MILITARY EXPENDITURE AND THE ECONOMY OF ZIMBABWE

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Abstract

This study examines the causal relationship between military expenditure and economic growth in Zimbabwe. The causality relationship between government military expenditure and economic growth has so far received attention from many economists, the dominant ones being Wagner (1890) and Keynes (1936). According to literature, there currently exist four perspectives around the causality relationship military expenditure and economic growth. The first perspective by Keynes (1936) suggests that military expenditure spur economic growth whilst the second perspective by Wagner (1890) mentions that economic growth affects military expenditure. The third perspective says both military expenditure and economic growth affects each other whilst the fourth perspective suggests the existence of no causality relationship at all between military expenditure and economic growth. The results of this study proves that military expenditure does not directly influence economic growth whilst economic growth does also not directly influence military expenditure both in the short and long run.

Key Words: Zimbabwe, Military Expenditure, Economic Growth, Co-Intergration

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1. Introduction

The study investigates the causality relationship between government military expenditure and economic growth in Zimbabwe. Though there have been quite a number of empirical studies on the causality relationship between government military expenditure and economic growth, the results are not yet conclusive. Wagner (1890) and Keynes (1936) are the two most dominant economists with their opposing perspectives in as far as the causality relationship between government military expenditure and economic growth is concerned.

The Keynesian perspective which was advocated for by Keynes (1936) suggested that government military expenditure is crucial in stimulating economic growth. A panel data analysis by Wijeweera and Webb (2011) discovered that military expenditure had a positive but negligible influence on economic growth across all South Asian countries that include India, Pakistan, India, Bangladesh, Sri-Lanka and Nepal. A 1% increase in military spending was found to have positively impacted on economic growth by a mere 0.04% in all the five South Asian countries (Wijeweera and Webb, 2011). According to Pieroni (2009), military spending impacted negatively on economic growth in countries with a huge defense budget. On the contrary, military expenditure had an insignificant positive influence on economic growth in countries whose defense budget is small both in the short and long run, revealed Pieroni (2009).

According to Wagner's theory (1890), economic growth positively influences government military expenditure. Using panel data analysis, Kollias et al (2004) discovered that economic growth positively influenced military expenditure across all the European Union countries that were under study. The feedback perspective explains that both government military expenditure and economic growth affect each other. In the long run, both military expenditure and economic growth were found to have influenced each other in Turkey (Karagol and Palaz, 2004). Kollias et al (2007) however discovered that both military spending and economic growth influenced each other in the long run in all the EU15 group of countries.

According to the no relationship perspective, there is no relationship at all between government military expenditure and economic growth. Kollias et al (2004) discovered no causality relationship between government military expenditure and economic growth in either direction in five European Union countries.

For a country like Zimbabwe whose yearly government military expenditure budget eclipses other government civilian expenditure budgets, the role of military expenditure on economic growth requires a thorough investigation. It is for this reason that the current study attempts to examine the relationship between government military

expenditure and economic growth in the context of Zimbabwe, using the Auto Regressive Distributed Lag (ARDL) bounds testing approach. The findings from this study will not only be helpful to Zimbabwe economic policy makers but also to the academia in form of an additional empirical study.

Time series data ranging from 1988 to 2012 is used to examine the causality relationship between government military expenditure and economic growth. Stationarity tests of both sets of data is first performed to determine the extent of data volatility and then followed by the co-integration test (ARDL-bounds testing procedure) to determine the existence of a long-run relationship between government military expenditure and economic growth. Granger causality test is then lastly done to examine the

directional causality relationship between government military expenditure and economic growth.

The study employs military expenditure (% of GDP) as a proxy for military expenditure and GDP per capita as a proxy for economic growth.Part 2 looks at the military and economic growth trends in Zimbabwe whilst part 3 presents a review of related literature. Part 4 deals with research methodology, part 5 conclude the study whilst part 6 looks at the bibliography.

2. Military Expenditure and Economic Growth Trends in Zimbabwe

The military expenditure for Zimbabwe during the period between 1988 to 2012 is characterized by fluctuations (see Figure 1).

Figure 1. Military expenditure (US$) trends for Zimbabwe (1988-2012)
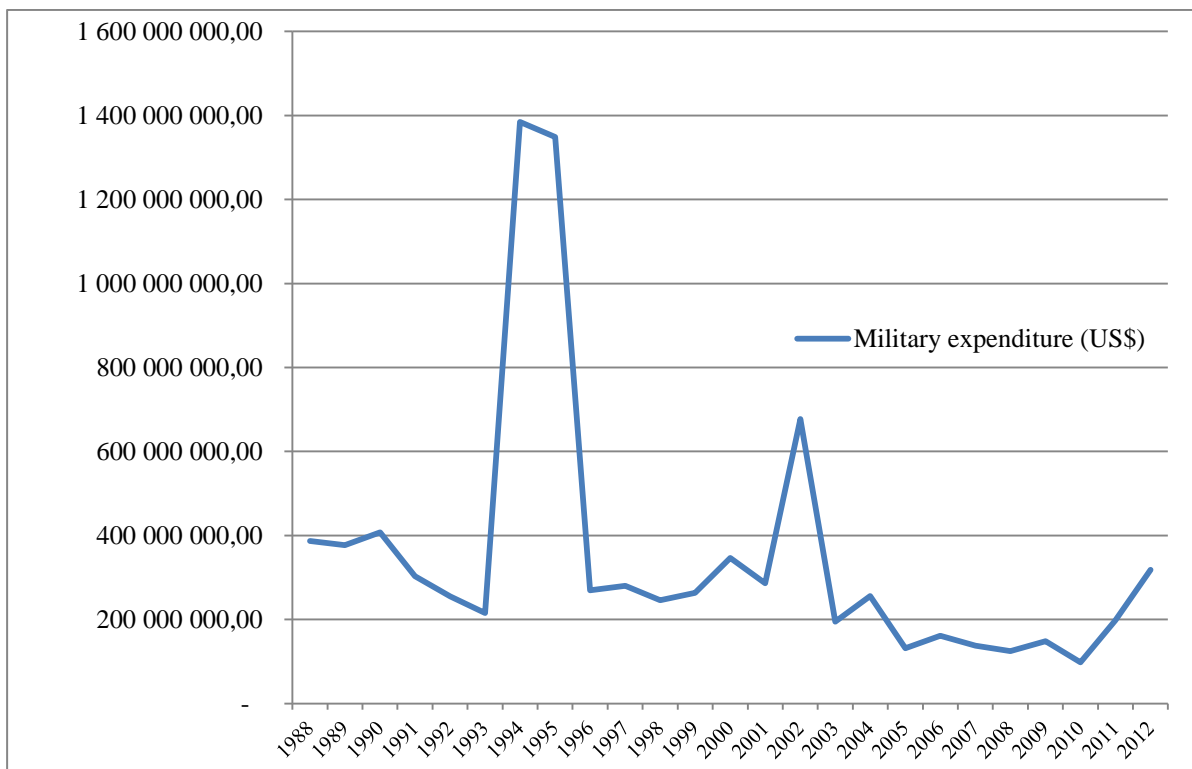
Source: World Bank (2012)

World Bank (2012) statistics shows that military expenditure went up by 5.21%, from US$387.23 million in 1988 to US$407.41 million in 1990, whilst GDP per capita increased from US$793 to US$839 during the same period. The period from 1990 to 1995 saw military expenditure growing by a massive 231%, from US$407.41 million to US$1.349 billion. The same period saw GDP per capita declining by 27.23%, from US$839.61 in 1990 to US$610.97 in 1995. The subsequent five-year period recorded another decline in GDP per capita from US$610.97 in 1995 to US$535.04 in 2000 whilst military

expenditure also declined from US$1.349 billion to US$346.31 million during the same period.

Military expenditure plummeted further by 62.06% between 2000 and 2005, before experiencing another huge decline, by a further 25.19%, from US$131.40 billion in 2005 to US$98.30million in 2010. On the other hand, GDP per capita went down by 15.37% between 2000 and 2005. The next five year period saw GDP per capita increasing by 25.54%, from US$452.79 in 2005 to US$568.43 in 2010. Both military expenditure and GDP per capita recorded positive growth between 2010 and 2012.

Military expenditure grew by a massive 223.50%, from US$98.30 million in 2010 to US$318 million in 2012. GDP per capita went up from US$568.43 in 2010 to US$714.23 in 2012, representing a 25.65% increase.

Figure 2. Military expenditure (% of GDP) and GDP per capita % change trends for Zimbabwe – 1988 to 2012
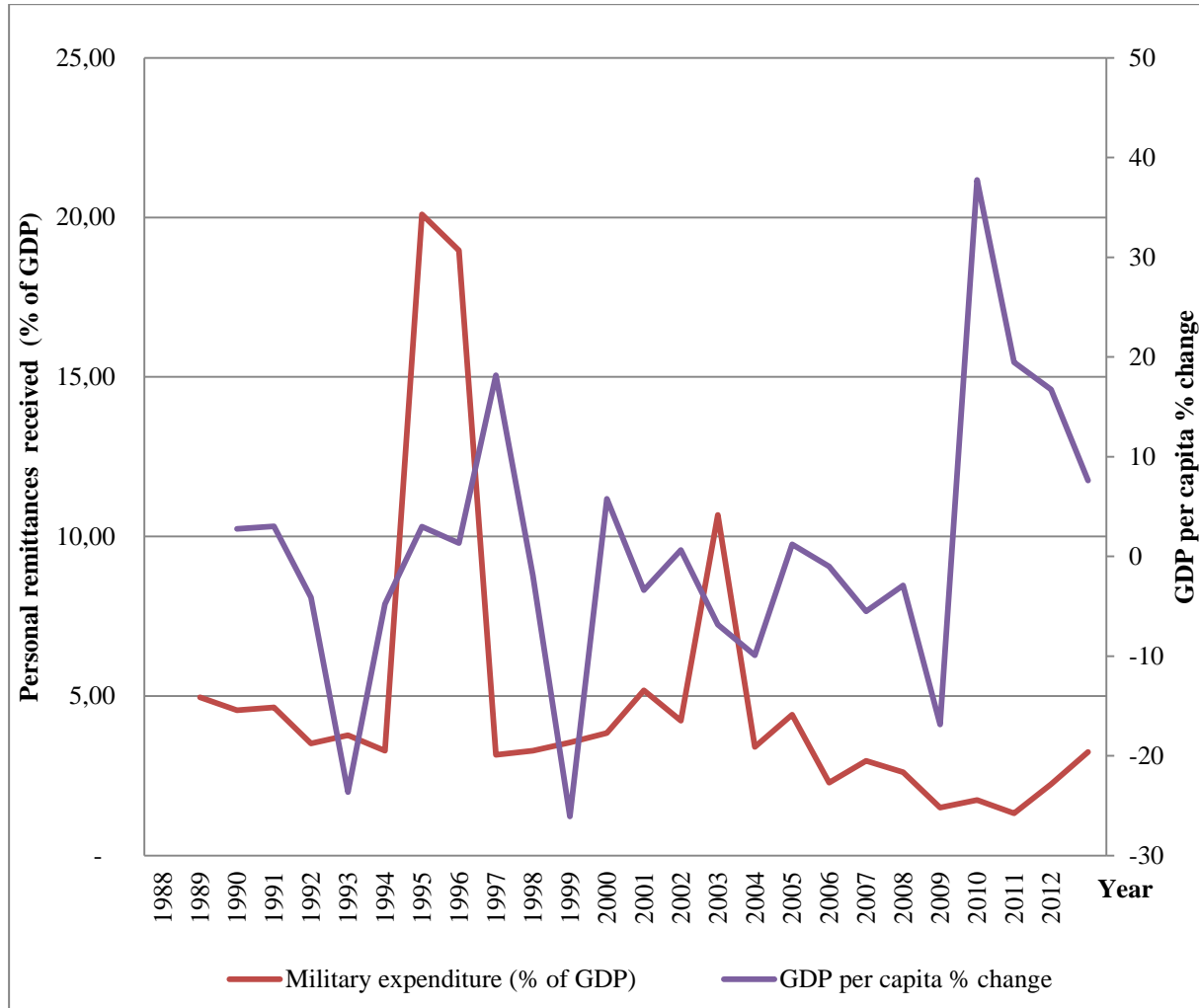
Source: World Bank (2012)

Military expenditure (% of GDP) went down from 4.96% in 1988 to 4.64% in 1990, representing a decline by 0.32 percentage points. However, military expenditure 9% of GDP) recorded a massive growth by 14.33 percentage points during the period 1990 to 1995 before plunging by a 13.79 percentage points, from 18.97% in 1995 to 5.18% in 2000. Moreover, military expenditure (% of GDP) continued on a downward spiral between the period 2000 and 2005 and 2005 and 2010. The period 2000 to 2005 was characterised by a 2.89 percentage points decline in military expenditure (% of GDP), from 5.18% in 2000 to 2.28% in 2005. The period 2005 to 2010 recorded a marginal decline in military expenditure (% of GDP) in Zimbabwe, from 2.28% in 2005 to 1.32% in 2010.

Last but not least, an increase by 1.92 percentage points in military expenditure (% of GDP)

was recorded between the five year period 2010 to 2012. The latter period saw military expenditure (% of GDP) increasing from 1.32% in 2010 to 3.24% in 2012 (see Figure 2). This trend is consistent with the report by IMF (2013).

3. Review of Related Literature

The Keynesian, Wagnerian, feedback and the no relationship perspective are the four dominant theoretical perspectives that explain the relationship between government military expenditure and economic growth. According to the Keynesian perspective, government military expenditure positively influences economic growth. Economic growth boosts government military expenditure according to the Wagner's perspective whilst the feedback perspective maintains that both government

military expenditure and economic growth affect each other. The no relationship perspective says there is no relationship at all in whatever direction between government military expenditure and economic growth.

The Keynesian perspective which was advocated for by Keynes (1936) suggested that government military expenditure is crucial in stimulating economic growth. Empirical studies that supported the Keynesian perspective include those undertaken by Lai et al (2005), Rufael (2009),Lee and Chen (2007), Atesoglu (2009), CuaresmaandReitschuler (2003), Robert and Alexander (1990),Smaldone (2006), Dunne et al (2005), Aizenman and Glick (2006), Dunne (2012), Karagol and Palaz(2004), Karagol (2006), Reitschuler and Loening (2005), only to mention but a few. A study by Lai et al (2005) discovered that economic growth was Granger caused by defense spending in China both in the short and long run. Using co-integration and Granger causality test, Rufael (2009) revealed that military spending had a positive impact on the external debt whilst economic growth had a direct reduction influence on external debtin Ethiopia. Lee and Chen (2007) also discovered the existence of a positive relationship running from military expenditure to GDP in OECD (Organization for Economic Cooperation and Development) countries only in the short run. The same study by Lee and Chen (2007) indicated that military expenditure had a negative influence on economic growth in non-OECD countries in the short run.

Atesoglu (2009) revealed that defense spending had a positive impact on aggregate output in the United States both in the short and long run. On the contrary, Cuaresmaand Reitschuler (2003) discovered that low levels of additional defense spending positively influenced GDP whilst higher levels of additional defense spending negatively impacted on GDP in the US economy. Robert and Alexander (1990) also suggested that huge military spending significantly influenced economic growth whilst a small military spending led to an insignificant contribution towards economic growth in the United States. The same study by Robert and Alexander (1990) suggested that a small reduction in military spending resulted in a negligible decline in economic growth in the United States.

Smaldone (2006) found out that defense spending had a negative impact on economic growth in those African countries that were experiencing legitimacy crisis. Economic growth was found to have been positively influenced by defense spending in those African countries that are enjoying peace and without any legitimacy crisis whilst African countries that are experiencing high poverty levels were discovered to be economically vulnerable if they increase their defense spending (Smaldone, 2006).

Dunne et al (2005) discovered that an increase in military expenditure positively contributed to an increase in aggregate output if the country is facing some external threat. In the event that the country is not facing external threat, an increase in military expenditure suffocates economic growth (Dunne et al, 2005). Aizenman and Glick (2006) revealed that an increase in military spending in the face of external threat boost economic growth whilst economic growth responds negatively to an increase in military expenditure when there is relatively peace prevailing in the country.

A study by Dunne (2012) revealed that military spending had a negative causality impact on economic growth in the short run in all Sub-Saharan African (SSA) countries. However, when the SSA countries were grouped according to income groups, Dunne (2012) discovered that military spending negatively impacted on economic growth in low and middle income SSA countries only. Economic growth was found to have been Granger caused by military spending in high income SSA countries both in the short and long run (Dunne, 2012).

Karagol and Palaz(2004) revealed the existence of a uni-directional causality relationship running from military expenditure to economic growth in Turkey in the short run only. However, the findings by Karagol (2006) suggested an indirect negative impact of military expenditure on economic growth through increasing external debt stock in Turkey. The same study by Karagol (2006) also found out that military spending had a huge negative impact on economic growth within the first two years and faded thereafter in Turkey. According to Eryigit et al (2012), military expenditure had a negative impact on economic growth whilst education and health expenditures positively impacted on the economy in Turkey both in the short and long run. A budgetary trade-off between education-health and military expenditures was also discovered in Turkey, revealed Eryigit et al (2012).

Yakovlev (2007) revealed that high military spending lead to reduced economic growth whether a country is a net exporter or net importer of arms. However, the same study by Yakovlev (2007) suggested that negative impact of military spending on the economy is higher if the country is a net importer of arms than if it is a net exporter of arms. Military spending could only lead to a positive economic growth if the net arms exports are quite significant (Yakovlev, 2007).

A study by Klein (2004) discovered military spending crowded out investments thereby stifling economic growth in Peru both in the short and long run. The rate of savings was also found to have been directly reduced by military expenditure in Peru in the long run (Klein, 2004). The same study by Klein (2004) suggested that a reduction in military spending will have a direct positive economic growth effect in Peru. A study by Narayan and Singh (2007) found out that both military spending and exports impacted positively on the GDP per capita in the long run in the

Fiji Islands. On the other hand, military expenditure positively influenced exports in Fiji in the short run (Narayan and Singh, 2007). In contrast, Reitschuler and Loening (2005) revealed that military spending had a very negligible effect on economic growth in Guatemala either positively or negatively. On the contrary, both military spending and corruption were found to have had a significant negative causality effect on GDP per capita directly and indirectly (Agostino et al, 2012).

Using a trivariate model, Bader et al (2003) discovered that military expenditure negatively impacted on economic growth in Egypt, Israel and Syria whilst civilian government expenditures promoted economic growth in Israel and Egypt. The findings implied that Egypt, Israel and Syria could easily boost their economic growth if they promote peace and reduce military expenditure, argued Bader et al (2003). Yildirim et al (2005) concurred with Bader et al (2003) by revealing that military expenditure positively impacted on the economy of all Middle East countries including Turkey.

Using both time series and panel data analysis, Dunne and Nikolaidou (2012) found out that an increase in military spending negatively influenced aggregate output in all the EU15 group of countries both in the short and long run. A study carried out by Kollias et al (2007) revealed the existence of a uni-directional causality relationship running from military spending to economic growth in the European Union (EU15) group of countries in the short run only.

According to Wagner's theory (1890), economic growth positively influences government military expenditure and empirical studies that supports Wagner's perspective include but are not limited to Smith and Tuttle (2008),Dritsakis (2004), Kalyoncu and Yucel (2006) and Kollias et al (2004).Smith and Tuttle (2008) discovered the existence of a uni-directional relationship running from output to defense spending in the United States. In other words, defense spending was found to have been Granger caused by real output (Smith and Tuttle, 2008). A uni-directional causality relationship running from economic growth to defense spending was revealed in both Greece and Turkey (Dritsakis, 2004) whilst Kalyoncu and Yucel (2006) also revealed that economic growth positively impacted on military expenditure in Turkey.

The feedback perspective explains that both government military expenditure and economic growth affect each other. Previous studies that are consistent with the feedback perspective encompass those undertaken by Lee and Chen, 2007), Lai et al (2005), Ali (2012), Kalyoncu and Yucel (2006), Kollias et al (2004),Dritsakis (2004), Karagol and Palaz (2004) and Kollias et al (2007), among others. In the long run, military expenditure and GDP were found to have Granger caused each other both in OECD and non-OECD countries (Lee and Chen, 2007). On the other hand, the results from a study by Lai et al (2005) showed the existence of a bi-directional causality relationship between defense spending and economic growth in Taiwan both in the short and long run.

In a study on MENA (Middle East and North African) countries, Ali (2012) discovered that defense spending increased the levels of economic inequality. The same study by Ali (2012) further revealed that both economic inequality and GDP per capita levels had a negative effect on defense expenditure. A study by Kalyoncu and Yucel (2006) confirmed the existence of a bi-directional causality relationship between military expenditure for Greece and military expenditure for Turkey both in the short and long run. Using time series analysis, a bi-directional causality relationship or a feedback effect between military spending and economic growth was found in three European Union countries, revealed Kollias et al (2004).

A study by Dritsakis (2004) also showed a feedback effect causality relationship between defense spending of Greece and that of Turkey. In other words, the study proved that the size of defense spending in Greece heavily rely on the size of defense spending in Turkey and vice-versa. Kollias et al (2004) discovered a bi-directional causality relationship between defense spending and economic growth in Cyprus both in the short and long run. High economic growth in Cyprus enabled an increase in defense spending which in turn spurred aggregate output, argued Kollias et al (2004).

According to the no relationship perspective, there is no relationship at all between government military expenditure and economic growth. Empirical studies that are consistent with the no relationship perspective include those undertaken by Lin and Ali (2009),Kollias et al (2004), among others. A study by Lin and Ali (2009) discovered no relationship at all between military spending and changes in economic growth across all the 58 countries studied. Neither was military spending found to have Grange caused economic growth nor economic growth discovered to have influenced military spending across all the 58 countries which were part of the study.

4. Research Methodology

Time series data from 1988 to 2012 was used for the purposes of this study. The data used in this study was extracted from the various issues of the World Development Indicators. The data was first tested for stationarity using the Philips-Peron, ADF-GLS and ADF to ensure stability of the data. The data sets were tested for unit root in both levels and first difference (see unit root tests in levels in Table 1).

Table 1. Stationarity Tests of Variables in Levels

Variable	NO TREND	TREND
Stationarity Tests of Variables on level - Phillips-Perron (PP) Test		
Ly/N	-2.664853**	-4.394309**
MILEXP	-2.664853**	-4.394309**
Stationarity Tests of Variables on level – Dickey-Fuller - GLS Test		
Ly/N	-2.281420**	-3.770000**
MILEXP	-2.281420**	-3.770000**
Stationarity Tests of Variables on level – ADF Test		
Ly/N	-2.664853**	-4.394309**
MILEXP	-2.664853**	-4.532598**

Note:

1)The truncation lag for the PP tests is based on Newey and West (1987) bandwidth.

2) Critical values for Dickey-Fuller GLS test are based on Elliot-Rothenberg-Stock (1996, Table 1).

2) ** denote 1% levels of significance.

Both economic growth and military expenditure were found to be non-stationary in levels (see Table 1 results). This necessitated the second procedure of differencing the data sets once in order to test for the stationarity on first difference (see Table 2 for results).

Table 2. Stationarity Tests of Variables on first Difference

Variable	NO TREND	TREND
Stationarity Tests of Variables on first Difference - Phillips-Perron (PP) Test		
DLy/N	-2.669359**	-4.416345**
DMILEXP/GDP	-2.669359**	-4.416345**
Stationarity Tests of Variables on first Difference – Dickey-Fuller - GLS Test		
DLy/N	-2.281420**	-3.770000**
DMILEXP/GDP	-2.674290**	-3.770000**
Stationarity Tests of Variables on first Difference – ADF Test		
DLy/N	-2.669359**	-4.416345**
DMILEXP/GDP	-2.674290**	-4.440739**

Note:

1)The truncation lag for the PP tests is based on Newey and West (1987) bandwidth.

2) ** denote 1% levels of significance.

3) Critical values for Dickey-Fuller GLS test are based on Elliot-Rothenberg-Stock (1996, Table 1).

Both variables are integrated of order 1 according to the results shown in Table 2.

4.3 Cointegration Test using the ARDL-bounds Testing Procedure

Once the data sets have been found to be stationary, the next procedure is to investigate the existence of a co-integration relationship between military expenditure and economic growth. This is done using the newly developed Autoregressive Distributed Lag (ARDL) bounds testing approach which can be expressed by the following equations 1 and 2 (see Odhiambo, 2009a):

$$\Delta Iny/N_t = a_0 + \sum_{i=1}^{n} a_{1i} \Delta Iny/N_{t-i} + \sum_{i=0}^{n} a_{2i} \Delta InMIL_{t-i} + a_3 Iny/N_{t-1} + a_4 InMIL_{t-1} + \mu_{1t} \qquad (1)$$

$$\Delta InMIL_t = \beta_0 + \sum_{i=1}^{n} \beta_{1i} \Delta InMIL_{t-i} + \sum_{i=0}^{n} \beta_{2i} Iny/N_{t-i} + \beta_3 Iny/N_{t-1} + \beta_{4i} InMIL_{t-1} + \mu_{2t} \qquad (2)$$

Where: y/N = Real GDP per capita; InMIL = Military expenditure; Δ = first difference operator.

With regard to the ARDL-bounds testing approach, the following two procedures are carried out in order to establish the existence or non-

existence of long run co-integrating relationship between military expenditure and economic growth. The first procedure is to find out the order of lags on the differenced once variables shown in equations (1) and (2). This is done using the Schwartz-Bayesian Criterion (SBC) and the Akaike Information Criterion (AIC). The results obtained from AIC and SBC tests show that the optimal lag of both military expenditure

and economic growth is lag 2. The next procedure after the optimal lags for both data sets have been established is to apply the bounds F-test to equations (1) and (2), in order to find out if a long-run co-integration relationship exist between military expenditure and economic growth (see results in Table 3 and 4).

Table 3. Unrestricted Cointegration Rank Test (Trace)

Eigenvalue	Trace Statistic	5% Critical Value	Hypothesized No. of CE(s)
0.683567	36.98439	15.49471	None *
0.411668	11.67021	3.841466	At most 1*

* Denotes rejection of the hypothesis at the 5% levels.
Trace test indicates 2 co-integrating equation at 5% level.

Table 4. Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Eigenvalue	Max-Eigen Statistic	5% Critical Value	Hypothesized No. of CE(s)
0.683567	25.31419	14.26460	None *
0.411668	11.67021	3.841466	At most 1*

* *Denotes rejection of the hypothesis at the 5% levels. Max-eigenvalue test indicates 2 co-integrating equation at 5% level.*

The results showed in both Table 3 and 4 shows the existence of a long run co-integrating relationship between economic growth and military expenditure. In other words, the null hypothesis that says there is no long run relationship between military expenditure and economic growth is rejected. This is confirmed by the eigenvalue that is less that the trace statistic (see Table 3) at 1% level of significance 1%. Furthermore, the eigenvalue which is less than the max-eigen statistic at 1% level of significance 1% (see Table 4) also corroborates the finding that there

exists a long run co-integrating relationship between military expenditure and economic growth.

4.4 Granger Causality Tests

After the finding that military expenditure and economic growth have got a long run relationship, the next step is to find out the causality directional relationship between the two variables. An error-correction model was used for the Granger causality tests which can be expressed as follows (see Narayan and Smyth, 2008):

$$\Delta Iny / N_t = \delta_0 + \sum_{i=1}^{n} \delta_{1i} \Delta Iny / N_{t-i} + \sum_{i=0}^{n} \delta_{2i} \Delta InMIL_{t-i} + ECM_{t-1} + v_{1t} \qquad (3)$$

$$\Delta InMIL_t = \lambda_0 + \sum_{i=1}^{n} \lambda_{1i} \Delta InMIL_{t-i} + \sum_{i=0}^{n} \lambda_{2i} \Delta Iny / N_{t-i} + ECM_{t-1} + v_{2t} \qquad (4)$$

Where ECM_{t-1} = the lagged error-correction term obtained from the long-run equilibrium relationship.

The Granger causality test results are shown on Table 5 below.

Table 5. Granger Non-Causality Tests

Null Hypothesis:	Obs	F-Statistic	Probability
Military expenditure does not Granger cause economic growth	23	3.09275	0.0715
Economic growth does not Granger cause military expenditure		3.01303	0.0758

We fail to reject the null hypothesis which says that military expenditure does not Granger cause economic growth whilst economic growth does not influence military expenditure both in the short and long run. This finding is supported by the F-statistic that is less than 4 and the p-values that are greater than 0.05. The finding is at variance with the co-integration results in both Table 3 and 4. The variance indicates that military expenditure and economic growth either indirectly promotes each other, military expenditure indirectly influence economic growth or economic growth indirectly via other factors influence military expenditure in Zimbabwe such as security provision, employment, human capital development, financial market development and stability, among others as enunciated in the literature review.

5. Conclusions

This study examines the causal relationship between military expenditure and economic growth in Zimbabwe. The causality relationship between military expenditure and economic growth has so far received attention from many economists, the dominant ones being Wagner (1890) and Keynes (1936). According to literature, there currently exist four perspectives around the causality relationship military expenditure and economic growth. The first perspective by Keynes (1936) suggests that military expenditure spur economic growth whilst the second perspective by Wagner (1890) mentions that economic growth is the one that affects military expenditure. The third perspective (known as the feedback view) says both military expenditure and economic growth affects each other whilst the fourth perspective suggests the existence of no causality relationship at all between military expenditure and economic growth.

The study has used the most recent co-integration technique developed by Pesaran et al. (2001) to examine this linkage. In order to examine the order of integration, the study has used the Phillips-Perron, ADF and ADF-GLS unit-root tests – both with trend and without trend. The results of this study proves that military expenditure does not directly influence economic growth whilst economic growth does also not directly influence military expenditure both in the short and long run. The study therefore recommends Zimbabwe authorities not only to scale up investment into military infrastructure improvement but also address indirect factors such as human capital development employment, financial market development, stability, peace, among others to enable economic growth sustainability.

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