The Underground Economy and Tax Evasion in Pakistan: Annual Estimates (1960–1998) and the Impact of Dollarisation of the Economy

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I. INTRODUCTION

The underground economy (UE) and tax evasion have been a focus of research in Pakistan for many years now. The growing interest in these areas is because of persistent budget deficits resulting from inadequate tax revenues. It is not the presence but the size of the underground economy and the extent of tax evasion that is a major cause of concern. The growth rate of the underground economy is crucial to policy making. Lack of information in this regard is often held responsible for distortions in major macroeconomic indicators. In effect, the socio-economic policies based on these indicators are made ineffectual. Thus up-to-date estimates of the size and growth of the underground economy are very important.

Social and economic policies directly affect the size and growth of the underground economy. Major policy changes like structural reforms in the financial and banking sectors make a significant impact on both .economies. In this respect, it is crucial to gauge the impact of structural changes like dollarisation of the economy on underground activities.

The term underground economy encompasses a vast variety of activities that are not deemed legal by law and one cannot be sure of the exact meaning of the phrase. There are several synonyms of the term underground; for example Secondary, Hidden, Irregular, Parallel, Unofficial, Black etc. However, there are four different categories under which the underground economy can be classified. The illegal economy consists of income produced by economic activities that are anti-social in nature. This category would comprise smuggling, gambling, prostitution, drug trafficking, and so on. The

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unreported economy refers to those economic activities that operate by evading the payment of taxes by not reporting income to the fiscal authorities. The unrecorded economy, similar to the unreported economy, consists of income that should be recorded in the national accounts but which are not. And lastly, the informal economy includes those activities that entail a cost but which are excluded from the rights and benefits of the formal economy. Thus the definition of the term differs with the objective and the approach of the study.

Consequently, every study presents different results based on its objective and approach. This study defines underground economy as consisting of income generated from activities that are hidden from tax authorities in an attempt to evade taxes. Therefore it does not measure illegal or informal economies.

The underground economy of Pakistan, based on the mentioned definition has been estimated previously. It is important to state here, that no previous estimate has been termed entirely accurate and neither can this one be termed so. However, this paper attempts to improve upon previous estimates, by taking a large sample size, and adding a new dimension to the approaches being used by evaluating the effect of dollarisation of the economy. It presents qualitative and quantitative consequences of a sizeable underground economy and its policy implications.

The paper is divided into six sections. After the introduction, Section II presents a brief literature review of the monetary approach. Section III provides the methodology of the estimation. This paper makes some modifications to the Tanzi methodology to make it suitable for the economy of Pakistan. The regression results and the estimates for the underground economy and tax evasion are tabulated in Section IV. Section V includes the important consequences followed by conclusion and policy implications in Section VI.

II. LITERATURE REVIEW

In most of the studies the measurement of the underground economy is restricted purely to attempts at estimating the level of underground income earned, as opposed to the level of underground wealth. This is because of the difficulty in measuring hidden wealth as well as because of conceptual difficulties that will necessarily be encountered. For example, a man who earns money through both legitimate and illegitimate means may keep the sum of his earnings in a single account. Measuring his level of underground wealth would therefore entail measuring the level of his savings. Complications arise when withdrawals are made from this account: should the remaining balance be treated as legal, illegal, or a combination of both? And if it is to be treated as a combination, in which proportions should the legally earned and illegally earned money be split? There are essentially five methods of estimating the size and extent of the underground economy, all of which focus on trying to gauge the level of underground income earned. They are: the monetary approach, the fiscal approach, the

national account approach, the labour market approach, and the physical input approach. Acharya (1986) and Pyles (1989) present a comprehensive critique of these approaches.

This paper incorporates the monetary approach to estimate the level of underground economy. The monetary approach assumes there to be an implicit and, more importantly, stable relationship between various monetary stocks. It suggests that underground economy translates into changes in the 'norm' value of certain monetary stocks. Essentially it attempts to determine the demand for currency holding equation, and estimate the effect of tax rate on the total demand. Various versions of this approach are available in the literature depending on the assumptions used to determine the currency demand.

Guttman (1977) estimated the impact of tax rate on currency to demand deposits ratio. He argued that a rise in this ratio indicates an increase in the underground economy. He assumed that income velocity of money is the same for both the underground and the observed economies. Fiege (1979) used Irving Fisher's *quantity theory of money to come* up with his estimates. He estimated the nominal GNP by using the transaction velocity of money and money supply defined as currency in circulation plus demand deposits. The difference between this GNP and the GNP measured by national accounts is assumed to estimate the underground economy. Finally, the Tanzi analysis (1980, 1982, 1983) used by this study, estimates demand for money (currency/M2) as a function of tax rate, share of salaries and wages to national income and interest rate on time deposit. This approach is based on two main assumptions: The underground economy is due to tax evasion and currency alone is used as a medium to carry out transactions in the underground economy. Tanzi estimated the GNP of the underground economy assuming that the underground velocity of money is the same as the observed economy. Several other studies; Ahmad and Qazi (1992); Shabsigh (1995); Iqbal, Qureshi and Mahmood (1996), modify this methodology to suit Pakistan's case. Ahmad and Qazi (1992) redefined the currency to money supply ratio to add the effect of bearer bonds. Shabsigh (1995) and Iqbal, Qureshi and Mahmood (1996) estimate the sectoral composition of the underground economy.

III. METHODOLOGY

This paper uses the Tanzi methodology with minor changes made to the specification of the demand for currency model to incorporate the effect of dollarisation of the economy. It includes more relevant variables and it measures the underground economy over the period 1960–98 to increase the accuracy of the estimates. However, due to large sample size, the sectoral composition is not included in this paper since there are inconsistencies between the data for the periods 1960–71 and 1971–98. Finally velocity is defined in a different manner to facilitate the modified model.

The liberalisation of the foreign exchange market in 1991 has resulted in dollarisation of the Pakistani economy, which has become a matter of serious concern in

the last few years. The introduction of foreign currency accounts for residents has been a key factor behind dollarisation. By June, 1998 these accounts were worth as high as Rs 278 billion primarily because of high rates of return, inflation and steady depreciation of the rupee. It is argued that *FCAs* serve to be a powerful source of carrying out transactions in the underground economy. These accounts are completely confidential, easily transferable and can be fed by remittances, traveller's cheques, foreign currency notes and other procedures. They can be used as collateral and credits cards and other loans may be issued against the balances. To incorporate dollarisation of the economy a new variable 'CFCA' is included which includes resident foreign currency accounts along with currency in circulation. The demand for currency is thus measured by the *CFCA* to money supply (*M2*).

The modified model is of log-log specification in which demand for currency is assumed to be determined by the tax rate, interest rate on time deposits and the level of economic development. The following equation is estimated for the period from 1960 to 1998:

$$ln(CFCA/M2)_t = \beta_1 + \beta_2 ln(TGDP)_t + \beta_3 ln(INT) + \beta_4 Y_t + \beta_5 DUM_t + \varepsilon_t$$

Where:

$CFCA$ = Currency in circulation + foreign currency accounts;
$M2$ = Money Supply (standard definition of *M2*);
$TGDP$ = Total tax revenues, GDP;
INT = Interest on time deposits;
Y = Growth rate of real GDP;
DUM = Dummy variable (1 for 1991–98, 0 otherwise);
ε = Stochastic Error Term.

The justification for the inclusion of these variables is as follows:

In this paper it is argued that a rise in the level of taxation increases the incentive for tax evasion. As the relative cost of non-tax (underground) activities goes down, the demand for these activities goes up. Since these activities are facilitated by the use of currency and *FCAs*, the demand for currency and consequently the *CFCA* to *M2* ratio goes up.

A higher interest rate on time deposits increases the opportunity cost of holding money. Therefore demand for currency goes down. At the same time the demand for *FCAs* and other time deposits goes up. Since *FCAs* and other time deposits are included in *M2*, *M2* goes up by a larger amount. Thus the overall effect of a rise in interest rates on *CFCA* to *M2* ratio is expected to be negative.

In most studies a higher level of economic development defined by annual growth in real per capita gross domestic product leads to decrease in the demand for

currency, which is replaced by other financial instruments. Following the justification of the interest rates for the overall ratio of *CFCA* to *M2*, it should be expected that this ratio would go down as per capita real GDP goes up. However as argued in Shabsigh (1995), in a developing country with low levels of per capita income, an increase in economic development can increase the demand for currency as well as time deposits. Therefore, it is argued that in Pakistan, demand for currency is positively related with the real per capita GDP.

Finally a dummy variable is used to cater for the financial sector reforms and the introduction of *FCAs* in 1991. The structural reforms have resulted in an increase in inflation that, in effect, reduces the real interest rates. This suggests a positive co-efficient for the dummy variable.

After estimating the equation the level of *CFCA/M2* is predicted with and without the tax variable TGDP for every year. The difference is multiplied by *M2* to get the level of illegal money (*IM*).

$$IM = [(CFCA/M2)_t - (CFCA/M2)_{wt}] * M2$$

The informal economy is estimated by taking the product of illegal money to the velocity of money (*V*). The velocity of money is defined as the ratio of GNP to *CFCA*. It is assumed this velocity is the same in both the underground and the observed economies.

$$\text{Underground Economy } (UE) = IM * V$$

Tax evasion is calculated by multiplying the estimate of the underground economy to the tax to GDP ratio (*TGDP*).

$$\text{Tax Evasion} = UE * TGDP$$

IV. RESULTS

All the data is taken from various issues of Pakistan Economic Survey and Annual Report of State Bank of Pakistan. The OLS estimate for the model is as follows:

$$ln(CFCA/M2)_t = -0.93 + 4.80 \ ln(TGDP)_t - 0.4.1 \ ln(INT)_t + 0.42 \ Y_t + 0.10 \ DUM_t$$
$$(9.13) \ (3.29) \qquad\qquad (7.97) \qquad\quad (1.42) \quad (4.70)$$

$$R^2 = 0.733$$
$$\text{Adjusted } R^2 = 0.702$$
$$\text{'d' Statistic} = 1.87$$

The figures in the parenthesis are the *t*-values of the respective coefficients. *TGDP* is significant at 95 percent confidence level. All other coefficients, except per capita real GDP growth rate, are significant at 99 percent confidence interval. Similarly the signs of all the variables are expected. Following Shabsigh (1995) the insignificance

of 'Y' is not unexpected in Pakistan where there is low per capita income and significant number of transactions are still carried out on cash basis. The results confirm the hypothesis that at low level of economic development of Pakistan there is fairly strong demand for cash transactions. The result suggests that an increase in the level of economic activity through development causes an increase in the demand for currency. The R^2 value is fairly reasonable and there is no sign of autocorrelation in the data.

Results confirm the main hypothesis that as level of taxation increases demand for currency goes up. It shows that higher interest rates increase the opportunity cost of holding money. The dummy variable shows that the structural reforms and the introduction of *FCAs* have increased the demand for holding currency and these accounts.

Table 1 contains the estimates of the informal economy for the years 1960–98. Figures 1 and 2 graph the estimates.

The estimates confirm the presence of a large underground economy in Pakistan. The underground economy increased from 29 percent of GDP (Rs 5.2 billion) in 1960 to 43 percent of GDP (Rs 216.5 billion) in 1998 at an annual average rate of 15.7 percent. Tax evasion has increased from Rs 405 million to Rs 123.6 billion (almost 84 percent of the budget deficit). On average, 90s is the only decade that saw slower growth of the underground economy relative to GDP.

Figure 1 shows a varying trend of the underground economy as a percentage of GDP. The underground economy grew in the sixties and fell down to its lowest level (27 percent of GDP) in 1976. It almost doubled in magnitude in 1981(52.6 percent of the GDP), shrunk through most of 80s and reached its highest level in 1991 (53 percent of GDP). Since then it has been gradually decreasing, so much so that in 1998 it reached its lowest level in the last 20 years.

The average annual growth in the underground economy has been relatively higher than that of the observed GDP during the sample period. Figure 2 indicates that the variance of the underground economy was significantly more than the variance of the GDP. The difference in growth levels was at times as high as 80 percent (1981). This is a possible cause of overall instability and a sluggish performance of the stabilisation policies.

The underground economy seems to be highly sensitive to political and economic events in the country. It is interesting to see that within a year of major political events the underground economy significantly increases relative to GDP (1965 and 1971 wars, martial law in 1977, Afghan War 1979, shift to democracy in 1988 and changes in government in 1990 and 1992). On the economic front stabilisation of the economy seems to have a positive effect on underground activities. As the country recedes from a sluggish performance of the economy, the share of the underground economy reduces. This is true for mid seventies where GDP grew at more than 23 percent per annum, and the mid-eighties that saw equally consistent growth. Almost no

Table 1

Estimates of the Underground Economy and Tax Evasion

Year	Underground Economy Rs Million	Tax Evasion Rs Million	As % of GDP		Growth Rate of the UE	Growth Rate of GDP
			UE	Tax Eva.		
1960	5079	405.3	29.0	2.31		
1961	5647	461.0	29.3	2.39	11.2	9.8
1962	6256	532.9	31.0	2.64	10.8	4.7
1963	6360	493.7	29.4	2.28	1.7	7.4
1964	7421	572.3	30.5	2.35	16.7	12.4
1965	9138	792.3	33.0	2.86	23.1	13.9
1966	9508	789.0	31.0	2.57	4.0	10.7
1967	12930	1212.1	37.0	3.47	36.0	13.8
1968	13165	1175.5	35.0	3.13	1.8	7.7
1969	16227	1720.0	41.0	4.34	23.3	5.4
60s	9439	839	33.6	2.92	14.2	9.5
1970	19024	1921.5	40.6	4.10	17.2	18.3
1971	16143	1460.3	32.4	2.93	−15.1	6.4
1972	23832	1930.4	44.4	3.60	47.6	7.6
1973	27824	2375.5	42.0	3.58	16.8	23.4
1974	29999	2755.2	34.7	3.18	7.8	30.5
1975	33409	2904.8	30.6	2.66	11.4	26.2
1976	34747	2701.2	27.1	2.11	4.0	17.3
1977	40430	3192.6	27.5	2.17	16.4	14.9
1978	80249	9287.8	46.3	5.36	98.5	17.8
1979	89459	10971.6	46.7	5.73	11.5	10.5
70s	40475	4047	38.2	3.63	21.6	17.3
1980	121046	16171.1	52.6	7.03	35.3	20.1
1981	126112	16549.8	45.3	5.95	4.2	21.0
1982	139580	17195.3	43.1	5.30	10.7	16.5
1983	170483	21282.6	46.8	5.84	22.1	12.4
1984	178443	21527.0	42.5	5.13	4.7	15.2
1985	190006	21193.6	40.2	4.49	6.5	12.5
1986	221407	25632.1	43.0	4.98	16.5	9.0
1987	221889	24124.2	38.8	4.21	0.2	11.3
1988	303926	40058.2	45.0	5.93	37.0	18.0
1989	354007	48527.0	46.0	6.30	16.5	14.0
80s	207840	25869	45.5	5.66	15.4	15.0
1990	376050	50086.5	43.9	5.85	6.2	11.2
1991	540649	70936.4	53.0	6.95	43.8	19.2
1992	548979	70969.8	45.3	5.86	1.5	18.7
1993	597462	76140.5	44.5	5.68	8.8	10.8
1994	672106	85053.5	42.7	5.41	12.5	17.3
1995	860343	112693.3	45.7	5.99	28.0	19.6
1996	948773	125996.8	43.8	5.82	10.3	15.1
1997	913461	118131.4	38.0	4.91	−3.7	11.0
1998	980253	123603.8	35.5	4.48	7.3	14.8
90s	418228	53613	42.9	5.44	13.2	15.1
60-98	216550	27372	39.3	4.33	15.7	14.4

Fig. 1.

Underground Economy as a Percentage of the GDP

1960 1965 1970 1975 1980 1985 1990 1995

Fig. 2.

—— Growth Rate of UE .... Growth Rate of GDP
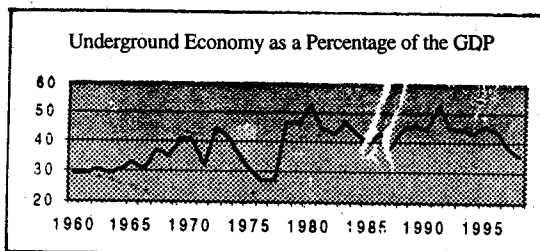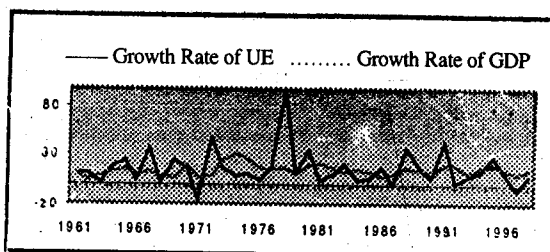
1961   1966   1971   1976   1981   1986   1991   1996

increase in the tax rates was also an important reason why growth of the underground economy was kept under check in these periods. Taxes were at an all time high in 1989 when the structural reforms were initiated. At the outset they had a negative impact on the economy. But eventually with financial and banking sector reforms, they had a dampening effect on the underground economy probably because of higher involvement in the formal economy. In addition taxation has remained almost constant at 13 percent of GDP in the 90s with focus shifted onto indirect taxation which is relatively less prone to evasion. Therefore it can be concluded that overall the effect of the financial sector reforms has been positive.

V. THE EFFECTS OF THE UNDERGROUND ECONOMY

The presence of such a substantial informal sector is itself an indicator of the widespread corruption prevalent in Pakistan. Besides having immense social costs, it also causes inefficiency in public administration. The large size of this sector renders information on the actual state of the economy less plausible. For example, under single exchange rate system, under-invoicing by the importers to save duty on imports and over-invoicing by the exporters to benefit from exports rebate was widely practised in Pakistan. Therefore it can be argued that Pakistan's trade deficit has been biased downwards. Furthermore, it can make policies based on the macroeconomic figures of

the observed economy completely unproductive. For example in years where the growth of the underground economy is greater than of the formal economy, expansionary policy of the government to boast up the sluggish economy could be more inflationary than expected.

It is believed that utilisation of resources is less productive in the underground economy as they do not have access to formal financial markets and because it is difficult for them to increase the scale of production due to fear of detection. Even with these constraints estimates show that during a few periods underground economy has been growing at a faster rate than the formal economy. Thus a potentially high growth sector of the country is not being able to be tapped by the government for revenues.

Rampant tax evasion has negative consequences for Pakistan's fiscal and monetary sectors. Primarily it has caused a loss in revenues of almost Rs 1.134 billion (98 percent of the total domestic debt) since 1960 and consequently it has increased the budget deficits. To compensate for this loss, the government has levied more taxes and increased the tax rate that itself has fed into greater incentive for evasion.

These effects are confirmed by other studies as well. Shabsigh (1995) points out significant misallocation of resources, including private investments, due to the existence of underground economy. He confirms that due to net loss of resources government is forced to compensate by increased public spending, therefore exacerbating the poor fiscal position of the government.

The underground economy also hampers equitable and efficient distribution of resources in different sectors of the society. In essence it increase the tax burden of the members of the formal economy. Because of progressive tax evasion, people with higher incomes are expected to evade higher amounts of taxes. Since these people are very influential in Pakistan, changes in the tax structure and tax reforms have been a very tedious task in Pakistan.

The monetary sector is affected as underground income changes the liquidity position of the economy. Often the credit rationing policies of the monitory authority are made ineffectual as income from the informal sector is often taken as an alternative source of finance. It is important to state here that although there is no hard evidence that the formal and underground markets negatively effect each other in Pakistan, there is a theoretical potential in the underground credit markets to destabilise the monetary policy.

It is widely accepted that the underground income has been contributed in massive amounts to the growth of foreign currency accounts (*FCAs*). These accounts are sensitive to economic situation of the country. Since this income is not legally earned, these accounts are highly sensitive to the risks associated with the maintenance of the accounts. The total liability of the government of Pakistan to the *FCA* holders is higher than the actual reserves of the country. Therefore in a foreign exchange crunch like the one being experienced at the moment in Pakistan, the country is highly

dependent on the foreign exchange infused by the underground income. Therefore the underground income has made dollarisation of the Pakistani economy a cause of concern.

VI. CONCLUSION AND POLICY IMPLICATIONS

The paper confirms the presence of a large underground economy and rampant tax evasion between 1960 and 1998. It has shown the variation in the growth of the underground economy relative to the formal GDP. The results suggest high variations that are sensitive to changes in the economic and political scenario of the country. The paper indicates that there are significant negative impacts of underground activities. Tax evasion alone has been close to 4.7 percent of GDP. The high cost of uncertainty and inefficiencies caused by the presence of underground elements is in addition to that. Further, it shows that dollarisation of the economy has become a problem because of a significant involvement of underground foreign exchange in the economy. However no negative impact of the dollarisation on the underground economy relative to the formal economy could be ascertained. The results of this paper can not be concluded as completely accurate. They are highly sensitive to the assumptions made and the modified model. Nevertheless, the trends captured based on the assumptions do give sight to possible ways of improving the situation.

Based on the results of this paper it can be argued that the underground economy is substantially sensitive to policy changes. The limited scope of this paper does not allow a detailed remedy plan. Nonetheless, it can be argued that the government should commit itself to long term planning. Complete transparency in the reforms is extremely important because underground activities have been found susceptible economic uncertainty. The tax reforms have to become a priority in the structural adjustment programme. A simpler taxation system with low-tax rates and broader tax base would not only decrease tax evasion, it would reduce the cost of being part of the formal economy and encourage people to involve themselves in the formal activities. In addition to the economic reforms the government has to create political stability, devise a detailed package to fight corruption and nepotism. It is important to state here that all these reforms have to take place in carefully planned and organised manner. Isolated and half-hearted measures would probably increase the overall uncertainty and aggravate the situation.

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