

## **Fiscal Policy Uncertainty and Economic Growth in Pakistan: Role of Financial Development Indicators**

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The macro-economic uncertainty has been considered crucial for economic growth in developing countries. Hypothetically, it threatens economic growth through its bearing on the investment pattern and future policy options. However, the financial sector development is expected to moderate the adverse effects of these uncertainties on the economic growth and can lead to fairly stable policy choices. This paper examines the relationship between fiscal policy uncertainty and economic growth along with coherent input from financial sector development in Pakistan for the period of 1970-2011, employing Auto-Regressive Distributed Lag (ARDL) approach to Co-integration. The findings suggest that fiscal policy instability on account of government expenditures, revenues generation and budget uncertainty have been abating the economic growth significantly in Pakistan. However, the relevance of financial development indicators as ratio of liquid liabilities and credit to private sector proved to be supportive in minimizing the said effect. Hence, the financial development should be promoted being pertinent in rendering high economic growth by offsetting the detrimental effects of fiscal policy uncertainties.

**Keywords:** Economic uncertainty, economic growth, fiscal policy instability, revenue generation, liquid liabilities, ARDL O4, H3, E4

### **1. Introduction**

The importance of stable and predictable macroeconomic policies for a prosperous and sustainable economic growth has long been realized by the developing countries. Economic analysts accused economic

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uncertainty as one of the major cause of low economic growth of these economies. Pastor and Veronesi (2012) argued that the bad economic news creates uncertainty over the future government policies which results in immediate decline in investment and economic growth. Theoretically, the influence of economic uncertainty laid down its channel through marginal productivity theory where marginal productivity of capital is convex to particular uncertain variable and penetrates into the behavior of investment. Therefore, macro-economic uncertainty modifies the expected net value of marginal product of capital and ultimately contributes to changes in economic growth. Such investment behavior held responsible to generate economic uncertainty in foregoing and future predictability, as well. The support to the role of policy uncertainty in economic growth also comes from the line of literature by Lucas and Prescott (1971), Arrow (1968) and Caballero (1991). Hence, the economic uncertainty is an integral part of decision making which is precisely inclined to the investment decisions and renders strong implications for the economic growth.

The experience of developing countries in 1960s and 1970s highlighted the role of macroeconomic instability as fundamental in shattering economic growth. It also connotes the great recession that witnessed low economic recovery due to economic uncertainty (Baker et. al, 2012). The proclaimed instability has also become prevalent in Pakistan and its origin is reflected in different macro-economic policy indicators. This instability, inherited by macro-economic uncertainty, has its roots in the economic structure and development indicators. It is well argued that impact of monetary and fiscal policy is intensified in the presence of economic uncertainties and gets reflected in terms of lower economic growth mainly due to backward and unpredictable behavior of investment (Bernanke, 1983; Pindyck and Solimano, 1993 and Dixit and Pindyck, 1994).

The fiscal policy uncertainty is very critical in this regards. According to Chaudhry and Shabbir (2005), economic uncertainty is demonstrated in worsened fiscal policy in terms of budget uncertainty as the uncertain budget imposes restrictions and distributive risks for the subsequent fiscal years. Pakistan, Govt. of (2010) proclaimed that the economy of Pakistan has perennial budget uncertainty rolls from 2.3% to 1.9% in 1980s and fell from 3% in 1990s to 1.6% in 2000, due to rescheduling of debt services, a very upshot of uncertain budget.

Similarly, the uncertainty in revenue collection imparts irreversible investment and has long run consequences for economic growth (Atif, Shahab and Mehmood, 2012). The upheavals in political scene and IMF conditionality reinforce revenue generation uncertainty in Pakistan to 0.8% and 0.4% in 1980s and 1990s, respectively. Ultimately, the optimality of government expenditures is desirable for sustainable fiscal conditions. The conventional fiscal policy in Pakistan has subdued persistently by uncertain government expenditures as one of the failures of fiscal policy entailment. The uncertain government expenditures are expected to have negative shock on the economic growth and endeavors to the rising tax liabilities in near future. Precisely, such instabilities are more likely to prevail in the developing countries as reported by Kneller et.al. (1998).

Herewith, the role of financial sector pertains to the economic growth of the country. According to Aghion et al., (1999), since the financial sectors are less developed in developing countries these economies suffer more from volatility. The signaling behavior of financial development enriched with capital market perfections can issue equity under economic uncertainty and hence absorb the likely risks. The contribution of liquidity for financial development in Pakistan was ranged from 43.25% to 53.45% in 1973 and reached to 50.95% in 2007 inclined with promoting economic growth for policy makers.

The relationship between financial development and economic growth is primarily emphasized from development perspective of the economy. In that context, the focus of this study is to put an effort to provide empirical evidence on the influence of financial development as a conducive factor to scale down the effect of macro-economic uncertainty on economic growth in Pakistan. The study covers time period from 1970-2011 and is expected to deliver important policy recommendations.

The rest of the study is organized as follows; Section 2 deals with the review of existing literature; Section 3 provides brief overview of fiscal policy indicators along with financial sector development in Pakistan; Section 4 provides the methodology and data description; Section 5 deals with the empirical results and discussions and section 6

concludes the study with policy recommendations on the basis of findings.

## 2. Literature review

The available literature stresses on the economic uncertainty as an integral part of decision making being logical to the investment and have strong implications for significance of economic growth. The relationship between uncertainty and dynamics of investment laid down its foundation by contemporary work by Pindyck et al. (1993). The consensus exists on the threatening behavior of irreversible investment in relation to the marginal productivity theory reflects in the rise in uncertainty.<sup>3</sup> The period apprehended by irreversible investment featured to entail sunk cost along with foregoing uncertainty and induces unpredictable macro-economic policies. Hence, the macroeconomic uncertainty affect economic growth by the backward and unpredictable behavior of investment (either public or private) as appraised by Bernanke (1983), Pindyck and Solimano (1993), Arrow (1968), Abel & Eberly (1994) and Caballero (1991).

Regarding the uncertainty issue, a number of studies examined the effect of uncertainty on investment at firm level, while Aizenman and Marion (1993) was first to integrate its effects from macro-economic perspective. For Pakistan, Fatima and Waheed (2011) examined the effect of macro-economic uncertainty on total investment and economic growth for the years 1975-2008 by using the accelerator model of investment and endogenous growth model. The finding indicates that macro-economic uncertainty has significantly negative effect on investment and per capita income. Economic uncertainty as a part of budget deficit create loop holes in deficit financing behind immature coerce of government to meet its expenditures and left adverse consequences in the form of high inflation, current account deficit and crowding out of private investment (Chaudhry and Abe, 1999). Hence, the deficit resultantly is not sustainable (Chaudhry and Ahmed, 1995). The optimality of government expenditures is desirable for the sustainable fiscal conditions. Moreover, Henrekson (1993)

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<sup>3</sup> Where irreversible investment comes into existence after the threshold cross of marginal rate of productivity of capital.

claimed that the dilemma of uncertain government expenditures reduces total factor productivity and impedes economic growth.

The linkage between financial development and macroeconomic volatility is supported in the empirical evidence both for the developing and developed countries. Financial development is able to reduce liquidity risk and increases investment efficiency. The ascertained research indicates that countries with more developed financial sector can diversify risks of economic uncertainty than countries with less developed financial sector. The studies by Lensink et al. (2001) and Aizenman and Marion (1993) suggested that the unstable government policy hurt economic growth more in the countries with poor developed financial sector.<sup>4</sup> The standardized bank-based financial sector by extending loan facilities fosters economic growth through rapid accumulation of monetary services.

Conclusively, the studies so far carried out distinctly for the relationship between uncertainties, financial development and economic growth but a dearth in the studies is observed which incorporates major fiscal policy uncertainties in undermining the economic growth keeping into account the role of financial development indicators. Therefore, this paper can be a significant contributor to the existing literature, particularly for Pakistan.

### **3. Fiscal Measures Uncertainty and Financial Sector Development Briefs in Pakistan**

The concurrence of macroeconomic uncertainty in Pakistan, although persistent, but mostly overlooked by the policy makers. The volatile macro-economic performance from fiscal front is due to low tax collection as proportion of national income and irrational expenditure behavior. The volatility was observed at 1.4 % in revenue generation for the year 1970-71 but later declined and fluctuated around 0.8 % and 0.4 % in 1980s and 1990s, respectively. According to Pakistan, Govt. of (2010), since inception perennial and persistent fiscal deficits

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<sup>4</sup> This proposes an avenue to auspicate the effect of financial sector development for significance of economic growth.

have been observed varying from as low as 2.9 percent to as high as 12.2 percent of GDP.

Similarly, budget uncertainty was at 2.3% in 1970 and the major shortfall recorded in the year 1976 due to the interruption after civil war and nationalization policies. The deficit revolved around 5 percent of GDP since 1980-81 (Ishfaq and Chaudhry, 1999). It again fell to 1.9 % in 1980s due to rising interest burden and high defense spending and again rolls on 2.6% in 2011. Likewise, the optimal government expenditures are much lower than the current size of government expenditures and persist at 2.2% in 1970s and 5.9% in 1989. Meanwhile, the expenditures contracted to 0.51% in 1996 and 1.57% in 2005 and then sustained at 4.25% and 7.95% in 2007 and 2011, respectively.

Turning towards financial development indicators, the financial deepening persisted at 41.86% in 1970s and 1980s and was increased to 44.22% in 1990s. A sharp rise has been observed later since 1999 from 39.6 % to 50.5 % in 2006-07 indicating a groovy job by the financial reforms in Pakistan (Pakistan, Govt. of (2010). Besides, the liquid liabilities redeem contribution for financial development on average of 43.25% and 44.94% in 1970s and 1990s, respectively that ultimately reached to 50.9% in year 2007. The performance of credit to private sector is worth mentioning and shows encouraging trend from 23.84% in 1970 to 25.92% in 1980s. This completes the discussion on the factual trend in fiscal policy uncertainty and financial development indicators in Pakistan. Now, we turn to the methodology adopted to encounter the research objectives.

#### **4. Model Specification and Data Description**

##### **4.1 Theoretical Framework**

The dynamic analysis of economic growth follows the traditional Solow Growth model (1956). The augmented Solow model offsets with constant returns to scale production function where output is a function of capital (physical and human) and augmented labor. The production function is given as:

$$Y_{(t)} = K_{(t)}^\alpha (A_{(t)}L_{(t)})^{1-\alpha-\beta} \quad (1)$$

Where  $\alpha$  and  $\beta$  are parameters and  $A_{(t)}L_{(t)}$  refers to the effective labor. The equilibrium of physical and human capital of a country is given as equation (2) and (3), respectively:<sup>5</sup>

$$k_t^* = \left( \frac{sk_t^{1-\beta} sh_t^\beta}{n+g+\delta} \right)^{\frac{1}{1-\alpha-\beta}} \quad (2)$$

$$h_t^* = \left( \frac{sk_t^\alpha sh_t^{1-\alpha}}{n+g+\delta} \right)^{\frac{1}{1-\alpha-\beta}} \quad (3)$$

By substituting equation (2) and (3) in the production function simultaneously, the growth model for a country can be written as:

$$y_{(t)}^* = \frac{Y_{(t)}}{L_{(t)}} = A_{(t)} \left( \frac{sk_t}{n+g+\delta} \right)^{\frac{\alpha}{1-\alpha-\beta}} \left( \frac{sh_t}{n+g+\delta} \right)^{\frac{\beta}{1-\alpha-\beta}} \quad (4)$$

Hence, the economic growth of a country virtually depends on the role of physical and human capital to ascertain its dynamic analysis along with other underlying determinants per research objectives.

## 4.2 Empirical Model

The empirical model is developed by modifying the growth model to ascertain that whether possible growth reducing effects of economic uncertainty may be realized by the intimidating role of financial sector development. The final equation to be estimated, following Lensink, R (2001), is given below:

$$GDP_t = \alpha_1 + \alpha_2 K_t + \alpha_3 H_t + \alpha_4 UNC_t + \alpha_5 UNC_t * FD_t + u_t \quad (5)$$

Where, *GDP* refers to the real *Gross Domestic Product*. The human capital (*H*) is measured by using proxy variables of higher education enrollment ratio, secondary school enrollment ratio and literacy rate. Capital (*K*) is the measure of physical capital stock, which is the

<sup>5</sup> See Takahashi (2012) for reference.

endowment of an economy and productivity deployed to produce flow of goods and services (GDP). Since the data for physical capital is not available directly, it is measured from the following formula.<sup>67</sup>

$$K_t = I_{t-1} + (1 - \delta)K_{t-1}$$

Where,  $I$  is the gross fixed capital formation, data collected from *World Development Indicators*,  $\delta_t$  is the depreciation rate and  $K$  is the capital stock.

*UNC* refers to the macroeconomic uncertainty measured by the volatility in budget, revenue generation and government expenditures. Similarly, *FD* stands for the financial development and is measured by three indicators namely; money and quasi-money to GDP ratio (MDP) which quantifies the size of financial deepening in the economy, credit to the private sector as percentage of GDP (CDP) that entails total amount of credit/loans provided to the private sector and liquid liabilities (M3) as percentage of GDP (LIQ) that is comprised of demand and interest bearing financial obligations. The interaction term of all constructed financial development indicators with macroeconomic uncertainty are included to empirically capture that whether financial sector development significantly mitigates the effect of economic uncertainty on economic growth. The analysis covers the period from 1970-2011 for Pakistan.

The data for financial development indicators are collected from the *World Development Indicators* (2011), World Bank Database. The data for economic growth, inflation rate, real interest rate, exports and real effective exchange rate are collected from *Monthly Statistical Bulletin* (2011), Pakistan Bureau of Statistics, respectively. The data for human capital is taken from *Labor Force Survey of Pakistan* (2011), published by the Pakistan Bureau of Statistics. While, the data on the fiscal

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<sup>6</sup> The method for measurement of physical capital stock is taken from steady state and neo-classical growth model approximated by growth rate of investment as referred by Harberger (1978).

<sup>7</sup> As the model uses variables as the log differenced in final estimation, they implicitly demonstrate the relative/percent changes in dependent variable with respect to independent variables and henceforth, the GDP refers to the growth rate, technically.



policy measures is collected from the *Economic Survey of Pakistan* (2011), published by Ministry of Finance, Government of Pakistan.

### 4.3 Measuring Fiscal Policy Uncertainty

In empirical analysis, the measurement of uncertainty has remained an important concern. The most robust approach to estimate uncertainty, keeping in view the violent behavior of uncertainty that is related with the expectation not with the actual outcomes, ex-ante measure of General Autoregressive Conditional Heteroscedasticity (GARCH) is recommended. The standard approach considered the GARCH(1,1) model for fiscal policy uncertainty and is given by following equation:

$$Y_t = X_t \theta + \epsilon_t$$

$$\sigma_t^2 = \omega + \delta \epsilon_{t-1}^2 + \gamma \sigma_{t-1}^2$$

Where  $\sigma_t^2$  is one period ahead forecast variance based on past information and is termed as conditional variance.

$a_1 a_3 a_4 e_t$  The economic uncertainty is expected to have significant negative relationship with economic growth as underscored in literature.<sup>8</sup>

### 4.4 Estimation Technique: Autoregressive Distributed Lag Approach to Co-integration

Pesaren and Shin (1999) developed Auto Regressive Distributive Lag Model (ARDL) to investigate the existence of co-integration and the long-run relationship between variables. The specified variables and their lags when added to auto regression, tend to generate autoregressive distributed lag model.

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<sup>8</sup>See Prescott (1971), Arrow (1968), Caballero (1991), Abel and Eberly (1994) and Lensink and Sterken (2001) for reference.

The model is specified as:

$$Y_t = \mu + \sum_{i=1}^p Y_i Y_{t-i} + \sum_{j=0}^r \beta_j X_{t-j} + \delta W_t + \varepsilon_t \quad (1)$$

Where,  $\mu$  is a vector of constant  $(\mu_y, \mu_x)$ .  $\beta$  is a matrix of Vector Autoregressive (VAR) estimates. A pair of series  $X_t$  and  $Y_t$  may be integrated at order I (0) and I (1). The time series vector  $X$  includes physical capital, human capital, fiscal policy uncertainty indicators and financial development indicators. The error term  $\varepsilon_t$  is assumed to be serially uncorrelated and vector  $\varepsilon_t = (\varepsilon_{y,t}, \varepsilon_{x,t}) \approx N(0, \Omega)$  where  $\Omega$  is positive and definite and  $t$  is time vector. The assumption of ARDL model is that errors have conditional mean of zero given all past values

$$\text{i.e. } E \left( u_t / Y_{t-1}, Y_{t-2}, \dots, X_{t-1}, X_{t-2}, \dots \right) = 0$$

#### 4.4.1 Bound Testing Approach

The ARDL bounds testing approach to co-integration uses  $(p + 1)^k$  to estimate the number of regressions. Where,  $p$  indicates the maximum number of lags used and  $k$  refers to the total number of variables. The order  $p$  in an auto-regression is selected on the basis of appropriate lags to avoid biasness.<sup>9</sup> The minimized residual's square on the basis of Schwarz Information Criterion (SIC) is given as:

$$SIC_{(p)} = \ln \left( \frac{SSR_{(p)}}{T} + (p + 1) \frac{\ln T}{T} \right) \quad (2)$$

Where,  $SSR_{(p)}$  is the sum of squared residuals and the lag length is selected using the minimum values of SBC.

The standard Vector Error Correction Model (VECM) is given as:

$$\Delta Y_t = \mu + \alpha_t + \lambda Y_{t-1} + \sum_{i=1}^{p-i} \gamma_t \Delta y_{t-i} + \sum_{j=1}^{r-j} \gamma_t \Delta x_{t-j} + \varepsilon_t \quad (3)$$

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<sup>9</sup> If the order of estimated regression is too low, the valuable information in the more distant lagged values is lost. If order is too high more coefficients are estimated than necessary which produces estimation error in forecasts.

The F-test is used to test the existence of long-run relationship with following hypothesis:<sup>10</sup>

$$\begin{aligned} H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = 0 \\ H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq 0 \end{aligned}$$

In the second step, following long run model is estimated:

$$\Delta(gdp)_t = \alpha_1 + \sum_{i=1}^n \beta_i \Delta(gdp)_{t-i} + \sum_{j=1}^n \beta_j \Delta(K)_{t-j} + \sum_{j=1}^n \delta_j \Delta(H)_{t-j} + \sum_{j=1}^n \varpi_j \Delta(Uncertainty)_{t-j} + \sum_{j=1}^n \rho_j \Delta(Uncertainty * FinDev)_{t-j} + \varepsilon_i \quad (4)$$

Subsequently, the Error Correction Model (ECM) is estimated to suggest the speed of adjustment towards long run equilibrium and also to evaluate the short run dynamics of model. The standard error correction representation of ARDL model is given as:

$$\begin{aligned} \Delta(gdp)_t = \lambda_1 + \delta_1 (ECM)_{t-1} + \sum_{i=1}^n \alpha_i \Delta(gdp)_{t-i} + \sum_{j=1}^n \beta_j \Delta(K)_{t-j} + \\ \sum_{j=1}^n \varphi_j \Delta(H)_{t-j} + \sum_{j=1}^n \varpi_j \Delta(Uncertainty)_{t-j} + \\ \sum_{j=1}^n [\rho_j \Delta(Uncertainty * FinDev)]_{t-j} + \varepsilon_i \end{aligned} \quad (5)$$

Where,  $(ECM)_{t-1}$  is lagged ECM of the model,  $\delta$  is its coefficient that shows the speed of adjustment and  $\varepsilon_i$  is the random error with zero mean and finite covariance matrix. In order to ascertain the goodness of fit the diagnostic test including Breusch-Godfrey LM and J-B normality test is conducted to check the serial autocorrelation and normality assumption of CLRM, respectively.

## 5. Empirical Results and Discussion

An intensifying feature of time series data, dominated by stochastic trends and examined by Augmented Dickey Fuller (ADF) test,

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<sup>10</sup> Null hypothesis is evaluated through the significance of lagged variables by computed F-statistics. If it exceeds the upper critical bound (UCB), then the series are co-integrated; if it is below the lower critical bound (LCB), there is no co-integration and if in between the UCB and the LCB, co-integration remain inconclusive. The critical bounds are taken from Pesaren and Shin (1999).

determines the stationary of variables.<sup>11</sup> The orders of integration for respective series are reported in Table 5.1.

**Table 5.1:** ADF Unit Root Test

Variables	Level		1 <sup>st</sup> Difference		Integration order
	statistic	p-value	statistic	p-value	
LGDP	-0.252	0.989	-4.835	0.001	I(1)
LK	-6.406	0.000	-13.10	0.000	I(0)
LH	-6.069	0.000	-9.954	0.000	I(0)
Ltax	-14.91	0.000	-23.51	0.000	I(0)
Lbud	-3.33	0.074	-7.892	0.000	I(0)
Lep	-2.27	0.438	-8.52	0.000	I(1)
CDP	-3.305	0.080	-4.913	0.001	I(0)
MDP	-4.744	0.002	-6.165	0.000	I(0)
LIQ	-4.890	0.001	-7.118	0.000	I(0)

Note: ADF is applied with intercept and trend option.

Table 5.1 shows that all the variables follow a combination of the integration order of I (0) and I (1) as natural log of capital stock (*K*), human capital (*H*), tax revenue (*tax*), budget deficit (*bud*), credit to private sector (*CDP*), money and quasi money to GDP (*MDP*), liquid liabilities (*LIQ*) are stationary at level while GDP and government expenditures (*ep*) have unit root and became stationary at first difference.

Subsequently, the Bound-testing approach to Cointegration ascertains the existence of long-run relationship among the selected variables. At first, the lag order on the basis of Schwarz-Bayesian criteria (SBC) is selected at one. The results for Bound test for the existence of co-integration are reported in table 5.2.

<sup>11</sup> Presuming the presence of structural instability in the model Clemente Montanes Unit root test was applied but didn't depict significant structural breaks deliberately for all variables. Hence, the ADF results are reported for unit root test for its more relevance.

**Table 5.2:** Bound Test for Co-integration

Dep. variable: LGDP	Credit to Private Sector			Liquid Liabilities			Money and Quasi Money		
	Lep	Ltax	Lbud	Lep	Ltax	Lbud	Lep	Ltax	Lbud
F-Statistic	4.938	6.477	5.408	5.289	6.003	6.003	5.171	5.522	5.332
Upper Bound Critical value (90%)	3.794	3.831	3.831	3.794	3.831	3.831	3.794	3.831	3.831
Conclusion	H <sub>0</sub> rejected and Co-integration exists for all variables.								

Note: All equations are estimated with three financial indicators namely; credit to private sector, money and quasi money to GDP and liquid liabilities with other selected variables.

It is concluded from the findings reported above that the application of bound test for co-integration remains valid and the null hypothesis for no long-run relationship is rejected for all equations.

The results for ARDL approach to Cointegration for each fiscal policy indicator are reported in section 5.1, 5.2 and 5.3. Overall, the results are satisfactory and in line with theoretical expectation. The results of diagnostic test including Lagrange Multiplier (LM) test of autocorrelation suggests that residuals are not serially correlated and Jarque-Normality test submits that errors are normally distributed for all estimated equations. These tests validate the robustness of estimates obtained from ARDL equations.

### 5.1 Results for Uncertain Government Expenditures and Financial Development

The ARDL results for the long-run cointegrating relationship and Error Correction Model are reported in Table 5.3, with real GDP as dependent variable, capital stock (K), human capital (H), government expenditures volatility (Lep) and its interaction term with financial development indicators.

**Table 5.3:** Empirical Results of Government Expenditures Uncertainty

Long Run Coefficients						
ARDL(1,0,0,0) based on Schwarz Bayesian Criterion						
Dependent Variable: (Lgdp)						
Variables	Eq. (1) CDP		Eq. (2) MDP		Eq. (3) LIQ	
	Coefficient	Std. error	Coefficient	Std. error	Coefficient t	Std. error
Constant	15.54***	0.48	16.32***	0.31	16.08***	0.27
LK	0.302***	0.01	0.30***	0.01	0.31***	0.01
LH	0.01	0.01	0.01	0.01	0.020**	0.01
Lep	-0.279*	0.15	-1.16	0.97	-0.063**	0.03
Lep*fin.dev	0.271*	0.15	0.30	0.25	0.023**	0.01
Error Correction ARDL Model						
$\Delta LK_t$	0.054***	0.01	0.05***	0.01	0.055***	0.01
$\Delta LH_t$	0.001***	0.001	0.002**	0.001	0.003***	0.001
$\Delta Lep_t$	-0.05**	0.02	-0.19	0.15	-0.011**	0.005
$\Delta Lep * fin. dev_t$	0.048**	0.02	0.05	0.04	0.004***	0.001
$ECM_{t-1}$	-0.179***	0.04	-0.16***	0.03	-0.175***	0.03
Diagnostic tests						
Serial correlation (LM Test)	0.009 (0.9)		0.50 (0.4)		0.021 (0.8)	
Normality Test	$\chi^2 = 0.264$ (0.8)		$\chi^2 = 0.60$ (0.7)		$\chi^2 = 0.040$ (0.9)	

Notes:1) \*, \*\*, \*\*\* indicate significance at 10 %, 5 % level and 1 % level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

Equation (1) yields statistically significant and positive impact of physical capital on economic growth. Specifically, this indicates that 1% increase in capital stock brings about 0.302% increase in real GDP. This demonstrates that the main source of economic growth is capital accumulation as also encountered by standard growth models. Similarly in other equations, capital stock has appeared as significantly positive and renders the physical capital as a strong contributor in GDP, bearing highest magnitude among all the explanatory variables.

The coefficient for human capital index appeared as statistically insignificant for equation (1) and (2) but it has appeared statistically significant and positive in equation (3) highlighting that economic growth copped with higher level of educational attainment as it increases the workers' productivity, once the model is controlled for the liquid liabilities.<sup>12</sup>

Returning to the results from equation (1), the uncertain government expenditures have statistically significant and negative effect on the economic growth indicating 0.279 % decline in real GDP occurring by 1% increase in the government expenditures' uncertainty. The justification lies with the irrational government spending which disrupts the macroeconomic equalizers of the economy. Moreover, the volatile government expenditures leaves less resource for development due to huge borrowing for non-development expenditures which further curtails the development process.

The inclusion of financial sector development measured by credit to private sector with uncertain government expenditures shows that 1 % increase in credit to private sector tends to reverse the negative effect of economic uncertainty and raises real GDP by 0.27%. The finding supports the significance and dominance of financial sector development for economic growth by Lensink et al. (2001). The influence of credit to private sector possibly enhances mobilization of savings and expands the economic opportunities as also identified by Levine (1997).

Additionally, the uncertain government expenditures along with financial indicator of liquid liabilities as % of GDP reported in equation (3) shows that 1% increase in liquid liabilities squeezes the negative effect of uncertain government expenditures and raise real GDP by 0.023%. This indicates the relevancy of financial intermediaries for bearing financial obligations in liquid assets as emerging in developing countries. The liquid liabilities help in financial deepening and reduce uncertainty by provision of secured investment portfolio in liquid assets. It is also empirically proved by

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<sup>12</sup> The study also used secondary school enrollment ratio and literacy rate but appeared insignificant, as well.

Baks and Crammer (1999) that liquidity increases the equity returns and minimize the risks and uncertainty associated with recession and helps predicting future advancement in economic growth. Hence, it can be argued that financial development can reverse the negative effects of government expenditure uncertainty. However, the results from the third indicator of financial development i.e., money to GDP ratio do not display any significance for government expenditures uncertainty and interaction term in explaining growth behavior.

The coefficient of  $ECM_{t-1}$  (-0.179) shows that deviation of long run economic growth corrected by 17.97% over each year. This term is negative and statistically significant at 1% level of significance which in turn determines the existence of model's stability and shows that the error correction process converges monotonically to the equilibrium path.

As the uncertain government expenditures get transfers to the budget uncertainty, its link with economic growth controlling for the financial development is discussed in next section.

## **5.2 Results for Budget Uncertainty and Financial Development**

The estimated long run coefficients integrating budget uncertainty and the role of financial development indicators to economic growth are reported in Table 5.4.



**Table 5.4:** Empirical Results of Budget Uncertainty

<b>Long Run Estimates</b>						
<b>ARDL( 1,1,0,0,1 ) based on Schwarz Bayesian Criterion Dependent Variable: (Lgdp)</b>						
<b>Variables</b>	<b>Eq. (1) CDP</b>		<b>Eq. (2) MDP</b>		<b>Eq. (3) LIQ</b>	
	<b>Coefficient</b>	<b>Std error</b>	<b>Coefficient</b>	<b>Std error</b>	<b>Coefficient</b>	<b>Std error</b>
<b>Constant</b>	17.66***	0.46	17.60***	0.46	17.61***	0.41
<b>LK</b>	0.279***	0.01	0.280***	0.01	0.290***	0.01
<b>LH</b>	0.011	0.01	0.012	0.01	0.014	0.01
<b>Lbud</b>	-0.273***	0.10	-	0.10	-	0.11
<b>Lbud*fin.dev</b>	0.069***	0.02	0.258***	0.02	0.362***	0.02
<b>Error Correction ARDL Model</b>						
$\Delta LK_t$	0.72	0.68	0.802	0.69	0.553	0.65
$\Delta LH_t$	0.001	0.001	0.001	0.001	0.001	0.001
$\Delta Lbud_t$	-0.03***	0.01	-	0.01	-	0.01
$\Delta Lbud * fin.dev_t$	0.006***	0.002	0.037***	0.002	0.047***	0.001
$ECM_{t-1}$	-0.144***	0.02	-	0.02	-0.130	0.02
<b>Diagnostic tests</b>						
<b>Serial correlation (LM Test)</b>	0.14 (0.70)		0.24 (0.62)		0.11 (0.73)	
<b>Normality Test</b>	$\chi^2 = 0.88$ (0.64)		$\chi^2 = 0.78$ (0.67)		$\chi^2 = 0.47$ (0.78)	

Notes:1) \*, \*\*, \*\*\* indicate significance at 10%, 5% level and 1% level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

The estimated coefficients of capital stock in Table 5.4 appeared as statistically significantly positive for all equations. The budget uncertainty yields statistically significant and negative influence on economic growth indicating that a 1% increase in budget uncertainty

brings about 0.273% decline in real GDP according to equation (1). This declining effect of budget uncertainty is due to failure of government policies to meet its expenditures resulting in unsustainable budget. The revenue gap is responsible for the long run budget uncertainty as acquainted by Siddique and Illyas (2011) for Pakistan. Hence, uncertain budgetary targets compress economic growth and delivers huge debt servicing in order to meet the loss of receipts thus exaggerating the distortions in economic growth.

The inclusion of all financial development indicators with the uncertainty measures appeared as significantly positive for economic growth. The credit to private sector reduces the budget uncertainty effect on economic growth as 1% increase in credit raises it by 0.069%. The financial sector is considered as source of 'easy' resources for the public budget as indicated by Roubini and Sala-i-Martin (1992). This means that government is able to follow policies of financial repression and can increase revenues through seigniorage taxation, thus assorting to minimize budget uncertainty. State Bank of Pakistan (2011) declared that budgetary borrowing from domestic financial institutions instead of external finance raises net domestic assets and reduces the uncertainty effects.

Similarly, the money and quasi money to GDP has statistically significant and positive impact on the economic growth showing that 1% increase in this ratio leads to increase real GDP by 0.055% and depresses the uncertainty effect by raising currency and demand deposits of central government. Hence, it strengthens the amount of financial resources in the economy by contributing in financial deepening and mortify the uncertainty effects. Additionally, liquidity has strong effect by raising real GDP by 0.073% and nullifies the reducing effect of -0.362% . The evidence shows that the reliance of government shifted to accumulate liquid assets as supporter of financial development which helps in debt servicing to diversify the loss of long run budgetary uncertainty.<sup>13</sup>

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<sup>13</sup> In this regards, the findings from this study highlights the emerging stance of monetary policy concerns to support fiscal policy measures.

The error correction term (-0.14) as reported in Table 5.4, shows that deviation from the long run equilibrium is adjusted by 14% over each year which in turn determines the existence of model's stability.

### 5.3 Results for Revenue Generation Uncertainty and Financial Development

The budgetary uncertainty is inclined with gaps in revenues generation capacity. A stable and consistent flow of tax revenues are required to carry on the development projects. The effect of tax revenue generation uncertainty on economic growth along with financial development is reported in Table 5.5.

**Table 5.5:** Empirical Results of Revenue Generation Uncertainty

<b>Long Run Estimates</b>						
<b>ARDL(1,1,0,0,0) based on Schwarz Bayesian Criterion</b>						
<b>Dependent Variable: (Lgdp)</b>						
<b>Variables</b>	<b>Eq. (1) CDP</b>		<b>Eq. (2) MDP</b>		<b>Eq. (3) LIQ</b>	
	<b>Coefficient</b>	<b>Std. error</b>	<b>Coefficient</b>	<b>Std. error</b>	<b>Coefficient</b>	<b>Std. error</b>
<b>Constant</b>	17.01***	0.58	17.00***	0.59	17.09***	0.6
<b>LK</b>	0.28***	0.01	0.28***	0.01	0.29***	0.01
<b>LH</b>	0.01	0.01	0.01	0.01	0.02**	0.01
<b>Ltax</b>	-0.93*	0.51	-0.62	0.68	-0.48	0.36
<b>Ltax*fin.dev</b>	0.27*	0.15	0.13	0.17	0.03***	0.01
<b>Error Correction ARDL Model</b>						
$\Delta LK_t$	0.392	0.85	0.95	0.83	0.75	0.75
$\Delta LH_t$	0.001	0.001	0.002**	0.001	0.003***	0.001
$\Delta Ltax_t$	-0.14*	0.08	-0.98***	0.11	-0.07	0.05
$\Delta Ltax$ <i>* fin.dev</i>	0.04**	0.02	0.02	0.02	0.005**	0.002
$ECM_{t-1}$	-0.15***	0.03	-0.15***	0.03	-0.14***	0.03
<b>Diagnostic tests</b>						
<b>Serial correlation (LM Test)</b>	0.17 (0.67)		0.07 (0.7)		0.06 (0.8)	
<b>Normality Test</b>	$\chi^2 = 0.22$ (0.89)		$\chi^2 = 0.41$ (0.8)		$\chi^2 = 0.39$ (0.8)	

Note1) \*, \*\*, \*\*\* indicate significance at 10%, 5% level and 1% level of significance, respectively.

2) p-values are reported in parenthesis of diagnostic tests.

The long run estimates of capital and human capital are positive as appeared in all estimated equations. The role of capital stock as major factor input in economic growth is demonstrated by the findings. However, it appeared as insignificant for human capital in first two equations as was the case with the results reported in Table 5.3.

The uncertainty of tax revenue generation has statistically significant and negative effect on economic growth and indicates that 1% increase in tax revenue uncertainty reduces real GDP by 0.93%, 0.62% and 0.48% in three equations, respectively. The rise in revenue generation uncertainty gets associated with uneven contribution of the economy in revenue collection. Specifically, for income and corporate taxes this uncertainty abrupt the pattern of irreversible investment and dispirited economic growth as noted by Atif, Shahab and Mehmood (2012). The persistent structure of tax evasion in developing countries is ample cause of revenue generation uncertainty (Roubini and Sala-i-Martin, 1992) and is acquainted to influence the economic growth adversely.

It is pertinent to mention that the uncertainty in revenue generation is overwhelmingly transmitting into the expenditures and budget uncertainty in Pakistan and leads to suppress the economic growth by large margin.

However, the financial development in the form of credit to private sector nullifies the adverse effects of uncertainty on economic growth. The credit to private sector and liquid liabilities enhances the real GDP by 0.27% and 0.03%, respectively. As discussed earlier, the financial resources intermediated in the economy modifies the investment decisions and leads towards increase in the tax net for revenue collection. Moreover, the tax evasion is a primary source of revenue collection uncertainty which reduces the efficiency of financial sector (Roubini and Sala-i-Martin, 1992). And in order to avoid the negative effect of uncertainty, the development of financial structure should be optimized. Government allows the financial markets, through financial repression, to control the inflation tax base originated through tax evasion and to increase the seigniorage taxation. Hence, inclusion of financial sector development has deliberating effect for reducing severity of uncertainty and makes headway for the economic growth.

The underlying error correction term (-0.15) shows that any shock to the series will make it close to the convergence point by 15% every year and implies the existence of long run stable relationship.

## **6. Conclusions and Policy Recommendations**

The empirical link between macro-economic uncertainty and economic growth is manifested in the literature as the economic uncertainty is mostly accused by policy makers to erupt the stability and sustainability of economic development of the economies. Comparatively, the role of financial development is considered to be vital for the economic growth. In this regards, this study connotes the financial development with the moderating effects of fiscal policy uncertainty on economic growth in Pakistan over the time period 1970-2011. The uncertainty in macro-economic environment due to fiscal policy instability induces hazarding policy decisions which prove to be erroneous in the future time period.

By employing ARDL approach to Cointegration, this study indicates that uncertainty originated from budget deficit, government expenditures and revenue collection have significantly negative effect on economic growth and financial development helps to mitigate these adverse effects. Uncertainty in irrational government expenditures reduces economic growth and induces huge burden for optimum fiscal imbalances. The relevance of liquid liabilities that reduces uncertainty is delivered by secure investment portfolio in liquid assets with high equity returns. The significance of financial sector development in easing the resources for public budget found to collaborate in lessening the uncertainty's effects. Moreover, the pertinence of tax evasion, huge debt servicing and unnecessary government expenditures serves as fiscal policy failure and left severe consequences for the economy. The reconciling of financial sector interacts strongly in global macro-economic environment and mitigates the endangering effects of economic uncertainty by controlling the factors of risk behavior, degree of irreversibility and expandability of investment and development.

Particularly, the fiscal policy failure in generating revenues due to tax evasion and narrow tax base and its dependency on debt servicing to

meet its expenditures induces the vulnerable budget. In order to minimize the uncertainty in fiscal policy indicators following policy implications can be derived from the empirical findings of the study.

- The tax base should be broadened and the statement of assets should be mandatory by the taxpayer as a part of annual return to avoid tax evasion.
- The good governance is required in order to deal with the issues of transparency and accountability in the taxation system of Pakistan.
- The monetary policy should be monitored carefully keeping the autonomy of the central bank.
- There should be reinvestigation of budget in order to minimize the variations on quarterly basis.
- The expenditure curriculum reforms should be introduced in order to analyze the cost and benefit of government expenditures.

Regarding the stimulating role of financial development, following policy measures are suggested.

- Financial sector development in the form of optimal resource allocation and mobilization is required.
- The development of financial institutions should be focused in accordance to establish new private enterprises which will be registered tax payers increasing the tax net.
- The financial sector should also regulate the international capital flows and mobilize the monetary services to control the monetary shocks.

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