THE NEXUS BETWEEN ECONOMIC GROWTH, INVESTMENT AND TAXES: EMPIRICAL EVIDENCE FROM PAKISTAN

Muhammad Atif
International Islamic University,
Islamabad,
PAKISTAN.
a4atif_aries@yahoo.com

Sadaf Shahab
School of Economic Sciences,
FUUAST, Islamabad,
PAKISTAN.
sadafshahab_leo@yahoo.com

M. Tariq Mahmood
School of Economic Sciences,
FUUAST, Islamabad,
PAKISTAN.
tm76pk@gmail.com

ABSTRACT

In this study we empirically test the impact of taxes, inflation and bank loans on investment and economic growth using a time series model for Pakistan economy. We applied OLS on stationary data of growth model, while used Johansen's co-integration methodology for investment mode and find that the taxes do not pose statistically significant effect on economic growth directly; rather the negative impact is seen through the investment channel. Inflation hampers growth and investment whereas bank loans to private sector have affected the private investment positively with very small magnitude due to effective utilization of the loans. We also find that higher income taxes impede growth and result the low investment due to the saving channel. It is suggested that government should lower the taxes on capital stock and the channel of loans to private sector for investment purposes should be effective with proper monitoring of the loans.

Keywords: Economic Growth, Investment, Inflation, Income Taxes, Bank Loan.

INTRODUCTION

One of the generally discussed issues in the economic literature is how taxes relate to economic growth. Supporters of tax cuts affirm that a decrease in the tax rate will lead to increased economic growth and prosperity (Alesina & Ardagna, 2009). Contrasting argument suggests that lessening taxes accrue all the benefits for rich who should pay the most taxes (Caroll *et al.,* 1998; Auerbach, 2002; Mintz & Smart, 2004).

As a result of increased taxes, (i) productivity declines because people opt to work less; (ii) people evade taxes and become less productive. So, the lower the tax rate, the higher the value of all the goods and services produced; and (iii) it is also observed that government tax revenue does not increase as the tax rate increases. The government will earn more tax income at 1% rate than at 0%, but they will not earn more at 100% than they will at 10%, due to the disincentives of high tax rates. Thus there is a peak tax rate where government revenue is highest (Caroll *et al.,* 1998).

Generally governments do change the tax rate to enhance the economic efficiency of the government and also promote economic growth. The effectiveness of tax structure depends majorly on the assignment of appropriate expenditures to different sectors, the appropriate tax rate to generate revenues and the efficient design of a system of transfers (Schaller, 2007).

The tax revenue in Pakistan has been on average 10.5% of the GDP in past ten years which presents a weak picture of our economy (Pakistan Economic Survey, 2010-11). A well designed fiscal policy comprising of well articulated revenue and expenditure reforms is always supportive to promote economic growth. Efficient revenue mobilization can help to reduce budget deficit and allow direly needed public goods and services. During the last three years expenditure overrun exceeded the revenue, and resulted in breaching budget deficit targets persistently.

In this study we look into the effectiveness of revenue policy by taking the effect of taxes on the private investment instead of government expenditure. Main aim also includes testing the efficacy of the tax revenue for economic growth. Our model comprises the determinants of growth and investment. In the earlier literature we find that GDP growth is determined by: (i) private investment (Alesina & Ardagna, 2009); (ii) income taxes (Buettner *et al.,* 2009) and (iii) inflation (Gokal &

Hanif, 2004). Inflation can lead to uncertainty about the future profitability of investment projects (especially when high inflation is also associated with increased price variability). This leads to traditional investment strategies, which result in lower levels of investment and economic growth. Moreover, inflation can interact with the tax system to distort borrowing and lending decisions.

The second model independently describes the effectiveness of tax revenue, bank loans and interest rate on the business fixed investment demand. In Pakistan, due to national and international factors investment has reduced to 13.4% of GDP in 2010-11 compared to 22.5% in 2007-08. The bank loan to private business has also decreased during the last two financial years. So, to study such changes in the investment becomes an important task of this paper.

LITERATURE REVIEW

To fulfill the objectives highlighted above require a thorough review of existing literature which reveals many dimensions of the effect of taxes and other variables on growth and investment. The imposition of effective and fare tax system is responsibility of the central government of each country.

Carroll *et al.,* (1998) investigated the impact of personal income tax on the investment decisions of enterprises for US data and found that a 5% increase in tax rate will decrease the investment by about 10% and vice-versa. Reported income of corporations can be highly responsive to statutory tax rates, when income can be easily shifted from one authority to another without moving real assets. Some authors have suggested that income shifting may encourage tax competition among governments and exert downward pressure on statutory rates and on corporate tax credits (Gordon & MacKie-Mason, 1995; Haufler & Schjelderup, 2000).

Recently the literature has shown interest in the imposition of flat tax which uses a constant tax rate on income or consumption above an exemption level. The flat tax advocated by Hall & Rabushka (1995) is basically a linear consumption tax and consequently equivalent to a linear expenditure tax. Ever since the study by (Hall & Rabuska, 1995), the tax exempts on capital income is in practice and allows full expensing of all business investment. However, the flat taxes that have recently spread throughout in Europe naturally consists capital income in the tax base. Thus flat tax becomes a linear alternative of the comprehensive income tax. Higher income taxes depress human capital investments and entrepreneurial activities.

Many studies focus on the issue of investment and bank loan. For example James (1987); Hoshi *et al.,* (1993); Fase (1995) found mixed results of the bank loans on the investment. Diamond (1991) uses data from the commercial banks who monitor their loans comparing with other loans and found that the commercial bank which are monitored are rated highly by investors and big investors do prefer such loans. This effect would result from the special or unique role of banks as "insiders" to the borrower firms, such that a decision to sell a customer's loan would be taken as a borrower's financial condition. Indeed, such an effect might be expected given the findings of James (1987); Lummer & McConnell, (1989). So, the new loans and loan renewals carry (positive) private information to the outside equity market about a borrowing firm's financial condition. The effect of bank loans on the economic growth through the channel of investment depends on the information asymmetry and moral hazards. On discussing the issue of lending restrictions Hoshi *et al.,* (1993) find that such restrictions have real effects with symmetric information, but do not have such effects if there is asymmetric information of the market to the investors. Contrasting argument was given by Diamond (1991) who claims the reputation of the businesses is more significant and the issue of misuse and inefficiency of bank loans become less severe. Dahiya *et al.,* (2003) find negative relationship between sales of bank loans and the investors' returns. This corollary views that banks play a special role in diffusing hitherto private information to outside investors.

Exploring nexus between inflation, taxes and economic growth, Roubini & Sala-i-Martin (1992) find that in the economies where tax evasion is huge, the authorities generate inflation tax to bottle-up the financial sector and the efficiency of financial sector will reduced. So, financial limitation of this kind is associated with high rate of tax evasion. On the other hand Azzimonti (2011) has shown that the effect of over-taxation has paid a relatively higher price than benefit to the economy and such a policy has been growth retarding instead of benefiting through the consumption channel.

The inefficiency of tax on investment income is measured through the deadweight loss even if household saving does not respond to taxes and the net rate of return (Feldstein, 1997). What matters is the response of future consumption. The tax on investment income is also effectively a tax on labor supply because current work effort produces income that will be spent on future consumption and the tax on investment income reduces the future consumption that results from more work today. Investment is one of the most important factors determining economic fluctuation in the short and long run.

MODEL AND METHODOLOGY

For this study we do a time-series analysis based on the data set from Pakistan wherein we use two models to analyze the effect of tax structure on the economic growth and investment.

Growth Model

$$\Delta Y = f(\Delta K, \Delta IT, \Delta P) \tag{1}$$

Here ΔY is annual GDP growth, depends on the change in capital stock, change in income tax and the inflation. ΔK is investment; ΔIT is change in income taxes and ΔP inflation. In this model some variables posit direct effect on growth rate and some variables have both direct and indirect effects. The increase in investment increases the growth rate of GDP, because higher investment level means higher supply of goods and higher level of employment of all factors of production, that result higher growth rate of GDP. So, theoretically, there is positive relationship between investment and growth. The change in income tax changes growth rate reciprocally. The increase in taxes means there are less chances of investment and consumption and a higher rate by the government will reduce investment. So there is negative relationship between taxes and Growth.

The inflation affects the GDP growth negatively, because higher price level means lower demand of goods by the people and it reduces the aggregate consumption level. Below is the econometric version of this equation:

$$\Delta Y_t = \beta_0 + \beta_1 \Delta K_t + \beta_2 \Delta IT_t + \beta_3 \Delta P_t + \mu_t \tag{2}$$

All the variables are as defined above. μ_t is white-noise error.

Investment Model

The second model related to this study is an investment function given as follows;

$$I = f(IT, BLP, R) \tag{3}$$

In this model I stands for investment as percentage of GDP is the dependent variable, IT is total (income) tax revenue as percentage of GDP, BLP is commercial bank loans to private sector as percentage of GDP and R is interest rate. IT, BLP and R are the independent variables.

Theoretically, interest rate reduces investment due to increase in the cost of borrowing and investment fund's demand lowers which reduces the investment and ultimately growth. The tax revenue is the second variable that affects the investment negatively. Higher the tax rate for the business and other sectors of the society, lower are funds available for investment whereas a tax cut can increase the investment.

The bank loans to private sector have mixed affect on the economy. If the loan is sanctioned for the business purposes, then the effect of loan may be positive on investment. But if the loans are forwarded to the other sector where it may be misused, then the loans have negative investment effect. Many important studies have been done for different economies with different variables of the model on the issue of investment and commercial bank loan. For example (Fase, 1995; James, 1987; and Hoshi et al., 1993) found mixed results of bank loans on investment.

After this discussion, the econometric version of this model is;

$$I_t = \alpha_0 + \alpha_1 IT_t + \alpha_2 BLP_t + \alpha_3 R_t + \varepsilon_t \tag{4}$$

All variables are defined above. ε_t is white-noise error. Thus in this study we include new combination of variables to test their impact on growth and investment. The existing literature on this issue does not use this combination of variables, particularly for the case of Pakistan.

Methodology

To estimate the models discussed above we do uni-variate and multivariate analysis. In uni-variate analysis we test the stationarity of the final data series through augmented Dickey and Fuller test. Then we use Johansen's methodology to test co-integration and estimate the long run relationship between the variables. For short run, the Granger's causality test is applied.

Data and Sources

This study utilizes the annual data set from 1981-2010. The data series are collected from International Financial Statistics, State Bank of Pakistan and Federal Bureau of Statistics.

Table 1. Variables

Symbol	Definition
INF	Inflation
INVPC	Investment % of GDP
ITPC	Income tax as percentage of GDP
BLPGRO	Growth rate of Bank loans to private sector
R	Interest rate
GROWTH	Growth rate of GDP
INVGRO	Investment growth
ITGRO	Income tax growth(%change)

DATA ANALYSIS

Unit-root Test

Since the financial and economic series show the trending behavior, so, it is required to test for stationarity to make an appropriate use of the data. For the said purpose, we have applied Augmented Dickey and Fuller (ADF henceforth), most commonly used by the econometricians and academicians.

Table 2 reports the results of the ADF test. The data series INF, GROWTH, INVGRO and ITGRO are stationary at level. These variables are members of growth model, so we can estimate growth model using OLS. These variables do not show chances of autocorrelation, so our results are not spurious.

Table 2. Unit Root Test

Variable	ADF Stat	Critical Value	Stationarity
INF	-3.796	-2.96	Level
GROWTH	-5.236	-2.96	Level
INVGRO	-2.391	-1.95	Level
ITGRO	-6.337	-2.96	Level
INVPC	-2.99	-1.95	1st Difference
ITPC	-7.196	-1.95	1st Difference
BLPGRO	-5.815	-1.95	1st Difference
R	-5.009	-1.95	1st Difference

The data series of INVPC, ITPC, BLPGRO and R show the difference stationary trend. All of these variables are stationary at 1st difference showing that we cannot apply OLS on these series. But since all these have same order of integration, so we can use Johansen's Co-integration test to estimate the long run relationship. Again these data series at first difference do not show the presence of autocorrelation, so the results obtained through these variables are not spurious and statistically robust.

Estimation

The results of the estimation through OLS and Co-integration are reported in Table 3. First column of the table shows the independent variables, the second column shows the results of the growth model, obtained through OLS, where annual growth rate of GDP is dependent variable. The last column shows the normalized coefficients of the investment model, obtained through Johansen's methodology. We interpret these results turn by turn before a combined analysis.

First the results of the growth model show that the average steady state growth rate is roughly greater than 7%. Inflation exerts negative effect on the growth, stating that 1% increase in the inflation results in 0.6 percent decrease in the growth. The t-stat of this results shows that it is also statistically significant. There is a positive relationship between investment and the growth and we find that investment is one of the main determinants of the GDP. The result of income tax indicates that taxes on average do not have significant impact on the economic growth, rather its effect is perceived through the investment, which we will discuss later. A middle ranged value of the R^2 indicates that all three independent variables determine 65% of the growth rate and F-stat confirms the significance of the model. The DW-stat shows that there is no chance of autocorrelation in the growth model. Overall, the results indicate that we reject the null hypotheses $\beta_1 = \beta_3 = 0$, and accept $\beta_2 = 0$. Thus in the model there is statistically significant relationship between growth rate of GDP, investment and=8inflation, whereas, the link of taxes to growth is not direct and we fail to reject the null of β_2.

The third column of the Table 3 indicates that long run steady-state rate of investment is 18.28% of GDP. Like earlier literature, we find negative association between income tax revenue and investment. A 1% increase in the tax revenue results in 0.343 percent decrease in the investment over the long run. Thus the government taxes dilute about 34% of the investment. Similarly the bank loans to private sector increase the investment opportunities and about 1% increase in the bank loans increase the investment by almost 0.1% over the long-run.

Table 3. Estimation Results*

Variables	Growth Model	Investment Model
C	7.417(4.70)	18.28(27.17)
INVGRO	0.28(4.58)	
ITGRO	0.0075(0.58)	
INF	-0.626(-4.49)	
ITPC		-0.343(2.14)
BLPGRO		0.093(3.86)
R		-0.237(3.54)
R^2	0.65	
F-stat	16.47	
S.E.	3.46	
D.W.	2.01	

t-stat in parentheses

According to standard Keynesian theory, the effect of interest rate on the investment is negative and very high. This indicates that the 1% increase in the rate of interest on financial liabilities decreases

the investment by 0.24%. Thus an increase in the interest rate reduces the investment by about ¼ of a percentage point. We reject null hypotheses $\alpha_1 = \alpha_2 = \alpha_3 = 0$.

Table 4 shows that the Granger causality among the variables of investment model and the economic growth. There is one-way causality from investment to growth exists. Similarly the two way causality is found between investment and income taxes, which means increase in investment causes the tax revenue to increase. The causality between income tax and interest rate is one-way running from interest rate to income taxes. Higher level of association between investment and interest rate is two-way, i.e., both cause each other. Two-way causality between bank loans and interest rate means that higher demand of loan increase the price of loans (interest rate) whereas an increase in the interest rate reduces the bank loan disbursement to private sector.

Table 4. Pair-wise Granger Causality Tests

Null Hypothesis, Obs: 30	F-Statistic	Probability
ITPC does not Granger Cause GROWTH	0.46309	0.50220
GROWTH does not Granger Cause ITPC	0.78073	0.38502
INVPC does not Granger Cause GROWTH	2.42915	0.13119
GROWTH does not Granger Cause INVPC	1.57428	0.22075
R does not Granger Cause GROWTH	2.04965	0.16415
GROWTH does not Granger Cause R	1.04995	0.31496
BLPGRO does not Granger Cause GROWTH	0.49055	0.48990
GROWTH does not Granger Cause BLPGRO	1.20879	0.28165
INVPC does not Granger Cause ITPC	4.99220	0.03394
ITPC does not Granger Cause INVPC	2.72124	0.11061
R does not Granger Cause ITPC	3.58810	0.06895
ITPC does not Granger Cause R	0.07944	0.78021
R does not Granger Cause INVPC	9.07015	0.00558
INVPC does not Granger Cause R	6.64947	0.01569
BLPGRO does not Granger Cause INVPC	8.78153	0.00628
INVPC does not Granger Cause BLPGRO	0.53953	0.46896
BLPGRO does not Granger Cause R	5.27952	0.02956
R does not Granger Cause BLPGRO	12.0570	0.00175

DISCUSSION

These results indicate that the investment affects the growth of the economy positively where is inflation hurts the growth in a significant way. The current episode of low growth in the Pakistan economy shows that the double digit inflation is the main cause of it. Income taxes do not contribute to growth in any way, i.e., neither positive or negative. But over the long run tax revenue, particularly income taxes have exerted negative impact on growth through the investment channel. The tax discourages investment and dies-out the 34% of the investment, thus impeding growth.

On contrary, bank loans to private sector have the positive, though very small in magnitude, but statistically robust effect on the investment. The reason of small coefficient for the Pakistan data is that private sector investment has been overlooked by the government during period of study. Many credit control measures have been adopted by the state, resulting low productivity of the private sector. We find that higher income taxes impede growth and result the low investment due to the saving channel (higher taxes means lower saving rate and lower availability of funds for investment).

CONCLUDING REMARKS

We find plausible effect of taxes on investment over the long run but not on the growth. Investment and inflation are found to be major determinant of growth. Our result also indicate that the bank loans help increasing the investment and we can obtain higher investment by creating many opportunities for youth. On policy side, to boost investment through credit to productive sectors should be prioritized. A socio-economic cost and benefit analysis is required before taking any decision on the taxes, particularly the income taxes.

However, in this study there remain many limitations that pave way for future research on this topic. For more detailed analysis of the tax structure we can incorporate different categories of taxes and other sources of government revenues. One can also bring-in government expenditure in the model to deeply analyze the fiscal sector of the economy.

REFERENCES

Alesina, A.F. and Ardagna, S. (2009). Large Changes in Fiscal Policy: Taxes versus Spending , *NBER WORKING PAPER SERIES* # 15438.

Auerbach, A.J. (2002), Taxation and corporate financial policy, in: Auerbach A.J. and M. Feldstein, *Handbook of Public Economics,* Vol. 3, 1251-1292.

Azzimonti, M. (2011). Barriers to Investment in Polarized Societies, *American Economic Review* (forthcoming).

Buettner, T., Michael, O., Ulrich, S. and Georg, W. (2009). Taxation and Capital Structure Choice – Evidence from A Panel Of German Multinationals, *Economic Letters, Elsevier,*105(3),309-311.

Carroll, R., Holtz-Eakin, Rider, M. and Rosen, H.S. (1998). Enterpreneurs, Income Taxes and Investment, *NBER Working Paper Series*, Working Peper # 6374.

Dahiya, S., Manju, P. and Anthony, S. (2003). Bank Borrowers and Loan Sales: New Evidence on the Uniqueness of Bank Loans. *Journal of Business* 76.4.

Diamond D.W. (1991). Monitoring and Reputation: The Choice between Bank Loans and Directly Placed Debt, *The Journal of Political Economy*, Vol. 99, No. 4,689-721.

Dickey, and Fuller. (1979). Distribution of the Estimators for Autoregressive Time Series with a Unit Root, *Journal of the American Statistical Association*, 74, 427–431.

Fase, M.S. (1995). The demand for commercial bank loans and the lending rate, *European Economic Review,* Volume 39, Issue 1, Pages 99-115.

Feldstein, M. (1997). The Effect of Marginal Tax Rates on Taxable Income: A Panel Study of the 1986 Tax Reform Act, *Journal of Political Economy,* 103, pp 551-572.

Gokal, V. and Subrina, H. (2004). Relationship between inflation and Economic Growth, *Reserve Bank of Fiji*, Working Paper # 04.

Gordon, R.H. and MacKie-Mason, J.K. (1995). The importance of income shifting to the design and analysis of tax policy. In: Feldstein, M., Hines, J.R., Hubbard, R.G. (Eds.), Taxing Multinational Corporations. *University of Chicago Press,* pp. 29–37.

Hall, R.E. and Rabushka, A. (1995). The Flat Tax. Second Edition, *Stanford: Hoover Institution Press.*

Haufler, A. and Schjelderup, G. (2000). Corporate tax systems and cross-country profit shifting, *Oxford Economic Papers* 52, 306–325.

Hoshi, T., Scharfstein, and Singleton, K.J. Japanese Corporate Investment and Bank of Japan Guidance of Commercial Bank Lending, in *Japanese Monetary Policy,* chapter 3. 63-94.

James, C. (1987). Some evidence of the uniqueness of bank loans, *Journal of Financial Economics* 19, 217-235.

Johansen, (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models, *Econometrica*, 59,1551–1580.

Lummer, S. and McConnell, J. (1989). Further evidence on bank lending process and capital market response to bank loan agreements, *Journal of Financial Economics* 25,52-63.

Mintz, J. and Smart, M. (2004). Income shifting, investment, and tax competition: theory and evidence from provincial taxation in Canada, *Journal of Public Economics* 88,1149– 1168.

Roubini, N. and Sala-i-Martin, X. (1992). A Growth Model of Inflation, Tax Evasion, and Financial Repression, *NBER Working Papers* #4062.