

## Chapter 2

### **Governance, Institutions and Growth: Empirical Lessons from the Post-Communist Transition**

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#### **1. Introduction**

The post-communist countries of Central Eastern Europe (CEE) and the Commonwealth of Independent States (CIS) have proved to be a fertile arena in which to empirically explore the role of institutions within the context of economic growth. As the short-term evolves into the medium-term, as quantitative proxies for institutions extend their coverage and grow increasingly sophisticated and as more advanced econometric techniques become available we now revisit the empirics of economic growth in transition. In particular, using data for 1989-2007<sup>1</sup>, we re-examine the role of both traditional factor accumulation variables and variables relating to policy choices. In doing the latter, we are able to observe more closely the causal links between institutions of governance, economic policy outcomes and economic growth and thus go some way towards identifying the important conditioning role played by governance institutions.

There have been numerous attempts to empirically examine economic growth in both transitional and non-transitional settings. The majority of economic growth studies, covering non-transition economies, confirm the positive role played by factor accumulation. That is, a higher capital investment ratio, higher levels of human capital investment and lower population growth rates are all associated with higher economic growth (Barro, 1991; Mankiw *et al*, 1992; Knight *et al*, 1993; Islam,

1995; Caselli *et al*, 1996; Sala-i-Martin *et al*, 2004; and Sala-i-Martin *et al*, 2004). In contrast, at least in the initial period of reform, studies on the transition economies have found these ‘standard’ variables to be insignificant. Accordingly, much of the research on transition has omitted the standard variables from the growth estimation in favour of a range of ‘transition specific’ variables pertaining to liberalisation and stabilisation (Fischer *et al*, 1996; Havrylyshyn *et al*, 1998; Berg *et al*, 1999; Fischer and Sahay, 2000; Campos, 2001; De Melo *et al*, 2001; Falcetti *et al*, 2006; Havrylyshyn, 2006).

It is in the spirit of this empirical research that we now interrogate afresh the relationship between institutions and growth in the post-communist economies. In particular, given the time elapsed since the ‘start’ of transition, we are now able to extend the ‘transition’ approach by (re)incorporating the traditional neo-classical factor accumulation variables while, at the same time, thinking more carefully about how to best capture the effects of macroeconomic stability in the evolving institutional context. Adopting this approach we find evidence, robust to a variety of econometric approaches, that institutions of governance are important for economic growth *through* their influence on the macroeconomic environment. That is, macroeconomic stability is important for economic growth (see figure 2.1) but it is the quality of the institutional environment which dictates the extent of macroeconomic stability (see figure 2.2). We also find that human capital (re)emerges as an important driver of growth over the medium term.

We proceed as follows. In section two we present a brief review of the theoretical and

empirical literature concerning institutions, macroeconomic stability, and economic growth in transition economies. In the following three sections we then revisit the empirics of economic growth and explore the links between growth and institutions using a variety of econometric techniques. We conclude in section six.

*{FIGURE 2.1 AND 2.2 ABOUT HERE}*

## **2. Economic Growth, Macroeconomic Stability and Institutions**

Macroeconomic stability has long been identified as one of the main determinants of economic growth in both transition and non-transition settings (Lucas, 1973; Easterly and Rebelo, 1993; Fischer, 1993; Aslund *et al*, 1996; Barro, 1995; Loungani and Sheets, 1997; Bruno and Easterly, 1998; Zinnes *et al*, 2001; Lawson and Wang, 2005; Falcetti *et al*, 2006; Havrylyshyn, 2006). In the bulk of this literature, the relevant empirical proxy for macroeconomic stability is an inflation variable, which is typically shown to have a negative and significant impact on economic growth.

One of our main contentions is that, while the macroeconomic environment is indeed crucial for economic growth, as indicated for the transition countries by figure 2.1, the use of inflation as a proxy for it deserves much more cautious treatment. Firstly, inflation is endogenous to growth: there may be some omitted variable, such as movement in the oil price, that is correlated with both growth and inflation; the association between growth and inflation may simply be spurious, particularly in transition economies where, following the initial ‘shock’, inflation/growth has declined/increased over time for transition specific reasons; and the growth-inflation relationship may suffer from simultaneity

(or reverse causality). Secondly, inflation is a policy *output* variable and therefore further caution is called for before thinking of it as an explanatory variable determining another output. This is likely to be particularly important in the transition context.

If inflation is the product of a set of policy choices then it should not be treated in the same way as other factor inputs typically are in economic growth estimates. Indeed, as Rodrik (2005) argued, if we fail to distinguish policy effort from policy outcomes when measuring potential growth determinants we are unlikely to learn much from our estimation efforts. Campos and Horvath (2006), in drawing the distinction between policy inputs and outputs, give further succour to this argument, while the empirical work of Loyaza and De Soto (2002) and Glaeser *et al* (2004) is also consistent with this line of reasoning.

In this spirit, we argue that macroeconomic stability is associated with the effectiveness of institutions and that the direction of causation is from the latter to the former and that nowhere is this more true than in the transition context where a stable macroeconomic environment reflects the degree of the government's commitment to a programme of stabilisation and its capacity to sustain it. Figure 2.2, depicting a simple cross-section of inflation during the current financial crisis against average government effectiveness, supports this thesis.

This being so, we cannot consider stabilisation itself to be an exogenous policy tool (Campos and Horvath 2006; Falcetti *et al* 2006). Accordingly, we argue that the inflation-economic growth transmission mechanism can be summarised thus: poor quality governmental institutions lower the

effectiveness of government; this in turn exacerbates fiscal and macroeconomic instability and *ceteris paribus* negatively impacts upon economic growth.

So, while we agree that macroeconomic stability is important for growth, we augment this observation by noting that the policy inputs that determine stability are related to institutions of governance. Thus, the role of the institutional environment is central to our story. Before detailing how we deal with this econometrically it is worth revisiting briefly the underlying argument linking institutions and economic stability in the empirical context.

To provide the necessary empirical realisation we call upon the Kaufmann (2007) indicators of institutional quality. Among diverse categories of institutions that may affect macroeconomic stability, Kaufmann catalogues six dimensions of governance: i) voice and accountability; ii) political stability; iii) government effectiveness; iv) regulatory quality; v) rule of law; and vi) corruption. We argue that it is the ‘government effectiveness’ indicator which best captures the underlying mechanism that most closely links institutions of governance with macroeconomic stability.

Kaufmann defines government effectiveness as ‘the quality of public service, the quality of civil service and the degree of its dependence from political pressures, the quality of policy formulation and implementation, and the credibility of the government’s commitment to such policies.’ This is crucial since it reflects the ability of the government to collect taxes, and thus removes the need (or temptation) to rely on seigniorage to increase its revenue. At the same time, less effective governance is likely to result in low tax collection and more prevalent tax evasion,

contributing to increased budget deficits and higher inflation. A recent World Bank Report (2007) supports this view, comparing the public spending and taxation regimes in the transition group with those in comparator countries in Asia and Africa, and demonstrating that government spending and taxation reforms have positive effects on the public finances. Furthermore, it is argued that higher public spending leads to macroeconomic instability and lower economic growth, specifically when institutions are weak. That is, with lower quality governance institutions, money is less likely to be well-spent and higher tax and/or fiscal deficits will eventually distort the business environment and threaten macroeconomic stability.

In sum, there is a growing and convincing body of evidence emerging suggestive of a strong causal link between institutional settings and macroeconomic stability. This body of literature, stemming from attempts to detail the conceptual, political economy linkages at play, has prompted the development of increasingly sophisticated quantifiable measures that attempt to capture institutional structures empirically. This makes our task of going beyond the conventional treatment of the inflation-growth relationship by identifying potential ‘input’ instruments for inflation more achievable.

### **3. Econometric Methodology**

Growth regressions have become a somewhat inveterate feature of empirical work in long-run macroeconomics in recent times. Examples abound, stemming from the original work of Barro (1991) and Levine-Renelt (1992), incorporating independent variables derived from both growth

theories as well as from macro- and microeconomic policy variables. The early examples utilise cross-country regressions measuring long-run ‘equilibrium’ values while, more recently, improved data sets and econometric software have facilitated a preponderance of panel-based empirical growth studies.

In the latter, real GDP per capita growth is typically regressed on a number of explanatory variables, as per equation (1), in which subscripts  $i$  and  $t$  denote country and time period respectively.

Thus,

$$G_{it} = \beta_0 + \beta_1 \ln(Y_0)_{it} + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

where,  $G_{it}$  represents the average growth rate in country  $i$  at time  $t$ ;  $\ln(Y_0)$  is the log of initial GDP per capita; and  $X_{it}$  is a vector of control variables derived from theories of economic growth supplemented with empirically plausible policy variables.

Panel data analyses have clear advantages over the earlier cross-section approaches in so far as they allow for differences in individual country effects, while also controlling for unobserved heterogeneity (Islam, 1995). Nevertheless our main macroeconomic stability variable – inflation – remains empirically troublesome since, as explained in section two, it is endogenous to the process of economic growth and is a product itself of the institutional environment emerging in transition. In this situation, instrumental variables approaches in the form of two-stage Least Squares (2SLS), is a popular procedure to adopt. Valid instruments though are hard to come by: they must be both strongly correlated with inflation and substantially uncorrelated with the error term in (1). If we can identify such instruments then we are in a position to explore whether inflation, as a growth determinant, is

robust to the attenuation of an inherent endogeneity. Following our earlier discussion, logic dictates that we should instrument inflation (a policy output) with a policy input variable and, in section two, we proposed the Kaufmann measure of ‘government effectiveness’, as a potential instrument, capturing the most generalised measure of public sector institutional quality.

So far, we have reviewed methods aimed at reducing the effects of unobserved heterogeneity and have discussed the important possibility that inflation, as a proxy for macroeconomic stability, is in fact an endogenous policy output variable. However, in empirical growth applications, it is also possible that other explanatory variables are in fact endogenous or indeed that there is state dependence in the dependent variable. In the spirit of the discussion above we may conceive of identifying instruments for each potentially endogenous variable, yet realistically, the plausibility and appropriateness of 2SLS as a general solution is questionable. Fortunately, panel data opens up the possibility of estimating parameters of dynamic models that specify the dependent variable for a particular country to depend in part on its values in previous periods. Indeed, the emergence of more reliable panel data series, augmented by more powerful econometric software, allows us to call upon Generalised Methods of Moments (GMM) techniques to produce ‘difference’ and ‘system’ dynamic panel analysis (Arellano and Bond, 1991; Blundell and Bond, 1998).<sup>2</sup>

Difference GMM (Arellano and Bond, 1991), uses the lagged values of the dependent variable as instruments for the endogenous variables in a differenced equation. Consider the standard panel dynamic model (2), where  $Y_{it}$  represents GDP per capita,  $X_{it}$  is a vector of explanatory variables,



$c_i$  is an unobserved country specific effect, and  $u_{it}$  is the error term.

$$\ln(Y_{it}) = \beta_0 + \beta_1 \ln(Y_{i,t-1}) + \beta_2 X_{it} + c_i + u_{it} \quad (2)$$

To net out the country specific effect ( $c_i$ ), we take first differences of this equation:

$$G_{it} = \beta_1 [\ln(Y_{i,t-1}) - \ln(Y_{i,t-2})] + \beta_2 [X_{it} - X_{i,t-1}] + [u_{it} - u_{i,t-1}] \quad (3)$$

where  $G_{it}$  now represents  $\ln(Y_{it}) - \ln(Y_{i,t-1})$ . In sweeping  $c_i$  out of the equation this transformation reduces the problem of omitted variable bias but, in so far as  $G_{it}$  and/or  $(X_{it} - X_{i,t-1})$  are correlated with the new error term  $(u_{it} - u_{i,t-1})$ , estimates of equation (3) will suffer from endogeneity bias. To overcome this we can use lags of greater than one period as valid instruments. In the growth context, for example, if  $X_{it}$  is the investment ratio, and current investment is correlated with the current GDP growth rate, then ‘standard’ approaches will be subject to endogeneity bias. Using difference GMM, and instrumenting investment with values of itself lagged two periods or more, we can expunge this bias (Arellano and Bond, 1991; Easterly and Levine, 2001; Hoeffler, 2002).

Blundell and Bond (1998) argued that estimators relying on lagged variables are weak instruments if the data in question are close to being a ‘random walk’. In this situation, the weak correlation of the lagged value of the regressor ( $X_{i,t-1}$  or  $X_{i,t-2}$ ) with its difference ( $X_{it} - X_{i,t-1}$ ), affects the asymptotic and small sample performance of the differenced estimator. In these circumstances, ‘difference’ GMM performs poorly as the coefficient variances are inflated and finite sample bias becomes an issue. To combat these potential problems, ‘system’ GMM emerged (Arellano and Bover, 1995; Blundell and Bond, 1998; Bond 2002), drawing on the same instruments as difference GMM

for the regression in differences but for the regression in levels the instruments are specified as the lagged differences of the corresponding variables (Easterly and Levine, 2001). Through this, system GMM reduces any bias associated with the weakness of instruments in difference GMM.

We present estimates stemming from all of these approaches in section five, after a brief introduction to the data.

#### **4. Data**

Empirical research on economic growth generally uses International Financial Statistics (IMF), World Development Indicators (WDI, World Bank), and the Summers-Heston data set (the Penn World Tables).<sup>3</sup> In this contribution, our focus is on 25 transition economies of CEE and the CIS.<sup>4</sup> We have data on these economies for a period, 1989-2007, which we consider as representing the ‘medium-term’<sup>5</sup>. Following the approach of Islam (1995) and Hoeffler (2002), rather than using annual observations from within our data, we construct three-year averages, resulting in six time units.<sup>6</sup> This is appropriate in our case as, by averaging over three-year periods, we introduce a stability to our data that serves to offset the missing values and measurement errors that afflict the data during the early stages of transition in particular. In addition, by reducing the number of time periods, from 19 to six, we constrain the number of instruments used to obtain the GMM estimates (Roodman, 2006).

As discussed, our growth estimation follows the approach widely used in the general

empirical literature: the growth rate is regressed on explanatory variables motivated with reference to a combination of growth theories and growth empirics. Accordingly, we estimate economic growth (change in log GDP per capita averaged over 3 year periods) as a function of initial income level, factor accumulations, and economic policies. Specifically:

$$\text{Growth} = \beta_0 + \beta_1 * \text{GDPPC} + \beta_2 * \text{WPOP} + \beta_3 * \text{INV} + \beta_4 * \text{SEC} + \beta_5 * \text{TRADE} \quad (4) \\ + \beta_6 * \text{FUEL} + \beta_7 * \text{INF}$$

where the convergence effect (Solow, 1956) is captured by incorporating the average value of PPP GDP per capita over each period (GDPPC); the evolving demographic situation is controlled for through the incorporation of the growth of the working age population (WPOP); and factor accumulation is captured through the ratio of gross fixed capital formation to GDP (INV) and the general upper secondary school enrolment rates (SEC). These four variables are relatively conventional and stem from the standard theoretical approach to modelling economic growth. We now briefly explain our empirical approach to capturing important policy effects.

Many studies on economic growth in transition have used the EBRD's liberalisation index (EBRD 1994 – 2008) to capture the seemingly important impact of transitional reforms. However, aside from being a subjective indicator and artificially constrained by its lower and upper bounds, it is also significantly correlated with virtually every relevant independent variable and therefore likely to bias the econometric results. We therefore adopt 'TRADE' - the sum of exports and imports of goods and services measured as the share of GDP – as our preferred proxy for liberalisation. In particular,

TRADE captures the important impact of economic openness on growth. In view of the significance of the natural resource sector to many of the CIS countries in our study, we also include the percentage of fuel exports over merchandise exports (FUEL). Finally and consistent with the literature, we use inflation as our proxy for macroeconomic stabilisation during transition.<sup>7</sup> In contrast to the GDP deflator, the CPI includes imported goods and therefore incorporates the surge of imports prompted by the initial external liberalisation associated with transition.

As discussed in section two, we regard (input) institutions as the appropriate instrumenting variable for inflation. Among the diverse categories of institutions that may affect macroeconomic stability, we draw on the Kaufmann *et al* (2007) governance indicators which range in value from -2.5 to +2.5 with the higher values corresponding to better governance outcomes. These indicators rely on 276 variables<sup>8</sup> to measure institutions across the six dimensions of governance indicated earlier. Unsurprisingly, the six Kaufmann governance indicators are closely correlated with each other, as table 2.1 demonstrates. This provides further justification for using the government effectiveness indicator rather than attempting to combine indicators. Therefore, in our 2SLS analysis, we instrument inflation (a policy output variable) with government effectiveness (a policy input factor). We turn now to a discussion of our empirical results.

*[TABLE 2.1 ABOUT HERE]*

## **5. Results**

In this section we present our empirical results in three stages: effects estimates controlling for unobserved heterogeneity; 2SLS estimates attenuating the potential endogeneity of our macroeconomic stability variable; and GMM estimates accounting for a dynamic process with multiple endogenous variables. The results of each approach are consistent and mutually reinforcing.

Following conventional panel procedures we estimate economic growth in transition using both fixed and random effects models, before conducting the Hausman (1978) test of whether the individual country effects are correlated with the explanatory variables. Finding that we are unable to reject the null hypothesis (P-value = 0.048), that they are correlated; we are left relying on the consistent, but less efficient fixed effects estimates. The latter allow us to control for omitted variables that differ between countries but that are constant over time. The results (table 2.2) indicate that, though fixed effects estimates are preferred, there is no major qualitative distinction to be made between the two.

*[TABLE 2.2 ABOUT HERE]*

The results are broadly consistent with expectations. Initial conditions, though insignificant, have the expected negative sign. The investment rate and openness to trade have the expected positive sign, though again are not significant and the working population growth is negative and insignificant. The proportion of natural resource exports is positive and weakly significant, perhaps reflecting the dominating effect of the oil price boom over the opposing forces of the more long term prospect of ‘Dutch disease’. Most promisingly however, education and macroeconomic instability are both highly

significant and with the expected signs. This is our first evidence that higher levels of human capital have a positive impact on economic growth in transition while macroeconomic instability has a negative impact. As discussed above, the latter result is consistent with findings elsewhere. However, until now, there has been little evidence of a significant positive association between education levels and economic growth in the transition context.<sup>9</sup>

In our earlier discussion we identified Kaufman's 'government effectiveness' indicator as an intuitively plausible instrument for inflation. Empirically, we find that 'government effectiveness' is significantly and negatively related to macroeconomic instability (inflation) but is consistently unrelated directly to economic growth. Indeed, reproducing the effects estimates of table 2.2, with government effectiveness incorporated, we are unable to discern any significant relationship with economic growth.<sup>10</sup>

Following Wooldridge (2002), we therefore proceed to combine 2SLS with effects models in order to obtain parameter estimates purged of both unobserved effects and endogeneity in the macroeconomic stability variable. Conducting the Hausman test we find no evidence that the individual country unit effects are correlated with the explanatory variables incorporated in the model and so we concentrate our discussion on the results of the random effects instrumental variables regression presented in table 2.3.<sup>11</sup>

*[TABLE 2.3 ABOUT HERE]*

In the first stage regression, where inflation (CPI) is the dependent variable, 'government

effectiveness' is strongly and negatively associated with 'CPI', whereas no other variable is significantly related to inflation. This result is not affected by the use of different estimators or specifications and is strongly supportive of our earlier discussion, namely that macroeconomic stability is an outcome of sound institutions of governance. In the second stage regression, where the growth rate is again the dependent variable, we purge the endogeneity introduced by the inflation variable by using, in its place, the 'government effectiveness' instrument. Entirely in keeping with the results of simple effects models, we find that initial conditions, the growth of the working population, the investment rate, trade openness and natural resource exports are all insignificant but with plausible signs, while macroeconomic instability and levels of human capital are both highly significant and with the expected signs. We now further investigate the robustness of these results using dynamic panel methods.

In table 2.4, we report four sets of dynamic growth regressions mirroring the specifications discussed above: pooled OLS, fixed effects, difference GMM and system GMM. By examining the coefficient on the lagged dependent variable we are able to check the validity and robustness of our GMM results. In particular, the estimate for the lagged dependent variable in the pooled OLS regression (column 1) is likely to be upward biased in so far as it is positively correlated with the unobserved country specific effects (Hoeffler, 2002; Hsiao, 1986). In contrast, the fixed effects estimator (column 2), though eliminating the problems stemming from country specific effects is likely to produce downward biased estimates of the lagged dependent coefficient (Nickell, 1981). The

coefficients, both of which are strongly significant, from these two approaches can therefore be thought of as approximate upper (1.02) and lower (0.21) bounds for the GMM regressions. That is, if the GMM estimates for the lagged dependent variable fall outside of the upper and lower bounds, it suggests some form of bias is also present in the GMM estimates.

*[TABLE 2. 4 ABOUT HERE]*

With the pooled OLS and fixed effects estimates confirming that there is a dynamic process at work we then address the problem of endogeneity within our model, first through difference GMM (column 3) and then through system GMM (column 4). Specifically, in each case we consider that the investment ratio and the human capital proxy, *as well as* the macroeconomic stability variable, are endogenous to the process of economic growth. In terms of our upper and lower bounds we find that the difference GMM estimate of the lagged dependent variable, 0.23, is similar to that of the fixed effects estimate, while the system GMM coefficient, 0.99, is just below the upper bound represented in the OLS estimate. Blundell and Bond (1998), demonstrate that the difference GMM estimator suffers large finite sample biases such that, if the instruments available are weak, difference GMM estimates are also downward biased. The evidence of table 2.4 is cautiously supportive of this finding and, since the corresponding system GMM estimate falls below the upper bound, we consider that the system GMM approach is preferred. Indeed, between these estimators, the system GMM has been preferred in many studies for logic mirroring that which we have applied (Blundell and Bond, 1998; Easterly and Levine, 2001; Hoeffler, 2002; Nkurunziza and Bates, 2003).



Notwithstanding these comments, any GMM estimate must have valid instruments and be correctly specified. In both of our GMM estimates, the Hansen test fails to reject the assumption that our instruments are valid, the Sargen test results are consistent with the assumption that our models are correctly specified and the overall results are robust to different lag structures (Roodman, 2006).

Concentrating on the system GMM results, table 2.4 provides strong evidence supportive of the findings derived from simple effects models and 2SLS approaches and of our *a priori* expectation that the growth process is indeed dynamic. Specifically, we find once again that macroeconomic stability and human capital are important for economic growth in the transition economies while, even allowing for their potential endogeneity; investment, trade openness, natural resource exports and growth of the working population have ambiguous effects on economic performance for this set of countries.

Finally, there is a further transition specificity, regarding the inflation-economic growth relationship, which merits consideration. It is well understood that at the start of the transition process there was a concurrent output decline and hyperinflation which may lead us to the erroneous conclusion that hyperinflation caused recession and thus that macroeconomic stability should result in economic recovery. This is not the effect we want to be capturing in this chapter. Indeed, the explanation for and implication of the initial price hikes is quite distinct from subsequent inflationary episodes occurring across parts of the post-communist world. In order to confirm our findings therefore, we estimate our model without the first two time periods, covering 1989-1994,<sup>12</sup> and are

thus able to observe the role of inflation in the later stages of transition. Reassuringly, our results are confirmed as we find once more that macroeconomic stability and education are significant and positive determinants of economic growth.<sup>13</sup>

In sum, by revisiting the latest panel data available for transition countries up to and including 2007, and averaging over 3 year periods, we find evidence that the key determinants of economic growth are human capital and macroeconomic stability. The latter result has been widely reported in the literature but we find evidence supportive of a slightly more nuanced explanation. That is, macroeconomic stability is an outcome of effective government institutions and it is this combination of factors which explains differences in economic performance across the transition economies. The former result, regarding education, is a new finding for the transition economies and indicates that as these economies emerge from the ‘transitional’ process they may converge on ‘behaviour’ concordant with that observed elsewhere. The results are robust to different econometric approaches, assumptions, specifications and time spans and are likewise robust to a range of different panel econometric approaches.

## **6. Concluding Discussion**

In this chapter we have systematically revisited the dense empirical and theoretical literature pertaining to economic growth in transition. We have done so with a view to refocusing the attention of researchers and policy makers on to the medium-term determinants of economic growth in the

post-communist economies. Thus, in taking a longer data series than previously available, we have: assessed the evolving impact of factor accumulations; controlled for well-rehearsed transition specificities; and incorporated a revised role for the institutions of governance. Our main findings are consistent and mutually reinforcing across econometric specification and technique and taken together they provide us with our two core contributions: (i) macroeconomic stability promotes economic growth in the countries of CEE and the CIS but it is robust institutions and good governance that are required to generate that macroeconomic stability; (ii) as transition has progressed human capital investment seems to have regained its significance as a generator of economic growth.

Macroeconomic instability, as proxied by inflation, is always statistically significant in our estimates and with a negative impact on economic growth. Inflation, it seems, is definitively bad for economic growth in transition. However, inflation itself is a policy output, the inclusion of which is likely to introduce simultaneity bias into our growth estimates. We therefore go further, instrumenting inflation with Kaufmann's 'government effectiveness' variable. We find that inflation is determined by effective governance, even though the latter cannot be linked directly to economic growth. That is, good governance is important for growth indirectly through its association with the kind of institutions that facilitate a stable macroeconomy.

Our results regarding investment in human capital are different from those provided by other studies on growth in transition, in which education is generally found to be insignificant. The explanation for this lies in the fact that we are using different measures and that we have a longer,

more medium-run time horizon. Most previous studies take the value of *initial* education to estimate the human capital-economic growth relationship. It should come as little surprise that levels of human capital characteristic of the end of the communist period transpire not to be appropriate for the market-based economy. Indeed, Laporte and Schweitzer (1994) argue that a higher level of initial education is meaningless for, or perhaps even detrimental to, economic growth since the social sciences and the humanities endured particular neglect during the central planning period. By way of contrast, we take three year averages of the secondary school enrolment rate on the grounds that sustained investment in education during the transition is more likely to have a significantly positive impact on economic growth. The raw data supports this thesis. Countries achieving high economic growth during the transition, such as Estonia, Poland, Albania, and Latvia, show a significant increasing trend in secondary education enrolments. On the other hand, the poor performers in terms of economic growth - Tajikistan, Georgia, and Turkmenistan – exhibit a decreasing or constant trend in educational enrolments.<sup>14</sup>

In terms of the other factor accumulation variables known to be important for economic growth in developed and/or developing economies our results pose more questions than answers since, although the signs on the variables are plausible enough, they are generally not statistically significant. We feel that, since physical investment in particular has been one of the main determinants of rapid growth elsewhere in the world, this merits further investigation. Several avenues show promise: it may be that there is some complex relationship between investment and inflation which our data

cannot detect; more plausibly still, as argued by Mickiewicz (2005), it is the quality of investment, rather than the quantity that matters in the transition context; finally, there may be a transition specific story relating the impact of investment to the appropriateness of institutions. These are interesting and important lines for future research but are outside the scope of this chapter. It is also worthy of comment that we have utilised an openness measure instead of the (more common) liberalisation indicator. We choose to do this on the grounds that it is less subjective and less sensitive to measurement error and not because we are denying the importance of microeconomic reforms in transition. Rather, our story is in the spirit of Mckinnon (1993) who argues that microeconomic, macroeconomic and institutional aspects are closely and inextricably linked. To the extent that we are able to capture this, we do so in our 2SLS estimation which confirms that government effectiveness leads to macroeconomic stability, which in turn is a main determinant of economic growth.

The recent financial crisis has exacted a heavy toll on the transition countries (EBRD, 2008) with economic growth in decline across the region though most substantially in the Baltic region and parts of the CIS. Inflationary pressures also emerged across the region but as figure 2.2 confirms, those countries with the best governance records have suffered the least in terms of inflation during this crisis. If our story is correct, then we might expect those countries retaining macroeconomic stability to find the smoothest paths back to their medium term growth paths.<sup>15</sup>

Finally, it is also worth reflecting that empirical growth studies must be treated with caution due to the ever present possibility of heterogeneity and endogeneity, data inconsistency, and the

potentially biased selection of variables. Moreover, these issues become potentially more worrisome in the case of transition economies. These concerns inform our systematic approach and our caution in interpretation. However, as Falcetti *et al* (2006) suggest, although we cannot yet have a clear understanding of the long-term determinants of growth in transition economies, investigating growth patterns in these important economies will rightfully continue to be fruitful areas of research as the transition from the command economy structures progresses. Ultimately, as we seek more generally to understand and refine economic growth models in a world in which institutions and governance are known to be ever more important, the research community should not ignore the lessons to be learnt from the unique setting provided by the transition economies of Central and Eastern Europe and the Former Soviet Union.

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**Table 2.1 Correlation Matrix of Six Governance Indicators**

	VA	PS	GE	RQ	RL	CC
VA	1.00					
PS	0.75	1.00				
GE	0.82	0.83	1.00			
RQ	0.87	0.79	0.93	1.00		
RL	0.82	0.85	0.98	0.92	1.00	
CC	0.78	0.82	0.97	0.88	0.98	1.00

Source: Kaufmann *et al* (2007)

Note: i)VA: Voice and Accountability; ii)PS: Political Stability;  
iii)GE: Government Effectiveness; iv)RQ: Regulatory Quality;  
v) RL: Rule of Law; vi) CC: Control of Corruption

**Table 2.2 Basic Model (Fixed and Random Effects)**

	T1 – T6 (1989-2007)	
	FE (n = 82)	RE (n = 82)
ln(GDPPC)	-4.85 (5.83)	-0.20 (0.59)
WPOP	-0.10 (0.02)	-0.01 (0.02)
INV	0.05 (0.23)	0.08 (0.11)
SEC	0.52*** (0.17)	0.18*** (0.05)
TRADE	0.03 (0.04)	0.002 (0.02)
FUEL	0.25* (0.14)	0.03 (0.03)
CPI	-0.02*** (0.004)	-0.02*** (0.003)
Hausman Test	Chi Sq = 14.20 Prob(Chi Sq) = 0.048	

Data Source: WDI (2008); IMF(2008); TRANSMONEE (2008)

**Table 2.3 Panel 2SLS Estimation (IV: Government Effectiveness)**

	T3 – T6 (1996-2007)	
	Fixed Effects (n = 68)	Random Effects (n = 68)
<b>1<sup>st</sup> Stage Regression</b>		
ln(GDPPC)	-294.06 (195.58)	26.88 (20.92)
WPOP	27.52 (35.22)	2.57 (14.09)
INV	1.87 (6.51)	2.49 (2.70)
SEC	4.93 (6.74)	-0.06 (1.27)
TRADE	-0.32 (2.10)	0.60 (0.44)
FUEL	1.77 (3.34)	0.12 (0.78)
Gov Eff	-96.66* (57.79)	-95.59*** (32.23)
<b>2<sup>nd</sup> Stage Regression</b>		
CPI	-0.03 (0.02)	-0.03** (0.01)
ln(GDPPC)	8.37 (8.94)	-0.47 (0.51)
WPOP	-0.57 (1.30)	-0.60 (0.47)
INV	-0.19 (0.20)	0.14 (0.09)
SEC	-0.10 (0.20)	0.15*** (0.04)
TRADE	0.04 (0.64)	-0.001 (0.02)
FUEL	0.22** (0.11)	0.03 (0.03)
<b>Hausman Test</b>	Chi Sq = 8.55 Prob(Chi Sq) = 0.29	

Data Source: WDI (2008); IMF(2008); TRANSMONEE (2008).

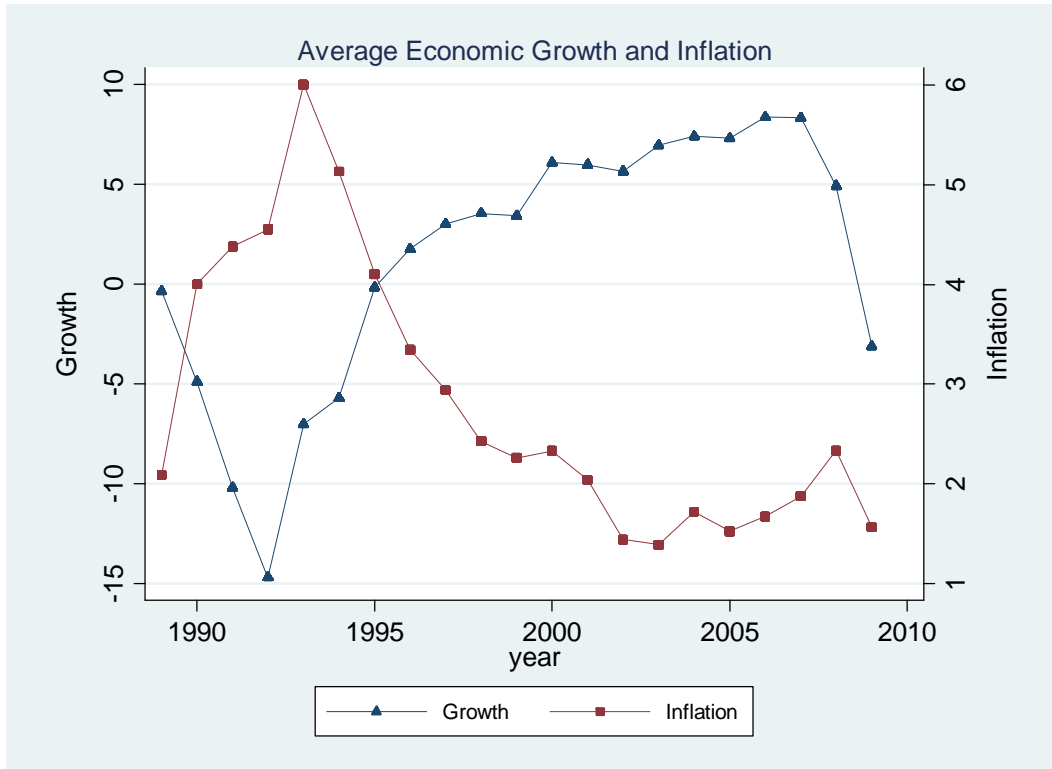
**Table 2.4 Growth Estimation of Transition Economies**

DV: $\ln(\text{gdppc})_{i,t}$	(1)	(2)	(3)	(4)
	<b>Pooled OLS</b>	<b>Fixed Effects</b>	<b>DIF-GMM</b>	<b>SYS-GMM</b>
	<b>(n = 79)</b>	<b>(n = 79)</b>	<b>(n = 55)</b>	<b>(n = 79)</b>
$\ln(\text{gdppc})_{i,t-1}$	1.02*** (0.02)	0.21** (0.09)	0.23 (0.22)	0.99*** (0.03)
WPOP	0.005 (0.02)	0.01 (0.02)	0.03 (0.06)	0.05 (0.03)
INV	0.005 (0.003)	0.01*** (0.003)	0.003 (0.02)	0.008 (0.006)
SEC	0.003*** (0.001)	-0.001 (0.004)	-0.04* (0.02)	0.01** (0.005)
TRADE	-0.001*** (0.0004)	-0.002 (0.001)	0.002 (0.005)	-0.001 (0.001)
FUEL	-0.001 (0.001)	0.005** (0.002)	-0.004 (0.006)	-0.0004 (0.002)
CPI	-0.0003** (0.0002)	0.0001 (0.0001)	-0.00008 (0.0003)	-0.001*** (0.0004)
AR(2)			0.328	0.922
Instruments			15	24
Hansen			0.727	0.349

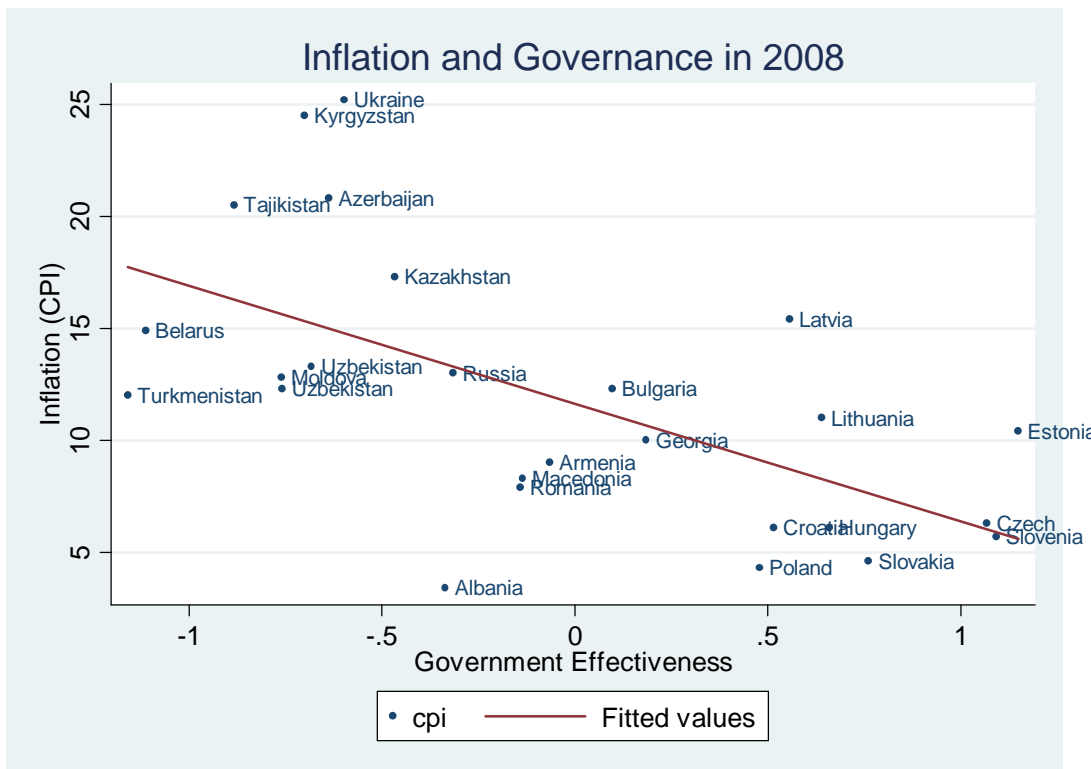
Data Source: WDI (2008); IMF(2008); TRANSMONEE (2008)

Notes: All standard errors are corrected for heteroskedasticity. Each regression includes time dummies, excluded here for ease of exposition.

**Figure 2.1: Inflation (CPI) and Economic Growth, 1989-2009 (2009 estimates)**



**Figure 2.2: Inflation (CPI) and Government Effectiveness (average 2002-2007)**



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<sup>1</sup> At the time of writing this is the latest comprehensive data available for the 28 EBRD countries (we do not include Mongolia in this analysis).

<sup>2</sup> Good applications of GMM techniques can be found in Bond, 2002; Hoeffler, 2002; and Nkurunziza and Bates, 2003. Roodman (2006) presents perhaps the definitive guide to implementing and understanding ‘Difference’ and ‘System’ GMM.

<sup>3</sup> Examples abound including Barro, 1991; Levine and Renelt, 1992; Mankiw *et al*, 1992; Islam, 1995; Quah, 1996; Sala-i-Martin, 1997; Barro and Sala-i-Martin *et al*, 2004.

<sup>4</sup> We exclude Serbia, Montenegro and Bosnia-Herzegovina (as well as Mongolia), from the 28 countries that the EBRD typically identifies as transition economies in the pan-European region, due to data availability in the early 1990s.

<sup>5</sup> Our data is drawn principally from the EBRD Transition Reports (1989-2008), augmented with data from WDI, IMF (inflation) and, for education, UNICEF’s TransMonee database.

<sup>6</sup> The six units T1, T2,...T6 are: 1989-91; 1992-94; 1995-97; 1998-2000; 2001-03; 2004-07. The latter time unit spans four years but this does not qualitatively affect the results and it remains too soon to construct a 7<sup>th</sup> time period based on 2007-2009.

<sup>7</sup> Specifically we use the change in the Consumer Price Index (CPI). The CPI is a measure of the average prices paid by consumers for a fixed market basket or bundle of goods and services. We obtain our data from IMF Financial Statistics (2008), since the IMF provides superior coverage.

<sup>8</sup> The data draws on 31 sources constructed by 25 different organisations, covering 213 countries for 1996, 1998, 2000, and annually for 2002-07.

<sup>9</sup> *All* results in this section are robust to the exclusion of TRADE alone, FUEL alone, and TRADE/FUEL together and to estimates using annual panel observations.

<sup>10</sup> We note also that the inclusion of government effectiveness as an explanatory variable does not qualitatively effect the results reported in this section.

<sup>11</sup> Since the Kaufman indicators are not available for T1 and T2, this estimate is indicative but is consistent with all of our other findings.

<sup>12</sup> As also in table 2.3.

<sup>13</sup> These results are not reported but are available on request from the corresponding author.

<sup>14</sup> Moreover, these findings are robust to the potential endogeneity of the human capital variable.

<sup>15</sup> It is of course too early to comment concretely on this since other factors, ranging from capacity constraints in labour markets, through fiscal and monetary policies to choice of exchange rate regime and beyond are condition the impact of global financial instability on the domestic macroeconomy.