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FOREIGN DIRECT INVESTMENT, GROSS CAPITAL FORMATION, FOREIGN REMITTANCES, AND ECONOMIC GROWTH IN ZIMBABWE

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Abstract

Research background: Capital investment financing has been cited as a critical element in economic growth the world over although there is no consensus regarding the significance, direction, and magnitude of the relationship.
Purpose: The article investigated the relationship between foreign direct investment, gross capital formation, personal remittances, and gross domestic product in Zimbabwe from 1960–2020.
Research methodology: The random effects model was used to examine this relationship using data collected from the World Development Indicators database. The random effects model was selected after performing the Hausman test.
Results: All the regression coefficients of the country's gross domestic product reveal a direct or positive relationship with the three independent variables. Furthermore, the study reveals that gross capital formation had the highest contribution to Zimbabwe's gross domestic product compared to that of foreign direct investment and personal remittances for the period under study. The coefficients of determination of the independent variables were significant. In other words, foreign direct investment accounted for 57.24%, gross capital formation 68.47%, and personal remittances 48.76% to foreign direct investment for the same period.

Novelty: The article closed the gap in knowledge by drawing attention to the relationship between foreign direct investment, gross capital formation, personal remittances, and gross domestic product in Zimbabwe.

Keywords: Gross Capital Formation; Economic Growth; Domestic Investment; Foreign Remittances; Personal Remittances; Diaspora Remittances; Zimbabwe

JEL classification: E22, F22, F24, F43, G21, O11, O16

Introduction

The need for foreign direct investment and personal remittance has been a topical issue in Africa. These funds have helped several economies to move forward, that is, growing their gross domestic product, standards of living, technological advancement, and human capital development. In the SADC region several countries have adopted policies that attract foreign direct investment, gross capital formation, and personal remittance. In Zimbabwe an investment house was established in order to avail investment information to potential investors. Recently, the government has adopted the mantra, "Zimbabwe is open for business" which has seen the re-engagement and engagement of foreign investors. Figure 1 shows the trends in foreign direct investment (FDI), gross capital formation (GCF), and personal remittance (PER), and GDP from 1960–2020. The Monetary Policy Statement (MPS) of 2021 shows that PER to Zimbabwe has slowly increased since the 2009 dollarization period (Figure 1). The increased efforts to lure FDI, GCF, and diaspora remittance do not guarantee economic growth in developing countries like Zimbabwe. Despite the positive trends of FDI and diaspora remittance the majority of people live below the poverty data line. Unemployment rate remains high at above 80%. The cost of living also remains high for the majority of the people. As a result, this article looks at the impact of FDI, GCF, and diaspora remittance to Zimbabwe`s economic growth. Foreign direct investment is the process whereby residents of one country acquired ownership of assets for the purpose of controlling the production, distributions and the activities of the firm in another country (Moosa, 2002). This might be through a joint venture either through horizontal FDI or vertical FDI in the value chain stage.

In a study by Moyo (2013), it was found that there is a positive impact of FDI on economic growth where economic growth was measured by the GDP factor. The study used secondary

data for the period 2009–2012. The study by Maliwa and Nyambe (2015) investigate the impact of foreign direct investment on economic growth in Zambia. They used the data from the World Bank's world development indicators for the period 1980 to 2012 to measure the relationship. The results showed that FDI does not cause economic growth in Zambia. Zimbabwe and Zambia are both SADC countries, but empirical studies show diverging results on FDI and economic growth. This shows the inconclusiveness of the debate regarding the impact of FDI, GCF, and PER to economic growth on the African continent. Adams (2009) states that the direction and volume of FDI, GCF, and PER depends on institutional and country-specific factors. To Maliwa and Nyambe (2015), trade openness, macroeconomic, political, and social stability are other factors affecting the flow of FDI, GCF, and PER.

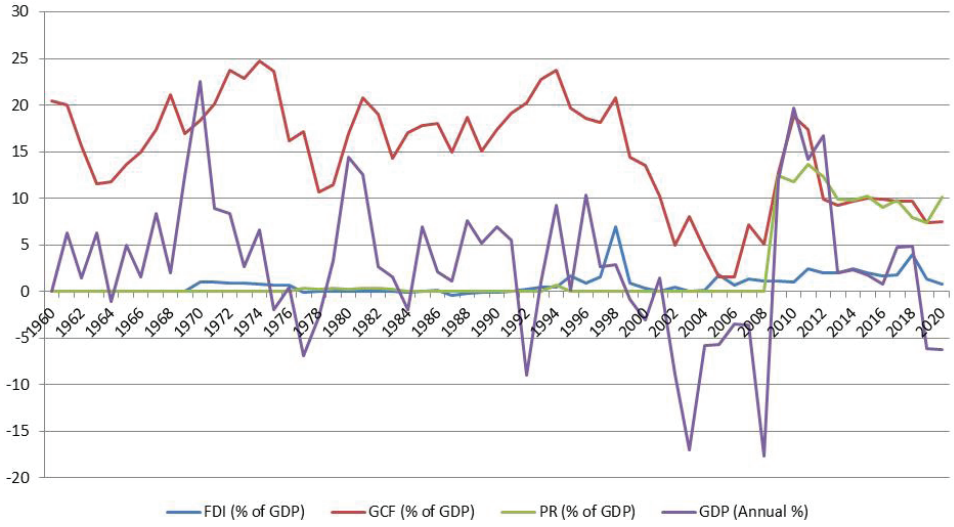


Figure 1. Foreign direct investment, gross capital formation, personal remittances, and gross domestic product in Zimbabwe, 1960–2020

Source: World Bank`s WDI (2022).

The current study focused on the impact of FDI, GCF, and PER on GDP from1960–2020. Foreign inflows must be put to good use to benefit the country at large. This helps signalize and augment the government initiative of re-engagement and engagement. This helps the government to stabilize and grow the economy as well as ensuring policy consistency with regards to foreign inflows. This will then translate to increased GDP per capital and improved living standards of the people. People in the diaspora need to be assured that their money is safe. The results will go a long way in positioning the country as a safe destination for

capital. However, substantial foreign ownership often gives rise to concerns about the loss of sovereignty and compromise over national security (Moosa, 2002). The current study will then contribute to the existing literature. Using data from the World Bank the study empirically investigates the impact of FDI, GCF, and PER to economic growth from 1960–2020.

The remainder of the article is organized as follows: Section 1 presents the literature review, section 2 outlines the research methodology, section 3 data analysis, presentation, and discussion of results. Next section provides the conclusion and recommendations.

1. Literature review

The literature is endowed with several empirical studies on the relationship between FDI, GCF, PER, and GDP. The relationship between FDI, GCF, PER, and economic growth can be expressed quantitatively (Bayan *et al*., 2013). According to Elboiashi (2011), FDI helps a country's economy through the transfer of skills. One of the African Union`s objectives is to promote an increase in FDI to reduce poverty. Along the same objective, SADC has developed policies and strategies aimed to attract FDI. Zimbabwe has been on the verge of privatization and economic liberation to attract FDI. Policy clarity and inconsistency by the Zimbabwe government has hindered the inflow of FDI and PER. Policy inconsistency brings uncertainty in terms of the investment environment. An investment center was created to increase FDI through a tax holiday and tariff exemption. In 1998 Zimbabwe received the highest FDI net inflows of USD 444 (IMF, 1998, see also Figure 1). These inflows were, however, hampered by the compulsory farm acquisitions in 2000 (Moyo, 2013; Maune, 2015). Since independence in 1980, Zimbabwe has adopted several policies which include ESAP, ZIMASSET, NDS1 & NDS2 without tangible economic benefits. IMF (2013) notes that policies implemented by the government should be transparent and protect property rights

Havranek and Irsova (2011) note that FDI increase local production hence economic growth. This concurs with findings by Borensztein *et al.* (1998) who conclude that FDI can improve productivity through transfer in technology and improved production activity. In developing countries like Ghana, FDI has played a major role in enhancing economic growth (Haroon *et al*., 2011 cited by Moyo, 2013). These studies however look at FDI and economic growth alone without taking the effects of PER and GCF. PER and GCF have also been considered key factors in GDP growth in several countries.

In a study by Egbo *et al.* (2011) in Nigeria a granger causality test of FDI and economic growth using time series annual variables data covering a period of 27 years from 1981 to 2007

was done and the results showed a positive relationship between FDI and GDP. Maliwa and Nyambe (2015) argue that FDI stimulates economic growth.

A study by Alkhasawneh (2013) on the granger causality relationship between foreign direct investment and economic development in Qatar from 1970–2010 found that FDI was affected mainly by government spending and gross domestic product. The findings confirmed a strong and positive relationship between economic growth and FDI inflows. The contributions of FDI, GCF, and PER to economic growth from several studies are not always positive but depend on the sectors of the economy where FDI is introduced in the host country (Maliwa, Nyambe, 2015).

Previous studies show that FDI, GCF, and PER contributes positively to economic growth, others have found that FDI, GCF, and PER have an insignificant and/or negative effect on economic growth. The differences and inconclusiveness in these results show the importance of country specific studies, hence the purpose of this study on the Zimbabwean economy and for policy formulation and implementation.

2. Research methodology

The research study employed the random effects model (REM) to examine the impact of foreign direct investment (FDI), gross capital formation (GCF) and personal remittances (PER) on the gross domestic product (GDP) in Zimbabwe from 1960–2020. The REM was adopted after performing a Hausman test on the data which favoured it ahead of the fixed effects model (FEM). The REM is a technique used in estimating the shrunken residuals of financial data and accounting for differentials in input variables through the use of random coefficient models.

Although the FEM is always considered and used in financial practices, it does not have such advantages enjoyed from the use of the REM (Clarke *et al*., 2010). The study used a time series data regression analysis in assessing the impact of FDI, GCF, and PER on the performance of Zimbabwe measured by its GDP from 1960 to 2020. The choice of the covariates of the data is based on the strict belief by the researchers that there are other variables related to the performance of a country that can be used as proxy variables, non-linear terms or dummy variables because they are uncorrelated with the dependent variable, GDP. The REM is suitable for use in this study because it holds for the given variables and can be reasonably applied to interpreting the correlation coefficient of the macroeconomic data as the average treatment effect. The FEE and REM cannot be used simultaneously since they compete to explain the effects of the residuals on the dependent variable.

2.1. The Hausman Test

The Hausman Test is a test for the independence of the X_{kits} and the λ_{is} as reflected in the REM. Hence, we used the Hausman Test for testing for no correlation between the regressors of the adopted model and the effects. On one hand, in the absence of correlations between the variables, we then conclude that both the fixed effects and the random effects are consistent, although in reality, the fixed effects would be inefficient. On the other if there is a correlation between the regressors and the effects, then fixed effects would be consistent and the random effects would become inconsistent. Thus, under the Null Hypothesis (no correlation between the variables), there will be no differences between the model variable estimators. In this case the Hausman Test is given by;

$$B_{RE} = \beta_{FE} \tag{1}$$

and its covariance,

$$W_i = (\beta_{RE} - \beta_{FE}) - \sum(\beta_{RE} - \beta_{FE})Y_i^{2k} \tag{2}$$

Therefore, the covariance of an efficient estimator with its difference from an inefficient estimator is zero. If the covariance measure, W is significant we will not apply the REE. The results in Table 1 represent the effects of the pooled independent variables (FDI, GCF and PER) on the GDP of Zimbabwe based on the REM over the period 1996–2020.

Table 1. Estimation of the random effects model results using X-treg and the option re

xtreg y x1, re			
where:			
Xtreg y = Outcome Variable			
X1 = Predictor Variable(s)			
Re = Random Effects Option			
GLS regression	Number of obs	= 244	
Group Variable: Zimbabwe's GDP	Number of Groups	= 4	
R-sq: within = 0.0748	Obs per group: min	= 61	
between = 0.0746	avg	= 8.0	
overall = 0.0060	max	= 8.0	
Random effects u_i ~ Hausmann	Wald chi2(1) = 1.92		
corr(u_i, X) = 0 (assumed)	Prob > chi2 = 0.1696		

Y	Coef.	Std. Err.	Z	P > |z|	[95% Conf. Interval]	
x1	3.25e+09	9.02e+08	1.38	0.167	–5.21e+08	3.02e+09
_cons	2.04e+09	7.91e+08	1.34	0.190	–5.13e+08	2.59e+09
sigma_u	2.065e+09					
sigma_e	2.796e+09					
rho	0.12664193	(fraction of variance due to u,i)				

Source: authors' computation from Eviews.

2.2. The random effects model

The REM was chosen for this study because the random effects are more efficient than fixed effects. Hence, its suitability to the assumption set of the unobservable fixed and the random variable residuals made it preferred to FEM. The sample information used in the REM is more common than that drawn from the entire population. The REM was also preferred to the FEM because it deals with regressors that are fixed across the individual variables drawn into the model. The application of the REM was done using time series data linear regression analysis (TSDLRA). This is a type of regression analysis that involves a time series data analytical technique. Time series data are said to be repeated observations on the same cross section, typically of individual variables that are observed for several time periods (Woolridge, 2004; Baum, 2006; Westham, 2009). It also provides a major means to a longitudinal analysis of the research data drawn from various sources and with time series that are rather short for separate time series analysis. Therefore, the study at hand adopted the REM and was carried out under the following hypothesis:

Null hypothesis (H_0): FDI, GCF, and PER have no impact on the GDP of Zimbabwe.

Alternative hypothesis (H_1): FDI, GCF, and PER have impact on the GDP of Zimbabwe.

The original REM is given by the algebraic equation:

$$Y^*_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \beta_k X_{kit} + \varepsilon_{it} \tag{3}$$

or

$$Y^*_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \beta_k X_{kit} + e_{it} + \lambda_i + \mu_{it} \tag{4}$$

where $\varepsilon_{it} = \lambda_i + \mu_{it}$ and λ_i = now part of the error term in the case of the sample observations. The REM is used when the λ_{is} are part of the composite error $\varepsilon_{it.}$ The model can be applied when an efficient estimator can be constructed. In order to construct an efficient estimator we have to evaluate the structure of the error and then apply a generalised least squares estimator to find an efficient estimator that is $E(\chi_{kit}\, \lambda_i) = 0$ for al k, t, i (This is a very crucial assumption for the REM). Thus, the choice of the REM is based on the fact that the random effects estimator (REE) has the standard generalised least squares form summed over all individual variables in the data set. However, when the fixed effects estimator (FEE) is written in generalised least squares (GLS) form, it brings out its relationship with the REE. The REM can be preferred to the REE (a weighted combination of the "within" and "between" estimators) because it is based only on the "within" estimators.

As revealed by the Xtreg and re model results, W = 0 which means that it is not significant and therefore we should use the REE instead of the FEE. The results showed that when the

Random effects (u; i) ~ Gaussian was run it gave us corr (u, i, X) = 0 (assumed) which effectively implied that the differences across units were uncorrelated with the regressors. This proved true that the REM does not permit a correlation between unit variables. Our Wald Chi-Square (1) was 1.92 and it states that when $\alpha < 0.05$ then the model is a good fit to the given data. We used the F test to determine whether all the coefficients in the model are different from zero. The model coefficients were different from zero which implies that the model is valid and reliable.

The interpretation of the model coefficients included both the within- and between-entity effects. Thus, the effects of the combined independent variables represent the average effect of the X input over Y when X changes across time by one unit as the dependent variable also changes. Our two-tailed p-value tests of the REM results were based on the hypothesis that each coefficient is different from 0. To reject this claim, the p-values of the adopted model should be lower than 0.05 (95% confidence interval) or an alpha of 0.10. In essence the independent variable (X) of the adopted model gave a significant influence on the dependent variable (Y) because its p-values were higher than 1.92 or 0.05 (95% confidence interval).

3. Data presentation, analysis, and interpretation

The discussion below detail the major research findings of the research on the impact of FDI, GCF, and PER on GDP in Zimbabwe from 1960–2020. We used a Time series data linear regression analysis model (TSDLRAM) that involves time series data analytical techniques to assess the impact of the above independent variables on Zimbabwe's GDP over the period under review.

3.1. Descriptive data analysis

The descriptive statistics examine the means and the standard deviations of regression variables. This research study measured the goodness of fit of the regression model using the R^2 value. The R^2 represents the proportion of variation of the dependent variable, accounted for by the independent variables in the regression model. The highest R^2 value indicates the strong predictability of a regression model. The lowest R^2 value shows the weak predictability of a regression model.

Zimbabwe's GDP shows the highest descriptive statistics characterised by minimum and maximum values of 10.53 and 20.55 respectively with a mean of 15.360 and a standard deviation of 4.8606 for the period 1960–2020. FDI contribution has a minimum contribution

of –0.0038 and a maximum of 0.718. However, FDI data for the period has a mean of 0.306 with a standard deviation of 0.2256. GCF was measured as a percentage and has minimum and maximum values of 1.525% and 20.75% respectively, together with a mean of 10.876% and a standard deviation of 8.6616%. PER had the lowest measures as it has 0.001 and 0.0044 as its minimum and maximum values respectively over the period examined. The average remittance (PER) is at 0.044 with a standard deviation of 0.0220. Overall GCF has the highest contribution to Zimbabwe's GDP, followed by FDI (though with a large dispersion) and in last is PER.

3.2. Model results and discussion

The specific TSDLRAM for Zimbabwe's GDP is given by:

$$\text{GDP} = \beta_0 + \beta_1\text{FDI} + \beta_2\text{GCF} + \beta_3\text{PER} + e_i \tag{5}$$

where: β_0 = autonomous GDP contribution, FDI = foreign direct investment, GCF = Gross capital formation, PER = Personal remittances and e_i = Error term and betas (β_{is}) are the sensitivities of GDP to various independent variables.

Table 2 shows the descriptive statistics generated from 1960–2020.

Table 2. Descriptive statistics of variables

Variable	N	Minimum	Maximum	Mean	Std. Deviation
GDP (US Bln)	61	10.5300	20.550	15.3600	4.8606
FDI (US Bln)	61	–0.0038	0.718	0.3060	0.2256
GCF (%)	61	1.525	20.750	10.8760	8.6616
PER (US Bln)	61	0.0010	0.044	0.0240	0.0220
Valid N (listwise)	61				

Source: authors' computation from Eviews.

3.2.1. Pooled PDLRAM results

Using data from Zimbabwe for the period 1960–2020, we used the Time Series Data Ordinary Least Squares (TSDOLS) method to determine the regression results tabulated above. We measured Zimbabwe's GDP performance based on three inputs namely FDI, GCF, and PER. Overall, the proposed time series data regression model came up with a specific model,

$$GDP = 0.6275 + 0.2778FDI + 0.6145GCF + 0.4856PER \tag{6}$$

All the regression coefficients of the country's GDP reveal a direct or positive relationship with the three independent variables. In other words, a 100% increase in all three variables will give rise to 27.78%, 61.45%, and 48.56% contributions from FDI, GCF, and PER respectively.

Table 3. Pooled TSDOLS regression results analysis

Variable	GDP	FDI	GCF	PER
α	0.6275	0.8929	0.2964	0.5206
GDP	0.9638	0.8725	0.6962	0.5802
FDI	0.2778	0.3654	0.4205	0.1718
GCF	0.6145	0.6020	0.5639	0.5428
PER	0.4856	0.3106	0.5982	0.3872
R-Squared (R^2)	0.7288	0.5724	0.6847	0.4876
Number of groups	4	4	4	4
Number of observations	244	244	244	244

Source: authors' data (Statistically significant at the 5% level).

These research findings are in agreement with the findings of Mousa *et al.* (2012) on a similar investigation. Furthermore, the study reveals that GCF had the highest contribution to Zimbabwe's GDP compared to that of FDI and PER in the period under review. The coefficients of determination of the independent variables, R^2 on GDP are 0.5724, 0.6847, and 0.4876 respectively. In other words, FDI accounted for 57.24%, GCF, 68.47% and PER, 48.76% to GDP in the period under review. The above results are in line with the best fit results proposed by prior literature (Tay *et al.*, 2014).

3.2.2 Correlation matrix

The nature of the linear correlation among dependent and independent variables and its direction are presented in Table 4. FDI, GCF, and PER have strong positive correlations of 0.956, 0.948, and –0.904 with Zimbabwe's GDP respectively. We also regressed all independent variables as dependent variables and dependent variable as independent variable, to determine the sum of squares and cross products and covariances. All models regressed show positive relationships between dependent and independent variables.

Table 4. Correlation matrix

Variable		GDP	FDI	GCF	PER
GDP	Pearson Correlation	1	0.956**	0.948**	0.904*
	Sig. (2-tailed)		0.002	0.005	0.013
	Sum of Squares and Cross-Products	18.348	12.675	14.232	6.468
	Covariance	3.647	2.280	2.876	1.269
	N	61	61	61	61
FDI	Pearson Correlation	0.956**	1	0.906*	0.795
	Sig. (2-tailed)	0.002		0.014	0.080
	Sum of Squares and Cross-products	12.568	6.586	9.375	3.789
	Covariance	2.276	1.509	1.841	0.708
	N	61	61	61	61
GCF	Pearson Correlation	0.948**	0.906*	1	0.868*
	Sig. (2-tailed)	0.005	0.014		0.025
	Sum of Squares and Cross-products	15.234	9.962	13.336	5.874
	Covariance	2.786	1.892	2.676	1.706
	N	61	61	61	61
PER	Pearson Correlation	0.904*	0.795	0.868*	1
	Sig. (2-tailed)	0.013	0.080	0.025	
	Sum of Squares and Cross-Products	6.987	3.573	5.894	2.836
	Covariance	1.287	0.720	1.076	0.568
	N	61	61	61	61

Source: authors' computation from Eviews.

When FDI was regressed on other variables, it gave strong positive correlations to 0.956, 0.906, and 0.795 with GDP, GCF and PER respectively. On the other hand, GCF translated into strong positive correlations of 0.948, 0.906, and 0.868 with GDP, FDI and PER while PER revealed correlations of 0.904, 0.795, and 0.868 with GDP, FDI and GCF respectively. We also performed a two-tailed test on all model variables as dependent variables. The results obtained show that FDI and GCF are relevant and significant to Zimbabwe's GDP model and only GDP is critical to luring FDI. On the other hand, GDP and PER significantly influenced GCF while only GCF influenced PER.

Conclusions and recommendations

This article examined the relationship between FDI, GCF, and PER on GDP in Zimbabwe from 1960–2020. The Hausman Test was used to test for independence of the variables X_{kits} and the λ_{is} in order to determine whether the study should adopt the REM or FEM. Therefore, we concluded that the covariance of an efficient estimator with its difference from an inefficient estimator is zero, we then prefer REM to FEM. Thus, by calculation when the model, $W = (B_{RE} - \beta_{FE})'\Sigma^{-1}(B_{RE} - \beta_{FE}) \sim \chi^{2(k)}$ equals 0, we adopt REM. However, when W is significant we should not use REM but REE.

Based on the results estimated from the TSDLRA model results we concluded that all the independent variables, namely FDI, GCF, and PER had positive and significant effects on the country's GDP at the 1% level of importance. The study also analysed results based on three states of the economy that is before, during, and after the dollarization of the Zimbabwean economy. The study concludes that the period before dollarization (PBD) had a negative and significant impact on Zimbabwe's GDP, suggesting that it significantly decreased its growth and development prospects. The study also concluded that the period during dollarization (PDD) had a strong positive and statistically significant impact on the country's GDP. In other words, FDI, GCF, PER and dollarization had a direct impact on the economic growth prospect of Zimbabwe as a country. However, the period after dollarization (PAD) negatively affected the country's ability to access FDI, GCF, and PER leading to the shrinking of Zimbabwe's economic growth or GDP prospects. The long-run personal remittances (PER) had a negative and significant impact on Zimbabwe's GDP growth rates. The constant term of the multiple regression model had a weak positive relationship with Zimbabwe's GDP.

The study ends by recommending that the Government of Zimbabwe should separate political and economic policies in order to lure both domestic and foreign direct investment (FDI) as well as GCF. The Government of Zimbabwe should not politicize economic fundamentals such as the currency system demand and supply policies. By so doing it will be able to attract new capital formation and investment needed to finance the development process towards sustainability. Finally, we recommend that the Reserve Bank of Zimbabwe (RBZ) and its affiliates such as commercial banks, building societies and similar financial institutions must advise the Government through the parent Ministry of Finance and Economic Development on the benefits the country would draw from an independent, democratic, and liberalized financial system. This is the best way to go for the country if it is to create a sound, viable, deep, and

broad financial system on which efficiency and effectiveness in service delivery to its citizens and the corporate world as a whole can be achieved.

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