Jukka Pirttilä

Fiscal Policy and Structural
Reforms in Transition Economies:
An Empirical Analysis

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Contents

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Abstract

This paper makes an empirical examination of the relationship between fiscal balance and structural reforms using panel data from 25 transition economies. The results indicate that price liberalisation has a positive impact on fiscal performance, while privatisation and restructuring, via unemployment, affect the fiscal balance negatively. These findings are somewhat in contrast with earlier empirical work and theoretical transition economics that maintain fiscal pressures are most severe in fast-reforming countries. The analysis further suggests that countries with better fiscal positions may have benefited from favourable initial conditions.

Key words: fiscal policy, structural reforms, transition economies

1   Introduction

Nearly all transition economies suffered large and persistent fiscal deficits during the early transition years (see Figure 1). Recent empirical evidence on growth determinants in transition economies, however, shows that countries able to limit their fiscal deficits and successfully stabilise their economies eventually enjoyed faster economic recovery and growth. Many countries, notably those of the former Soviet Union, failed to limit their fiscal deficits to a sufficient degree. In addition to poorer growth prospects, these countries became vulnerable to economic crises and to the threat of transition policy withdrawals. The Russian financial crisis of autumn 1998 is the freshest example of such an event. Surprisingly, while reaching a sustainable fiscal balance is clearly a key policy issue for transition economies, the empirical transition literature (cited below) devotes little attention to fiscal policy issues.[1] As a result, we still lack an understanding of – let alone the ability to quantify – the determinants of fiscal deficits in transition economies.

Fiscal policy has important connections with structural reforms in transition economies. Most transition literature dealing with this issue suggests a trade-off between structural reforms and fiscal balance, i.e. rapid structural reforms, even if beneficial for the economy, may generate a cost in the form of a deteriorating fiscal balance. This conclusion is derived from the theoretical models of e.g. Dewatripont and Roland (1992) and Coricelli (1998). Tanzi (1993) further supports this view, noting that an excessively tough fiscal stance can actually impair structural reforms. Coricelli's (1998) empirical findings for early transition years in Central and Eastern Europe indeed suggest that fiscal pressures were more severe in the fastest reforming countries.

In this study, we address these issues empirically using panel data from 25 transition economies from 1990-97. We first analyse the determinants of fiscal performance in these economies and then test the theoretical position of a trade-off between fiscal deficit and structural reforms. Structural reforms are measured by the liberalisation indices originally developed by the World Bank (De Melo, Denizer and Gelb (1996)) and an additional proxy, the unemployment rate. We also control for GDP growth rates and address the importance of country-specific initial conditions (circumstances at the onset of transition) on fiscal policy. The methodology the paper adopts is

similar to the approach taken in recent empirical analysis of the determinants of growth in transition economies, e.g. studies by Christoffersen and Doyle (1998), Havrylyshyn, Izvorski and van Rooden (1998) and Berg, Borensztein, Sahay and Zettelmeyer (1999).

In the first part of the econometric analysis, the aim is to measure how structural reforms affected fiscal adjustment (i.e. the annual change in budget balance) in these countries. In the second part, where the formulation is in level form with fiscal balance as the dependent variable, the focus is on understanding the role of initial conditions in fiscal performance and the interrelation between transition reforms and initial conditions. In both regimes, we seek to identify a satisfactory general model and then, using model reduction, a preferred simple specification. We apply a Hendry-type general-to-specific methodology in our analysis of fiscal balance, following the simplification strategy recently suggested by Berg et al (1999). Berg et al provide a transparent set of prior beliefs to the sequence of specification search that stresses the importance of structural policy variables against other determinants. Moreover, their method indicates how less structural, or *ad hoc*, model selection methods may give rise to misleading specifications.

The results from the preferred simple models indicate that internal (or price) liberalisation has a robust positive impact on fiscal performance. On the other hand, privatisation (private sector entry conditions) or enterprise restructuring, reflected in a rise in unemployment, negatively affect the fiscal balance. While the latter result is in line with the theoretical conclusion of a trade-off between fiscal balance and structural reforms, the former is not. Hence, we have here a suggestion that different forms of liberalisation have had opposite (and richer than the theory suggests) effects on fiscal balance in transition economies. However, with the inclusion of initial conditions into the analysis, we see that countries with better fiscal balance likely enjoyed better initial conditions. Thus, after controlling for initial conditions, the results concerning the effects of liberalisation on budget balance are more ambiguous.

The next section of the paper discusses earlier theoretical and empirical work on fiscal balance in transition economies. Section 3 presents the empirical analysis of the connection between the speed of reform and fiscal performance, while section 4 concentrates on examining the importance of initial conditions on the level of fiscal deficits. Section 5 concludes.

2   Fiscal balance and transition

2.1 Some theory

In this section, we consider the transition specific issues determining fiscal deficits. Most of the discussion in transition literature treats these issues informally. Indeed, the theory basis is somewhat limited and tentative. Among the informal analyses, Coricelli (1997) considers several reasons why fiscal deficits easily occur during transition. Almost by definition, the size of the government diminishes during transition, and since revenues are likely to fall faster than expenditures, deficits are hard to avoid. Coricelli notes that a rapid transition (reallocation and restructuring of production) tends to worsen the expenditure/deficit ratio more severely than slower speed of reform. Fast restructuring leads to a rapid closure of unproductive state-owned enterprises, which reduces tax revenues collected from enterprise taxation – an important tax instrument in socialist countries. In addition, labour shedding increases the expenditure on unemployment benefits and other social targets. Pension payments are also a key area of social expenditure: transition probably hits older workers harder, so offering retirement may have been a way to compensate losers in a reform. Again, in fast reforming countries, the need for such compensation is likely to be higher.

In slower reforming countries, however, the need to employ various forms of soft budget constraint, either through subsidies or tax arrears, is among the main reasons for the emergence of fiscal deficit. Rapid implementation of tax and benefit reforms, if associated with general restructuring, naturally offsets part of the difference in the fiscal pressure between fast and slow reformers. On balance and other things being equal, Coricelli (1997) expects fiscal deficits to be higher in fast-reforming countries. As transition progresses, the fiscal position is likely to improve gradually as tax and benefit reforms are put in place and the economy (and tax revenues) grow through the new private sector and improved efficiency in restructured state enterprises. Thus, like output development, the fiscal deficit growth and reduction could be expected to follow a U-shaped figure during the transition period.

These ideas are also illuminated by more theoretical approaches. Dewatripont and Roland (1992) construct a micro-model whereby firm restructuring causes redundancies for part of the workforce. The government

must plan its reform proposal subject to the political constraint that the reform is acceptable to the majority of the workforce, either through employment or adequate exit compensation. They show that a gradual reform may be more attractive than an allocatively fully-efficient big-bang approach. The gradual reform requires less compensation payments and hence is less costly to the state budget. In the more macro-oriented transition model of Blanchard (1997), unemployment may be beneficial for firm restructuring and the emergence of new private sector due to the wage-moderating impact of high unemployment. However, unemployment also creates a burden for government finances and may therefore lead to rising tax rates. The greater tax burden, in turn, increases labour costs and slows restructuring. Thus, a high government revenue requirement could derail transition by stultifying private sector expansion and growth. Coricelli (1998) points out that allowing for deficit financing in this set-up provides a way to alleviate the derailment problem by relaxing the government budget constraint. In Coricelli's (1998) transition model, unemployment on the beneficial transition path (i.e. the one leading to output growth) first rises more rapidly than on the less successful restructuring path. Similarly, the budget deficit follows the development of unemployment. Thus, in the successful transition/restructuring case, the deficit is initially larger than in a less successful restructuring case. This is essentially the same basic intuition according to which aiming at smaller budget deficits slows the pace of reform presented by Tanzi (1993). Coricelli (1998) also presents a formalisation of the U-shaped figure of the development of the deficit.

These macro-models of transition are mostly inspired by experiences of Central and Eastern European countries. A well-documented theme in the literature on transition economies is that transition has been more arduous in CIS countries, where liberalisation policies have not led to significant enterprise restructuring and eventual output growth. In addition, transition has been shaped by a multitude of other problems such as barter and various issues in lack of transition in the public sector (see e.g. Shleifer (1997)). Some of these caveats and the suitability of the theory for various country groups are addressed below in the discussion of results.

2.2 Empirical observations

Figure 1 depicts the development of the budget deficit, measured as a percentage of GDP, in Central and Eastern Europe (CEE) and the Baltic States and in the Commonwealth of Independent States (CIS). Time is expressed as transition years. 1990 is the first transition year for Hungary and Poland, 1991 for the other CEE countries, and 1992 for the former Soviet Union (FSU) countries. Table 1 contains fiscal deficits in transition economies.

The figure confirms the U-shaped (or perhaps more V-shaped) development of the deficit. Especially during the first three transition years, the deficit was substantially larger in the CIS-countries. Figure 2 reports the first difference of fiscal balance, fiscal adjustment.[2] This concept is extensively used in the analysis below. It may be useful to contrast this information with Figures 3 and 4, which express the development of structural reforms measured by the cumulative liberalisation index (CLI) developed by De Melo, Denizer and Gelb (1996) and its first difference, liberalisation index, respectively.[3] The figures suggest that in contrast to the theoretical ideas above, fiscal deficits have on average been larger in slow-reform countries (often FSU states), whereas CEE countries have faced smaller fiscal pressure despite rapid reforms.

Obviously, fiscal adjustment can result either from expenditure cuts or increases in government revenues. Figure 5 provides interesting information in this respect. All transition economies started with very high levels of government expenditure. The CEE countries managed to finance the expenditure with tax revenues, and as a result, their budget deficits remained moderate. In contrast, CIS countries' revenues during the early transition years fell drastically short of government outlays. To balance the situation, the CIS economies were forced to decrease government expenditure on average 15 percentage points during the first four transition years. Meanwhile, revenues fell, leaving sizeable budget deficits during later transition years. In the CEE countries, revenues remained fairly stable, which made it possible for these economies to maintain high level of public expenditure without widening public deficits.

Results from earlier empirical studies are mixed. Coricelli (1998) maintains that the theoretical case for negative correlation between the speed of reform and fiscal balance is supported by his empirical analysis. Notably, his regressions are rather restrictive. He mainly uses data from CEE countries in

the early years of transition and, more importantly, he uses the unemployment rate instead of the liberalisation indices as a proxy for reform. Budina and van Wijnbergen (1997), in turn, conduct sustainability calculations for the fiscal stance in various transition countries along the lines of Buiter (1996). They illustrate that the average time needed for output recovery is shorter in countries whose budget deficits are characterised as sustainable. Quicker recovering countries tend to be fast reformers. Budina and van Wijnbergen do not, however, go so far as to conduct a regression analysis.[4]

It may be finally appropriate to note an alternative approach to empirical fiscal policy analysis, namely the effects of various fiscal indicators such as expenditure policies, tax rates and fiscal deficit, on economic growth (e.g. De la Fuente (1997) and Gerson (1998)). Here, motivation is not seen to arise from fiscal issues, but rather from their impact on welfare through growth. The impact of fiscal deficits on welfare is generally ambiguous. It is likely positive if fiscal deficits offer a possibility for long-term investment, consumption smoothing etc., and negative if crowding out is severe. In this paper, the motivation is not directly related to these growth concerns, but to the positive analysis of the determinants of fiscal balance.

3 The relationship between structural reforms and fiscal adjustment

Before proceeding to the actual regression analysis, it may be worthwhile to briefly consider the extent of the responsiveness of fiscal adjustment to GDP changes in transition economies. We know from developed economies that the fiscal balance is highly dependent on changes in GDP growth due to the presence of automatic stabilisers. Virén (1998) reports that the elasticity of primary deficits with respect to GDP changes typically varied from 0.3 to 0.7 in OECD countries from 1961 to 1996. It may therefore be useful to examine the responsiveness of fiscal adjustment in transition countries towards GDP changes.

Table 2 reports the results from simple country-wise regressions where fiscal adjustment is explained by GDP growth rate in each country. The columns depict the point estimate for the explanatory variable and the goodness-of-fit of the regressions. Average values are given in the last row. The

values for a pooled regression with all the 25 countries are depicted in the category 'All.' The figures show that the range of the coefficient for GDP is very large over the countries. In some cases, the coefficient is even negative, suggesting that GDP growth leads to worse budget balance. Goodness-of-fit is also poor: the coefficient for GDP is significant only for two countries and in the pooled regression. It may therefore be deduced that the GDP growth rate alone is an insufficient determinant of fiscal adjustment in these countries. While the figures given here are not comparable to the calculations in Virén (1998) because they are for the overall, not the primary, deficit, they nonetheless convey the sense that budget systems in transition economies have been much less dependent on GDP changes than in developed economies. A possible reason is that automatic stabilisers were still undeveloped in these economies.[5] Note also that the poor explanatory capacity of GDP changes leaves a strong potential for other explanations such as the transition policies considered below.

3.1 Model specification

In the first part of the regression analysis, the aim is to examine whether the change in budget balance, i.e. fiscal adjustment, measured as a share of GDP, can be partly explained by the speed of reform. We use two approaches to measuring the speed of reform. The main way is to use the liberalisation indices gathered by De Melo et al (1996). These measure the progress in liberalising the economy in three spheres: the first index captures internal (price) liberalisation, the second external liberalisation (i.e. lifting restrictions from foreign trade) and the third, 'private sector entry', addresses the extent of privatisation and the regulations on competition and private enterprises. The general liberalisation index reported in Figure 3 is a weighted average of the three sub-indexes. While the liberalisation indexes capture the extent of liberalisation within a year, the cumulative liberalisation indices measure the level of transition reforms by a given date.

It is not clear *a priori* which of these indexes is most closely connected to the theoretical notion of speed of reform, discussed earlier. It is clear, however, that the speed of reform requires the use of liberalisation indices rather than the cumulative index. If the idea of the reform is to initiate enterprise restructuring, the 'private sector entry' index is perhaps the correct proxy here.[6] However, price liberalisation is also a prerequisite for competi-

tive markets. In the empirical analysis in this paper, we examine the influence of all three indices on the fiscal adjustment.

An alternative way to measure the speed of reform is through the unemployment rate, because fast restructuring entails a rise in unemployment. This is, in fact, the approach taken by Coricelli (1998). Therefore, the regressions below employ the change in unemployment as an alternative proxy for the speed of reform. However, interpretation of this variable is difficult as unemployment also reflects macroeconomic circumstances. This suggests that liberalisation indices are probably preferred proxies for transition changes.

Explanatory variables also include the change in GDP as a macroeconomic control variable. The basic equation of the analysis is therefore of the following type:

$$fad_{i,t} = \alpha + \beta_1 lii_{i,t} + \beta_2 lii_{i,t-1} + \beta_3 lie_{i,t} + \beta_4 lie_{i,t-1} + \beta_5 lip_{i,t} + \beta_6 lip_{i,t-1}$$
$$+ \beta_7 Dur_{i,t} + \beta_8 Dur_{i,t-1} + \beta_9 gdp_{i,t} + \beta_{10} gdp_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

where *fad* is the fiscal adjustment as a percentage of GDP, *lii* denotes internal liberalisation, *lie* external liberalisation, *lip* private sector entry, *Dur* the change in unemployment rate and *gdp* the growth rate of GDP. We also allow for lagged values of the variables in an attempt to partially capture possible inertia in the influences.[7] The specification contains a common constant term for all cross-sections (i.e. we run a standard pooled regression). This restriction was tested as well and the hypothesis that all the constant terms are the same could not be rejected.

The panel used is unbalanced. It covers 25 transition economies in Central and Eastern Europe and in the Former Soviet Union over the transition years 1-8 (1990-1997) for Hungary and Poland, 1-7 (1991-1997) for the rest of the CEE, and 1-6 (1992-1997) for the CIS and the Baltic States. Data on macro-variables are EBRD data (1996, 1998, 1999). The fiscal adjustment measures the annual change in the consolidated government budget balance. The liberalisation indexes have been obtained from Havrylyshyn et al (1998). As always in empirical analysis of macroeconomic variables in transition countries, it is important to bear in mind the caveats concerning the quality of the data (which were especially poor during the early years of transition). The mere availability of the data sets some constraints: data on e.g. unemployment are not available for all the countries in all the years, and information about primary deficits, which would have been perhaps more appropri-

ate measure of fiscal adjustment, has similarly not always been available.[8] One problem specific to data on fiscal deficits is that the official deficit figure may leave out information about quasi-fiscal deficits, resulting from e.g. soft loans to the private sector or from deficits in extra-budgetary accounts. While there is probably little to do in terms of remedying these problems, they are nonetheless potentially significant and should be borne in mind.

The analysis below follows the general-to-specific methodology, i.e. we first examine a general model, as discussed above, and then continue by simplifying the structure to arrive at our preferred parsimonious specification. In the simplification search, we employ some prior choices about the order of simplification, drawing on the contribution of Berg et al (1999). In the following, we present both the general and the final model as well as some special cases with restricted samples.

3.2 Regression analysis

We start with the general model of equation (1) and supplement it by imposing time dummies for transition years and dummies for the single biggest adjustment in Armenia.[9] Regression results from this specification are reported in model (1) in Table 3.

Before focusing on the results, it is worthwhile to discuss some regression diagnostic issues. First, as suggested by Beck and Katz (1995), we use White heteroscedasticity-consistent estimates of the standard errors (thus, all the reported t-values in the tables are heteroscedasticity consistent). Each cross-section contains only 6-8 observations, so it is hardly fruitful to consider possible problems of autocorrelation. As a tentative guideline, the Durbin-Watson statistic's value for the general model is 2.35, which suggests that the model does not suffer from severe (negative) autocorrelation. However, the DW statistic should be interpreted with care, because although they are not statistically significant, the model also contains possible cross-section differences in the levels of residuals. The RESET test indicated that in the general model, the null of the correct specification could not be rejected with a p-value 0.15. However, normality of the residuals was strongly rejected. This is not surprising given the large variation in the macro data, especially from the early transition years (see e.g. Table 1). It however creates apparent problems for inference; to remedy the situation, dummies for the largest residuals were included.[10] This helps gain normality; and hence,

in the model reduction phase, the general model with the set of country dummies was used.

As might be expected, the interpretation of results from Model 1 is complicated by the presence of many non-significant variables. A potential source for this is multicollinearity between regressors. It is very likely, for instance, that the three liberalisation indexes move the same direction. Moreover, one might argue that at least in the most developed of these countries, GDP and unemployment variables are highly correlated. We therefore simplified the model to arrive at a more parsimonious set-up, which is then used in interpretation of the results.

In the model reduction, two alternative approaches were used. In the first, more general, one, we tested the joint significance of variable classes first (e.g. the joint significance of all liberalisation indices, GDP variables, UR variables and time dummies) in various orders. The results from this analysis showed that we cannot drop all liberalisation indices/macro-variables from the model because we cannot say which of them always survive, irrespective of the order of simplification. Problems of the path-dependency in the simplification processes are common the general-to-specific approach. As a partial remedy to this problem, all the model reduction processes in the paper are based on the following procedure, which draws again onthe important contribution by Berg et al (1999). The idea is to simplify first among those variables believed to be less important to the basis of underlying theory and to give the policy variables a chance to survive. Therefore, we first simplify among the time dummies, then among the more macro-related variables (GDP and UR) and finally among the liberalisation indices. In addition, we always simplify first among a group of variables (e.g. GDP and UR) before proceeding to reduction within other groups. Finally, a complete group of variables may be dropped as well, if allowed by the data. This procedure makes the model reduction more transparent and hopefully accessible for the main purpose of the paper – analysis of the impact of transition policies on fiscal performance. Following this method, we arrive at a final simplified structure for the OLS model, depicted as Model 3 in Table 3. This model survives the RESET and also normality test, when the set of country and year specific dummies, given above, are employed.

An additional worry in the analysis above is potential endogeneity of the right-hand side variables. Most of the transition literature, cited in the introduction, assumes that the liberalisation indexes are exogenous, despite the

fact that some of the studies show that liberalisation can also be explained by macro-variables. We abstract from these complications here and focus on another potential source of endogeneity, i.e. on the possibility that fiscal adjustment can affect the growth rate of the economy. Therefore, we also report 2SLS estimates of the model with contemporaneous GDP instrumented (a fixed effect specification with lagged macro-variables, lagged inflation rate, liberalisation indices and a war dummy were used as instruments for GDP). The results are depicted in Model 2 of Table 3. As above, we progressed from this general set-up along the lines of the simplification procedure to arrive at a final specification, Model 4.[11]

Finally, we check for significant differences in the regression results for the early transition years (when most of the policy changes occur) to those for later transition years. A similar interesting partition is a separate analysis for the more progressed Central and Eastern Europe countries and the CIS countries. The results from the regressions on these restricted samples are given in Table 4.

3.3   Regression results

Consider first the results from the restricted Models 3 and 4 with the whole sample in Table 3. The results show first of all that internal (i.e. price) liberalisation has a strong positive influence on fiscal adjustment. This is somewhat surprising, since most of the price liberalisation takes place during the early transition years when the fiscal pressure has been the highest. One possible explanation for this impact is that when prices were liberalised, the governments also abolished subsidies, hence giving some leeway to alleviation of fiscal pressures. Stylised facts suggest that the share of these subsidies was quite high in many cases. According to CIA figures, in the former Soviet Union, they amounted to approximately 20% of the total government expenditure. Nonetheless, the fact that liberalisation has positive impacts on budget balance – indeed the positive impacts most significant statistically – is not in line with the theoretical literature (mentioned above in Section 2), which emphasises the negative impacts of transition on budget balance.

However, the negative signs of the coefficients for lagged private sector entry and lagged change in unemployment indicate that effects were flowing through negative channels as well. These variables are probably more in line with the theoretical ideas of enterprise restructuring in the models discussed

in Section 2. Thus, one point of the theory is supported by the data – initiating enterprise restructuring through private sector entry and perhaps actual restructuring is reflected in a rise in unemployment and creates a burden on public finances. As discussed above, the channels may reach the budget both via the revenue side (lower enterprise tax revenues) and the expenditure side (e.g. an increase in unemployment benefits).

The interpretation of these variables remains the same, irrespective of the regression method (OLS vs IV). In the IV model, Model 4, the t-values are somewhat higher, suggesting that that approach may work better in this respect. The only point where the two methods give rise to different qualitative conclusion is in the case of lagged external liberalisation, which significant at 10% level in the OLS model. While this finding is less robust than those through *lii* and *lip*, the same interpretation as for the case of internal liberalisation might be valid: liberalisation also frees government resources by limiting subsidisation (e.g. of imports). From the other factors, the GDP growth rate and its lagged value remain in the final specifications as macroeconomic control factors with a straightforward interpretation. In addition, part of the time dummies become significant, reflecting the visible time dimension in the path of the fiscal adjustment (see Figure 2).[12]

Consider finally the results of the regression with limited samples given in Table 4. Equations (1) and (2) focus on the early years of transition and to the late transition years, respectively. The results from this analysis are not surprising. The fit of the regression on the early years is much better than in the late transition years. Moreover, it seems that the interpretation of the results for the entire period and for the early years is the same. There is, however, little we can say about the regressions on the late transition years.

Another sensible exercise concerns checking whether there are important differences in the separate regressions for CEE and CIS countries (Equations 3 and 4 in Table 4). Indeed, in CIS countries, the signs of the policy variable remain unaffected but seem to have less influence on fiscal adjustment. This is apparently driven by GDP variables. The results for Central and Eastern Europe are more in line with the regression for all countries with respect to the policy variables, but the GDP variables become less important. In addition, in the more developed transition economies, the unemployment rate tends to have bigger influence on fiscal adjustment than in the whole sample.

While it is clear that the regressions of Table 4 should be interpreted with care (due to the small number of observations), they nevertheless provoke the question as to why liberalisation in CIS countries does not seem to be influenced by fiscal adjustment. In the theoretical discussion of section 2, it was pointed out that liberalisation has not necessarily yielded enterprise restructuring and therefore there has been less pressure for compensation payments. Another factor working in the same direction is that social security policies are much less developed in these countries. The results in Table 4 thus indirectly reinforce the notion that macro-theoretic transition model may work better when analysing the experience of CEE countries. An alternative explanation is that the initial conditions the economies faced were significant for policy outcomes. The next section of the paper addresses this issue by examining some time invariant properties of various countries.

4 The level of the deficit and initial conditions

The recent growth literature (see references in the introduction) has emphasised the importance of initial conditions on growth performance of transition countries, and hence on the specification of growth regressions. By the same token, it can be argued that similar conditions also affect the budget balance, which might possibly reduce the importance of transition policy on deficit developments.

In this section we examine the role of time-invariant initial conditions on fiscal performance. We take first steps towards this direction by using two aggregate sets of initial condition variables taken from De Melo et al *(1997)*. The first *(ic1)* captures variables related to macroeconomic distortions (repressed inflation, black market premium, trade dependency, market memory, existence as independent state prior 1989 and location). The second *(ic2)* measures the level of development and industrialisation (1989 per capita income, the level of urbanisation and over-industrialisation, prior economic growth and natural resource reserves). The same initial conditions were directly used by e.g. Havrylyshyn et al (1998) in their growth regressions.

4.1 Model specification

It makes limited sense to include time-invariant effects to the model of previous section, where the specification is essentially in a difference form. Therefore in this section we concentrate on explaining the level of fiscal deficit. While a proper way to measure the impact of liberalisation on budget pressure involves using fiscal adjustment as the dependent variable, it might also be worthwhile to consider whether similar conclusions of these impacts carry over to the setting of explaining the level of fiscal balance.

The fiscal balance *(bal)* specification we examine is the following:

$$bal_{i,t} = \alpha_i + \beta_1 lii_{i,t} + \beta_2 clii_{i,t} + \beta_3 lie_{i,t} + \beta_4 clie_{i,t} + \beta_5 lip_{i,t} + \beta_6 clip_{i,t} \\ + \beta_7 ur_{i,t} + \beta_8 ur_{i,t-1} + \beta_9 gdp_{i,t} + \beta_{10} gdp_{i,t-1} + \beta_{11} rt_{i,t} + \varepsilon_{i,t} \tag{2}$$

where *clii*, *clie* and *clip* depict the cumulative internal liberalisation, the cumulative external liberalisation and the cumulative private sector entry, respectively. *Ur* denotes the unemployment rate, and *rt* is a regional tension (i.e. war) dummy variable. As the dependent variable is fiscal balance, we also allow for the level of liberalisation indices and for the level of unemployment.[13]

For comparison to the previous section, we first report regression results for a specification with country-specific fixed effect without the initial conditions. Then we describe the regression result from the pooled OLS setting with the initial conditions. As in the previous section, we apply the general-to-specific approach with the same *a priori* assumptions of the sequence in model reduction (drawing on Berg et al (1999)).

Table 5, model (1), reports the regression result for general model of specification (2) (after adding time dummies and a dummy for Armenia, year 2). The reported t-values are again heteroscedasticity-consistent. An F-test indicated that we could reject the hypothesis that $\alpha_i = \alpha$ for all i, and therefore we concentrate on the fixed effects specification. Likewise, the Breusch-Pagan LM-test suggests that random effects cannot be rejected. It is interesting to note that when choosing between a fixed and random effects specification, the Hausman test recommends using the random effects. A fixed effect specification was however chosen, as the sample includes all the

transition economies and as fixed effects estimator, though not necessarily efficient, is nevertheless consistent. LM statistic was used to test for first-order autocorrelation in the residuals from this fixed effects regression (see Baltagi, Ch. 5). The p-value of 0.39 of the null hypothesis that the autocorrelation coefficient is zero indicates that the model does not suffer from severe autocorrelation. In addition, the normality of residuals could not be rejected with a p-value of 0.53.

Again, the general model contains few significant variables. Applying the model reduction principles (simplifying first among the time dummies, then the macro-variables and finally the liberalisation indices) in this set-up leads to a preferred final model of equation (2). The residuals from this model again satisfy the normality and no autocorrelation assumptions.

The next phase is to consider the role of initial conditions. Model 3 is the general specification in a pooled OLS setting with these time invariant initial conditions *ic1* and *ic2*. Note that the discussion of initial conditions here applies a simplified assumption that their impact remains the same over transition time. While admittedly a crude way to capture these impacts, it nonetheless provides some idea of their influences on fiscal performance. The model reduction leads to the final equation given by Model 4.

4.2 Results

Consider first the results from the specification (2) without the initial conditions. It appears that it is more difficult to capture the impacts of transition policies on fiscal performance, if fiscal balance is used as a measure instead of fiscal adjustment. The only significant effect is a positive impact of price liberalisation, now expressed in the form of the cumulative internal price liberalisation. Note however that in this fiscal balance specification, no evidence can be seen of the possible negative impacts of liberalisation and enterprise restructuring on budget balance.

Let us now turn to the examination of the impact of initial conditions on budget balance in Model 4. It is quite striking that controlling for the two initial conditions, especially for *ic2* (the level of development and industrialisation prior transition), radically changes the conclusions stemming from the liberalisation indices. The significant influences are now also in the cumulative indices form, but price liberalisation loses its significance while

external liberalisation and private sector entry remain in the model. Their signs are opposite and roughly of the same size, hence offsetting each other. In addition, ic2 affects fiscal balance positively. It may therefore be deduced that including initial conditions reduces the impact of liberalisation on the budget balance. As fast-reforming countries are on average those with beneficial initial conditions (*ic2* takes high values), this suggests that there could be an omitted variable problem in the regressions focusing only on policy variables. Thus, we know that the fiscal stance is better in countries with rapidly liberalising prices, but the liberalisation itself may be influenced by beneficial initial circumstances. Puzzles like this are common to much of the empirical growth literature (see the discussion e.g. in Berg et al 1999) but no less important for that.

It is important to bear in mind certain caveats when interpreting the results concerning initial conditions. It is not very surprising that fiscal balance has been better in the most developed and richest transition economies. The initial conditions we analyse are also aggregate indices capturing a number of determinants. However, it is hard here to trace which of them specifically has been influential in the budget balance equation. Finally, there might be some other explanations behind the level of budget balance such as tax reform or the quality of governance in fiscal sphere, which we briefly discuss in the next section. Nevertheless, the results of this section indicate that the interrelation between initial conditions and reforms is a complicated and potentially decisive process in the context of fiscal policy analysis.

5 Conclusions

Earlier empirical work on macroeconomic development in transition economies has concentrated mostly on inflation and growth determinants, while fiscal policy has received only limited attention. The purpose of this study is to offer a remedy to this deficiency by empirically examining the determinants of fiscal deficits in transition economies using data from 25 countries from 1990-97. The analysis was based on the general-to-specific approach, where fiscal performance, measured either as fiscal deficits or the change in deficit, fiscal adjustment, was explained by transition policy variables (three liberalisation indices), macroeconomic variables, initial conditions and a set

of time and country dummies. Following a method of model reduction suggested by Berg et al (1999), the general models were then simplified to arrive at a set of preferred simple equations. The paper also contains separate analyses of fiscal behaviour during the early versus late transition years and in the Former Soviet Union versus the rest of the transition countries. In addition, potential endogeneity of the macro-variables was addressed by the instrumental variables method.

The results indicate that internal/price liberalisation has a robust positive impact on fiscal behaviour, while enterprise restructuring, measured either through private sector entry or increase in unemployment, increases fiscal deficits in transition economies. The beneficial impact on fiscal performance from price liberalisation can probably be explained by reduced use of consumer price subsidies in conjunction with price liberalisation. The negative impacts from private sector entry and unemployment on budget balance support some of the transition theoretical considerations of a possible trade-off between the speed of reform and the level of budget deficits. While the link between GDP growth and fiscal deficits in transition economies is arguably weaker than in most developed economies, the GDP growth rate has a positive impact on fiscal balance in transition economies as well. Finally, the inclusion of initial conditions into the model suggests that fiscal deficits were lower in countries most developed at the onset of transition and that the impact of transition policies on the deficit is less clear in comparison to the sole analysis of liberalisation policies.

This paper focused on the connection between transition policies and fiscal deficits. As one of the few papers to address the topic, it has of necessity been kept straightforward in its methodology. Obviously, there is much to study in extending the analysis. The first of the extension possibilities concerns the idea of the tax and benefit reform. As mentioned above, if a country reforms its tax and expenditure system at the same time it pursues general transition reforms (reflected in the LIs), the theoretical case for reforms resulting in fiscal pressure is weakened because the efficiency of tax collection increases. It would be interesting to analyse this issue in general, as well as test whether tax reforms are indeed associated with smaller deficits in transition economies.[14] One option would be to look at how countries collect taxes. Advanced reformers typically have tax systems resembling Western taxation systems, whereby most revenue is collected by indirect taxes and income taxation. In less advanced transition economies, tax sys-

tems have often relied heavily on taxation of firms and foreign trade.

Finally, this issue is related to a broader theme concerning the quality of governance/public sector in transition economies. This is reflected in the analysis of fiscal policy through the link to tax evasion, with the possibility that fiscal deficits arise where revenue collection is poor and tax evasion is rampant.[15] In the recent discussion of growth determinants in cross-country comparisons, the overall quality of government and institutional environment have attracted increasing importance (see Havrylyshyn and van den Rooden (1999) for the study of these issues in transition economies). Anecdotal evidence from transition countries and the discussion related to initial conditions suggest that such analysis would certainly be worthwhile also in the context of fiscal policy.

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Notes

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[1] This literature is reviewed in section 2 of this paper.

[2] We utilise this simple definition of fiscal adjustment and, primarily for data reasons, do not investigate primary deficits or any cyclically adjusted concepts of fiscal adjustments (for an analysis on these in OECD countries, see e.g. Alesina and Perotti (1997)).

[3] For years 1994-1997, the index was updated by linking the measure to the transition indicators of the EBRD.

[4] In addition, there are a number of papers that describe the development of the size of the government, expenditure and revenue classes in transition economies. For such analyses, see e.g. Ambrus-Lakatos and Schaffer (1997).

[5] In the analysis of developed economies, it is often thought that automatic stabilisation mainly results from adjustment in revenues while expenditure is regarded as exogenous. Similar assumptions are clearly not valid in the case of transition economies, where public expenditure systems were also radically changed. Examining the dependency of change in government revenues on GDP changes confirms that indeed, revenues are not affected by gdp growth in any more systematic way than the fiscal deficits. This caveat is nevertheless appropriate to keep in mind when interpreting the results of Table 2.

[6] This variable captures both progress in privatisation and enterprise environment. Unfortunately it does not directly measure actual restructuring. As in other studies in this field, it is nevertheless used as one proxy for it.

[7] Loss in degrees of freedom hinders the use of a richer lag structure.

[8] These deficiencies also explain why the sample size varies somewhat in the regressions below.

[9] During the war time, at t=2 in Armenia the budget balance was –55 % and at t=3 – 11 %.

[10] These are the following: FYR Macedonia, year 4, Armenia, year 2, Armenia, year 3, Azerbaijan, year 4, Georgia, year 3; Kazakstan, year 3; Kyrgystan, year 4; Moldova, year 2. It appears that for most of these countries, conflicts or wars probably explain the unusual fiscal adjustments.

[11] Again, RESET and normality test do not suggest diagnostic problems.

[12] One additional issue is the interpretation of the different signs for contemporaneous and lagged liberalisation variables in the general models of Table 3. Since we do not have a clear theoretical idea on the time paths of the effects, one possible solution would be to look at the sums of the signs for each liberalisation factor. Interpreting equations 1 and 2 this way would give similar results than those discussed in the main text based on parsimonious models.

[13] One might ask why we have not also included the level of GDP instead of its growth rate. The reason is that gdp growth turned out to be better explanator and the specification with the levels suffered from autocorrelation.

[14] The fact that CEE-countries have progressed quite substantially in reforming their tax system (see e.g. Ambrus-Lakatos and Schaffer 1997), and have also managed to collect more revenues (see Figure 5), provides further motivation for such an analysis.

[15] Johnson, Kaufmann and Shleifer (1997) have collected information about the share of informal economy in transition economies.

Figures

Figure 1: The development of fiscal balance in transition economies.
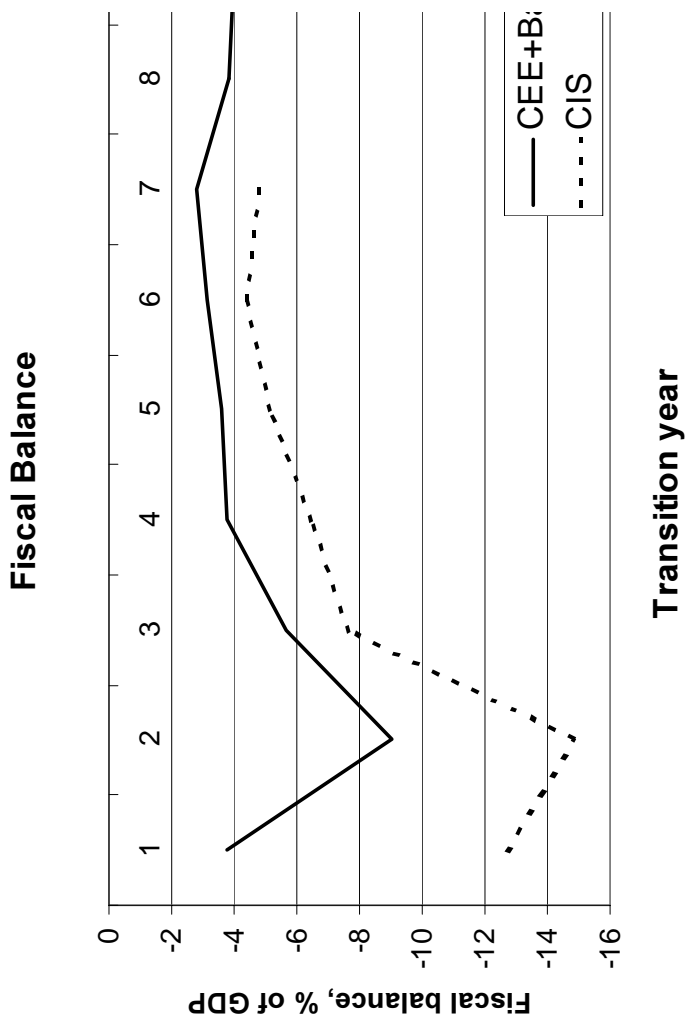Data on 1998 are estimates taken from EBRD (1999).

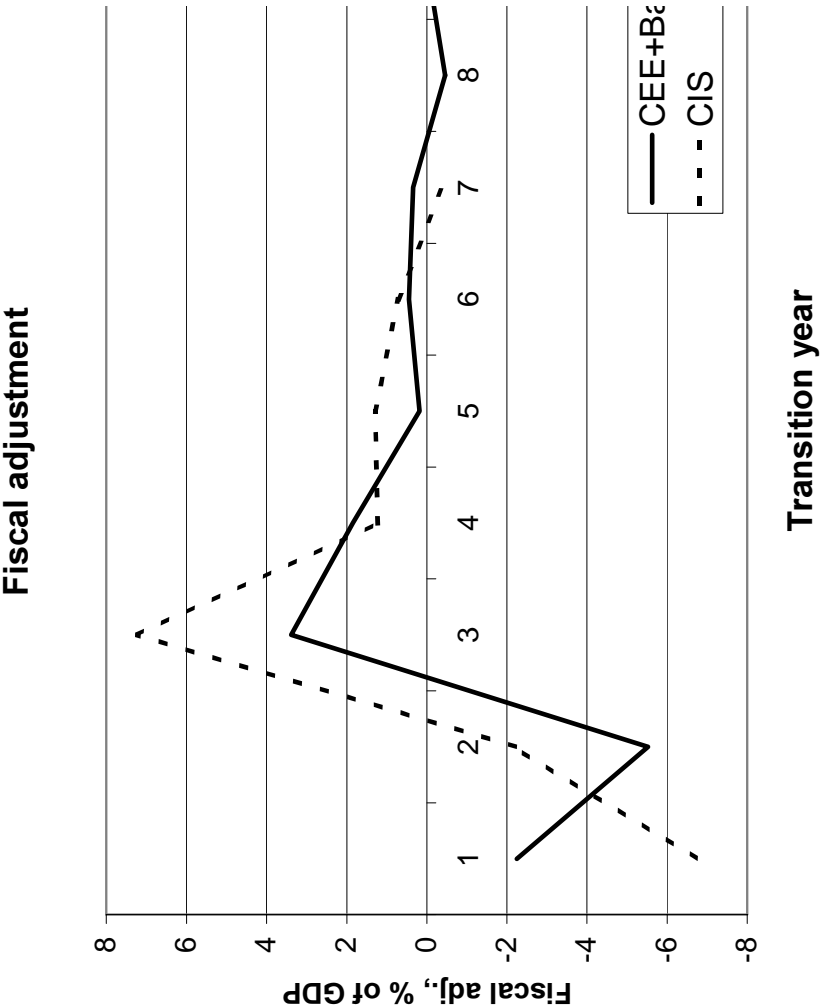Figure 2: The development of fiscal adjustment in transition economies.

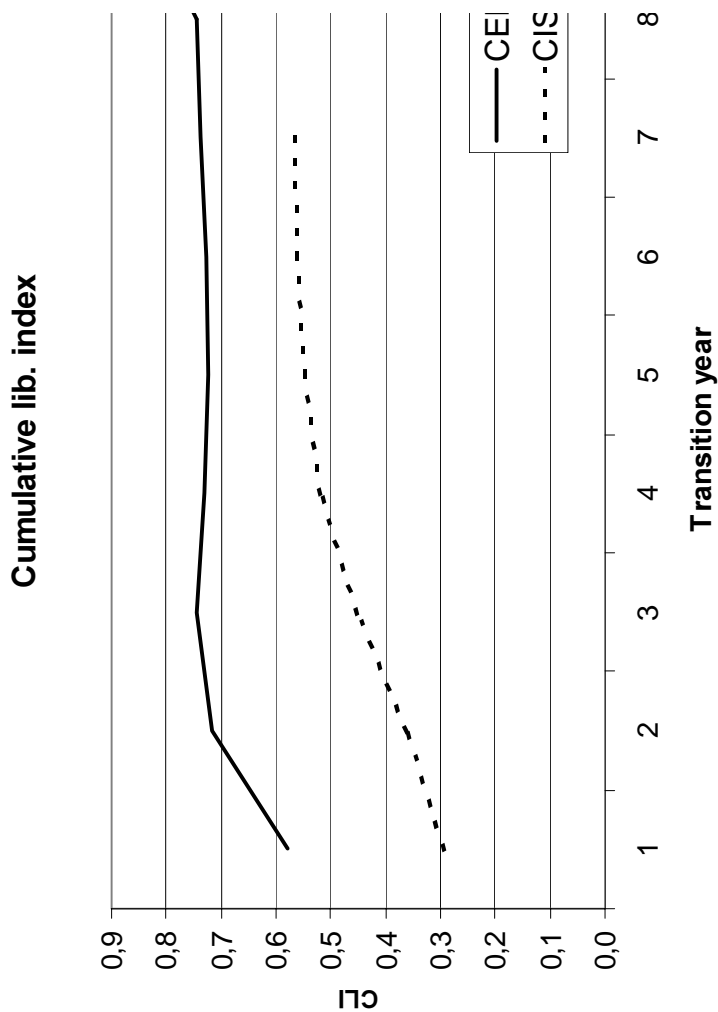Figure 3: Cumulative liberalisation index in transition economies.

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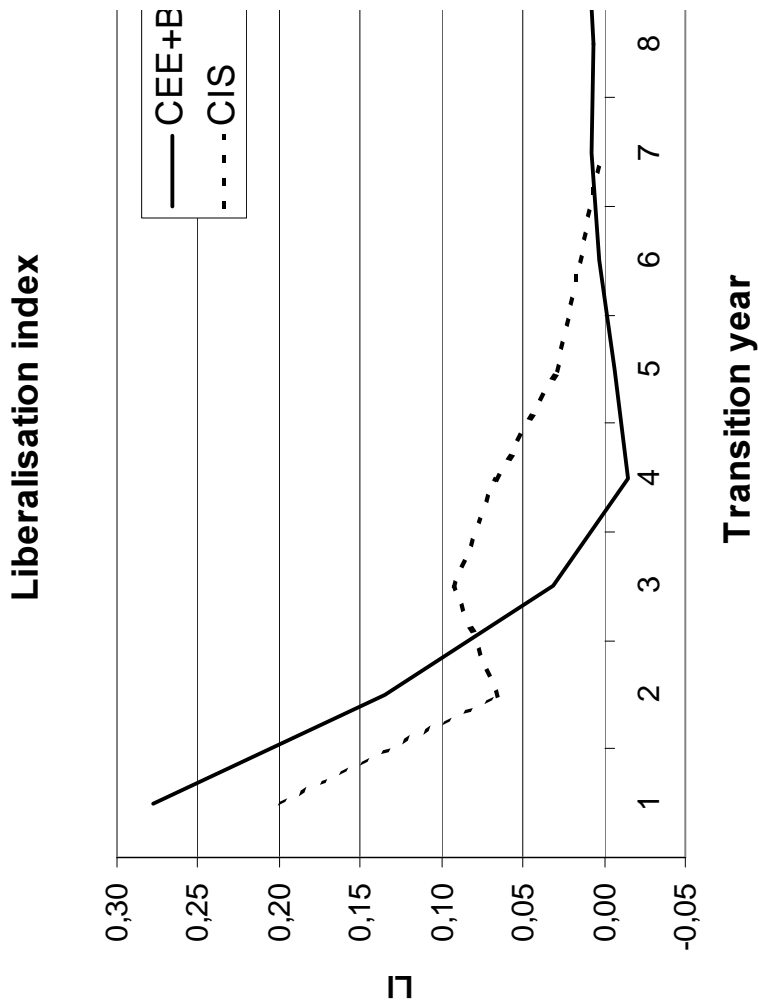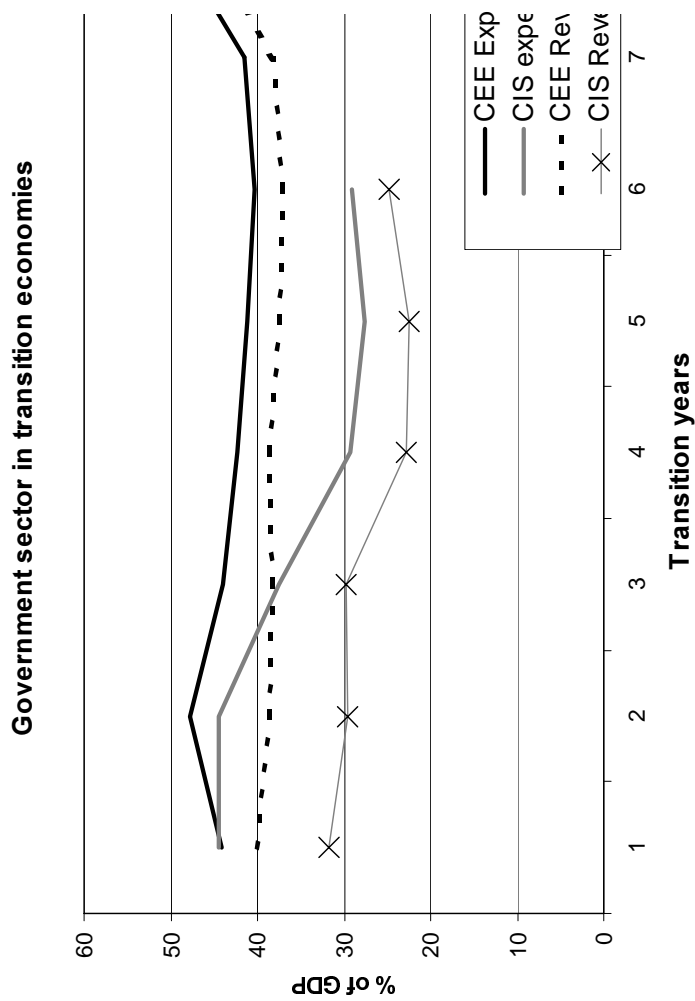Figure 4: Liberalisation index in transition economies.

Figure 5: Public sector expenditure and revenues in transition economies.

Tables

Table 1: Fiscal balance of transition economies (percentage of GDP)

Transition year	1	2	3	4	5	6	7	8	9
Central and Eastern Europe and the Baltic States									
Albania	-31	-20,3	-14,4	-12,4	-10,3	-12,1	-12,7	-13,9	
Bulgaria		-5,2	-10,9	-5,8	-5,6	-10,4	-2,1	-2	
Croatia	-5	-3,9	-0,8	1,6	-0,9	-0,4	-1,3	-0,5	
Czech republik	-1,9	-3,1	0,5	-1,2	-1,8	-1,2	-2,1	-2,4	
Estonia	-0,3	-0,7	1,3	-1,3	-1,5	2,2	2,5		
FYR Macedonia		-9,6	-13,8	-2,9	-1,2	-0,5	-0,4	-0,8	
Hungary	0,4	-2,9	-6,8	-5,5	-8,4	-6,7	-3,1	-4,9	-4,9
Latvia	-0,8	0,6	-4,1	-3,5	-1,4	1,4	1		
Lithuania	0,5	-3,3	-5,5	-4,5	-4,5	-1,8	-3,6		
Poland	3,1	-6,7	-6,7	-3,1	-3,1	-2,8	-3,3	-3,1	-3,1
Romania	3,3	-4,6	-0,4	-1,9	-2,6	-4	-3,6	-5,5	
Slovak Republik	-2	-11,9	-7	-1,3	0,2	-1,9	-3,8	-4	
Slovenia	2,6	0,2	0,3	-0,2	0	0,3	-1,1	-1	
Commonwealth of Independent States									
Armenia	-13,9	-54,7	-10,5	-11	-9,3	-6,3	-5,8		
Azerbaijan	2,8	-15,3	-12,1	-4,9	-2,8	-1,7	-3,6		
Belarus	-1,6	-1,9	-2,5	-1,9	-1,6	-2,1	-3		
Georgia	-25,4	-26,2	-7,4	-4,5	-4,4	-3,8	-2,5		
Kazakstan	-7,3	-1,4	-7,2	-2,5	-3,1	-3,7	-5,5		
Kyrgystan	-17,4	-13,5	-7,7	-17	-9	-9,4	-8,1		
Moldova	-26,2	-7,4	-8,7	-5,7	-6,7	-7,5	-8		
Russia	-4,1	-7,4	-9	-5,7	-8,3	-7,4	-8		
Tajikistan	-28,4	-23,6	-10,2	-11,2	-5,8	-3,3	-3,3		
Turkmenistan	13,2	-0,5	-1,4	-1,6	-0,2	0,01	-4		
Ukraine	-25,4	-16,2	-9,1	-7,1	-3,2	-5,6	-3		
Uzbekistan	-18,4	-10,4	-6,1	-4,1	-7,3	-2,3	-3		

Table 2: Response of fiscal adjustment to GDP changes.
* denotes statistical significance at 5 % level and ** at 1 % level.

	Coefficient	R^2
Albania	0,339	0,353
Bulgaria	0,115	0,015
Croatia	-0,127	0,271
Czech Republik	0,101	0,097
Estonia	0.229*	0,464
FYR Macedonia	0,2	0,035
Hungary	0,156	0,09
Latvia	-0,001	0
Lithuania	0.154*	0,593
Poland	-0,134	0,03
Romania	0,699	0,02
Slovak Republik	0,202	0,11
Slovenia	-0,901	0,095
Armenia	0,505	0,197
Azerbaijan	0,955	0,021
Belarus	0,489	0,05
Georgia	0,304	0,295
Kazakstan	-0,732	0,011
Kyrgystan	0,304	0,125
Moldova	0,574	0,384
Russia	-1,05	0,284
Tajikistan	0,214	0,1
Turkmenistan	-0,007	0
Ukraine	-0,21	0,052
Uzbekistan	0,968	0,376
All	0.207**	0,081
Average	0,129	0,163

Table 3: Fiscal adjustment regression results.

	Dependent variable: Fiscal adjustment						
Method	OLS		IV		OLS		IV
Range	All		All		All		All
Model	1		2		3		4
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.
Variable							
Internal lib. index	21,107	3,73	25,564	4,991	18,472	4,858	20,356
Internal lib. index, lagged	-1,648	-0,45	0,399	0,093			
External lib. index	-3,711	-0,926	-5,925	-1,385			
External lib. index, lagged	4,543	1,31	6,701	1,66	4,161	1,715	
Private sector entry	-2,403	-0,35	4,495	0,519			
Private sector entry, lagged	-13,165	-1,973	-17,504	-2,803	-11,932	-2,56	-7,908
D unemployment rate	-0,11	-0,668	0,805	0,53			
D unemployment rate, lagged	-0,281	-1,516	-0,497	-2,914	-0,249	-1,937	-0,212
GDP growth rate	0,182	1,994	0,452	2,878	0,108	2,179	0,244
GDP growth rate, lagged	-0,232	-2,387	-0,362	-3,032	-0,102	-2,372	-0,166
Transition year 2	-0,117	-0,046	-2,383	-1,041	-3,928	-2,903	-4,001
Transition year 3	2,188	1,114	1,261	0,743			
Transition year 4	3,853	2,293	4,085	2,571	1,365	1,626	
Transition year 5	2,398	1,762	1,752	1,41			
Transition year 6	2,738	2,006	2,94	2,344			
Transition year 7	2,449	1,623	1,567	1,069			
Number of obs.	118		106		119		107
R^2	0,733		0,693		0,863		0,801

Table 4: Fiscal adjustment: additional results

Dependent variable: Fiscal adjustment							
Method	OLS		OLS		OLS		O
Range	Trans. years 1-4		Trans. years 5-9		CIS		CEE+
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Co
Variable							
Internal lib. index	28,181	3,435	12,737	1,584	12,425	0,943	23
Internal lib. index, lagged	4,343	0,953	-10,398	-1,678	-0,291	-0,038	7,
External lib. index	-11,006	-1,576	-1,268	0,338	-4,157	-0,506	-2
External lib. index, lagged	3,378	0,536	6,046	1,455	9,67	1,386	3,
Private sector entry	-3,104	-0,24	-3,274	-0,456	9,031	0,624	-5
Private sector entry, lagged	-23,215	-1,91	-2,308	-0,4	-9,614	-0,703	-17
D unemployment rate	-0,16	-0,606	0,114	1,136	-0,428	-0,947	0,
D unemployment rate, lagged	-0,55	-1,715	-0,663	-0,495	0,178	0,28	-0
GDP growth rate	0,313	2,441	0,131	1,04	0,288	2,068	0,
GDP growth rate, lagged	-0,307	-2,425	-0,156	-1,52	-0,302	-2,849	-0
Transition year 2	-3,669	-1,273			-0,212	-0,065	-5
Transition year 3	-1,761	-0,849			2,949	0,609	1,
Transition year 4					0,445	0,144	5,
Transition year 5			0,826	0,572	0,215	0,096	2,
Transition year 6			1,523	1,07			2,
Transition year 7			1,293	0,847			1,
Number of obs.	59		59		49		6
R^2	0,788		0,329		0,85		0,

	Dependent variable: Fiscal balance							
Method	OLS, fe		OLS, fe		OLS		OLS	
Range	All		All		All		All	
Model	1		2		3		4	
	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value	Coeff.	t-va
Variable								
Internal lib. index	2,76	0,71			-3,89	-0,698		
Cumulative internal lib. index	8,101	1,805	9,115	2,471	5,532	0,99		
External lib. index	-2	-0,584			-0,423	-0,119		
Cumulative external lib. index	2,676	0,676			-4,898	-1,87	-5,038	-1
Private sector entry	7,227	1,3			3,908	0,646		
Cumulative private sector entry	-1,766	-0,251			8,494	2,061	8,405	2
Unemployment rate	-0,172	-1,355			0,103	0,609		
Unemployment rate, lagged	-0,041	-0,323			-0,558	-0,326		
GDP growth rate	0,072	1,289			0,177	0,28		
GDP growth rate, lagged	0,058	1,09	0,091	3,46	0,872	1,329	0,094	1
Regional tension	-9,25	-4,034	-9,273	-6,917	-7,398	-2,701	-8,312	-3
Initial conditions 1					-0,421	-0,809	-0,477	-0
Initial conditions 2					1,704	3,171	1,507	2
Transition year 2	0,019	0,007						
Transition year 3	-0,815	-0,468						
Transition year 4	-0,08	-0,072						
Transition year 5	0,215	0,199						
Transition year 6	0,249	0,279						
Transition year 7	0,485	0,411						
Number of obs.	129		136		129		136	
R^2	0,81		0,791		0,69		0,636	

Table 5: Fiscal balance regression results. Fixed effects not reported.

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