The Impact of Fiscal Deficit on Economic Growth: Using the Bounds Test Approach in The Case of Morocco.

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Abstract

The study employed the bounds test (ARDL) approach to cointegration to examine the long run and short run relationships between macroeconomic variables, fiscal deficit and economic growth in Morocco as the case study. The results show that fiscal deficit affect economic growth in the Moroccan economy in the long run as in the equilibrium correction was found to be significantly quick.

Introduction

In recent studies the emphasis on the growth of African countries has been over the need for a balance between expenditure and revenue for sustainable development. The growth of the economy through the effect of fiscal policy is being reexamined with focus on sustainability. Economic growth looks at the possible expansion of a country's production through the factors of production. Various authorities in research have propounded growth models that incorporate various factors and policies to explain how countries can grow. Fiscal policy is the mechanisms countries use to monitor the changing face of public spending and tax revenues in the economy Fiscal Policy is used by governments to influence development and growth in their economies and in the management of resources from fiscal consolidation to job creation. Economic Recovery Program and Structural Adjustments programs instituted by several African countries was helpful in stabilizing economies over the years. The Highly Indebted poor country (HIPC) program which relieved some countries of their debt burden in the 2000s set them on a path to structural reforms, but the effects of fiscal discipline have not been

maintained. African countries have undergone financial sector reforms and IMF reform programs to improve their economies.

Fiscal policy reforms need to be re-examined to assess the real effect on the economy. Most studies over the years have done so in panel data studies which have not dealt specifically with the unique issues faced by the African countries in this geographic area. This study is providing an insight into the effects of fiscal policy on economic growth through macroeconomic variables, the paper examines the effect of fiscal policy on economic growth in the Morocco from 1990 to 2017. The paper looks at the specific long and short run effects of the variables and the direction of their relationship with economic growth. There is the need for a strong and effective fiscal policy to measure and take into consideration the activities needed to manage the long run effects of their activities.

Literature Review

Countries depend heavily on tariffs charges, tax and receipts from trade, for revenue mobilization. Revenue mobilization has over the years been inefficient with majority of the governments domestic revenue generation stemming from trade receipts and tariffs which are volatile forms of revenue generations. This form of revenue is dependent on the terms of trade and volatile. Shortages in revenue and excess spending has plagued the economies over several decades with different governments instituting different measures. Public spending normally takes the form of capital expenditure for developing countries as well as through recurring expenditure. Capital public spending is most often on public works and utilities whiles recurring expenditure is made on salaries and allowances of the government workers. Over the years governments have used fiscal policy to direct the demand aggregates through mechanisms such as monetary supply and interest rates. Fiscal policy is expected to curb fiscal deficit which is caused with spending exceeding revenue leading to potential rise in the rates of interest and inflation. Cost incurred doing business for private sector investors is mostly

affected by this with investment being heavily reduced followed by exchange rate depreciation and trade deficits. Fiscal policy offers economist the chance to effectively assess the effect of governments control systems and their effects if any on the economy.

There are three schools of thought on the impact of fiscal policy on the growth of the economy which are the Classical, Keynesian and Ricardian schools. They have expressed the role of fiscal policy from different angles, from the classical point of view, they advocate for market mechanism to work. Thus, price mechanism works when efficient market hypothesis exists with resources allocation being effective and independent without government intervention. The limits to this school of thought is the evidence of market failure which is the in ability of the market to distribute fairly welfare for the society through the equitable distribution of income in the society leading to the Great Depression in the 1930s (Paul, 1994; Samuelson,2015).The Neoclassical school viewed fiscal deficits as a deterrent to investment as they crowd out the private sector slowing down growth. They assumed that when government expenditure was financed by tax revenue, this will lead to an increase in fiscal deficits which will raise consumption. This will lead to low savings and a rise in real interest rates for the capital market to be in equilibrium, which will then crowd out private investment and reduce growth. The first school which is the tax and spend believe in other for governments to spend they need to tax and use the revenue collected from their citizens to engage in projects that will benefit the economy (Friedman,1978). They established a positive and significant relationship between public spending and revenue. The reduction of tax is seen by the economic environment in the local or domestic economy as governments readiness to boost the economy (Buchanan & Wagner,1978). This was seen in the work of Keho (2010) who found that when governments reduce taxes it improves the budget deficit of the country.

The Keynesian school which then followed was propounded by Keynes in his view the multiplier effect of governments activities such as government participation should be encouraged. They argued that fiscal deficits results in a raise in domestic production as the

level of public capital expenditure in infrastructure such roads, power, airport and water increase the optimism of private investors for the future there by crowding in private investment. Thus, effects of unemployment, exchange rates, inflation, interest rates and population were as result of failure from the governments to implement and intervene with economic policies. He advocated for the participation of government which would boost private sector participation and encourage growth in the short and long run. (Blinder,2016; Saleh,2003; Zuze,2016). The is supported by the Spend and tax school of thought by Peacock and Wiseman(1979) whose work followed keenly that of Friedman disagreed and believed that in other not to delay pertinent programs and projects governments needed to spend after which they tax and collect revenue to pay off the debt incurred. When public spending is excessive in the short-term, governments must increase taxes to meet their debt obligation in the long term (Barro, 1979).

The Ricardian were of the view that governments operate closed economy, Gray and Stone (2005) in relation to this found that public spending has no effect on tax in this state. When fiscal deficits reduce it offsets a rise in the desired levels of private savings which leads to no change in the national savings as such real interest rate in due course do not rise. Tax financed deficit has no effect on the trade balance and real exchange rate. Budget deficit and current account deficit no longer exist (Barro1989). Feldstein (1974) found that there is no effect on investment and public debt as interest rate do not rise to bring a balance between national savings and investment. Thus, budget deficits have no influence on private investment as taxes do not trigger growth consumption as such have no expansionary effect as households have the foresight to anticipate and evaluate the present value of their savings in relation to the future rise in taxes (Barro,1974 cited in Krajewski and Mackiewicz,2007). They were of the view that governments should be impartial in their fiscal management. Thus the third and fourth school of thoughts follow the this line in their arguments as in 1981, Meltzer and Richard argued for the fiscal synchronization of public spending and taxes through transformation at

the same time which was in support of the work done by Musgrave, (1966).The bases for their argument was that the decision to raise revenue cannot be independent of public spending decisions by government. this interdependency between the two calls for decision making to be made together. Barro (1979) based on his model form the Ricardian equivalence theorem, he developed the tax smoothing model which supports the findings that when government finance their spending through deficit it results in tax increasement in the future. This points to the need for governments to critically analyze the cost and benefits of other options before implementing programs. (Narayan and Narayan, (2006); Abu Al-Foul and Beghestani, (2004); Ayşe Kaya and Hüseyin Şen, (2013).

McNown and Baghestani (1994) proposed the fiscal neutrality which sort to establish that there was no link between public spending and revenue for some economies. The decisions that govern the public spending and revenue are based on long term growth prospects as the management of these two variables are determined by different institutional bodies. This goes to strengthen the independence of these two bodies (Ayşe Kaya and Hüseyin Şen, 2013) The development of economies and infrastructure requires the need for governments to spend. The fluctuations experienced by countries in the short run are often controlled through spending by governments. This stability drive is financed by revenues through the mechanism of taxation. all governments can avoid budget deficits when they are able to stimulate revenue through the tax and spend theory. For the spend and tax theory to hold government needs to spend first and then pay by raising revenue to pay off the debt incurred. When decisions for spending are made independently of revenue then fiscal synchronization theory will not hold and budget deficits will occur as governments increase taxes. The institutional directions of the different agencies in the economy has impact on the decisions being made on revenue and as they have different interest which underlines the lack of causal link (Wolde-Rufael,2008; Petanlar and Sadeghi,2012; Ayşe Kaya and Hüseyin Sen, 2013). The growth model which was expanded by Slow (1956) took into consideration the effect of taxation on the growth of the economy. He

argued that when all conditions and variables required for production are present with constant returns to scale there is no impediments to growth. The economic system will adjust to take into consideration changes in growth factors from labour until it reaches an equilibrium of proportional expansion relative to growth. This model considers the role of labour and capital as the only factors for growth in the long run. The model does not take into consideration policies and tax but expect an adjustment to occur to take them into consideration over a transitionary time. The endogenous growth model on the other hand seeks to stimulate growth of output through fiscal policy. Romer, (1987) introduced this model with the introduction of technological changes making it endogenous as against the exogenous variable in Solow's model for economic growth measuring the impact and transformative nature of fiscal policy on growth. King and Rebelo, (1993), point out the effect of research and development, human capital and advancement of the financial sector with the progressive innovative technology through investments as having an impact on growth in the long term.

Empirical Review

Empirical studies on the relationship between fiscal policy and economic growth in academia have yielded diverse results due to differences in countries. Different studies have attempted to demonstrate the impact of fiscal policy on economic growth. Studies by Akram et al in (2011) and Karimi and Khosravi, (2010) found that expenditure crowds out private sector investment whiles Dauda, (2010) found that expenditure crowds in investment with rise in employment, income and consumption. The role of taxation in the analysis of the relationship between fiscal policy and economic growth has been assessed and many authors have found inconclusive results (Ogiogio,1995; Odusola and Fajingbesi,1999). The impact of capital expenditure was positive while recurrent expenditure had little impact on economic growth. Budget recurrent expenditure was found to have a high impact than capital expenditure on the growth of the economy. In 2012, Tumasi in his study found that in the long-run fiscal variables had an impact on economic growth. Using the autoregressive distributed lag (ARDL) covering

1981 to 2008. In the long-run investments and transfer payments from the government had a positive impact whiles tax and consumption had a negative effect in the short-run investments and transfer payments showed a positive effect on growth with insignificant effect from consumption and tax. In the study of Budget deficit and its effect on the economy. Adams and Sakyi, (2012), found that democracy and public expenditure have no effect on growth in the long in short run independently but rather had an effect when they interacted. This study covered from 1960 to 2008 using the ARDL model. Mashkada, (2013) from his study that fiscal deficit in combination with instability and bad governance affected the growth of the economy. This was conducted from 1980 to 2008 for Botswana, Ghana, Morocco, Zambia and Zimbabwe. Akosah (2013) found an inverse long run relationship from 2000 to 2012. His study showed that the financing of recurrent expenditure with deficit slows down growth. Tax and recurrent expenditure in the long run slowed down growth whiles capital expenditure boost growth in the long run. Public debt was also found to affect economic growth in the long run. Othmane and Youssef (2019), found a negative effect on economic growth from tax in the short run whiles direct tax in the long run held a positive effect and indirect tax remaining negative. They also reported on investment and trade openness with investment having a negative effect in the long run whiles openness had a positive effect. Their study cover 1981 to 2017 using the ARDL model. In 2014, Havi and Enu studied the impact of monetary and fiscal policies on Ghana's growth and found that the two improved growth in the country positively from 1980 to 2012. Adu and Ackah (2015), found from their study that long and short term, spending had negative and significant impact whiles recurrent expenditure had a positive impact on the growth of the country. Their study covered 1970 to 2010 using the disaggregated level with the ARDL model. Elosiuba and Chukwuma, (2017) in their studies found a positive relationship government expenditure and economic growth, this covered 1981 to 2014 using the Ordinary least Squares (OLS) technique for the regression. Abdenour and Tounsi, (2015) in their study employed the threshold effect by Hansen (1996,1999,2000) and found that fiscal deficit has a

non-linear relationship with economic growth. They found a positive investment effect on growth once fiscal policy was held beneath 5.1 percent of gross domestic product and negative when above it. A rise in public debt and consumption had a negative effect on economic growth. Mansouri (2008) in his studies found that for Egypt, Tunisia and Morocco, found a crowding in effect of investment on economic growth in all three countries. Morocco showed a positive impact in the long and short run whiles the other two countries had positive impact only in the long run. Khurshid (2019) found that Fiscal Deficit had a negative significant effect on GDP which confirmed the work of Mohammed et al (2010). Barro (1995), examined the impact of inflation on economic growth for 100 countries and found a negative relationship between inflation and economic growth through investment. However, Ghosh and Phillips (1998) found a positive relationship between inflation and economic growth for 145 countries when inflation was below 2 and 3 percent but was negative and significant when inflation was high. Quartey (2010), found a negative relationship between economic growth and inflation for the case of Ghana. Osuala et al (2013) found a positive and significant relationship between inflation and economic growth for Nigeria.

Methodology

The study uses the model proposed by Mohanty (2018) as expressed below to test the linear relationship linkages between fiscal deficits and economic growth using the model below.

$$Y = A\, f(K, L)$$

$$GDPc = f(FD, INF, IM, EX, INV)$$

Where GDPc, is the real Gross Domestic Product per capita, as a proxy of economic growth, FD represents fiscal deficit as a percentage of GDP and the control variables INF, inflation rate, INV, total investment, IM, import and EX, export are the control variables (Tan ,2006: Varamini and Kalash 2010: Rana and Wahid 2017; Goher Fatima, Ather Maqsood Ahmed, and Wali Ur Rehman 2017; Mohanty 2018;Vishal Sharma and Ashok Mittal,2019).The annual

series data from the World Development Indicators (WDI) data base and World Economic Outlook (WEO) period 1990 to 2017.All variables are set in natural logarithms with the FD and INF set in level form. The variables are as follows; '*Ingdpc*', log of GDP per capita, '*fd'*, Fiscal deficits as percentage of GDP, *'inf'*, Inflation rate thus, end of period, '*ex'*, log of export as a percentage of GDP, '*im'*, log of import as a percentage of GDP, '*inv*', total investment as a percentage of GDP

The hypothesis for the study is whether the coefficients of fiscal deficit is positive or negative. In the case of a positive coefficient fiscal deficit will promote economic growth and a negative coefficient will hamper growth. If fiscal deficit (FD) increases capital accumulation will rise through public investment strengthening the outlook and crowding in private investments in the future. However, the negative coefficient will mean fiscal deficit will cause a rise in interest rates as government's demand for funds to finance deficit rises crowding out private investment as capital accumulation falls leading to the layoff of employees especially in the low skilled sector. Inflation (INF) is expected to have a negative impact on growth as higher inflation reduces disposable income leading to a reduction in consumption and aggregate demand as the demand for goods and services fall. This causes a rise in uncertainty on the expected returns from investment projects, making production expensive and firms reduce their number of employees through layoffs. Inflation in moderate levels is expected to create a favorable investment environment and augment savings whiles high inflation rates. Total investment (INV) is expected to have a positive impact on growth as when physical capital grows it leads to a rise in the rate of economic growth. Exports (EX) is expected to have a positive impact on GDP. A rise in exports will cause the GDP to rise leading to an expansion in the economy and a rise in labour specialization and a reduction in cost of production. Imports (IM) is expected to have negative impact on economic growth as a higher import over exports leads to trade deficit. Trade deficits causes a rise in fiscal deficits which in turn hampers economic growth.

Hypothesis

The hypothesis to be tested are as follows:

H_0: There is a no long run relationship between fiscal deficits and economic growth in Morocco

H_1: There is a long run relationship between fiscal deficits and economic growth in Morocco

Hypothesis one is to show the positive impact of fiscal deficits on the capital stock growth through the public investments thus, strengthening the local firms and increasing private investments. In Hypothesis two the test will seek to show that a rise in fiscal deficit crowds out private investment as interest rate rise causing a liquidity constraint on firms and a reduction in capital accumulation.

Model Specification

The model for the study is estimated to analyze the long-run and dynamic interactions for the variables using the bounds testing (or the autoregressive distributed lag (ARDL) cointegration procedure, developed by Pesaran et al., (2001). The autoregressive distributed lag (ARDL) is the model used to check the existence of the short and long run relationship for the variables. The simplicity of the model as against the Johansen and Juselius (1990) multivariate cointegration technique was chosen as it estimated the OLS by identifying the lag order for the cointegration relationship among the variables. The bounds test did not require the pre-testing of unit-root as is done in the Johansen cointegration test. The model uses both the I(0), I(1) variables or when the model is mutually integrated. The model takes into consideration the data size however, the model does not use the I(2) series.

$$\Delta Y_{it} = \alpha\,[y_{i,t-1} - \lambda'_I X_{i,t}] + \sum_{j=1}^{p-1} \xi_{ij}\,\Delta\, y_{i,t-j} + \sum_{j=0}^{q-1} \xi_{ij}\,\beta'_{ij}\,\Delta X_{i,t-j} + \varphi_1 + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (1)$$

Natural logarithm terms are taken for the dependent variable. The first difference operator is Δ and the constant is α, and the co-efficient for the various variables are $\beta_1, \beta_2, \beta_3, \beta_4$, and the error term for the equation is ε_t. Using the Wald test (F-Statistic) the linear restrictions on the

estimated equation in the long run coefficients are checked using the bounds test approach for a one period lag for the variables. The variables for the estimated equation are tested for the null hypothesis of no co-integration and the alternative of co-integration among the variables.

The test equations are as below:

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7$

H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7$

The Lower bound critical values are assumed to be explanatory variables which are integrated of the order I (0) and the upper bound critical values are assumed to be integrated of the order one I(1). The F-statistics of a lower bound if small means the rejection of the null hypothesis and if the F-statistics is more than the upper limit bound then the null hypothesis is accepted. However, when the F-statistics is flanked by the lower and upper limit bounds the results are deemed inconclusive.

The ARDL is estimated as follows:

$$\Delta InGDP_t=\alpha_{01}+\beta_{11}InGDP_{t-1}+\beta_{21}FD_{t-1}+\beta_{31}INFt_{-1}+\beta_{41}InIMt_{-1}+\beta_{51}InEXt_{-1}+\beta_{61}InINVt_{-1}+$$

$$\beta_{71}InEXP_t+\sum_{t=0}^{m-1}\alpha_{1i}\Delta InGDP_{t-1}+\sum_{t=0}^{m-1}\alpha_{2i}\Delta FD_{t-1}+\sum_{t=1}^{k-1}\alpha_{3i}\Delta INF_{t-}\sum_{t=1}^{k-1}\alpha_{4i}\Delta InIM_{t-}$$

$$_1+\sum_{t=1}^{k-1}\alpha_{5i}\Delta InEX_{t-1}+\sum_{t=1}^{k-1}\alpha_{6i}\Delta InINV_{t-1}+\sum_{t=1}^{k-1}\alpha_{7i}\Delta InEXP_{t-1}+\varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots(2)$$

The short run dynamic parameter of the error correction model is as follows:

$$\Delta InGDP_t=\Delta\alpha_{01}+\sum_{t=0}^{m-1}\alpha_{1i}\Delta InGDP_{t-1}+\sum_{t=0}^{m-1}\alpha_{2i}\Delta FD_{t-1}+\sum_{t=1}^{k-1}\alpha_{3i}\Delta INF_{t-1}+\sum_{t=1}^{k-1}\alpha_{4i}\Delta InIM_{t-}$$

$$_1+\sum_{t=1}^{k-1}\alpha_{5i}\Delta InEX_{t-1}+\sum_{t=1}^{k-1}\alpha_{6i}\Delta InINV_{t-1}++\sum_{t=1}^{k-1}\alpha_{7i}\Delta InEXP_{t-1}\ \varepsilon_{1t} \quad \ldots\ldots\ldots\ldots\ldots..(3)$$

The Long run dynamic parameter of the error correction model is as follows

$$\Delta InGDP_t=\Delta\alpha_{01}+\sum_{t=0}^{m-1}\alpha_{1i}\Delta InGDP_{t-1}+\sum_{t=0}^{m-1}\alpha_{2i}\Delta FD_{t-1}+\sum_{t=1}^{k-1}\alpha_{3i}\Delta INF_{t-1}+\sum_{t=1}^{k-1}\alpha_{4i}\Delta InIM_{t-}$$

$$_1+\sum_{t=1}^{k-1}\alpha_{5i}\Delta InEX_{t-1}+\sum_{t=1}^{k-1}\alpha_{6i}\Delta InINV_{t-1}+\sum_{t=1}^{k-1}\alpha_{7i}\Delta InEXP_{t-1}+\lambda ECT_{t-1}+\varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots(4)$$

The $\lambda=(1-\sum_{j=1}^{p-1}\delta_i)$, represents the speed of adjustment parameter with a negative sign. ECT $=(InGDP_{t-1} - \Theta X_t)$, as the error correction term, $\Theta= (\sum_{j=1}^{p-1}\beta_I)/\alpha$, as the long parameter and α_{1i} is the short-run dynamic coefficients of the model's adjustment long-run equilibrium.

Unit Root Test

Testing the Unit roots of the equations to check whether the data is stationary or not stationary. The study uses the Augmented Dickey -Fuller (ADF) of (1979), Phillip-Perron test and Dickey fuller generalized least square (DF-GLS) proposed by Elliot et al., (1996) to test for order of integration and non-stationarity among the variables. The ARDL bounds test is conducted based on the assumption that the variables are integrated of the order I(0) and I(1) and to avoid any variable being of the order I(2). This is to ensure that the series are not spurious as such if the variables are of the order two, we cannot interpret the values of the F-statistics. The results are shown in table 1 and table 2 under unit roots test in the appendix. They show that all the variables are non- stationary at levels, but stationarity is achieved at first difference and being of the order one I (1).

Bounds Test Approach for Cointegration

The ARDL bounds test estimates the equation by using the Ordinary least squares (OLS) to test for the existence of a long run relationship among the variables in the study. The F-test is conducted on the joint coefficients of the lagged variables with the null hypothesis as H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7$ and alternative hypothesis as H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7$. The critical values bonds for the test for co-integration is when the independent variables are of the order zero I(a) (where $0 \leq a \leq 1$). The null hypothesis of no cointegration is rejected if the F-statistics is above the upper critical bound for the orders of integration in the series. However, the null hypothesis is accepted if the F-statistics falls below the lower critical value. If the F-statistics falls between the lower and upper values the results are inconclusive. The critical values propounded by Pesaran and Pesaran, (1997) are used for the test (F-statistics). Testing

for the existence of the long-run relationship I use a specific modelling approach directed by SIC since the data length is short in nature at a lag length maximum of 2, in the ARDL-VECM estimation. I estimate the OLS regression for the first difference, test the joint significance of the lagged level variables of the parameters using the guide of Pesaran and Pesaran (1997). The F-statistics of the null- hypothesis are tested jointly for the coefficients of the lagged variables to ascertain if a long-run relationship exist. The F-statistics is reported in the table 3 when each variable is considered as a dependent variable in the equation for the regression. The f-statistics F_{lnGDP} (lnGDP/ FD INF lnINV lnIM lnEX lnEXP) =5.067, F_{fd} (FD/ lnGDP INF lnINV lnIM lnEX lnEXP) =7.773, F_{lnim} (lnIM/ FD INF lnINV lnEX lnEXP) =6.547, F_{lnex} (lnEX/ FD INF lnINV lnIM lnEXP) =6.503, F_{lnEXP} (lnEXP/ FD INF lnINV lnIM lnEX) =8.676, are higher than the upper limit bound critical value so I reject the null- hypothesis of no co-integration. F_{inv} (lnINV/ lnGDP FD INF lnIM lnEX lnEXP) =3.420, falls between the lower that the upper bound critical value of 3.15 and 4.43 at the 1 per cent level which is inconclusive. F_{INF} (INF/ lnGDP INF lnINV lnIM lnEX lnEXP) =2.898 are lower than the lower limit bound critical value of 3.15 at the 1 percent level, thus the null- hypothesis of no co integration is accepted see table 3.

Once I established that a long-run relationship existed, using the estimated the ARDL (2 2 2 0 1 2 0) specification. The results obtained by normalizing on real GDP per capita ($lnGDP_t$) in the long run estimates reported in table 4. The estimated coefficients of the long-run relationship show that fiscal deficit has a high significant negative impact on economic growth proxied by GDP per capita in Morocco which is undesirable as it shows the ineffectiveness of government policies and investments. A percentage change in fiscal deficit is associated with a 0.364 percent decline in economic growth on average all things being equal at the 1 percent level. In this case of a negative coefficient hampers growth in the long run. A decline in fiscal deficit (FD) causes a rise in interest rates as government's demand for funds to finance deficit rises crowding out private investment as capital accumulation falls leading to the layoff of

employees especially in the low skilled sector. As such, investment policy requires changes so that the significant growth may be achieved in Morocco. Imports (IM) show a negative non-significant impact on economic growth. A 0.883 percentage decline all things being equal. A higher import over exports leads to trade deficit which causes a rise in fiscal deficits which in turn hampers economic growth.

The impact of trade on growth through exports saw a positive significant impact on economic growth at the 1 percent level. A percentage change in Exports leads to a 0.872 percent increase in economic growth. This rise in exports will cause GDP per capita to rise leading to an expansion in the economy and a rise in labour specialization and a reduction in cost of production. Investment has a positive significant impact on the growth with a 1 percent increase in investment leads to a 1.118 increase in GDP per capita. Inflation and total expenditure both showed a negative significant impact on economic growth at the 5% and 1% percent levels respectively. High inflation reduces disposable income leading to a reduction in consumption and aggregate demand as the demand for goods and services fall, production falls and firms reduce their number of employees through layoffs. Inflation in moderate levels create a favorable investment environment and augment savings, hence government should implement policies to moderate inflation levels.

Results from the short run coefficients relate to relationships in the long run for the error correction model equation are shown in table 5. The short run signs for the model show the impact change for most of the reporting variables with only imports maintaining its negative sign in the long run. Inflation is highly significant at the 1percent level whiles fiscal deficits, imports and investments significant at 5 percent. In the short run the fiscal deficit positive impact of on the Moroccan economy at 5percent levels, thus a 1 percent change in the fiscal deficit brings a 0.008 percent positive change in the Moroccan economy. The low nature of the positive impact of fiscal deficit on the Moroccan economy shows that if government policies and investments are effective the results will be desirable. Imports in the short run have a

negative impact on the economy which has a significant impact on the economy in the short term at 5 percent levels. Investment is negatively significant at 5 percent whiles Inflation is positively significant at the 1 percent level in the short run. The coefficient of the error correction term (ECT) has a negative sign at 1 percent level. The negative sign is statistically significant as the value shows that there exists cointegration relationship among the macroeconomic variables and GDP. The coefficient ECT is -0.52, which is highly significant at (0.001) with a negative sign which depicts that the speed of adjustment towards long-run equilibrium after a shock. Approximately 52 percent annual disequilibria from the previous year's shocks will converge in the long-run equilibrium in the current year. Fiscal deficit changes have a negative and significant effect on the Moroccan economy in the long run but a slightly positive effect in the short run.

Stability test

The stability of the model has been measure using the CUSUM test. The plot of the CUSUM test lies in between the two straight lines in figure 1 in the appendix. This shows the estimated coefficients are stable within the 5 percent significance level.

Conclusion

The study employed the bounds test (ARDL) approach to cointegration to examine the long run and short run relationships between macroeconomic variables, fiscal deficit and economic growth in Morocco as the case study. The bounds test suggested that the variable of interest is bound together in the long-run. The associated equilibrium correction was found to be significant confirming the existence of the long-run relationship as the equilibrium quickly corrected. The results show that fiscal deficit affect economic growth in the Moroccan economy. The government should improve tax collection and check and improve the ratio of indirect tax and direct tax. The tax base of the economy should be increased. The government should control and reduce its expenditure whiles improving price stability in the economy.

Lender interest rates should be reduced to attract investment into the country which in turn will contribute to employment opportunities. The drop will encourage small investors to invest and help government generate revenue whiles sustaining and improving trade.

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Appendix

Table3: Bounds test

Dependent Variable	F-Statistics	Co-integration	What next
$InGDPc_t$	$F_{InGDPCt} = 5.067$	Yes	Estimate ECM Error correction model
FD_t	$F_{FDt} = 7.773$	Yes	Estimate ECM Error correction model
INF_t	$F_{InINFt} = 2.898$	No	Estimate ARDL Short run model
$InINV_t$	$F_{InINVt} = 3.420$	Inconclusive	Estimate ARDL Short run model
$InIM_t$	$F_{InIMt} = 6.547$	Yes	Estimate ECM Error correction model
$InEX_t$	$F_{InEXt} = 6.503$	Yes	Estimate ECM Error correction model
$InEXP_t$	$F_{InEXPt} = 8.676$	Yes	Estimate ECM Error correction model

Notes: Asymptotic critical value bounds are obtained from Table C(iii) Case III: Unrestricted intercept and no trend k=5 (Pesaran et al., 2001). Lower bound I (0) = 3.15 and Upper bound I (1) = 4.43 at 1% significance level.

Unit Root Tables

Table 1: Variables at levels with lag (1)

Variables	ADF test			DFGLS test			PP test		
	SIC lag	T-stat	Critical Value at 5%	SIC	T-stat	Critical Value at 5%	SIC	T-stat	Critical Value at 5%
InGDPc	0	0.016 (0.9598)	-2.994	0	-2.938	-3.421	0	0.405 (0.9817)	-2.994
FD	0	-2.036 (0.2712)	-2.994	0	-2.463	-3.421	0	-2.258 (0.1857)	-2.994
InINF	0	-3.367 (0.0121)	-2.994	0	-3.957	-3.421	0	-3.325 (0.0138)	-2.994
InINV	0	-0.837 (0.8080)	-2.994	0	-2.022	-3.421	0	-0.903 (0.7871)	-2.994
InIM	0	-0.705 (0.8455)	-2.994	0	-2.709	-3.421	0	-0.500 (0.8921)	-2.994
InEX	0	-0.656 (0.8578)	-2.994	0	-3.442	-3.421	0	-0.382 (0.9131)	-2.994
InEXP	0	-1.143 (0.6977)	-2.994	0	-2.201	-3.421	0	-1.104 (0.7136)	-2.994

Table 2: At First difference lag(0)

Variables	ADF test			DFGLS test			PP test		
	SIC lag	T-stat	Critical Value at 5%	SIC	T-stat	Critical Value at 5%	SIC	T-stat	Critical Value at 5%
ΔInGDPc	0	-10.439 (0.0000)	-2.997	0	-10.559	-3.436	0	-9.595 (0.0000)	-2.997
ΔFD	0	-4.337 (0.0004)	-2.997	0	-4.420	-3.436	0	-4.333 (0.0004)	-2.997
ΔINF	0	-11.075 (0.0000)	-2.997	0	-11.862	-3.436	0	-11.264 (0.0000)	-2.997
ΔInINV	0	-4.380 (0.0003)	-2.997	0	-4.178	-3.436	0	-4.365 (0.0003)	-2.997
ΔInIM	0	-6.312 (0.0000)	-2.997	0	-6.165	-3.436	0	-6.483 (0.0000)	-2.997
ΔInEX	0	-6.541 (0.0000)	-2.997	0	-6.223	-3.436	0	-6.920 (0.0000)	-2.997
ΔInEXP	0	-5.705 (0.0000)	-2.997	0	-5.612	-3.436	0	-5.688 (0.0000)	-2.997

Table4: Estimated Long Run Coefficient using ARDL Approach

ARDL(2 2 2 0 1 2 0) selected based on AIC, Dependent variable in $\Delta InGDP_t$				
Regressors	Coefficient	Standard Error	T-Ratio	Probability
fd	-.0364771	.0089236	-4.09	0.002***
Inim	-.0883851	.2822079	-0.31	0.761
Inex	.8728326	.2430965	3.59	0.005***
Ininv	1.11824	.3016621	3.71	0.004***
inf	-.0206878	.0086317	-2.40	0.038**
Inexd	-1.049267	.2573386	-4.08	0.002***
Ecm(-1)	-.5219176	.1195974	-4.36	0.001***
***(**) denotes 1%(5%)significance level				

Table5: Estimated Short run Coefficient using ARDL Approach

ARDL (2 2 2 0 1 2 0) selected based on AIC, Dependent variable in $\Delta InGDPc_t$				
Regressors	Coefficient	Standard Error	T-Ratio	Probability
fd	.008706	0027977	3.11	0.011***
Inim	-.1242452	.0635242	-1.96	0.079**
Ininv	-.2892655	.141279	-2.05	0.068**
inf	.0150526	.0032581	4.62	0.001***
Cons	3.636395	.8185803	4.44	0.001***
*ecm = lnGDPc + 0.364*lnFD - 0.883*lniIM + 0.872*EX +1.18*lnINV -0.20*lNF - 1.049*lnEXP+0.521*C*				
R-Squared =0.9982			F-stat. F (15, 10) = 364.75(0.000)	
Breusch-Godfrey LM test = 1.901(0.1680)			DW-statistic = 2.364534	
White's test = 26.00(0.4076)			Skewness= 20.61 (0.1496)	
Kurtosis = 0.25 (0.6205)			Jarque-Bera = 0.3883 Chi (2) 0.8235	
Akaike Info. Criterion = 59.65371			Schwarz Bayesian Criterion = 50.58285	

***(**) denotes 1% (5%) significance level

Figure 1: CUSUM graph.