to manage macroeconomic conditions. Hence, the threat will be the actual loss of monetary autonomy if the local money is formally eliminated from the local financial system.

## 2.2. The Economic Causes, Benefits and Cost of Dollarization

Dollarization is a common regularity in transitional and developing economies. The possible causes of dollarization is due to large exchange rate depreciation and persistent of high inflation levels. Dollarization is a gradual process, as domestic inflation rate increases, economic agents do not expeditiously abandon local currency for foreign substitutes, but rather the use of foreign currency in domestic transactions gradually grow with the increase in domestic inflation rate. Rational economic agents switch to an alternative currency with high degree of purchasing power strength against a background of high inflation and exchange rate devaluation expectations. Evidence has shown that in some instances, countries that experience high inflation, the economy automatically dollarize as residents use foreign currency as the store of value. When the country's monetary autonomy has been eroded due to failure by the monetary authorities to control high inflation and large exchange rate depreciations. The country will be forced to abandon its local currency and officially dollarize its economy. Foreign currency will be allowed to be used as a unity of account and finally as the official medium of exchange. Dollarization policy will then bring exchange rate stability and tame down the rampant inflation (Berg and Eduardo, 2000). Official dollarization is when a country allow a foreign currency (currencies) to be a full legal tender and reduce its own currency if any to a secondary role and only issued in coins but having a small value. Usually, under such arrangement there will be no risk of currency crisis. The adopted currency (currencies) will be used for both private and public transactions. However, full dollarization

is relatively more difficult to reverse compared to currency board arrangements (Makochekeka, 2013).

Unofficial dollarization follows when domestic residents of any given country hold a large proportion of their financial wealth in foreign currency dominated assets. The foreign currency would not be a legal tender according to the country's financial or monetary laws. Under such circumstances the US dollar or any other foreign currency will be extensively used in private transactions as a medium of exchange, unit of account, store of value and standard of deferred payments. However, dollarizing an economy that has been under hyperinflation has benefits and costs to the dollarizing country (Curutchet, 2001). If a country dollarize its economy it has the ability to stabilize inflation and this has been evidenced in Zimbabwe when the country dollarize its economy post 2008 hyperinflation and financial crisis. The multicurrency regime managed to halt the high inflation level which was prevailing over that period. The dollarizing country's inflation is closely linked to the anchor country's inflation rate. This is because the dollarizing country will be relying on anchor country's monetary policy (Koech, 2011). Dollarization reduce administrative expenses. The government of the dollarizing country will not bear the cost of maintaining an infrastructure devoted exclusively to the production and management of local currency for example printing money. These savings will be significant particularly to a country that has been facing economic challenges and such savings can be channeled to other productive sectors of the economy (Cohen, 2000).

Dollarization supports the establishment of a sound financial sector. A sound financial sector would be created through financial integration with the anchor country. Domestic financial institutions will be forced to improve in efficiency and service quality. Dollarization can result in irreversible institutional change. Where institutions will be committed to low inflation, fiscal responsibility, and transparency (Cohen, 2000).

It can result in lower interest rates. Dollarization could result in interest rate drop for local borrowers. It lowers the level and volatility of domestic interest rates (real and nominal interest rates) through eliminating the risk of devaluation, thus eradicating the devaluation-risk premium in local currency interest rates. The government can achieve instant credibility without investing heavily in building market confidence using its own monetary policy (Nkomazana and Niyimbanira, 2014). Dollarization can stimulate the development of domestic long-term capital markets through eradicating high inflation risk and currency devaluation. This is due to the fact that monetary policy is exogenously determined by the anchor country. Thus, the dollarizing country cannot devalue the anchor currency it has adopted. The adopted currency (among other factors) brings confidence that motivates investors both locally and internationally to take part in the long term capital markets (Berg and Eduardo, 2000). Further, dollarization can lower transaction costs. The use of the anchor currency which is highly traded and convertible such as the US dollar unlike the local currency, transaction costs in international trade and investments will be significantly reduced since there will be, if any, no need for currency conversions in international transactions. Nevertheless, dollarization costs

counterbalances benefits that accrue to the dollarizing country. The dollarizing country will not be able to use its monetary policy since it will be exogenously determined by the anchor country. Thus dollarization infers the forfeiture of autonomous monetary authority. The dollarizing country will not be able to unilaterally use its monetary policy to control the level of money supply in the economy or exchange rate. If the dollarizing country adopts the US dollar for instance as its anchor currency, the authority to use monetary policy is automatically relinquished to the US Federal Reserve. Usually, when monetary decisions are made in the anchor country, the dollarizing country's economic circumstances will not be taken into consideration. Generally, when the country resolve to dollarize there is high likelihood that the country's monetary autonomy will have been completely rendered useless. This is because there will be high degree of currency substitution before the decision to dollarize the economy is taken.

Further, dollarization result in seigniorage revenue loss. By dollarizing, the country forgo the capacity to create money otherwise known as seigniorage. Seigniorage is the interest income earned by the central bank through issuing non-interest bearing money to buy interest-bearing assets. The interest is part of government revenue since a country's central bank is part of its government. Thus seigniorage can be considered as state alternative revenue source beyond what can be raised via taxation or through borrowing from financial markets at home or abroad (Makochekeka, 2013). With dollarization, the country will not be able to use inflation tax (revenue of last resort) through money printing in national emergency situations. Usually, when government prints money it generate inflation in the process, hence it charges an implicit inflation tax to the citizens holding the local currency. Due to inflation the real money value declines over time, thus inflation acts like a tax levied on those who hold the local currency. Therefore, if the country dollarize, government can no longer print money and so it can no longer use inflation tax (Cohen, 2000). The bank lender of last resort function vanish owing to dollarization. The dollarizing country domestic banks may become vulnerable to potential liquidity risks. The central bank will not be able to intervene during financial crisis. The central bank can, however, avert domestic financial crisis given that dollarization usually reduce the overall need for international reserves, since external transactions that used to involve foreign currency is now considered as domestic transaction equivalent. Thus the percentage of the central bank's dollar assets could then be devoted to a public stabilization fund that will bail out domestic financial institutions under stress. An alternative channel is setting up of a contingency fund with foreign banks through using future tax revenue as collateral (Klein, 2002). The dollarizing country will be unable to adjust exchange rate in precarious circumstances. The fact that the dollarizing country and the anchor country differ economically, necessitates that exchange rate policies have to be tailored to complement the dollarizing economic conditions. The loss of control over exchange rate policy could expose the country's economy to external shocks given the highly integrated global markets (Berg and Eduardo, 2000).

### 2.3. The Effect of Dollarization on Trade

There have been studies conducted on the impact of dollarization on trade. A series of published papers regarding the effect of

dollarization have come to different conclusions regarding the effect of dollarization policy on trade flows. The research on the effect of multicurrency arrangement on Zimbabwe bilateral trade over a period from 2004 to 2012 using a total of 50 Zimbabwe major trading partners, the results from the gravity model suggest that the multicurrency regime negatively affected bilateral trade by 15%. (Buigut, 2015). According to Makochekeka and Chimombe (2014) investigated the impact of dollarization on trade with countries that shared same currency during the dollarization policy regime. A gravity model approach was used for the study. However, the findings showed that dollarization had positive but insignificant impact on Zimbabwe exports to countries it shared the same currency with. Further (Nkomazana and Niyimbanira 2014) cited Nakunyada and Chikoko (2012) who tested the stationarity of the current account deficit as well as examining the cointegration of exports and imports between 1990 and 2012. The results indicated that during the dollarization period the country's current account deficit and external sector position has been unsustainable. Thaver and Bova (2014) applied the bounds testing approach to cointegration to estimate Ecuador's export demand function with the US between 1965 and 2011 with special focus on impact of dollarization on exports.

The study results revealed that dollarization had a significant negative inelastic long and short run impact on Ecuador's exports to the US. Edwards and Magendzo (2003) analyzed the macroeconomic record of dollarized economies. They investigated whether dollarization is associated with lower inflation and faster growth. A matching estimator technique was applied to analyse the data. The results suggest that inflation has been very low in dollarized countries than non-dollarized countries. Further, economic growth was lower in dollarized economies compared to non-dollarized economies. In case of high internal pressure to re-dollarize the economy as a result of inflation with government allowing the USD dollar to work along the local currency, insights from Korab and Heryan (1934) could help to understand how such a policy could affect the stability of local currency. They investigated the impact of nominal exchange rate volatility on banking deposits in two currencies in two parallel currency markets in South America, Chile and Argentina, where the national currency operates along with the US dollar. The use of GARCH model suggest that the increase in volatility of nominal exchange rate affects negatively deposits in national currency and positively deposits in the US dollar. This is because "bad currency drives out the good one Gresham's Law and could be the same situation that is unfolding in Zimbabwe under the current economic conditions post dollarization policy.

### 2.4. The Gravity Model Historical Development and its Specification

The gravity model of international trade concept is centered on Newton's law of Universal Gravitation. The equation relates to the attraction force between two objects to their combined mass and to the distance separating them. The gravity model has been useful in estimating impact of several factors on international trade in many studies. Application of gravity model

on international trade, however, was first proposed by James Stewart in the 1940s. Tinbergen (1962) first applied the model to international trade. The model predicts bilateral trade flows between countries as a function of their size and the distance between them. With economic size measured in terms of gross domestic product (GDP) or population/per capita income, distance is measured by means of distances separating capital cities of trading partner countries (Anderson and Wincoop, 2003). With regards to gravity model empirical work predated theories, several researchers have been able to prove beyond doubt that the gravity model fundamental assumptions can be derived from wide range of trade theories. The theoretical bases for gravity model application is a derivative of previous trade models such as Ricardian and the factor proportions theory or Heckscher-Ohlin trade model. Evidence from a series of published papers has shown that gravity model can be derived from both Ricardian and HO models. Adding to that, Anderson (1979) as well specified that the gravity framework is consistent with a world trade model in which products are differentiated by the country of origin (Muganyi and Chen, 2016). Though research on gravity model theoretical bases is still underway, its predictive power in international trade analysis has proved to be important.

When natural logarithms of the equation derived from Newtonian physics are taken, it results in the following basic form of gravity model equation.

$$\ln X_{ij} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln D_{ij} + \varepsilon_{ij}$$

where:

$X_{ij}$  denotes the monetary value of trade between nation  $i$  and nation  $j$ .

$\beta_0$  Is a regression constant.

$\beta_{1-3}$  are regression coefficients.

$GDP_i$  symbolizes the Gross Domestic Product of country  $i$ .

$GDP_j$  symbolizes the Gross Domestic Product of country  $j$ .

$D_{ij}$  is the distance in between country  $i$  and  $j$ .

$\varepsilon_{ij}$  is an error term.

From the above log linearized gravity model equation, it can be shown that countries with larger economic sizes in terms of GDP are likely to trade more whereas countries further apart in terms of distance are anticipated to trade less owing to indirect higher trade costs. Current studies have shown that the model specification can be improved through addition of other variables that may possibly impact trade flows between countries. The variables include dummy variables such as common language, common borders and colonial ties among countries. Further, the model can as well be used for evaluating policy effectiveness, for instance, impact of common currency or dollarization policy on trade flows between countries (Glick and Rose, 2001).

### 3. METHODOLOGY

To discover the impact of dollarization policy on Zimbabwe trade flows, the study applied the gravity model approach. The model includes the multilateral resistance or country effects by cooperating dummy variables that capture effect of regional

integration agreements, language and colonial ties among trading partner countries.

#### 3.1. Data Sources

This study uses panel data. The secondary data is collected for 20 years spanning from 2001 to 2020 with potential Zimbabwe 50 historical trading partners. The uni-direction trade data in nominal US dollars was sourced from IMF's Direction of Trade Statistics. The study has 50 countries and 20 years hence there are  $(2 * N * N - 1 * T) = 98,000$  bilateral trade data points since each trade flow is reported as import and export. And there were 1000 observations with 112 missing values in the data. The data for GDP and population were collected from World Bank Development Indicators database. Exchange rate data were sourced from the IMF International Financial Statistics database. Other variables that are expected to influence trade flows such as distance between trade partners, contiguity, common languages, and colonial relations are sourced from the Institute of Research on International Economy (CEPII) data base. Distance is reported in kilometers and the variable is used to capture trade costs or barriers to trade in the model. The study covers Africa, Asia, Western Europe, Eastern Europe, North and South America and the countries are listed in the Appendix 1.

#### 3.2. Empirical Model

The following specification of the gravity model expressed in natural logarithmic form is applied for this study:

$$\ln \text{Exp}_{ijt} = \beta_0 + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln N_{ij} + \ln \beta_4 D_{ij} + \ln \beta_5 \text{Ex}_{ijt} + \beta_6 \text{Doll}_{it} + \beta_7 \text{SADC}_{ij} + \beta_8 C_{ij} + \beta_9 L_{ij} + \varepsilon_{ijt}$$

The variables in the above stated model denote the following:  $i$ : Country 1 (Zimbabwe)  $j$ : 2, 3, 4, 5, ..., 50 (Partner Countries)  $t$ : 2000, 2006, 2007...2020.

$\text{Zim Exp}_{ijt}$ : Zimbabwe exports with country  $j$  in year  $t$ .

$GDP_{it}$ : Zimbabwe's GDP in year  $t$ .

$GDP_{jt}$ : GDP of partner  $j$  in year  $t$ .

$\text{Doll}_{it}$ : Dummy variable for dollarization policy (1=dollarization period, 0 = otherwise).

$N_{it}$ : Population of country  $i$  (Zimbabwe) in year  $t$   $N_{jt}$ : Population of partner  $j$  in year.

$t$ .

$D_{ij}$ : Distance between Capitals of Zimbabwe and country  $j$ .

$\text{Ex}_{ijt}$ : Exchange rate between Zimbabwe and country  $j$  in year  $t$ .

$\text{SADC}_{ij}$ : Dummy variable showing whether partner country is part of SADC. (1 = SADC, 0 = Otherwise).

$C_{ij}$ : Dummy variable for common colonizer (1 = trading partner has common colonizer with Zimbabwe, 0 = different colonizer).

$L_{ij}$ : Dummy variable for language (1 = trading partner shares a common language with Zimbabwe, 0 = no common language).

$\varepsilon_{ijt}$ : Error term.

Zimbabwe GDP indicates the country's production capacity and ability to supply export products on the international market. GDP of importing or receiving country indicates the purchasing power and absorption capacity. Populations in trading countries are important factor enhancing trade flows. Population represents the importer's market size and absorption capacity.

### 3.3. Estimation Procedure

In econometric analysis, the application of panel data has several advantages, in particular it becomes possible to analyze variables at various levels commonly referred to as hierarchical modeling. Relevant to this study, panel data permits the control for variables that are difficult to observe or measured. Nonetheless, the leading methods for analyzing panel data are Pooled model, fixed effects model (FEM) and random effects model (REM). Entities respectively have their individual features which may affect explanatory variables called individual effects. For instance, infrastructure may not be included in the model but still affect trade flows of each country in the model. If individual effects are absent in the model, a pooled model will be more preferable. And if individual effects happen to exist in the model, then FEM and REM will be chosen (Nicita, 2013). FEM controls for time invariant variances between two countries. Applied primarily when the focus of the study is to evaluate the effect of predictor variables that vary over time. It controls for time invariant factors such as the political system of a particular country which may affect trade flows. The omission of time invariant factors presents bias to the fixed effects model principally on the slow changing variables.

FEM assumes that a certain factor within a country may affect or bias the predictor outcome. It as well omits the impact of time invariant characteristics as aforesaid, this is essentially to precisely evaluate the net impact of predictor variables on the principle or outcome variable. The principal challenge of FEM is that time invariant variables cannot be estimated directly in this model (Muganyi and Chen, 2016). Hence variables such as culture and distance between countries will not be supported in the FEM. The quintessential insight in the fixed effect model is that if the unnoticed/undetected/unobserved variable does not vary over time, hence, any variation in the outcome variable must be owed to other effects than these fixed features. The important distinction between fixed and random effects is on whether unobserved individual variable impact expresses characteristics that are correlated with independent variables in the model not on whether the influences are stochastic or not. Conversely, the REM assumes that the change across entities is random and uncorrelated with the outcome variable within the model. The REM allows the inclusion of time invariant variables, which are however absorbed in the intercept when FEM is applied. In the REM there is need to specify individual features that may possibly or may not impact the predictor variables. The difficult with this is that some variables may not be obtainable thus leading to omitted variable bias in the model (Oscar, 2007). Centered on the above discussion, the REM is applied for this study using Panel FGLS regression method corrected for heteroskedasticity and contemporaneous correlation across panel. Hausman test used to test for the presence of random effects in the model. Further Breusch-Pagan LM test was utilized to test for cross sectional correlation and an LR test was as well use to test for heteroscedasticity across panels.

## 4. RESULT DISCUSSION AND POLICY IMPLICATIONS

To find the best method to estimate the gravity model equation, the Hausman test was conducted to test for cross section random

effects. The null hypothesis is that Random effect model is appropriate and the alternative hypothesis is that fixed effect model is appropriate. The probability of the housemen test was above 5% level of significance meaning that we accept the null hypothesis that the REM is most appropriate for the study (Table a in appendix). Thus, our estimation results are based on the random effect model. The sample size was big enough and so the impact of multicollinearity on estimated results was controlled. Further, Breusch-Pagan LM test was utilized to test for the presence of heteroskedasticity and contemporaneous correlation. However, the test indicated that there was cross sectional dependence and heteroscedasticity across panels (Table b and d in appendix). To correct for these a FGLS specification was used for correcting heteroskedasticity and contemporaneous correlation across panels. The estimated results in table below indicates that Zimbabwe exports are influenced by Dollarization policy, SADC membership status, Trading partner countries GDP, Zimbabwe GDP, Zimbabwe bilateral exchange rate, Population of partner countries.

### 4.1. Impact of Dollarization Policy on Exports

The period under dollarization policy was significant at 1% level with a negative coefficient of 1.028681. Hence the period under assessment when Zimbabwe adopted USD as the country's anchor currency had a negative but big impact on exports of -64% i.e.,  $100(e^{-1.028681}-1)$  between Zimbabwe and its 50 historical major trading partners. It indicates that Zimbabwe's exports were relatively uncompetitive in the world market, which can be attributed to the weak international competitiveness on the overvalued exchange rate of the USD which was the dominant currency in both public and private sector transactions. Higher prices of domestically produced goods are uncompetitive in the international market. Thus, the appreciation of exchange rate reduces export volumes and increase the appetite for imports. The cost of a basket goods in Zimbabwe over that period perhaps was very high compared to the cost of goods of its trading partners. These results confirm findings of other researchers on the impact of dollarization on trade. Conferring to the research carried out on the effect of dollarization on Ecuador exports. It has been found that dollarization negatively affected Ecuador's competitiveness as its exchange rate appreciated, making its goods more expensive than its trading partners (Thaver and Bova, 2014). However, some proponents of dollarization policy as well acknowledged that dollarization undesirably affect export growth. The recent internal pressures to re-dollarize the economy requires an understanding of what they ought to focus on in the event that de-dollarization process fails. Policy makers ought to rely on internal devaluation, since under dollarization policy, monetary and exchange rate policies are exogenously determined, internal devaluation can be attained by measures designed to exert downward pressure on domestic costs, wages and prices. As well, government has to create an environment that encourage foreign direct investment inflows to address liquidity challenges likely to be experienced under dollarization regime.

### 4.2. Impact of GDP

Zimbabwe GDP was positive with a coefficient of 2.527158 and significant at 1% level. A 10% increase in GDP could

**Table 1: Estimation results**

Variable	Dependent variable Zimbabwe exports			
	Coefficient	Std. Error	t-Statistic	Prob.
Common colonizer	-0.446518	0.531837	-0.839577	0.4014
Common language	-0.458985	0.503382	-0.911804	0.3621
Dollarization policy	-1.028681	0.171176	-6.009500	0.0000
SADC membership status	3.362263	1.053501	3.191513	0.0015
LN GDP of partner countries	0.359306	0.148732	2.415790	0.0159
LN Zimbabwe bilateral exchange rate	-0.032718	0.010892	-3.003732	0.0027
LN Distance	-0.091136	0.464524	-0.196193	0.8445
LN Population of partner countries	0.421688	0.167250	2.521311	0.0119
LN Zimbabwe GDP	2.527158	0.487964	5.178983	0.0000
Constant	-53.60932	11.77567	-4.552550	0.0000

Source: Researchers' own estimation. Significant at 1% level

increase exports by 250%. It indicates the country's production capacity and ability to supply export products to the international market. Thus Zimbabwe has to focus on addressing economic fundamentals affecting economic growth. The GDP of Zimbabwe historical trading partners was positive with a coefficient of 0.359306 and significant at 1% level. A 10% increase in GDP of importing or receiving country surge the demand of Zimbabwe exports by 35%. Hence the rise in GDP of trading partners as well increase the purchasing power and absorption capacity of these countries. Zimbabwe policy makers have to pay particular attention to trade cycles and take advantage during periods of high GDP growth rates in trading partner countries.

#### 4.3. Zimbabwe Bilateral Exchange Rate

Exchange rate has a significant negative coefficient of  $-0.032718$  at 1%. A decrease in the exchange rate suggests that the appreciation of the local currency makes the exportable goods expensive. This implied that appreciation of exchange rate has implication on Zimbabwe export growth. A 10% appreciation of the exchange rate has a 3% negative effect on exports. The appreciation of the local currency may cause locally produced goods to be more expensive when compared to same basket of goods produced in other countries, making exports expensive. The findings concur with theoretical predictions that the exchange rate movements are positively related to export growth.

#### 4.4. Effect of SADC Membership Status

The coefficient for regional integration was positive 3.362263 and significant at 1% level. The fact that Zimbabwe is a SADC member country and the countries as well share the same continent, this had positive impact of 2896% i.e.,  $100(e^{3.4}-1)$  on exports in the SADC region. This could be the result of geographic proximity and bilateral trade agreements signed in the region. However, since South Africa is the major historical trading partner in the region both in terms of imports (43%) and export (19%) volumes, its economy is larger when compared to that of Zimbabwe, hence it has the capacity to absorb Zimbabwe exports.

#### 4.5. Impact of Population, Common Language Common Colonizer and Distance

The population coefficient was positive 0.421688 and significant at 1% level, demonstrating that the greater the population in the partner countries has a positive impact on Zimbabwe exports. A 10% increase in population may lead to 42% in demand for Zimbabwe exports. If the population in trading partner countries is high it create the market and increase demand for Zimbabwe exports. Thus population in trading partner countries is an important factor that enhances trade flows. Population represents the importer's market size and absorption capacity. The coefficient of distance is negative but insignificant to explain variations in Zimbabwe exports to its 50 trading partners. However, it confirms that the greater the distance between countries the lower their trade due to higher trade costs. The common language and colonizer variables were nevertheless not significant in the study.

### 5. CONCLUSION

The focus this paper was to examine the impact of dollarization regime on Zimbabwe exports. Several studies have been conducted in this area using the gravity model approach. Nevertheless, few if none have focused on the impact of dollarization policy, which was put in place post 2008 hyperinflation. The conclusions of the study indicated that dollarization policy, GDP, bilateral exchange rate, SADC membership status and population explains most of the variation in Zimbabwe exports. When Zimbabwe adopted USD as the country's economic anchor currency in 2009, the dollarization policy is found to have a negative impact on exports of 64% between Zimbabwe and its 50 historical trading partners. Still, post dollarization high inflation rate threatened to weaken the recently introduced bond notes. This have renewed calls to re-dollarize the economy. The unofficial economy re-dollarization in the recent past between year 2018 and 2020 have undermined the role of local currency in the domestic financial system. Nonetheless, if government going forward is forced to re-dollarize the economy, focus should be directed on the real exchange rate devaluation. The devaluation of the real exchange rate is achieved by addressing cost drivers that make locally produced goods uncompetitive on the international market such as high electricity, water, borrowing and labour costs, poor infrastructures, high transportation, multiplicity of fees and charges, tariff policy and cumbersome regulations and procedures without lowering the nominal exchange rate value. This should improve competitiveness of tradable goods under dollarization policy. Further, bilateral exchange rate was found to influence exports. A 10% appreciation of the exchange rate has a 3% negative effect on exports. Monetary authorities ought to put in place exchange rate policies that favour export growth. There is also need to address economic fundamentals to stimulate GDP growth.

It has been found that a 10% increase in GDP could increase exports by 250%. If enough resources are channelled towards increasing the country's production capacity, this will enable the country to have the ability to supply export products to the international market, and curb import growth. Also, attention should be paid to GDP growth rates of Zimbabwe trading partners. Because evidence from the study shows that a 10% increase in GDP of importing

or receiving country increase the demand of Zimbabwe exports by 35%. Zimbabwe could take advantage of boom cycles in the global economy, since demand will be at its pick. Same applies to global population growth, population presents opportunity by creating market and demand for the country's domestically produced goods. Evidence from this study indicated that a 10% increase in partner country population may lead to 42% demand for Zimbabwe exports. SADC membership status was found to have a positive impact on export growth of 2896%. Thus countries in the SADC region should focus on lowering the barriers to trade and simultaneously taking full advantage of geographic proximity that permit the lowering of trade costs. This could be used as a route to improve trade and economic growth of the countries in the region. The above estimated results are not exclusively irrefutable due to a number of panel data econometric manipulation restrictions as well as the integral limitation of the gravity model application in trade enquiries. Notwithstanding the aforesaid glitches, we powerfully accept as true that the study delivers great insights on the influence of dollarization policy, GDP, bilateral exchange rate, regional integration and population on Zimbabwe exports. These are important insights particularly at a time when the monetary authorities are under pressure to re-dollarize the economy.

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## APPENDIX 1

**Table 1a: Correlated Random Effects - Hausman Test**

Correlated random effects - Hausman test			
Test cross-section random effects			
Test summary	Chi-sq. Statistic	Chi-sq. d.f.	Prob.
Cross-section random	0.000000	6	1.0000

**Table 1b: Residual Cross Section Dependence Test**

Residual cross section dependence test		
Null hypothesis: No cross section dependence (correlation) in residuals		
Breusch Pagan LM		
Model	Chi-sq	Prob.
Random effects	5212.204	0.56560

**Table 1c: Likelihood ratio test**

Null hypothesis: Homoscedastic		
Likelihood ratio test		
Model	Chi-sq	Prob.
Random effects	4712.204	0.43520

**Table 1d: Zimbabwe historical trading partners**

Zimbabwe historical trading partners				
United States	Italy	Denmark	Russia	Israel
United Kingdom	India	Philippines	Portugal	Sweden
Germany	Singapore	Egypt	Senegal	Malawi
Japan	Uganda	Hungary	Mexico	Namibia
China	Poland	Australia	Turkey	Botswana
France	Malaysia	Finland	South Korea	Zambia
South Africa	Canada	Kuwait	Brazil	Vietnam
Belgium	Mauritius	Indonesia	Burundi	New Zealand
Netherlands	Greece	Ireland	United Arab Emirates	Mozambique
Kenya	Switzerland	Czech Republic	Morocco	Nigeria