Taxation, Corruption and the Exchange Rate Regime

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Abstract:

The paper analyzes the relation between institutional quality, such as corruption, in a country and its monetary regime. It is shown that a credibly fixed exchange rate, like a currency board, can reduce corruption and improve the fiscal system. A monetary union, however, has ambiguous effects. In an asymmetric monetary union this depends on the initial degree of corruption in the countries involved, while in a symmetric monetary union with a dependent central bank corruption is likely to increase.

JEL-classification: D 72, E 63, F 33.

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1. Introduction

Empirical evidence shows a marked contrast concerning the choice of exchange rate regime for industrialized and developing countries, with emerging markets falling somewhat in between. Whereas industrial countries (with the notable exception of the member states of the European Union) mostly tend to have floating exchange rates, developing and transition countries often choose fixed exchange rates, at least de facto if not de jure (Calvo and Reinhart 2002, Reinhart and Rogoff 2004, Meissner and Oomes 2006). Arguments explaining this difference include the lower credibility of the monetary regime, the shallowness of financial markets, the openness of the country, and the existence of a dominant trading partner or a former colonial tie (for a survey of the arguments, see Rogoff et al. 2004, Isard 2005). Another factor where these groups of countries tend to differ is the amount of corruption or the quality of institutions and amount of good governance more generally. Although industrial countries are not immune to these problems, they are clearly more prevalent in developing and transition countries as indices such as Transparency International show (TI 2006). What, if any, are the interactions between these two dimensions?

In this paper I aim to explore the connection between institutional quality, the fiscal system, and the choice of the exchange rate regime. The issue is important for countries in which monetary policy is not completely unaffected by fiscal policy and where monetary policy plays an important role in financing the public budget (Cukierman et al. 1992, Crowe 2006). In addition, those countries where central banks are not completely independent and able to ensure monetary stability, other dimensions of institutional quality are often lacking as well. Corruption and rent-seeking is a prevalent phenomenon in many developing and transition countries, going hand in hand with higher rates of inflation and ambitious spending policies. In particular, resource rich countries are often characterized by high levels of corruption and rent-seeking (Ahrend and Thompson 2006, Havrylyshyn 2006, Lane and Tornell 1996, van der Ploeg 2006).
The model developed in this paper is hence relevant for countries in Africa, Central Asia or the Caucasus where corruption is a widespread phenomenon. Countries in Africa and the Commonwealth of Independent States (CIS) to a large extent exhibit traits that are reflected in the model. Several of them have considerable amounts of natural resources such as oil or gas, are plagued by widespread corruption and weak institutional capacities, and have distortive and highly unequal tax systems (pushing economic activities underground). At the same time, monetary policy institutions are not very credible. For this and other reasons, many consider forming a monetary union among themselves, such as a Western Africa Monetary Union (WAEMU) (Masson and Pattillo 2005) or among CIS states (Chaplygin et al. 2006).

Another option is a unilateral peg to a dominant currency. However, monetary arrangements need not be based on a peg to the dollar or the euro, anchor currencies where the connection between monetary policy and corruption is largely non-existent. Instead, they might be based on regional anchor currencies which are themselves subject to pressures that result in relatively high inflation. This case is relevant for some countries of the former Soviet Union, contemplating to peg to the Russian ruble (Gulde et al. 2004), or African nations that might consider joining a monetary union with, say, Nigeria (Masson and Pattillo 2005).

The paper is related to three issues so far discussed separately in the literature. One dimension discussed in the literature is the question how fiscal policy and exchange rate regimes go together (De Kock and Grilli 1993, Tornell and Velasco 2000). Monetary policy is considered part of fiscal policy and needed to finance part of the budget. The trade-off considered is one between lower inflation and higher taxation that goes hand and hand with a peg or monetary union. Tornell and Velasco (2000) argue that flexible rates impose more fiscal discipline because fixed rates shift the costs of deficits into the future and thus induce reckless fiscal policy.
This literature overlooks that there is a second dimension of fiscal policy, that is, the question of corruption or leakages from fiscal revenue more general (for a survey, see Aidt 2003). In particular many transition economies and developing countries have a fundamental problem of corruption affecting fiscal revenues. A closely related literature discusses the influence of interest groups on fiscal policy, arguing that powerful interest groups tend to overspend revenues (Tornell and Velasco 1992, Lane and Tornell 1996). This is a standard tragedy-of-the-commons-problem in which uncoordinated groups do not take into account the external effects of their behavior and thus overuse a given resource. While this literature usually asks what institutional solutions might help to solve this problem, I ask whether a particular exchange rate regime could help to induce governments to be less tolerant with corruption.

Finally, there exits the voluminous literature that looks at the connection between monetary policy and institutional quality more broadly. This literature, starting with Rogoff (1985), usually focuses on the institutional independence of the central bank or other institutional solutions that lead to a low rate of inflation. The closely related dimension of institutional quality in the sense of corruption and rent-seeking, however, is largely unexplored.

Most closely related to this paper is recent work by Huang and Wei (2006) who have made a first step into exploring the connection between institutional quality and monetary policy but with a different focus. They analyze the question of optimal monetary regime more broadly and include such regimes as inflation targeting and a conservative central bank. Given deficits in institutional quality in many of these countries, however, internal solutions, such as appointing an independent and conservative central banker or moving to inflation targeting, are not very credible and I therefore focus on different types of external solutions like a peg or monetary union. Moreover, I reach different results than they do concerning the desirability of choosing fixed exchange rates. While they argue that pegging is not the best result, I conclude
that pegging to a stable anchor currency will lead to lower levels of corruption than monetary autonomy or a monetary union per se. One important reason why they reach a different result could be that in their model taxes and institutional quality (or corruption) are not chosen simultaneously but sequentially. This obviously leads to different results than allowing that both are chosen jointly as in my model.

The paper is structured as follows. Section 2 develops a theoretical model that analyzes the relation between fiscal policy, corruption and inflation. Sections 3-5 look at monetary independence, a tight peg, and a monetary union respectively. Section 6 discusses the results, and section 7 looks at the case of a dependent central bank. Section 8 concludes.

2. The Model

The model I use is a combination of the models proposed by De Kock and Grilli (1993) and Huang and Wei (2006), which draws on Alesina and Tabellini (1987). The real economy is reflected in an expectations augmented Phillips-curve where output can be increased from its potential by surprise inflation and is lowered by distortive taxation. The slope of the Phillips-curve is assumed to be unity, and the negative influence of taxes on output is measured by $\alpha < 1$ which thus measures how distortionary taxes are. Thus, output follows

$$y = \bar{y} + (\pi - \pi^*) - \alpha\tau$$

This budget constraint is based on the models introduced by De Kock and Grilli (1993) and Huang and Wei (2006), comprising different sources of revenue. Extending these models, I assume the government benefits from some exogenous income stream, $\kappa \geq 0$, that might be thought of as revenue from natural resources, such as oil, gas, diamonds or gold. This allows introducing aspects important for many developing and transition economies with considerable amounts of natural resources at their disposal.
Nominal tax revenue, to be determined by the government, is $\tau$. $\theta$ denotes leakages or theft, or corruption for short. Corrupt officials (or parts of the government) may be bribed into not collecting all tax obligation by underreporting profits of firms, they may steal part of the revenue, or might divert funds for personal purposes, and a non-benevolent government might abuse public funds for personal use and prestige objects. Finally, it could also reflect the access of uncoordinated interest groups to the budget (Tornell and Velasco 1992). In contrast to Huang and Wei (2006) I do not assume that corruption is a share of tax revenue but an absolute sum that might, because of $\kappa$, even be larger than the tax revenue $\tau$. Corruption is not only a reduction of tax revenue but it might in addition divert a part of the exogenous revenue stream from natural resources and from seigniorage into private pockets.

In addition, the government benefits, depending on the exchange rate and monetary system that it operates, from seigniorage revenue that is assumed to be transferred from the central bank to the budget. Because the private sector economizes on the holdings of money in a high inflation environment, seigniorage is falling in expected inflation so that only surprise inflation is yielding revenues (DeKock and Grilli 1993). However, because residents cannot fully economize on the holdings of national money (unless the country is officially dollarized), even expected inflation yields some revenue. Its contribution is measured as $s$.

The budget constraint is thus given as

$$g = \kappa + \tau - \theta + \varpi(\pi - \pi^e) + s\pi^e$$

There are three players: the private sector, the central bank and the government. The private sector forms rational expectations about the rate of inflation and is otherwise passive.

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1 Corruption is only a shorthand expression for all forms of expropriation of official funds. This can be by the bureaucracy, government ministers, managers of publicly owned resource extraction industries, or anybody else with access to public funds. See Aidt (2003) for a thorough discussion of how corruption leads to revenue leakages.

2 A fully or nearly fully dollarized economy would thus have $s$ close to zero.
Government and central bank are two independent actors. This could either reflect some degree of independence of the central bank or describe a conflict between different entities of the government, such as between the ministry of finance and other ministries and the central bank. All players play Nash against each other, so that fiscal policy, monetary policy, expectations and anti-corruption measures are all taken simultaneously and non-cooperatively.\(^3\)

Like it is standard in the literature, I assume that the central bank is concerned with avoiding deviations of inflation from zero and stabilizing output around its distortion-free level (Barro and Gordon 1983, Rogoff 1985).\(^4\) The degree of conservatism of the central bank (Rogoff 1985) is measured with \(c\). The higher is \(c\), the more the bank is concerned with stabilizing inflation at zero. Then, the central bank’s objective function is given as

\[
L = c\pi^2 + (y - \bar{y})^2
\]  

(3)

The government is supposed to be under the influence of several important interest groups in the economy, so that it aims simultaneously to stabilize output and inflation, as well as meeting a spending target, which could reflect the aim of being reelected or other demands from interest groups the government must satisfy. The more the government is under pressure to meet spending targets, the higher is the spending target \(g\). In addition the government in concerned with corruption (or leakages of fiscal revenue). Changes to the given level of corruption \(\theta\) are assumed to be costly in political terms. Increasing corruption might result in protest from the population, lower foreign investment or less support from international

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\(^3\) The Nash assumption is relaxed in section 7.

\(^4\) Huang and Wei (2006), using Alesina and Tabellini’s (1987) approach, assume that the central bank is also concerned with stabilizing government spending around the target value. This leads to an inflation bias independent from the output target. However, since it is not obvious why central banks should be concerned with spending targets, I use the standard formulation.
financial organizations (like the World Bank and the International Monetary Fund). A reduction in corruption, in contrast, leads to personal income losses for the government, or, in case of a benevolent government, to alienation of former beneficiaries of corruption. I hence assume that the level of corruption can be reduced by the government from a given level \( \bar{\theta} \) by increasing the control of public servants, by reducing the influence of interest groups and rent-seeking, and by creating better institutions like setting up independent courts and improving public administration. The costs of creating a more efficient and less corruptible system are measured by \( C(\theta) \). Depending on the government’s own position, \( C(\theta) \) might be negative in case that some interest groups resist corruption fighting, or that the government itself profits from corruption. In this case, \( \theta \) is a private benefits and not a cost. On the other hand, the government might be honest and interested in reducing corruption, in which case it is a negative influence on the utility of the government. Because there are costs of fighting corruption, I assume that changes in either direction from a given level are politically costly. For simplicity, \( C(\theta) \) is specified as \( C(\theta) = \gamma(\theta - \bar{\theta})^2 \) in what follows.

The government’s objective function is

\[
V = c\pi^2 + (y - \bar{y})^2 + b(g - \bar{g})^2 + C(\theta)
\]

(4)

Note that, in contrast to Huang and Wei (2006), I assume that \( \theta \) is chosen simultaneously with taxation. Their assumption is that it this variable is chosen only after taxation has been chosen. Here, because governments, because they can control corruption to some degree, consider fighting corruption as an alternative to increasing taxation and thus optimize the mix between fighting corruption and increasing taxation, rather than optimizing taxation and only afterwards deciding about much effort to put into fighting corruption.

\[\text{Pomfret (2006) and Havrylyshyn (2006) for instance report that strong increases in corruption have lead to stops in credits from IMF and World Bank in several CIS states.}\]
3. Corruption and Independent Monetary Policy

One choice of the government can be to keep monetary policy nationally determined. Assuming that the central bank is independent enough not to be a direct instrument of the government (which is relaxed in section 7 below), all players make their choices in Nash-fashion, that is, the two national players choose their optimal policies in a non-cooperative game.

I begin by describing the choice of the central bank. Its optimal policy follows form minimizing (3) as \( \pi = \frac{\alpha \tau + \pi^e}{1 + c} \). With rational expectation of the private sector, expected inflation can be derived as \( \pi^e = \left( \frac{\alpha}{c} \right) \cdot \tau \), leading to

\[
\pi^N = \frac{\alpha}{c} \tau^N
\]

where the index \( N \) refers to nationally set monetary policy. Because of the deterministic structure of the model actual and expected inflation are equal and monetary policy has no stabilization role but only contributes to financing the government’s budget. The central bank is thus pushed into trying to compensate for the negative influences of taxation on output because too high taxation lowers output by too much.\(^6\) The more inflation averse is the central bank the lower is the reaction to fiscal policy. Increasing \( c \) can thus be seen as appointing a more conservative central banker, leading to a lower rate of inflation in response to taxation.

Next, I analyze the policy choices of the government. Optimization of (4) with respect to fiscal policy and corruption yields \( \tau = \frac{b}{\alpha^2 + b \left( \bar{g} - \kappa + \theta - s \pi^e \right)} \) for taxation and a level of

\(^6\) As indicated above, assuming that the central bank is concerned with a spending target as well would in addition increase inflation due to the bank’s intention to contribute to financing these expenditures.
corruption of \( \theta = \frac{b}{b+\gamma}(\tau + s\pi^c + \kappa - \bar{g}) + \gamma \bar{\theta} \). Solving these equation simultaneously, yields optimal taxation as

\[
\tau^N = \frac{c\gamma(\bar{g} - \kappa + \bar{\theta})}{c\alpha^2(\gamma + b) + \gamma b(c + \alpha s)}
\]  

(6)

Taxation is increasing in the difference between spending targets and exogenous revenue (windfalls) \( \bar{g} - \kappa \) and in the initial degree of corruption \( \bar{\theta} \) since this implies that fiscal revenue is lower, all else equal. An ambitious spending target increases taxation (also increasing distortions in the real economy as the output equation (1) shows), and so do high levels of corruption. Taxations is falling in the contribution of seigniorage to the budget, measured by \( s \), and is increasing in \( c \), the central bank’s conservatism. Because \( c \) lowers inflation and seigniorage, taxation has to increase.

Corruption is allowed to be

\[
\bar{\theta}^N = \frac{\gamma \bar{\theta}(c\alpha^2 + b(c + \alpha s)) - bc\alpha^2(\bar{g} - \kappa)}{c\alpha^2(\gamma + b) + \gamma b(c + \alpha s)}
\]  

(7)

which is falling in \( (\bar{g} - \kappa) \), meaning that a higher spending target induces more efforts to fight against corruption and it is increasing in initial corruption. The higher is the windfall \( \kappa \), the higher corruption will be allowed, as is frequently observed in resource rich countries (van der Ploeg 2006). \( \bar{\theta}^N \) is increasing in \( s \) (the contribution of seigniorage to the budget) if (and only if) \( \bar{\theta} > (\bar{g} - \kappa) \), and it is decreasing in \( c \). That is, the more conservative is the central bank the

\[ \text{Notice, however, that there is no voracity effect, as derived by Lane and Lane (1996). They show that appropriations from the budget might even increase more than windfalls. Here instead } \frac{\partial \theta}{\partial \kappa} < 1. \]
more efforts the government will make to lower corruption and other forms of leakages because it can expect only little contribution from seigniorage to the budget.

4. Exchange Rate Pegs

One frequently chosen alternative to independent monetary policy is an exchange rate peg, still mostly chosen by developing and transition countries (Calvo and Reinhard 2002, Reinhard and Rogoff 2004, Keller and Richardson 2003, Rogoff et al. 2004) because of persistent credibility problems with independent monetary policies. There are many forms of pegs, of course, but I will focus on the subgroup of very hard peg, such as dollarization and currency boards. Intermediate regimes with some limited flexibility provide a combination of peg and flexible rate and are chosen by many more advanced developing countries and larger transition economies (Frankel 1999). However, intermediate forms are in general much less credible than hard pegs, which is particularly relevant for those countries that are also plagued by high levels of corruption and weak institutions. The difference to the case of monetary union, to be considered in the next section, is that the central bank of the anchor country does not take into account developments in the pegging country. Hence, inflation is completely exogenous for the pegging country and there is no reaction of monetary policy to taxation or corruption. While this provides the most credibility, it also increases budgetary problems because seigniorage revenues is lost.8

Denoting inflation in the anchor country as $\pi$, the government’s choice of taxation and corruption tolerated (indexed P) are

$$\tau^p = \frac{b\gamma(\bar{\pi} - \kappa) + \bar{\theta} - s\pi}{\alpha^2\gamma + b(\alpha^2 + \gamma)}$$

(8)

and

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8 While it is theoretically possible that the anchor country transfers seigniorage revenue to the pegging country, this is not observed in reality (Williamson 2006).
For all practical purposes, it can be assumed that inflation in the anchor country is so low that the contribution of seigniorage to the budget at this rate of inflation is negligible. I therefore set \( \pi = 0 \) in the further analysis.\(^9\) This implies that I cannot distinguish between a very tight peg, such as a currency board, and full dollarization, however. While the former, in principle, implies some seigniorage revenues as long as the anchor rate of inflation is positive, this is not the case in the latter case.

Comparing the two regimes with each other, one finds that corruption will go down with a credible peg and that taxation will go up. Thus, \( \tau^p > \tau^N \) and \( \theta^N > \theta^p \). Hence, exchange rate pegging will lead to a more efficient and equitable fiscal system. Because the output gap is, without stochastic shocks, only a function of the level of taxation, it also follows that the output gap will be increasing under pegging, \( y^N > y^p \). Inflation, due to the assumption of zero inflation under pegging will obviously fall in comparison to autonomy \( \pi^N > \pi^p \). Comparing the level of spending, it follows that \( g^p > g^N \), so that pegging will in generally imply a lower level of spending despite the fact that taxation has increased.

This is summarized in the following proposition:

**Proposition 1:**

A tight peg leads to more taxation, lower output, lower inflation, lower spending and lower corruption than monetary autonomy.

\(^9\) This may of course be different for a country that unilaterally pegs to another developing or transition country. Since most pegs are to the dollar or the euro, however, I neglect this case.
Because the government loses seigniorage the budget constraint becomes harder, forcing the government to look for alternative sources to finance the budget and to lower the overall level of spending. There are two sources which are both used to make up for the loss of seigniorage, taxation and fighting corruption. Because both instruments have increasing marginal costs of using them, it is clear that both will be used and costs are spread evenly.

5. Monetary Union

The case of a monetary union is more complicated. I assume there are \( n \) countries in the monetary union and that the individual country \( i \) has a relative share of \( z_i = \frac{1}{n} z \) with respect to the entire union. The average of the other countries is \( z_2 = \frac{1}{n} \sum_{j \neq i} z_j \), so that \( z_1 + z_2 = 1 \).

Since I am interested in the situation of the individual country, which is likely to be rather small in comparison to the rest of the monetary union, I assume \( z_2 > z_1 \). This reflects, for instance, a monetary union between a very large and a small country, such as discussed Russia and individual CIS and thus be equal to a very large monetary union, such as the European monetary union. As Chaplygin et al (2006) argue it is even possible that \( z_1 \to 0 \) so that the smaller country plays no role in determining optimal monetary policy. The difference to a unilateral peg, however, is that some seigniorage revenue is distributed to the country.

In a Nash-game it is obvious that with symmetric countries the values for a single country are equal to the average and vice versa. Thus, the result will become only interesting if the two countries (group of countries) diverge in some characteristics. In order to focus on economic differences, I assume \( (\overline{g}_1 - \kappa_1) \overline{z} (\overline{g}_2 - \kappa_2) \) and \( \overline{\theta}_1 \overline{z} \overline{\theta}_2 \) while all utility parameters are equal across countries. (It is rather trivial to derive economic consequences of different preferences. Moreover, higher or lower preferences for, say corruption, lead to the same effect as a higher initial level of corruption.)
The central bank’s objective function in the monetary union (indexed MU) is

\[ L_{MU}^{\pi} = c\pi^2 + b(z_1(y_1 - \bar{y}_1) + z_2(y_2 - \bar{y}_2))^2 \]

where I assume that inflation is equal across the monetary union. Inflation is then given as

\[ \pi_{MU}^{\pi} = \frac{\alpha}{c}(z_1\tau_1 + z_2\tau_2) \]  \hspace{1cm} (10)

The reaction function of taxation to this rate of inflation (with a similar expression for \( \tau_2 \)) is then given as

\[ \tau_{MU}^{\pi} = \frac{b(y_c(c - \kappa) - saz_2\tau_2)}{\alpha^2(y + b) + \beta(b + saz_1)} \]  \hspace{1cm} (11)

for the pegging country. Because inflation reacts to taxation in the rest of the union positively and contributes to seigniorage in the pegging country, tax rates in the countries are negatively correlated. The larger the rest of the union, the stronger is this influence. The lower is the own relative weight, the higher will taxation be because the central bank does not react to domestic taxation and thus inflation will not be increasing. Therefore, revenue has to come from taxation and \( \tau_{MU}^{\pi} \) is increasing in \( z_1 \).

Optimal corruption is

\[ \theta_{MU}^{\pi} = \frac{b}{b + \gamma} \left( \tau_1(c + \alpha sz_1) - c - \tau_2 \cdot \alpha sz_2 + (c - \kappa) \right) + \frac{\gamma}{b + \gamma} \bar{v}_i \]  \hspace{1cm} in country 1

with a similar expression in country 2. Solving taxation and corruption simultaneously, the equilibrium tax rate in the domestic country is
As before, taxation is increasing in the structural spending gap and initial corruption in the home country. However, it is falling spending gap and corruption in the other countries. Again, this is because those variables give rise to higher inflation and thus seigniorage. The larger the relative weight $z_2$ of other countries, the more domestic taxation can decrease.

The level of corruption follows as

$$
\theta^{\text{MU}}_1 = \left(\frac{c\alpha^2 (\gamma + b) + \gamma b (c + \alpha s)}{\alpha^2 (\gamma + b) + \gamma b}\right) \left[\frac{\alpha^2 (\gamma + b) \gamma b - \alpha^2 b (\bar{g}_1 - \kappa_1)}{\alpha^2 (\gamma + b) + \gamma b}\right]
$$

$$
= \frac{\gamma^2 \alpha^2 \beta^2 \alpha s [z_1 (\bar{g}_2 - \kappa_2 + \bar{\kappa}_1) + z_1 (\bar{g}_1 - \kappa_1 + \bar{\kappa}_1)]}{\alpha^2 (\gamma + b) + \gamma b}\left[\frac{c\alpha^2 (\gamma + b) + \gamma b (c + \alpha s)}{\alpha^2 (\gamma + b) + \gamma b}\right]
$$

Corruption is increasing in the initial level and decreasing in the spending gap, like in the case of monetary independence. It is additionally increasing in seigniorage revenue (the second term), which in turn is function of spending gaps and initial corruption in all member countries. Hence, corruption levels in member countries are complements.

Comparing the results for monetary union with the results under monetary autonomy leads to the following proposition:

**Proposition 2:**

Taxes will decrease, $\tau^{\text{MU}}_1 > \tau^{\text{N}}_1$, and corruption will increase $\theta^{\text{MU}}_1 > \theta^{\text{N}}_1$, in an asymmetric monetary union if $\bar{g}_2 - \kappa_2 + \bar{\kappa}_2 > \bar{g}_1 - \kappa_1 + \bar{\kappa}_1$. In this case, output will increase $y^{\text{MU}}_1 > y^{\text{N}}_1$ (because taxation is lowered) and inflation will increase $\pi^{\text{MU}}_1 > \pi^{\text{N}}_1$. Spending under monetary union is larger $g^{\text{MU}}_1 > g^{\text{N}}_1$ if $z_2 > z_1$. 
Monetary union will thus not necessarily have beneficial structural effects in the potential member country. If the average of the other member countries has a high financial gap and a high degree of corruption, this means that taxation in those countries must be relatively high. In this case, inflation set by the common central bank is relatively high, which in turn implies that seigniorage is relatively high for the home country as well. Thus, the country can “afford” to let corruption increase and lower domestic taxation. If, as seems logically for most small countries, the relative weight is smaller than that of the average of other countries, government spending will increase because of the higher revenue from inflation, even though corruption does increase as well. Thus, a highly asymmetric monetary union with a strong partner country that is additionally characterized by high levels of corruption and ambitious spending targets is likely to deteriorate institutional quality in the smaller country. There is hence a convergence between countries; countries with a high initial level of distortions will increase corruption in the other country while a monetary union with a lower average level of corruption than the home country will have a disciplinary effect on the home country. A monetary union will hence be beneficial for institutional quality only if it is with the “right” partner countries.

Comparing instead the tight peg to the monetary union yields the following results:

**Proposition 3:**

Taxes will decrease, $\tau_i^P > \tau_i^{MU}$, and corruption will increase $\theta_i^{MU} > \theta_i^P$, if a country moves from a tight peg to an asymmetric monetary union. Inflation and the level of output will increase $\pi_{i}^{MU} > \pi_{i}^P = 0$ and $y_{i}^{MU} > y_{i}^P$. The level of spending will decrease $g_{i}^{MU} > g_{i}^P$ if $z_2 > z_1$ and $\bar{g}_2 - \kappa_2 + \bar{\sigma}_2 > \bar{g}_1 - \kappa_1 + \bar{\sigma}_1$. 

15
Since by definition the peg is accompanied by a zero rate of inflation and also zero seigniorage, it is clear that inflation increases in the monetary union, while taxation will decrease. Due to higher seigniorage revenue, the government will allow corruption to increase. Because of lower taxation under monetary union output will increase. The influence on the overall level of spending is ambiguous. Thus, countries that are considering moving from a unilateral peg to an asymmetric monetary union where they are junior partners at best risk seeing their institutional qualities deteriorate.

6. Comparison of Monetary Regimes

The simplest result is the rate of inflation which will be lowest by a peg to a very hard currency (with a rate of inflation of zero). Therefore, pegging leads to the lowest inflation. A monetary union between countries with positive rates of inflation will lead to an increase of inflation under monetary union $\pi_{MU} > \pi_i^N$ if $\bar{g}_2 - \kappa_2 + \bar{o}_2 > \bar{g}_1 - \kappa_1 + \bar{o}_1$. Thus, whether inflation will increase or decrease is basically a function of the levels of distortions that members bring into the union.

Because seigniorage is lowest under pegging, this also implies that taxation has to be higher under this regime than under national monetary autonomy. Moreover, $\tau_i^N > \tau_{MU}$ iff $\bar{g}_2 - \kappa_2 + \bar{o}_2 > \bar{g}_1 - \kappa_1 + \bar{o}_1$ because higher inflation leads to lower taxation under monetary union. Since the output gap, under certainty, is only a function of the level of taxation, it follows that the output is increasing in taxation. Thus, the highest level of taxation will also lead to the lowest output. Since taxation is higher under the peg than under monetary union or monetary autonomy, it follows that the gap will increase vis-à-vis both alternatives. That is, entering a monetary union with more distorted countries increases output as inflation increases and thus taxation can decline because of higher seigniorage revenue. Higher seigniorage revenue also leads to higher levels of spending, implying lowest spending under
pegging. Moreover, because of lower revenue, corruption will decrease under pegging, but go up under monetary union if it is accompanied by higher inflation.

The opposing effects of changes in taxation and corruption on the level of utility (or losses) for the government are not obvious. An increase in taxation in case of active monetary policy (the national case or monetary union) will lead to an increase in inflation and lower output, thus increasing the gap between desired level and actual output. It will, on the other hand have beneficial impact on the fiscal policy, which is further supported by lower corruption (that usually goes hand in hand with an increase of taxation). However, the lowering of corruption as well has a negative impact on utility as it leads to losses in political support from those groups in the economy that have benefited from it before reform. The overall effect on utility thus mainly depends on the relative weights a government assigns to these opposing influences.

It must be kept in mind though that the lowest rate of inflation under pegging is mainly driving these results. A very tight peg to a country with a positive rate of inflation might lead to different results if this inflation is higher than under monetary autonomy or monetary union.10 Countries with relatively low levels of distortions in spending targets and corruption might thus see an increase in corruption if a different monetary regime leads to higher seigniorage revenue.

7. The Case of a Dependent Central Bank

Finally, I briefly consider the case of a central bank that is not able to commit its policy. There are obviously countries where the government is able to fully predict the central bank’s reaction function because the central bank is not fully independent. Technically speaking this corresponds to the government assuming the position of Stackelberg-leader in the domestic

10 This is unlikely case, however, because unilateral pegs are usually to low inflation currencies.
game. The government thus optimizes (4) taking (5) into account. In this case, national
taxation and corruption are given as

$$
\tau_i |_{DCB}^N = \frac{bc\gamma(c + \alpha s)(\bar{r}_i - \kappa_i + \bar{u}_i)}{c\alpha^2(1 + c)(\gamma + b) + b\gamma(c + \alpha s)^2}
$$

(14)

and

$$
\theta_i |_{DCB}^N = \frac{\gamma\bar{u}(c\alpha^2(1 + c) + b(c + \alpha s)^2) - bc\alpha^2(1 + c)(\bar{r}_i - \kappa_i)}{c\alpha^2(1 + c)(\gamma + b) + b\gamma(c + \alpha s)^2}
$$

(15)

In such a case, countries might still consider to form a monetary union with other
countries that are likewise able to lead their central banks. It is rather unlikely that those
countries would completely be willing to join a monetary union in which they lose this role.
Thus, I assume that the monetary union is formed by identical countries that are Stackelberg-
leaders with respect to the common central bank.

The objective function of the common central bank is assumed to be

$$
L = c\pi^2 + b(y_{MU} - \bar{y}_{MU})^2
$$

(16)

where \(y_{MU} = \frac{1}{n}\sum_{i=1}^{n}(\bar{y}_i + \pi - \pi^\varepsilon - \alpha\tau_i)\) and \(\bar{y}_{MU} = \frac{1}{n}\sum_{i=1}^{n}(\bar{y}_i)\). For this case, I also assume that
inflation is equal across all member countries. The same is true for all parameter values.

In this case, the common rate of inflation is

$$
\pi_{MU} |_{DCB} = \frac{1}{n}\sum_{i=1}^{n} \frac{\alpha}{c} \tau_i
$$

(17)

Taxation will result as
\[ \tau_i^\text{MU}_{\text{DCB}} = \frac{bc\gamma(nc + \alpha s)(\bar{g}_i - \kappa_i + \bar{\theta}_i)}{c\alpha^2(nc + 1)(\gamma + b) + b\gamma(nc + \alpha s)(c + \alpha s)} \]  \hspace{1cm} (18)

and corruption will be

\[ \theta_i^\text{MU}_{\text{DCB}} = \frac{\gamma\theta(c\alpha^2(1 + nc) + b(nc + \alpha s)(c + \alpha s)) - b\alpha^2(1 + nc)(\bar{g}_i - \kappa_i)}{c\alpha^2(nc + 1)(\gamma + b) + b\gamma(nc + \alpha s)(c + \alpha s)} \]  \hspace{1cm} (19)

These results are obviously equal to the national case when setting \( n=1 \). Thus, the question is, how the number of member countries to the monetary union influences the results. Taking the derivative of (18) with respect to \( n \) shows it is positive, which also implies that inflation will increase and output fall in \( n \). The derivative of (19) with respect to \( n \) is positive if \( \bar{\theta}_i > \bar{g}_i - \kappa_i \). Government spending will increase in \( n \) if \( \bar{g}_i - \kappa_i + \bar{\theta}_i(c + \alpha s) > 0 \). We hence have:

**Proposition 4:**

Taxation in a symmetric monetary union with a dependent central bank will increase in the number of member countries, leading to higher inflation and lower output. Corruption and government spending will increase if initial corruption is higher than the structural financial gap.

Monetary union will lead to higher taxation the larger is the monetary union because any single country realizes that it is only \( 1/n \) th of the monetary union, not expecting the common central bank to increase seigniorage enough in order to finance the budget sufficiently when increasing taxation. Because of higher taxation it also follows that output is decreasing while inflation will increase in equilibrium. For countries with very high level of
corruption this will further increase, whereas countries with high spending targets and low windfalls will be disciplined through the move towards monetary union. Government spending will increase if spending targets are high, windfalls are low and initial corruption is high. In comparison to monetary autonomy, the government feels less constrained because of higher seigniorage and taxation.

8. Conclusion

The paper has analyzed a relatively underexplored dimension of institutional quality and monetary policy. While the existence of independent and conservative central banks has often been explored in comparison to external anchors for monetary policy, the influence of fiscal policy and corruption and rent-seeking is relatively under-explored. I develop a model that explicitly considers the connection between fiscal policy and monetary policy if corruption and other leakages from fiscal revenue are important. It is shown that a tight peg to a low inflation currency can improve the institutional quality in a country, that is, lower the level of corruption. The government is induced to fight more strongly against leakages and corruption if the revenue from seigniorage is lowered. This, unfortunately, also leads to higher taxation and thus higher output distortions. Which of the regimes is preferred by a government mainly depends on the initial level of distortions and corruption and the relative preference for reducing inflation, stabilizing output and expenditures, and fighting corruption.

Moving to a full monetary union can lead to more or less corruption, depending mainly on the choice of partner countries for the monetary union. Countries with different levels of corruption and spending targets for fiscal policy will experience a convergence in corruption and spending. Thus, lower corruption will only result if the country joins a monetary union where is has a relatively little weight and where the other countries have relatively well developed institutions.
These results have obvious implications for those countries in a high corruption environment, such as in Africa or the CIS states. Since some of these countries are considering one or the other form of monetary integration with dominant neighbors, these results suggest to be careful. It might be better in some cases to rather peg or continue to peg to currencies like the US-dollar or the euro. It also casts some doubt on the now nearly universal IMF advice that countries chose flexible exchange rate regimes. Such a solution may actually be accompanied by a deterioration of institutional quality which is also one of the aims of international organizations. It should be taken into consideration that these aims need not necessarily go together well.

References


Transparency International (2006) Corruption Perception Index,