THE INFORMAL ECONOMY OF PAKISTAN: AN INSTITUTIONAL AND FISCAL POLICY PERSPECTIVE

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Abstract

This paper takes a crucial step in incorporating the institutions which have focused on informal sector and tax evasion in Pakistan. The study highlights the imperative role of institutions and fiscal policy, which are largely identified as the major constituent in the development of an informal economy. The study uses GMM (Generalized Method of Moments) regressions to deal with potential endogeneity and to strengthen the validity of results. The informal sector in Pakistan covering the period from 1984 to 2018 provides ample evidences that (i) effective fiscal policy is capable of executing functions that can imitate the institutional quality variables, (ii) development of institutions shrink the informal sector and increase in the tax rates induces informal economy, (iii) tax evasion and informal economy moves in the same direction and, (iv) government development expenditures helps in decreasing the size of informal sector but the impact is insignificant. The article states that as a consequence of these complex interrelations between fiscal policy, institutions and tax evasion, the development of informal economy in Pakistan is intricate, which is the very reason that Pakistan is among one of the world’s lowest tax to GDP ratio countries and facing significant challenges for the realization of its potential tax revenues. Failure of policy makers to take these associations into account while formulating policies can produce many unforeseen outcomes.

Keywords: Informal sector; Institutions; Tax Evasion; Interaction Term, GMM; Political economy

JEL Classification: P16; O17; 020

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I. Introduction

The existence of huge informal sector is one of the most prominent features of emerging countries. The informal sector comprises of all those economic actions which are not recorded or incorporated in the National Income Accounts. These consist of both lawful and unlawful economic activities. As stated in the 19th International Conference of Labor Statisticians (ICLS), the legal side of informal sector consists of own use producers of services and direct volunteers giving services to households. The illicit side of informal economic activities include; gambling, smuggling, forbidden commodity trade, theft, prostitution etc. National Income Accounts leave out several activities for instance, illegal employment (child labor), moonlighting, unregistered income generated through FOREX, transfer of money via hundi, unregistered employment, under reporting of retail sales, barter business and hidden rentals. These activities conceal massive amount of taxes, thus trigger burden on public treasury. The constant fiasco to handle economic system is reflected by low tax to GDP ratio, growing fiscal deficit, escalation of energy requirements, incessant inflationary pressure on food stuffs and consumer durables elucidates the neglect of quantification, implications and causes of the underground economy within the public policy context.

Kemal (2003) results show that tax evasion is an important factor of informal economy. Graph 1 in the appendix shows that they both move in the same direction. Informal economy is the mainstay of Pakistan’s economy. But, we do not know how large it is due to lack of accurate estimates. Accurate estimates of the informal economy/shadow economy will help policymakers to make better macroeconomic policies. If efforts have been made to include informal economy into the formal economy, then government can tap more revenues and the existing formal sector will have to take less pressure of taxes (Kemal & Qasim, 2012)

Numerous studies establish the effect of the institutions on informal sector size. Torgler and Schneider (2009) and Aruoba (2010) concluded negative association between quality of institutions and underground economy. Friedman et al. (2000) notice the positive relation between shadow economy and corruption; while Singh et al. (2012) show negative link between the underground economy and rule of law. On the other hand many authors consider that fiscal policy has a major impact on the development of underground economy (Albu, 1995). Kemal (2007) argued that high tax rates wear away the tax base. According to loayza (1996) size of informal
sector and proxies for tax burden move in the same direction. Schneider & Enste (2003) affirm that countries with lower rate of taxes and fewer regulations will likely have minor informal sector. In this study efforts have been made on theoretical and empirical grounds to explore the joint effect of institutional quality and tax rate on informal economy.

Regarding government services Hanousek and Palda (2004) affirm that when people have confidence that taxes are used for public and social services, and their taxes are not getting into the pockets of revenue authorities and legislators, then they are expected to pay the taxes. Loayza (1996) asserts that when public services are more productive relative to private services, the relative size of the informal sector drops. In this study endeavors have been made to capture the impact of government development services on informal sector. Moreover, no work throws light on the interaction among government development services and institutions. This paper takes into account both the angles of literature to gauge if institutional quality takes part in mediating the effect of development expenditures on informal economy. If development expenditures and institutions complement one other, then the informal economy impact from development expenditures is magnified in the presence of better institutions. On the contrary, if expenditures and institutions are substitutes, then the effect of development expenditure on informal economy shrinks as institutional quality escalates.

This study highlights the extent of informal economy in Pakistan. It is imperative to consider the size of informal sector because of low level of tax collection by the authorities. Despite many efforts by the government to convalesce the tax net, tax to GDP ratio is waning instead of improving. As mentioned above the current study explores the combined effect of fiscal policy and institutional quality on informal economy. The study also includes interaction term between development expenditures and institutions. In the current circumstances this analysis is remarkably vital for Pakistan because country is facing high fiscal deficits. The graph in the appendix shows that fiscal deficit is not growth promoting.

The rest of the paper is designed as follows; the next segment describes theoretical framework. Third section presents data and model specification. Section fourth presents and analyses our results. Finally, we present the conclusion of the paper in the last section.
II. Theoretical Framework

Assume that agents in the economy have initial level of capital which include both human and physical capital \((K_i)\) but may differ in production \((Y_i)\), as \(Y_i\) also depends on \(A\), which represents exogenous growth. On the same hand, \(yt\) represents aggregate output and \(\beta\) shows elasticity of output w.r.t. \(ga/yt\), it evaluates the output of government amenities in relation to private amenities \((ga/yt)\). Returns to capital are constant (Rebelo 1991) in producing one commodity, which could be invested or consumed.

Barro and Sala-i-Martin (1992) presume that returns on the capital hinges on the existing public amenities in relation to the total production. We specify production function as equation (1)

\[
Y_i = A \left(\frac{ga}{yt}\right)^{\beta} K_i, \quad \text{where,} \quad 0 < \beta < 1 \tag{1}
\]

The formal sector earnings are subject to taxes. However, the earnings from the informal sector are often accompanied with tax evasion. Formal agents give specific amount of money as proportional income tax and resultant revenues are used for two purposes, i) to provide government amenities \((ga)\), ii) to compensate the enforcement structure. On the other hand, agents in the informal sector give a part of their proceeds as fines.

According to Loayza (1996) earnings from fines are utilized mutually as payoffs to public representatives and for states enforcement system; Hence informal penalty proceeds are not utilized for government services confined in \(ga\). Due to illicit standing, informal sector persons can obtain merely a part of existing government amenities. The status of Formal and Informal sector is given as equation (2) and (3);

\[
Y_i^f = (1-\tau) A \left(\frac{ga}{yt}\right)^{\beta} K_i, \quad 0 < \tau < 1 \tag{2}
\]

\[
Y_i^i = (1- \theta) A \left(\frac{\Box ga}{yt}\right)^{\beta} K_i, \quad 0 < \theta < 1 \tag{3}
\]

Here, \(\tau\) shows the tax rate, \(\theta\) denotes the amount of penalty, \(\Box\) shows the part of government services accessible to the agents of informal sector, \(f\) and \(i\) superscripts symbolize formal and informal sector respectively.

Informal sector size is defined as follows

\[
i = \frac{y_i}{y} \tag{4}
\]

Taxes collected in the formal sector are used to finance government amenities as equation (5) and (6)
ga = \eta (IQ, \lambda) \left(\tau y^f\right), \quad 0 < \eta(.) \leq 1 \quad (5)
\partial \eta / \partial IQ > 0, \quad \partial \eta / \partial \lambda < 0 \quad \partial^2 \eta / \partial \lambda \partial IQ > 0 \quad (6)

Loayza (1996) denotes taxes used for the delivery of government amenities as \eta(.). The remaining part 1-\eta(.) from the tax proceeds is either misused or spent on the enforcement system. The paper assumes positive link between \eta(.) and institutional quality denoted by IQ. This is because of the fact that that developed institutions enforce less regulations and manage fiscal assets more proficiently. Here \lambda shows the power of the enforcement system.

Government amenities relative to the total production are shown as equation (7)
\frac{ga}{yt} = \eta (IQ, \lambda) \left(\tau (1 - i)\right) \quad (7)

Given with \eta(.) and \tau, growth of the underground economy, i, reduces the efficiency of capital for all. This is due to the fact that informal production does not help in supporting government services.

It is assumed that the actual penalty rate, \theta, rests on two things, i) powerful enforcement system, ii) disappointment of people with regard to underground economy as underground economy is responsible for decreasing agent’s productivity (they do not contribute in government services). According to Loayza (1996) intensifying enforcement efficiency takes up fiscal funds; the further so lower will be the institutional quality.

The amount of penalty is specified as equation (8) and (9)
\theta = \theta (\lambda, i) \quad 0 < \lambda < 1 \quad (8)
\partial \theta / \partial \lambda > 0, \quad \partial \theta / \partial i > 0 \quad (9)

Enforcement system strength is denoted by \lambda. Here the relative size of underground economy, i, shows public discontentment with the consequences of informal sector on capital stock. A formula can be derived from the equation (8) by adding positive interaction term among the variables \lambda and i as shown in equation (10)
\theta = \lambda i \quad (10)

In an economy formal and informal sectors exist side by side. At the equilibrium level, it is assumed that returns from both the sectors are balanced. This state gives us the existing magnitude of informal sector. From the above equations (2), (3) and (10)
\left(1 - \theta (\lambda, i)\right) \Box^\beta = (1 - \tau) \quad (11)
Thus;
In the above equation symbol of each variable shows the symbol of partial derivative of $i$ regarding this variable. Concerning the size of informal economy, following results are acquired from the equation (13). Increase in tax rates inflates the underground economy. If government amenities will not become accessible to the agents in the informal sector in particular police and judicial system then the size of informal economy shrinks. There is inverse relation between enforcement system and the size of informal economy. It is also evident that an increase in institutional quality (IQ) leads to lessen the shadow economy. Lastly, when quality of government amenities is more pronounced relative to the private sector amenities then this will also reduce the size of informal economy.

By adding moderating and control variables our estimated model will be as follows;

$$IE_t = \beta_0 + \beta_1 IQ_t + \beta_2 TAXRATE_t + \beta_3 DE_t + \beta_4 DE_t \ast IQ_t + \beta_5 X_t + \epsilon_t$$

(14)

The coefficients $\beta_0, \beta_1, \beta_2, \beta_3, \beta_4$ and $\beta_5$ represent the parameters to be estimated. A significant negative symbol for $\beta_1$ will yield confirmation that the size of informal sector shrinks with better institutional quality. Positive sign for $\beta_2$ will imply that high tax rates induce informal economy. Negative symbol for $\beta_3$ will show that better quality of government development expenditures helps in reducing size of informal sector. $\beta_4$ represents the interaction term between institutional quality and development expenditures. Where a negative sign for interaction term $\beta_4$ proposes that developed institutions amplify the effect of government development spending on informal economy, meaning institutions and development expenditures are complements. On the contrary, a positive symbol for $\beta_4$ shows that impact of development expenditures on informal economy is smaller when institutions are well developed; meaning institutions and development expenditures work as substitutes. However lack of statistical significance of $\beta_4$ shows that influence of development expenditures on informal economy is not effected by the institutional quality. $\beta_5$ indicates coefficient of control variables. Here $t$ in the equation represents the time period and $\epsilon_t$ is the disturbance.

Before closing this section we would like to focus on interaction term in the model. According to Cepparulo et al. (2017) the existence of the interaction term shows the total effect of specific regressor on the regressand has to be evaluated by calculating the marginal effects of that specific regressor. Following them, the interaction term in our model indicates that the overall effect of
development expenditures on informal economy has to be gauged by calculating the marginal effects of development expenditures as displayed in equation (16)

$$\frac{\partial I_{E_t}}{\partial D_{E_t}} = \hat{\beta}_3 + \hat{\beta}_4 * IQ$$

(16)

Here $\hat{\beta}_3$ and $\hat{\beta}_4$ are the expected co-efficient of development expenditures and the interaction term respectively. IQ is the certain level of institutional quality

### III. The Data and Estimator


The detail of variables used in the model is given in the table below:
### Description of Variables

<table>
<thead>
<tr>
<th>Abbreviations</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>IE</strong></td>
<td>Simple monetary approach is used to get the estimates of informal economy. We take informal economy as percentage of GDP - the data is borrowed from Kemal &amp; Qasim (2012) and extended till 2018</td>
</tr>
<tr>
<td><strong>TAXRATE</strong></td>
<td>Log of per capita real tax used as a proxy for tax rate</td>
</tr>
<tr>
<td><strong>OPEN</strong></td>
<td>Log of Per Capita Real Trade</td>
</tr>
<tr>
<td><strong>INVEST</strong></td>
<td>Log of per capita real Investment</td>
</tr>
<tr>
<td><strong>TAXEVASION</strong></td>
<td>IE*(total taxes/GDP)</td>
</tr>
<tr>
<td><strong>DE</strong></td>
<td>Log of per capita Development Expenditures</td>
</tr>
<tr>
<td><strong>IQ</strong></td>
<td>The data for Institutional Quality variable is obtained by compiling various components of political risk from ICRG (International Country Risk Guide), these components are Ethnic tensions, Democratic accountability, Corruption, Law and order, government stability and Investment Profile. All of these variables range from 0-10. Where greater values indicate improved institutional framework and lesser values suggest poor quality. By taking all these variables, we developed an index of institutional quality (IQ) by principal components analysis (PCA). PCA is a statistical technique which is used to construct single weighted index from different but uncorrelated variables.</td>
</tr>
<tr>
<td><strong>DEIQ</strong></td>
<td>Interaction term between log of per capita development expenditures and institutional quality index</td>
</tr>
<tr>
<td><strong>BUREAU.Q</strong></td>
<td>Bureaucracy Quality. The data is from International Country Risk Guide</td>
</tr>
<tr>
<td><strong>CPI</strong></td>
<td>Consumer Price Index with the base 2008</td>
</tr>
<tr>
<td><strong>LAG1IE</strong></td>
<td>One period lagged value of informal economy</td>
</tr>
<tr>
<td><strong>POV</strong></td>
<td>Poverty. Head Count Ratio as percentage of Population</td>
</tr>
<tr>
<td><strong>TRATEIQ</strong></td>
<td>Interaction term between log of per capita real tax and institutional quality index</td>
</tr>
<tr>
<td><strong>LAG1RGDP</strong></td>
<td>Log of GDP with one period lag. (We take GDP at constant factor cost. Here data is in million rupees)</td>
</tr>
</tbody>
</table>

### IV. Results and Implications

This section focuses on the findings of the simulation. We start by examining the institutional quality index. The coefficient for institutional quality index is negative and statistically significant,
means that the effect of institutional quality helps to reduce the size of underground economy. Aforementioned finding is in accordance with Singh et al. (2012), Torgler and Schneider (2009) and Aruoba (2010), who established negative link between institutional development and size of underground economy. The results also provide evidence that increase in tax rates (TAXRATE) induces informal economy and these results are in accordance with earlier findings on taxes-informal economy nexus. (Loayza (1996), Kemal (2007).

The coefficient for development expenditures is negative and insignificant. This shows that public services are less productive as compared to private services as established in theoretical framework. To evaluate the overall effect of development expenditures on informal economy we construct an interaction term between government development spending and institutions (DEIQ). As indicated in the table 1, the sign of interaction term is positive and statistically significant. This result favors a substitution effect where the insignificant effect of development expenditures on informal economy reduces with the rise in institutional quality. Likewise, the effect of institutional quality on informal economy becomes weaker when the development expenditures are efficient. In short we can say that effective fiscal policy is capable of performing functions that can imitate the institutional quality variables. Since Pakistan is a resource constraint economy this outcome suggests that in order to reduce the size of informal economy the resources should either be directed to institutional building or to optimal allocation of development expenditures.

According to Kemal (2003) increase in the private investment pushes up the whole economic activities whether in formal or informal sector. Our estimate come out in line with this study and shows that the impact of investment (INVEST) on informal economy (IE) is positive and statistically significant. The sign for trade openness (OPEN) is negative which reinforces the Gulzar et al (2010) view that the informal sector is significantly accountable for adding less value to the commodities traded in the global market. Since trade openness is based on the idea of comparative advantage so trade openness restricts the size of informal economy. It is also confirmed that tax evasion (TAXEVASION) and informal economy (IE) moves in the same direction (Kemal, 2007). These results are shown in the table 1 and are obtained by the Ordinary Least Square (OLS) estimator.
### Table 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN</td>
<td>-2.777*</td>
<td>0.952</td>
</tr>
<tr>
<td>TAXRATE</td>
<td>5.667*</td>
<td>1.711</td>
</tr>
<tr>
<td>INVEST</td>
<td>8.120*</td>
<td>2.020</td>
</tr>
<tr>
<td>DE</td>
<td>-0.116</td>
<td>0.799</td>
</tr>
<tr>
<td>TAXEVIASION</td>
<td>1.219*</td>
<td>0.322</td>
</tr>
<tr>
<td>IQ</td>
<td>-7.851**</td>
<td>3.353</td>
</tr>
<tr>
<td>DEIQ</td>
<td>1.067**</td>
<td>0.449</td>
</tr>
<tr>
<td>C</td>
<td>-66.160**</td>
<td>25.010</td>
</tr>
</tbody>
</table>

Notes: The dependent variable is informal economy. The interaction term DEIQ corresponds with the interaction between development expenditures and institutions. *, **, *** indicate significant at 1, 5 and 10 percent level of significance respectively.

Source: Author’s own calculations

### IV.B. Robustness scrutiny and extensions

In order to check the validity of the results we carry out some further regression analysis in this section. The results are given in the table 2A and 2B. Results confirm negative and significant impact of institutional development on informal sector’s size. The results also provide evidence that increase in tax rates (TAXRATE) increases informal economy. The sign for government development expenditures is negative and insignificant as with OLS regression. The coefficient of interaction term (DEIQ) is positive and significant in all the equations. Such a result for interaction term shows a substitution effect that is the insignificant effect of government development expenditures on informal sector reduces as institutional development is enhanced. It is vital to know that institutions and development expenditures are not perfect substitutes. Our results reflect that only some of the negative effect of better institutional quality on informal economy can also stem from efficient government development expenditures.

Other estimates also justify our presumption and indicate that investment (INVEST) is positively and significantly affecting the informal sector. The sign for trade openness (OPEN) is also
negative. It is also confirmed that tax evasion (TAXEVASION) and informal economy moves in the same direction. In all the equations, key variables retain their sign and significance. Hence the GMM results strengthen the validity of our OLS results.

We have added some extra control variables like Poverty, Bureaucratic quality, Lagged variable of informal economy, CPI, Interaction term between tax rates and Institutional quality and Lagged value of formal GDP to check the robustness of the model.

| Table 2A |
| Dependent Variable : Informal Economy |
| Technique: Generalized Methods of Moments |
| Variables | Equation 1 | Equation 2 | Equation 3 |
| | Coefficient | Std.Error | Coefficient | Std.Error | Coefficient | Std.Error |
| OPEN | -3.149** | 1.206 | -2.579** | 1.181 | -3.250** | 1.604 |
| TAXRATE | 6.984* | 2.333 | 7.213** | 2.738 | 7.030*** | 3.749 |
| INVEST | 11.144* | 3.333 | 10.840* | 3.09 | 11.266* | 3.007 |
| DE | -0.01 | 0.677 | -0.586 | 1.105 | -0.149 | 2.471 |
| IQ | -11.328** | 4.968 | | | |
| DEIQ | 1.478** | 0.634 | | | |
| TAXEVASION | 1.081** | 0.479 | 1.017** | 0.488 | 1.161*** | 0.578 |
| BUREAUQ | -1.551 | 1.239 | -1.431 | 0.899 | |
| POV | | | 0.028 | 0.099 | |
| LAG1IE | 0.124 | 0.162 | 0.083 | 0.137 | 0.001 | 0.170 |
| R2 | 0.53 | 0.57 | 0.57 | |
| DW | 1.97 | 1.91 | 1.86 | |
| Prob(J-stat) | 0.38 | 0.73 | 0.17 | |

Notes: The dependent variable is informal economy. The interaction (DEIQ) corresponds with the interaction between development expenditure and institutions. Institutional quality variable is treated as endogenous. A constant term is also included in all the above equations but not reported. *, **, *** indicate significant at 1, 5 and 10 percent level of significance respectively. Source: Author’s own calculations
Table 2B

<table>
<thead>
<tr>
<th>Variables</th>
<th>Equation 4</th>
<th></th>
<th>Equation 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Std.Error</td>
<td>Coefficient</td>
<td>Std.Error</td>
</tr>
<tr>
<td>OPEN</td>
<td>-2.485***</td>
<td>1.385</td>
<td>-2.485***</td>
<td>1.385</td>
</tr>
<tr>
<td>TAXRATE</td>
<td>9.885**</td>
<td>4.690</td>
<td>7.956*</td>
<td>2.802</td>
</tr>
<tr>
<td>INVEST</td>
<td>10.816**</td>
<td>4.609</td>
<td>8.186***</td>
<td>4.857</td>
</tr>
<tr>
<td>DE</td>
<td>-2.068</td>
<td>1.612</td>
<td>-0.046</td>
<td>1.082</td>
</tr>
<tr>
<td>IQ</td>
<td>-10.521***</td>
<td>5.790</td>
<td>-11.785***</td>
<td>7.004</td>
</tr>
<tr>
<td>DEIQ</td>
<td>1.415***</td>
<td>0.768</td>
<td>0.632***</td>
<td>0.378</td>
</tr>
<tr>
<td>TAXEVASION</td>
<td>0.702***</td>
<td>0.399</td>
<td>0.632***</td>
<td>0.378</td>
</tr>
<tr>
<td>CPI</td>
<td>0.035**</td>
<td>0.014</td>
<td>1.376***</td>
<td>0.824</td>
</tr>
<tr>
<td>TRATEIQ</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAG1RGDP</td>
<td></td>
<td></td>
<td>6.531</td>
<td>5.882</td>
</tr>
<tr>
<td>LAG1IE</td>
<td>0.038</td>
<td>0.070</td>
<td>-0.033</td>
<td>0.069</td>
</tr>
<tr>
<td>R2</td>
<td>0.59</td>
<td></td>
<td>0.60</td>
<td></td>
</tr>
<tr>
<td>DW</td>
<td>1.91</td>
<td></td>
<td>2.05</td>
<td></td>
</tr>
<tr>
<td>Prob(J-stat)</td>
<td>0.94</td>
<td></td>
<td>0.79</td>
<td></td>
</tr>
</tbody>
</table>

Notes: The dependent variable is informal economy. The interaction term (DEIQ) corresponds with the interaction between development expenditure and institutions. Institutional quality variable is treated as endogenous. A constant term is also included in both the equations but not reported. *, **, *** indicate significant at 1, 5 and 10 percent level of significance respectively.

Source: Author’s own calculations

Informal economy depends positively on its previous values in equations 1, 2 and 3. But the coefficient is insignificant because government policies are helpful to some extent in restricting the size of underground economy.

Hassan (2018) analyzes the informal sector of Bangladesh and points out that bureaucracy is one of the key reasons behind the large informal sector. Loayza (1996) identifies bureaucratic requirements (red tape and paper work) as a significant cost of remaining formal. Friedman et al (2000) have showed that firms remain informal to avoid bureaucracy rather to avoid tax liability. Our results show that as bureaucratic quality increases, informal economy shrinks but this variable...
fails to achieve any level of significance because of fragile bureaucracy in Pakistan as noted by Loayza (1996) that implementation of taxes is laborious in developing countries due to weak bureaucracies.

Equation 3 indicates that the coefficient of poverty (POV) is positive and this is so because informal sector is considerably quick in creating employment as compared to formal sector (Gulzar et al. (2010)). However relation is not significant because according to Gulzar et al. (2010), low income jobs are created in the informal sector that have unclear effect on the brutality of poverty conditional upon inflation. In equation 3 the key variables retain their sign and significance.

According to Kemal (2007) government in Pakistan fails to impose progressive taxation and in order to get revenues they impose different taxes or increase the tax rates or increase the price of those commodities whose demand is inelastic to its price, e.g., wheat flour (this is known as inflation tax). As a result, fiscal deficit and inflation increases in the country. Hence such analysis justifies the positive and significant coefficient of CPI in equation 4.

Equation 5 indicates the statistical significance of substitution effect between tax rates and institutions which shows that the impact of tax rates on informal sector reduces as the quality of institutions increases. Also equation shows that increase in formal economy affects positively to the informal economy. Adam and Ginsburgh (1985) find positive association among informal sector and the official economy. However the sign is insignificant which can be justified with the findings of La Porta and Shleifer (2008) who argues that economic growth is generally brought by productive formal firms and we would not anticipate much from the informal sector. Informal firms provide support to the poor’s but they get eliminated over time.

V. Conclusion

A substantial amount of literature on informal economy either throws light on the effect of tax rates or institutional development. These previous studies have generally shown that increase in tax rates induces informal economy while institutional development shrinks the size of informal sector. In this study joint effect of institutional quality and tax rates is explored on informal economy. Moreover study makes endeavor to capture the impact of government development expenditures on informal sector because limited work has been done in this dimension. Notwithstanding these results and to get more precise determinants of informal economy, an
interaction term has been constructed between institutions and development expenditures, which we thought may be creating omitted variable problem.

We have applied GMM regressions to deal with potential endogeneity and to strengthen the validity of results. The key outcomes of our empirical investigations can be summed up as follows. First, we observe that tax rates have positive and significant influence on informal economy size. Secondly, the institutional development has negative and statistically significant influence on informal sector. Third, development expenditures have negative but insignificant impact on informal economy. Fourth, the insignificant effect of development expenditures on informal economy reduces when institutional quality is better and increases when institutional quality is week. Last but not the least, informal economy and tax evasion moves in the same direction.

To achieve our national goal of inclusive growth and socio-economic development, the public policy may be devised with the sole objective of increasing Tax to GDP ratio through expanding the tax base and plugging the tax leakages. Another policy implication is that government institutions should focus on low enforcement mechanism to manage fiscal assets more proficiently. Since Pakistan is a resource constraint economy our outcomes also suggest that in order to reduce the size of informal economy the resources should either be directed to institutional building or to optimal allocation of development expenditures. There is a requirement of policy mix which retains all the positive aspects of the informal economy (as it induces investment and increases growth) and then in the later stage helps it in formalizing through regulating its backward and forward connections with the formal sector in all domains.
References


Appendix
Source: Author’s own calculations
Simple Monetary Approach

In this paper simple monetary approach is used to find the estimates of informal economy. This approach states that currency is the only standard of exchange for informal transactions. Thus elevated levels of currency holdings show greater tax evasion and greater size of informal sector. Following Gulzar et al (2010), we require the estimations of regression equation given below:

\[ CRM = \beta_0 + \beta_1 Tax_t + \beta_2 Pop_t + \beta_3 Inf_t + \beta_4 CRM_{t-1} + \beta_5 D_t + \beta_6 BDBA_t + \beta_7 Y_{gt} + \beta_8 PD_t + \epsilon_t \]

Where,
- CRM = currency in circulation plus foreign currency accounts of residents divided by money supply or in simple words currency ratio
- Tax = tax to GDP ratio
- Pop = population
- Inf= inflation rate
- CRM (-1) = lagged vale of currency in circulation plus foreign currency accounts of residents divided by money supply
- D = dummy variable denoted by 1 from 1991-2018 (to describe the effect of FCA i.e. foreign currency accounts ahead of 1990’s)
This approach has following key assumptions: (a) informal activities are the outcome of high taxes; (b) informal activities are carried out in currency (so total currency in use has two parts: currency used for formal activities and informal activities; and (c) velocity of money is same in the formal as well as in the informal sector.

Predicted value of (CRM) for every single year is calculated by subtracting regression results of (CRM) with no tax variable (CRM)_wt from the regression results of (CRM) with tax variable (CRM)_t. If we hold tax variable equal to zero and leave the coefficients of remaining variables as unaffected, we will be able to access the currency stock in untaxed society (CRM)_wt. Currency used for informal activities (CRM)_i which is influenced by taxes is estimated by subtracting (CRM)_wt from (CRM)_t. FCA i.e. residents foreign currency accounts are included along with the currency in circulation because they are assumed to perform same functions as cash in hand.

We can calculate the estimates of informal sector, tax evasion, licit and illicit money as follows

- Illicit money (MI) = CRM*MS
- Licit money (ML) = MS- MI
- Velocity of money (vel) = GDP/ML
- Informal sector (IS) = MI*vel
- Tax Evasion (ET) = IS * (aggregate taxes / GDP)
- IS as percentage of GDP = (IS / GDP) * 100
- ET as percentage of GDP = ( ET / GDP)*100

According to Tanzi (1980) the estimates of informal economy through monetary approach are not that much accurate because they are responsive to assumptions. Nevertheless, these estimates can serve as broad indicators of unstable trend in the given period of study.