Impact of External Debt on Aggregate Investment and Productivity in Pakistan

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Abstract

Investment and factor productivity are important economic indicators to explain the economic prosperity of the economy. This intellectual effort is executed in Pakistan economy, to find the relationship between investment & debt, and between factor productivity and debt. The relationship between (investment & debt and between factor productivity & debt) is estimated by using annual time series data from 1979 to 2020 under controlled policy variables like, interest rate, consumer price index, trade openness, fiscal development, fiscal deficit, population and human capital. The auto regressive distributed lag model is used for empirical quantification and augmented dicky fuller test is used to test stationarity of data. The findings suggest that debt, fiscal deficit, financial development, population growth and interest have negative relationship with investment whereas inflation, employed per person income and trade openness has positive impact on the investment. The other findings provide the evidence that debt, interest rate, has negative impact on productivity and human capital, fiscal development, fiscal deficit and inflation has positive impact on productivity. The findings suggest that there is need to curtail the debt in long run to increase the investment and productivity. Government needs to increase its revenue with influencing the domestic interest rate which leads to reduction in investment and influence the output of the economy.

Key Words: Investment, Productivity, Debt, Interest Rate, Fiscal Deficit

Introduction

The problem of external debt as a policy to stimulate economic progress creates thoughtful debate between, researchers, policy makers & economists. Presently, external borrowing is a global issue for the

current and future progress of most countries in the world (koilo et al., 2018). Government executes lots of functions such as providing security, public goods, protection of property rights and preventing externalities etc. To perform all these functions government needs money, to finance the public expenditure. The key sources of these finances are taxes such as value added tax, income tax etc. Though, there are circumstances when the finances collected became inadequate to finance the public expenditure, this situation is termed as budget deficit. In order to remove the budget deficit or to meet the economic requirements the government creates revenue through printing new currency, imposing taxes, and borrowing from both internal and external resources (Mambepa, C. M. 2020). Internal resource deal with domestic debt and external resource deal with external debt, in this study we deal with external debt. The World Bank (2009) describe external debt as "money acquire by the nations from external creditors. Interest on such obligation should be pay back in the foreign money in which the loan was taken". High spending & Low domestic savings results in fiscal deficits and increasing debt (AfDB, 2019).

Economists are always concerned about how to achieve high and long-term economic growth. Emerging economies have seen a significant drop in economic growth since the beginning of the 1980s. Deterioration in capital accumulation, which has a direct and positive impact on real growth rates (IMF (1988) for a wide sample of developing countries), has been a major cause of this slowdown. Diminishing of investment trend can be described in a variety of ways however this study focuses on the external borrowing channel. Investment is capital formation, the acquisition or creation of resources to be used in production. Aggregate investment is the summation of public and private investment. When the external debts are used productively, then it largely boosts growth. External borrowing is acquired when an economy is devoid of the foreign exchange and local savings required to meet national and other developmental goals (Siddique et al., 2015).

Debt accumulation, on the other hand, comes with a number of risks: as debt grows, borrowers' refund abilities become more sensitive to drops in income, while interest rates climb. It also reduces regimes' incentives to engage in costly and challenging policy reforms aimed at boosting expertise and resource use, resulting in slower productivity growth. In other words, a higher amount of debt increases the risk of default, which stifles economic activity, resulting in financial instability and a slower rate of growth (Poirson et al., 2004; Karadam, 2018 Cecchetti et al., 2011).

"Productivity isn't everything," Paul Krugman said in 1994, "but it is almost everything in the long term." It's more about "working smarter" than "working harder" when it comes to productivity. Productivity demonstrates our potential to increase output by combining inputs such as fresh ideas, technical advancements, and so on. (Nath 2021) All over the world, many developing countries suffered by the problem of external debt has fascinated global attention; Nowadays external Debt problem is one of the most critical issues that face the whole world's countries, either they are developing or the developed countries, lender or borrower countries. The World Bank data show that in 2019 the debt stock as percentages of GNI for the low & middle-income countries stocks were 32.9 and 25.8 respectively.

Normally, in the existing literature, two hypotheses "debt overhang" and "crowding out" have been tested to explain the link between government debt and growth. Agreeing to the debt overhang hypothesis, if debt increases than a country's refund capacity, then the cost of predicted debt-servicing would be greater that in turn fall private investment and hence economic progress (Krugman, 1988). Conversely, the crowding out hypothesis implies that when government increases their debt by acquiring funds from the domestic markets then not only it decreases the funds available for the private investors but also increases

the cost of these funds as a result private investment is reducing. The crowding out hypothesis explains the effect of external debt on economic efficiency with two channels. First, crowding out implies that public debt reduces economic growth by decreasing the private investment. Second, a rise in the existing debt indicates higher future taxes which reduces saving and investment in the future and eventually declining economic growth (Sachs &Kenen, 1990).

One of the biggest issues facing emerging nations at the start of the twenty-first century is a huge debt load. Compared to foreign debt, domestic debt received less attention from international organizations and policymakers. External or internal borrowing must be done to advance economic development and social wellbeing (Akram, 2011). The Keynesian hypothesis holds that public debt bridges the budget deficit and boosts economic growth to a certain point. Conversely, excessive debt has a negative impact on the expansion of the economy. Higher levels of government debt increase the interest rate in the future, therefore, crowded out private investment that affects economic growth adversely (Jebran et al., 2016). Pakistan's debt has been rising steadily since 1947, and it continues to do so year after year as a result of increased borrowing and currency depreciation. Every regime has relied on external borrowing both domestically and internationally rather than mobilizing resources from home sources. Large volume of debt remained one of the major policy issues in Pakistan since the start of 21st century (Akram, 2013). According to a World Bank and IMF report on Pakistan, the country's external debt burden is the root of the country's economic troubles. What will be the quality of education, living standards, health, infrastructure, and defense if a country spends 65 percent of its revenue to finance debt in dollar form and the remaining 30 to 35 percent on defense or development programs such as education, health, infrastructure, and others? As a result, the country's physical and social infrastructure, as well as other growth objectives, will almost certainly be harmed (Ali 2008).

In the neoclassical growth framework proposed by Modigliani (1961), Diamond (1965), and then Saint-Paul (1992), it was stated that an economy's growth rate will always drop if foreign debt rises. As a result of the high debt-to-GDP ratio, investment declines, resulting in low productivity and capital accumulation. The majority of scholars emphasize the influence of foreign debt on efficiency while ignoring its impact on growth determinants such as productivity. Simon and Carmine (2012) investigated the influence of external debt on two important determinants of economic progress: productivity and capital accumulation. These two criteria have traditionally been the most important determinants of growth in growth theories. Examining these two characteristics (capital accumulation and productivity) through debt revealed that a high level of public debt has always had a negative impact on investment and productivity, implying that it will have a long-term impact on growth (Acemoglu, 2009 and bonfiglioli,2008). External debt has the potential to harm long- term growth in a variety of ways. To begin with, if the debt is serviced through taxation, private investment will be crowded out as a result of lower savings (due to lower disposable income), resulting in distortionary taxation. Second, when the likelihood of default rises, growing external debt will raise long- term non-linear yields. Higher long-term rates crowd out beneficial government investment and, more crucially, increase the cost of capital, reducing private investment. "Reductions in R&D expenditure will have long-term negative repercussions on growth," (Elmeskov and Sutherland, 2012). Third, government officials make decisions to inflate away the obligation and high costs in a weak institutional system. (kumar & woo, 2010).

The major goal of this paper is to look into the relationship between debt and investment, as well as debt and productivity. This paper looks into the empirical relationship between debt-investment and debt-

productivity, which is either linear or nonlinear. Another research goal is recognized that is the external debt an obstacle to growth and identified channels through which debt can have an impact on growth? There has been a lot of work done in the literature on the relationship between external debt and growth, as well as the relationship between external debt and investment, but there has been less work done on the relationship between debt and the two key factors of growth, productivity and capital accumulation. Though there is substantial stock in the literature for established economies and the OECD, there is a dearth of similar work for developing countries like Pakistan. Pakistan is beset by two significant debt and deficit problems. This is the driving force for this paper, which aims to investigate the impact of external debt on aggregate investment and productivity in Pakistan.

LITERATURE REVIEW

The world began to pay close attention to the heavily indebted emerging nations in the second part of the 1990s, and more studies and research have been done to address contentious issues such what are the levels of debt that have a significant impact on the Economy and progress? what are the channels that illustrate these impacts? High obligation is a truth of the worldwide economy and for developing countries it is a significant problem. However, external borrowing is the most noticeable financial source and a big problem at the same time (Shkolnyk & Koilob, 2018 Riffat& Munir, 2015;).Krugman (1988), Musgrave (1959) and Myers (1977) noted that large amount of Debt can result in a debt overhang problem, which can lead to high interest rates and inflation, which can crowd out private investment and, as a result, low economic progress. The result of different researcher showed the significant and insignificant effects of debt on investment and economic progress.

In case of Bangladesh Saifuddin (2016) investigated debt and growth relation. Study used the quantitative research method in which the time span is from 1974-2014 was collated in the study. Data collected in the study have been tested by the usage the ADF test and the TSLS repression examination. Results of the study show that debt is significantly linked to investment as well as growth. Result also indicates that in order to boost growth debt should be used in productive purposes. In advanced countries to empirically analyze the impact of debt on growth Serrao (2016) performed research for twenty superior nations including Australia, Austria, Belgium, Canada, Ireland, Italy, Japan, and the United States etc. Data spanning sixty-four years (1964-2009) were used. Inferential analysis was used and result of the study showed that in advanced countries a negative relation between debt and growth exists. Based on findings, in advanced economies study encouraged new public debt management strategies, examining their economic as well as financial performance.

In South-East Asia nations to test the connection between debt and growth Muhammad (2017) carried out a study. The study used quantifiable research method and secondary data for ten years (2006-2015) were gathered. Data were explored in this study using the VAR technique, and different inferential analyses. Results indicate that debt affects growth of a country positively in the long run. Brini, Jemali, and Ferroukh (2016) investigated Tunisia's state debt and growth. The study used a quantifiable approach, with secondary data collected over a period of time ranging from 1990 to 2013. Inferential techniques, such as the Autoregressive distributed lag model ARDL, were used to investigate the data collected in the study. The study's findings revealed that deb have a negative and significant effect on growth in the long run, and that there is a unidirectional causation between debt and growth in the short and long-term. According

to the analysis, there is a bi-directional correlation between total debt and long-term growth improvement. However, there is no indication that this is the case.

In Malaysia, Siew-Peng and Yan-Ling (2015) looked at governmental debt and growth. Other debt load measures, such as the deficit in budget, expenditure, debt service, and consumption, were examined to see if they had an impact on economic advancement. The numerical data was used in this investigation. Secondary data was compiled for the years 1991 to 2013. The data acquired in study subjected to inferential analyses. The findings of the studies demonstrated a negative link between debt and growth. Khan, Rauf, Mirajul-Haq, and Anwar (2016) undertook a study to empirically examine the influence of debt on growth in Pakistan. Over the period 1972 to 2013, secondary data was used in the study. Inferential analyses were used to assess the data acquired in the study. The study's findings demonstrated a favorable but statistically insignificant association between governmental debt and economic advancement. The study also showed that a high pace of people expansion had a negative impact on economic success.

In Tanzania, Said and Yusuf (2018) investigated state debt and growth. In this study data spanning forty-five years was used. In Tanzania the VECM estimate revealed a negative association between debt and growth. There is no causal relationship between debt and growth, according to the Granger causality test. Mwaniki (2016) looked at the impact of Kenya's public debt on the country's GDP. The study looked at the influence of external debt on GDP. The study used causal research design& OLS regression. And time series data was collected over a twelve-year period (2003-2015). Inferential analysis was performed on the data gathered in the study. Bank loans, external debt, and government securities all have a substantial association with GDP, according to the findings. Following these findings, the report recommended that the government increase long-term domestic and international borrowing, as well as the use of funds.

Awan et al. (2020) examine the influence of external debt on Pakistan's growth from 1980 to 2017. Study used ADF's & ARDL Mode. The data demonstrate that during the study period, debt & other variables had positive effects on GDP. According to the analysis, Pakistan needs to lower its external debt. Mumba et al. (2020) examine the link between debt and growth in nine Southern African nations from 2000 to 2018. A panel ARDL technique was used in the research. Using the dependent variable of real GDP growth and the independent variables, investment (INV), trade (TR), and inflation rate (INF). The short- and long-run effects of debt on growth are identified by empirical findings, which reveal that foreign debt stifles growth in both the short and long-term. The result show that policymakers in Southern Africa cannot solely rely on external debt to generate economic growth; improve and progress their economies.

RESULTS AND DISCUSSION

The current research objective is to estimate the relationship between debt and investment. The initial process identified the ardl bound co-integration approach is suitable and justifiable on the results of unit roots. The relationship between debt and investment is tested under some other control policy such as deficit, trade openness, productivity, inflation, interest rate, fiscal development, population growth. The annual time series data is used and results are presented and discussed below.

Table 1: Lag order selection criteria

LLag	LogL	LR	FPE	AIC	SC	HQ

10	204.1091	NA	4.51e-07	10.92867	11.31257	11.06641
11	97.74257	448.9076	6.04e-12	-0.397055	3.441933	0.980341
22	249.4914	155.6398*	3.26e-13	-4.025199	3.268879	-1.408147*
33	473.4789	126.3519	2.66e-15*	-11.35789*	-0.608724*	-7.501183

After checking the stationarity of data, the VAR model is used for selection of appropriate lag in the required Ardl bound model for empirical estimation. There are five criteria's which are used to suggest the appropriate lag length in particular model are (LR, FPE, AIC, SC, HQ). Table 1 contains the result of var model and in this we see that AIC, SC and FEP suggest 3 lags and LR and HQ suggest 2 lags for Ardl bound estimation. So, in this study we used three lag which by three criteria (AIC, SC and FEP) and most commonly used criteria are also AIC and SC.

Table 2: Bound testing; Autoregressive Distributed Lag estimates Dependent variable is gross fixed capital formation.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNGFCF(-1)	0.700074	0.295635	2.368039	0.0641
LNGFCF(-2)	-0.527710	0.552138	0.955758	0.3831
LNDTGDPR	0.414101	0.213738	.937418	0.1104
LNDTGDPR(-1)	0.078501	0.196143	0.400221	0.7055
LNDTGDPR(-2)	0.032599	0.287211	.113503	0.9140
LNDTGDPR(-3)	0.384092	0.378505	1.014761	0.3568
DFTGDPR	28893.54	36437.74	0.792956	0.4638
DFTGDPR(-1)	-24170.82	20201.11	-1.196509	0.2851
DFTGDPR(-2)	-7913.325	14320.07	-0.552604	0.6043
DFTGDPR(-3)	18313.38	11282.55	.623160	0.1655
CPI	-0.033001	0.009506	-3.471454	0.0178
CPI(-1)	-0.028390	0.016840	-1.685872	0.1526

CPI(-2)	-0.026939	0.023836	-1.130162	0.3097
CPI(-3)	0.015452	0.013668	.130576	0.3095
FNDEV	0.001391	0.019449	.071529	0.9458
FNDEV(-1)	-0.029609	0.028566	-1.036516	0.3475
FNDEV(-2)	0.017278	0.015591	1.108178	0.3182
GDPPEP	-0.000168	0.000126	-1.328949	0.2413
GDPPEP(-1)	-0.000214	0.000126	-1.697709	0.1503
GDPPEP(-2)	0.000360	0.000112	3.208459	0.0238
GDPPEP(-3)	0.000182	0.000123	1.480180	0.1989
POPGR	-4.823579	1.974780	-2.442591	0.0585
POPGR(-1)	1.605814	2.600715	0.617451	0.5640
POPGR(-2)	217209	1.873861	1.289962	0.2535
POPGR(-3)	-3.415782	1.259732	-2.711516	0.0422
TO	-0.009848	0.017530	-0.561793	0.5985
TO(-1)	-0.012745	0.009975	-1.277705	0.2575
TO(-2)	-0.000100	0.014630	-0.006835	0.9948
TO(-3)	0.012748	0.011640	1.095130	0.3234
IR	0.050318	0.017957	2.802137	0.0379
IR(-1)	0.028225	0.026768	1.054441	0.3399
IR(-2)	-0.026574	0.017270	-1.538766	0.1845
IR(-3)	-0.019276	0.019756	-0.975731	0.3740
C	75.73061	21.39182	3.540166	0.0166

*5% level of significance is used

The value of F-stat is used to check Cointegration between the time series. The ardl bound testing is employed for this particular purpose. The estimated value of f-stats is 3.86 which is greater than critical lower and upper bound value at,10%, 5% and lower than 1 percent. In this study we used 5% level significance criteria and reject null hypothesis and accept alternative that Cointegration exist.

Table 3: Model goodness of fit

R2	**0.9498**	**MDV**	**27.1895**
Adjusted R2	0.9188	S.D of DV	1.4597
SER	0.0489	AIC	-3.5071
SRR	0.0119	SC	-2.0568
Log likelihood	102.3892	HQ	-2.9867
F-statistic	10.4581	DW	2.2127
Prob(F-statistic)		0.0000	

The most important part of any research contribution depends upon the goodness of fit of that particular model which used for empirical estimation between the relationship of the required dependent and independent variables. There are many parameters which are used to summarize the goodness of fit of model but two parameters' ore more important than other are R2 and f-stats value. The value of R2 explained the variation in dependent variable which is related to independent variables and f-stats describes that model is correctly specified for particular analysis. The value of R2 in table 3 is 0.94 which describe that 94 percent variation in dependent variable gross fixed capital formation is explained due to these factors which are include in given model and remaining 6% is due to those variables which are not include in model. The f-stats value is 10.45 and p-value is less than 0.05 so we rejected the null hypothesis that model is not good fitted and not correctly specified and accept the alternative hypothesis that model is good fitted and correctly specified.

Table 4: Diagnostic testing of residual

Test statistics	**LMs version**
Serial Correlation	2.3127 (0.6745)
Functional Form	1.3127(0.1324)
Normality	0.8394(0.6572)
Heteroscedasticity	5.0331(0.3718)

Table 4 contains the result of checking the assumption of classical liner regression model of residual. The assumptions which are tested are serial correlation, normality, functional form of model and constant variance. For serial correlation and constant variance Breusch-Godfrey Serial Correlation LM Test and Breusch-Pagan-Godfrey heteroscedasticity LM version are used and for normality JB test used and Ramsey reset test for functional form of model. The value of Breusch-Godfrey Serial Correlation LM test for serial correlation is 2.3127 and p-value (0.6745) where for constant variance 5.0331 and (0.3718). In case of LM version, we used Obst*R-squared for serial correlation and constant variance. For measuring the normality of residual, the JB test used and estimated

value is 0.8394 and p-value is 0.65672 that means null hypothesis accepted that error is normally distributed. For functional farm of model is checked with Ramsey reset test and the f value of test is 1.3127and p-value is 0.1324 which is higher than 0.05 so null hypothesis is accepted that model is correctly specified.

Table 5: Error correction mechanism (ECM)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNGFCF(-1))	0.527710	0.552138	0.955758	0.3831
D(LNDTGDPR)	0.414101	0.213738	1.937418	0.1104
D(LNDTGDPR(-1))	-0.0325	0.2872	-0.1135	0.9140
D(LNDTGDPR(-2))	-0.3840	0.3785	-1.0147	0.3568
D(DFTGDPR)	28893.5376	36437.7371	0.7929	0.4638
D(DFTGDPR(-1))	7913.32543	14320.0744	0.5526	0.6043
D(DFTGDPR(-2))	-18313.3781	11282.5487	-1.6231	0.1655
D(CPI)	-0.0330	0.0095	-3.4714	0.0178
D(CPI(-1))	0.0269	0.0238	1.1301	0.3097
D(CPI(-2))	-0.0154	0.0136	-1.1305	0.3095
D(FNDEV)	0.0013	0.0194	0.0715	0.9458
D(FNDEV(-1))	-0.0172	0.0155	-1.1081	0.3182
D(GDPPEP)	-0.0001	0.0001	-1.3289	0.2413
D(GDPPEP(-1))	-0.0003	0.0001	-3.2084	0.0238
D(GDPPEP(-2))	-0.0001	0.0001	-1.4801	0.1989
D(POPGR)	-4.8235	1.9747	-2.4425	0.0585
D(POPGR(-1))	-2.4172	1.8738	-1.2899	0.2535
D(POPGR(-2))	3.4157	1.2597	2.7115	0.0422
D(TO)	-0.0098	0.0175	-0.5617	0.5985
D(TO(-1))	0.0001	0.0146	0.0068	0.9948
D(TO(-2))	0.01274	0.0116	-1.0951	0.3234
D(IR)	0.0503	0.0179	2.8021	0.0379

D(IR(-1))	0.0265	0.0172	1.5387	0.1845
D(IR(-2))	0.0192	0.0197	0.9757	0.3740
CointEq(-1)	-0.8077	0.6305	-3.5329	0.0167

Table 5 shows the results of error correction mechanism. Error correction model (ECM) describes the short run relationship between the variables and direction. Error correction model is commonly used to measure the strength of economy how quickly the economy came back to its equilibrium position or speed of adjustment after the shock in economy, and that shock may be positive or may be negative. The result in table 5 CointEq (-1) value is -0.8077 which suggest that there are 80 percent chances that economy moves towards the equilibrium position after economic shock in the economy. The negative sign of Count Eq confirms the convergence and positive sign indicates the divergence.

Table 6: Long run estimates

Variable	Coefficient	Std. Error	t-Statistic	prob.
LNDTGDPR	-0.4081	0.0904	-4.5104	0.0063
DFTGDPR	-6.7882	2.0329	-3.3339	0.0319
CPI	0.0327	0.0146	2.2390	0.0453
FNDEV	-0.0049	0.0076	-0.6441	0.5479
GDPPEP	0.000072	0.000056	2.2910	0.0432
POPGR	-1.8926	0.3100	-6.1037	0.0017
TO	0.0044	0.0123	0.3628	0.7316
IR	-0.0146	0.0089	-1.6478	0.1603
C	33.9936	0.7775	43.7180	0.0000

Table 6 presents the findings of long run slop coefficients, standard error, t-stats and p-values of the individual slops. Slop coefficients predict the changes in dependent variables if the independent variables change. The t-stats is used to measure the individual significance of that particular variable.

The slop coefficient of the debt to GDP ratio is -0.4081 and negative. This result shows the inverse relationship between these two variables debt and gross fixed capital formation. The slop value -0.4081 suggest that if debt to GDP ratio increase by 1 percent the gross fixed capital formation would decrease by -0.4081 on average while holding the effect of other variables constant. The t-stats for this slop parameter is -4.5104 and p-value is 0.0063 less than 0.05 so debt to GDP ratio has significant impact on the gross fixed capital formation at national level. These results are statistically and theoretically significant. We know that when the debt of any economy increases in log run the burden of debt servicing increase on the economy and pay much amount from the government revenue for the payment of debt servicing which leads to reduction in the gross fixed capital formation at national level. With an increase in the level of debt there is a reduction in aggregate investment observed. This result is similar with following studies Qayyum & Haider (2000), Salotti & Trecroci (2010).

The estimated slop parameter for deficit to GDP is also has negative sign and indicating inverse relationship. If deficit grow on regular bases, it decreases the required level of investment, because to finance this regular deficit government make deficit financing and borrow from domestic financial market and put pressure on interest rate which leads to reduction in investment because of crowding out phenomena. This crowding out mechanism is explained with two approaches, under the situation government is facing debt, through the taxes and the other one is interest rate using fiscal policy or using monetary policy. The estimated slop parameter for deficit to GDP is -6788.25 suggest that if the deficit increase by 1 percent the gross fixed capital formation at national level decrease by 6788.25 on average keeping the other factors constant. These results are theoretically and statistically significant because sing is negative and p-value is less than 0.05. This result coincided with Qayyum & Haider (2000), Salotti & Trecroci (2010).

The slop coefficient of the inflation (CPI) is 0.0327and positive. This result shows the direct relationship between these two variables inflation and gross fixed capital formation. The slop value 0.0327suggest that if inflation increase by 1 percent the gross fixed capital formation would increase by 0.0327on average while holding the effect of other variables constant. The t-stats for this slop parameter are 2.2390 and p-value is 0.043 less than 0.05 so inflation has significant impact on the gross fixed capital formation at national level. These results are statistically and theoretically significant. These finding predicts that increase in prices is incentive for investors as their profit margins increase and their level of income also increase. When prices increase the investors increase their investment to earn more profits which put positive impact on the required gross fixed capital formation volume increase. This result is line with Salotti & Trecroci (2010) and Shahzad & Javid (2015).

The slop coefficient of the GDP per person employed is 0.000072 and positive. This result shows the direct relationship between these two variables GDP per person employed and gross fixed capital formation. The slop value 0.000072 suggest that if GDP per person employed increase by 1 unit the gross fixed capital formation would increase by 0.000072% while holding the effect of other variables constant. The t-stats for this slop parameter are 2.2910 and p-value is 0.043 less than 0.05 so GDP per person employed on the gross fixed capital formation at national level. These results are statistically and theoretically significant. These finding predicts that increase in GDP per person employed is better indicator to access the better economic conditions of the economy. When there are better economic conditions there are better chances to increase the gross fixed capital formation. The GDP per person employed is good proxy for labor productivity and which is helpful for gross fixed capital formation or investment. This result is line with Salotti and Trecroci (2012 and Shahzad &Javid (2015).

The slop coefficient of the population growth is -1.8926 and negative. This result shows the inverse relationship between these two variables population growth and gross fixed capital formation. The slop value - 1.8926 suggest that if population growth increase by 1 unit the gross fixed capital formation would decrease by - 1.8926% while holding the effect of other variables constant. The t-stats for this slop parameter are -6.1037 and p- value is .0017 less than 0.05 so population growth has significant impact on the gross fixed capital formation at national level. These results are statistically and theoretically significant. As the population of developing economies increase and

due to low level of income the consumption increase and the level of savings decrease which leads to reduction in the investment and gross fixed capital formation at national level. These findings are match with Salotti and Trecroci (2010) and Shahzad &Javid (2015)

The slop coefficient of the trade openness is 0.0044 and positive. This result shows the direct relationship between these two variables trade openness and gross fixed capital formation. The slop value 0.0044 suggest that if trade openness increase by 1 unit the gross fixed capital formation would increase by 0.0044 % while holding the effect of other variables constant. The t-stats for this slop parameter are 0.3628 and p-value is 0.7316 greater than 0.05 so trade openness on the gross fixed capital formation at national level. These results are statistically insignificant and theoretically significant. Trade openness plays a vital role for transferor of resources, technology. Transfer of resources in the form of foreign direct investment help to increase the level of investment in the developing economies. The other important points are transfer technology and skilled person which also play important role growth of investment. This result is similar to Salotti and Trecroci (2012 and Shahzad &Javid (2015).

The estimated slop of interest rate is negative sign and indicating inverse relationship. If interest rate on regular bases it decreases the required level of investment, because the return on the invest decrease and it hurt the investors. There are many channels which are responsible for higher interest rate but we discuss two most important of all, government borrowing and monetary policy. How government play important role to increase interest rate is deficit financing and borrow from domestic financial market and put pressure on interest rate which leads to reduction in investment because of crowding out phenomena. The monetary policy increases interest rate to control the inflation and stable the value of exchange rate. The estimated slop parameter for interest rate is -0.0146 suggest that if the interest rate increases by 1unit the gross fixed capital formation at national level decrease by 0.0146 % keeping the other factors constant. These results are theoretically significant and statistically insignificant because sing is negative and p-value is greater than 0.05. This result coincided with Qayyum& Haider (2000), Salotti& Trecroci (2010).

The slop coefficient of fiscal development is -0.0049 and negative. This result shows the inverse relationship between these two variables fiscal development and gross fixed capital formation. The slop value 0.0049 suggest that if fiscal development increase by 1 unit the gross fixed capital formation would decrease by 0.0049 % while holding the effect of other variables constant. The t-stats for this slop parameter are -0.6441 and p- value is 0.54 greater than 0.05 so fiscal development has insignificant impact on the gross fixed capital formation at national level. These findings are match with Salotti and Trecroci (2010) and Shahzad& Javid (2015).

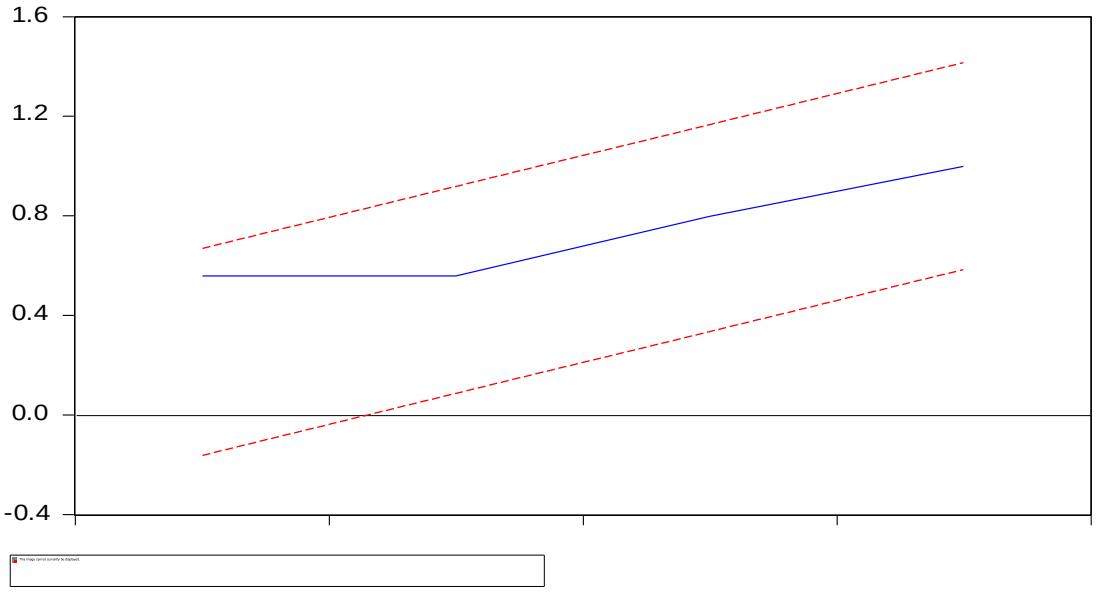

Figure 1: Structural satiability

The red lines in the figure 1 shows the 5% level of significance band and if the blue line remain within the red band, then we conclude that there is structure stability between the variable and relationship which are empirically tested in analysis.

CONCLUSION

Research investigate the link of debt with important macroeconomic indicator investment for Pakistan using annual time series data from 1979 to 2020. The auto regressive distributed lag model Cointegration approach is used to measure long run and short run relationship between these variables under the presence of some policy variables like, interest rate, consumer price index, trade openness, fiscal development, fiscal deficit & population. The estimation results provide the evidence that debt has negative and significant relationship with investment. when the debt increases the required level of investment decrease which also leads to reduction in private investment in the form of crowding phenomena and decrease the productivity of the economy. Fiscal deficit also shows negative relationship with investment. When government borrowing from domestic market increases it influences, the interest rate which decreases investment, whereas due to increase in government expenditure it increases the economic activities and expand the economy.

When the debt and fiscal deficit increase, it shows negative impact on investment. With the increase of debt and deficit decrease in investment is called crowding out mechanism. So, under the situation of crowding out and increasing debt the government has two possible options, whether to increase the tax earnings or borrow loans from banking system to meet the requirements. If government increases the taxes, it will hurt the investors to not making investment because higher portion of their income would be deducted as form of tax. After this scenario the other option for

government is to borrow from the finical markets, and when government borrows it increase the domestic interest rate which always discourage the investment.

In model estimated to measure the impact of debt on investment. Model measure the relationship between debt and investment in presence of following policy variables such as deficit, trade openness, productivity, inflation, interest rate, fiscal development, population growth. The findings suggest that debt, fiscal deficit, financial development, population growth and interest rate have negative relationship with investment whereas inflation, employed per person income and trade openness has positive impact on the investment. The results from eight variables 5 are statistically and theoretically significant and three are insignificant.

POLICY RECOMMENDATION

The auto regressive distributed lag model Cointegration approach is used to measure long run and short run relationship between debt and investment under the presence of some policy variables like, interest rate, consumer price index, trade openness, fiscal development, fiscal deficit & population. The findings suggest that debt, fiscal deficit, financial development, population growth and interest rate have negative relationship with investment whereas inflation, employed per person income and trade openness has positive impact on the investment. The findings of study spark the following policy message emerge in mind in the light of this research and on the bases of findings.

1. Government needs to reduce its debt
2. There is need to increase tax base other than tax rate
3. Rethinking of resource allocation
4. Investment in human capital
5. Import substitution subsides
6. Policy coherence
7. Charter of policy

The policy package is useful for Pakistan economy in short run and long under with these conditions and if the condition changes, then we rethink the policies.

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