

Creating Capitalism: Politics, Reforms, and Economic Performance

An econometric analysis of six countries from 1989—1999

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*Eldon Smith Professor of Economics, Pomona College. This paper modifies Appendix B of Creating Capitalism: Reforms and Growth in Post-Soviet Europe, with Patricia Dillon, Edward Elgar Press, forthcoming, so that it may be read as a stand alone article. It is the second of two papers of an econometric analysis of the dynamic interactions between politics, reforms, and economic progress. In the first paper precise linkages between each of the five key generic economic reforms from socialism to capitalism and choices and outcomes derived from neoclassical and endogenous growth models are developed. Here the econometric model is completed and applied to ten years of experience in six transition economies.

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Abstract

Building on a model that integrates reforms into exogenous and endogenous growth models, this paper designs an econometric model of the interplay between economic reform measures, political decisions and economic performance. Several key hypotheses about transition are tested using two-stage least squares on a logit model using data for six countries (Bulgaria, the Czech Republic, Estonia, Hungary, Russia and Slovakia) over their first ten years of freedom.

We draw three conclusions from the empirical evidence. (1) Contrary to the litany that everyone favors reforms, we find that voting for strong reform parties leads to more reforms. (2) History matters, even in a model of forward looking rational agents. Where communism was relatively popular, Russia, Hungary and Bulgaria, reform is slower, more problematic, and aimed toward a welfare state not US-style capitalism. The cost of debunking communist ideology evidently slows progress considerably. (3) Better economic performance does not result quickly from reforms. From a public choice perspective the immediate identifiable social costs of reforms often appear stronger than the eventual diffuse benefits. Though not surprising this result does not auger well for reformers.

Finally, critical macroeconomic data for the earlier years around the transition period are very poor quality. Indeed economic data seems to be too poor to reveal much about changing economic circumstance. Measured output may actually move in the opposite direction of realized output. International agencies could contribute greatly to analysis of transition by quickly and deeply engaging the local statistical agencies.

Creating Capitalism: Politics, Reforms and Economic Performance

An econometric analysis of six newly independent countries from 1989—1999

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To assess reform progress toward growth empirically requires an econometric model linking voting decisions, economic reforms and economic performance. In the model developed here politics influences economics and economics influences politics. We briefly review the integration of five generic economic reforms (price liberalization, property privatization, macroeconomic stabilization, trade liberalization and industry restructuring and deregulation) into the growth model framework.¹

In section 2 we link analysis of growth and reforms to voting behavior. Next we model the relationship between decisions by voters, proposals by reformers and election outcomes.² Finally, we model an intertemporal sequence linking historical economic performance and proposed reforms to decisions by voters in elections. We also argue that reform regimes carry the effects of the past on to contemporary economic performance. Reform regimes follow from election outcomes and votes for reformers depend on prospective reforms. Thus we encounter possible simultaneous equation bias. We model this in section 3.

Before dealing with data we analyze in section 4 the concern that votes do not reflect pocketbook issues. Some people choose not to vote at all and others vote for non-economic reasons. We model this problem employing analysis from the labor market supply literature.

In section 5 we explain construction of the variables for reform and voting to be used in subsequent analysis.³ We begin the empirical analysis in section 6 with a model using simple (crude) binomial (0 - 1) dummy variables for voting and reforms. Section 7 reports on increasingly sophisticated estimation techniques using indexes of reform and percentages of votes

¹ The five reforms come from Blanchard et. al. (1992). The companion paper, modified Appendix A, contains the growth model analytics and the relation between reforms and growth.

² Modeling voting, reform and economics is explained in Dillon and Wykoff (2001).

and seats as variables. This section contains ordinary least squares and two-stage least squares models. We sum up with conclusions about voting, reforms and economic performance that we derive from the empirical research.

1. Reforms and the growth model

We summarize here the influence reforms will have on the representative consumer in a growth model. Six sets of forces that express behavior of consumers, producers, and government and the constraints they each face, carry reform measures into the computation of economic prospects. We summarize these functions, the profit function, the utility function, the consumer budget constraint, the producer production and technology constraint and the government spending policies and its budget constraint, in Illustration 1.⁴

Illustration 1. Behavioral and constraint functions

Profit function:

$$\Pi_0 = \int_{t=0}^{t=\infty} [f(k_{ht}) - (w_t + v_t k_{ht})] e^{-rt} dt$$

Production function:

$$Y_t = K_t^\alpha (H_t)^{1-\alpha}$$

Utility function (case of constant elasticity of substitution):

$$U_0 = \int_{t=0}^{t=\infty} u(c_{ht}) e^{-\rho t} dt \quad \text{where } \sigma \equiv [-u'/cu'']$$

Consumer's budget constraint:

$$y_{ht} = w_t + (1 - z)v_t k_{ht} - \tau_{ht}$$

Government budget constraint (balanced budget policy):

$$g_{ht} = \tau_{ht} + z v_t k_{ht}$$

We summarize in Illustration 2 below the nature of the steady state equations. Some reforms operate on these conditions and do not appear in the behavioral and constraint equations.

Illustration 2. Steady state conditions

³ See Appendix C in Dillon and Wykoff (2001) for details on data.

Euler condition:

$$c_{ht}^{\bullet}/c_{ht} = \sigma[(\rho + \delta + \eta + \gamma) - (1 - z\nu)\alpha]$$

The modified golden rule

$$\partial y_{ht}/\partial k_{ht} = (\rho + \gamma + \eta + \delta)/(1 - z\alpha)$$

The dynamic path of capital

$$k_{ht}^{\bullet} = y_{ht} - [g_{ht} + c_{ht} + (\gamma + \delta + \eta)k_{ht}]$$

Steady state output

$$y_t^* = y_{et}^* H_t^* = y_{et}^* \kappa e^{\phi t} (A_t/L_t)^{\gamma} N_t$$

Steady state consumption

$$c_h^* = y_h^* - [g_h + (\gamma + \delta + \eta)k_h^*]$$

Each reform has specific effects on the steady state, either by altering the path of steady state values of certain variables (changes in growth rates) or by altering the level of variables on the steady state paths (level effects). Since all of this is discussed in Appendix A, we merely summarize these effects here with the help of the equations in illustration 1 and 2.

Price liberalization raises the steady state level of utility associated with each level of consumption. This increase in utility reflects the improved mix of consumption goods resulting from a market-driven price set that reflects consumer preferences rather than prices administered by a central agency.⁵

Property privatization, operating on the incentives of producers and savers, alters many aspects of the behavioral relations and the steady state conditions. Individual producers, after privatization, are the residual claimants of the profit function. This alone has many consequences for production, employment, capital acquisition and the path of capital at the steady state. Thus, we expect privatization to improve productive efficiency through many channels. Private property

⁴ These equations are taken from companion paper, modified Appendix A. All symbols are defined in Appendix A.

⁵ In growth models the only good is consumption. No distinction is made between different goods in the consumption bundle. The only choice consumers have is between consumption and saving (that leads to capital formation and future consumption). Nonetheless empirically consumption must be represented by some aggregate index of consumer goods. It is in altering the mix of the goods that comprise the underlying index toward those chosen by consumers that will increase utility from any given quantity of aggregate consumption. See Blanchard and Fischer (1989).

also influences the behavior of consumers, because they become the residual claimants of savings. We identify, therefore, three distinct effects of property privatization on production. (1) It jolts output upward for each mix of inputs. (This effect acts like a one-time positive Hicks neutral technological shock.) (2) It also alters the nature of the production function itself by causing a more efficient production process. These two effects are a direct result of creating a private residual claimant. Both operate directly on $af(k_h)$ where “a” is the rate of Hicks neutral technological change.⁶ (3) Private investors will purchase or produce higher quality capital. Thus, we would expect lower depreciation rates for every type of fixed capital (structures, machinery and equipment).⁷ The depreciation rate δ enters the Euler condition, the modified golden rule and the dynamic path of capital at the steady state.

Private market economies tend to be more dynamic than administered systems. Thus, we believe privatization will increase the rate of technological change. This effect alters the growth rate at the steady state through the Harrod neutral parameter γ .⁸ The behavior of private individuals will also change when they become residual claimants of private property. Knowing that one’s savings will result in high rates of return implies savings rates will rise. The subjective rate of time discount, ρ , will fall as well since people will have more confidence in gains from sacrifice of contemporary consumption for saving, i.e., saving has a higher rate of return. This parameter enters the Euler condition. Finally, if privatizing encourages savings, then it will also increase the rate of accumulation of effective education and skill development. Two parameters of steady state output, under a human capital model, ϕ and μ , will rise. Recall that ϕ represents the level of education and μ is the effect on productivity of education.

⁶ While Harrod neutral is used in the modeling for tractability purposes, we prefer Hicks neutral here because it is a simple one-time shot to output that leaves the technology imbedded in the production function unchanged.

⁷ The mix of capital may change. For instance, private producers may decide to use more computers and fewer structures. This could raise the aggregate depreciation rate. However, we are talking about improvements in the efficiency that should result from the private profit motive, of every type of capital.

⁸ The parameter γ is the growth rate of technological change. This parameter enters into the Euler condition, the modified golden rule and the steady state output equation.

Stabilization policy, while operating primarily on the financial side of the economic system via low inflation, also has real effects. Stabilization operates in our modeling through government budget policy. A lower level of government spending allows for higher consumption at each steady state, that is, if g^* falls then c^* rises for each y^* . We emphasize here that this analysis refers to government spending on Warsaw Pact military activity and on inefficient state owned enterprises. We do not intend the model to apply to government spending on education and infrastructure investment. These would more properly enter the model as part of the development of human capital, e^{ph} , and acquisition of physical capital k .

Large shares of satellite states and former Soviet government budgets consisted of transfer payments. Balancing the budget and reducing the size of government can mean lowering transfers. In our model this term τ , influences the consumer budget constraint. Obviously net transfer recipients lose income whereas net taxpayers gain income.

Restructuring and deregulation, while targeted toward specific firms and industries, amounts to reducing government interference in private decisions to employ capital. Thus, the tax on capital income term, z , is the parameter through which deregulation influences the steady state. This z -term also reflects actual taxes on capital, so that both stabilization reform and deregulatory reform act on z , the implicit tax on income from capital.

The fifth reform, **freer international trade flows**, operates in several ways in the analysis. The Ricardian view that trade exploits comparative advantage and thus benefits both trading partners is central to economists' well-known advocacy of free trade. This means that free trade improves the mix and quality of consumer goods, which in turn increases utility derived from each level of consumption. For the same reason free trade will lower economic depreciation by improving the mix and quality of capital goods. The endogenous growth model that allows technology transfer from advanced economies to emerging ones introduced the κ -term. This term is the parameter through which technology is transferred from advanced to emerging economies.

Thus, the free trade reform raises the rate of transfer of technology. This mechanism reflects two different effects. First, domestic producers, forced to compete on international markets, adopt more efficient methods. Second, foreign firms producing domestically use new technologies.

2. Voting behavior and the growth model

In principal, an economic agent could compute the gains or losses that she expects to accrue from a reform or a package of reforms. Consider an economic and political agent (possible voter) who confronts the choice of voting for a reform (or reform package). If the reformer wins, the reforms will be installed and this will alter her economic environment. If the reformers lose, then reforms will not be installed. According to our growth model, the outcome of the election will influence her calculation of the present discounted value of her future utility stream, based on her optimal plan. How will she vote?

Suppose she exploits the model in the previous section to compute her expected income and well-being under the reform(s) and compares this to her economic well-being in the previous period without the reforms. Let U^*_t be the utility expected from implementation of the reforms given information available to the economic agent at time t of the election:

$$(1) U^*_{i,t} = \mathfrak{S}_i [U_{i,t} : R^*_t, E_{t-1}, C_i]$$

where \mathfrak{S} is an expectation operator contingent on the information about R_t given E_{t-1} and C_i . R^*_t is the package of economic reforms proposed by reformers in the election at time t . C_i is the relevant characteristic set of individual- i that enters in to her calculation of U^*_t . Utility at $t-1$ is determined from known economic conditions at that time:

$$(2) U_{i,t-1} = U[E_{t-1}, C_i]$$

where E_{t-1} is the state of the economy prior to the election. The economic agent computes her utility from her knowledge of economic conditions before the election.

Let the difference for person- i in the time- t election be

$$(3) D_{i,t} \equiv U^*_{i,t} - U_{i,t-1}.$$

Her voting decision is straightforward. Let $v_{i,t}$ be a variable that takes on the value 1 if she votes yes and 0 if she votes no. Then we have

$$(4) \quad v_{i,t} = \begin{cases} 1 & \text{iff } D_{i,t} > 0 \\ 0 & \text{iff } D_{i,t} \leq 0 \end{cases}$$

If $i = 1, 2, \dots, n$, then

$$(5) \quad V_t \equiv \sum_{i=1}^{i=n} v_{i,t} > n/2 \quad \Rightarrow \quad \text{reformers win the election.}^9$$

If our model were strictly accurate and if we had certain data, we could forecast the vote of each person. We would need data on the pertinent characteristics of each individual voter (or subset of voters). We would need data on each proposed reform as well as on economic conditions each period before the election. With this information, we could compute $D_{i,t}$ and predict how each person will vote in the election. In theory such information is available before each election. That is, nothing we assume to know in our calculations is unobservable in principle. Of course, the world is not so well behaved, our model is not strictly accurate and such detailed data is unavailable for transition economies.

Nonetheless, we focus on two econometric problems. First, we deal with the simultaneous and interactive nature of economic events, reforms and elections. Second, our model applies to people who vote according to their own immediate economic self-interest and assume that their votes count. There are people who do not do this. After all, some people do not vote. Some people vote for reasons unrelated to their own self-interest—perhaps ideology, for example. We develop a conceptual model for this problem in section 4.

⁹ We abstract here from tie votes and other anomalies.

3. Simultaneous equation system

Our model implies that the vote in an election for reformers will depend on specific factors. Existing economic conditions, $E_{i,t-1}$, determine $U_{i,t-1}$ in equation (3) for each individual- i . The proposed set of reforms, R^*_t will determine $U^*_{i,t}$, the potential future gains for voters of reforms. This is seen in equation (1). The characteristics of the voting population, C_i , will influence how each $D_{i,t}$ is determined and translated into an actual vote. Recalling that V represents the number of votes for reform parties, we have

$$(6) V_t = V_i [C_i, R^*_t, E_{t-1}, Y_{t-1}] \quad \forall i=1, \dots, n.$$

The variable Y_{t-1} represents non-economic factors that influence elections. The model formalizes the result that the outcome of a political event, the votes in an election, depends on the proposed reform package and on economic conditions before the election. Thus, politics depends on economics as well as on the proposals by candidates during the election.

Economic performance at time- t depends on previous elections through the rules set by the party in power during previous periods, R_{t-1} . Thus,

$$(7) E_t = E_t [R_{t-1}, E_{t-1}, H_j]$$

where H_j represents forces other than prior economic performance and the reform (or non-reform) regime of the previous election and the subscript j indexes countries. E_{t-1} represents inertia in the economic system. H_j will be used empirically to distinguish attitudes toward capitalism that have resulted from historical experiences or lack thereof with capitalism and with relative well-being under communism.

In addition to economics influencing voting and voting influencing economics through reforms, reforms undoubtedly reflect votes for reformers as well as historical experiences. This gives us:

$$(8) R_t = R_t [V_t, H_j].$$

Equations (6) – (8) comprise a three-equation system. We think of C_i as a country-specific dummy variable so that some countries voting may be influenced by different non-economic factors. H_j is a possible dummy variable for differences in historical experience before and during communist control.

We linearize the system as follows:

$$(9) \quad \begin{aligned} E_t &= \alpha_{01} + \alpha_{31} R_{t-1} + \alpha_{41} E_{t-1} + \alpha_{61} H_j + \varepsilon_t^E \\ V_t &= \alpha_{02} + \alpha_{22} R_t^* + \alpha_{42} E_{t-1} + \alpha_{52} C_i + \varepsilon_t^V \\ R_t &= \alpha_{03} + \alpha_{13} V_t + \alpha_{63} H_j + \varepsilon^R \end{aligned}$$

Since we have no independent data on expected and realized reform regimes, we represent them empirically by the same variable R . Therefore (expected) reforms, measured as realized reforms, influence votes and votes influence subsequent reforms. This creates simultaneous equation bias. To correct for this bias we will employ two-stage least squares methods. In model equation-system (9) the coefficient of V in the reform equation, α_{13} , is overidentified.

We ran Hausman tests for simultaneous equation bias and as will be shown later, these tests confirmed the bias of the ordinary least squares estimator of α_{13} . To illustrate the theory of the two-stage least squares estimation procedure in this case, we rearrange terms in equation system (9) for matrix notation,

$$(9') \quad \begin{aligned} E_t & - \alpha_{01} - \alpha_{31} R_{t-1} - \alpha_{41} E_{t-1} - \alpha_{61} H_j &= \varepsilon_t^E \\ V_t - \alpha_{22} R_t - \alpha_{02} & - \alpha_{42} E_{t-1} - \alpha_{52} C_i &= \varepsilon_t^V \\ - \alpha_{13} V_t + R_t - \alpha_{03} & - \alpha_{63} H_j &= \varepsilon^R \end{aligned}$$

Using matrix notation, we define variables as follows:

$$y \equiv [E_t, V_t, R_t] \quad \Gamma \equiv \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & -\alpha_{13} \\ 0 & -\alpha_{22} & 1 \end{bmatrix}$$

$$X \equiv [1 \ R_{t-1} \ E_{t-1} \ C \ H]$$

$$B \equiv \begin{bmatrix} -\alpha_{01} & -\alpha_{02} & -\alpha_{03} \\ -\alpha_{31} & 0 & 0 \\ -\alpha_{41} & -\alpha_{42} & 0 \\ 0 & -\alpha_{52} & 0 \\ -\alpha_{61} & 0 & -\alpha_{63} \end{bmatrix} \quad \varepsilon \equiv [\varepsilon^E \ \varepsilon^V \ \varepsilon^R],$$

The matrix y is the matrix of endogenous variables, X is the matrix of exogenous and predetermined variables, and ε is the matrix of stochastic terms. The model is

$$y\Gamma - XB = \varepsilon.$$

Solving for y we have

$$y = XB\Gamma^{-1} + \varepsilon\Gamma^{-1}.$$

Finally, defining

$$\Pi \equiv B\Gamma^{-1} \quad \text{and} \quad \mu \equiv \varepsilon\Gamma^{-1}$$

we have

$$(10) \ y = X\Pi + \mu.$$

Equation (10) is a system of three equations that can be used to estimate the unknown parameter set Π . The structural parameters in B and Γ depend on Π . As we noted earlier the

coefficient for the vote variable in the reform equation, α_{13} , is over-identified. We determine α_{13} from Π using two-stage least squares. Before turning to estimation, we consider problems resulting from the fact that some eligible voters choose not to vote and some who do vote do not base their choice on their own personal self-interest (pocketbook issues). With the right kind of data, this problem can be dealt with by modifying the second equation in the equation system (9).

4. Allowing for not voting pocketbook issues

The model above applies to individuals who vote in their own economic self-interest, i.e., they “vote their pocketbooks.” People may vote for reformers because they think the reforms will improve their long-range economic prospects. Other people vote against reformers because they expect reforms to result in personal losses. In either case, we modeled above the conduct only of agents who vote their pocketbooks. Voting behavior is of course far more complex. Many people do not vote their pocketbooks and some people do not vote at all. Some people vote for ideological, social or other reasons without regard to pocketbook issues. Furthermore, a sensible voting model needs to allow for two people with the same economic prospects to vote differently, or to allow for one person to vote while another does not.

It would also be interesting to model the intensity of interest in political events. Some people devote enormous energies to electoral politics and some pay little attention. We turn now to a model that allows some of these distinctions in voter behavior.

The model exploits the notion that voting takes time and that time is valuable. This allows us to adapt a model from labor market theory.¹⁰ Suppose utility, W , derives from goods, G , and from leisure, L :

$$W = W(G, L) = G^\alpha L^\beta.$$

Solving for the marginal rate of substitution between goods and leisure in the Cobb-Douglas case yields

¹⁰ This model is from Berndt (1991), pp. 617-29.

$$MRS_{L,G} = (\beta/\alpha) G/L.$$

Recall that D was the gain (or loss) expected to accrue from the election. If we let T be the time needed to vote, then the gain from the election is $D \times T$. If leisure time is lost for voting, then the time to vote costs lost leisure. If we normalize on leisure time, then $L = 1 - T$. If income from sources uninfluenced by the reform package is Θ , then $G = D \times T + \Theta$. Since different people have different tastes regarding goods versus leisure, we introduce a stochastic term η so that

$$W = [D \times (T + \eta) + \Theta]^\alpha [1 - (T + \eta)]^\beta.$$

The marginal rate of substitution is:

$$(11) \quad MRS_{L,G} = (\beta/\alpha) [D \times (T + \eta) + \Theta] / [1 - (T + \eta)].$$

Some people will not vote at all and others will vote for reasons other than their own economic self-interest. Consider a person for whom $T=0$ because, based on the economic implications for his own utility, he does not find it “worth his time to vote.” At what level do benefits from voting rise just enough to persuade this person to vote? The answer is the point at which benefits exactly equal the time cost of voting. We call this level of benefits the “reservation benefit”. (This is analogous to the concept of a reservation wage.) Letting D_r be the reservation benefit, we have

$$D_r = (\beta/\alpha) [(D \times \eta) + \Theta] / [1 - \eta].$$

For any give value of η , people will find it worth their time to vote their pocketbook if and only if $D > D_r$ or $D > (\beta/\alpha) [(D \times \eta) + \Theta] / [1 - \eta]$.

Following Berndt, define $\varepsilon \equiv -\eta$; $b \equiv \beta/(\alpha + \beta)$ and define $J \equiv (1 - b) - b(\Theta/D)$. The following decision rule determines who will vote their pocketbooks and who will not:

$$(12) \quad T > 0 \quad \text{iff} \quad \varepsilon > -J \quad \Rightarrow \quad \text{Vote your pocketbook.}$$

$$(13) \quad T = 0 \quad \text{iff} \quad \varepsilon \leq -J \quad \Rightarrow \quad \text{Do not vote your pocketbook.}$$

For $T > 0$, then $D = MRS_{L,G}$ and we can solve for T :

$$(14) \quad T = (1 - b) - b(\Theta/D) + \varepsilon \quad \text{for } T > 0.$$

This model may now be used to explain the decision process by which people decide how to vote. The model may be interpreted in one of two ways. One approach is to assume that T is zero, in which case the personal economic implications of an election are not relevant to the potential voter. He either fails to vote or votes for reasons unrelated to reforms. If T is not zero, we assume the person chooses to vote. He must then decide whether to vote for or against reforms. Notice that the decision to vote for reformers involves two decisions. One is a decision to vote and the second is a decision to vote yes or no on the reform proposal (or candidate).

Suppose we consider data only on voters. We are implicitly ignoring the first stage of the decision and censoring our sample. One implication of the model is that the variables that determine how one would vote are the same variables that determine whether or not to vote. This means that if we fail to allow for non-voters, then the disturbance term in our voting equation will be correlated with the variables in the voting equation, causing biased estimators. To generate unbiased estimators of an equation explaining votes, we need to account for nonvoters. To do this, we recognize that the decision to vote yes on reform is determined by a system of equations, equations (13), if $T=0$, and equations (12) and (14) if $T \neq 0$. With data on Θ , D , and T one can build an econometric model based on (12) – (14).

A second interpretation of the above model is that it explains the amount of time one spends in voting one's pocketbook. That is, it could explain variations in the value of T when $T > 0$. Equation (14) comes into play when $T > 0$. This equation explains how much time a person will spend on voting. It depends on α , β , Θ , and D and ϵ . Put another way, this model tells us how much effort one may put into electoral politics. The amount of time depends on specific variables described next.

The coefficients α and β represent the elasticity of substitution between tastes for goods and for leisure. The term Θ is income unrelated to the election. If the person owns considerable resources unrelated to the election then she is less likely to vote. However, given Θ if D is large,

then much is at stake in the election and she is likely to spend more time in electoral politics. Perhaps this helps to explain why some elections bring out many union voters or special-interest voters or senior citizens. In our context, it helps to explain why employees of state owned enterprises may be politically very active and why young, low-income voters with long-range prospects may be very active. Older people who feel their pensions are threatened are also likely to vote their pocket books and spend some time involved in the political process.

The model has another nice feature. The term ε can be thought of as the person's "taste for voting." This means two people with the same Θ and D , the same nonpolitical sources of income and same stakes, may behave differently. One may vote and devote energies to politics and one may not.

We turn now to estimation considerations of this model. Let ε_i be person i 's taste for voting. This could be his ideological belief in voting or his enjoyment of the process. Let J_i be the value of J given (α, β) , Θ_i and D_i . We assume a normal distribution for ε and a variance of σ :

$$\varepsilon_i \sim N(0, \sigma).$$

It follows that $\varepsilon_i / \sigma \sim N(0, 1)$. Thus the probability that person- i votes is

$$\begin{aligned} P(i \text{ votes}) &= P[(\varepsilon_i > J_i \Leftrightarrow (\varepsilon_i / \sigma_i) > (J_i / \sigma_i)] \\ &= \int_{z = -J_i / \sigma}^{z = \infty} f(z) dz = 1 - F(-J_i / \sigma) \end{aligned}$$

where

$$f(z) = (1/\sqrt{2\pi\sigma^2}) e^{-\{T-[\gamma_1 - \gamma_2 b(\Theta/D)]\}^2 / \sigma^2}$$

where $\gamma_1 = (1-b)$ and $\gamma_2 = b$ and where we let $\gamma = [\gamma_1 \ \gamma_2]$

and where

$$F(-J_i/\sigma) = \int_{z=-J_i/\sigma}^{z=\infty} f(z) dz.$$

The likelihood function is

$$\mathbf{L} = \prod_{i \in \Omega} [1 - F(\cdot)] \prod_{i \notin \Omega} F(\cdot),$$

where Ω is the set of voters. Maximizing the log of the likelihood function with respect to γ_1 , γ_2 and σ yields three normal equations from which we can estimate the three unknowns γ_1 , γ_2 and σ . Empirical implementation of this model requires information on the unknown parameter set α , β , Θ , and D for specific individual voters (or groups of voters.) We do not have such data for transition economies. We next employ the data that we do have for six transition economies.

5. Econometric results and the data

In the econometrics we focus on three questions drawn from theory. First, does it make sense for us to talk about reformers vs. non-reformers? In some countries such a distinction may seem inappropriate. Unless reformers can be distinguished from non-reformers, then we have no way of assessing the relationship between politics, reform and economic outcomes. If everyone is an equivalent reformer, then the voters' choices are not relevant to whether or not reforms occur. We thus explore this question before we look at the interactions between election outcomes, reform policies, and economic performance. We believe that in most countries some political parties are more inclined toward strong reform policies than other parties. In Europe, liberals are typically strong advocates of market-based reforms and socialists may resist such reforms.¹¹ In some countries, however, such distinctions are blurred.

The second question (contingent on answers to the first) deals with votes for reformers. Under what economic conditions and with what reform proposals do reformers get elected? We

¹¹ In Central Europe capitalism is clearly not the only option.

consider several measures of economic performance, several indicators of reform, and several measures of election outcomes. Third, how have transition economies performed during and after political regimes strongly inclined toward reform and away from socialism? Even partial answers to this last question may indicate problems that reform supporters will have to confront in moving economies toward markets.

The data used in the regression analysis had to be converted from the detailed election outcome results and reform indicators.¹² Economic data was converted from an annual basis to an election interval basis for some tests. First, we report on constructed reform indexes for each country and each year. Table 1 contains reform indexes that we constructed, when possible, for each country in each year from 1989 to 1999. Each country's reform index in Table 1 is compiled from annual indexes for each of the five reform areas, when adequate data is available. Thus, these indexes represent reform progress in each country, across all reform areas, with a common base, 1995 = 100. We first constructed sub-indexes for price liberalization, property privatization, macroeconomic stabilization, trade liberalization, and restructuring and deregulation. The country annual index number is an average of the five sub-indexes. Where feasible, each sub-index received the same weight.

Table 1: Reform progress indexes by country 1989-1999						
Year	Bulgaria	Czech Rep.	Estonia	Hungary	Russia	Slovakia
1989	76.9	94.0	131.6	102.3	110.9	----
1990	84.9	106.8	112.3	128.9	116.6	----
1991	96.0	101.7	119.3	109.7	109.6	----
1992	108.9	96.5	129.1	115.0	141.1	----
1993	105.5	96.0	97.4	105.4	134.2	91.9
1994	98.1	102.5	111.0	81.0	108.9	105.0
1995	100.0	100.0	100.0	100.0	100.0	100.0
1996	96.0	87.2	104.8	115.5	106.9	98.2
1997	119.0	84.9	101.6	122.8	141.4	82.0
1998	121.6	100.4	106.0	117.5	114.6	114.8
1999	----	----	96.0	----	123.3	86.5

¹² Reform events are summarized in Table 14. Details on political and economic data come from Dillon and Wykoff (forthcoming). Economic data come primarily from well-known international agency sources, the IMF, the World Bank, the European Bank for Reconstruction and Development, and Country Studies of the Library of Congress.

We illustrate the procedure in Table 2 that has the five sub-indexes for Bulgaria. The underlying data for the sub-indexes comes from reform data. Data for each reform policy was quite different so that each index in Table 2 had to be compiled in a different manner. In the cases of price liberalization and property privatization, we had only general and occasional pieces of information. We know when key laws or agencies were created and when the reform process was announced and initiated. We also have occasional information on the percentages of prices liberalized or of certain types of property privatized. One cannot always be certain of the quality of government data. The data on restructuring and deregulation consists of binomial data signifying only when major changes were made in the organization of the finance sector, bankruptcy laws, wage controls, major international trade agreements, fiscal reforms and so forth. These are intended to reflect the disentanglement of the government from normal private market activity. Price liberalization, property privatization and restructuring indexes are thus rough indicators of reform progress built from non-cardinal data sources.

Table 2: Reform sub-indexes for Bulgaria 1989-1998 1995=100						
Year	Prices	Privatize	Stabilize	Trade	Restructure	General
1989	57.5	79.0	77.0	71.0	100.0	76.9
1990	57.5	79.0	85.0	84.0	118.7	84.9
1991	125.4	81.5	76.0	78.2	118.7	96.0
1992	125.4	99.3	98.0	102.9	118.7	108.9
1993	125.4	101.9	84.0	97.5	118.7	105.5
1994	100.0	104.5	93.0	92.8	100.0	98.1
1995	100.0	100.0	100.0	100.0	100.0	100.0
1996	100.0	98.6	76.0	105.2	100.0	96.0
1997	100.0	130.5	88.0	128.0	148.7	119.0
1998	100.0	130.5	121.0	107.8	148.7	121.6

The reform indexes for stabilization and trade policies contain some data that are more traditional and typically cardinal. In the case of stabilization, we have data on budget deficits by year and on changes in exchange rates per year. We have some data on money growth. Each of

these sources contributed to our stabilization index. In the case of the trade liberalization index, we used data on foreign debt and imports as percentages of GDP. We used balance on current account figures and the ratio of foreign direct investment to GDP.

To form indexes of each area of reform, we had to find a way to integrate information from disparate sources. We wanted to compute averages from each data source in order to use all the data and minimize the importance of any individual source of error. The relative importance of each element of an average depends on its variance. Thus, we wanted to deal with the problem that one source of data with a large variance could dominate and distort the average. This is undesirable, because one source may contain errors and because while progress may have been unusually good or bad for any one indicator, reform overall might have been different. To achieve our goal from the “raw data,” we compiled the Table 2 sub-indexes as follows. For each data source, say the budget deficit, we took the observations over the period and converted them into a variable that centered on 100 with a variance of 25. This resulted in giving each data source the same influence on variance. We normalized each series by setting 1995 to 100, and then averaged the several raw data series for that reform area to obtain the sub-index for that reform.

Table 3 contains the values per election interval of the country-specific reform indexes. It also contains the percentage of votes for reform parties in each election, derived from the election outcomes and on our best judgment regarding reform and non-reform parties and coalitions. The first column contains a binomial 0-1 variable for whether pro-reform parties were elected or not. Column 2 is the percentage of the vote for reformers in each election. There were a total of twenty-five national elections in the six countries from 1989 to 1999. We determined these percentages from the figures reported both for elections and for parliamentary seats actually acquired. We had to delete three elections due to data limitations on some variables. The reform indexes, column 3 in Table 3, are averages of the annual reform indexes for the intervals between elections.

Reform indexes are calculated for the relevant election intervals on an annualized basis. That is, reform variables are weighted averages of the annual data. The weights reflect the number of months of each year during the election interval. In other words, if an election occurs in May, the fifth month of the year, then seven months of that year are attributed to the new regime. We do not have monthly data, so we assign a weight of 7/12 to that year's reform index.

Table 3: Elections regimes and a reform index by country			
1989 – 1999			
**** Bulgaria****			
Month/Year	Regime 1⇒ reform	% vote-reformers	Reform index
6/1990	0	43.0%	91.0
1/1992	1	49.5	104.0
1/1995	0	45.4	98.0
4/1997	1	59.7	120.6
****Czech Republic (Czechoslovakia until 1993)****			
6/1990	1	51.5%	101.7
6/1992	1	36.7	96.4
12/1996	0	33.3	90.1
6/1998	1	49.0	100.4
****Estonia****			
5/1990	1	61%	120.0
9/1992	1	54.7	107.2
3/1995	0	46.1	102.5
3/1997	0	39.0	103.3
3/1999	1	76.7	(96.0)
****Hungary****			
4/1990	1	42.7%	110.2
5/1994	0	27.7	108.5
5/1998	1	52.5	117.5
****Russia (Duma)****			
3/1989 (Yeltsin)	1	(89.4%)	113.1
6/1991-Pres.	1	57.3	132.4
12/1993-Duma	0	27.9	104.5
12/1995-Duma	0	24.2	106.9
7/1996-Pres.	1	57.4	124.1
12/1999-Duma	1	56.1	123.3
****Slovak Republic****			
12/1992	0	48.0%	98.5
3/1994	1		
12/1994	0	45.2	97.7
10/1998	1	57.2	(88.8)

Table 4 combines the voting and reform data from Table 3 with corresponding economic variables, after deleting unusable observations. We actually used two sets of economic data. We used the percentage changes in GDP, the inflation rates and the unemployment rates for the specific year after the election and the year before the election. Like the reform index, economic variables were calculated for election intervals. These figures are in Table 4. All regressions were run using both annual economic data and election-interval economic data.

Table 4: Elections, reforms, and economic performance Six countries, 1990 – 1999. All variables cover election intervals								
Year	Votes for reformers	Reform index	GDP % change		Inflation rate		Unemployment rate	
	%	1995=100	After	Before	After	Before	After	Before
Bulgaria								
1990	43.0	91.0	- 10.8	- 4.3	233.6	14.1	8.0	0.8
1992	49.5	104.0	- 2.3	- 10.8	86.7	233.6	14.8	8.0
1995	45.4	98.0	- 4.8	- 2.3	233.9	86.7	12.1	14.8
1997	59.7	120.6	- 0.5	- 4.8	11.3	233.9	14.0	12.1
Czech Republic								
1990	51.5	101.7	- 9.0	2.6	33.5	4.2	2.9	0.5
1992	36.7	96.4	1.6	- 9.0	12.1	33.5	3.2	2.9
1996	33.3	90.1	- 0.2	1.6	9.1	12.1	5.0	3.2
1998	49.0	100.4	- 1.3	- 0.2	5.0	9.1	8.8	5.0
Estonia								
1990	61.0	120.1	- 11.4	3.8	466.2	3.8	1.2	0.3
1992	54.7	107.2	- 5.0	- 11.4	165.5	466.2	7.4	1.2
1995	46.1	102.5	4.9	- 5.0	23.8	165.5	9.9	7.4
1997	39.0	103.3	6.4	4.9	8.7	23.8	9.8	9.9
Hungary								
1990	42.7	110.2	- 4.1	- 0.4	26.4	3.5	9.9	0.8
1994	27.7	108.5	2.8	- 4.1	21.8	26.4	10.7	9.9
1998	52.5	117.5	4.4	2.8	11.6	21.8	9.4	10.7
Russia								
1991	57.3	132.4	- 10.3	- 2.2	978.3	18.0	4.1	3.5
1993	27.9	104.5	- 8.4	- 10.3	459.5	978.3	7.7	4.1
1995	24.2	106.9	- 3.5	- 8.4	47.6	459.5	9.2	7.7
1996	57.4	124.1	- 1.0	- 3.5	43.0	47.6	11.3	9.3
1999	56.1	123.3	1.7	- 1.0	85.7	43.0	12.0	11.3
Slovak Republic								
1992	48.0	98.5	- 4.5	- 5.6	18.3	22.6	6.2	11.1
1994	45.2	97.7	6.3	- 4.5	7.0	18.3	10.0	6.2

6. Votes, reforms and performance: dummy variable models

Before we can begin to analyze the relationships between economics and politics, we first need to establish whether votes for parties that we refer to as “reformers” actually lead to reforms.

Thus, our first set of results concern the influence votes for reformers have on subsequent reforms.

Binomial dummy variables

The econometric analysis begins with a simple model using binomial dummy variables to represent votes for reformers or socialists and dummy variables for reforms. These data are constructed as follows. First, all the countries and elections are pooled, though specific country dummy variables are used to explore certain country-specific hypotheses. Each election is treated as a discrete event in which the winners can be identified as either pro-reform or antireform. Dummy variables identify the outcome. The variable *Vote* is 1 when a reform government won an election, and *Vote* is 0 when reformers lost. The socialist (non-reform oriented) variable, *Votsoc*, is simply 1 when socialists win and 0 otherwise. As noted above, in many cases, the interpretation of pro-reform vs. antireform is open to argument. In Hungary, for instance, many communists lay claim to favoring reforms. As we explain in the earlier, we regard these claims as problematic. While changes in how business is undertaken had to occur and new legislation had to be proposed and passed, this is not the same as reform aimed at establishing a viable climate for private markets. The types of reforms needed to make capitalist economies work are not likely to be endorsed by communists, whether reform minded or not.

The dummy variable *Reform* indicates whether an actual major reform period occurred or not. This simplification of real-world events assigns a distinctly noncontinuous variable to a qualitative set of activities. The dummy variable *Reform* is set to 1 when significant economic reforms were installed (the reform index exceeds the average for the country) and 0 when not. There are two incumbency dummy variables: One for incumbent, for an election in which voters retain the (dominant) incumbent parties, and one for elections in which reform incumbents are retained. The continuous economic performance variables include the rate of real GDP growth, the rate of inflation in the consumer price index and the unemployment rate. We also add the inflation and unemployment rates to create a misery index.

Table 5: Dummy regression results on reforms
 Reform = RI Votes, Economics, Country

	Reform dummy – Dependent variable						
Constant			-.1018 (.6791)	-.0333 (.1629)	.1049 (.8668)		
Vote	.6944 (6.794)	.6919 (7.9972)	.7271 (4.8150)	.7317 (4.324)	.9418 (6.4241)	.7947 (6.7322)	.8198 (6.8624)
Reform -- lagged	-.4434 (2.8950)	-.5100 (3.6059)	-.2847 (1.6798)	-.3215 (1.6880)			
Income					.0380 (2.6936)		.0166 ^L (1.1088)
Misery					.0006 (2.6936)	.0004 (1.2975)	.0005 (1.4404)
Gov deficit	-.0389 (2.0480)	-.0252 (1.2895)	-.0229 (.8770)	-.0321 (1.1277)			
Slovakia	1.0165 (4.2877)	1.0029 (4.4252)	.5727 (2.5256)	.5168 (2.0247)	.8390 (3.2979)	.6632 (2.6079)	.7242 (2.8003)
Hungary	-.3675 (2.1058)	-.3187 (1.9257)		-.3229 (1.2148)	-.4731 (2.3073)		
Bulgaria				.1219 (0.4763)			
Incumbent	.2033 ^R (1.0464)	.2192 (1.9819)	.3356 (2.5256)	.1646 (.8695)	-.4737 (3.2918)	-.3436 (2.1976)	-.3006 (1.8770)
Equation statistics							
R ²	.7804	.8190	.6791	.6783	.7642	.6120	.6381
DF	16	15	16	14	15	18	17
F-statistic	11.3739	11.3141	6.7723	4.2176	8.1012	9.4625	7.4947
R-bar ²	.5946	.5850	.5172	.4522	.5458	.5245	.5166
N	22	22	22	22	22	22	22

*The t-statistics are in parentheses beneath coefficients. L: variable lagged one period.
 R: Incumbent reformers only.

Why reform?

Votes for reformers are consistently correlated with subsequent reforms. The coefficients indicating the effect on reform of votes for reformers (the variable Vote) are positive in every reform equation in Table 5. All vote coefficients are significantly different from zero – we can reject the null hypothesis that voting for reformers has no effect on reforms taking place. The coefficient of the lagged reform variable is negative and significant in two of four equations. This result indicates that reforms can lead to the ouster of reformers. This observation would be consistent with our view that reforms are going to be unpopular in the short run, so that undertaking reforms is a risky political business. Reform progress toward capitalist markets in former socialist states is likely to be a stop-go process, since unpopular reform results in removal

of reform parties. Socialists then replace reformers until a new economic crisis induces reelection of reformers.

The only country variable that was significant in the reform dummy equations was the Slovakian dummy that was positive, which suggests that reform occurred in Slovakia even though reformers were not elected.

It seems evident from the raw data that the reformers enter office during extremely poor economic conditions, usually depression or hyperinflation or both. While this point may seem obvious, socialists are unlikely to relinquish power unless forced to by crisis. Perhaps more importantly, official statistics of economic conditions, while probably flawed, imply that economic conditions deteriorate more after reformers are in office. These facts have important implications for the political dimensions to economic reform. Every reform regime has to make a case for people tolerating hard times before reforms are going to bring about a turn of events. This is a major problem for economic reforms in any democracy. How does one get the electorate to accept the down time before reforms can kick in? It is especially difficult in former communist regimes in which promises of a better future were a well-worn mantra.

Indeed, positive economic performance slightly favors socialists. Voters may risk the security of the welfare state and the siren song of socialism unless under severe economic distress. The hard reforms needed to achieve Western-style market economies are unlikely to be popular. Incumbency, as in the West, tends to help both parties. It strongly favors the socialists, who apparently have to mess the economy up pretty badly to be unseated. Reformers have had a more difficult time sustaining power. This may reflect the fact that economic performance is poor under their leadership. Unfortunately for reformers, successful economic performance can lag significantly behind political actions that set the stage for such performance. This creates a serious political challenge for supporters of reform.

Should they vote for reformers?

The next set of dummy variable regressions, Table 6, attempts to explain voting behavior as a function of reforms, economic forces and country dummy variables. While reforms mildly tend to support better economic performance, the presence of reform governments indicates poorer economic performance. This latter effect probably reflects the poor conditions inherited by reformers and their inability in many instances, especially in Bulgaria, Russia and Hungary, to obtain decisive majorities that would have allowed them to institute robust and meaningful reforms.

	Dependent variable						
	Vote for reformers			Reform incumbent		Vote for socialists	
	Constant	.1332 (1.0362)	.2131 (1.8010)	.5677 (4.7545)	.1356 (1.5371)	.0880 (1.1767)	.4012 (2.8037)
Reform	.6003 (3.5221)	.5984 (3.4233)	-.536 ^L (1.6809)	.5078 ^L (3.8261)	.5048 ^L (4.1924)	-.6484 ^L (3.2592)	.5103 ^L (1.7340)
Income			.0034 ^L (0.2081)	.0040 ^L (0.4419)			.0274 (1.5006)
Inflation	.0004 (1.4077)			-.0001 ^L (.5478)			
Gov. deficit				.0453 ^L (2.2885)	.0398 ^L (2.1720)	-.0408 ^L (1.3458)	
Bulgaria						.3587 (1.5752)	
Slovakia							.4396 (1.2453)
Incumbent	.2854 (1.4566)	.2213 (1.1235)	1.0059 (2.6300)			.1967 (1.5752)	-.8169 ^R (2.1457)
Equation statistics							
R ²	.5127	.4590	.2799	.5713	.5362	.4789	.3945
DF	18	19	18	17	19	17	17
F-statistic	6.3120	8.0606	2.3317	5.6627	10.9834	3.8998	2.7689
R-bar ²	.4394	.4153	.2399	.4624	.4851	.3874	.3193
N	22	22	22	22	22	22	22

*The t-statistics are in parentheses beneath coefficients. L variable lagged one period.
R: Incumbent reformers only.

Measured economic performance

Table 7 contains regressions to explain economic variables with lagged economic variables and other economic variables as well as dummy variables for votes and for reforms. The first four equations are attempts to explain income. The lagged reforms variable tends to be negatively correlated with income. This result suggests that reforms do not quickly lead to increases in

growth rates. Income has some trend in it, judging from the positive coefficient on lagged income. Inflation lagged has a negative effect on income growth. This is certainly consistent with traditional analysis of inflation's negative effects on market performance. Lagged government budget deficits have persistent negative effects on income growth, again a result consistent with our expectations.

The inflation variable seems to us to be one of the more reliable economic indicators. In Table 7, columns 5 to 7 are attempts to explain this economic variable. Inflation follows lagged inflation and corresponds to lower income and lower unemployment. Government budget deficits, lagged, raise the inflation rate. The negative significant coefficient on the Bulgarian variable implies, *ceteris paribus*, lower inflation than elsewhere. We now turn to more precise measures of voting behavior and reform regimes.

Table 7 Economic variables on dummy variables for reform and votes Economics = D[Vote, Reform, Economics, Country]							
	Dependent variable						
	Income				---- Inflation ----		
	Per year		Per election interval				
Constant	.7357 (.3417)	1.6978 (0.8003)			-270.654 (2.1675)		-213.969 (1.6215)
Vote	-3.1601 (1.3418)	-3.3644 (1.0336)	-2.7644 (1.5290)	-1.2727 (0.7496)			
Reform	-3.2777 (1.5916)	-3.3262 ^L (1.6902)	-4.5994 ^L (2.3035)	-4.3858 ^L (2.1018)	131.014 (1.2345)	-151.526 ^L (1.4996)	-110.457 ^L (1.153)
Income	.5404 ^L (3.2081)	.5403 ^L (3.3640)		-.0229 ^L (0.1463)	-22.525 (2.2366)	-20.695 (2.0276)	-24.5902 (2.4699)
Inflation	-.0053 ^L (1.4622)	-.0056 ^L (1.6239)	-.0092 ^L (2.6450)	-.0091 ^L (2.2035)	.7088 ^L (3.7156)	.5728 ^L (3.0019)	.5837 ^L (3.2780)
Unemploy					52.348 (3.3577)	34.258 (3.9673)	54.813 (3.5779)
Gov. deficit	-.9015 ^L (2.5042)	-.8446 ^L (2.3843)	-.9392 ^L (2.2755)	-.8165 ^L (1.9497)	70.578 ^L (3.2782)	56.723 ^L (2.6058)	59.102 ^L (2.9390)
Czech R.		-3.2697 (1.5059)	.9317 (1.7452)	-2.7944 (1.6126)		-35.692 (1.3775)	
Bulgaria		-3.6747 (1.4693)	-4.3941 (1.5503)	-5.1616 (1.7467)	-377.340 (3.0014)	-280.692 (1.9378)	-334.775 (2.6147)
Equation statistics							
R ²	.5860	.6722	.4927	.4876	.7632	.7282	.7603
DF	16	14	16	15	15	15	15
F-statistic	4.5298	4.1021	3.1081	2.3795	8.0555	6.6981	7.9311
R-bar ²	.4465	.4482	.3754	.3483	.5451	.5201	.5431
N	22	22	22	22	22	22	22

*The t-statistics are in parentheses beneath coefficients. L: variable lagged one period.

7. Votes, reform and performance: percentage of votes and reform indexes

Does the percentage of votes cast for reform parties (as we identify them) lead to more reform in the subsequent election interval? We ask a corollary question. Are any countries different in terms of the influence of elections on reforms? Some observers have claimed that “everyone is a reformer.” This is most certainly not true in some countries. Bulgaria, for instance, has two sets of parties or coalitions that have distinct differences of opinion regarding markets. Socialist and agrarian parties have tended to resist reforms, whereas the UDF has been very strongly pro-reform. The socialists have also proven unwilling to correct fiscal imbalances and have been slow to accept central bank independence. The relative power of the communists in the Russian Duma also seemed to have an important impact on Yeltsin’s willingness and ability to adopt strong reforms.

However, in some countries identifying reformers is much more problematic. In countries like Estonia and Hungary the issue is much less obvious and differences are blurred. Still, we tried to distinguish parties likely to have stronger pro-market orientation from those who may resist the more difficult pro-market policies. In Hungary, for instance, the socialist parties have a lot of former communists who may feel lukewarm about privatization, stock markets and restructuring. In Czechoslovakia the Velvet Divorce reflected strong differences of opinion between the Czech leader Mr. Klaus and the Slovak leader Mr. Merciar. The former was, at least in the early years, a staunch pro-market advocate, whereas the latter held to the old ways. Later in the Czech Republic, under a weakened ODS led by Mr. Klaus, reform stalled. In fact, the opposition parties ran against the ODS on the ground that more restructuring was needed. Indeed, it became evident that the highly visible voucher privatization had in fact led to less “private” and more “government” influence than had been advertised. The central bank retained significant influence through ownership of financial assets of many companies, especially in the financial sector; and the government controlled banks that in turn controlled investment funds that held most vouchers.

Many local analysts felt the slump in the Czech economy in the late 1990s reflected the failure of the Czech government to adopt stronger restructuring efforts. Not only was central control of the financial sector sustained, but also many state owned enterprises with large numbers of workers stayed on the government payroll. It was these delays and the position of Mr. Klaus's opposition that caused us to identify him as a "relative non-reformer" and them as "relatively pro-reform" prior to the 1996 and 1998 elections.

Estonia is an interesting case, because everyone purports to favor reforms. This is as we had expected, given the antagonism toward external domination and the subsuming of all Estonia into the centrally planned economy of the Soviet Union. Estonians are to be in a hurry to return to the western fold. Still, even here the socialist ways are hard to give up and the pace of reforms has not been even over election cycles.

Country-specific analysis

Table 8 reports country-specific regressions of the following equation:

Reform = $\alpha + \beta$ Vote + ϵ , where α and β are the unknown intercept and slope coefficients to be estimated and ϵ is the unknown disturbance term. For most countries we have few observations because they have not held many national elections. These regressions do indicate the degree of correlation between votes for reformers and subsequent reforms.

Table 8: Country-specific and pooled regressions on reform*							
Reform = $\alpha + \beta$ Vote + ϵ							
	Country equations					Pooled data	
Variable	Bulgaria	Czech Rep.	Estonia	Hungary	Russia		
Constant	19.1237 (3.2520)	75.7583 (12.2291)	72.0684 (4.6526)	98.0517 (13.5202)	88.2783 (14.3782)	79.8486 (8.6831)	67.2115 (13.228)
Vote	1.7060 (14.4502)	.4952 (3.5187)	.7207 (2.3679)	.3421 (1.9874)	.6716 (5.1518)	.5975 (3.0527)	.7409 (6.1464)
History under Communism							16.6763 (7.4078)
Equation statistics							
R ²	.9905	.8755	.7371	.7986	.8984	.3178	.8245
DF	2	2	2	1	3	20	19
F-statistic	208.809	14.0637	5.6071	3.9661	26.5406	9.3187	44.6218
R-bar ²	.6603	.5837	.4914	.3993	.6738	.3027	.7459
N	4	4	4	3	5	22	22

*The t-statistics are in parentheses beneath the coefficients.
History under communism is 1 for Russia and Hungary. 0 otherwise.

The slope coefficients in the country-specific regressions are positive and range from .34 for Hungary to 1.86 for Bulgaria. Evidently votes for reformers as we measure them are correlated with the index for reform as we measure it. We have few events, so statistics do not tell us much, but these results fail to rule out a connection between votes for reformers and subsequent reforms. The last two regression columns in Table 8 are pooled data for all six countries. The last regression includes a dummy variable equal to 1 for Russia and Hungary. This variable, History, represents the idea that strong local support for communist philosophy is retained in these two countries. We elaborate on this idea below.

Analyzing reform with pooled data

To look in more detail at whether one can distinguish reformers from non-reformers, we ran a number of regressions on pooled data. Table 9 contains reports on eight regressions. The reform index for each election interval, the dependent variable, depends on the percentage of votes garnished by reformers, on an economic variable (or set of variables) and on a history variable. The history variable is a dummy variable—1 for countries (Russia and Hungary) that had strong homegrown communist parties and relative success while under communist control. Of course, considerable additional experimentation was done and Table 9 is illustrative. We tested for history before communism—Estonia, the Czechs and Hungary all had golden eras of success in recent periods prior to the ascent of communism. We tested another history under communism variable; some countries had relatively good relations with communists (Bulgaria and Slovakia). Only the history under communism representing the strong version of well-being under communism mattered. We can reject the null hypothesis that history under communism does not matter to subsequent reform efforts.

Table 9: Do votes for reformers result in reforms? Reform = R[Vote, Economics, History]*								
Variable	linear forms				natural log-linear forms			
Constant	67.212 (13.23)*	68.405 (13.57)	65.417 (11.677)	68.81 (14.34)	3.20 (20.79)	3.62 (20.20)	3.52 (18.91)	3.52 (19.12)
Vote	.741 (7.15)	.701 (6.65)	.770 (6.94)	.699 (6.99)	.2614 (5.79)	.2592 (5.49)	.2767 (6.02)	.2772 (6.06)
Misery		.0068 (1.374)	.0041 ^L (0.80)	.		.0021 (.242)	.0098 ^L (1.29)	
Income %chg real				.4238 (1.73)				
Inflation				.0137 (2.22)				.0098 ^L (1.36)
History under Communism	16.68 (7.41)	15.72 (6.82)	16.36 (7.09)	15.91 (6.73)	.1605 (6.67)	.1581 (5.96)	.1588 (6.71)	.1591 (6.75)
Equation statistics								
R ²	.8245	.8411	.8305	.8647	.7672	.7680	.7869	.7888
DF	19	18	18	17	19	18	18	18
F-statistic	44.62	31.77	29.39	27.16	31.31	19.86	22.16	22.41
R-bar ²	.7459	.7210	.7118	.7000	.6942	.6583	.6745	.6761
Best	Russ – 93	Bulg – 92	Bulg – 92	Esto – 92	Russ – 93	Bulg – 92	Esto – 95	Esto – 95
Worst	Bulg – 97	Bulg – 97	Bulg – 97	Bulg – 97	Bulg – 97	Bulg – 97	Esto – 90	Esto – 97

* The t-statistics are in parentheses beneath the coefficients. All variables cover election intervals.

L = lagged one period. We included 22 elections, so n = 22.

Best = observation with the smallest error term. Worst = largest error.

The effect on reform actions, given voting behavior, is clearly different for Russia and Hungary than for other countries in the sample. (Equations with the one history variable outperformed two separate dummies, one for Russia and one for Hungary) It appears that reformers are even more sensitive to voters in Russia and Hungary. These two countries still have politically strong communist influences. The Russian communist party control of the Duma is historic. The socialist parties populated by many former communists continue to dominate Hungarian politics. These countries also seem to be ambivalent about adopting reforms. We expected this. Both Hungary and Russia had relatively good relations with the communist leadership. Russia was the seat of power for the entire Soviet Union, the satellite countries and with the exception of Lenin's train ride from Germany communism was homegrown. Despite the collapse of the Soviet Union, Russians are conflicted about abandoning the old ways. This evidently has made reformers quite sensitive to votes for members of the Duma. Yeltsin was

criticized for not stabilizing the economy and legal system, but he may have had little choice given the post-Soviet power of Russian communists.

Many in Hungary harbor affection for communism for a different reason. After the Hungarian revolt in 1957, even though Russian tanks destroyed the resistance, Hungary eventually was allowed a good deal of independence. As long as Hungarians maintained outward support for socialism and participated fully in the Warsaw Pact, they were allowed to develop small-scale markets. Hungary was referred to as “the happiest barracks in the camp” precisely because their economy was the strongest in Central Europe. This relative success of socialism blended with small-scale market economics and the authority of local communists gave Hungarians less reason to despise communist rule. Hungarians felt less eager to overthrow the old regime.

It is evident from Table 9 that votes for reformers are positive and statistically significant. We reject the null hypothesis that votes for reformers do not lead to reforms. Put another way, our reform index is positively correlated with the percentage of votes for reform parties. This result holds up in both linear and log-linear forms and regardless of the economic variables included in the equation. The vote variable was also positive and significant in similar equations (explaining reform) using annual economic data rather than economic data per election interval. We also experimented with dropping observations where we felt the data might be less reliable. We deleted the first election in every country to see if poor early data had a significant impact on results. They did not.

What explains votes for reformers?

Suppose through campaigns that voters know what to expect from the more reform-oriented parties. Will these reforms and contemporary or lagged economic variables lead to votes for reformers? Does history under communism make a difference—do some countries’ voters act differently? Table 10 contains results of eight regressions intended to shed light on these questions. Regressions in Table 10 explain about 65 to 75 percent of the variation in votes for

reformers. Reforms are invariably a significant variable and values are positive. A 10 percent increase in a reform index is associated with a 10 percent increase in votes for reformers.

Economic variables do not seem to have substantial effects on votes. Economic variables were rarely significant. We tested the percent change in GDP, the inflation rate, the unemployment rate, and a misery index (inflation plus unemployment). Lagged values of all economic variables were also examined.

While insignificant, the economic variables tended to work against reformers. These empirical results may reflect several factors. One is that some of the data, especially unemployment and GDP figures for early years, are suspect. Second, all of the countries in our sample went through deep slumps with double digit declines in income. These occurred early in the period, right after the country swept away the communist government. Changes in the way of doing business had to change in all countries since the trading regime had collapsed. This first government after communism also had the first opportunity to institute reforms. Thus, just as the economies and in fact the entire social structures were collapsing around them, reformers tried to institute new reforms; price liberalization and property privatization initiatives were common. These initiatives contributed to our index of reforms. Thus, reforms are correlated in early years with the collapsed economies.

Regardless of how one stands on the issue of shock therapy or on the quality of the data, one must accept the reality that reform is correlated, at least early on, with poor economic outcomes. As we have noted, this correlation is part of the reason reforms are difficult to adopt. Benefits accrue only after a long lag. Furthermore, the intent of reforms is to set the stage for long-run economic growth, not for instant gratification. The fact that the economic variables are not significantly and negatively correlated with votes for reformers is itself an indicator that people have been willing to give reform a chance.

Table 10: Why do people vote for reformers? Vote = V[Reform, Economics, History]*								
Variable	linear forms				natural log-linear forms			
Constant	-53.30 (3.76)	-56.06 (3.63)	-48.57 (3.44)	-48.41 (3.16)	-7.44 (3.82)	-7.37 (3.66)	-7.18 (3.86)	-7.23 (3.90)
Reform	0.984 (7.146)	1.014 (6.65)	.945 (6.94)	.9433 (6.41)	2.44 (5.79)	2.42 (5.49)	2.41 (6.02)	2.42 (6.06)
Misery		-.0031 (0.509)	-.008 ^L (1.47)			.0078 (.301)	-.0379 ^L (1.75)	
Inflation				-.0081 ^L (1.295)				-.037 ^L (1.79)
History under Communism	-17.51 (5.53)	-17.55 (5.43)	-16.14 (5.02)	-16.04 (3.77)	-.440 (4.96)	-.445 (4.82)	-.4221 (4.97)	-.424 (5.02)
Equation statistics								
R ²	.7384	.7421	.7664	.7663	.6607	.6623	.7098	.7119
Df	19	18	18	17	19	18	18	18
F-statistic	26.81	17.26	19.68	13.93	18.50	11.77	14.68	14.83
R-bar ²	.6680	.6361	.6569	.6203	.5977	.5677	.6084	.6102
Best	Bulg – 92	Russ – 91	Esto – 95	Esto – 95	Russ – 91	Bulg – 92	Czec – 90	Czec – 90
Worst	Russ – 95	Russ – 95	Hung – 94	Esto – 97	Russ – 95	Russ – 95	Russ – 95	Hung – 94

*The t-statistics are in parentheses beneath the coefficients. All variables cover election intervals.
L ≡ lagged one period. 22 elections, so n = 22. Best ≡ observation with smallest error term.

The dummy variable for relatively positive performance under communism, the history variable, has a negative and significant coefficient. Voters in Russia and Hungary, two countries with strong domestic communist parties, relatively happy under communism, are less likely to respond positively to reforms than are voters in the other four sample countries.

Can economic performance variables be explained?

Table 11 contains results of six equations intended to explain variations in two economic variables, inflation and income. Economic data seem to be much poorer than the voting data. Measured GDP leaves out work at home and on small farms, which blossomed during the early stages of transition and in some countries it may have been difficult to capture growth in small retail firms. Failing large-scale former government enterprises cause severe decline in measured output, but this may exaggerate the decline in real underlying income since some gray market and extra-market activity began to take place in these plants and factories during early phases of

transition. Also, loss of production from some state owned enterprises may have involved loss of product that was unwanted in the first place.

Table 11: Can economic performance be explained? Economics = E[Reform, Vote, Economics _{t-1} , History]						
	Inflation – dependent variable			Income – dependent variable		
Variable	Percent rate of change in CPI			Percent rate of change in GDP		
Constant	-1502. (2.22)	-1499. (2.22)	-1503. (2.35)	-24.96 (1.71)		
Vote				-.241 (1.42)	-.076 (1.79)	-.205 (1.95)
Reform	15.80 (2.42)	15.82 (2.42)	15.47 (2.50)	.352 (1.73)	.076 (1.61)	.080 (1.71)
Income			-15.24 ^L (1.75)		.436 ^L (2.82)	-.514 ^L (4.02)
Inflation		.764 ^L (3.00)	.579 ^L (2.76)	-.019 (4.22)	-.0029 (0.905)	
Misery	.7641 ^L (3.99)					
History under Communism	-368.1 (2.34)	-367.8 (2.35)	-339.2 (2.27)	-3.80 (1.01)		
Equation statistics						
R ²	.4992	.5002	.5767	.5283	.5005	.4778
DF	18	18	17	17	18	19
F-statistic	5.980	6.005	5.789	4.760	6.012	8.691
R-bar ²	.4279	.4288	.4668	.4277	.4290	.4323
Best	Hung – 98	Hung – 98	Russ – 93	Czec – 98	Russ – 96	Hung – 94
Worst	Esto – 92	Esto – 92	Esto – 92	Slov – 94	Esto – 97	Esto – 97

* The t-statistics are beneath coefficients. All variables cover election intervals.

L ≡ lagged variable. 22 elections, so n = 22. Best ≡ observation with smallest error term.

We focus on two issues raised in our theory work. Are reforms related positively to economic performance? If not, then the political work by reform-oriented political parties is more difficult. Unless growth follows reforms pretty quickly people may tire of promises. After all, the communists always promised a better tomorrow. A task of political leaders to educate the public about the benefits of new programs that will improve welfare, even if there are short-run costs. This task is hard if reforms deliver benefits only after a lengthy delay.

Second, do differences in historical experiences among countries play a role in economic performance? We had two historical hypotheses. One, the existence of a golden era, in which capitalism and democracy were successful before the communist period, gives a practical “goal” for reform to achieve. This suggests that countries like Estonia, Czech Republic and Hungary should fare better than Russia, Slovakia and Bulgaria. The latter three countries have almost no

experience with democracy or successful capitalist industrialization. Estonia, the Czech Republic and Hungary were relatively well off and westernized before the advent of communism.

The second historical hypothesis is that the experience under communism will influence the pace of adopting reforms. Relatively good times under communism could make it more difficult to repudiate communism. It is easier to discredit communist ways if they were imposed from outside and if your people were maltreated. Russia and Hungary came to be governed by willing local leaders. Despite, or some say because of, the 1954 Hungarian revolt, local communists were given a good deal of freedom in adopting a mixed economy. The Soviets gave Hungarians some control over their economic fortunes as long as they remained loyal to socialism. Communism, while unpopular with many Russians, was largely a homegrown product. Repudiating communism's ways is harder when they resulted from decisions made by Russians. The Estonians and Czechs disliked the Soviet imposition of communism. The Slovaks and Bulgarians were better off in some respects under communism, and never really had a golden era of industrialization under capitalism and democracy. Thus, history under communism should influence the adoption of reforms, votes for reform parties, and economic performance.

We attempt to explain variations in two economic outcome variables, income and inflation. Income, measured as the growth rate of GDP, is closest to the growth variable our theoretical work focuses on, but the quality of data is suspect. Inflation may be a more reliable statistic, at least for most countries after the fall of communism. Even this statistic is subject to serious criticism related to inadequate correction for quality improvements. Early price liberalization resulted in nominal price increases that indicated an increase in inflation. However this index increase merely reflected adoption of a market price system, a very different process from inflation. Nonetheless, these are the data available. We report six equations in Table 11. Inflation is the dependent variable in equations of columns 1 to 3 and income (measured as the percentage rate of change in real GDP) is the dependent variable in equations of columns 4 to 6.

The explanatory power of the economic variable equations is lower than that of reform and vote equations. The $R\text{-bar}^2$ (coefficient of determination adjusted for degrees of freedom) range from 42 to 45. The R^2 values are around .5, so that almost half the variation in economic variables can be explained by the equations. Inflation is positively correlated with the reform index. This may suggest that reformers liberalized prices. Lagged inflation influences inflation, suggesting inertia. The history variable (1 for Russia and Hungary and 0 for the other countries) is negative and significant. Evidently, inflation is worse for countries that performed relatively well or had homegrown communist leadership.

Variations in the growth rate of GDP are harder to explain. The model explains nearly half the variation in real GDP; the political variables have little influence on measured economic variables. Neither reforms nor history seem to matter much in explaining variations in measured GDP growth. Though reforms have a modest positive effect on income, votes for reform have a modest negative effect. Neither vote nor reform is statistically significant. Only lagged growth in real GDP has a positive and significant correlation with the growth rate of real GDP. This suggests inertia in the income figures. Contemporary inflation is negatively correlated with growth in real GDP, a sensible result. Recall our belief that economic variables are probably rather unreliable. Also, they are being reported for highly unstable periods. This project suggests the importance of serious revisions of economic data from new market economies. Still, even if the economic data do not reflect actual performance, these figures can influence policy. A disconnect between adoption of painful reforms and measured economic success can deflate reform efforts.

Two-stage least squares results

Table 12 contains results from two-stage least squares estimation models to determine the effect on reforms of votes for reformers. Equation system (9) is the model we are estimating. We estimated several different versions of the model to check for robustness of the results.

There are two sets of results presented in Table 12. The first row equation estimates the coefficient of Vote from predetermined and exogenous variables of the system: Reform_{t-1}, Bulgaria, Inflation_{t-1}. We estimated several different versions of this equation. For instance, the second set of results in Table 12 excludes Bulgaria from the first equation. We also replaced Inflation_{t-1} with Income_{t-1} and tested for serial correlation with Inflation_{t-2} and Income_{t-2}. These variables added nothing to the equation. We repeat that the income data again seems to contain severe measurement error. Nonetheless, the results for the second stage estimator of the over-identified coefficient in the reform equation were the same for all variants of the model.

Recall that in the second stage, the stage I estimators of Vote (or Vote*) replace the variable Vote in the reform equation. The coefficient of Vote* indicates that an increase in the vote received by reform parties tends to lead to a nearly proportional increase in the rate of reforms.

The Hausman tests indicate that simultaneous equation bias was present for the vote variable. Hausman test 1 involves testing whether the coefficients on Vote* and Error* are the same. We cannot reject the null that they are the same indicating bias. Hausman test 2 amounts to the null hypothesis that, with bias, the coefficient on Error* is zero. We cannot reject this null. These tests hold for all variations in the model specification. These coefficient estimates are .93 to .95 for the effect of votes on reform. (These are the last two equations of each set in Table 12.)

The second stage of the two-stage process provides an estimate of about .93 for the coefficient capturing the effect on reform of votes for reformers. Table 9 indicated coefficients for this variable between .7 and .8. All of these estimators of the unknown α_{13} in the third equation of system (9) are all close to but less than 1. We conclude that reform policy response is nearly proportional to votes for reformers. This result indicates that the political system is quite effective in determining the pace of reforms.

Table 12: Two-stage least squares estimation				
Model Vote = V[Reform _{t-1} , Bulgaria, Economics _{t-1}]				
Economics = E[Reform _{t-1} , History, Economics _{t-1}]				
Reform = R[Vote, History]				
Stage I				
Vote = -.1300 + .445 Reform _{t-1} + 11.257 Bulgaria - .020 Inflation _{t-1}				
(.006) (2.240) (1.870) (2.781)				
n=22	df = 18	R ² = .3450	F-statistic = 2.161	R-bar ² = .2957
Inflation = -1499 + 15.82 Reform - 367.8 History + .764 Inflation _{t-1}				
(2.219) (2.422) (2.435) (3.997)				
n=22	df = 18	R ² = .5002	F-statistic = 6.005	R-bar ² = .4288
Stage II				
Reform = 58.925 + .9330 Vote* + 15.255 History				
(4.836) (3.603) (4.619)				
n=22	df = 18	R ² = .6154	F-statistic = 15.203	R-bar ² = .5568
Hausman test 1				
Reform = 57.641 + .9490 Vote* + 16.776 History + .6326 Error*				
(7.240) (5.611) (7.705) (5.152)				
n=22	df = 18	R ² = .8446	F-statistic = 32.612	R-bar ² = .7239
Hausman test 2				
Reform = 57.641 + .9490 Vote + 16.776 History - .3164 Error*				
(7.240) (5.611) (7.705) (1.527)				
n=22	df = 18	R ² = .8446	F-statistic = 32.612	R-bar ² = .7239
Model without Bulgaria				
Stage I				
Vote = 21.483 + .254 Reform _{t-1} - .017 Inflation _{t-1}				
(1.146) (1.403) (2.250) 0				
n=22	df = 19	R ² = .2177	F-statistic = 2.644	R-bar ² = .1970
Stage II				
Reform = 59.608 + .9298 Vote* + 13.783 History				
(3.571) (2.577) (3.770)				
n=22	df = 19	R ² = .5203	F-statistic = 10.305	R-bar ² = .4708
Hausman test 1				
Reform = 58.471 + .9332 Vote* + 16.482 History + .6852 Error*				
(5.790) (4.276) (7.295) (5.825)				
n=22	df = 18	R ² = .8337	F-statistic = 30.087	R-bar ² = .7146
Hausman test 2				
Reform = 58.471 + .9332 Vote + 16.482 History - .2480 Error*				
(5.790) (4.276) (7.295) (1.002)				
n=22	df = 18	R ² = .8337	F-statistic = 30.087	R-bar ² = .7146

Vote* is the estimated vote from the stage I vote equation. Error* is the error from the stage I vote equation. The t-statistics are in parentheses beneath the coefficients.

Logit results

The dependent variable in the vote equation in stage I is the percent of the vote received by reformers. As a percent it cannot be distributed as normal. Even though most observations are far from the likely tails of the distribution, we transformed Vote using a logit model. These results are presented in Table 13. The confirm results from Table 12. The logit model Hausman tests confirm simultaneous equation bias of the vote coefficient in the reform equation. The effect on reform of votes for reformers is still close to but less than one, around .94.

Table 13: Logit analysis with two-stage least squares				
Model $[\ln(\text{Vote}/1-\text{Vote})] = V[\text{Reform}_{t-1}, \text{Bulgaria}, \text{Economics}_{t-1}]$				
Economics = $E[\text{Reform}_{t-1}, \text{History}, \text{Economics}_{t-1}]$				
Reform = $R[\text{Vote}, \text{History}]$				
Stage I				
Logit-Vote = $-2.0650 + .018 \text{Reform}_{t-1} + .474 \text{Bulgaria} - .001 \text{Inflation}_{t-1}$				
$(2.312) \quad (2.171) \quad (1.857) \quad (2.793)$				
n=22	df = 18	R ² = .3437	F-statistic = 3.143	R-bar ² = .2946
Stage II				
Reform = $59.912 + .9155 \text{Vote}^{**} + 15.287 \text{History}$				
$(5.006) \quad (3.587) \quad (4.618)$				
n=22	df = 18	R ² = .6140	F-statistic = 15.113	R-bar ² = .5555
Hausman test 1				
Reform = $58.003 + .9424 \text{Vote}^{**} + 16.788 \text{History} + .6336 \text{Error}^{**}$				
$(7.420) \quad (5.656) \quad (7.703) \quad (5.160)$				
n=22	df = 18	R ² = .8443	F-statistic = 32.540	R-bar ² = .7237
Hausman test 2				
Reform = $58.003 + .9424 \text{Vote} + 16.788 \text{History} - .3088 \text{Error}^{**}$				
$(7.240) \quad (5.656) \quad (7.703) \quad (1.515)$				
n=22	df = 18	R ² = .8443	F-statistic = 32.540	R-bar ² = .7237

Vote** is the predicted vote computed from the anti-log of the stage – I vote equation. Error** is the error from the stage – I vote equation transformed to be comparable to Vote**. The t-statistics are in parentheses beneath the coefficients.

8. Conclusions and recommendations

We conclude with the key points we draw from the empirical analysis.

- Voting for reform parties does result in reforms. Votes for reform parties tend to lead to nearly proportional increases in the reform indexes. This result holds up for a variety of functional forms, for nearly all countries and for a variety of specifications and data measures. Socialist and agrarian parties are slower to adopt reforms than are European liberals.

- History matters. Voters are less likely to endorse reformers in both Russia and Hungary. This is consistent with our hypothesis that countries that had enjoyed relatively good economic performance under homegrown communist leaders have a more difficult time adopting capitalist rules through reform. We found no empirical evidence that history before communism made a significant difference in voting behavior, adoption of reforms or measured economic performance. We conclude from these observations that countries without past experience with capitalism can achieve reform. However, to the extent they are unwilling to abandon the old ways or unable to constrain socialist impulses, transition to capitalism will be difficult, contentious and slow.

- Economic variables for inertia, inflation and income are negatively correlated. The economic data do not support the view that reforms improve economic performance quickly. While one may suspect this result, it does not augur well for reform. This increases political pressure on reform advocates.

- With the possible exception of inflation figures, economic performance variables are poor quality. International and national statistical agencies should shore up these data, so analysts can get a more accurate picture of the transition process.

The problems with economic data are severe and important. Errors in the data may reflect obfuscation on the part of national statistical agencies, practices that were common under communist rule. Such practices may still take place. But even in countries with conscientious and honest statistical agencies, meaningful measures of economic performance are not available. These can be attributed to several well-known measurement problems in compiling statistical aggregates. But, while well known among western measurement specialists, these problems are more severe in transition economies and can lead to serious distortions of the transformation process. These distortions can work against attempts to reform these economies.

Specific measurement problems that require attention are an overemphasis on the costs of the decline in state owned enterprises. This reflects the relative ease of obtaining nominal output data from these sources and the failure to measure adequately the usually poor quality of the output these firms had been producing. The quality of output was poor both in terms of physical characteristics of the goods themselves and in terms of the market values of these goods in the post cold war environment. Many state enterprises were producing shoddy goods for markets that were not there.

A second problem, the flip side of the first, is inattention to the importance in early transition of do-it-yourself, trade-out, and small-scale gray market production. Many small entrepreneurial enterprises in the transition stage are extra-market. People take on second jobs, work for one another without formal compensation, build additions to their homes for rentals and undertake numerous other activities that are inadequately captured by statistical agencies. There may well be a buzz of economic activity that is replacing the failing and wasteful production of the dinosaurs, the large-scale state owned enterprises.

International statistical agencies could serve a constructive role for transition economies by sending in measurement teams to produce viable data for economic performance. Data collection and analysis may serve a more important role than traditional research efforts when major shocks to the social system accompany economic transformation.

Table 14. Some key reform dates

	Price liberalization					
	Bulgaria	Czech R.	Estonia	Hungary	Russia***	Slovak R.
Initial effort	1991	1991	1990	1968	1/1992*	1991
Progress	*	*	*	41%-87 62%-89 77%-90 85%-99		1999
	Privatization					
Initial effort	1992 18%-'97	1991	1991	1982	11/1992	1991
Major progress	12/1998 70%	1992	1992	10/1989	93-33% 6/1994 5-6/1997	1998
Vouchers	1997-98	1992 W I	10/1994		10/1992	1992
Setback	1995-6	1994 W II	3/1995	7/1994 1/1996	Stop 94/5	9/1995
	Stabilization					
Two-tier banking		1/1990	1991	1987		1/1990
Tax reform	1997/98	1993	1994		1990 VAT	1/1996 VAT
Fiscal reform	1998		1992	12/1995		9/1990
Pensions				1997-98		
Currency reform	1991	9/1990	1992	1995	7/1993	1995
Currency board	7/1997		6/1992			
Serious setback	1994-96 Ponzi	5/1997 1995-97	11/1992		10/1994 1/1996	1996-97
Tightened budget	1998					1998
Stock exchange	1992	1993	5/1996	5/1990		1993
	Trade liberalization					
EU—first tranche		1999	1999	1999		
EU Associate	1995	?	?	1992		?
Liberalize effort		1991	12/1991	1982		
Setback	1996-97				1995-97	7/1994
IMF**	3/1997 M	1990 M	5/1992M	1982 L	6/1992 M	3/1994 L
Setback	1996	5/1997			On/off reforms	1996-97
WTO	1996	1995		1995	1995	1/1995
OECD		12/1995		5/1996		
Foreign div. invest. ↑	1998			2xCzech		
	Deregulation –restructuring					
Soft credits, no big failures	1991- 96**					
Dump Soviet planning					10/1990	
Cut \$ off ministries					11/1991	
Bankruptcy Laws	1994 **Zunk (junk bonds)	1991/93	1992	1/1992	1992/98 ***No staples included	1991/93

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