# The Impact of Taxes on Capital Formation in Tanzania

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**Abstract**
This paper investigates the impact of taxation on capital formation in Tanzania through application of Autoregressive distributed lag (ARDL) model, using the data sourced from National Bureau of Statistics (NBS) and Tanzania Revenue Authority (TRA) for 1966 – 2019. The results show that corporate income tax has a negative impact on capital formation in both the short-run and long-run, the exception being the magnitude. The paper recommends the need to review the taxation policies so as to attract more investment in the country in order to foster economic growth. This, among others, can be done through putting more emphasis on the implementation of the already established Blueprint for Regulatory Reforms to Improvement of Business Environment that aims at improving business environment climate in the country. Additionally, there is a need to keep encouraging more private sector participation in the economy, especially in those sectors which are not considered as a high priority sector, as well as encouraging the Public Private Partnership (PPP) initiative.

**Keywords:** Corporate income tax; capital formation; Autoregressive Distributed Lag model
**JEL Classification Codes:** H20

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## 1.0 Introduction

The question that has over the years spurred both academic and political debates is on how should capital be taxed? Capital is needed to fund investments, provide consumption benefit as well as to serve as a vehicle for individuals to transfer resources across time, jurisdictions, and generations (Bastani & Waldenstrom, 2018). As the global policy discussions on development continues, Levin (2005) has cautioned that they must be wary with increasing taxation for three reasons: taxation increase might have adverse supply-side effects by restraining the already low private investment, thus undermining growth; second, taxation normally upsets the alignment of investment, which might be a more essential problem for growth, mostly in African countries, than the level of overall investment itself; and third, the investment-and-growth literature recognizes risk-aversion and the irreversibility of investment-projects as separate and important channels through which uncertainty about investment-returns can affect growth.

To answer this question, the Government of Tanzania has been striving to design and implement equitable and efficient system of capital taxes so as to foster the development of the country (Bigsten & Danielsson, 1999). These efforts were undertaken so as to attract foreign private capital, which is seen as a catalyst for fast tracking growth and development. The Investment Code of 1990 initiated the reform-process in investments but failed due to weak response from the private sector. The New Investment Policy was legislated in 1996 and its implementation led to the enactment of the Investment Act of 1997, which has caused a rapid increase in the amount of foreign capital inflows (URT, 2013). The stock of Foreign Direct Investment (FDI), which is the foremost component of foreign private capital, increased from USD 0.01 million in 1990 to USD 684,887.7 million in 2020[1].

Nonetheless, despite of the rapid increase in the amount of FDI inflows, it is argued that the Government policies and actions have not effectively keep and attract investment[2] to the point of the country being ranked 141 out of 190 countries on the World Bank's 'Doing Business' ranking. One of the biggest challenges to investment identified is the unfriendly and opaque tax policies, evidenced by the results of investment-climate surveys that found out that more than 50 percent of the firms perceive taxation, as well as access to finance as severe constraints to investment (Levin, 2004). Levin (2004) argue that the issuance of tax incentives to priority sectors have led to increased foreign investment, as well as, caused a relatively high-tax rate to other sectors and thus discourage investment in those sectors. Therefore, this paper adds to the academic knowledge by econometrically analyzing the effect of taxation on capital formation, which are scant to a developing country like Tanzania.

This is due to the fact that, in spite of this increase in amount of foreign capital inflows in the country, the jury is still out as to by how much has the country's taxation policy contributed to this increase in capital formation. The study is crucial to the policy dialogues on growth, especially

[1] https://data.worldbank.org/indicator/BX.KLT.DINV.CD.WD?locations=TZ
[2] https://www.state.gov/reports/2020-investment-climate-statements/tanzania/

now at the time when the Government is striving to attain industrialization through increased capital formation in the country.

The remainder of this study is organized as follows. Section reviews the literature on tax and capital formation. Section three presents the methodology. Section 4 presents and discusses the estimated results. Section 5 concludes.

**2.0 Literature Review**

The literature defines the capital tax as any tax on the return to savings, capital gains, dividend income, firms' profits (corporate taxation), property taxation, inheritance/estate taxation, and wealth taxation. This paper focused mostly on the corporate taxation (a special tax on the profits accruing to private firms) as it is one that affects largely developing countries like Tanzania. Tanzania possesses a reasonably good corporate income tax structure which is levied at 30 percent as a general rate and 25 percent for newly listed companies to the Dar es Salaam Stock Exchange (DSE) with at least 30 percent of its shares issued to the public for three consecutive years from date of listing[3].

Tanzania also provides a variety of preferential tax rates to favored business activities in an effort to encourage the growth of specific industrial sectors (TRA, 2013). Some of the preferential tax rates include: a corporation with a newly established plant for assembling motor vehicles, tractors, fishing boats or out boats engine and having a performance agreement with the Government shall be taxed at a reduced corporate rate of ten percent for five consecutive years from the year of commencement of production; a newly established entity dealing in manufacture of pharmaceuticals or leather products and having a performance agreement with the Government of the United Republic of Tanzania shall be taxed at a reduced corporate tare of twenty percent for five consecutive years from the year of commencement of production; and Income of a corporation with perpetual unrelieved loss for three consecutive years shall be taxed at the rate of 0.5 percent of the turnover of the third year of perpetual unrelieved loss[4].

The reasons as to why taxation of corporate income tax matters arises from three arguments as stressed by Bastani & Waldenstrom (2020), first, the corporate income tax is a complement to the income tax as it is in practice difficult to tax individuals with low labor income and large fortunes derived from inventions, patents, or other intellectual property. Second, the corporate income tax is a way to tax foreign investors that donot pay capital income taxes in the host country. Final argument is that corporation tax can be viewed as a payment for infrastructure that the Government provides, such as roads, airports, bankruptcy management, or the value of a stable and secure democracy.

[3] https://www.tra.go.tz/images/headers/CHAPTER_332-THE_INCOME_TAX_ACT-1.pdf
[4] https://www.tra.go.tz/images/headers/CHAPTER_332-THE_INCOME_TAX_ACT-1.pdf

Recently, Cullen and Gordon (2002) have developed a theoretical model that provides a unified framework on how taxation affects the incorporations decission by firms. The model identifies three channels where corporate income taxes affects the entry-decission by incorporatins. First, corporate income taxes cause and income-shifting effect which may encourage entry by incorporations. This is due to the fact that corporate income taxes often entails a lower tax rate than the personal income taxes (Da-Rin, Di-Giacomo, & Sembenelli, Entrepreneurship, Firm Entry, and the Taxation of Corporate Income, 2009). Second, depending on how a country structure its personal and corporate income taxes, then the progressivity of the personal income tax rates always creates a risk-subsidy to entry by incorporations (Da-Rin, Di-Giacomo, & Sembenelli, 2009; Cullen & Gordon, 2002). Third channels entails that the corporate income taxation allows sharing of the entrepreneurial risks with the Governmnet when the financial markets imperfections have prevented risk-sharing with investors (Da-Rin, Di-Giacomo, & Sembenelli, Entrepreneurship, Firm Entry, and the Taxation of Corporate Income, 2009).

**2.1 Empirical Review**

Studies on taxation impact on investment dynamics have been distributed according to the regional groupings. Alves (2019) and Bond & Xing (2015) found evidence which where strikingly consistent with the basic economic theory of corporate investment for the OECD countries. Drebler (2012) and Brandstetter & Jacob (2013) find that corporate income tax affects investment negatively, whereas, corporate income tax cut will lead to domestically owned firms increasing investments to a larger extent than foreign-owned. This paper borrowed much of the methodological approach adopted by these studies in establishing its assessment of the channels in which taxes affects mostly investment in Tanzania.

Further, Da-Rin, Di-Giacomo, & Sembenelli (2009) found that corporate income taxes significantly affects negativelly the firm's entry rates, whereas, the reduction in corporate income tax rate is more effective in countries with better institutional structure. Simirary, Braunerhjelm & Eklund (2013) found that firm's entry rate is significantly reduced by the tax administration burden, whereas, a reduction of the corporate income tax rates will lead to a 3 percent increase in the entry of firms to the market. These results are also supported by those obtained by Bond & Xing (2015) who find that there is a negative relationship between taxes on firms and the firm's capital-output ratios.

Further review of the cross-country studies have revealed that: the effective corporate income tax rate have a large adverse impact on aggregate investment (Djankov, Ganser, & Shleifer, 2008); the after-tax interest rate is a significant factor for consumer spending therefore tax policies that raise the after-tax return on saving would stimulate personal saving and thus investment (Mankiw, 2010); and there exists a powerful effect of tax rules on business investment implying that the types of changes in taxation would significantly reduce business fixed investment (Feldstein, 1987). The desirable impact of these studies is that they investigated the impact that corporate taxes has on levels of investment, something which is similar with what this paper investigates.

Despite of the fact that there are many empirical evidences for taxation of capital for the developed countries, this is a new area of investigation for the developing countries like Tanzania, thus literature and knowledge on this area are still scant. Babu, Pantaleo, & Ndanshau (2020) found that the corporate income tax, as well as the Value Added Tax, have a significant negative on private investment to Tanzania and other sub-Saharan African countries. The lack of enough empirical evidences for Tanzania acted as a driving force for this paper. For the Government to be able to establish strong capital taxation policy, empirical evidence is still needed of the impact that the current policies have had on capital formation in Tanzania, a gap that is filled by this paper.

**3.0 Methodology and Estimation Technique**

This paper has adopted the model applied by Alves (2019). In order to determine the impact of taxation on capital formation in Tanzania, we hypothesize that capital formation dynamics is a function of composition of taxation. The share of each tax revenue source as a percentage of GDP, is denoted by T, and thus $\Delta I = f(T)$, where $\Delta K$ is a change in investment. We make use of gross fixed capita formation as proxy for investment, thus

$$\Delta I_t = \beta_1 + \beta_2 T_t + \sum \beta_i Z_t + \varepsilon_t. \quad (1)$$

Where, $Z_t$ represents the set of control variables, and $\varepsilon_t$ is white noise error term.
In addition, in order to assess the existence of non-linear effects of taxation structure on investment decisions, we introduce a squared term, as demonstrated in equation (2).

$$\Delta I_t = \beta_1 + \beta_2 T_t + \beta_3 T_t^2 + \sum \beta_i Z_t + \varepsilon_t \quad (2)$$

Differentiating equation (2) with respect to each tax component, and then rearranging the derivative we obtained each tax item threshold in respect to investment as:

$$0 = \beta_{2,t} + 2\beta_{3,t} T_t^* \Leftrightarrow T_t^* = \frac{-\beta_{2,t}}{\beta_{3,t}} \quad (3)$$

Thus, if $\beta_{3,t}$ is significant and has a negative sign, there is a concave relationship between a tax item and the investment dynamics, which interprets as an optimal value for that tax source to maximise investment. On the other hand, a convex relationship from a positive and significant coefficient for $\beta_{3,t}$ translates as a value that hinders investment growth decisions.

On the empirical perspective, we begin from the theoretical equation (2), to apply equation (4) in estimation of the impact of corporate income tax on investment growth,

$$\Delta I_t = \beta_1 + \beta_2 COR_t + \beta_3 GE_t + \beta_4 GDPPC_t + \beta_5 ER_t + \beta_6 INF_t + \varepsilon_t. \quad (4)$$

Where *GE* is the government expenditure and *GDPPC* is the real GDP per capita, *ER* is the real exchange rate and *INF* is the inflation rate. The share of capital formation to GDP ($\frac{I}{GDP}$) is used as a proxy for investment growth. The share of Corporate Income Tax paid to GDP ($\frac{COR}{GDP}$) is a proxy for tax revenue, while the total government expenditure to GDP ($\frac{GE}{GDP}$) is a proxy for government expenditures and the real GDP per capita is used as a proxy for economic growth. We use secondary data to estimate the role of corporate income tax in the capital formation for Tanzania. The data spans from 1966 to 2019, and were sourced from the National Bureau of Statistics (NBS) and Tanzania Revenue Authority (TRA).

In estimating the impact of taxes on capital formation in Tanzania we utilized the Autoregressive Distributed Lag (ARDL) model[5] approach. The ARDL technique is preferable when dealing with variables that are integrated of different order, I(0), I(1) or combination of both and, robust when there is a single long run relationship between the underlying variables in a small sample size. The long run relationship of the underlying variables is detected through the Pedroni and Kao statistics (Nkoro & Uko, 2016). The major advantage of this approach is that: it can be used even when variables in the model have different orders of integration; and the technique produces consistent estimates.

The ARDL model helps to determine the effects of a change in a policy variable over another. Since cointegration regression takes into account long-run properties only, it is necessary to include short-run dynamics to explain the adjustment process once there is disequilibrium. The error correction model is thus estimated for that reason. The ARDL model was specified as,

$$\begin{aligned}\Delta I_t = {} & \beta_0 + \beta_1 t + \sum_{t=1}^{p} \beta_{2i} \Delta I_{t-i} + \sum_{t=1}^{p} \beta_{3i} \Delta COR_{t-i} + \sum_{t=1}^{p} \beta_{4i} \Delta GE_{t-i} + \\ & \sum_{t=1}^{p} \beta_{5i} \Delta GDPPC_{t-i} + \sum_{t=1}^{p} \beta_{6i} \Delta ER_{t-i} + \sum_{t=1}^{p} \beta_{7i} \Delta INF_{t-i} + \delta_1 \Delta COR_{t-1} + \\ & \delta_2 \Delta GE_{t-1} + \delta_3 \Delta GDPPC_{t-1} + \delta_4 \Delta ER_{t-1} + \delta_5 \Delta INF_{t-1} + \mu_t \,, \end{aligned} \quad (5)$$

where *p* is lag length, $\Delta$ is difference operator and $\mu_t$ is an error term which is assumed to be serially uncorrelated. The first stage of bound test is F-test, the null hypothesis in equation 5 is ($H_0$: $\delta_1 = \delta_2 = \delta_3 = \delta_4 = \delta_5 = 0$), implying non-existence of long-run equilibrium relationship, while the alternative is ($H_1$: $\delta_1 \neq \delta_2 \neq \delta_3 \neq \delta_4 \neq \delta_5 \neq 0$).

Optimal lag length in the model is selected on the basis of Schwarz-Bayesian Criterion (SBC). Once existence of long-run equilibrium relationship among variables is certain, long-run and error correction estimate of ARDL model are obtained. Accordingly, the error correction representation of a series was specified as,

[5] The pre-estimation tests employed by the paper were: Augmented Dickey Fuller unit root test (ADF), Philip Peron Unit Root Test and Zivot Andrews Unit Root Test (which takes into account structural breaks) that tested for stationarity of variables; and the ARDL bound test to test for the long-run equilibrium relationship among time series variables (Judge, Driffiths, Lutkepohl, &Lee, 1985).

$$\Delta I_t = \beta_0 + \beta_1 t + \sum_{t=1}^{p} \beta_{2i} \Delta I_{t-i} + \sum_{t=1}^{p} \beta_{3i} \Delta COR_{t-i} + \sum_{t=1}^{p} \beta_{4i} \Delta GE_{t-i} + \sum_{t=1}^{p} \beta_{5i} \Delta GDPPC_{t-i} + \sum_{t=1}^{p} \beta_{6i} \Delta ER_{t-i} + \sum_{t=1}^{p} \beta_{7i} \Delta INF_{t-i} + \gamma ECM_{t-1} + v_t, \quad (6)$$

where ECM comes as a residual obtained from equation (6) and $\gamma$ is a speed adjustment parameter.

**4.0 Results and Discussion**

According to descriptive statistics, the average rate of investment for the period of this study is 9.3. Also, results indicate an average rate of corporate tax, approximately equals to 9.6 with a standard deviation of 2.4. During the period, the average government expenditure rate was 11.8 with a deviation of 3.6. Tanzania maintained an average rate of 10.6 GDP per capita with a standard deviation of 2.9. The average nominal exchange rate for the given period was TZS 765.7 per US$ with a deviation of 769.6. The average inflation rate was 15.7 during the period, which was relatively high with a standard deviation of 11.2.

We applied the mean-based coefficients of skewness and kurtosis to test the normality of variables used. Skewness measures symmetry of probability distribution of a variable about its mean, and normally distributed variables are expected to range between -2 and +2. On the other hand, Kurtosis was expected to range between -3 and +3 if data was normally distributed. Skewness results show that investment, corporate tax, government expenditure and GDP per capita are negatively and normally distributed, while exchange rate and inflation rate are positively and normally distributed. Table 1 presents descriptive statistics of the variables.

**Table 1: Descriptive Statistics**

| Variable | Mean | Std. Dev. | Skewness | Kurtosis |
|---|---|---|---|---|
| Investment | 9.3023 | 4.3310 | -0.5339 | 2.7195 |
| Corporate tax | 9.5565 | 2.3610 | -0.2504 | 1.9128 |
| Government expenditure | 11.7985 | 3.5709 | -0.5276 | 3.3392 |
| GDP per capita | 10.5599 | 2.8825 | -0.1090 | 1.5113 |
| Exchange rate | 765.7048 | 769.6248 | 0.5277 | 2.0034 |
| Inflation rate | 15.7080 | 11.1971 | 0.4848 | 1.6672 |

The variables correlation is tested and the results are presented in table 2, which shows that corporate tax, government expenditure, GDP per capita and exchange rate are positively related with the dependent variable (investment) while inflation rate is found to be negatively related with investment.

**Table 2: Correlation Matrix**

| | Investment | Corporate tax | Government expenditure | GDP per capita | Exchange rate | Inflation rate |
|---|---|---|---|---|---|---|
| Investment | 1.0000 | | | | | |
| Corporate tax | 0.5300 | 1.0000 | | | | |
| Government expenditure | 0.4514 | 0.7012 | 1.0000 | | | |
| GDP per capita | 0.5778 | 0.9681 | 0.7367 | 1.0000 | | |
| Exchange rate | 0.5755 | 0.9113 | 0.6515 | 0.9481 | 1.0000 | |
| Inflation rate | -0.2924 | -0.2779 | -0.2960 | -0.4304 | -0.5820 | 1.0000 |

*Source: Author's estimation*

The other pre-estimation diagnostic conducted is the unit root test to check stationarity of the utilized time series data. The results of the Augmented Dickey Fuller (ADF) test found that investment and government expenditure are stationary at the level and failed to reject the null hypothesis of stationarity. But, the test rejected the null hypothesis of stationarity on corporate tax, GDP per capita, exchange rate and inflation rate in both tests (ADF and PP test). To correct non-stationarity problem, we differenced the variables once and variables turned stationary at the first difference. Moreover, we tested the presence of structural breaks using Zivot-Andrews test and found that, there is significant structural break in 2003 for investment variable caused by implementation of the Export Processing Zones Act, 2002 that aimed at attracting and promoting investments for export-led industrialization, create and increase employment opportunities, attract and encourage transfer of new technologies and to promote processing of local raw materials for export and the structural break in 1998 for corporate tax it was first year of the implementation of the new Value Added Tax Act, 1997 that replaced the sales tax . The structural breaks in 2011 for government expenditure was due to the announcement by the Government to attain the fiscal deficit of 6.6 percent of GDP from the targeted deficit of 8.0 percent and the 1987 for GDP per capita resulted to implementation of the first Economic Recovery Programme (ERP-I) in 1986 to 1989. The 1998 structural breaks on exchange rate attributed to enactment of the Foreign Exchange Regulations, 1998 and the Foreign Exchange Circular, 1998 as the instruments to control the inflow and outflow of foreign currency. The structural breaks in inflation rate in 2002 shows the lowest recorded inflation rate in the country. Table 3 presents the results of the unit root tests.

**Table 3: Results of the Unit root test**

| Variable | ADF | | PP | | Zivot-Andrews | | Order of Integration |
|---|---|---|---|---|---|---|---|
| | Level | 1st Diff | Level | 1st Diff | Level | 1st Diff | |
| | t-statistics | t-statistics | t-statistics | t-statistics | t-statistics | t-statistics | |
| Investment | -4.339*** | | -4.438*** | | -5.472***(2003) | | I(0) |
| Corporate tax | -0.281 | -6.968*** | -0.346 | -7.235*** | -6.569***(1998) | | I(1) |
| Government expenditure | -3.726*** | | -3.552** | | -7.581***(2011) | | I(0) |
| GDP per cap. | -0.059 | -4.054*** | -0.162 | -4.033*** | -6.969***(1987) | | I(1) |
| Exchange rate | 1.407 | -5.314*** | 1.063 | -5.285*** | -2.450 | -6.540***(1998) | I(1) |
| Inflation rate | -2.112 | -9.408*** | -1.969 | -9.564*** | -4.323 | -10.069***(2002) | I(1) |

Source: Author's estimation

Finally, we tested for the cointegration using the ARDL Bound Cointegration test. The estimated results show that the null hypothesis against its alternative is rejected at the 1 percent level. The F-statistics is above the upper boundary critical value at 1 percent, suggesting that there exist two long run relationships between change in investment and explanatory variables. Table 4 provides the results of the ARDL Bound Cointegration test.

**4: ARDL Bound Cointegration Test**

| | F-test |
|---|---|
| Lower-bound critical value at 1% | 3.15 |
| Upper-bound critical value at 1% | 4.43 |
| **Statistical test** | **15.218***** |

Source: Author's estimation

Following the existence of long-run relationship, estimation of ARDL model is possible, which is based on Bayesian information criterion. The order of ARDL model is ARDL (3, 4, 2, 5, 3, 3, 5). Table 5 presents estimated short run and long-run coefficients of ARDL Approach.

The long-run-run analysis shows that taxation has a negative statistically significant impact on investment dynamics in the country. We found out that in the long-run a unit increase in the change of corporate income tax on firms is associated with a significant decrease in investment levels of 62.1 percent, approximately. This result is in line with the underlying economic theory and empirical evidence from other studies including Babu, Pantaleo, & Ndanshau (2020), Da-Rin, Di-Giacomo, & Sembenelli (2009), Braunerhjelm & Eklund (2013), Bond & Xing (2015), Djankov, Ganser, & Shleifer (2008), Drebler (2012) and Brandstetter & Jacob (2013). The empirical results of the studies found that there is a negative relationship between taxes on firms and the firm's capital-output ratios

Further long-run results revealed that GDP per capita have a positive effect on investment from a long-term perspective. For example, 1 percent increase in GDP per capita tends to lead to an increase in investment by 15.9 percent, approximately. Furthermore, government spending variation and exchange rate variations also seem not provide enough evidence in the long term for the effect in the change of the investment since they have insignificant coefficients. On the other hand, there is a surprisingly positive impact of inflation rate on aggregate investment dynamics. However, the magnitude of this effect is small, representing a positive impact of no more than 1.3 percent on aggregate investment growth by an increase of a percentage point of inflation rate.

**Table 4: Estimated short run and long run coefficients**

| Dependent Variable: Change in Investment | Coefficient | Std. Err. | t | p-value |
|---|---|---|---|---|
| **ECM** | -1.1888** | 0.4179 | -2.84 | 0.014 |
| **Long Run** | | | | |
| L1. Corporate tax | -62.1020** | 27.8736 | -2.23 | 0.044 |
| L1. Corporate tax Square | 2.1289* | 1.0148 | 2.10 | 0.056 |
| L1. Government Expenditure | -1.0505 | 1.0976 | -0.96 | 0.356 |
| L1. GDP per Capita | 15.9248** | 7.3040 | 2.18 | 0.048 |
| L1. Exchange rate | 0.0042 | 0.0079 | 0.53 | 0.605 |
| L1. Inflation rate | 1.2909** | 0.5576 | 2.32 | 0.038 |
| **Short Run** | | | | |
| LD. Change in Investment | -0.6498* | 0.3106 | -2.09 | 0.057 |
| L2D. Change in Investment | -0.5386*** | 0.1592 | -3.38 | 0.005 |
| D1. Corporate tax | -120.0797*** | 23.1077 | -5.20 | 0.000 |
| LD. Corporate tax | -95.7025*** | 23.3666 | -4.10 | 0.001 |
| L2D. Corporate tax | 11.4533*** | 3.0072 | 3.81 | 0.002 |
| L3D. Corporate tax | 18.1493*** | 3.3678 | 5.39 | 0.000 |
| D1. Corporate tax Square | 4.8759*** | 1.0046 | 4.85 | 0.000 |
| LD. Corporate tax Square | 4.4396*** | 1.0776 | 4.12 | 0.001 |
| D1. Government Expenditure | 0.3874* | 0.2083 | 1.86 | 0.086 |
| LD. Government Expenditure | 1.8075 | 1.3339 | 1.36 | 0.198 |
| L2D. Government Expenditure | 3.0187* | 1.5612 | 1.93 | 0.075 |
| L3D. Government Expenditure | 14.8910*** | 4.4839 | 3.32 | 0.006 |
| L4D. Government Expenditure | 10.2364** | 4.1341 | 2.48 | 0.028 |
| D1. GDP per Capita | 7.8005* | 3.9673 | 1.97 | 0.071 |
| LD. GDP per Capita | -15.8366*** | 4.8878 | -3.24 | 0.006 |
| L2D. GDP per Capita | -6.9922 | 4.7000 | -1.49 | 0.161 |
| D1. Exchange rate | -0.0184** | 0.0060 | -3.04 | 0.010 |
| LD. Exchange rate | -0.0258*** | 0.0070 | -3.70 | 0.003 |
| L2D. Exchange rate | -0.0159** | 0.0067 | -2.35 | 0.035 |
| D1. Inflation rate | 0.4091*** | 0.0958 | 4.27 | 0.001 |
| LD. Inflation rate | -0.6875*** | 0.1473 | -4.67 | 0.000 |
| L2D. Inflation rate | -0.8804*** | 0.1477 | -5.96 | 0.000 |
| L3D. Inflation rate | -0.9727*** | 0.1449 | -6.71 | 0.000 |
| L4D. Inflation rate | -0.3549*** | 0.0938 | -3.79 | 0.002 |
| Constant | 254.6608*** | 46.5604 | 5.47 | 0.000 |

Source: Author's estimation

The asterisks * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Note: L stands for Lagged

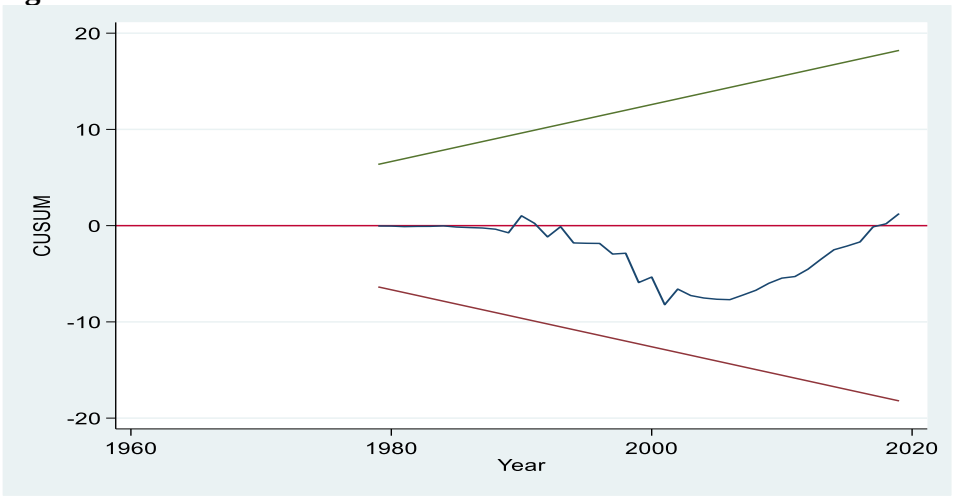
D stands for Differenced

For the short-run perspective, with regards to linear relationships between tax revenues and investment, the results obtained highlight patterns similar to those verified for long-run effects on tax items and investment growth, the exception being the magnitude. In detail, a unit increase in the change of corporate income tax on firms is associated with a significant decrease in levels of investment of 120.1 percent, approximately. The result reflects the volatility nature of the firm's investments in the short-run, which are mostly foreign capital, as a result of the absence of a well-defined and predictable investment strategies.

Further the short-run results revealed that change in investment, change in GDP per capita coefficient have a significant positive effect to the investment levels in the country. However, with an exception of government expenditure of first lag period, government expenditure occurred up to last four lag periods also increases investment significantly. Nonetheless, change in the exchange rate was found to have a statistically negative effect to the investment levels in the short-run by 0.02 percent. Even when the change occurs in the previous periods still affects the current change in investment negatively but the magnitude of the effect is small in the short run. Furthermore, in the short-run, it is observed that, the current change in the inflation rate leads into a significant increase in the investment by 0.41 percent but what reduces the aggregate investment is the lag of change in inflation of the past 4 periods.

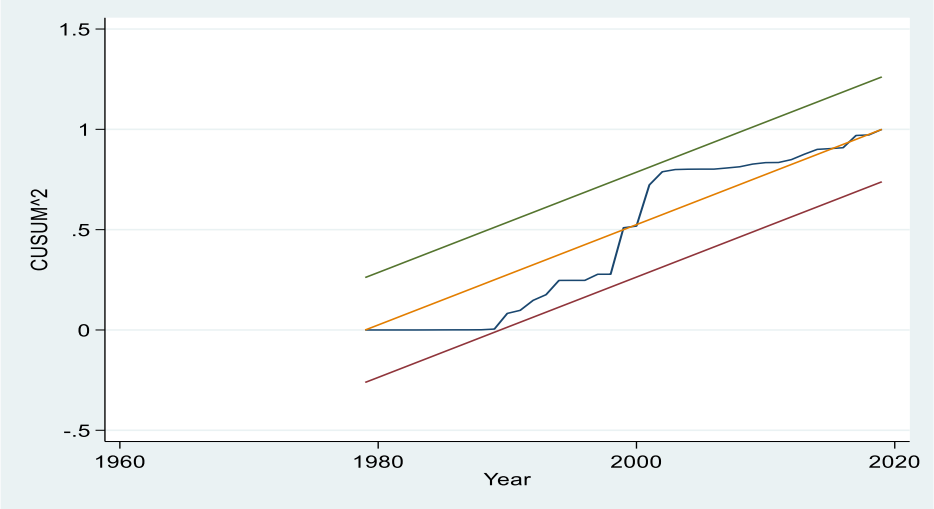
Figure 1 and Figure 2 indicate that all coefficients of estimated ARDL error correction model are stable as they fall within the critical bounds at five percent significance interval. Figure 1 and 2 presents Cumulative Sum of Recursive Residuals and Cumulative Sum of Squares of Recursive Residuals respectively.

**Figure 1: Cumulative sum of Recursive residuals**




*Source: Author's estimation*

**Figure 2: Cumulative Sum of Squares of Recursive Residuals**




*Source: Author's estimation*

## 5.0 Conclusion

This article investigated the impact of taxation on the development of capital formation in Tanzania through the application of the Autoregressive distributed lag (ARDL) model. The results show that corporate income tax has a negative impact on investment dynamics in both the short-run and long-run, the exception being the magnitude. From the findings, the study recommends the review of taxation policies so as to attract more investment in the country as a way to foster economic growth. This, among others, can be done through putting more emphasis on the implementation of the already established Blueprint for Regulatory Reforms to Improvement of Business Environment that aims at improving business environment climate in the country. Additionally, the study recommends to keep encouraging more private sector participation in the economy as well as encouraging the Public Private Partnership (PPP) initiative.

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