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Commitment, Institutional Capacity and the Monetary-Fiscal Mix

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ABSTRACT

An interesting theory of transition must give a convincing account of structural adjustment and supply side improvement. In this paper, I discuss the incentives for government to undertake costly supply side improvement and how these relate to incentives governing the design of monetary and fiscal policy during transition. The government cares about deviations of inflation, output and government spending from their ideal levels, is subject to a budget constraint in which inflation yields some real revenue, and recognizes the distortionary effects of excess levels of taxation. Costly structural adjustment enhances future output by reducing supply side distortions.

Within this framework, optimal policies are derived. For a given level of inherited structural capacity, optimal levels of inflation, output and government spending are derived. A poor structural inheritance forces high tax distortions, low output, and heavy reliance on the inflation tax. Hence there is a negative cross-country correlation of output and inflation, because of differences in structural inheritance, even though each country faces a vertical long run Phillips curve. Relative to the first best, failures of monetary precommitment lead to an inflation bias. Joining EMU may improve matters by solving this problem, but may induce two other difficulties: it may reduce the inflation tax too much, and it may lead to stabilization of the wrong shocks. It need not be welfare enhancing.

The incentive for structural adjustment is then examined. Compared with the first best speed of adjustment, a failure of monetary discretion, by raising distortions, increases the marginal benefit of reform and induces more rapid adjustment. If transition economies willingly enter EMU, their distortions are reduced and in consequence they will reform more slowly. Since this seems at variance with current perceptions, the paper then introduces two further failures, namely in fiscal commitment and in commitment to reform itself. It is shown that these can interact to make complete stagnation of reform the optimal policy conditional on the failures remaining. In those circumstances, EMU membership, or even its prospect, may be a powerful force for speeding up the pace of reform in countries that otherwise would have stagnated.

JEL Classification: E32, E42, F41, F42

1. INTRODUCTION

Economic transition entails macroeconomic stabilization and structural adjustment. This paper is about the relation between the two, and the impact of EMU on both. Stabilization involves getting the public finances under control and developing credible policies for progressive disinflation. Structural adjustment involves developing the institutional infrastructure for markets to function effectively: property rights, corporate governance, competition, appropriate regulatory institutions, modern tax structures and enforcement of tax compliance. Satisfaction of macroeconomic stabilization criteria will be necessary if European transition economies are to join EMU. However, prior membership of the EU itself will also be needed, and this will depend heavily on success in structural adjustment. Structural adjustment, for example the institution of modern tax structures and a tradition of their effective enforcement, is also the most reliable route to lasting macroeconomic stabilization. The 1990s have shown, most spectacularly in Russia, that sudden monetary rectitude unsupported by fiscal responsibility leads quickly to a new setback.

How might one examine the likely impact of EMU on Europe's transition economies? One might explore the changing nature of competition, market integration, and factor mobility. Such considerations can be incorporated into the analysis below, but are not my primary concern. I focus on the effect of EMU entry, actual or prospective, on the credibility of macroeconomic policy, and through this, on the incentive to undertake structural adjustment.[1]

Reform is costly today but improves future opportunities. I capture cumulative progress to date by the extent to which an effective tax base has been established and enforced. Two reasons make this a good choice. First, collapse of the ability to raise revenue lay behind many of the setbacks in the countries lagging in transition. Second, tax capacity is a natural link between structural adjustment of the supply side and the public finance constraint on fiscal policy, monetary policy, and inflation.

To answer questions about structural adjustment, my paper needs to develop some building blocks along the way. I view various monetary and fiscal regimes as chosen delegation of operational powers in response to inefficiencies arising from market distortions or commitment failures. The delegation of *monetary* policy is the subject of a large literature, spawned by the conservative central banker in Rogoff (1985). It has led to the

creation of many independent central banks, whose obligations, explicit or implicit, have been examined in the formal contracts of Walsh (1995), and the inflation targets recommended in Svensson (1997).

In contrast, the literature on delegation of fiscal powers is sparse. Governments rarely give away fiscal powers for macroeconomic reasons. However, disaggregation within the cabinet matters: appointing an 'iron chancellor' as finance minister is the fiscal analogue of a conservative central banker. Economists have paid this scant attention, presumably because they believe that finance ministers are fired more easily than central bank governors. For an early examination of problems of fiscal commitment, see the 'benevolent dissembling dictator' in Fischer (1980). Some measure of fiscal delegation is precisely what is accomplished when countries agree to budget conditions imposed by external agencies, such as the IMF or EU, as part of some wider agreement.

Recognizing limits to fiscal commitment also has implications for monetary policy design. Given interactions between monetary and fiscal policy, it is inappropriate to design monetary institutions that neglect failures in fiscal policy. The problem is innately second best. Most of the literature on monetary institutions ignores this reality.[2] A fortiori, it is impossible to understand transition economies in the 1990s without placing centre stage two problems of fiscal commitment: the difficulty in sticking to plans to set adequate tax rates (including dispensing with subsidies at the planned rate), and the difficulty of implementing promises to undertake structural adjustment. I consider how a benevolent government might choose to delegate powers to mitigate distortions,[3] and then explore how prospective EMU entry may affect behaviour in transition economies.

Section 2 sets out a basic model. For comparison with the literature on monetary commitment, initially I treat as given the level of structural adjustment, represented by a given level of tax capacity, and ignore problems of fiscal commitment. Government spending is financed by the inflation tax or distortionary taxes that reduce output. Fully solving the monetary precommitment problem yields the first-best policy. Various second best policies are examined. For some parameter values, the government may choose to delegate monetary policy to a central bank that is *less* conservative, because the low inherited tax capacity makes other forms of taxation even more distortionary than expected inflation.

A low level of structural adjustment leaves the government with poor choices. Such a country faces high inflation, high tax distortions, low

government spending and low output. Even though the implicit 'Phillips curve' is vertical with respect to expected inflation, a cross-country comparison, using countries at different stages of structural adjustment, would find on average a negative relation between inflation and output,[4] not because inflation depresses output but because resort to the inflation tax is a symptom that distortionary taxes are already in use owing to a low initial level of tax capacity. Structural adjustment improves all options for the future. In contrast, undue tightening of monetary policy merely deprives the government of the (optimal) amount of inflation, forcing either further reliance on distortionary taxes or inefficiently low levels of government spending.[5]

Section 3 examines how a government can improve the future. The optimal speed of reform depends both on costs and benefits. Benefits are the ability to raise more tax revenue for any given level of output distortion. I assume quadratic costs of reform, which provide a reason to smooth reform over time. Although this may appear to give inadequate scope for issues lying behind 'big bang' recommendations, two rejoinders are persuasive. First, advanced transition economies now contemplating EU entry have long since settled down to steady reform. Second, by introducing commitment problems in reform itself, some reasons for rapid reform can be made explicit.

The speed of reform in the first-best is derived, and compared with the speed of reform in various second-best cases. More distorted countries (or regimes) have a greater benefit of reform, and thus go *more quickly* if they face the same costs of reform. If EMU entry enhances commitment and diminishes distortions, other things equal it should (optimally) slow the pace of reform.

Many aspects of actual transition are hard to square with this interpretation. Section 4 shows that commitment problems in fiscal policy and in reform itself yield more familiar results: sluggish reform, high government spending, and depressed output. I explore mechanisms of institutional design and external conditionality that would counteract these distortions, in the extreme case allowing the full decentralization of the first-best, including the optimal pace of structural adjustment. In such a setting, I ask how well EMU fulfils such a role, extending arguments set out in Begg, Halpern and Wyplosz (1999) about the role external conditionality can usefully play in these circumstances. Section 5 draws conclusions and makes suggestions for further research.

2. THE BASIC MODEL

Consider a small transition economy raising no strategic issues in relation to other countries. Distortionary taxes reduce equilibrium output, but the degree of distortion imposed by any particular tax revenue depends on the size of the tax base and the degree of tax compliance. Suppose t^+ describes the 'tax capacity' of an economy. Significant distortions arise when actual taxation t exceeds t^+. Structural adjustment increases tax capacity t^+, allowing the government to finance larger spending levels in a nondistortionary way.[6]

Each period, the private sector sets nominal contracts given expected inflation. Output obeys

$$y = a\pi^u - b\tau + \varepsilon \qquad a, b > 0 \quad , \quad \tau = t^e - t^+ \qquad (1)$$

Output responds to unexpected inflation π^u, a contemporaneous shock ε, and excess taxation τ, the amount by which actual taxes are expected to exceed tax capacity.[7] The government supplies goods and services G, which can be financed by taxation or the inflation tax

$$G = t + \lambda\pi \qquad (2)$$

Following Debelle and Fischer (1994), the inflation-tax Laffer curve is linear in the relevant range, with slope λ. The per period loss function of the government is

$$L = \pi^2 + cy^2 + dg^2 \qquad c, d > 0 , \qquad g = G - G^* \qquad (3)$$

implying a target level of zero for inflation and output (the latter being a source of inflation bias when $\tau > 0$), and where g is the deviation of G from its target level G*. From (2)

$$g = \tau - h + \lambda\pi, \qquad h = G^* - t^+ > 0 \qquad (4)$$

The government cares about price stability, deviations of output from zero, and deviations of its spending from G*. Crucially, G* exceeds its initial capacity t^+ for nondistortionary taxation. The government uses both excess taxation and the inflation tax to move initial levels of government spending closer to its target level.[8] Over time, as tax capacity rises, tax distortions

and inflation can fall. Indeed, once t^+ eventually increases to G*, both τ and π become zero.

I analyse both how policy depends on h, a measure of the tension between aspirations and existing capacity, and the dynamics of how structural adjustment of h proceeds over time. Superimposed on this problem of optimal taxation are commitment problems. In the baseline model, I study the usual monetary temptation to use surprise inflation to boost output and mitigate the distortionary effect of excess taxation; and the stabilization problem caused by the authorities' informational advantage over the private sector: inflation can be chosen after the output shock is observed, but tax decisions and private wage setting reflects ex ante expectations.[9]

I take seriously the idea that monetary policy is more flexible than fiscal policy. The sequence of events within each period is as follows. First, the government chooses government expected spending, g^e, and expected taxes, τ; next, the private sector forms inflation expectations, π^e; then the output shock ε is realized; finally, actual inflation is chosen. The government budget constraint (2) implies that surprise inflation tax revenue must be reflected either in unexpected spending, unexpected tax revenue, or both. In a model including debt accumulation, unexpected tax revenue could be used to retire debt. In my simpler model, once one controls for unexpected inflation and unexpected spending, unexpected tax revenue is of no benefit and simply disappears down a black hole. The spirit of the model is therefore better served by assuming that all unexpected inflation receipts go into unexpected government spending.

I confine my analysis to the special case in which all parameters in equations (1)-(4) are unity:

$$y = \pi^u - \tau + \varepsilon \qquad (5a)$$

$$L = \pi^2 + y^2 + g^2 \qquad (5b)$$

$$g = \tau - h + \pi \qquad h = G^* - t^+ > 0 \qquad (5c)$$

This greatly simplifies the algebra without affecting the qualitative results. The general case is discussed in Begg (1999).

2.1 First-best policy, for given tax capacity t^+ and given fiscal tension h

Suppose the government can precommit not to exploit the temptation to pursue surprise inflation. First-best policy is a vector of rules relating expected values of policy variables to inherited levels of the state variable, h; and the optimal innovation-contingent stabilization policy, relating surprise inflation to output shocks.

For a given h, choosing (π^e,τ) to minimize the expected loss E(L) subject to the output equation (5a), the budget constraint (5c), and using subscripts F to denote these first-best levels

$$0 = \pi^e_F + g_F = \pi^e_F + [\tau_F + \pi^e_F - h] \quad (6a)$$

$$0 = - y^e_F + g_F = \tau_F + [\tau_F + \pi^e_F - h] \quad (6b)$$

whence the first-best levels of taxes, expected inflation, expected output and expected spending are

$$\tau_F = h / 3 \qquad \pi_F^e = h / 3 \quad (7a)$$

$$y^e = - h / 3 \qquad g^e_F = - h / 3 \quad (7b)$$

The larger the fiscal tension h between aspirations and capacity, the larger are distortionary taxes and resort to the inflation tax, the more taxes reduce output, and the more the government finds it optimal to hold expected spending below its ideal level. With equal weighting of losses from less than ideal levels of inflation, taxes and government spending, the optimal trade-off in (7) shares the burden of inherited fiscal tension h equally among the three variables τ , y, and g.

Ex ante, the expected loss also contains second moments because of the shock ε. Only when choosing inflation is the shock known to policy makers. Unexpected inflation can respond to the shock, and, via the budget constraint (5c), yield revenue available for unexpected government spending. Choosing unexpected inflation to minimize the loss L subject to (5a) and (5c), letting the superscript u denotes the unexpected component, thus yields $0 = \pi^u + (\pi^u + \varepsilon) + \pi^u$. Hence, the first-best degree of stabilization is given by

$$\pi^u = -\varepsilon/3, \quad y^u = 2\varepsilon/3, \quad g^u = -\varepsilon/3 \qquad (8)$$

Thus, a positive output shock ε induces a tighter monetary policy to stabilize output, lower inflation, and less inflation tax available to finance government spending.

Optimal policy decomposes into a set of innovation-contingent feedback rules (8) independent of the state variable h, and the reduced form policy rules (7) describing how excess taxes, expected spending and expected inflation are linearly related to h. Equations (7) provide a rationale for crawling 'exchange rate' or 'inflation target' bands whose centre moves as structural adjustment takes place and the state variable h diminishes. Later I will give an explicit solution consistent with bands whose slope steadily flattens as progress takes place. Equations (8) indicate that extent of accommodation of shocks, for which band width is a proxy, should remain constant throughout transition. Moreover, if second best attempts to mitigate distortions rely on delegation of powers, the fact that optimal levels of expected variables in equations (7) *change* with the degree of structural adjustment accomplished means that delegation to agents with *fixed* preferences is not merely inefficient but time inconsistent, and therefore unlikely to be carried out. Having examined the ideal solution, I next introduce the problem of imperfect monetary commitment made famous by Barro and Gordon (1983).

2.2 Monetary discretion

For the moment, h is fixed and fiscal promises can be delivered. Fiscal plans are made and announced, then the private sector forms expectations, then the shock is realized, and finally monetary policy chooses the inflation rate. All decisions are made by the government; the central bank is subservient. The equilibrium is derived by dynamic programming. Monetary policy chooses inflation to minimize (5b), subject to (5a) and (5c) whence, letting the subscript D denote the discretionary regime, the first order condition is $0 = \pi_D + y_D + g_D$. Since everyone knows this is how monetary policy will be determined, this can be used both to form expectations, and to deduce how the unexpected component depends on the shock ε

$$0 = \pi^e_D + y^e_D + g^e_D \qquad (9a)$$

$$0 = \pi^u_D + y^u_D + g^u_D = \pi^u_D + (\pi^u_D + \varepsilon) + \pi^u_D \qquad (9b)$$

Using (5a) and (5c), (11a) implies[10]

$$\pi^e_D = h / 2 \qquad (10)$$

Since ex ante loss partitions into second moment terms independent of the tax rate, and functions of first moments, fiscal policy can be viewed as minimizing L (π^e, y^e, g^e), subject to the (expected values) of output equation (5a) and the budget constraint (5c), with a first order condition

$$0 = \tau_D + g^e_D \qquad (11)$$

The first term shows the cost of higher tax distortions in reduced output; the second term the benefit of higher tax revenue in allowing additional government spending (note that g is negative since actual spending is below its target level). Solving (5c), (10) and (11)

$$\tau_D = h / 4 < \tau_F \qquad (12a)$$

$$\pi^e_D = h / 2 > \pi^e_F \qquad (12b)$$

$$g^e_D = - h / 4 > g^e_F \qquad (12c)$$

For *given* fiscal policy, monetary temptation makes inflation higher than in the first-best. Anticipating this, fiscal authorities 'spend' higher inflation tax revenue partly on higher spending and partly on lower taxes and lower output distortions.

2.3 Delegating the conduct of monetary policy

2.3.1 Delegating using preferences of central bankers

Suppose the government can fully precommit the delegation of monetary policy. Consider a central banker, selected by the government, with preferences

$$L_B = \pi^2 + f y^2 \qquad f > 0 \qquad (13)$$

Equation (13) asserts that the central bank has responsibility for inflation and output alone. The issue is whether, and if so how much, it should care even about output. The government chooses f, and selects a particular banker, to minimize government expected losses given that the central bank then acts with discretion, for which the first order condition is

$$0 = \pi + fy \qquad (14)$$

whence $0 = \pi^u + f(\pi^u + \varepsilon)$ and

$$\pi^u = -f\varepsilon/(1+f) \qquad y^u = \varepsilon/(1+f) \qquad (15)$$

Taking conditional expectations in (14),

$$\pi^e = f\tau \qquad (16)$$

The government knows that it will choose fiscal policy recognizing its effect on the independent central bank. Hence the first order condition for choosing the tax rate is

$$0 = \pi^e f + \tau + [\tau - h + f\tau][1+f] \qquad (17)$$

whence using the subscript M to denote delegated monetary independence

$$\tau_M = h[1+f]/\Delta_M \qquad \Delta_M = f^2 + 1 + (1+f)^2 \qquad (18a)$$

$$\pi^e{}_M = f\tau_M \qquad (18b)$$

Finally, the government chooses f to minimize $E(L^2)$ subject to the preceding equations:

$$0 = \{f\pi^e + \tau + [\tau - h + f\tau][1+f]\}\,\delta\tau/\delta f + \{\pi^e + [\tau - h + f\tau]\}\tau + \delta/\delta f\ \{[1+f]^{-2}[1+2f^2]\}\sigma^2.$$

The first term is zero by equation (17): the envelope theorem applies to the effect of f on the choice of τ. The middle term is the effect of f on expected variables, other than through its induced effect on the choice of taxes (equation (18b)). The third term is how f affects the accommodation of shocks, and hence the variance of inflation, output and government spending, expressed as functions of σ^2, the variance the exogenous shock ε.

Substituting from (18) and undertaking the differentiation in the third term, the first order condition for the choice of f is

$$0 = \{ [h / \Delta_M]^2 [f^2 - 1] \} + \{\sigma^2 [1+f]^{-3} [2f - 1]\} \quad (19)$$

If there are no shocks, the second term is zero. Then the optimal choice is $f_M = 1$ which also equals the government's own weight on output in (3) when all parameters are set to unity. In this case, *the benefit in precommitment that a more conservative central banker would provide is exactly offset by the loss arising from lower inflation tax and greater reliance on distortionary taxes that depress output*.[11]

Now suppose the variance of shocks is positive in (19). If the first term was zero (eg because full structural adjustment had reduced h to zero), the optimal choice would be f = ½, half the weight on output stabilization than the government itself attaches to it, restoring the first-best degree of stabilization in (15). *A 'conservative' central banker is now appropriate, but not for any reason to do with mitigating temptations to inflate.* Rather it is because the central bank ignores the effect of its actions on government spending. Since the central bank does not internalize the effect of surprise inflation in changing the ability to finance government expenditure, the central bank pays too much attention to output stabilization and not enough to price stability; a suitably conservative central banker will exactly offset this effect.

Of course, the two parts of (19) cannot be assessed separately. In practice, the optimal choice of f trades off its effect in partly mitigating the temptation to inflate against the fact that in consequence it departs from the ideal level of accommodation of shocks. Since (18) implies (19) is a quintic equation in f, locating the global minimum is not straightforward. In general, the optimal f will depend on (h, σ^2). Structural adjustment leads to the evolution of h over time. Thus the optimal f changes as h changes. *Using the preferences of the central banker is therefore an unhelpful way to try to mitigate the problem of monetary commitment, since one would need to keep changing the central banker as h evolves.* Asserting that a particular central banker had a long prospective tenure since this would be time inconsistent: unless structural adjustment had become bogged down, it would soon become optimal to change the central banker. The existing literature (Walsh 1995; Svensson 1996, 1997) recognizes that conservative preferences fail to achieve the first-best by forcing a trade-off between shock accommodation and inflation reduction. Whilst this still obtains in

my analysis, the policy is also time inconsistent, and thus internally contradictory, a more damning objection.

2.3.2 Delegation through contracts and targets

Provided precommitment is possible through several channels, there is no need to accomplish it by sacrificing the efficiency of shock accommodation in order to mitigate the systematic temptation to inflation. Instead, it may be possible to use a contractual approach in which the government lays down an inflation target, perhaps reinforced by an explicit penalty imposed on its agent, the central bank, if operational independence of monetary policy is misused or pursued incompetently.

Prescribing an inflation target decouples the (optimal) manipulation of expected inflation from the ideal degree of shock accommodation and also enables the government to prescribe a moving target for inflation, which, if suitably calibrated with progress on structural adjustment, restores time consistency. The first-best can be fully realized provided the delegation is fully credible. Suppose the government appoints a central banker with preferences

$$L_B = (\pi - \pi^*)^2 + ky^2 \qquad k > 0 \qquad (20)$$

where π^* is the inflation target delegated by the government and k the relative weight on output deviations from the zero target. The central bank's choice of inflation now obeys

$$0 = (\pi - \pi^*) + ky \qquad (21)$$

whence $0 = \pi^u (1+k) + k\varepsilon$, so

$$\pi^u = - k \varepsilon / [1+k] \qquad y^u = \varepsilon / [1+k] \qquad (22)$$

The first-best response (9) is accomplished by choosing

$$k = ½ \qquad (23)$$

As in (19), a conservative central banker is needed merely to compensate for the fact that the central bank does not internalize the effect of its actions on the revenue that finances government spending. Having used k to get the

appropriate stabilization, the extra policy instrument π^* can be used to deal with the inflation bias. From (21),

$$\pi^e = \pi^* + k\tau \qquad (24)$$

The fiscal authority chooses τ knowing how the central bank will subsequently behave, yielding

$$\tau = \{h(1+k) - \pi^*[2k+1]\} / \{k^2 + 1 + (1+k)^2\} \qquad (25)$$

which would reduce to (18a) if we replaced k by f and set $\pi^* = 0$. Suppose the government chooses a central banker with k = ½ and delegates the target

$$\pi^* = h / 6 \qquad (26)$$

(25) confirms that fiscal policy will then choose the first-best tax rate h/3. This decentralizes the first-best outcome.[12] When the only commitment problem is in monetary policy, only monetary policy needs a Pigovian intervention; no conditionality or delegation is needed for fiscal policy. The optimal inflation target π^* is linear in h, and declines in absolute value as structural adjustment takes place and h converges on zero.

2.3.3 Open loop commitments for inflation

Suppose next that the country agrees to external conditionality, such as membership of EMU or a binding agreement with the IMF, such that inflation follows a given path. For simplicity, suppose this is completely certain.

$$\pi^u = 0 = g^u \qquad y^u = \varepsilon \qquad (27)$$

Accommodation of (country-specific) shocks is zero, which is inefficiently low. The first order condition for setting fiscal policy is

$$0 = -y^e + g^e = \tau + g^e = \tau + [\tau - h + \pi] \qquad (28)$$

Since this is as in (6b), setting the open loop path for inflation *at the first-best level* automatically induces the choice of τ as in the first-best. However, any other inflation path will induce a suboptimal tax rate in (28).

Moreover, even if (expected) inflation and tax rates are at first-best levels, the outcome is first-best only if the variance of output shocks is zero. More generally, first moments are all correct but insufficient accommodation of shocks is taking place. If the commitment problem in monetary policy is large enough, and the variance of shocks small enough, a country would prefer the regime offering it an open loop path provided that path is sufficiently close to the first-best level of inflation. Since the systematic component of first-best inflation in (7) is linear in h, it would be costly for a transition economy with poor fundamentals, large h, and an optimally large level of expected inflation, to enter an EMU characterized by low average inflation, which would correct 'too much' for the commitment problem.

Table 1 shows four cases: FB (first-best: precommitment and optimal shock accommodation), DISC (monetary discretion exercised by the government), MON (the government delegates an inflation target and chooses a central banker with appropriate preferences), and EMU, caricatured as zero levels of both expected and unexpected inflation.

TABLE 1
EQUILIBRIUM AND WELFARE UNDER DIFFERENT REGIMES

Outcome	FB	DISC	MON	EMU
τ	h/3	h/4	h/3	h/2
π^e	h/3	h/2	h/3	0
y^e	-h/3	-h/4	-h/3	-h/2
g^e	-h/3	-h/4	-h/3	-h/2
$L(\pi^e, y^e, g^e)$	$h^2/3$	$(3/8)h^2$	$h^2/3$	$h^2/2$
$(\pi^*; k)$			(h /6;1/2)	
π^u	-ε/3	-ε/3	-ε/3	0
y^u	2ε/3	2ε/3	2ε/3	ε
g^u	-ε/ 3	-ε/3	-ε/3	0
$L(\pi^u, y^u, g^u)$	$2\sigma^2/3$	$2\sigma^2/3$	$2\sigma^2/3$	σ^2

In the first-best, $\tau = \pi^e = h/3 = - y^e = -g^e$. Unexpected inflation accommodates a third of the output shock, and $y^u = 2\varepsilon/3$. The ex ante loss is $[h^2/3 + 2\sigma^2/3]$. When the government cannot precommit monetary policy, expected inflation h/2 is higher. Shock accommodation is unaltered. Total ex ante loss rises to $[3h^2/8 + 2\sigma^2/3]$. The third column shows how the first-best can be attained by delegating monetary policy appropriately. The

conservative central banker has a weight k = 1/2 on output relative to inflation (half the unit coefficient in the government's own loss function, since the banker neglects costs of fiscal volatility), and is told to use an inflation target of h/6 (rather than the zero ideal level in the government's own loss function).

The final column shows what would happen if EMU membership led to zero inflation. Without shock accommodation, the ex ante loss associated with shocks is higher. Additionally, however, in this particular example even the first moments are unhelpful: EMU is a lower inflation club than the transition economy would want to join. Even if the variance of shocks is zero, the expected loss under EMU would be $h^2/2$, larger not merely than the first-best but even the outcome in which the transition economy retains monetary discretion. Putting it differently, since the economy would ideally delegate [$\pi^* = h/6$, $k = ½$], an EMU with zero inflation is simply too tight. This conclusion applies even as structural adjustment proceeds and h converges on zero. Waiting doesn't help.

Other parameters could reverse this. Specifically, if the parameter a, reflecting the monetary temptation to create surprise inflation, is large enough relative to the benefits of expected inflation in reducing other distortionary taxation, the commitment value of EMU must rise relative to the discretionary solution. EMU entry is then desirable, though even better forms of conditionality could get closer to the first-best.

2.3.4 Taking stock

In the baseline model, a country faces monetary temptation to create surprise inflation but simultaneously needs to raise inflation tax revenue to mitigate higher output distortions caused by trying to levy taxes when the tax base, and the capacity to enforce it, is low. When precommitment is possible, optimal policy sets taxes and expected inflation as linear functions of the extent of structural adjustment so far achieved. Poor fundamentals generate low output and high expected inflation, and hence a negative correlation between the two despite the absence of any money illusion. Both are merely symptoms of the fundamentals. Tougher monetary policy than this reduces inflation 'too much' and causes 'too big' a recession since scarce government spending has to be financed by 'very' distortionary taxes.

First-best policy does not ignore output stabilization. Output shocks are partly accommodated by unexpected inflation to prevent even larger

variations in output. In the first-best, this stabilization policy can be completely decoupled from the optimal choice of taxes and expected inflation. As fundamentals improve, expected inflation falls, output recovers, but the degree of shock accommodation remains constant. These properties would characterize the ideal design of policy rules—whether as feedback rules or as simpler 'bands' within which policy variables should lie.

Simply appointing a central banker who places unduly high weight on price stability has several difficulties. First, accommodation of shocks is inefficiently low. Second, the appointment is time inconsistent, since the ideal appointment of a banker has to keep changing with the degree of structural adjustment accomplished; a long tenure is therefore incredible. The first-best might however be decentralized through a different route, namely delegating an inflation target and choosing an appropriately conservative central banker. The latter is necessary only because the bank does not internalize the effect of its actions on fiscal policy. The delegated inflation target could be lower *or higher* than the government's ideal target, depending on the importance of monetary temptation relative to the need to use inflation for the public finances and to avoid even larger output distortions when tax capacity is low.

Even where no domestic solution to the monetary commitment problem exists, EMU may or may not be an attractive way of solving this problem. Generally, it will raise the costs of shocks because a small open economy is unlikely to find EMU pursuing a stabilization policy appropriate to its own needs. Against this, EMU sufficiently assists in the solution to the commitment problem to make entry attractive. However, it may not. I constructed a simple example in which EMU reduced inflation expectations to such an inefficiently low level, that the higher costs of distortionary taxes outweighed the commitment benefit to the transition economy; nor did this difficulty evaporate as structural adjustment progressed.

This may imply a misplaced enthusiasm of transition economies to join EMU or indicate that the model is not yet adequate to the task. Section 3 endogenizes the speed of structural adjustment.[13] Even this leaves the results of the model at odds with the current ambitions of some transition economies. Section 4 introduces further commitment problems in fiscal policy and structural adjustment, which increase the attractiveness of EMU membership as a solution.

3. ENDOGENIZING STRUCTURAL ADJUSTMENT

Structural adjustment allows lower expected inflation, less output distortion, and more government spending. However incentives to adjust also depend on the costs of adjustment. I explore the case of quadratic adjustment costs. An increasing marginal cost of reform is a necessary feature of any plausible model of transition; otherwise, big bang on day one would always be optimal. Since the marginal cost of any particular degree of adjustment is exogenous, faster adjustment is optimal when initial distortions are greatest and the benefits of reform largest. Thus, EMU speeds up reform only if it increases initial distortions and welfare losses. But then countries would choose not to join. Within this framework, EMU (or any other access to external conditionality) must slow down the (second-best) optimal speed of adjustment.

The state variable h is (G^*-t^+), the excess of ideal government spending over the existing level of nondistortionary tax capacity t^+. Structural adjustment increases t^+ and reduces h. Once adjustment is complete, $h = 0 = g$, and the first-best levels of π^e and y^e become zero. In this section, the per period loss function (3), still specialized to the case of unit coefficients, is augmented to (30a), and governments care about the present value of expected losses, using the discount factor ϕ.

$$L = \pi^2 + y^2 + g^2 + (h - h_{-1})^2 \qquad (29a)$$

$$V = L^e + \phi V_{+1}^e \qquad 0 < \phi < 1 \qquad (29b)$$

Each period, the government first chooses h, then sets taxes. Inflation expectations are then formed, the output shock is realized, and finally monetary policy and inflation are chosen.

3.1 The first-best

The government chooses h to minimize the expected value (29b) knowing how τ, π^e and g^e will then be chosen. Since equation (6) already displays the first order conditions for choosing τ and π^e, given h, the envelope theorem applies. The marginal benefit of changing h operates only through g^e, in other words through $[t–h+\pi^e]$. The first order condition is thus

$$0 = - g^e_F + (h-h_{-1}) – \phi (h_{+1}-h) \qquad (30)$$

where $g^e_F < 0$ is the first-best level of expected spending, and $-g^e_F$ is expected benefit of reducing h (and expected cost of increasing h). The second term is the present cost of raising h, the third term shows how raising h this period affects adjustment costs next period. From (7), $g^e_F = -h/3$. Conjecture that the solution to (30) is

$$h = \rho_F h_{-1} \qquad 0 < \rho_F < 1 \qquad (31)$$

then (30) becomes

$$0 = h_{-1}[-1 + \rho_F \{4/3 + \phi\} - \phi \rho_F^2] = h_{-1} [\Phi(\rho_F)] \qquad (32)$$

Since $\Phi(0) = -1$, $\Phi(1) = 1/3$, and $\Phi(\rho_F)$ is negative for large positive ρ, the unique convergent value of ρ_F satisfying (30) is the first-best rate of structural adjustment.

3.2 No monetary precommitments

Now suppose the transition economy can rely only on monetary discretion. When the government chooses reform at the start of the period, it can rely on its own subsequent ability to optimize taxes, and apply the envelope theorem to τ. However, the commitment failure in monetary policy means expected inflation is not chosen to maximize the government's own ex ante loss function. It is necessary to keep track also of the extent to which h affects the subsequent choice of expected inflation. This yields a first order condition for h

$$0 = -g^e_D + [1/2][\pi^e + g_D] + [(h-h_{-1}) - \phi (h_{+1}-h)] \qquad (33)$$

The first term shows the direct effect of h on g^e for given taxes and expected inflation. The third term is the marginal cost of adjustment. The second term shows how h affects expected inflation in (10), and thus affects both inflation directly and its ability to finance government spending. Using (12), (33) may be rewritten

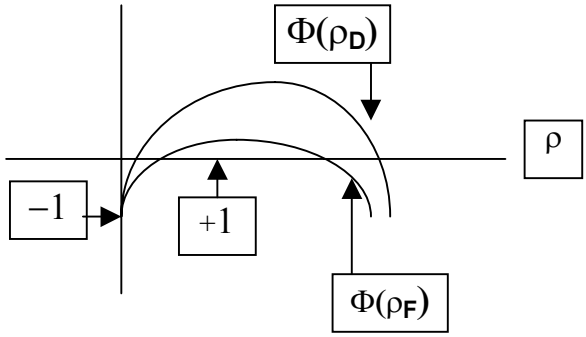
$$0 = 3h/8 + [(h-h_{-1}) - \phi (h_{+1}-h)] \qquad (34)$$

and assuming a solution similar to (31)

$$0 = h_{-1}[-1 + \rho_D \{11/8 + \phi\} - \phi\rho_D^2] = h_{-1} [\Phi(\rho_D)] \qquad (35).$$

For positive ρ, the expression for $\Phi(\rho_D)$ in (36) exceeds that in (33) since $(11/8)\rho > (4/3)\rho$. Given the inverted U-shape of the quadratic, it cuts the horizontal axis from below at a higher value of ρ. Hence $\rho_D < \rho_F < 1$, as in Figure 1. Initial conditions are unwound more quickly under the regime of monetary discretion; there is less persistence. Structural adjustment is more rapid because the marginal benefit of reform is larger when initial distortions are greater.

FIGURE 1
CONVERGENT ROOTS UNDER FIRST-BEST AND MONETARY DISCRETION



This is quite general. Ignoring both the welfare costs associated with shocks (which are independent of h) and adjustment costs (which depend only on h), other expected losses are of the form Ah^2 since all expected variables are linear in h. Larger values of A reflect larger distortions. The marginal benefit of reform is increasing in A. With marginal costs $[(h-h_{-1}) - \phi(h_{+1}-h)]$, independent of A, reform is faster the larger is A. If even the prospect of EMU reduces distortions by counteracting commitment failure in monetary policy, it will (optimally) slow the speed of adjustment prospective entrants!

4. BEYOND MONETARY DISCRETION: COMMITMENT FAILURES IN FISCAL POLICY AND IN REFORM ITSELF

Thus far, I have assumed it is possible to precommit both the tax rate and tax capacity: each period both are chosen irreversibly before private sector expectations are formed. There is then no reason to distinguish separately t

and t^+ that make up $\tau = t - t^+$. The choice of t^+ can be viewed as the choice of h (= G^*-t^+). I now relax these assumptions, beginning with the tax rate.

Recognition of time inconsistency in fiscal policy dates back at least to Fischer (1980), even though this field has been much less ploughed than the field of monetary discretion. Suppose the level of tax capacity is fixed but the government is tempted to use unexpected taxes t^u (hence τ^u) and the private sector anticipates this in forming expectations. The simplest motivation is to recall that in (1) output distortions depend on *expected* taxes. Surprise taxes avoid output distortions and give additional opportunities for financing valuable government expenditure. Later, I extend the commitment problem to the choice of reform itself. Section 4.1 however deals with given t^+ and h.

Even if fiscal policy reneges at 1230 on Monday, I assume the central bank could change monetary policy at 1231 (or at least after a decent lunch). Faced with the modelling choice of having inflation and surprise taxes simultaneously chosen, or preserving the sequential structure in which monetary policy, being most flexible, is chosen last, I continue to prefer the latter description of the economy. One issue still unresolved is whether surprise tax policy, like monetary policy, knows the current shock, or whether the temptation to surprise occurs after expectations have been formed but before the shock is known. For simplicity, I analyse the latter, which makes all sources of tax surprise a source of trouble, not a channel of potential benefit. The analysis could be generalized, allowing tax policy to assist monetary policy in shock accommodation.

4.1 Failures of fiscal commitment

4.1.1 The first-best

The first-best overcomes all commitment problems, and the only policy surprise is the innovation-contingent feedback rules by which monetary policy reacts to its informational advantage about the output shock unobserved when private expectations are formed. The previous characterization remains relevant.

4.1.2 Fiscal discretion (F-discretion)

To overcome monetary temptation, suppose monetary policy has been delegated to an independent central bank. Monetary policy is chosen last, and previous equations for monetary policy remain relevant. Thus from (21) and (22)

$$\pi = \pi^* + ky \tag{36a}$$

$$\pi^u = - k \varepsilon / [1+k] \qquad y^u = \varepsilon / [1+k] \tag{36b}$$

Treating τ^e, π^e, and g^e as predetermined, the government chooses surprise taxes τ^u. Since these affect neither output nor inflation in (36b), the only objective is to minimize the final term g^2 in the government's loss function. Hence the first order condition is

$$g^e = 0 \tag{37}$$

This condition recognizes two things. First, since surprise taxes act like lumpsum taxes, there is no reason not to raise sufficient revenue to meet all fiscal spending ambitions, Second, this applies only in conditional expectation. Since the monetary authority has an informational advantage, its choice of surprise inflation cannot be anticipated, but will have spillovers onto surprise government spending via surprises in the inflation tax revenue raised. However, an independent central bank, which neglects these fiscal consequences, does not allow this to amend its own first order condition, which is why (36) remains relevant.

Unlike the first-best, in which scarcity of tax capacity induces low government spending in order avoid excessive distortionary taxes or inflation, the inability to precommit taxes leads the government to spend as if it already enjoyed all the riches of full structural adjustment. Where excessive government spending has to be financed by high inflation and highly distortionary taxes, early transition entails a larger output recession than along the first-best path. With $g^e = 0$, the budget constraint implies $\tau^e = h - \pi^e$. Combining this with (36a) allows us to solve for (π^e , τ^e) as functions of (π^*, k). However, there is no way in which the choice of central bank parameters can affect (37). Since the first-best choice of g is $(-h/3)$, further Pigovian interventions are required. In short, three problems—monetary temptation, fiscal temptation, and spillovers from monetary to fiscal policy—cannot be solved by two design parameters (π^*, k).

Moreover, it cannot then be optimal to choose targets or regimes designed only to rectify monetary failures. *Hence, as a matter of theory, central bank independence should not be discussed without reference to the fiscal regime in place.* Regime design must address monetary and fiscal failures simultaneously. In principle, parameter values exist where monetary independence that neglects fiscal failures may be worse than simply living with monetary and fiscal failures. What is needed, of course, is an additional form of intervention.

4.1.3 Stability pacts and other forms of fiscal conditionality

Delegation of a fiscal target might also play a useful role. Can fiscal policy be delegated *within* the government? The appointment of an 'iron chancellor' as finance minister may help but, within most forms of government, such ministers can be dismissed by the prime minister at will. Personality alone may be insufficient to confer commitment in testing times. Nor is the example of monetary delegation of much practical benefit, since in most countries decisions about taxes and spending are simply too political to consider domestic institutions that remove such powers from ultimate control by prime minister and cabinet.

Some governments have endeavoured to 'educate' their voters in an attempt to raise the cost of reneging on fiscal promises. Famously, Mrs Thatcher proclaimed there would be 'no U-turn' from the tight fiscal policy needed to underpin tight monetary policy in the UK in the early 1980s. In so doing, she hoped to raise the costs of fiscal expansion, to enhance the commitment technology. In the late 1990s in the UK, Chancellor Brown voluntarily adopted a code of fiscal stability. The US passed the Gramm-Rudman amendment for balancing the budget, though for a decade subsequently it was largely ignored. The EU has adopted the Stability Pact.

What lessons does the preceding analysis hold for transition economies prior to EU entry? One is to make the central bank care additionally about the fiscal position, thereby providing not merely a counterweight to opportunistic fiscal behaviour but a predictable response that will be internalized by tax policy and hence have a deterrent effect. The other is to invoke external conditionality that directly constrains fiscal policy itself.

The former could be accomplished by choosing a central banker with preferences not only over inflation and output but also government spending or taxes. However, since this would be tantamount to appointing a government in exile within the central bank, it would be likely to encounter

problems in relation to accountability and democratic control. Even if it turned out to be in the interests of the voters, it might not be the best way to sell them the package.

4.1.4 Direct conditionality on fiscal policy

The obvious solution is to devise an additional restriction on fiscal policy. However, the issue is whether this can be accomplished credibly by domestic means alone. If sufficient commitment cannot be accomplished by domestic means, external conditionality is the only alternative. Early in transition, this was a role that the IMF sought to play, but often it lacked credible penalties for violation of promises. For more advanced transition economies, engaged in entry negotiations with the EU, conditions imposed by the EU may be much more significant.

From the preceding analysis, we know that central bank independence, coupled with appropriate choices of k and $\pi*(h)$, can take care of two of the problems. Think again about incentives to choose fiscal surprises, and consider how to augment the loss function to obtain the correct fiscal choice. Recall that the first-best levels are $g = -h/3 = -\tau$. Augmenting the loss function by a term such as $[g-\tau]^2$ will not work since $[g-\tau] = h - \pi$ which, being independent of τ^u, will not have the desired influence on the first order condition for choosing τ^u. In this example, conditions on the budget deficit are inappropriate.

Since the problem of fiscal failure is that both taxes and government spending are too high, conditions on their difference do not address the problem. What is needed is a penalty for high levels of government spending or taxes. Suppose there is a fiscal target g* and the loss function is augmented by $(g-g^*)^2$. The first order condition for τ^u becomes $0 = g^e + (g^e-g^*)$, whence to attain the first-best

$$g^* = 2g^e = -2h/3 \qquad (38)$$

4.1.5 EMU membership

As in the earlier remedies for purely monetary failures, the optimal settings for expected policy variables are linear in h, the degree of structural adjustment. Conditionality that makes inflation or fiscal variables *independent* of h, for example by using parameters appropriate to mature economies in which structural adjustment has been largely accomplished,

could depart significantly from what is optimal for economies that still have substantial amounts of transition to accomplish. Thus, while EMU membership offers transition economies the potentially benefit of fiscal conditionality, it remains possible that the form in which it is applied is either less helpful than it could have been or actually harmful.

4.2 Commitment failures in reform itself

While the introduction of fiscal failures helps explain why government spending has often been high in transition economies, it leaves open several issues. First, if monetary-cum-fiscal failures lead to large distortions, the chosen speed of structural adjustment should be correspondingly rapid. Large failures cannot explain slow reform. Second, as noted above, in some circumstances the enthusiasm of transition economies for membership of EU and EMU is hard to explain. These twin difficulties can be resolved by the final device of recognizing the significance of commitment failures in the reform process itself. So far, I have assumed that each reform is undertaken at the start of each period, before expectations are formed. For commitment issues to arise, the reform decision must arise after expectations are formed. Given any kind of intertemporal behaviour by the public, for example in pricing assets and debts, there will always be scope to use behaviour in *future* periods to renege on promises made today, and the exact timing of the reform decision *within* the current period will be relatively unimportant for the qualitative results. It is a special feature of the simple model I have been using—flexible prices, no persistence in variables other than h—that makes commitment issues disappear when reform is undertaken each period before (single period) expectations are formed.

To explore commitment issues in reform, it is simpler to change the assumed timing of reform within the period than to develop a full intertemporal model of private behaviour. I now suppose that, within each period, the private sector first forms expectations (about fiscal policy, reform, and monetary policy), then the government chooses the level of reform, then the level of taxes, and finally monetary policy chooses inflation. The only change compared with section 4.1 is inversion of the timing of expectations formation and structural adjustment.

Although the government actually chooses tax capacity t^+ and actual taxes t, we can think of this equivalently as choosing h (= G^*-t^+) and τ (= $t - t^+$). Since actual tax rates are chosen after reform, the equations of section 4.1

describing the choice of τ remain relevant. In particular, if the problem of fiscal commitment is not solved, $g^e = 0$.

The prior decision about reform now treats inherited expectations as predetermined. Effectively the government chooses h^u, treating h^e and other expectations as given. Surprise inflation is independent of h and unaffected by reform. Moreover, the only unexpected variable to affect output is unexpected inflation since tax surprises are lumpsum. Changing h also affects fiscal policy through the budget constraint. This has three effects. First, the contemporaneous marginal benefit of lower h^u (marginal cost of higher h^u) is $[g^e][-1]$, namely the weight on fiscal policy, times the marginal effect on $[g^e]^2$ times the effect of h on g via the budget constraint $g = \tau - h + \pi$, recognizing that h^u has no induced effects on τ^u and π^u.

Second, h^u affects adjustment costs both in the current period and the next. Third, since in equilibrium h evolves according to $h = \rho h_{-1}$, the reduced form for ex ante losses is of the form $V = Mh^2_{-1} + N\sigma^2$, where M and N are positive constants. Hence the third effect of h^u is on the present value of future losses whose expected present value is $E\{\phi V_{+1}\}$ or $\phi\{Mh^2 + N\sigma^2\}$. Adding together these three effects of varying h^u yields the first order condition

$$0 = -g^e + \{[h-h_{-1}] - \phi[h_{+1}-h]\} + \phi Mh.$$

Along the convergent path on which $h = \rho h_{-1}$, this implies

$$0 = -g^e + h_{-1}[(\rho-1)(1-\phi\rho) + \phi\rho M] \qquad (39)$$

which yields several interesting results.

When fiscal and reform commitment are impossible, $g^e = 0$ in (39) and, for a sufficiently short-sighted government, as ϕ tends to zero, ρ tends to 1 *and structural adjustment vanishes*. Discounting the future sufficiently makes current payoffs vital. Surprise inflation and output are independent of surprise reform. Costly reform will be undertaken only if it helps government spending within the period. Since simultaneous fiscal failure leads to the bliss level of government spending, the marginal benefit of surprise reform is zero. Although it helps in the future, this becomes almost worthless when the discount rate is high. In the limit, with no benefit, no structural adjustment is undertaken. In contrast, the ability to precommit to reform means that structural adjustment also affects expected levels of

inflation, taxes and output, and hence provides a contemporaneous marginal benefit to reform even when the future is discounted. It is thus the *simultaneous* presence of commitment problems in the related fields of tax policy and economic reform that seriously inhibits structural adjustment when the future is heavily discounted.

None of these difficulties would be insuperable in isolation. For example, suppose discounting of the future is complete but there are no precommitment problems in monetary policy, fiscal policy or reform. The speed for reform is then given by the first-best case (32) treating ϕ as 0, which yields $\rho = 3/4$, which generates steady if slow structural adjustment. Thus, myopia is not a sufficient condition for a failure of structural adjustment. Rather it stems from the interaction of several effects: a short-sighted government, inability to commit fiscal policy, and inability to commit to reforms. In many circumstances, the problems generated by this package of problems is an order of magnitude larger than problems generated by failures in monetary commitment alone.

4.2.1 Decentralizing appropriate reform incentives

In practice, reform design may need to consider an intricate second best case in which other distortions remain elsewhere. Nevertheless, it is helpful to know how one would try to solve the reform problem if monetary and tax distortions had already been eliminated. How could one then replicate the first-best rate of reform ρ_F in (32)? Suppose the quadratic cost of reform, applying to the speed of adjustment, was augmented by a cost νh^2 which additionally penalizes the level of distortions yet to be removed by structural.

$$L = \pi^2 + y^2 + g^2 + (h-h_{-1})^2 + \nu h^2 \qquad \nu > 0 \qquad (40)$$

Proceeding as previously in the choice of h^u , the first order condition becomes

$$0 = - g^e + [(h-h_{-1}) - \phi(h_{+1}-h)] + M\phi h + + \nu h$$

which one would like to be identical to the first-best equation (30)

$$0 = -g^e + [(h-h_{-1}) - \phi(h_{+1}-h)]$$

for which we need

$$M\phi = \nu \qquad (41).$$

The inability to precommit to reform can be overcome by imposing an additional cost quadratic in the deviation of the level of structural reform from its (zero) steady state level. This shadow price on poor fundamentals forces the government to internalize the cost of failing to reform.

Suppose the EU wishes to act as benevolent supplier of conditionality to transition economies. The foregoing reasoning indicates that such economies may require assistance in overcoming three distinct commitment problems, in monetary policy, in fiscal policy, and in reform itself. Solving the monetary problem alone is insufficient. Even if the stability pact constrained the worst excesses caused by failures in fiscal commitment, it is still necessary to address reform incentives. Improving the fundamentals through structural adjustment and the building of institutional capacity should not be an optional add-on, but an intrinsic part of the strategy. Imposing entry conditions is one important device through which the EU can help.

To sum up, transition economies unable to find adequate domestic means of precommitment may benefit from EMU membership, even prospectively, not merely because it offers assistance in simultaneously meeting monetary and fiscal commitment problems but because it helps sustain structural adjustment. However, separate conditionality on reform itself is needed, especially prior to reform. Specifying entry conditions is one way this could be achieved.

5. CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

I have considered how actual and prospective membership of EMU might affect European transition economies. To answer the question one needs an interesting characterization of what is special about a transition economy. Of the many possible aspects, I focus on the role of (costly) structural adjustment in enhancing the capacity to raise nondistortionary taxes. This allows greater levels of government spending, lower output distortions, and less reliance on the inflation tax. I examine a model in which smooth convergence to western standards is a possible outcome.

Monetary and fiscal policy interact. Initially I examined commitment failures of monetary policy, and explored EMU membership as a commitment device. Low levels of structural adjustment make early adoption of low inflation inefficient by forcing the government to adopt very distortionary taxes and inefficiently low levels of spending; EMU may also reduce the ability to accommodate shocks appropriately. Whether or not early EMU entry is beneficial depends on the relative magnitude of the need to find a monetary precommitment device, the need for inflation tax revenue, and the need to be able to accommodate idiosyncratic shocks.

This is pretty standard stuff, but for the observation that the alternative, domestic delegation of monetary policy, may not always choose a conservative central banker. Once monetary-fiscal interactions are recognized, the reason to appoint a banker with conservative preferences is not to solve monetary commitment, but (optimally) to compensate for the fact that the banker ignores the effects of inflation surprises on fiscal revenues, and this needs to be dampened if the bank is implicitly to internalize government concerns. First-best delegation also makes use of an inflation target, but this may be looser or tighter than exact price stability depending on the competing needs of avoiding monetary temptation and raising inflation tax revenue to compensate for low structural adjustment to date. Optimal monetary design cannot ignore the fiscal position or the state of structural adjustment.

The pace of structural adjustment can itself be endogenized. The benefit of adjustment is that higher tax capacity improves government trade-offs between low inflation, low output distortions and high government spending. Provided there is an increasing marginal cost of adjustment, optimal policy smoothes adjustment over time. As adjustment occurs, optimal inflation rates fall, equilibrium output rises, and government spending increases. In this sense, a negative correlation exists between inflation and output once structural adjustment is endogenous. The efficient way to disinflate is to improve the fundamentals through structural adjustment, not to engage in draconian monetary policy that inefficiently curtails fiscal spending and induces unnecessarily high taxes that severely distort output.

Moreover, provided policy is appropriately decentralized, the pace of adjustment is orthogonal to the efficient policy of shock accommodation, which is constant throughout structural adjustment unless the distribution of shocks is itself being affected. Per se, this supports policies analogous to

exchange rate bands of constant width but slopes that decline over time at an ever decreasing rate.

Regimes with larger distortions offer a greater marginal benefit of reform. Hence, if the costs of reform are independent of other economic variables—which might not be true if the opportunity cost entailed other forms of government spending—reform will be faster the more distorted the initial economy. Within such a framework, if EMU confers sufficient benefits to diminish distortions, it will also reduce the pace of structural adjustment.

Other circumstances can alter this result. It is strange to place so much stress on failures of monetary commitment without asking similar questions of fiscal policy and reform itself. Such failures will arise if these policies are chosen after the public forms expectations. For example, if output distortions depend only on expected taxes, subsequent tax surprises are tempting because they act as lumpsum taxes. This temptation will then be built into expectations themselves. Similarly, if promises to reform affect public expectations and behaviour but then costs of reform can be avoided by reneging on reform, there is a foreseeable temptation to go slow on reform. Given unhelpful circumstances—heavy discounting of the future, and simultaneous commitment failures in reform and fiscal policy—structural adjustment can come to a standstill.

There may then be a large payoff to policies that enhance the ability to commit on both fiscal policy and reform. Few improvements are likely to be achieved while retaining all fiscal sovereignty within the government. Delegating to the central bank an inflation target that was also contingent on fiscal policy might help, providing a Pigovian intervention that allowed the government to internalize the inefficiency without losing visible control of the setting of tax rates themselves. Even if accomplished, this would still leave commitment failures in reform itself.

Here, external conditionality may help. For the commitment to be plausible, we need a large carrot or a large stick. EMU entry offers a possible carrot. Unlike earlier examples, in which EMU had at best a marginal advantage and might even make things worse, if EMU membership allows a transition economy to overcome stagnation in structural adjustment, the benefits could be large. Prescribing entry criteria structural adjustment itself may be appropriate. The more indirectly related the criteria are to this ideal standard, the greater the induced side-effects

and the more the scope for other forms of strategic behaviour in attempting to meet the criteria.

There is nothing in the foregoing analysis to encourage the view that transition economies (or EMU countries) will be well served by forcing potential entrants into an ERM style arrangement that focuses on symptoms (such as inflation) rather than causes (such as progress in transforming the state variables). Nor is the current EMU preoccupation with price stability something to be inflicted too soon on transition economies at the expense of other things, most notably progress in structural adjustment itself.

5.1 Directions for future research

The foregoing analysis raises several questions. First, we need much more analysis of interactions between monetary and fiscal policy rather than ever more studies of monetary policy in isolation. I hope to have shown the significance of two distinct issues: the strategic interaction between fiscal and monetary policy, in which fiscal authorities are forced to anticipate how more flexible monetary policy is likely to react, and failures in fiscal commitment itself. Strategic interactions are yet more complicated in assessing how one monetary authority in EMU interacts with eleven fiscal authorities.

Second, the preceding framework needs refinement in three directions: introduction of a monetary transmission mechanism, extension to open economies and exchange rates, and recognition that governments can issue bonds. The monetary transmission mechanism makes interest rates not inflation the instrument of monetary policy. Not merely does this alter the nature of interactions with fiscal policy, it forces consideration of the transmission mechanism as a key element of transition itself. This apart, it should not be too difficult to draw on work by Lars Svensson and others who have analysed interest rate choices and their open economy implications in frameworks in which monetary policy is considered in isolation from fiscal policy.

Simultaneously introducing the intertemporal budget constraint of the government, including debt accumulation and debt service, is an order of magnitude more difficult since the use of interest rates in shock accommodation then destroys the certainty equivalence that made the linear-quadratic framework so tractable. Moreover, recognition of debt raises the question of the extent to which capital markets are imperfect and

the issue of how much governments in transition economies can and should borrow. Nevertheless, extension to bond financing is an important part of future research, not least because the stability pact exists and is likely to constrain future choices of transition economies hoping to join EMU at some future date.

My analysis was cast entirely within the framework of flexible prices, not because I believe that to be a good description of European economies but because it provides rapid answers to so many questions. Recasting the analysis within models of sluggish price adjustment and output persistence is another important priority. Clearly this increases the number of state variables, and adds an extra dimension of difficulty. However, the payoff justifies the effort.

Finally, I hope to have demonstrated that the fundamentals of structural adjustment can play an interesting role in macroeconomics in general; in the study of transition they are even more important. There are, of course, many other ways to introduce structural adjustment—in monetary transmission, in creditworthiness, in labour market flexibility, in shock correlation with trading partners, to name but a few. Each raises questions of interest for macroeconomic policy design.

NOTES

[1] For discussions of the relation between EMU entry and reform incentives, see Sibert (1998), Sibert and Sutherland (1998) and Ozkan, Sibert and Sutherland (1997). Begg, Halpern and Wyplosz (1999) discuss other forms of conditionality that the EU might impose to assist transition in prospective accession countries.

[2] Honourable exceptions include Beetsma and Uhlig (1997), Beetsma and Jensen (1999).

[3] Assuming that policy decisions are made by a single principal, the government, rules out many interesting issues in political economy within transition economies. I also assume each transition economy is small, raising no strategic issues in its relationship with the EMU bloc.

[4] See Bruno and Easterly (1995) and the many subsequent papers corroborating this empirical finding.

[5] The model endorses the conclusion in Begg (1996), who argued that IMF policy advice to European transition economies was too preoccupied with inflation symptoms and not enough with fundamental causes.

6 The model could be generalized to allow smaller distortions when taxes are below current tax capacity.

7 Since (1) can be rewritten as $y = a\pi^{u} - bt + bt^{+} + \varepsilon$, the interpretation of t^{+} as tax capacity is only one of several possible interpretations. formally, the ensuing analysis applies to any programme of costly structural adjustment that invests in raising the level of some supply side variable t^{+}.

8 Ideally, the government budget constraint should also allow borrowing. In practice, the creditworthiness of governments in transition economies is limited. I also plead a technical justification of its omission: once I consider the intertemporal problem of choosing h, having debt as a second state variable complicates the analysis. Section 3 allows governments to accumulate h, an implicit asset in intertemporal optimization.

9 The literature now recognizes that the central bank chooses interest rates not inflation directly. I revert to the earlier specification on the grounds of simplicity. However, the transmission mechanism of monetary policy is less well understood for transition economies, and may even be perverse earlier in transition.

10 Begg (1999) shows that when the parameters in (1) - (4) are not unity, π^{e} depends both on h and τ.

11 Begg (1999) gives the general condition when parameters are no longer set at unity.

12 With more general parameters, as in (1) – (4), it is the relative size of the temptation to inflate and the benefits of the inflation tax in lowering distortionary taxes that determines whether the delegated inflation target should lie above or below the government's own preference (Begg 1999).

13 Martin (1995) studies convergence but with an exogenous pace of adjustment. Sibert (1998), Sibert and Sutherland (1997) and Ozkan, Sibert and Sutherland (1997) endogenize adjustment but with simpler dynamics.

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