CAN THE SHADOW ECONOMY UNDERMINE THE EFFECT OF POLITICAL STABILITY ON INFLATION? EMPIRICAL EVIDENCE

UMMAD MAZHAR[1*]
Suleman Dawood Business School, LUMS, Pakistan

JUVARIA JAFRI
City, University of London, United Kingdom.

Submitted September 2014; accepted June 2016

This paper revisits the empirical relationship between political stability and inflation while explicitly accounting for the presence of the shadow economy. Using a large data set of 122 countries over the 1999 to 2007 period, we find that the well established negative correlation between political stability and inflation holds only if the size of the shadow economy remains modest; and it ceases to exist at higher levels of the size of the informal sector. This finding contributes to the existing literature on public finance that assigns special importance to political determinants of inflation. The results are robust against alternative specifications and satisfy the usual assumptions of a valid statistical inference.

JEL classification codes: O17, E52, H26, H27
Key words: political stability, informal sector or shadow economy, inflation, openness, tax revenue.

I. Introduction

The issue of inflation, particularly in developing countries, continues to attract the attention of economists as well as non-economists. Due to its strong political economy aspects, inflation requires a wider context to understand its determinants (Leeper 2010). This study takes the view that one key variable which has not been sufficiently analyzed is the shadow economy.

The shadow economy refers to economic activities that would generally be taxable if they were to be reported to the authorities responsible for taxation and regulation (Schneider and Buehn 2013).[2] A large informal economy not only threatens the tax base but also has implications for stabilization policy. In these circumstances, a government that is uncertain about its revenue base is more likely to reach for short-term measures at the cost of policy

[*] Ummad Mazhar (corresponding author): Suleman Dawood Business School, Lahore University of Management Sciences, DHA, Lahore Cantt., 54792, Pakistan; email ummad.mazhar@lums.edu.pk. Juvaria Jafri, Doctoral Researcher City Q-Step Fellow, School of Arts & Social Sciences, City, University of London EC1V 0HB, United Kingdom; email juvaria.jafri@city.ac.uk. The authors wish to thank Jorge M. Streb (the Editor), anonymous referees, and participants at the SZABIST International Conference, Karachi, for many valuable comments. All errors belong to the authors.

[2] Within the literature there is often an overlap between the description of the term 'shadow economy' and other terms such as unofficial economy, underground economy, undeclared activities, informal economy, hidden economy, clandestine activities, black economy, which describe similar types of economic activity. For the purpose of this study it is worth noting that all of these terms involve income that is unreported and hence not taxed. There are numerous descriptions of the shadow economy. A broad definition of the shadow economy is found in Schneider (2012): "unreported income from the production of legal goods and services, either from monetary or barter transactions – and so includes all productive economic activities that would generally be taxable were they reported to the state (tax) authorities".

consistency. The shadow economy influences monetary policy outcomes because it is associated with a larger demand for currency, and fiscal policy outcomes because of its impact on the size of the tax revenue. The existence of a shadow economy undermines policy outcomes even in the presence of political stability (Besley and Persson 2013; Buehn et al. 2015).

This line of reasoning leads to the conjecture that the systemic weaknesses entailed by a considerable shadow economy undermine the advantages of political stability. Do we have any evidence to support this conjecture? We empirically test the relationship between inflation, the shadow economy, and political stability. This is done in the context of a multivariate econometric model estimated using a large panel data set of 122 countries over the 1999 to 2007 period.

The findings of the study add a novel dimension to the relationship between political stability and inflation. The empirical evidence supports the hypotheses that political stability reduces inflation, and that it does so to a lesser extent in the presence of a large shadow sector. The estimates are robust to a variety of estimation procedures and also against alternative measures of macroeconomic and institutional indicators associated with inflation.

These findings are consistent with recent, as well as older literature on the political economy of inflation (for literature surveys see Fernandez-Albertos 2015; Alesina and Stella 2011). It is well known that political influences affect the credibility of the policy if agents rationally expect that policies will be time inconsistent. Similarly, seigniorage and political stability are related because less stable governments are more likely to pursue inflationary policies, especially those arising from fiscal profligacy and corruption.

The findings of the study contribute to several strands of the extant literature. Most of the existing studies show a positive correlation between the tax burden and the informal sector, for instance Dabla-Norris et al. (2008) and Anderson (2012). Our findings go beyond pure economic effects to suggest that the informal sector can undermine returns to political stability. Secondly, it contributes to the empirical research on the structural determinants of inflation and seigniorage, such as Edwards and Tabellini (1991), Cukierman et al. (1992b), or Aisen and Veiga (2006). That literature has documented a robust relation between political instability and inflation. One important implication of Cukierman et al. (1992b) is that political stability is necessary for reforms that improve the efficiency of the tax system. Huang and Wei (2006) also relate inflation to the efficiency of the tax system in a model of endogenous monetary policy with time inconsistency. However, neither Cukierman et al. (1992a and

1992b) nor Huang and Wei (2006) provide evidence of a relation between the informal sector, political stability and inflation. By specifically incorporating the shadow economy in our model we seek to fill this gap.

More details on both of these themes are highlighted in the literature review, which is the next section. Following that, we will present the salient features of our research design, data, and methodology. Subsequent sections contain our empirical results, and conclusions.

II. Literature review

In any modern economy, inflation expectations play a key role in determining the actual level of inflation. The issue thus is how to keep expected inflation within a pre-determined comfort zone. Among the ensuing debates is the one that weighs the costs and benefits of discretionary versus rule-based policy. The ascendancy of the latter is reflected in the institutional structure called central bank independence (CBI), which is based on the game-theoretic insights of Kydland and Prescott (1977) and Barro and Gordon (1983). To overcome the problem of inflation bias associated with discretionary monetary policy, Rogoff (1985) proposes the appointment of a central banker sufficiently conservative to assign greater weight to inflation compared to other objectives.

The case for independent central banks became well known in the 1990s and a number of central banks in developed and developing economies had been given autonomy. However, as noted by Cukierman (1992) and Cukierman et al. (1992a), the negative relationship between CBI and inflation does not hold for developing countries. This finding is attributed to institutional weaknesses that create a gap between *de jure* and *de facto* independence. Differently, Hayo and Hefeker (2002) point out that studies that link CBI to low inflation incorrectly assume CBI as exogenous, when in fact it should be considered endogenous. Complementing this insight, Acemoglu et al. (2008) provide evidence that de facto institutional reforms are not sufficient to achieve the objective of low inflation unless backed by the requisite level of political will.

These observations offer only a partial explanation of why developing countries, including those with formally independent central banks, continue to face high inflation. The sharp variation in inflation outcomes draws attention to other possible determinants of inflation. One of these is openness. Using the time-inconsistency framework, Romer (1993) builds upon Rogoff's (1985) observation to argue that surprise monetary expansion results in a currency depreciation which moderates the inducement to expand. Hence, inflation and openness are negatively related because openness provides a check on the policymaker's incentive for a monetary expansion. Moreover,

openness is also associated with productivity spillovers and helps overcome supply side shortages in time (Harrison and Rodriquez-Clare 2010).

Romer's (1993) evidence was reinforced and extended (for example in Campillo and Mirron 1997 and Lane 1997 using large cross sectional data sets) to find that the negative relation between openness and inflation holds for developing economies as well and that CBI is not the most important determinant of inflation. However, Terra (1998) argues that the negative relationship in Romer (1993) may be due to high debt burdens, an omitted variable in Romer's analysis. Less open economies need a larger devaluation to generate the trade surplus required for debt repayment and this raises the domestic cost of external liabilities, requiring a larger private to public sector transfer. Given weak tax revenue collection, this transfer will be in the form of an inflation tax. Al-Nasser et al. (2009) use a large panel data for 1950-1992 and find that the inflation-openness inverse relationship is not restricted to a time frame or a set of countries.

Political instability has been used in some studies as a variable to examine the determinants of fiscal deficits. Roubini and Sachs (1989), for instance, find that larger deficits are associated with political factors, departing from previous work on budget deficits which attributed them to tax smoothing hypotheses based on the equilibrium model of fiscal policy.[3]

A similar point is made by Cukierman et al. (1992b). They find that more unstable or polarized political systems are more prone to scenarios where the revenue collection capabilities of a government are constrained deliberately by inefficient tax systems. A similar discussion about deficit bias is carried out by Calmfors and Wren-Lewis (2011) where it is argued that debt accumulation may be strategically used as a constraint, placed by the current regime on future governments. This indirectly supports the Campillo and Miron (1997) finding of a positive relationship between political instability and higher inflation.

Similarly, Cukierman et al. (1992b) find that seigniorage as a source of government revenue is used more frequently in politically unstable societies than it is in stable and homogenous countries because given tax evasion or high collection costs, it is relatively easy to gather.[4]

[3] This approach is attributed to Barro (as cited in Roubini and Sachs 1989) and argues "that actual tax and deficit policies are a reflection of an intertemporal optimization over a long time horizon by the budgetary authorities, who choose their policies to reduce the excess burden of taxation for a given path of government spending".

[4] The evidence on the impact of political institutions on inflation is not unmixed. For example, Mijiyawa (2011) finds that democracy increases inflation if it stimulates money creation and compromises trade liberalization.

How does the shadow economy relate to the determinants of inflation, particularly those discussed earlier here? The presence of a large shadow economy can be inflationary because of the inducement to use inflation tax to meet budgetary requirements when large sections of the economy are unrecorded and hence untaxed (Canzoneri and Rogers 1991; Nicolini 1998). Other studies that discuss the optimality of the inflation tax in the context of a large informal sector are Cavalcanti and Villamil (2003), and Koreschkova (2006). In their empirical analyses, Mazhar and Méon (2017) find a positive relationship between the size of the shadow economy and inflation, and a negative relationship between the size of the tax revenue and the shadow economy.

In a study that focuses on the positive relationship between inflation and corruption, Al-Marhubi (1999) finds that one of the reasons for the increased reliance on the inflation tax is the tendency of businesses to go underground in response to corruption. The link between the shadow economy and corruption is studied by Buehn and Schneider (2012), who find that the shadow economy and corruption are complementary variables.

This discussion can be related to studies that find that inflation is linked to political instability. This is so because weak states are related to poor contract enforcement (Acemoglu et al. 2008) which diminishes the benefits of being formal (Schneider 2012). Gordon and Li (2005) find that a major source of the differences between tax policy in developed and developing countries is the value of financial intermediation. In richer countries the value added by the financial sector is considerable and as a result firms will choose to operate in the formal sector, hence resulting in a smaller shadow economy.

Huang and Wei (2006) model corruption as the reduced ability of governments to collect tax revenue through formal channels. Corruption in their study is hence used as a proxy for weak institutions. Among the important conclusions they arrive at is that an inflation targeting policy is suboptimal for developing countries because of the widespread presence of bureaucratic corruption. Given that corruption and the shadow economy complement each other, CBI may not be effective in the presence of a large shadow economy. This result is consistent with the previous studies that examine the relationship between CBI and inflation (Campillo and Miron 1997).

A possible relationship between openness, inflation, and the shadow economy is mentioned by Bowdler and Malik (2005), who posit that openness increases the revenues obtained from taxing tradables which are easier to monitor than non tradables which will find it relatively easier to operate in the shadow economy.[5]

[5] This hypothesis is developed by Bowdler and Malik (2005) in the specific context of a situation where a government in a period of low revenues might consider other means to meet budgetary requirements.

III. Empirical specification and data

Broadly speaking, our research question touches political economy, public finance and macroeconomics. More importantly, this study, perhaps for the first time, gathers empirical evidence on a tripartite relationship between inflation, political stability, and the size of the shadow economy.

A. Empirical hypothesis

As the previous section argues, the negative relationship between inflation and political stability may turn weaker or entirely disappear at higher levels of the shadow economy. To what extent this insight has relevance for actual economies is an empirical question. This discussion may be presented in the form of a hypothesis.

Hypothesis: A large shadow economy reduces the effect of political stability on inflation

This hypothesis is tested using a multivariate econometric model that controls for both the economic and institutional determinants of inflation. Given our discussion in the previous section, the focus is on the interaction effect of the shadow economy and political stability. For this purpose a multiplicative interaction term is constructed using the shadow economy and a measure of political stability[6]. To study the significance of the relationship of the shadow economy and political stability with inflation in a realistic setting the marginal effects of our variables of interest are examined at different sizes of the shadow economy in our sample.

For the purpose of highlighting the contribution of this work against the previous studies, the empirical results related to usual linear specification are also presented. In simple terms, the linear model can be presented as specification 1:

$$Inflation = \beta_0 + \beta_1 ShadowEco + \beta_2 PolStab + \beta_4 Controls + \varepsilon. \quad (1)$$

[6] Please refer to Table A1 in Appendix for definition of the variables.

On the basis of previous evidence (e.g. Mazhar and Méon 2017; Koreshkova 2006; and Aisen and Viega 2008) we can expect β_1 (the effect of the shadow economy on inflation) to be positive and β_2 (the effect of political stability on inflation) to be negative.

However, the main focus of this enquiry is the nonlinear relationship between political stability and inflation as a function of the shadow economy. For this purpose we estimate specification 2:

$$Inflation=\alpha_0+\alpha_1\, ShadowEco\, +\alpha_2\, PolStab+\alpha_3\, ShadowEco*PolStab+\alpha_4\, Controls+\varepsilon. \quad (2)$$

The interpretation of the interaction term in (2) requires the computation of marginal effects. Taking partial derivative of equation (2) with respect to *PolStab* yields the impact of political stability on inflation as a function of the shadow economy. The coefficients α_2 and α_3 in specification (2) allow us to capture the hypothesized influence of political stability on inflation evaluated at interesting values of the shadow economy. In order to determine the statistical significance of the marginal effects associated with (2) at different levels of the shadow economy we use delta method standard errors.

It is important to note that this paper does not estimate the precise threshold beyond which the shadow economy dominates the inflation reducing influence of political stability. Such an inquiry may require detailed individual case studies of the countries in our sample, which is beyond the scope of this work. The aim here is more general: whether the existence of the shadow economy undermines the inverse link between political stability and inflation or not. To this end, we turn to data and empirics.

B. Data

We use a large panel data set of 122 countries over the 1999 to 2007 period. The size of the data set varies from 722 to 841 observations across specifications due to missing observations for some countries. Tables A1 and A2 in the Appendix provide the description and sources as well as summary statistics of the variables used in our analysis.

The dependent variable is inflation which is annual percentage change in the Consumer Price Index (CPI), as provided by the World Bank in *World Development Indicators* (WDI 2015) and an online data base. It can be seen (in Table A2) that the maximum value of inflation in our sample exceeds 500 percent which may influence

coefficient estimates. Thus, to avoid the outlier's effect we ignore all the cases where inflation exceeds 100 percent. This change, however, removes only 10 observations from the data set.

For estimates of the shadow economy the data set prepared by Schneider et al. (2010) is used, which covers 162 countries over the1999 to 2007 period. These estimates are derived using MIMIC methodology which is considered superior to other methods used to estimate the shadow economy. Moreover, the estimates of Schneider et al. (2010) are highly correlated with the estimates derived using structural modeling approaches (e.g., Elgin and Oztunali 2012), a fact enhancing their reliability.

Schneider et al. (2010) employ various econometric specifications, using different sets of causal and indicator variables to estimate the size of the shadow economy. With reference to Table 3.1 in their paper, we use specification (6), which does not include GDP per capita, one of the control variables in our regressions, as it would be tautological to use an estimate that is partially inferred from it.

For political stability (*PolStab*), the indicator from the World Bank's Worldwide Governance Indicators (http://info.worldbank.org/governance/wgi/index.aspx#home) is used. This index provides yearly observations on the likelihood of political instability or politically motivated violence. The values of the index are in standard normal units ranging from -2.5 to 2.5 with higher values corresponding to better outcomes (i.e., greater political stability in this case).

The control variables include the (logarithm of) Gross Domestic Product per capita (*GDP(log)*) based on Purchasing Power Parity to represent the level of economic development and overall economic structure of a country. This was obtained from the World Development Indicators (WDI 2015) dataset. It is expected that higher values of GDP per capita will be associated with lower levels of inflation as more prosperous societies tend to have lower levels of inflation.

Openness (*OPEN*) is also included as a control variable given its importance, as a macroeconomic indicator and its place in the time inconsistency literature, as a determinant of inflation. This variable is obtained from the World Bank's World Development Indicators online data base. It measures openness as the ratio of imports and exports to GDP. This variable is expected to have a negative correlation with inflation.

Additional control variables are included to capture the culture and institutional factors. Such factors constrain individual choices and thus exert an important influence in shaping the outcomes in a broader context. To account for this influence, a measure of absence of corruption (*Uncorrupt*), based on Transparency International's

Corruption Perception Index, is used here. It measures absence of corruption on a 100-point scale, where a higher score indicates less corruption and a lower score indicates higher levels of public corruption. To the extent that corruption complements informal activities, it can be expected to have a positive correlation with inflation (e.g., Dreher and Schneider 2010). This implies a negative sign for the coefficient of *Uncorrupt* in our data set.

As a further control for institutional quality, a measure of voice and accountability (*Voice&Acc*) is extracted from the Worldwide Governance Indicators. This variable relies on various sources that reflect transparency, accountability, electoral process, as well as civic liberties. Similar to political stability *Voice&Acc* is measured on a normalized scale from -2.5 to 2.5 with higher values indicating more effective mechanisms for citizens. This is expected to be negatively related to inflation.

As is usual with macroeconomic variables, the data here exhibits persistence and an unbalanced panel structure. More precisely, its cross-sectional dimension contributes most of its observed variation. Together these two features imply that estimating fixed effects model would prevent any identification and will lead to poor inference (Kennedy 2008). Therefore, the models in specifications (1) and (2) above are estimated using ordinary least squares with panel corrected standard errors.[7] The later is recommended by Beck and Katz (1995) for cases when observations of the same country cannot be considered independent, admittedly the case with our data because the informal economy in a country has implications for its neighbors. The examples of informal economic linkages between US-Mexico, Pakistan-Afghanistan, Morocco-Spain, and Bangladesh-India reflect this tendency.[8]

Admittedly, the data set we use to estimate the models in specifications (1) and (2) is observational and not experimental. It exposes it to a number of issues, namely the endogeneity of the variables of interest, omitted variable problem, and measurement errors. The magnitude of each of these issues is difficult to discern so a series of robustness checks are conducted to determine whether the estimates reported are so fragile as to lose significance if we change our assumptions about estimation methodology, model specification, and the measurement of the variables of interests. The key conclusion of the robustness checks is that our findings are fairly stable across a number of different specifications and estimation techniques.

[7] The *xtpcse, hetonly* command in version 13 of STATA was used to run the regressions. This provides estimates in which the standard errors are panel corrected only for panel level heteroskedasticity (StataCorp, 2011). An alternative approach is to use feasible generalized least squares (FGLS). We opted not to use this approach based on the Beck and Katz (1995) finding, cited in Stata Corp (2011), that FGLS is likely to result in inaccurate standard error estimates.

[8] The shadow economy linkages for US-Mexico are discussed in Andreas (2004), and for South Asian countries in Prabir and Iyengar (2014).

IV. Results

As explained in the previous section the main focus of our empirical analysis is to estimate the impact of political stability as a function of the shadow economy.

A. Basic estimates

It is appropriate to first replicate the previous findings of a negative correlation between political stability and inflation using a linear model and its various specifications. The results of this linear specification are summarized in Table 1.

[INSERT TABLE 1]

The first column in Table 1 presents the baseline regression containing political stability and national income (*GDP(log)*) in per capita terms. The other models are extensions of this basic specification.[9]

As is clear from the table, the significance of all the models is confirmed by Wald Chi-square statistics which allows for the rejection of the null hypothesis that there is no relationship between the dependent variable and the independent variables. As explained previously, the sample size varies across specifications due to missing values of the control variables. The smallest sample in the estimated models of Table 1 has 113 countries with 753 observations (in the specification of column 5) and is thus sufficiently large to ensure reliable inference.

In most of the cases we do not find any significant impact of control variables on inflation. This may indicate that in the presence of political stability other variables do not exercise any significant independent impact. For instance, the coefficients of both *Voice&Acc* and *Uncorrupt* are insignificant at conventional levels. The coefficient of *GDP(log)* per capita is consistently negative and significant indicating that higher living standards are associated with low inflation.

Importantly, the linear impact of the shadow economy is significant and pro-inflationary in all the cases. However, in terms of elasticity it is less than unity. For instance, the estimates of column (2) in Table 1 suggest that

[9] It is standard practice in the empirical political economy literature to add institutional variables one at a time. For instance one may refer to classic papers like Johnson et al. (1998) or Acemoglu et al. (2001). The usual justification is the high correlation among institutional variables and also the common sense explanation that institutional factors often change together. For this reason there is no advantage in controlling for one institutional aspect to see the influence of another.

a 10 percent increase in the size of the shadow economy would increase inflation by 3.4 percent only. To put things in context, the average (within country) variation in the shadow economy in our sample is only 1.22 percent per annum implying that a 10 percent change in the shadow economy is not a very realistic supposition.

The impact of political stability on inflation, in line with the previous findings in the literature, is significant in all the cases. In terms of magnitude, the base line regression (column 1) implies that a 1 point increase in the index of political stability will reduce inflation by 1.2 percentage points. This effect reduces to 0.72 percentage points in the last specification (column 5) but remains significant at conventional levels of significance.

Though consistently significant, the impact of political stability on inflation diminishes from column (1) to column (2). In other words, controlling for the effect of the shadow economy reduces the magnitude of the coefficient of political stability on inflation.

The linear specifications in Table 1 establish the significance of political stability as a significant determinant of inflation controlling for the influence of other possible factors including the shadow economy. However, it does not take into account non-linear effects which may be captured through the use of an interaction term combining informal sector and political stability.

The results with interaction effects are shown in Table 2 using the same set of control variables as in Table 1. Thus, columns (1) to (4) in Table 2 correspond, with the addition of an interaction term, to the specifications in columns (2) to (5) in Table 1. Different specifications in Table 2 (as reported in columns 1 to 4) indicate that each specification is highly significant as shown by the probability value of the Chi-squared test statistic reported in the lower half of Table 2. As in Table 1, the control variables are insignificant except *GDP(log)* which indicates that higher per capita income on average is associated with lower inflation. In terms of elasticity, the effect is not high: a 1 percent increase in GDP is associated with a reduction of 0.14 percent in inflation.

[INSERT TABLE 2]

The interpretation of the coefficients of the interaction between *PolStab* and *ShadowEco* is not straightforward. This becomes clearer through the partial differential of inflation with respect to political stability. For instance, in specification (1) in Table 2 we get:

. (3)

A number of important points related to equation (3) deserve clarification. Firstly, the influence of political stability on inflation is now a function of the shadow economy, as hypothesized in the previous section. Secondly, the estimated coefficients in Table 2 column (1) do not provide us with the standard errors for the right hand side term in equation (2). In other words, by interpreting the coefficients in Table 2 in the usual way we cannot identify the significance of the right hand side term in equation (3). (For details one may see Brambor et al. 2006).

To estimate the standard errors (and thus the significance) of the right hand side term in equation (2) we have constructed Table 3 that reports the marginal effects of the interaction term in Table 2. In order to see the change in the influence of political stability on inflation we compute the marginal effect of political stability at three different levels of the shadow economy in our sample[10]. These are the 25th percentile value, the 75th percentile value, and the maximum value.

[INSERT TABLE 3]

As discussed in the previous section, it is possible that the relationship between political stability and the shadow economy loses significance at higher levels of the shadow economy. In Table 3, this effect can be seen at work. Thus, the influence of political stability on inflation when the size of the shadow economy is at the 25th percentile (i.e., equal to 32 percent of the national output) is, in statistical and economical terms, highly significant. If we evaluate the significance of the influence of political stability on inflation at higher levels of the shadow economy, for instance at the 75th percentile, there is a marked decrease in both the size and significance of political stability's influence (shown in the last column of Table 3). More importantly, at the maximum value of the shadow economy in our sample (i.e., where the size of the shadow economy equals 72 percent of the national output) the relationship between political stability and inflation ceases to exist.

As the shadow economy is one of the two constituent elements in the interaction term, its impact is also given by an equation similar to equation (4), and can be written as follows:

[10] The elasticity is computed using STATA's inbuilt routine "margins". Using "margins" one can compute the marginal effects of different control variables, binary variables, and interaction terms in a regression. It allows one to calculate elasticities as well. In our model the dependent variable "inflation" is in levels but GDP is in logs. Therefore, to compute elasticity we invoke "margins" option "eydx" which is used when dependent variable is in levels and independent variable is in log. For further details about margins command one may refer to Williams (2012).

. (4)

Understandably, the impact of the shadow economy on inflation as a function of political stability is not our primary concern, therefore, we estimate the right hand side of equation (4) at the average value of political stability in our sample. (This explains the unchanged coefficients of the shadow economy in the columns in Table 3). In all the cases, the increase in the shadow economy increases inflation at the average levels of political stability. The only exception is the specification in column (4) that controls for the influence of corruption (*Uncorrupt*). To explain this result, note that corruption and the shadow economy both are underground activities and are difficult to discern. Empirical evidence supports the complementary nature of the two (Dreher and Schneider 2010). Therefore, it would be wrong to conclude that controlling for corruption weakens the shadow economy's influence on inflation. Nonetheless, in the robustness section we employ instrumental variables for the size of shadow economy to take care of these issues.

B. Robustness

Our results are robust against various specifications and changes in the major variables as well as techniques of estimation. For example, replacing the Schneider et al. (2010) shadow economy measure with structural estimates given by Elgin and Oztunali (2012) does not change our results. Understandably, this may reflect the high correlation (of around 0.98) between the two estimates. The results of this robustness check are not reported here to conserve space but are available on request.

As pointed out previously, our results are prone to problems of endogeneity, and omitted variable bias. The problem of endogeneity in social sciences is a perennial issue and especially difficult to tackle using observational data (e.g., Freedman 2010). However, one way to resolve the issue is by estimating the models using instrumental variables technique. Following Dreher and Schneider (2010), we employ *business costs* and *start-up procedures related to new businesses* to instrument the shadow economy.[11] These variables measure the cost of becoming formal. They should therefore affect the size of the shadow economy. Because they are at the same time unlikely to directly affect the dependent variable, they are suitable instruments. Using instrumental variable Generalized

[11] Both these variables have been taken from the World Development Indicators (WDI 2015) data base of the World Bank.

Methods of Moments (GMM) estimator we find that our core results (as presented in Table 1) hold with these regressions also. (The results are available on request). The results are reliable as our instruments satisfy most of the requirements of good instruments. In a particular case where our instruments do not qualify as reliable we are unable to reject the null hypothesis that the shadow economy can be treated as exogenous. Admittedly, with instrumental variable regression the computation of non-linear effects, as presented in Tables 2 and 3, is difficult and may fall outside the scope of this research. However, to the extent that we are interested in capturing the linear exogenous impact of the shadow economy while controlling for political stability, our instrumental variable results are favorable.

Nevertheless, to account for the endogeneity of the political stability we take its lagged values in our baseline regressions of Table 1 and Table 2 to find whether or not it remains significant. As reported in Table 4 column (5) one can see that even with lagged political stability and the shadow economy, the pattern of marginal effects of political stability is similar to those shown in column (1) of Table 3. On the basis of the above findings we can claim that our results do not suffer from endogeneity issues though we resist attributing causality to these findings given the non-experimental nature of our data.

An important determinant of inflation is an independent central bank. However, it is difficult to determine a priori how central bank independence will affect our reasoning. On the one hand, the destabilizing impact of the shadow economy on inflation through political stability may not be significant if the central bank of a country is sufficiently independent of political influences. On the other hand, politically stable regimes are more likely to grant *de facto* independence to the central bank and vice versa. The issue is complicated and unfortunately difficult to investigate due to lack of data on de facto central bank independence. The index of CBI developed by Cukierman et al. (1992a) and updated by Crowe and Meade (2008) is available for two years (1998 and 2006) for 65 countries in our sample (thus yielding only 65 usable observations). Importantly, if we add CBI in our model of column (1) in Table 2, the whole model turns insignificant. Whereas if we add it as an additional control in the model of column (2) in Table 1, the coefficients of political stability and the shadow economy remain qualitatively the same and significant at 10 percent level. These results, available upon request, are in line with the finding of Mazhar and Méon (2017) that *de jure* central bank independence does not completely eliminate the relationship between inflation and the shadow economy.

As Romer (1993) argued, a flexible exchange rate regime may increase the cost of policy inconsistency and thus impose fiscal discipline with or without political stability. It is also well known that flexible exchange rates are necessary for greater autonomy of a central bank. Thus, we can assume that a flexible exchange rate regime and central bank independence are positively correlated. Given this, we use a flexible exchange rate dummy as a proxy, admittedly imperfect, for CBI. The results using this dummy (labeled *FlexExRate*) are reported in column 2 of Table 4 and 5. The results with *FlexExRate* follow the pattern in Table 2, i.e., political stability either loses significance or the magnitude of its coefficient decreases with an increase in the size of the shadow economy.

[INSERT TABLE 4 AND TABLE 5]

It is important to take into account the impact of government spending on inflation. Otherwise we cannot claim that the positive relationship between inflation and the shadow economy necessarily reflects the influence of the shadow economy or government spending if the later influence is not controlled for. In Table 4 column (1) we include government spending (*GovtSpend*) as an additional control to the baseline specification of column (1) in Table 2. The marginal effects of political stability and the shadow economy are reported in Table 5. The pattern of these marginal effects remains unchanged from what we presented in Tables 2 and 3. Thus, we can conclude that the impact of the shadow economy on inflation is not due to the omission of government spending from our model.

Finally, in Table 4 columns (3) and (4) we specifically check the robustness of our baseline results against the inclusion of time fixed effects and an alternative measure of political instability, respectively. For the former we use year wise dummy variables for each year in our sample to find that the results remain unchanged. For the later, we use the International Country Risk Guide's (ICRG) Internal Conflict Index. Given the modern view that forward looking inflation expectations determine the actual inflation, we can assume that an increase in the risk of internal conflict will trigger inflation expectations. Therefore, we can use this index (labeled here as *InternalPeace*) to measure the link between inflation and political instability. It assumes a value from 0 to 12 with higher values indicating lower risk of conflict. As shown in Table 5 column (4), the marginal effect of *InternalPeace* is significant and has a negative coefficient when the size of the shadow economy is restricted to 25 percentile in our sample. But this effect turns insignificant when the size of the shadow economy reaches 75 percentile in the sample. These

results are similar to the results reported in Table 3 using *PolStab*, thus suggesting robustness of our results against a change in the measurement of the key variable.

In sum, the robustness analysis allows us to conclude that our results are not weakened by endogeneity issues or from omitted variable bias. Moreover, the results are also robust against the alternative measures of the key variables in our analysis, namely political stability and the shadow economy.

V. Conclusion

This study revisits the link between political stability and inflation in a more realistic setting characterized by the presence of the shadow economy. Political stability is an important determinant of inflation because less stable governments are more inclined to use the inflation tax because of their tendency to use inefficient economic policies and due to their less willingness to implement reforms that would benefit future governments. The presence of a large shadow economy may enhance both likelihoods. The results in this study imply that higher inflation and policy failures are likely to occur in an economy with more shadow activity keeping political stability unchanged.

These predictions are supported by empirical evidence derived through the use of an econometric model and panel dataset comprising 122 countries over the 1999 – 2007 period. The novel contribution of this study is the finding that inflation is determined not only by the shadow economy and political stability independently, but that there is an interaction effect between the two variables. The computation of the marginal effects of political stability on inflation at increasingly higher values of the size of the shadow economy reveals a diminishing effect of political stability on inflation.

A large shadow economy acts as an incentive for policymakers and politicians to use the inflation tax for revenue, regardless of the degree of political stability. Thus, political stability contributes to lower inflation only if there is a small shadow economy.

Appendix

[INSERT TABLE A1 AND A2]

References

Acemoglu, Daron, and Thierry Verdier (2000). The choice between market failures and corruption. *The American Economic Review* 90: 194–211.

Acemoglu, Daron, Simon Johnson, and James A. Robinson (2001). The colonial origins of comparative development: An empirical investigation. *The American Economic Review* 19: 1369–1401.

Acemoglu, Daron, Simon Johnson, Pablo Querubín, and James A. Robinson (2008). When does policy reform work? The case of central bank independence. *Brookings Papers on Economic Activity* 1: 351–417.

Aisen, Alberto, and Francisco J. Veiga (2006). Does political instability lead to higher inflation? A panel data analysis. *Journal of Money, Credit, and Banking* 38: 1379–1389.

Alesina, Alberto, and Andrea Stella (2011).The politics of monetary policy. In B. M. Friedman and M. Woodford, editors, *Handbook of Monetary Economics*: Vol 3B. Amsterdam, Elsevier.

Alesina, Alberto, Sule Özler, Nouriel Roubini, and Phillip Swagel (1996). Political instability and economic growth. *Journal of Economic growth* 1: 189–211.

Alesina, Alberto, and Guido Tabellini (1990). A positive theory of fiscal deficits and government debt. *The Review of Economic Studies* 57: 403–414.

Al Nasser, Omar M., Adolfo Sachsida, and Mário Mendonca (2009). The openness-inflation puzzle: Panel data evidence. *International Research Journal of Finance and Economics* 28: 169–181.

Al-Marhubi, Fahim A. (2000). Corruption and inflation. *Economics Letters* 66: 199–202.

Anderson, James, E. (2012). Efficient policy in a predatory economy: To him who hath shall be given? *International Economic Review* 53: 157–174.

Andreas, Peter (2004). Illicit international political economy: The clandestine side of globalization. *Review of International Political Economy* 11: 641–652.

Barro, Robert J., and David B. Gordon (1983). Rules, discretion and reputation in a model of monetary policy. *Journal of monetary economics* 12: 101–121.

Beck, Nathaniel, and Jonathan N. Katz (1995). What to do (and not to do) with time series cross section data. *American Political Science Review* 89: 634–647.

Besley, Timothy, and Torsten Persson (2013). Taxation and development. Discussion Papers 9307. CEPR.

Bowdler, Christopher, and Adeel Malik (2005). Openness and inflation volatility: Cross-country evidence. Working Paper 2005-08. University of Oxford. CSAE.

Brambor, Thomas, William R. Clark, and Matt Golder (2006). Understanding interaction models: Improving empirical analyses. *Political Analysis* 14: 63–82.

Buehn, Andreas, and Friedrich Schneider (2012). Corruption and the shadow economy: Like oil and vinegar, like water and fire? *International Tax and Public Finance* 19: 172–194.

Buehn, Andreas, Roberto Dell'Anno, and Friedrich Schneider (2015). Exploring the dark side of tax policy: An analysis of the interaction between fiscal illusion and the shadow economy. Working Papers No. 5466. Munich. CESifo.

Calmfors, Lars, and Simon Wren-Lewis (2011). What should fiscal councils do? *Economic Policy* 26: 649–695.

Campillo, Marta, and Jeffrey A. Miron (1997). Why does inflation differ across countries? In C. D. Romer and D. H. Romer, editors, *Reducing inflation: Motivation and strategy, NBER studies in business cycles*. University of Chicago Press.

Canzoneri, Mathew B., and Caril A. Rogers (1990). Is the European Community an optimal currency area? Optimal taxation versus the cost of multiple currencies. *American Economic Review* 80: 419–433.

Cavalcanti, Tiago V. de V., and Anne P. Villamil, (2003). Optimal inflation tax and structural reform. *Macroeconomic Dynamics* 7: 333–362.

Crowe, Christopher, and Ellen E. Meade (2008). Central bank independence and transparency: Evolution and effectiveness. Working Paper WP/08/119. IMF.

Cukierman, Alex (1992). *Central Bank Strategy, Credibility, and Independence: Theory and Evidence*. Cambridge, MA, MIT Press.

Cukierman, Alex, Steven B. Webb, and Bilin Neyapti (1992a). Measuring the independence of central banks and its effect on policy outcomes. *The World Bank Economic Review* 6: 353–398.

Cukierman, Alex, Sebastian Edwards, and Guido Tabellini (1992b). Seigniorage and political instability. *American Economic Review* 82: 537–555.

Dabla-Norris, Era, Gabriela Inchauste, and Mark Gradstein (2008). What causes firms to hide output? The determinants of informality. *Journal of Development Economics* 85: 1–27.
Dreher, Axel, and Friedrich Schneider (2010). Corruption and the shadow economy: An empirical analysis. *Public Choice* 144: 215–238.
Edwards, Sebastian, and Guido Tabellini (1991). Explaining fiscal policies and inflation in developing countries. *Journal of International Money and Finance* 10: S16–S48.
Elgin, Ceyhun, and Oguz Oztunali (2012). Shadow economies around the world: Model based estimates. Working Paper No. 2012/05. Bogazici University. Istanbul.
Fernandez-Albertos, J. (2015). The politics of central bank independence. *Annual Review of Political Science* 18: 217–237.
Freedman, David (2010). *Statistical models and causal inference: A dialogue with social sciences*. New York, NY, Cambridge University Press.
Gordon, Robert, and Wei Li (2005). Tax structure in developing countries: Many puzzles and a possible explanation. Working Paper 11267. Cambridge, MA, NBER.
Hayo, Bernd, and Carsten Hefeker (2002). Reconsidering central bank independence. *European Journal of Political Economy* 18: 653–674.
Harrison, Ann, and Andres Rodriquez-Clare (2010). Trade, foreign policy and industrial policy for developing countries. In D. Rodrik, and M. Rosenzweig, editors, *Handbook of Development Economics* Vol. 5: North Holland, Elsevier.
Huang, Haizhou, and Shang-Jin Wei (2006). Monetary policies for developing countries: The role of institutional quality. *Journal of International Economics* 70: 239–252.
Johnson, Simon, Daniel Kaufmann, and Pablo Zoido-Lobaton (1998). Regulatory discretion and the unofficial economy. *The American Economic Review* 88: 387–392.
Kennedy, Peter (2008). *A Guide to Econometrics*. Wiley-Blackwell.
Koreshkova, Tatyana, A. (2006). A quantitative analysis of inflation as a tax on the underground economy. *Journal of Monetary Economics* 53: 773–796.
Kydland, Finn. E., and Edward C. Prescott (1977). Rules rather than discretion: The inconsistency of optimal plans. *The Journal of Political Economy* 85: 473–491.
Lane, Phillip R. (1997). Inflation in open economies. *Journal of International Economics* 42: 327–347.
Leeper, Eric M. (2010).Monetary science, fiscal alchemy. Working Paper 16510. Cambridge, MA, NBER.
Mazhar, Ummad, and Pierre-Guillaume Méon (2017).Taxing the unobservable: The impact of the shadow economy on inflation and taxation. *World Development* 90: 89–103.
Mijiyawa, Abdoul G. (2011). Fighting inflation in developing countries: Does democracy help? An empirical investigation. *Journal of International Development* 23: 656–696.
Nicolini, Juan P. (1988). Tax evasion and the optimal inflation tax. *Journal of Development Economics* 55: 215–232.
Prabir, De, and Kavita Iyengar (2014). *Developing economic corridors in South Asia*. Manila, Asian Development Bank.
Rogoff, Kenneth (1985). The optimal degree of commitment to an intermediate monetary target. *The Quarterly Journal of Economics* 100: 1169–1189.
Romer, David (1993). Openness and inflation: Theory and evidence. *The Quarterly Journal of Economics* 108: 869–903.
Roubini, Nouriel, and Jeffrey D. Sachs (1989). Political and economic determinants of budget deficits in the industrial democracies. *European Economic Review* 33: 903–933.
Schneider, Friedrich, Andreas Buehn, and Claudio E. Montenegro (2010). Shadow economies all over the world: New estimates for 162 countries from 1999 to 2007. *International Economic Journal* 24: 443–461.
Schneider, Friedrich (2012). The shadow economy and work in the shadow: What do we (not) know? Working Paper 6423. Bonn. Institute for the Study of Labor (IZA).
Schneider, Friedrich, and Andreas Buehn (2013). Estimating the size of the shadow economy: Methods, problems, and open questions. Working Paper 4448. Munich. CESifo.
Stata Corp (2011). *Stata Statistical Software: Release 12*. College Station, TX: Stata Corp LP.
Terra, Christina, T. (1998). Openness and inflation: A new assessment. *Quarterly Journal of Economics* 113: 641–648.
WDI (2015). *World Development Indicators 2015*. The World Bank Group, Washington DC.
Williams, Richard (2012). Using the margins command to estimate and interpret adjusted predictions and marginal effects. *The Stata Journal* 12: 308–331.

Table 1. Political stability and inflation

DepVar: Inflation (excluding cases with greater than 100 percent annual inflation).					
	(1)	(2)	(3)	(4)	(5)
PolStab	-1.252***	-1.058***	-1.125***	-0.911**	-0.719*
	(0.382)	(0.399)	(0.023)	(0.413)	(0.423)
ShadowEco		0.060**	0.054***	0.058***	0.047**
		(0.024)	(0.023)	(0.023)	(0.022)
GDP(log)	-0.970***	-0.717***	-0.725***	-0.620**	-0.649*
	(0.256)	(0.272)	(0.266)	(0.308)	(0.345)
OPEN(log)			-0.607		
			(0.513)		
Voice&Acc				-0.396	
				(0.438)	
Uncorrupt(log)					-0.204
					(0.734)
Constant	14.354***	10.087***	7.663**	9.304***	10.535***
	(2.196)	(2.659)	(3.354)	(2.957)	(2.834)
Observations	841	829	824	829	753
R-squared	0.062	0.065	0.064	0.066	0.053
Number of countries	122	122	121	122	113
Probab Chi-sq	0.000	0.000	0.000	0.000	0.000

Note: Panel corrected standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 2. Political stability and shadow economy interaction and inflation

DepVar: Inflation (excluding cases with greater than 100 percent annual inflation).	(1)	(2)	(3)	(4)
PolStab	-2.090**	-2.547***	-2.307**	-3.307***
	(1.059)	(1.000)	(1.097)	(0.967)
ShadowEco	0.060***	0.544***	0.077***	0.065***
	(0.023)	(0.022)	(0.022)	(0.023)
*ShadowEco*PolStab*	0.028	0.038*	0.030	0.065***
	(0.026)	(0.023)	(0.026)	(0.023)
GDP (log)	-0.661**	-0.647**		
	(0.292)	(0.284)		
OPEN(log)		-0.634		
		(0.508)		
Voice&Acc			-0.581	
			(0.429)	
Uncorrupt(log)				-0.421
				(0.617)
Constant	9.737***	7.074**	3.483***	5.417**
	(2.726)	(3.372)	(0.851)	(2.561)
Observations	829	824	833	757
R-squared	0.066	0.136	0.063	0.056
Number of countries	122	121	122	113
Probab Chi-sq	0.000	0.000	0.000	0.000

Notes: Panel corrected standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table 3. Marginal effects of the political stability at different levels of shadow economy

Columns report the marginal effects corresponding to the specifications in Table 2.

	(1)	(2)	(3)	(4)
ShadowEco (at 25 percentile)	0.053**	0.118***	0.069***	0.049**
	(0.026)	(0.026)	(0.025)	(0.025)
PolStab	-1.201***	-1.034***	-1.133***	-1.229***
	(0.429)	(0.378)	(0.431)	(0.428)
ShadowEco (at 75 percentile)	0.053**	0.118***	0.069***	0.049**
	(0.026)	(0.026)	(0.025)	(0.025)
PolStab	-0.840**	0.400	-0.939**	-0.385
	(0.433)	(0.523)	(0.421)	(0.442)
ShadowEco (at Max.)	0.053**	0.118***	0.069***	0.049**
	(0.026)	(0.026)	(0.025)	(0.025)
PolStab	-0.075	3.434***	-0.102	1.400
	(0.962)	(1.110)	(0.965)	(0.908)
Observations	829	824	833	757

Notes: Delta Method standard errors in parenthesis;*** p<0.01, ** p<0.05, * p<0.1

Table 4. Robustness analysis (coefficients estimates)

DepVar: Inflation (excluding cases with greater than 100 percent annual inflation).					
	(1)	(2)	(3)	(4)	(5)
PolStab	-3.228***	-2.179**	-2.279**		
	(1.046)	(1.072)	(1.063)		
ShadowEco	0.064***	0.065***	0.059**	-0.138	
	(0.023)	(0.023)	(0.024)	(0.152)	
*ShadowEco*PolStab*	0.059**	0.031	0.031		
	(0.025)	(0.026)	(0.026)		
GDP(log)	-0.764**	-0.665**	-0.590**	-0.512	-0.605**
	(0.301)	(0.290)	(0.292)	(0.347)	(0.285)
GovtSpend	-0.053***				
	(0.017)				
InternalPeace				-1.622**	
				(0.639)	
ShadowEco InternalPeace*				0.023	
				(0.015)	
FlexExRate		0.613			
		(0.637)			
L.PolStab					-1.035
					(0.890)
L.ShadowEco					0.074***
					(0.025)
*L.ShadowEco*L.PolStab*					-0.004
					(0.024)
Constant	14.238***	9.504***	10.610***	23.919***	8.514***
	(2.967)	(2.722)	(2.783)	(6.152)	(2.854)
Observations	748	829	829	830	722
R-squared	0.072	0.067	0.072	0.059	0.085
Number of countres	113	122	122	96	122
Probab Chi-square	0.000	0.000	0.000	0.000	0.000
Time Fixed Effects	No	No	Yes	No	No

Notes: Panel corrected standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1; "L" stands for lag.

Table 5. Robustness analysis (marginal effects)

DepVar: Inflation (excluding cases with greater than 100 percent annual inflation).
Columns report the marginal effects corresponding to the specifications in Table 4.

	(1)	(2)	(3)	(4)	(5)
PolStab	-1.338***	-1.178***	-1.287***		
	(0.438)	(0.427)	(0.430)		
ShadowEco(at 25 percentile)	0.497**	0.056**	0.051**		
	(0.024)	(0.025)	(0.025)		
PolStab	0.570	-0.772*	-0.885**		
	(0.424)	(0.444)	(0.436)		
ShadowEco(at 75 percentile)	0.050**	0.056**	0.051**		
	(0.025)	(0.025)	(0.025)		
InternalPeace				-0.897***	
				(0.254)	
ShadowEco(at 25 percentile)				0.068**	
				(0.031)	
InternalPeace				-0.020	
				(0.539)	
ShadowEco(at 75 percentile)				0.068**	
				(0.030)	
L.PolStab					-1.174***
					(0.381)
L.ShadowEco(at 25 percentile)					0.075***
					(0.026)
L.PolStab					-1.101***
					(0.470)
L.ShadowEco(at 25 percentile)					0.075***
					(0.026)
Observations	748	829	829	830	722

Notes: Delta-method standard errors in parenthesis; *** p<0.01, ** p<0.05, * p<0.1; “L” stands for lag.

Table A1. Variable description and sources

Variable	Description	Source
Inflation	Annual percentages of average consumer prices are year-on-year changes.	IMF WEO September 2011
Shadow economy (*ShadowEco*)	Shadow economy as a percentage of GDP.	Schneider et al. (2010) estimates
Political Stability (*PolStab*)	Measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional means. Its values range from -2.5 to 2.5 on a normalized scale, with higher values indicating political stability.	World Governance Indicators 2012
GDP (*GDP(log)*)	(log of) Gross domestic product based on purchasing-power-parity (PPP) per capita GDP.	IMF WEO September 2013
Openness (*OPEN(log)*)	Ratio of imports plus exports to GDP.	Penn World Tables 7
Corruption Perceptions (*Uncorrupt(log)*)	A country/territory's score indicates the perceived level of public sector corruption on a scale of 0-100, where 0 means that a country is perceived as highly corrupt and a 100 means that a country is perceived as very clean. (Note that log transformation is possible as minimum value of this index in our sample is 4).	Transparency International (http://www.transparency.org/cpi2014/in_detail#myAnchor1)
Voice and Accountability (*Voice&Acc*)	Captures perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.	World Governance Indicators 2011
InternalPeace	International Country Risk Guide (ICRG) measure of political risk (https://www.prsgroup.com/). The subcomponent of their political risk index is Internal Conflict index which comprises of three sub-indices namely, threat of coup, political violence, and civil disorder	https://www.prsgroup.com/

Table A2. Summary statistics of the main variables

Variable	Obs.	Mean	Std.Dev.	Min.	Max.
Inflation	1090	9.24	28.88	-17.22	550
ShadowEco	1015	37.68	12.35	8.4	72.5
PolStab	861	-0.27	0.89	-2.61	1.62
GDP(log)	1089	8.25	1.26	5.36	11.31
OPEN(log)	812	4.28	0.54	2.66	6.09
Voice&Acc	861	-0.22	0.88	-2.22	1.75
Uncorrupt	995	34.78	20.54	4.00	96.00

Notes: Sample of countries is given by Albania, Algeria, Angola, Armenia, Australia, Austria, Azerbaijan, Bahamas, Bangladesh, Belarus, Belize, Benin, Bhutan, Bolivia, Bosnia & Herzegovina, Botswana, Brazil, Brunei Darussalam, Bulgaria, Burkina Faso, Burundi, Cambodia, Cameroon, Cape Verde, Central African Republic, Chad, Chi na, Colombia, Comoros, Democratic Republic of Congo, Republic of Congo, Côte d'Ivoire, Croatia, Cyprus, Dominican Republic, Ecuador, Egypt, El Salvador, Equatorial Guinea, Estonia, Ethiopia, Fiji, Gabon, the Gambia, Georgia, Ghana, Greece, Guatemala, Guinea, Guinea-Bissau, Guyana, Haiti, Honduras, Italy, Jamaica, Japan, Kazakhstan, Kenya, Korea, Kyrgyz Republic, Lao, Latvia, Lebanon, Lesotho, Liberia, Libya, Lithuania, Luxembourg, Macao, Macedonia, Madagascar, Malawi, Malaysia, Maldives, Mali, Malta, Mauritania, Mexico, Moldova, Morocco, Mozambique, Myanmar, Namibia, Nepal, Netherlands, New Zealand, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Poland, Romania, Russian Federation, Rwanda, Senegal, Sierra Leone, Singapore, Solomon Islands, South Africa, Sri Lanka, Suriname, Swaziland, Switzerland, Tajikistan, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, United Kingdom, United States, Uruguay, Yemen, Zambia.