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THE MEASUREMENT OF PAKISTAN'S BLACK ECONOMY: A MODIFIED CURRENCY DEMAND APPROACH

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Abstract. The study re-examines the size of Pakistan's informal sector using the dynamic monetary method. It investigates the relationship between the tax burden and currency ratio by controlling the impact of education, financial development, interest rate and strength of government regimes. Previous work on Pakistan indicates that most of the studies used traditional currency demand approach, which involves a number of problems and henceforth gives spurious results. Study applied Auto Regressive Distributed Lag (ARDL) bound test approach to estimate dynamic monetary model and unearthed the existence of volume of shadow economy in Pakistan. The empirical results of the study reveal a positive and significant long-run equilibrium relationship between tax burden and currency ratio. Besides, it is also observed that financial development, regime strength, education and interest rate have inverse linkage with money demand. Results of the study predict that size of Pakistan's informal sector was at its highest 49.38% of GDP in 1998 and reduced to 27.16% of GDP in 2015. Besides, it is also observed that volume of shadow economy remained less during the era of dictatorship as compared to democracy. Empirical findings of the study envisage that economic managers of Pakistan's economy should work on

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readjusting tax brackets and focus on increasing tax base rather than tax rates.

Keywords: Shadow Economy, Monetary approach, ARDL, Financial Development

JEL Classification: O17, E26, G3, K4

I. INTRODUCTION

THEORETICAL AND PRACTICAL RELEVANCE

The inefficiencies of market system resulting from lack of legal and political institutions in low income and developing countries increased the significance and consequences of existence of underground economy in these nations. Theoretical and empirical literature argues that informal economy comprises of all the market operations is not recorded in the official statistics of national output. Recorded estimates of informal economy have exceeded 40% in developing countries, which signify the inability of public institutions to tax a major share of output. These figures show that shadow economy prevails parallel to the legal market operations whose income is untaxed and undocumented[1].

Literature failed to present a unified definition of shadow economy; difference in researchers' opinions might be a result of variation in research objectives and contrary estimation technique. This is pertinent to the notion that the measurement of its degree and extent to which it prevails in a region require complex measurement methods. Conducive environment for shadow economy to flourish is primarily dependent upon the entrepreneurs' intention of finding a safe haven from unwarranted taxation and tight regulations. Main question to be investigated is, whether informal sector substitutes or complements the official economy? Allingham and Sandmo (1972) argue that black economy tends to spur that official economic activities in which government employees work for gaining private earning. When the entrepreneurs face the option of working in the underground economy, they hinder the ability of a fraudulent official to distort the formal sector for his/her

[1] For detail see Kemal (2010)

private gains. Under this stance, the role of shadow economy complements the official sector instead of substituting it. Friedman et al. (2000) point out that the businessmen consider the black economy as a lucrative option to reduce the burden of bureaucracy and corruption.

The greatest concern of researchers and scholars to estimate the volume of underground economy is to expose misguided current policies, which are framed on inaccurately calculated statistical accounts. This implies that an existence of active underground economy always promotes the meanness of taxation policies and regulatory laws[2]. Basic objective of macroeconomic policies is to reduce market uncertainty through effective fiscal and monetary policies. The effectiveness of these macroeconomic policies depends on precisely calculated estimates of key statistics including unemployment and output. Therefore, presence of non-trivial production and unrecorded market transactions can distort the estimation of key economic statistics. This makes it impossible for government officials to devise informed strategies at national level. Due to untaxed economic activity, the countries face negative consequences for competitiveness while undermining social cohesion and law and order, resulting into huge fiscal losses. Failure to detect shadow economy can change the country into dysfunctional state that is ineffective, unfair and inefficient. Hence, for governments, the major concern is to detect and measure the size of informal economy so that informed decision and policies can be made accurately.

During late 1970s and 1980s, United States faced an intense recession and high rates of unemployment. However, it is believed by some scholars that since the employment statistics of underground economy in United States were not recorded in the official employment statistics, so the whole recession era was a mirage[3]. Since this is considered as a polarizing point of view about the negative impact of inaccurate calculations due to existence of shadow economy, it still highlights the significant importance of measuring the informal sector. It is highly pertinent to take the analogy into account that the effect of unofficial economy is not primarily limited to developed countries. The

2 For detail see Tanzi (1983)

3 For detail see Edgar (1989)

discrepancies in national accounts also have serious repercussions for underdeveloped and developing countries like Pakistan and India.

The rising Asian underground economy[4] has made it a focal point of discussion for analyzing the brunt of the dip in developing/transitional economies of the region. Shehryar (2014) argues that globalization and liberalization has become a smooth path for informal economies to enter into the formal sector and sustained their impacts in most of the developing nations, especially Pakistan. Since Pakistan is a third world country with extractive institutions and narrow tax base, a high opportunity of fraudulent behavior in tax auditing fuels the impetus to become a part of shadow economy (Gulzar et al., 2010). Hence, amongst poverty and unemployment situation in the country, shadow economy has also become one of the inhibiting development issues to be resolved. The mounting concern in Pakistan of the expanding informal sector makes it imperative to reevaluate it. According to Kemal (2010), the size of shadow economy in Pakistan was 92% of GDP in 2009. Therefore, objective of the study is to re-examine the volume of informal sector of Pakistan for economic managers to address the issues of narrow tax base, strength of political regimes, stagnating higher education enrollment and under developed financial sector. The aforementioned factors might play a key role in exhibiting higher trends in Pakistan's shadow economy. Rest part of the study is organized as follow: section II presents brief review of existing literature, section III outlays the methodology for the study, section IV provides the results and discussion and section V presents the conclusion.

II. REVIEW OF LITERATURE

The informal sector constitutes a major share in national output, and it is not limited to developing countries but developed economies also portray similar pattern. Across the emerging market economies, the shadow economy has continued to expand due to increased tax burden, political instability and underdeveloped financial sector. According to Blades et al (2011), a large proportion of the income of the masses is dependent upon the shadow economy in the developing world. This is the main reason

[4] Almost 41% as a percentage of GDP

why there is an expanding informal sector in the developing regions of the world (Schneider and Enste, 2000). According to Schneider et al (2010) the shadow economy in the developing countries has remained between 40 to 60 % of GDP.

Major portion of existing literature supports the common notion that overall tax burden is the prime reason of shadow economy's existence[5]. Tax burden and tax distortions have become a key issue for the researchers as it highly contributes toward increasing the discrepancy between the aggregated costs associated with labor, and after tax earnings. According to Schneider et al. (2010), higher inconsistency between labor expenditure and after-tax earning motivates the individuals to indulge in illegal economic activities. The burden of tax is a fundamental force behind the growth of informal sector all over the world. Moreover, it is argued by many researchers that a rise in levels of taxation leads to an increase in tax burden awareness. This induces people to switch from formal to informal activities, hence, indicating a positive linkage between tax burden and shadow economy (Ahmed and Hussain, 2008; Chaudhry and Munir, 2010).

Apart from tax burden, financial development in a country is also considered as a well-known contributing factor to shadow economy. Empirical findings of Blackburn et al. (2012) reveal that financial development suppresses the existence and growth of black economy. It is also argued that the countries having low level of financial development face higher rates of shadow economy and tax evasion (Capasso and Jappelli, 2013). Other informal sector promoting factors are social polarization, autocratic authority pattern, political reforms and political instability (Elbahnasawy et al., 2016; Elgin 2010) and (Jamalmanesh, 2013). It is observed in literature that when the political stability is higher in a country, there is low level of corruptive activities, inflated burden of tax and reduced size of hidden economy (Elgin, 2010). When tax burden is higher and there is political stability in the country, the excessive tax revenue will be rapidly used for the production of public goods, building an incentive to operate in the formal sector while decreasing the aggregated magnitude of the underground economy (Aslam, 1998).

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[5] See Schneider et al., (2010)

According to Horvath (2017), for the measurement and estimation of shadow economy, the importance of interest rates fluctuation cannot be undermined. The contraction in the interest rate in an emerging economy can cause stagnation in output and an expansion of informal sector. The transactions taking place in illegal market operations are primarily based on cash because of unavailability of other financial tools. Hence, due to rise in interest rates, the opportunity cost of holding money increases while causing a decrease in hidden economic activities (Tanzi, 1983; Shneider et al., 2010).

As concerned to Pakistan, literature reports that financial underdevelopment is a major cause of growing informal economy (Gulzar et al., 2010). According to Arby et al. (2010), during the weak and fragile political regimes, the informal economy has been found out to be at its peak in Pakistan. Apart from the above mentioned factors, the extent of higher education in developing countries also plays a vital role in curbing the informal sector. Higher level of education creates civic sense and improves morality in the public while reducing the size of shadow economy. Many studies have found a significantly negative relationship between education and informal sector[6]. According to Chaudhry and Munir (2010), low tax revenue is found to be associated with low level of education in Pakistan.

Brief review of literature reveals that mostly, the size of informal sector is assessed by using ad hoc approaches like traditional currency demand approach and MIMIC, and simple OLS and structural equation modeling was used for estimation. These estimation techniques do not address the issues of stationarity and endogeneity that lead to spurious results. In addition, none of the study considered the instability of regimes, financial development measured by domestic credit to private sector by the bank as a percentage of GDP and enrolment at higher education level[7] while estimating the volume of shadow economy in Pakistan. Hence, this study has considered above mentioned factors to estimate the size of informal sector of Pakistan's economy to fill the existing research gap.

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[6] Chaudry and Munir (2010), Arby et al. (2010) and Gulzar et al (2010)

[7] Except Arby et al. (2010).

III. THEORETICAL BACKGROUND AND METHODOLOGY

Gutmann (1977) and Tanzi (1983) used the idea of Cagan (1958) to measure the size of shadow economy of USA, which states that increasing rates of taxation cause people to make use of currency for transactional purposes in order to avoid taxation. These studies do not address the issues of time series data while estimation through simple OLS and used dependent variable (currency ratio) in the log form that creates a serious disaggregation problem.

THEORETICAL FRAMEWORK AND MODEL SPECIFICATION

Following Arby et al. (2010), modified monetary approach is used to estimate the volume of informal sector of Pakistan. This approach measures size of shadow economy by currency ratio (M0/M2) and assumes that all informal sector transactions are carried out only via currency outside the banks. Besides, it is also assumed that velocity of money of informal and formal sectors is similar. Main focus of the study is on tax to GDP ratio to assess the volume of informal sector of Pakistan after controlling the impact of financial development, regime durability, enrolment at higher education level and interest rate. Functional form of relationship between currency ratio with other variables is shown as follows:

$$CR = f(TB, FD, RS, i, ED) \qquad (1)$$

Where:

CR = Currency Ratio

TB = Tax Burden

FD = Financial Development

RS = Regime Strength

i = Interest Rate

ED = Level of Higher Education

Equation (1) shows that tax burden positively impacts the informal sector measured by currency ratio, and all other variables such as financial development, regime strength, interest rate and level of higher

education negatively effect of size of shadow economy. Following econometric form of equation (1) is used for estimation.

$$CR = \beta_0 + \beta_1 TB + \beta_2 FD + \beta_3 RS + \beta_4 i + \beta_5 ED + \mu \qquad (2)$$

Literature prevailing on the issue predicts that $\beta_1 > 0$ and $\beta_2, \beta_3, \beta_4, \beta_5 < 0$. Study used Auto-regressive Distributive Lag (ARDL) technique to estimate the equation (2). The ARDL model assists in addressing some of the issues related to the traditional currency demand approach. The auto regressive distributed lags model allows the use of variables integrated of order I (0) and I (1) in the model and can be helpful in producing long run relationship between the dependent and the independent variables. According to Pesaran and Shin (1999), the estimators based on the ARDL model are super consistent and valid inferences linked with long run parameters can be chalked down with the use of customary normal asymptotic theory. Furthermore, they also suggest that the model is sufficient to correct serial correlation of the residuals and address the problem of endogeneity and non-stationarity. Equation (3) is the ARDL version of equation (2) which shows the short run as well as long run dynamics of the model.

$$\begin{aligned}\Delta CR_t = {} & \lambda_0 + \lambda_1 CR_{t-1} + \lambda_2 TB_{t-1} + \lambda_3 i_{t-1} + \lambda_4 FD_{t-1} + \lambda_5 RS_{t-1} + \\ & \lambda_6 ED_{t-1} + \sum_i^k \alpha_{1i} \Delta TB + \sum_0^k \alpha_{2i} \Delta i_{t-1} + \sum_0^k \alpha_{3i} \Delta FD_{t-1} + \\ & \sum_0^k \alpha_{4i} \Delta RS_{t-1} + \sum_0^k \alpha_{5i} \Delta ED_{t-1} + U_t\end{aligned} \qquad (3)$$

Where subscript t indicates time period, currency ratio (CR) is the ratio of M_0 with respect to M_2 (M_0 is the currency in circulation and M_2 is broad money), Tax Burden (TB) is the ratio of aggregated tax revenue to nominal GDP, interest rate (i) is measured by nominal interest rate, Regime Strength (RS) is measured by regime durability, Level of Higher Education (ED) is measured by the total enrollment in the universities and colleges and finally Financial Development (FD) is measured by the domestic credit provided to private sector by the banking sector as a percentage of GDP and U_t is the error term.

Following Arby et al., (2010), following equation is used to calculate the volume of informal sector of Pakistan.

$$\varepsilon_t = \frac{Y_i}{Y} = \frac{\lambda_2 TB + \lambda_6 ED}{m_t} \qquad (4)$$

Where $\frac{Y_i}{Y}$ is the size of shadow economy with respect to official sector of Pakistan, λ_2 is the estimated coefficient of Tax Burden (TB) variable, λ_6 is the estimated coefficient of level of Higher Education (ED), and m_t is money demand ratio i.e. M_2 to M_1.

VARIABLE SPECIFICATION AND DATA SOURCES

Currency Ratio variable is designed by dividing M0 (currency in circulation) to M2 (broad money) that measures the amount of currency outside the banks with respect to the total money supply. The tax revenue to GDP measures the tax burden in an economy. Regime Strength/durability shows the strength of the government regime in terms of time in office before the latest regime change i.e. from democracy to dictatorship and vice versa. It takes into account the first year of regime change as 0 and then adds 1 for each subsequent year until there is another change in the regime. Money market interest rate has been taken as a proxy for the opportunity cost for holding money. It is defined as the interest that is paid on interest bearing accounts and is higher than the saving accounts. Financial Development is measured by domestic credit to private sector as a percentage of GDP. For the level of higher education, total enrolment in universities and colleges are considered. Money supply M1 and nominal GDP have also been taken into account to calculate the size of informal sector of Pakistan.

The data for money Supply M0, M1, M2 and enrollment in universities and colleges are taken from Pakistan's Handbook of Statistics. Money market interest rate and nominal GDP have been extracted from International Financial Statistics. The data for tax revenue to GDP ratio and domestic credit to private sector is taken from the World Development Indicators. Lastly, regime durability is taken from Polity IV data set.

IV. EMPIRICAL RESULTS AND DISCUSSION

Study used time series data from 1972 to 2015 to estimate the volume of shadow economy of Pakistan, using ARDL estimation method. Results of

unit root test predict that money market interest rate and regime durability series have I(0) order of integration (stationary at level) and all other variables are integrated of order I(1)[8]. In ARDL estimation technique, selection of optimal lag length is important, as the variation in F-statistic is highly dependent on the included lags associated with the equation (3). Vector Auto Regressive (VAR) lag selection criteria is used and values of Akaike, Shwartz, and Hannan Quin criterion suggest that optimum lag to be the first lag, as shown in Table 1.

TABLE 1

VAR Lag Selection

Lags	LogL	LR	FPE	AIC	SC	HQ
0	-132.68	NA	3.49e-05	6.76	7.02	6.86
1	68.531	333.72*	1.13e-08*	-1.29*	0.46*	-0.65*

The optimal length of Lag is shown by (*)

After selection of optimal lag length, the short run dynamics of the variables are tested, and results presented in Table 2 indicate that all short run coefficients of variables are highly significant and signs are as per predictions of previous studies.

TABLE 2

Results of Short Run Dynamics of Variables

(Dependent variable: Currency Ratio)

		Coefficients		**T-statistics**	
Currency Ratio (-1)		0.4919		4.81***	
Tax Burden		0.9311		3.02***	
Interest rate (-1)		-0.0042		-2.26**	
Financial Development		-0.0033		-3.37***	
Regime Strength		-0.0029		-2.79***	
Higher Education		-0.0153		-4.62***	
C		0.3311		5.16***	
R^2	0.9256	DW	1.89	F- Stat.	62.19***
Adj. R^2	0.9107	X_{LM} (Pr ob)	0.29	SIC	-5.07
		X_{hetro} (Pr ob)	0.61	AIC	-5.18

Note: ***, ** and * indicate 1%, 5% and 10% significance level, respectively

[8] For unit root results see appendix Table A-1.

ARDL Bound Test is applied to test the existence of long run equilibrium relationship among variables, and results shown in Table 3 reveal that the null hypothesis about the prevalence of no long run relation among the variables is rejected at 5% significance level. Besides, critical value of F-statistic is also above the upper bound value of the test. This propagates that there prevails a long run linkage between the dependent and independent variables.

TABLE 3

Result of ARDL Bound Test

Test statistic	Value	K
F-statistic	3.40**	5
Significance	I(0) Bound	I(1) Bound
10%	2.08	3.0
5%	2.39	3.38
2.5%	2.70	3.73
1%	3.06	4.15

Note: ** indicates 5% level of significance

Following Table 4 presents the long run coefficients and error correction term estimated through ARDL method. Results indicate that long run coefficients are providing statistical significance and have signs as per prediction of theory and previous studies. Coefficient of tax burden shows the elasticity which predicts that 1% increase in tax to GDP ratio will result in 1.83% increase in currency ratio, hence, increases the volume of shadow economy in Pakistan. Empirical findings of previous studies suggest that harsher tax regulations cause people to move out of the official market operations and indulge in illegal economic activities. The higher the tax burden, the greater are the incentives to seek employment in the informal sector. The monetary approach to measurement of shadow economy assumes that all the transactions taking place in the economy are based on cash transactions. So, higher currency ratio signifies an inflated size of illegal market operations. This finding is also supported by the results of previous studies such as Tanzi (1983) and Arby et al., (2010).

Monetary approach also predicts that increase in rate of interest increases the opportunity cost of holding money, thereby reducing the demand for currency. The empirical results of the study reveal that there is a negative relationship between the market interest rate and the

currency demand. Apart from interest rate, financial development also leads to a decline in the unofficial sector. A regulated financial sector increases the role of the banks and other financial institution in business transactions and reduces cash dealings in an economy. This helps in shrinking the magnitude of the informal sector as predicted by the results of the study in hand.

TABLE 4

Long Run Results of ARDL

(Dependent Variable: Currency ratio)

Variable	**Coefficients**	**T-statistics**
Tax burden	1.8326	4.08***
Interest rate	-0.0096	-3.63***
Financial development	-0.0066	-3.34***
Regime Strength	-0.0057	-2.51**
Higher Education	-0.0301	-6.78***
C	0.6519	6.36***
$EC_{(t-1)}$	-0.4319	-4.17***

Note: 1%, 5% and 10% significance level are shown by ***, **, *, respectively

Another finding of the study is relationship between currency ratio and regime strength (regime durability). Results of the study indicate a negative relationship between currency ratio and regime strength, which implies that social polarization, autocratic authority pattern and instability of government regimes cause insecurity among the nation. This causes people to indulge in the informal sector in order to earn more for the bad financial times to come. When the political stability is higher in a country, there is low level of corruptive activities and reduced size of hidden economy. These findings are supported by the empirical findings of previous studies like Elgin (2010) and Elbahnasawy et al. (2016). Another important finding of the study is, 100% increase in level of higher education will bring 3% decrease in currency ratio, resulting in reduction of the size of Pakistan's informal sector. This implies that level of higher education in the country inculcates the sense of morality in the general population therefore reducing the size of the underground economy.

In addition, coefficient of error correction term is negative and significant, which implies that 43.19% short run disequilibrium will be

adjusted towards long run equilibrium in the first year. Study also used CUSUM and CUSUMSQ tests to test the stability of the model, and results are shown by Figure-1 and Figure-2. Both figures indicate that estimated residuals are within the 5% bound; signifying that performance of the model remained stable during the sample period of the study.

FIGURE 1

Cumulative Sum of Recursive Residuals

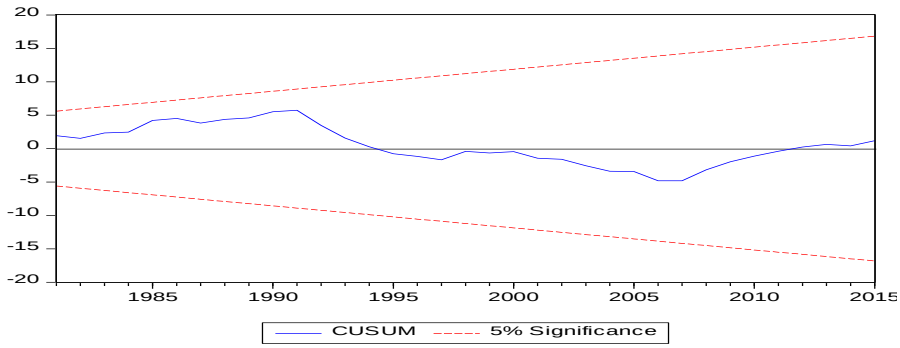
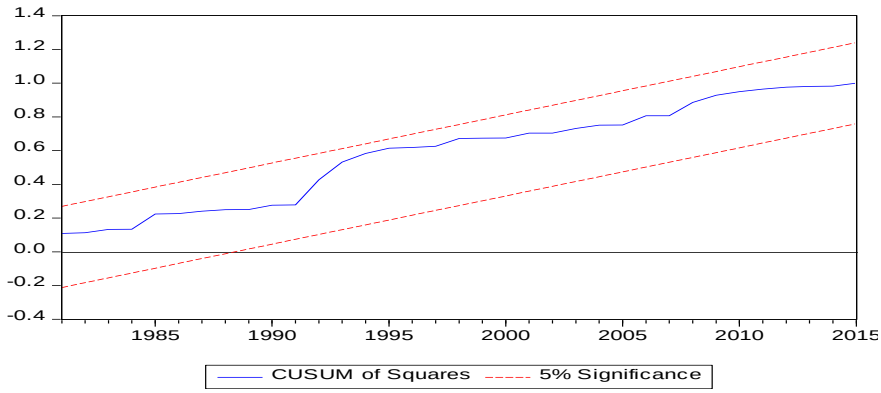


FIGURE 2

Cumulative Sum of Square of Recursive Residuals



SIZE OF THE SHADOW ECONOMY OF PAKISTAN

After establishing the long run relationship, study calculated the size of shadow economy (SE) of Pakistan by using equation (4), and calculated results are compared with previous studies; Arby et al., (2010)

and Gulzar et al., (2010) in Table 5. The previous studies[9] did not control the variables of regime durability and financial development. The current study takes into account both the aforementioned variables while calculating the size of the informal sector. Calculated values of the study of the shadow economy of Pakistan are little bit higher than the values of previous studies which might be the result of higher estimated value of tax burden as compare to mentioned studies. According to Tanzi (1983), the magnitude of the coefficients might change depending upon the types and the number of variables used in the equation, causing the size of the shadow economy to vary across studies. Tanzi (1983) postulates that the direction of the shadow economy over the period is more important rather than the size of the shadow economy. Findings of the study also reveal that volume of shadow economy of Pakistan remained higher during the decade of 1990s, and it was highest in 1998 (49.38% of GDP). It is also observed that size of shadow economy remained higher during the era of democracy as compared to dictatorship.

TABLE 5

Estimates of the Pakistan's Shadow Economy

Years	SE % of GDP (Study Result)	SE % of GDP (Arby, et.al., 2010)	SE % of GDP (Gulzar, et.al., 2010)
1966	-	24.4	-
1967	-	29.2	-
1968	-	28.8	-
1969	-	33.1	-
1970	-	36.0	-
1971	-	32.3	-
1972	36.37	29.8	-
1973	35.53	29.3	27.66
1974	35.99	27.1	26.56
1975	29.16	25.9	26.96
1976	32.99	28.4	27.54
1977	31.36	27.9	27.14
1978	33.73	29.2	27.13
1979	32.37	31.1	26.77
1980	35.92	33.3	26.32
1981	33.25	33.1	26.17

[9] Arby et al (2010) and Gulzar et al (2010).

Years	SE % of GDP (Study Result)	SE % of GDP (Arby, et.al., 2010)	SE % of GDP (Gulzar, et.al., 2010)
1982	35.70	31.6	26.41
1983	35.71	32.8	25.65
1984	35.58	32.1	21.83
1985	33.39	29.6	25.97
1986	35.08	35.2	31.02
1987	32.50	35.4	26.57
1988	30.71	32.7	21.57
1989	31.49	32.5	20.45
1990	30.30	30.0	24.74
1991	29.16	26.1	16.48
1992	36.44	27.7	16.44
1993	38.31	30.1	26.69
1994	39.11	33.3	14.61
1995	42.50	34.8	14.37
1996	45.96	36.8	22.00
1997	46.64	36.4	18.88
1998	49.38	36.4	25.36
1999	36.44	35.2	20.99
2000	33.32	26.0	29.89
2001	22.59	26.3	28.15
2002	21.57	27.0	32.85
2003	21.34	29.0	26.85
2004	20.82	24.9	22.75
2005	20.47	18.7	21.51
2006	28.82	18.3	21.48
2007	29.87	18.9	22.42
2008	29.86	19.6	20.35
2009	30.82	-	19.23
2010	29.39	-	18.23
2011	27.54	-	-
2012	30.42	-	-
2013	26.63	-	-
2014	27.04	-	-
2015	27.16	-	-

V. CONCLUSIONS AND POLICY IMPLICATIONS

The study used ARDL Bound Test approach to estimate the size of shadow economy of Pakistan using currency ratio as dependent variable, and tax burden, financial development, interest rate, regime strength and higher education enrolment as independent variables. Empirical findings

of the study predict that increase in tax burden (measured by tax to GDP ratio) promotes demand for currency and hence increases the volume of shadow economy. Higher degree of financial development and regime strength, an increase in interest rate and improvement in higher education enrolment will be helpful in reducing the size of informal sector of Pakistan. Results of the study predict that 1% increase in tax burden will increase the size of informal sector by 1.83%, and 100% increase in enrolment at university and college level will lower the volume of shadow economy by only 3.1%. Results of all diagnostic tests show that estimated model is stable and free from time series issues such as autocorrelation and serial correlation. Important observation of the study is that volume of informal sector of Pakistan remained higher during the decade of 1990s and was highest in 1998 (49.38% of GDP). It is also observed that size of shadow economy was less in the era of dictatorship as compared to democracy. Results of the study suggest that economic managers of Pakistan economy should focus on tax base instead of adjusting the tax brackets. Besides, it is also suggested that policies should be framed to enhance the enrolment at university and college level to reduce the size of shadow economy of Pakistan.

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APPENDIX

TABLE A-1

Unit Root Test Results (Augmented Dickey Fuller Test)

Unit root	Currency Ratio		Tax burden		Interest Rate	
	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
Level	-3.59	-1.23	-1.82	-1.49	-2.55	-2.68**
First difference	-6.01***	-6.00***	-6.05***	-5.66***	-5.59***	-5.61***

Unit root	Financial Development		Regime Strength		Higher Education	
	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
Level	-1.77	-1.61	-3.26**	-3.14***	-0.90	1.07
First difference	-5.37***	-5.38***	-6.82***	- 6.91***	-6.23***	-3.51**

TABLE A-2

Descriptive Statistics

	Currency Ratio	Interest Rate	Tax burden	Regime Strength	Financial Development	Log Enrollment
Mean	0.246	8.72	0.112	3.364	23.82	11.713
Median	0.251	8.86	0.109	3.00	24.21	11.228
Maximum	0.350	12.47	0.142	10	29.79	14.419
Minimum	0.155	2.13	0.091	0	15.39	9.770
St. Deviation	0.057	2.35	0.014	2.754	3.57	1.382
Skewness	-0.053	-0.66	0.396	0.513	-0.62	0.608
Kurtosis	1.884	3.49	2.094	2.301	3.02	2.117
Jarque-Bera	2.305	3.66	2.654	2.828	2.82	4.162
Probability	0.316	0.16	0.265	0.243	0.24	0.125
Sum	10.83	383.68	4.938	148.0	1047.95	515.41
Sum Sq. Deviation	0.14	237.92	0.008	326.19	548.19	82.146
Observations	44	44	44	44	44	44