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Corruption and Inflation Tax in Selected Developing Countries

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Abstract: The purpose of the present paper is to investigate the impact of corruption on inflation tax in selected developing countries. To do so, we concentrated on a sample of 25 countries; that consist of Middle East and North Africa countries and also some selected developing countries like Singapore, Pakistan, Malaysia, India, Indonesia, Thailand, Tajikistan and Zimbabwe; for which the necessary data were available for the period 2003-2008. We have also used a composite index of corruption called Corruption Perception Index (CPI). Our findings based on a panel data regression model support the view of a positive relationship between corruption and inflation tax. In other words, the higher is the corruption the higher will be the inflation tax. Therefore, policies to alleviate corruption are recommended in these countries.

Key words: Corruption Perception Index (CPI) · Inflation tax · Panel data · MENA countries

INTRODUCTION

In recent years, and especially in the 1990s, a phenomenon broadly referred to as corruption has attracted a great deal of attention. In countries developed and developing, large or small, market-oriented or otherwise, governments have fallen because of accusations of corruption, prominent politicians (including president of countries and prime ministers) have lost their official positions, and, in some cases, whole political classes have been replaced. Corruption is not a new phenomenon. Two thousand years ago, Kautilya, the Corruption, defined as the misuse of public office for private gain, has attracted a great deal of attention in recent years. Many international and regional organizations now regard corruption as major obstacles to good policy making. The ways in which corruption can manifest and impact on the economy are many and varied, and it is important to understand the range and diversity of the mechanisms involved. In this paper we present a theoretical and empirical analysis of a mechanism that relates to considerations. The general relationship between corruption and inflation tax has been identified in some empirical studies indirectly [1]. These and other investigations (including theoretical work) also provide insight into the many channels through which corruption might take effect. A non-exhaustive list of these is the following: corruption may cause a misallocation of talent and skills away from productive (entrepreneurial) activities [2]; corruption may undermine the protection of the property rights, create obstacles to doing business and impede innovation and technological transfer [3,4]; corruption may cause firms to expand less rapidly, to adopt inefficient technologies and to shift their operations to the informal sector [5]; corruption may limit the extent of a country' trade openness and reduce inflows of foreign investment [6,7]; corruption may lead to costly concealment and detection of illegal income, resulting in a deadweight loss of resources [8,9]; corruption may compromise human development through a deterioration in the scale and quality of public health and education programs [10-12]; and corruption may cause a general misallocation of public expenditures as certain areas of spending (military spending) are targeted more for their capacity to generate bribes than their potential to improve living standards [13-15].

In terms of public finances, corruption may impact independently on both the expenditure and revenue sides of the government's budget: for any given state of the latter, corruption can distort the composition of expenditures in ways described above; for any given state of the former, corruption can alter the manner by which

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revenues must be generated, as suggested by other empirical evidence. Thus Ghura [16], Imam and Jacobs [17] and Tanzi and Davoodi [15,18] conclude that corruption reduces total tax revenues by reducing the revenues from almost all taxable sources (including incomes, profits, property, capital gains and goods and services.) The implication is that, ceteris paribus, other means of raising income must be sought, and one of the most tempting of these is seigniorage. Significantly, it has been found that inflation (a likely consequence of seigniorage) is positively related to the incidence of corruption [19]. It is these observations that provide the motivation for this paper which seek to analyze in detail the influence of corruption on inflation tax through decreasing in the composition of government revenues and increasing in government expenditures, especially non-productive government expenditures. The theory of optimal taxation [20] contends that the government tries to equate the marginal cost of inflation tax with the marginal cost of output taxes in order to minimize the distortions of taxation. Therefore, the government may choose to use seigniorage as a way to finance public expenditures and budget deficit. When there is possible for the government to use seigniorage to finance government expenditures and budget deficit, it is easier to increase government expenditures compared with the situation that government has to raise taxes to finance government expenditures. Governments, especially in developing countries, try to obtain revenue from printing money by creating inflation as a way to finance budget deficit. Inflation and money supply growth are higher when central banks are less independent [21]. Alesina and Perotti [22] discuss the political economy of budget deficit. Fischer *et al*. [23] discuss the effect of budget deficit, seigniorage and some other determinants of modern hyper and high inflations. Although seigniorage can explain the high rates of inflations in many developing countries, but it does not analyze the underlying forces that are behind budget deficit and inflation while they are not socially favorable. Corruption provides the economics of budget deficit through increasing government expenditure especially non-productive government expenditure, that in many countries, budget deficit may finance through printing money that if occurs without production support, will contribute to inflation which is called "inflation tax".

Taleshi, [24] in his research concluded that the centralization of the economical and service facilities and welfare prosperity, the increase of immigrants and the lack of economical power of rural immigrants has caused informal settlement. It creates environmental issues and social economic problems such as drug addiction, the spread of the center of moral corruption and finally instability in the urban system. The participation of new urban immigrants in these unstable parishes and the organization of the urban self sufficient units as self regulating municipalities with financial, service and developmental support of governmental systems for a short period, as long as these management units can get autonomy.

Sivapalan *et al*., [25] in an article analyzed the impact of trade restriction and facilitation regulations on the cross border trade of Dumai in Indonesia's Province of Riau. The methodology consisted of interviewing key government officials and cross border trades and examining documentary sources. The finding of this study revealed that the institutional restriction on and facilitation mechanisms of Dumai's cross border trade had worked to the disadvantage of local trading communities and local economy. Not only did restriction regulations curtail cross border trade and thus local economic development, it had also prohibited the growth of trade related facilities such as one stop logistics centers. In conclusion, local states would be handicapped in enabling cross border trades if cross border regulations were controlled by the central government. As such, further cross border trade studies, should explore inter and intra state relations gauge further insights into the complexity of the matter.

Jafari and Jamshidbaygi, [26] studied the relationship between budget deficit and inflation in Iran in the period of 1990- 2008. They concluded that there is a positive and significant impact of budget deficit on monetary variables and as a result on inflation. They have also found a positive and significant impact of price index on budget deficit. Finally regarding the sensitivity analysis their finding support the robustness of their estimation results with respect to definitions of inflation as well as money supply.

Jafari and Hosseinmardi, [27] in a sample of 25 selected developing countries from 2000-2008, examined women participation in politics and labor force and some other social impact on gender corruption. Specifically investigate the hypothesis is that increasing women participation in parliament and labor force can reduce financial corruption.

Model, Data, and Estimation Methodology: We have studied the case of 17 developing countries and applied annual data for the 2003- 2008. The time period and frequently is largely dictated by the availability of data. Data on is the ratio of inflation tax to GDP (percent). is the ratio of foreign trade (export plus import to GDP). is GDP per capita and is the inflation that all of them are from WDI[1]. Also, a composite index for corruption have been used, called Corruption Perception Index (CPI Corruption Perception Index (CPI) is an e-index based on 17 different types of votes by 10 organizations that are from transparency international organization. Index range is between zero and 10 that zero shows the maximum amount of corruption and 10 shows the minimum amount of corruption in the country; because of this contradiction, we minus all of the scores from 10, so the higher scores represent the maximum amount of corruption and the lower scores show the minimum amount of corruption in the country.

The basic model is estimated on panel data for 17 developing countries and the sample period is 2003- 2008.

$$It_{it}=C_i+\beta_1+SFT_{it}+\beta_2 LOG(PGDP_{it})+\beta_3 CORR_{it}+\beta_4 IN_{it}+\beta_5[IT]_{-1}+\beta_6[CORR-DUM]_{it}+\varepsilon_{it}$$

Where;

i = Time.
t = Country.
IT = Ratio of inflation tax to GDP.
SFT = Ratio of foreign trade to GDP.
PGDP = GDP per capita.
CORR = Corruption index.
IN = Inflation.
$[IT]_{-1}$ = Ratio of inflation tax to GDP with one lag.
DUM = Dummy variable.

$\beta_1,\beta_2,\ldots,\beta_6$ are parameters in the model and ε_{it} is error term.

First, we use Levin, Lin, Chu unit root test to test the stationary of the variables .The results, as represent in Table 1, show that all of the variables are stable.

Table 1: The results related to stationary test for dependent variable.

Variable	Statistic test	Unit root test result
IT_F[1]	-13.97	Stability
IT_{IB}[2]	-6.43	Stability
IT_V[3]	-5.88	Stability

Source: Authors calculations using Eviews 6.

Table 2: The results related to stationary test for independent variables

Variable	Statistic test	Unit root test result
LOG(PGDP)	-1.6	Stability
SFT	-4.2	Stability
CORR(CPI)	-3.2	Stability
IN	-3.7	Stability
$[IT_F]$[4]	-12.7	Stability
$[IT_{IB}]$[5]	-5.1	Stability
$[IT_V]$[6]	-7.9	Stability

Source: Authors calculations using Eviews 6.

Table 3: Model's regression findings.

Variable	Equation (1)	Equation (2)	Equation (3)
C	(-2.57E+10)***	(0.35)***	(-7.8)***
SFT	(4.49+09)***	(0.0001)***	(1.51)***
LOG(PGDP)	(7.39E+08)***	(-0.01)**	(0.019)***
CORR(CPI)	(2.43E+09)***	(0.004)***	(0.77)***
IN	(10596900)***	(0.01)***	(0.004)***
IT(F)(-1)	(-5.89)***		
IT(IB)(-1)		(-3.7)***	
IT(V)(-1)			(-5.3)***
CORR(CPI)*DUM	(-68171187)***	(-0.03)***	(-0.006)***
R- squared	0.99	0.99	0.99
Adjusted R-squared	0.99	0.99	0.99
H_{test} result	R.E.	R.E.	R.E.
N	114	114	114

Source: Authors calculations using Eviews 6.
*, ** and *** respectively significant at 10%,5% and 1 and level.

Second, we test heterogeneous between units by F-statistic. If null hypothesis is not accepted, we use panel data. Null hypothesis is:

$H_0: \mu_1 = \mu_2 = \ldots = 0$
$H_0 \neq H_1$

$$F = \frac{\frac{(RRSS - URSS)}{(N - 1)}}{\frac{URSS}{(NT - N - K)}}$$

RRSS = Restrict Residual Sum Squares.
URSS = Unrestricted Residual Sum Squares.

[1]World Development Indicators.
[1]Ratio of inflation tax to GDP (Friedman definition).
[2]Ratio of inflation tax to GDP (International Bank definition).
[3]Ratio of inflation tax to GDP (Tanzi definition).
[4]Ratio of inflation tax to GDP with one lag (Friedman definition).
[5]Ratio of inflation tax to GDP with one lag (International Bank definition).
[6]Ratio of inflation tax to GDP with one lag (Tanzi definition).

N = Number of units.
K = Number of parameters.

Then for choice between Fixed Effect (F.E) and Random Effect (R.E) models, we used Hausman Test:

$$H = (b_s - B_s)\,(M_1 - M_0)^{-1}\,(b_s - B_s) \approx x^2(r)$$

Where r = number of parameters, M_1= covariance matrix for coefficient of F.E model (b_s).

In Hausman test null hypothesis show Fixed Effect. In according above test, as shows in table 1, we run some of the regressions with Random Effect test and some of them with Fixed Effect test.

According to equation 1, Friedman inflation tax definition and Corruption Perception Index (CPI) have been applied. Based on regression results in this table, the estimated parameters coefficient of CORR in equation 1 is positive and significant. The coefficient of the ratio of foreign trade to GDP (SFT) is positive and significant. GDP per capita (PGDP) is positive and significant. The coefficient of inflation (IN) is also positive and significant.

The coefficient of the ratio of inflation tax with a lag ($[IT_F]_{-1}$) is positive and significant. The coefficient of Dummy variable is positive and it is significant. To understand the difference between Iran's performances and the average of other countries, we plus the coefficient of Dummy variable with the coefficient of corruption index. If the result is near the coefficient of corruption index, means that any difference cannot be seen between Iran's performances in comparison with other countries; and if the result is far from the coefficient of corruption index, means that a significant difference between Iran's performances and other countries can be seen. For this respect, the result shows that the relationship between corruption and inflation tax, in Iran, would not have a significant difference in comparison with the average of other countries.

According to equation 2, International Bank inflation tax definition and Corruption Perception Index (CPI) have been applied. Based on regression results in this table, the estimated parameters coefficient of Corruption (CORR) in equation 2 is positive and it is significant. The coefficient of the ratio of foreign trade to GDP (SFT) is positive and significant. GDP per capita (PGDP) is positive and significant. The coefficient of inflation (IN) is positive and it is significant. The coefficient of the ratio of inflation tax with a lag ($[IT_{IB}]_{-1}$) is negative and significant. According to the coefficient of Dummy variable and the coefficient of corruption index, the relationship between corruption and inflation tax, in Iran, would have a significant difference in comparison with the average of other countries; but, an increase in corruption contributed to decrease in inflation tax.

According to equation 3, Tanzi inflation tax definition and Corruption Perception Index (CPI) have been applied. Based on regression results in this table, the estimated parameters coefficient of Corruption (CORR) in equation 3 is positive and significant. The coefficient of the ratio of foreign trade to GDP (SFT) is positive and significant. GDP per capita (PGDP) is also positive and significant. The coefficient of inflation (IN) is positive and significant. The coefficient of the ratio of inflation tax with a lag ($[IT_v]_{-1}$) is negative and significant. According to the coefficient of Dummy variable and the coefficient of corruption index, the relationship between corruption and inflation tax, in Iran, would not have a significant different in comparison with the average of other countries.

Concluding Remarks: Corruption can be effective in creation of inflation tax through budget deficit. The results show that, in this selected developing countries, the more increase at corruption will contribute to a higher inflation tax rate. So a positive and significant relationship between corruption and inflation tax, in general, have been existed in the countries under consideration.

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