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Reform Redux:
Measurement, Determinants and Reversals

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Reform Redux: Measurement, Determinants and Reversals

Nauro F. Campos and Roman Horváth*

Abstract

What do we know about the effects of structural reforms? One main reason the answer may be “little” is inadequate measurement. In this paper we put forward improved measures of economic liberalization across countries over time. We show that structural reforms, carefully measured, follow richer dynamics (than those from existing indexes) which are very closely linked to the theoretical work. For example, we find FDI inflows reduce the likelihood of privatization reversals and labour strikes increase that of price liberalization reversals. We also find that our new measures, in standard specifications, have larger and more precisely estimated impacts on growth.

JEL Codes: E23, D72, H26, O17.

Keywords: Structural reforms, reform reversals, price liberalization, trade liberalization, privatization, political economy.

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Nontechnical Summary

In this paper we aim to contribute to the growing literature on the political economy of reform. The economic transition in Central Europe and the former Soviet Union is arguably the largest natural experiment on economic reform in recent history and it is paradoxical to say the least that efforts to systematically measure such reform efforts have not emerged. In consequence, there have been very few efforts to take the many theoretical insights to the data. This is in part because reform is a political economy topic par excellence: reform is multidimensional and it is driven by the complex interplay of political and economic forces.

This paper tries to address this gap in the literature by constructing “objective” measures for three main reform areas in all transition economies for all years from 1989 to 2001. Compared to the existing (subjective) indexes, our new measures not only generate a less optimistic assessment of the reform process, but also depict this process as being much less smooth than previously thought (more specifically, according to our measures reform reversals abound, while that is not the case with the subjective measures). We also believe this is one of the first papers to try to implement empirically the distinction between reform effort inputs and outcomes. This distinction is important because the inclusion of outcome indicators can severely bias the resulting measures.

Our results suggest that domestic growth is a determinant for external liberalization and privatization, concentration of political power matters for internal liberalization, and democracy is important for all three of them. We also find that FDI inflows reduce the likelihood of privatization reversals, labour strikes increase that of internal liberalization reversals, and OECD growth increases that of external liberalization reversals. Finally, we replicate the results from the main econometric studies of the effects of reform on growth and find that those effects, using our objective measures of reform, are larger, more precisely estimated and more robust.

1. Introduction

Since the early 1990s, a number of structural reforms have been implemented throughout the world, with varying degrees of success. A large literature has developed, although according to two authoritative surveys (Drazen, 2000, and Persson and Tabellini, 2000) commensurate empirical evidence has yet to materialize: “the gap between theory and evidence is a final weakness of the existing literature” (Persson and Tabellini, 2000, p. 481).¹ One would expect that evidence from developing and transition countries (i.e. from those that have implemented large-scale economic reforms) would provide such empirical evidence at once, but that has not happened either.

The theoretical political economy literature on structural reforms started out by addressing issues such as why socially beneficial reforms are not implemented, and evolved towards normative questions such as how reforms can be designed so that they overcome political resistance so as to end up not being reversed.² Fernandez and Rodrik (1991) place status quo bias at the centre of these problems: individual-specific uncertainty over the outcome of a reform (more precisely, who will be the winners and losers) leads a majority of voters to expect to lose from reform *ex ante*, even though they all know that a majority gain from reform *ex post*. If reform is implemented, the losers will be a minority so they will not have the political power to reverse the reform, while the winners cannot credibly promise to compensate the losers. Alesina and Drazen (1991) look at this issue in terms of implementation delays in a war of attrition model. This generates an important hypothesis (for which we find some empirical support) regarding political fractionalization. Governments will not need to negotiate how to allocate the short-term cost of reforms if they have a stable majority in parliament. Dewatripont and Roland (1992, 1995) provide various influential models of reform dynamics inspired by the transition from communism. They stress the role of uncertainty about the outcome of reforms in terms of the government choice of implementation sequence. Contrasting big-bang to gradualist strategies, they argue the latter is easier to implement because it involves learning and experimentation.³ Although the theoretical arguments for sequencing seem to have been somehow vindicated by the emergence of the so-called second-generation reforms, a number of authors have spelled out the case for a big-bang strategy. The main arguments for the latter include the costs of partial reforms, time-consistency issues and the advantages of a political honeymoon in which credibility provides an opportunity to implement painful measures.⁴ One central element in the

¹ Or more specifically, “There are a number of theoretical models that stress the role of reform strategies. Yet the data for discriminating among these models is lacking. The few indicators available are unnecessarily subjective” (Campos and Coricelli, 2002, p. 831).

² For surveys of the literature, see Asilis and Milesi-Ferretti (1994), Rodrik (1996), Bhattacharya (1997), Drazen (2000), Persson and Tabellini (2000) and Kuczynski and Williamson (2003).

³ On the role of learning in reform dynamics see also Goodhue, Rausser and Simon (1998) and Schroder (2001). Appropriately sequenced reforms also create constituencies for further reforms. Collier and Gunning (1999) argue that a main reason for the poor performance of IMF-supported structural adjustment programmes is inattention to sequencing.

⁴ Martinelli and Tommasi (1997) argue that even when gradualism is the unconstrained choice of the social planner, time-consistency considerations may force simultaneous implementation of all reforms.

Dewatripont-Roland models is the role of reform reversals: reformers try to design reform packages that incorporate costs of reversal that are high enough to deter political resistance (see also Cukierman and Tommasi, 1998). There are also important models arguing that crises trigger economic reforms (see Drazen and Grilli, 1993). The argument is that the political impediments to reform may be so large that reform will not be implemented unless a crisis occurs because a larger share of the population benefits from it in the aftermath (Drazen and Easterly, 2001).

What do we actually know about the determinants and effects of structural reforms? Unfortunately, the answer is little and this is because there have been too few efforts empirically testing the main theoretical propositions from the political economy literature. One important reason is that structural reforms are difficult to measure consistently across countries and over time. Moreover, some reforms (e.g. privatization) have elements of both “stroke of the pen national policies” (Easterly, 2006) and harder-to-change “institutions” (Acemoglu, Johnson and Robinson, 2006). Another important reason is the paucity of comprehensive reform measures. There are a number of studies that focus on one reform and/or on one country but few that dealt with multiple reforms in more than one country over time.⁵ A third, final reason is that the results using the existing measures of reform are far from conclusive. Babetskii and Campos (2007) collect data from 43 econometric studies and show that the t-values of the more than 300 coefficients (on the impact of reforms on growth in transition economies) follow a normal distribution with mean zero: a third of them are positive and significant, another third are negative and significant, and the remaining third are not statistically significant. They try explaining this variation in terms of differences in econometric method, in specification and in the measurement of reform. Bearing in mind that all 43 papers use data from exactly the same sources (more on this in section 2 below), subject to small variations such as levels, changes, stocks and lags, they find that about two-thirds of the explained variance is accounted for by measurement.

The period after the collapse of communism generated what is arguably the largest natural experiment in economic reform in recent history and it is paradoxical that more satisfactory indicators of reform are still unavailable. This paper tries to close this gap. The objective of this paper is two-fold. One is to construct “objective” (more on this below) measures of privatization and external and internal liberalization reform efforts for 25 Eastern European and former Soviet Union economies between 1989 and 2001. The second is to use these new measures to shed light on various hypotheses from the

In their model, the time-inconsistency of the “optimal reform sequences” arises because winners from early reforms will oppose any later reforms that may hurt them. Knowing that, losers from early reforms will oppose the earlier measures and require additional compensation. See also Lipton and Sachs (1990) and Murphy et al. (1992).

⁵ The measurement of economic reforms was pioneered by Lora (1997, 2001), who studied five reforms: trade, tax, financial, privatization and labour market regulation. These are aggregated in a structural policy index for 20 Latin American countries yearly from 1985 to 1995. In addition, two reform areas that have received a great deal of attention across countries and over time are financial liberalization and privatization. On privatization, Megginson and Netter (2001) provide an extensive review of the evidence, while on financial liberalization, important recent contributions are those by Kaminsky and Schmukler (2003) and Abiad and Mody (2005).

theoretical literature on the political economy of reform that have not been explored before (notably the case of reform reversals).

Our main findings are as follows. Compared to existing measures, ours generate a less optimistic assessment of the reform process, depicting it as being much less smooth than previously thought (in other words, we find a much larger number of instances of reform reversals). We find that political reform (democratization) is the main determinant of reform (in the sense that it matters irrespective of the type or area of reform). We find a few important reform-specific determinants: economic growth for external liberalization and privatization, and concentration of political power for internal liberalization. We also find that inflows of foreign direct investment reduce the probability of privatization reversals, labour strikes increase that of internal liberalization reversals, and negative terms of trade shocks increase that of external liberalization reversals. Finally, we replicate various econometric studies on the effects of reform on growth and find that those effects, using our objective measures of reform, are larger and more precisely estimated.

We should note at the outset that we leave one major topic for future research. Two central issues in the political economy of reform literature are reversals and sequencing. We have dealt extensively with the former in this paper, but have strong reasons to leave the latter for future efforts. This is despite our results being somewhat clear in this respect: in our sample, the set of countries seems to have implemented reform by advancing first internal liberalization, then external liberalization and finally privatization. This sequence is observed even in the countries that have gone the furthest in privatizing and opening up their economies. Because we have focused on only three reform areas, the number of potential sequences of reform is limited. We are convinced that disaggregating our three indexes is vital for a deeper examination of sequencing issues. For instance, from the raw data we can identify that wage liberalization was preceded by price liberalization in most countries (these are two components of our internal liberalization index).

The paper is organized as follows. In the next section we briefly review the existing measures of reform. Section 3 presents our new objective reform indicators and benchmarks them against the subjective indicators used in most of the literature. Section 4 compares the performance of our indicators with that of the existing indicators in terms of the determinants of reform and in terms of growth implications. Section 5 concludes and presents some suggestions for future research.

2. The Rationale for Improved Reform Measures

International organizations are the main source of indicators of reform for our sample of countries, as such indexes have been constructed by the World Bank and the EBRD. The World Bank started this work in the early 1990s by putting forward three reform indicators, covering privatization and internal and external liberalization efforts. Later on, the EBRD took over this task and improved upon the early set by offering many more (nine) indicators, covering finer, more detailed aspects of reform. The two sets of indexes

are constructed in a similar manner, namely in three steps: (1) a comprehensive set of underlying objective variables is collected, (2) a common scale and weighting scheme is agreed upon, and (3) country and sector specialists study these data, judge them and agree on individual scores on each reform item for each country in each year (the top score is set to reflect the standards and performance typical of those in advanced industrial countries).

One main advantage of this approach is the ability to “quality-weight” the data. Consider, for instance, a government that chooses to manipulate the data because it believes that if more favourable figures are presented this would increase the likelihood of receiving a loan from an international organization or improve the terms of that loan. Subjective indexes can to some extent discount, or give a lower weight to, such information. Another main advantage is that these indexes are available in a balanced panel format for all years since 1991.

The data effort carried out at the World Bank is presented in the World Development Report 1996 (further details are in de Melo et al., 1997). The overall liberalization index is a weighted average of three areas: (1) internal markets (liberalization of domestic prices and the abolition of state trading monopolies), (2) external markets (liberalization of the foreign trade regime, including elimination of export controls and taxes, and substitution of low-to-moderate import duties for import quotas and current account convertibility), and (3) private sector entry (privatization of small-scale and large-scale enterprises and banking reform). The weights for this overall liberalization index are determined a priori and set as follows: 0.3 for internal liberalization, 0.3 for external liberalization and 0.4 for privatization.

The EBRD (2004) reform indicators are more numerous and cover large-scale privatization, small-scale privatization, governance and enterprise restructuring, price liberalization, trade and foreign exchange system, competition policy, banking reform and interest rate liberalization, securities markets and non-bank financial institutions, and infrastructure reform. For this paper, the EBRD indexes on price and external liberalization and privatization are of particular interest. Regarding price liberalization, they survey national authorities and use IMF country reports to determine the share of administered (regulated) prices in the Consumer Price Index as well as the share of goods with administered prices in a standardized “EBRD-15 basket”.⁶ The EBRD also provides information on whether or not wages are regulated. Concerning external liberalization, the EBRD reports on the share of trade in GDP, the share of trade with non-transition economies and tariff revenues (as a percentage of imports; it includes all revenues from international trade, and imports are those of merchandise trade). With respect to privatization, the EBRD surveys national authorities for data on, inter alia, the share of privatized enterprises and the estimated share of private sector output and employment to GDP and total employment, respectively. The EBRD then creates aggregate indexes, one for price liberalization, one for foreign exchange and trade liberalization, and one for

⁶ The basket consists of the following 15 goods and services: flour/bread, meat, milk, gasoline, cotton textiles, shoes, paper, cars, TV sets, cement, steel, coal, wood, housing rents and intercity bus service.

small- and large-scale privatization.⁷ These take values from “1” to “4+”. For example, regarding price liberalization, higher values of the index are associated with a smaller extent of price regulation. Thus, a score of 1 is obtained when most prices are controlled by the government. A score of 2 stands for some lifting of price administration, yet the state still sets the majority of prices. A score of 3 is reserved for significant progress in price liberalization, but still some involvement of the state in price regulation. A score of 4 stands for comprehensive price liberalization, with only a small number of administered prices remaining. A score of 4+ means that standards and performance are typical to those of advanced industrial countries with no price control outside housing, transport and natural monopolies.

What are the main problems with these efforts? We identify five potential problems: (1) lack of information regarding which variables make up each index; (2) lack of information regarding how the underlying variables are combined into the aggregate indexes; (3) the fact that in the lists of potential underlying variables presented in the above-mentioned reports one finds policy inputs as well as policy outcomes; (4) the fact that the indexes change without attendant changes in the underlying data; and (5) the fact that these indexes’ maximum scores refer to an ill-defined reference point such as a “well-functioning market economy” or an “advanced industrial economy”.

Let us now expand on each of these potential problems. One first problem we identify is the difficulty of knowing the exact variables underlying each reform indicator. More precisely, accompanying each index one finds a (sometimes large) number of related variables. Yet, statements indicating exactly which one of these variables is used in computing each reform index are not provided.

A second potential problem is that it is very difficult to know exactly how the reform scores are generated. In other words, we were not able to find a description of how the set of underlying variables is translated into the overall scores. Notice that in the World Bank case, we know how each individual reform indicator is weighted in an overall reform index. But this is not what we have in mind here. In this case, we know how the aggregate reform index is constructed (that is, we know which variables are taken into account and what weights are attached to each of them), but we do not know how each of the three individual components are constructed (that is, an exact list of underlying variables and set of weights are not provided). The same holds with respect to the EBRD indexes.⁸

Third, and in our view the most important issue, is that in the list of underlying variables provided, one finds policy inputs as well as outcomes. For example, in the list of potential underlying variables often presented for external liberalization, one can find tariff levels as well as trade openness. As noted, Rodrik (2005) argues that we learn little from cross-

⁷ Note that the price liberalization index was revised in 2003. The revision stressed the distinction between state price controls and utility price regulation. The improved index focuses solely on state price controls (see EBRD Transition Report, 2003, p. 18).

⁸ For instance, “The transition indicators scores in Chapter 1 reflect the *judgment* of the EBRD’s Office of the Chief Economist about country-specific progress in transition” (EBRD, 2004, p. 119, italics added).

country regressions of growth on reform because, *inter alia*, the literature does not isolate effort from outcomes when measuring reform. Loayza and Soto (2004) and Glaeser et al. (2004) also make this important point.

Fourth, there are many instances where the overall reform score has been revised despite the fact that the “underlying data” remained unchanged, which suggests that the algorithm may well have changed.⁹ This is rather surprising. It is well-known that statistical offices in the former communist countries were excellent in measuring output and employment (in physical terms), but were unprepared to deal with, say, inflation and unemployment (Bartholdy, 1997). One would expect the underlying data to be revised first, not the indexes.

Fifth and finally, existing reform indicators are not continuous and are also benchmarked against an imprecisely defined reference point. They are categorical variables taking values from 1 to 4+, the latter reflecting the level of liberalization achieved in an “advanced industrial economy”. In an important paper, Nicoletti and Scarpetta (2003) show that “advanced industrial economies” are highly heterogeneous with respect to the implementation of economic reforms, which diminishes the usefulness of this comparator.

3. Improving the Measurement of Structural Reforms

The objective of this section is to present the indexes of structural reform we construct for 25 former communist economies between 1989 and 2001. We focus on three areas of reform. The first is internal liberalization reform efforts, by which we mean the extent of price and wage liberalization. The second area we focus on is external liberalization reform efforts, in particular the severity of trade barriers and capital controls. The third captures privatization reform efforts. How are these new reform measures constructed? Firstly, we compile an extensive set of underlying variables. Secondly, we evaluate various ways to normalize and aggregate these data, *inter alia*, simple averages, principal components and the one proposed by Lora (1997) and decide for the last mentioned on the basis of it being the simplest and most transparent as well as the one approach that has been used in the reform literature (see also Loayza et al., 2005). Thirdly, we classify these underlying objective indicators into “input” and “outcome” indicators of reform in order to generate input-only measures. Fourthly, and finally, we subject our indexes to various robustness tests by (a) excluding outcome indicators (or conversely, by examining our preferred input-only measures of reform),¹⁰ (b) assessing reform dynamics across countries for various sub-periods and (c) comparing our objective indexes with those from the European Bank for Reconstruction and Development (EBRD) and World Bank.

⁹ Another possibility is that learning occurred. There are many examples of such changes, but arguably none less pronounced than the revisions one can observe in the scores for the Baltic countries in subsequent versions of the World Bank papers and of the EBRD’s Transition Reports.

¹⁰ This is very important because it is one way of addressing the Rodrik critique (2005), according to which we learn little from regressions of growth on policies because existing measures seldom isolate effort from reform outcomes. If outcomes receive a high weight in the index (this is likely if they are subjective), then regressing indexes heavily weighted towards outcomes on outcomes themselves clearly should not be very informative.

In constructing these indexes, we try to address each of the major drawbacks we identify in the existing measures. More specifically (and referring to the individual potential problems discussed in the previous section), the goal is to be as transparent and explicit as possible regarding (1) what are the underlying variables that make up each of our three reform indexes, (2) how the underlying variables are combined into each of the reform indexes, (3) how we separate out reform effort inputs from reform outcomes, (4) how our indexes change over time, relating these changes to changes in the underlying variables, and (5) how we use the in-sample maximum value of each index as a reference point (as opposed to an ideal “well-functioning market economy”).

We set out to construct indexes of structural reform for 25 countries for all years between 1989 and 2001.¹¹ This time window covers the period immediately following the collapse of communism as well as the late transition period (that is, the years following the Russian crisis of August 1998).

What are the underlying variables that make up each of our three reform indexes? Altogether, we collect data on 44 underlying variables. These underlying variables for each of our three reform indexes are listed in Table 1 (which also shows how we choose to separate reform inputs from outcomes; more on this below).¹²

Regarding internal liberalization, we collected data for the following indicators: the number of goods subject to price regulation in the 15-good EBRD basket, the share of administered prices in the consumer price index (CPI) and wage regulation. The latter is a dummy variable reported in the EBRD Transition Report and is admittedly a very rough measure of labour market liberalization. The other two underlying variables also originate from the EBRD Transition Report, although we have contacted all the 25 national statistical offices and Ministries of Finance (and/or Economy) for assistance in double-checking and filling any remaining data gaps. Out of our three reform indexes, the internal liberalization measure is clearly the closest to the existing indexes (except that it also includes wage regulation). As discussed below in more detail, despite this resemblance when we examine the correlation coefficients between ours and the existing reform measures, those for internal liberalization turn out surprisingly to be lower than those for external liberalization and privatization.

Regarding external liberalization, the variables underlying our index are more numerous and contain 29 measures of capital controls and trade barriers. Capital controls indicators are as follows: controls on commercial credit, controls on foreign direct investment, controls on the liquidation of foreign direct investment, documentation requirements for the release of foreign exchange for imports, exchange rate taxes, interest rate liberalization, investment liberalization, multiple exchange rates, permission requirements

¹¹ These are: Albania, Armenia, Azerbaijan, Belarus, Bulgaria, Croatia, Czech Rep., Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldavia, Poland, Romania, Russia, Slovakia, Slovenia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan. Bosnia and Herzegovina, and Serbia and Montenegro were excluded for lack of data. We believe it would be worthwhile to update the indexes to address the further sensitivity checks on the usefulness of these indexes.

¹² A detailed appendix with information on the definition, coding and source for each of these variables is available at the end of the Appendix.

for foreign exchange accounts held abroad by residents, permission requirements for foreign exchange accounts held domestically by residents, permission requirements for foreign exchange accounts for non-residents, repatriation requirements, repatriation requirements for invisible transactions, surrender requirements and surrender requirements for invisible transactions. Data on trade barriers include the following: compatibility with Article VIII (current account convertibility), export duties as a percentage of tax revenues, export licences, export taxes, import duties as a percentage of tax revenue, import licences and quotas, import tariff rate, OECD and WTO membership, trade openness, share of trade with non-transition countries, tariff code lines, tariff revenues as a percentage of imports, and tax revenues on international trade (as a percentage of revenue).

The underlying variables for external liberalization come from various sources. One main source of data is the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (Bodenstein, Plumper and Schneider, 2003). Additional data sources are the World Bank's World Development Indicators, UNCTAD's Handbook of Trade Statistics, EBRD's Transition Reports, Penn World Tables 6.1 and the IMF, OECD and WTO websites. We have again contacted all 25 national statistical offices and Ministries of Finance (and/or Economy) for assistance in filling data gaps.

Lastly, the privatization index is based upon the following variables: privatization revenues as a percentage of GDP, the share of small firms privatized, the ratio of assets of private-owned banks to assets of all banks, total number of enterprises privatized, total cumulative number of private enterprises, total number of small and medium-sized enterprises privatized, total number of large enterprises privatized,¹³ share of foreign-owned banks over total number of banks, private sector share in GDP, credit to private sector, private sector share of employment and private sector investment. The sources of the underlying variables for our privatization measure come from various sources: IMF's International Financial Statistics, WB's ECSPF database, EBRD's Transition Reports, and EBRD survey to Central Banks and national authorities. We have also in this case contacted all 25 national statistical offices and Ministries of Finance (and/or Economy) for assistance in filling data gaps.

How are these variables combined into each of the reform indexes? There are various aggregation methods available. Two obvious candidates are simple arithmetic averages and principal components. One major drawback of simple averages is that when we have so many different underlying variables in different units and scales, the ensuing values of the indexes would be difficult to interpret. One major drawback of principal components is that maximum and minimum values of the resulting indexes are entirely determined by the data and have no clear economic meaning.¹⁴ For these two reasons, we choose to apply the methodology developed by Lora (1997). One important advantage of Lora's method is that it has been developed and used previously for similar purposes (that is, to

¹³ The total cumulative number of private enterprises, total number of small and medium-sized enterprises privatized and total number of large enterprises privatized was normalized by the country's population.

¹⁴ Simple averages and principal components versions of our indexes are available upon request.

capture various reform efforts across countries and over time). A major advantage of the Lora transformation is that the reference point is within the sample. In other words, this method does not require us to benchmark reform efforts against an ideal “well-functioning market economy”. Our reference point is the maximum reform effort observed across our sample of countries in the respective time window. The major cost of this choice is that enlarging the time window and/or the sample of countries can potentially affect the values of our indexes. Needless to say, we believe that this drawback is preferable to those of benchmarking against something that cannot be defined with sufficient precision, either across countries or over time.¹⁵

Our overall index I for i -th country is constructed as follows:

$$I_i = \frac{1}{m_i} \frac{1}{n_i} \sum_{j=1}^{m_i} \sum_{t=1}^{n_i} \left[\frac{V_{j \max} - V_{jit}}{V_{j \max} - V_{j \min}} \right] \quad (1)$$

where V is the value of the j -th variable in the i -th country at time t . n stands for the number of years (typically 13) and m for the number of variables. Also note that $V \in (0,1)$ for all i, t , which is because we normalize the “raw” V value of the j -th variable by the maximum value observed in all countries at time t . Notice that, firstly, in the case of year-by-year indexes, we do not average over time and thus all terms containing n drop out. Secondly, the equation holds when higher values of the underlying variable indicate less reform (for the opposite case, the numerator becomes the difference between the actual value and the observed minimum).

How do we separate out reform inputs from reform outcomes? The distinction between input and output variables is not always clear cut. When measuring reform, it is advisable to focus on the indicators that are directly under the control of the government (Rodrik, 1996; Loayza and Soto, 2003). Including outcome indicators in the construction of aggregate reform indexes may introduce bias in estimating the degree of liberalization. This is so for the simple reason that outcome indicators can be the result of many things other than reform inputs.¹⁶ In addition, it may well be the case that there is a time lag between reform inputs and reform outputs. Therefore, we construct input-only measures for the three reform policies yearly for 25 former communist economies, but also compute indicators combining inputs and outcomes as a robustness check. Our prior is that the correlations between the existing reform indexes will be lower with respect to our input-only indexes (which are the ones we prefer) than with respect to our indexes that combine reform inputs and outcomes. As noted below, our results support this statement, which can be taken as evidence that the existing subjective indicators do indeed mix

¹⁵ In aggregating the underlying variables, we must address the issue of weights. In our view, it is impossible to determine the “true” set of weights. Further, these weights probably change from country to country and over time. As a result, we decided it is more transparent to use equal weights for all underlying variables. This can clearly be improved upon, although it would be difficult to accomplish in a non-arbitrary manner.

¹⁶ For instance, the share of trade with non-transition countries may be strongly affected by the geographical proximity to non-transition countries. Therefore this variable should not be included in an input-only index of external liberalization efforts.

inputs and outcomes (although we cannot be sure of that, as the precise lists of underlying variables are seldom provided).

Notice also that in selecting reform outcomes variables we need to minimize the probability that a “true reform input” is mistakenly classified as a “reform outcome”. Therefore, the resulting list of reform outcomes should only contain variables that are clearly reform outcomes and, conversely, the list of reform inputs will contain variables for which a certain level of reform outcomes is present. The reason for doing this is to try to “stack the cards” against our indexes, as this will surely minimize the differences (over time and across countries) between ours and the existing reform measures. We consider as outcome indicators the following variables (the first column of Table 1 lists reform inputs, while the second lists reform outcomes). For internal liberalization, we single out as an outcome indicator the share of administered prices in the CPI. This is because this is a function of the share of non-administered prices in the CPI. Thus if the introduction of new goods is beyond the control of the government’s internal liberalization policies, so is the total number of goods (prices) in the economy. For external liberalization, we consider as outcome variables the share of trade with non-transition countries, openness, import duties as a percentage of tax revenues, tariff revenues as a percentage of imports and the taxes collected on international trade. For privatization, we consider as outcome variables the private sector share in GDP, credit to the private sector and private sector investment.

How do input-only objective indexes of reform change across countries and over time? We make two general observations. The first is that the correlation coefficients among our measures of reforms are all significantly positive, but rather low. The correlation between internal and external liberalization is 0.48, that between internal liberalization and privatization is 0.39 and that between external liberalization and privatization is 0.66.

The second observation refers to reform reversals. While reform measured by the World Bank and EBRD indexes is better portrayed as a smooth, uninterrupted process of continuous improvement (note that this is even more so when considering the cumulative version of those indexes), it is a much more turbulent process according to our measures. Ours show a fair amount of trial and error and experimentation, which translates into the occurrence of numerous reform policy reversals. This matters because reform reversals are at the heart of the theoretical literature (e.g. Dewatripont and Roland, 1995). Merlevede (2003) calculates reform reversals using the EBRD indexes and reports 21 cases in which the subsequent value of a reform indicator is lower than the current value (we also adopt this definition of reform reversal here). Because this is from a total of 237 changes, it implies that reversals are observed in 8.9% of cases. Also note that Merlevede considers reversals across all nine EBRD reform indicators. Considering just our three indexes, we obtain a much larger number of reversals, we find: 42 reversals out of 295 (14.2%) in the internal liberalization reform indicator; 61 reversals out of 300 (20.3%) in the external liberalization reform indicator; and 44 reversals out of 243 (18.1%) in the reform indicator for privatization efforts. Further, using the EBRD reform measures Merlevede (2003) finds that only half of the countries experienced reform reversals.

According to our indexes basically all countries have experienced at least one reversal in one of the three reform dimensions we consider.¹⁷

3.1 Internal Liberalization Index

Figure 1 shows our input-only internal liberalization index on a yearly basis for all the 25 countries in our sample.¹⁸ Overall, there is clear progress across countries over time in terms of the liberalization of prices and wages. Notice, however, that reform reversals abound, as for example, in Albania and Ukraine in 1997, Lithuania in 1995 and Uzbekistan in 1994. Most of these seem related to wage regulation, which plays a significant role in the index. For example, Lithuania according to our data stopped regulating wages in 1995 and consequently the value of the index increases accordingly. Similarly, a large drop in the value of the index for Uzbekistan is a result of the introduction of wage controls in July 1994 (Anderson and Pomfret, 2002). Albania deregulated wages in 1997, resulting in a large increase in the value of the index. Slovakia and Ukraine reintroduced wage regulation in the years 1997–1998 and the value of the index declines accordingly.¹⁹ Because this particular index is composed of very few variables, which are equally weighted, any changes in the underlying variables will have large consequences in terms of the aggregate index.²⁰

How do these measures compare to the existing indicators? Note that the EBRD liberalization indexes cover the years 1991–2001 and the World Bank index developed by de Melo et al. (1996) is available only for 1989–1997. Thus, correlation coefficients are based only on the years for which all the corresponding data are available. The correlation between our input-only internal liberalization index is 0.52 with the EBRD's and 0.38 with the World Bank's, while the correlation between our index combining inputs and outcomes is 0.42 with the World Bank's and 0.56 with the same EBRD index.²¹ As noted,

¹⁷ Given the small numbers of reversals found by previous studies, it is common practice to comment on each of them. There are too many reform reversals in our data for us to comment on each of them individually (we do comment on a selected few below), so in the following section we provide an econometric analysis of the determinants of reform reversals.

¹⁸ See the Appendix for country-specific data (also for external liberalization and privatization efforts).

¹⁹ In terms of the overall ranking of countries, we find Kazakhstan highly placed. Although this is somewhat surprising, it can easily be explained by tracing the index through its underlying variables: Kazakhstan has the lowest number of goods subject to price regulation and the lowest possible score for wage regulation for all 25 countries during 7 of the 13 years (1989 to 2001). The second and third places are (less surprisingly) occupied by Estonia and Hungary, respectively, while at the bottom of the ranking we find Romania, Belarus, Russia and Moldova. Countries such as Albania and Georgia made great progress in terms of price and wage liberalization only more recently. On the other hand, Turkmenistan and Uzbekistan seem to have moved towards greater regulation over time. Overall, the internal liberalization index seems unaffected by the exclusion of outcome variables and to splitting the time window. The Baltic countries and countries from the Caucasus seem to be slightly more liberalized in terms of price and wage regulation. Using the input-only index, we still find the ranking topped by Estonia, Kazakhstan and Hungary. At the bottom, we find Moldavia and Belarus, which few observers would find surprising.

²⁰ The source of most pre-1991 data for the former Soviet Union countries is national authorities.

²¹ If we use only data in the period 1997–2001, the coefficient falls slightly to 0.49 for both our indexes (with and without outcome indicators). The correlation of our index with the WB index in the years 1989–1994 is 0.42, or 0.38 excluding the outcome indicators. If we extend the WB index to include the years up to 1997, the corresponding correlation coefficient rises to 0.48 and 0.53 respectively.

while our measure is at first sight very similar to the EBRD's, the correlation between them is lower than in the cases of external liberalization and privatization (see below).

Figures 2 and 3 show the behaviour of our internal liberalization index over time when we divide the sample into two groups, namely Central and Eastern European Countries (CEECs) and the Commonwealth of Independent States (CIS). The CIS includes all former Soviet Union republics except the Baltic States. For the sake of comparison, we normalize the EBRD indexes, in that smaller values refer to less liberalization effort. We present the two indexes in Figures 1 to 3 below. Visual comparison suggests that the EBRD may have been somewhat more generous in rating internal liberalization in the CEECs vis-à-vis the CIS, and this may have been particularly so for the period 1989–1995.

3.2 External Liberalization Index

Our external liberalization index is shown in Figure 4. It is worth noting that, as in the case of the internal liberalization index, the EBRD external index clearly indicates more liberalization on average than our index for all years but 2001 (although the gap between the measures early on is not as great as in the case of internal liberalization). Except for 2001 (marginally), our indexes suggest that external liberalization efforts were less intensive, on average, than internal liberalization efforts.²²

One issue that is important to keep in mind is that there is considerably more variation in terms of external liberalization both across countries and over time than is the case for internal liberalization, so a closer analysis of the trajectories of each country is worthwhile. We learn that there are more cases of policy reversal, but none of them are as severe as the ones seen for price liberalization. Admittedly, this may be caused by the smaller number of underlying variables for the latter measure.

Examining the relative rankings, the results are in line with expectations both for the top and for the bottom countries. Indeed for the top three it is maybe mildly surprising that the Baltics are still such intensive reformers even in the very late transition years. The external liberalization indexes show that the highest average values were found for the Czech Republic, Latvia and Estonia, while the lowest values were for Turkmenistan, Uzbekistan and Belarus. As noted, the correlation coefficients between our external liberalization and the EBRD's and World Bank's indexes are higher than for internal liberalization. The correlation with the World Bank's is 0.73 and that with the EBRD's is

Additionally, the correlation between our internal liberalization index with and without the outcome indicators stands at 0.97.

²² In terms of the overall ranking of countries, we find Latvia on top, closely followed by Estonia (see Appendix 1). The third post is (maybe) surprisingly occupied by Kyrgyzstan. This is because of extremely high values for external reform effort from 1993 onwards across the range of 29 variables underlying our index. At the bottom of the ranking we have Uzbekistan, Turkmenistan and Albania. The greatest jump we observe in the value of index is for Turkmenistan in 1999. Examining the underlying variables, we find that Turkmenistan, *inter alia*, liberalized interest rates and abolished multiple exchange rates in 1999. Another example worth mentioning is Uzbekistan, which reintroduced severe exchange rate controls as a reaction to a balance of payments crisis in the autumn of 1996 (Pomfret, 2000). This is reflected in a large decline in the value of its external liberalization index from 0.32 in 1996 to 0.24 in 1997.

0.81, while the same coefficients for our input-only external liberalization indexes are lower, at 0.65 and 0.79 respectively.²³

Figures 4 to 6 show that our external liberalization index never “crosses” the EBRD index after 1991. In other words, the EBRD index indicates more liberalization on average than our index for almost all years. Again, the gap tends to be larger for the CEEC than for the former Soviet Union countries.

3.3 Privatization Index

Figure 7 presents our privatization index. Concerning country-specific results, it is worth noting that only Hungary and Poland privatized their economies, to a certain extent, before 1991. Generally, Hungary shows the greatest extent of privatization, followed by Slovakia, Macedonia and Latvia. On the other hand, Belarus and Turkmenistan have made the least progress with privatization. It is interesting to note that for the most intensive reformers in this respect the process is much less bumpier than in those countries which privatized their economy only partially (see Appendix 1). Further examining major changes in the values of the privatization measure, Hungary’s privatization revenues (normalized by GDP) increased sharply in 1995, resulting in a substantial improvement of the index (see Canning and Hare, 1996). The index declines sharply for Macedonia in 1994 and 1995 for a number of reasons, but principally because of a large reduction of credit to the private sector as a percentage of GDP, which falls from 45% to 23% from 1994 to 1995.

We should also note that typically the values of our indexes are lower for privatization than for internal and external liberalization, which hints at a specific reform sequence adopted by these countries that entailed leaving privatization for later. The correlation between our privatization index and those from the EBRD is 0.8, or 0.66 if we exclude the outcome indicators. If we restrict the sample to 1997–2001, the simple correlation coefficients are 0.82 and 0.64 (after exclusion of the outcome indicators). The correlation with the 1989–1994 World Bank index is 0.52, or 0.43 after exclusion of the outcome indicators. The correlation coefficient between our privatization index with and without the outcome indicators is 0.94.

Figures 7 to 9 show that our index of privatization efforts is also less optimistic than the assessment from the EBRD and World Bank. Interestingly, the difference between ours and the EBRD index for privatization is larger for the CEECs. Again, the CEECs seem to have been more aggressive privatization reformers than the CIS countries.

²³ If we restrict the sample to 1997–2001, the correlation is somewhat higher at 0.81, or 0.79 excluding the outcome indicators. The correlation coefficient with the 1989–1994 World Bank index is 0.73, or 0.65 excluding the outcome indicators. The correlations are almost unchanged if we use the 1989–1997 World Bank index. They are 0.71 and 0.69 without the outcome indicators for our index. Finally, the correlation coefficient is 0.93 between our external liberalization index with and without outcome indicators.

4. Econometric Results

The objective of this section is three-fold: firstly, we assess the factors that help explain structural reform dynamics across countries; secondly, we analyse the determinants of reform reversals; and thirdly, we use various econometric models from the literature and re-estimate with structural reform measures so as to have a sense of how much of an improvement our measures can deliver.

4.1 Reform Determinants

What are the main determinants of economic reform? Here we consider some of the key insights from the theoretical literature on the political economy of reform to throw light on the determinants of each of our three indicators. The literature discussed above has generated a number of hypotheses that have rarely been tested empirically (Roland, 2000). One set of potential determinants is related to economic conditions: favourable changes in economic conditions (e.g. less unemployment) allow greater margins for the reforming government to compensate losers and thus implement “more reform” (Aghion and Blanchard, 1994). A closely related notion is that of the consequences of a sharp deterioration in economic conditions: an economic crisis increases the number of supporters (that is, potential winners) of reform (Fernandez and Rodrik, 1991). Another well understood set of reasons relates to politics, e.g. more democratic countries would be able to implement more reform (because, for instance, democratic elections allow the monitoring of compensation promises). Further, less concentrated political power (an example would be communists losing seats in parliament) would be associated with the implementation of “more reform” (Hellman, 1998).

Let us now turn to the econometric methodology. There are two main questions: (a) What are the factors that determine the dynamics of reform across countries and over time? And (b) is the set of determinants the same for each of the three reform areas (namely privatization and external and internal liberalization)? Based on the large case study evidence on reform dynamics cited above and on what we learned about this process in collecting the underlying data for our objective indexes and the holding attendant discussion with public officials, our prior is that these three reforms are driven by different factors. This is partly because we observe a distinct sequence of reforms. Internal liberalization happened immediately after the fall of communism (often with the exception of wage regulation). This was followed by external liberalization and then by privatization efforts. This sequence makes it unlikely that the same set of determinants would hold for each of our three different reform measures. Moreover, if there were an identical set of determinants there would be little reason to focus on individual reforms, as an aggregate index would be the right way to proceed. In our view, such strategy would not do justice to the complex dynamics we observe with respect to reform efforts across these countries over time (our results below corroborate this insight).

In what follows, we will examine the determinants of each of the three reform areas separately.²⁴ We first estimate the following equation:

$$R_{itc} = \beta_0 + \beta_1 GDPgrowth_{itc} + \beta_2 Unempl_{itc} + \beta_3 Democracy_{itc} + \beta_4 IC_{itc} + \beta_5 V_{itc} + \varepsilon_{itc}$$

(2)

where R_{itc} stands for our objective indexes of reform, with i denoting reform area (privatization, external or internal liberalization), t denoting year and c denoting country. $GDPgrowth_{itc}$ is the rate of real per capita GDP growth (in country c and year t), $Unempl_{itc}$ is the unemployment rate, $Democracy_{itc}$ is the Freedom House index of democracy (the continuous version from their Nations in Transit project), IC_{itc} is a principal components index of initial conditions²⁵ and V_{itc} is a vector of auxiliary control variables. We expect the coefficient on GDP growth, unemployment and initial conditions to be positive (the hypotheses are that faster growth, higher unemployment and more favourable initial conditions are more conducive to the implementation of reform) and expect the coefficient on democracy to be negative (the hypothesis being that democracy is more conducive to the implementation of reform).

Table 2 has our econometric results on the determinants of each of our three indexes of reform. The first three columns show these results for our internal liberalization index. In this case, the Hausman test indicates that the random-effects estimator is appropriate. The results in column 1 broadly confirm our hypotheses: GDP growth, unemployment and democracy all exert a positive and statistically significant impact on internal liberalization efforts. The addition of initial conditions (reported in the next column) has little impact on those coefficients. Yet, the results suggest that countries with more favourable initial conditions are more likely to implement internal liberalization reforms. Also notice the substantial increase in the R-squared once initial conditions are accounted for. In the third column we add a Herfindahl index of concentration of political power (referring to the number of seats in the lower house). Although this addition proves to be of interest (we find that in parliaments in which political power is less concentrated, reforms move further), the coefficients on growth and unemployment are now less precisely estimated.

The next set of columns has the results for external liberalization. In this case we have a more robust set of determinants in that now GDP growth, unemployment and democracy all have the expected effects. It is interesting to note that while the effect of democracy is smaller for internal liberalization than for external liberalization and privatization, this is inverted with regard to initial conditions. We believe this is in part because of the timing of these reforms: internal liberalization takes root much faster than external and privatization, thus leaving little time for the process of democratization to play a fuller

²⁴ An instrumental variable estimator is employed. We also estimated the equations with lagged regressors and obtained largely the same results, which are available upon request. We also introduced squared unemployment and squared GDP, but failed to find them significant. One reason for introducing the squared variables is to disentangle the theories of Fernandez and Rodrik (1991) and Aghion and Blanchard (1994), who put forward that better (or worse in the case of the latter theory) economic conditions foster more reform.

²⁵ The initial conditions are a measure of the macroeconomic distortions as of 1989 and are constructed in line with, among others, EBRD (2002) and Merlevede (2003).

role (notice, however, that low concentration of political power is an important determinant in this respect), with a similar reasoning applying for the role of initial conditions on privatization (the latter generally takes place too late for the effect of those initial conditions to be fully felt). Also notice that we report that the growth of OECD countries, as a measure of global economic conditions, is an important reform determinant in this case: external liberalization is more likely to be implemented under favourable global economic conditions.

As can also be seen from Table 2, the results for privatization are in line with those for external liberalization. GDP growth, unemployment rates and initial conditions show a positive and significant impact, while the coefficient on democracy also accords with our priors. It should be noted that there are important endogeneity issues, to which we return in section 4.3. For example, the consistent result we obtain showing that higher unemployment rates are associated with more reform efforts can be understood in conflicting manners: it may well be that rising unemployment enlarges the ranks of potential winners and thus increases the support for reform, leading to the intensification of reform efforts (which is, as noted above, consistent with the Fernandez and Rodrik model), or it may be that reform directly causes a (temporary) increase in the rate of unemployment (consider the case of privatization).

We subjected the results above to various sensitivity checks (see the tables in the Appendix). We find that greater inflation rates decrease external liberalization and privatization efforts (but not internal liberalization). We also investigate the role of financial crisis (measured as the weighted average of exchange rate pressure and interest rate differentials) and do not find that it affects our reform indicators, with the somewhat surprising exception of privatization (similarly, fiscal deficit is never statistically significant). We also examined a number of political issues. EU negotiations (a dummy variable taking the value of 1 from the year when EU accession negotiations started) are found to affect positively external liberalization as well as privatization efforts, but not internal liberalization. This is maybe a consequence of price and wage liberalization occurring well before the negotiations started. The occurrence of violent conflict was found to have a surprisingly limited impact: controlling for initial conditions in our baseline specifications, the coefficient on wars is statistically significant at conventional levels only for the case of privatization. Following Frye and Mansfield (2004), we create a variable capturing the electoral calendar (the number of years until elections). Surprisingly, we find little evidence for the timing of elections driving any of our reform indicators except for external liberalization. Further, we employ various measures of changes in the government's ideological orientation to address the potential effects of political alternation on reform. For this purpose we use the number of ideological alternations (e.g. from centre-left to centre-right) and the number of leadership changes.²⁶ We find that cumulative leadership and political changes are positively associated with our three indexes of reform. Not surprisingly, for two of them (internal liberalization and

²⁶ We are grateful to Branko Milanovic for these data. Ideological alternation is defined as any change of the government's ideological orientation on a 16-cell ideological grid. Leadership change captures personal changes in the locus of power, whether it is a change of prime minister (due for example to a change in the governing majority) or a change of president. For details, see Hoff, Horowitz and Milanovic (2005).

privatization) we find that these measures of political alternation substitute for democracy, as the latter becomes insignificant after the inclusion of any of the two alternation variables. Finally, we have undertaken a spatial econometrics exercise to examine the role of distance between countries. The idea here is to assess the possibility of reform contagion: whether countries are more likely to implement reform say because of learning from the experience of close neighbours or because reform in close neighbours directly induces domestic reform (consider the case of competition among countries for FDI inflows). However using various such measures (distance from Brussels, distance between capital cities, whether or not previously part of the Soviet Union), we fail to find that reforms are driven by how much other “close” countries reform. In a nutshell, with the exception of the political and ideological alternation variables, we find no robust additional determinant of reform efforts, while our principal results remained unchanged.

4.2 Reform Reversals

A second objective here is to try to explain reform reversals. One main motivation is that although reform reversals occupy a central place in the theoretical literature, there are, to the best of our knowledge, no systematic efforts to try to explain these reversals empirically. The potential reversibility of reforms plays a fundamental role in the theoretical normative political economy of reform literature. Most of these theoretical contributions attempt to devise ways of designing reform packages that have a low probability of reversal (see, for example, Dewatripont and Roland, 1995).²⁷

Further, this gives us a way to assess the reliability of our new objective measures. It may well be the case that the larger number of reversals is not an indication of our indexes’ quality but, a critic may charge, they reflect the fact that these indexes are finely measured and small changes in the underlying variables as well as country and time coverage may have an undesirably large impact on our measures. One way to try to put aside this concern is to explain reversals: if we cannot provide a reasonable explanation, then they may be right. We try to model reversals in two ways. In the first a reversal is simply defined as a decrease in the value of any of our three indexes in two consecutive years (a dependent dummy variable that takes the value of 1 if a reversal occurred, and zero otherwise), while in the second we consider a particular measure of the severity or persistence of reversals, namely how many times reversals have occurred consecutively (the dependent variable is 1 when a reversal occurred, 2 when reversals occurred in two consecutive years, and so on).

One feature of the available indexes of reform is that, according to them, reform reversals seldom occur. Although this can be explained by well-informed policy-makers, other explanations include that there may be political pressure on the international organizations constructing these indexes not to lower previous scores, or that national authorities mistakenly understand the survey questions as referring to their cumulative

²⁷ Some of the mechanisms devised to deal with this issue are compensating packages, gradual implementation of reform and adherence to institutions that commit to future transfers (or directly to the implementation of reforms associated with WTO or EU accession).

efforts. As such, the empirical analysis of reform reversals has been scarce, especially vis-à-vis the central role it occupies in the theoretical literature. Using our indicators, we observe twice as many reversals as with other indexes. As discussed, this may well be caused by the fact that our objective indicators are measuring reform too finely, or it may also be caused by the non-availability of a few variables for that particular year (as the panel data set for the underlying variables is in some cases unbalanced).

What explains reform reversals in these economies?²⁸ It is important to note that in the empirical literature this question has not been raised, as Merlevede (2003) is concerned mainly about the impact of reversals on growth. One reason for reform reversals is unfavourable changes in economic conditions. An economic crisis or a sudden increase in unemployment or a slowdown in growth rates may change the support for reform and cause a reversal. Another potential reason is a change in political conditions. For instance, if we observe major turnovers of the leading party in government, then reversals are likely (a left-wing government that succeeds a right-wing government may favour redistribution or compensation).

In this light, we estimate a random-effects logit model in which the dependent variable is coded 1 if there was a reform reversal in that indicator in that year for that country, and zero otherwise. In the following model we investigate political and economic factors as potential explanations for reform reversals:

$$P(\text{reversal}_{itc} = 1) = \Phi(\beta_0 + \beta_1 \text{GDPgrowth}_{itc} + \beta_2 \text{Unempl}_{itc} + \beta_3 \text{Democracy}_{itc} + \beta_4 V_{itc})$$

(3)²⁹

where reversal_{itc} is a binary variable indicating whether reform i in country c in year t has experienced a reversal (defined as a decline in the absolute value of the index); GDPgrowth_{itc} is the rate of real per capita GDP growth (in country c and year t), Unempl_{itc} is the unemployment rate, Democracy_{itc} is the Freedom House index of democracy; V_{itc} is a vector of auxiliary control variables; and Φ is the cumulative logistic distribution function. Note that this means we do not expect the reform determinants we found above to play a role for reversals. By performing a separate analysis of the bottom half of the distribution of our reform indicators we expect they are driven by different factors than the mean itself. If that turns out to be the case, we gather additional support for the reliability of our measures. Yet failing to explain reversals would suggest that our measures are maybe too fine and are not reflecting changes in reform efforts but are picking up mostly noise. Accordingly, we should expect that the majority of the

²⁸ Notice that this exercise differs from the one on reform dynamics above. The latter explains both positive and negative variations from the mean. Its validity is an empirical question: if the set of determinants turns out to be different between reform efforts and reform reversals this should reinforce the confidence we can attach to our measures. The latter also captures a sense of the magnitude of these variations (including reversals of course). However, in this exercise we treat all reversals in the same way, giving equal weight to small and large reversals in trying to explain their occurrence. In our view, this stacks the odds against our indicators and as such is a conservative test of their usefulness and reliability.

²⁹ For convenience, we simplify this notation, as if there were no country effects. More precisely, the random effects maximum likelihood estimator of the parameters for this model – which we employ – does not have a closed-form solution and the solution is obtained numerically using quadrature methods. See Cameron and Trivedi (2005) for further details.

explanations will come from the vector of auxiliary control variables, ideally with individual variables playing a role for the reversals of each of our three individual reform measures.

The first columns of Table 3 show our baseline results for internal liberalization reversals. These seem driven primarily by political factors, specifically by a direct form of protest (labour strikes). In some specifications, high rates of unemployment are associated with the likelihood of reversals, but this result is not robust. The significance of labour strikes points to the importance of a better grasp of initial political conditions in understanding reform dynamics. It also highlights the timing of reforms: because internal liberalization (according to our indexes) was implemented before external liberalization and privatization, the most effective way to revert internal liberalization may have been by direct influence.

The results with respect to our two other indexes are intuitive. We find for privatization reversals that the main explanatory factor is FDI inflows, while those factors explaining external liberalization are average growth rates of OECD economies (an increase in those rates implies a higher probability of reversal), while terms of trade shocks show a negative impact in the probability of reversal.

Table 4 repeats these specifications, but instead of explaining whether or not a reversal occurred, we try to understand the persistence (or duration) of reform reversals. We report random-effects negative binomial estimates in which the dependent variable is the number of consecutive years for which we observe a reform reversal. Interestingly, the results for persistence are in line with those for reversals: labour strikes explain the persistence of internal liberalization reversals, OECD growth explains the persistence of external liberalization reversals and FDI inflows explain the persistence of privatization reversals.

We subjected these results to various sensitivity checks. Although we find that our main results are indeed robust to the inclusion of a number of important variables, none of them proved to be systematically related to reform reversals. We find no systematic effects from inflation, financial crises, fiscal deficit, EU negotiations, war, the timing of elections, ideological alternations, the number of leadership changes, and distance from Brussels, distance between capital cities, and whether or not previously part of the Soviet Union as measures of distance in our spatial econometrics exercise (see the Appendix). The results are similar with respect to the persistence of reform reversals, with three exceptions. Two of them concern the external liberalization index: we find that inflation and proximity as measured by being a former Soviet Union republic increase the persistence (or severity) of external liberalization reversals. We also find that ideological alternation tends to increase the persistence of internal liberalization reversals. In sum, we find no robust additional determinants of reform reversals (or of their persistence), while our principal results remain unchanged.

In addition, it is vital to note that we have also re-estimated all our results with EBRD reform indexes and reform reversals calculated from these indexes. While in general the

reform determinants do not yield qualitatively different results, the EBRD indexes fail to find any significant determinant for privatization reversals and to a certain extent also for external liberalization. On the other hand, the EBRD indexes do a good job in explaining the internal liberalization reversals and their persistence. Our results in sections 4.1 and 4.2 are robust to re-defining the beginning of the sample. More specifically, the results are qualitatively unchanged if we define the starting year of transition as the year for which the country experienced the largest GDP fall.

4.3 Endogeneity Issues: Do These New Indexes Change the Existing Results?

We believe that the two sets of results above (on the determinants of reform dynamics and on reform reversals) suggest that our indexes are useful and reliable in improving our understanding of reform. Yet, the literature on the economic effects of reform has long recognized that growth and reform may be jointly determined. The reform is carried out in the expectation that it will translate into faster growth rates, while a growing economy enables a reformist government to compensate losers from reform and thus continue, or even intensify, reforms. There is also the notion that the impact of reform on growth occurs with a lag: the contemporaneous effect of reforms on growth may be negative, while the lagged effect may be positive. It is thus important to investigate what are the ultimate consequences, in terms of existing econometric results, of using our indexes (note that in this section in order to replicate previous studies, we use an overall reform index, which is a simple average of our three indexes – internal and external liberalization and privatization). Moreover, our results so far do not reflect the concerns expressed in the more recent literature regarding endogeneity and robustness. One way to address such issues is to directly re-estimate some of the “reform equations” from the literature using our reform indicators instead and compare the ensuing coefficients. Also, there is now a somewhat sizable literature on the effects of reform on growth, which has, generally speaking, found a positive impact of reform on growth when reform is proxied by the subjective indicators we discussed above. It is also important to investigate whether our objective indexes change these results.

We select four well-known papers which report a “first-stage” reform equation.³⁰ To this end, Table 5 contains the “reform equations”, while Table 6 has the corresponding “growth equations”. The reform equations we re-estimate are originally from Heybey and Murrell (1998), Merlevede (2003), Falcetti, Raiser and Sanfey (2002) and Kim and Pirttila (2003). It is worth noting that we use the same variables in the replication, except we change the reform measure used by the authors for our aggregate index of reform.³¹

Heybey and Murrell (1998) specify reform (as measured by the World Bank indexes discussed above) as a function of economic growth, democracy as measured by the Freedom House index, the extent of initial economic liberalization and the share of manufacturing in GDP. Their results are reproduced in the second column of Table 5:

³⁰ Notice that all of these are part of a system of equations (that is, they are all estimated jointly with a growth equation), which if reported in the original paper is also replicated in the present study.

³¹ In order to replicate these results we need to generate an aggregate index of overall reform effort (which is done using the Lora algorithm described above and averaging the three reform indexes we computed).

although economic growth facilitates the implementation of economic reforms, an extensive history of reform attempts seems to be a hindrance (maybe reflecting Kornai's "reform windmill"). Using our reform indexes, we are able to reproduce their results with respect to the initial level of liberalization and indeed strengthen them in the sense that the coefficient is larger and estimated more precisely. Yet, we could not reproduce the result for economic growth.³²

Merlevede (2003) analyses the impact of reform reversals. The paper reports the coefficients from a reform equation. Merlevede's data show that reform (measure by the EBRD indexes) is driven by contemporaneous economic growth and democracy as measured by the inverted Freedom House index (in the inverted index, higher figures indicate more democracy). He reports that initial conditions matter in explaining reform dynamics. Using our reform indexes, we are able to replicate the finding that democracy is an important factor in driving reform. However, we do find that although contemporaneous growth is positively associated with reform progress, lagged economic growth turns out to be inversely related to reform. The latter result is usually interpreted as supporting the notion that economic crises are important determinants of reform. Finally, we find little support for the role of initial conditions.

As can also be seen from Table 5, one main feature of the reform equation from Falcetti, Raiser and Sanfey (2002) is the comprehensiveness of initial conditions.³³ Our reform indexes not only reproduce the growth effects reported by Falcetti et al., but also are in this case estimated more precisely and the size of the coefficients is once again larger. The situation with respect to democracy is similar, though the size of the coefficient is smaller. One main difference is that we find little evidence supporting the notion that initial conditions play a significant role in explaining reform dynamics.

The last reform equation in Table 5 is from Kim and Pirttila (2003). It explains reform dynamics using various macroeconomic variables. More specifically, growth and budget surpluses are expected to foster reform efforts (because, for instance, both increase the government's credibility in terms of compensating potential losers) and unemployment and inflation are expected to hinder reform efforts (because, for instance, both increase individual and aggregate uncertainty, as in Dewatripont and Roland, 1995). Our reform indexes not only reproduce the growth effect reported by Kim and Pirttila (2003), but also estimate it more precisely and, once again, the value of the coefficient is larger than in the original. Interestingly, however, we find opposite results with respect to unemployment: in ours, changes in the rate of unemployment (note that the Arellano-Bond estimate refers to variables in first differences) are associated with an increase in reform efforts. Interestingly, the coefficients on inflation and unemployment both have the same sizes as in Kim and Pirttila, but also opposite signs.

³² The replication results for Heybey and Murrell's growth equation are available upon request.

³³ Following this literature, we used the principal components method to cluster the initial conditions into two groups. The first, denoted by IC1, is interpreted as capturing the macroeconomic distortions inherited from socialism, as the largest loadings are for the exchange rate black market premium before 1989, repressed inflation during 1987–1990 and the share of CMEA trade in GDP in 1990. The second cluster of initial conditions, IC2, can be interpreted as the level of socialist development, as the largest loadings are for real GDP per capita in 1989 and the share of the population in urban areas in 1990.

We now turn to the replication of the attendant growth equations to investigate whether using our reform indexes changes the existing results on the economic impact of reform. The growth equations we re-estimate are originally from Fidrmuc (2003), Merlevede (2003), Falcetti, Raiser and Sanfey (2002) and Kim and Pirttila (2003).

The specification from Fidrmuc (2003) has as its main arguments contemporaneous reform, fiscal balance, school enrolment and investment rates, and involvement in armed conflict. The first column in Table 6 shows Fidrmuc's original coefficients, while the second column shows ours. As can be seen, our reform indicators are able to replicate all the original results, but with our measure these coefficients turn out to be larger and more precisely estimated (notice that originally the coefficient on investment was not statistically different from zero).

The specifications from Falcetti et al. (2002) and from Merlevede (2003) are similar. The main difference is the latter having an additional dimension for initial conditions as well as a dummy variable capturing the occurrence of reform reversals. From the Falcetti et al. equation, we are able to replicate and improve upon the reform results (again more precisely estimated and larger). Note, however, that using our indicators, we find little support for the role of initial conditions or for the role of fiscal balances.³⁴ The outcome is similar with respect to Merlevede's specification: the coefficients on our objective reform indicator are more precisely estimated and larger in size than in the original paper.

Finally, the results from Kim and Pirttila (2003) are shown in the last two columns. These authors argue that growth is mainly driven by reform, cumulative reform, fiscal balance, investment and inflation. Using our new reform indexes, we are again able to replicate these results, although this was the only case in which our coefficients are slightly smaller and not in every case more precisely estimated.

In sum, our new objective measures of reform seem able to replicate key results from the literature. These new measures show a much stronger effect on growth (contemporaneous and lagged), but a smaller (yet still significant) effect of cumulative reform. Crucially, re-estimating some of the main growth equations from the literature using these new measures provides less support for initial economic conditions (raising, among other issues, the possibility that initial political conditions maybe a more important aspect, albeit one that has been largely neglected so far).

5. Conclusions

This paper tries to contribute to the growing literature on the political economy of reform. There have been very few efforts to take the many theoretical insights to the data. This is in part because reform is a political economy topic par excellence: reform is multidimensional and it is driven by the complex interplay of political and economic forces. The transition from communism to capitalism in Central Europe and the former

³⁴ It is important to keep in mind that in replicating these results, we have measured the variables used, mimicked the specifications and chosen exactly the same estimators. In other words, to the best of our abilities, everything but the reform measures is exactly the same as in the original papers.

Soviet Union is arguably the largest natural experiment on economic reform in recent history and it is paradoxical to say the least that efforts to systematically measure such reform efforts have not emerged. In particular, the fact that objective indicators of reform are still unavailable is, in our view, a reason for serious concern. This paper tries to address this gap by constructing measures for three main reform areas in all transition economies for all years from 1989 to 2001. Compared to the existing (subjective) indexes, our measures not only generate a less optimistic assessment of the reform process, but also depict this process as being much less smooth than previously thought (more specifically, according to our measures reform reversals abound, while that is not the case with the subjective measures). We also believe this is one of the first papers to try to implement empirically the distinction between reform effort inputs and outcomes. This distinction is important because the inclusion of outcome indicators can severely bias the resulting measures. Among the main determinants of reform, we find domestic growth for external liberalization and privatization, concentration of political power for internal liberalization, and democracy for all three of them. We also find that FDI inflows reduce the probability of privatization reversals, labour strikes increase that of internal liberalization reversals, and OECD growth increases that of external liberalization reversals. Finally, we replicate the results from the main econometric studies of the effects of reform on growth and find that those effects, using our objective measures of reform, are larger, more precisely estimated and more robust.

In terms of future work, the main suggestions we offer are as follows. First, it is important to provide objective indicators for more reforms, while simultaneously offering a more disaggregated look at the three main reforms we focused on here. For instance, future work should separate out wage from price liberalization in order to throw light on their seemingly very different dynamics. Our results give us reason to suspect, for instance, that the factors explaining reversals in the two sub-components of our internal liberalization indexes will be rather different. In terms of additional reforms that we believe should be examined, those of a more institutional nature that fall under the heading “second generation reforms” should be given top priority. These encompass important areas such as competition policy, anti-corruption initiatives and judiciary reform. The second main suggestion we offer for future research builds upon the first: to study interdependencies between the reform areas (that is, to focus on the issues of sequencing and speed of reforms). Because we have focused on few reform areas, the number of potential sequences of reform is limited. Further, because these are defined broadly there is maybe too blurred a consensus from the data on the actual choice of sequences. Future research would do well to examine the relationship between objective indicators of reform in more areas and attempt to identify differences in their sequencing and speed so as to allow a well-informed discussion (based on data and facts) of the possible relationship between the different reform speeds and sequences, on the one hand, and political development, reform outcomes and aggregate economic performance, on the other.

References

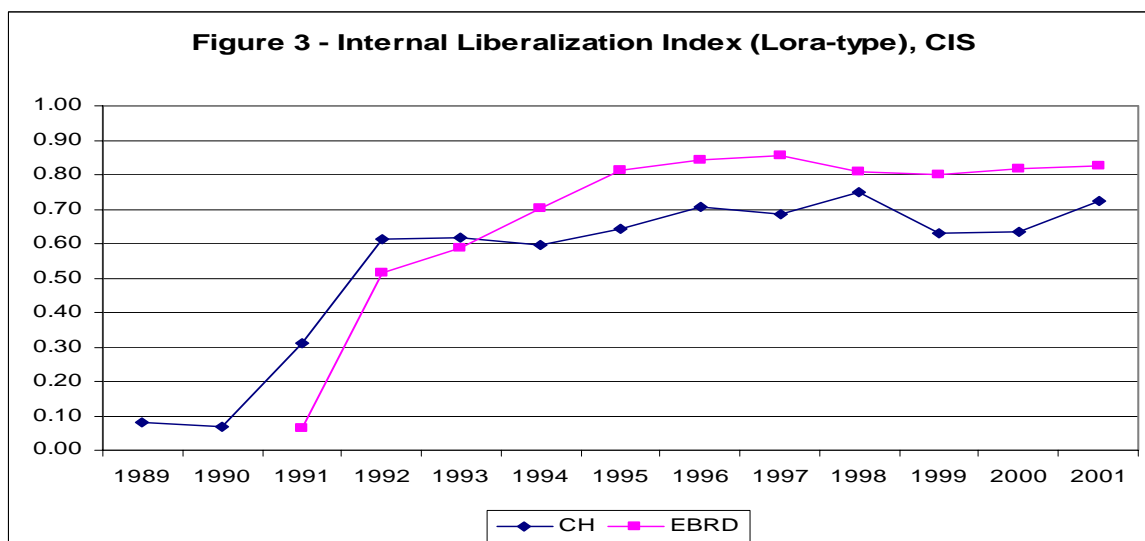
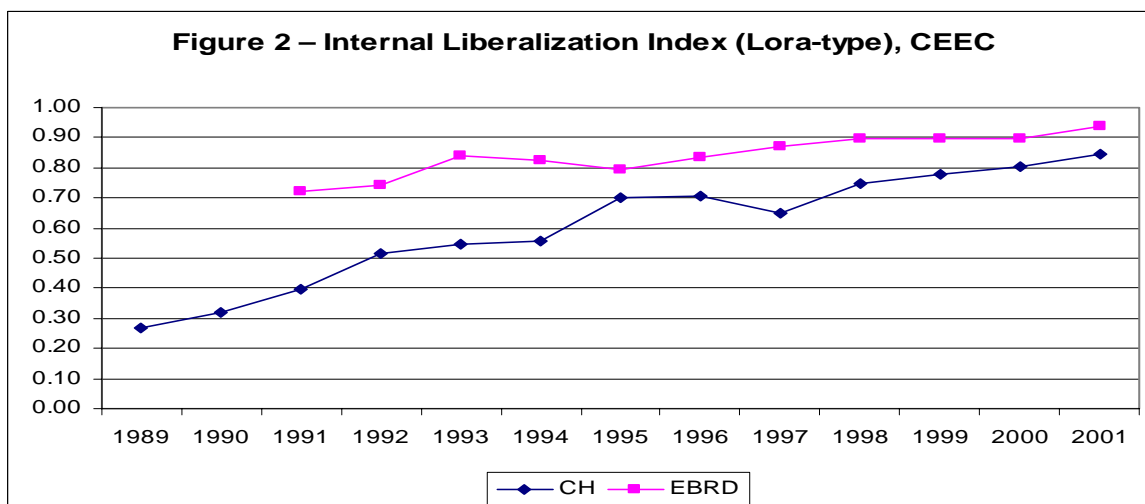
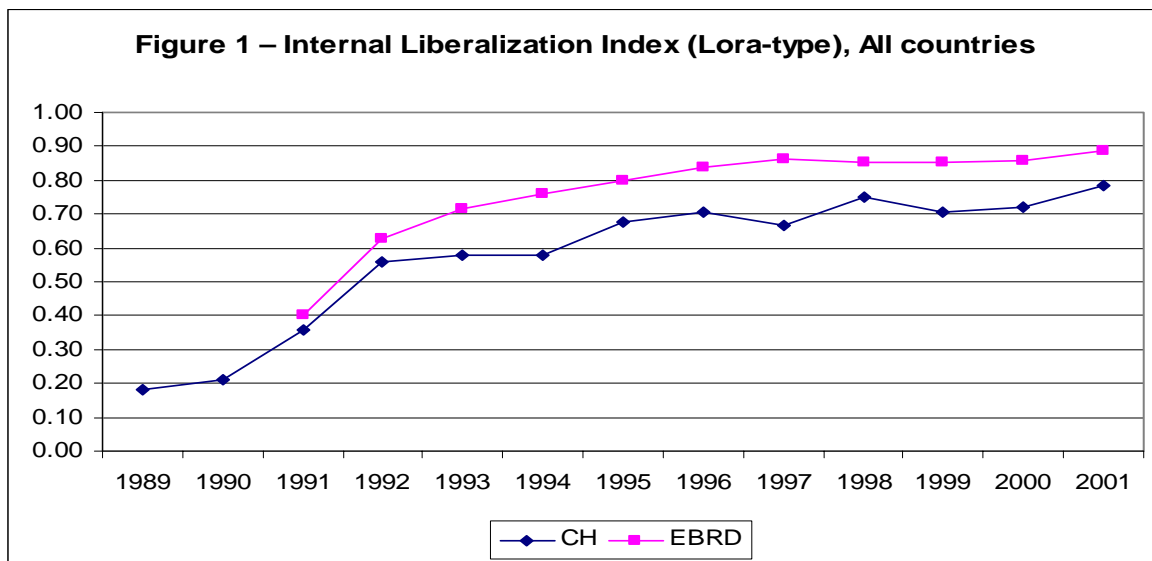
- ABIAD, ABDUL, AND ASHOKA MODY, 2005. "Financial Reform: What Shakes It? What Shapes It?" *American Economic Review*, 95, 66–88.
- ACEMOGLU, DARON, SIMON JOHNSON AND JAMES ROBINSON, 2006. "Institutions as the Fundamental Cause of Long-Run Growth," in Philippe Aghion and Steven Durlauf (eds.): *Handbook of Economic Growth*, Elsevier.
- ANDERSON, KATHRYN, AND RICHARD POMFRET, 2002. "Gradual Economic Reform and Well-Being in Uzbekistan," in Lu Aiguo and M. Montes (eds.): *Poverty, Income Distribution and Well-being in Asia During the Transition*, UNU/WIDER Studies in Development Economics and Policy, Palgrave Macmillan, 187–214.
- AGHION, PHILIPPE, AND OLIVIER BLANCHARD, 1994. "On the Speed of Transition in Central Europe," in Stanley Fischer and Julio Rotemberg (eds.): *NBER Macroeconomics Annual 1994*. Cambridge: MIT Press, 283–320.
- ALESINA, ALBERTO, AND ALLAN DRAZEN, 2001. "Why Are Stabilizations Delayed?" *American Economic Review*, 81, 1170–1188.
- ÅSLUND, ANDERS, PETER BOONE AND SIMON JOHNSON, 1996. "How to Stabilize: Lessons from Post-Communist Countries," *Brookings Papers on Economic Activity*, 1, 217–291.
- ASILIS, CARLOS, AND GIAN MARIA MILESI-FERRETTI, 1994. "On the Political Sustainability of Economic Reform," IMF Papers on Policy Analysis and Assessment: PPAA/94/3.
- BARTHOLDY, KASPER, 1997. "Old and New Problems in the Estimation of National Accounts in Transition Economies," *Economics of Transition*, 5(1), 131–146.
- BERG, ANDREW, EDUARDO BORENZSTEIN, RATNA SAHAY AND JERONIM ZETTELMEYER, 1999. "The Evolution of Output in Transition Economies: Explaining the Differences," IMF Working Papers, 99/73.
- BHATTACHARYA, RINA, 1997. "Pace, Sequencing and Credibility of Structural Reforms," *World Development*, 25(7), 1045–1061.
- BODENSTEIN, THILO, THOMAS PLUMPER AND GERALD SCHNEIDER, 2003. "Two Sides of Economic Openness: Non-Tariff Barriers to Trade and Capital Controls in Transition Countries, 1993-2000," *Communist and Post-Communist Studies*, 36, 231–243.
- CAMERON, COLIN A., AND PRAVIN TRIVEDI, 2005. *Microeconometrics: Methods and Applications*, Cambridge University Press.
- CAMPOS, NAURO, AND FABRIZIO CORICELLI, 2002. "Growth in Transition: What We Know, What We Don't, and What We Should," *Journal of Economic Literature*, 40, 793–836.
- BABETSKII, JAN, AND NAURO CAMPOS, 2007. "Does Reform Work?" Czech National Bank Working Paper No. 2/2007.
- CANNING, ANNA, AND PAUL HARE, 1996. "Political Economy of Privatization in Hungary: A Progress Report," Center for Economic Reform and Transformation Discussion Paper No. 13.

- CASTANHEIRA, MICAEL AND GÉRARD ROLAND, 2000. "The Optimal Speed of Transition: A General Equilibrium Analysis," *International Economic Review*, 41(1), 219–239.
- COLLIER, PAUL, AND JAN WILLEM GUNNING, 1999. "The IMF's Role in Structural Adjustment," *Economic Journal*, 109(459): F634–651.
- CUKIERMAN, ALEX, AND MARIANO TOMASSI, 1998. "When Does it Take a Nixon to go to China?" *American Economic Review*, 88, 180–197.
- DE MELO, MARTHA, CEBDET DENIZER AND ALAN GELB, 1996. "Patterns of Transition from Plan to Market," *World Bank Economic Review*, 10(3), 397–424.
- DEWATRIPONT, MATHIAS, AND GERARD ROLAND, 1992. "The Virtues of Gradualism and Legitimacy in the Transition to a Market Economy," *Economic Journal*, 102, 291–300.
- DEWATRIPONT, MATHIAS, AND GERARD ROLAND, 1995. "The Design of Reform Packages under Uncertainty," *American Economic Review*, 85(5), 1207–1223.
- DRAZEN, ALLAN, AND WILLIAM EASTERLY, 2001. "Do Crises Induce Reform? Simple Empirical Test for Conventional Wisdom," *Economics and Politics*, 13(2), 129–157.
- DRAZEN, ALLAN, AND VITTORIO GRILLI, 1993. "The Benefit of Crises for Economic Reforms," *American Economic Review*, 83(3), 598–601.
- DRAZEN, ALLAN, 2000. *Political Economy in Macroeconomics*, Princeton University Press.
- EASTERLY, WILLIAM, 2006. "National Policies and Economic Growth: A Reappraisal," in *Philippe Aghion and Steven Durlauf (eds.): Handbook of Economic Growth, Elsevier*.
- EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT (EBRD) (VARIOUS YEARS), *Transition Report*, London: EBRD.
- GLAESER, EDWARD, RAFAEL LA PORTA, FLORENCIO LOPEZ DE SILANES AND ANDREI SCHEILFER, 2004. "Do Institutions Cause Growth?" *Journal of Economic Growth*, 9(3), 271–303.
- GOODHUE, RACHAEL, GORDON RAUSSER AND LEO SIMON, 1998. "Privatization, Market Liberalization and Learning in Transition Economies," *American Journal of Agricultural Economics*, 80(4), 724–737.
- FALCETTI, ELISABETTA, MARTIN RAISER AND PETER SANFEY, 2002. "Defying the Odds: Initial Conditions, Reforms, and Growth in the First Decade of Transition," *Journal of Comparative Economics*, 30(2), 229–250.
- FERNANDEZ, RAQUEL, AND DANI RODRIK, 1991. "Resistance of Reform: Status Quo Bias in the Presence of Individual-Specific Uncertainty," *American Economic Review*, 81, 1146–1155.
- FIDRMUC, JAN, 2003. "Economic Reform, Democracy and Growth during Post-communist Transition," *European Journal of Political Economy*, 19(3), 583–604.
- FISCHER, STANLEY, RATNA SAHAY AND CARLOS VEGH, 1996. "Stabilization and Growth in Transition Economies: The Early Experience," *Journal of Economic Perspectives*, 10(2), 45–66.

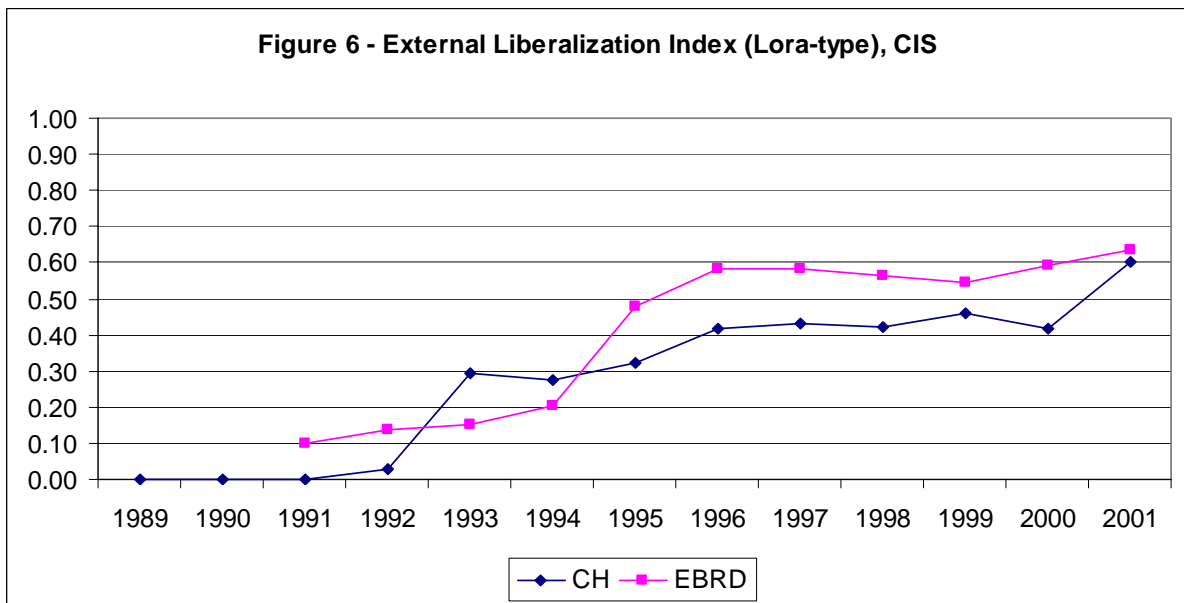
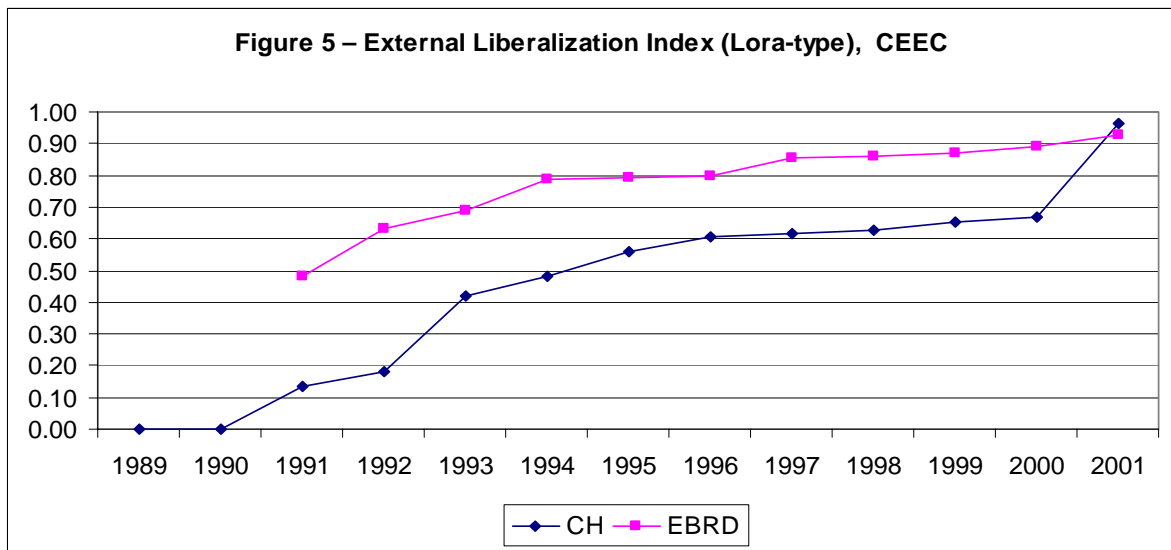
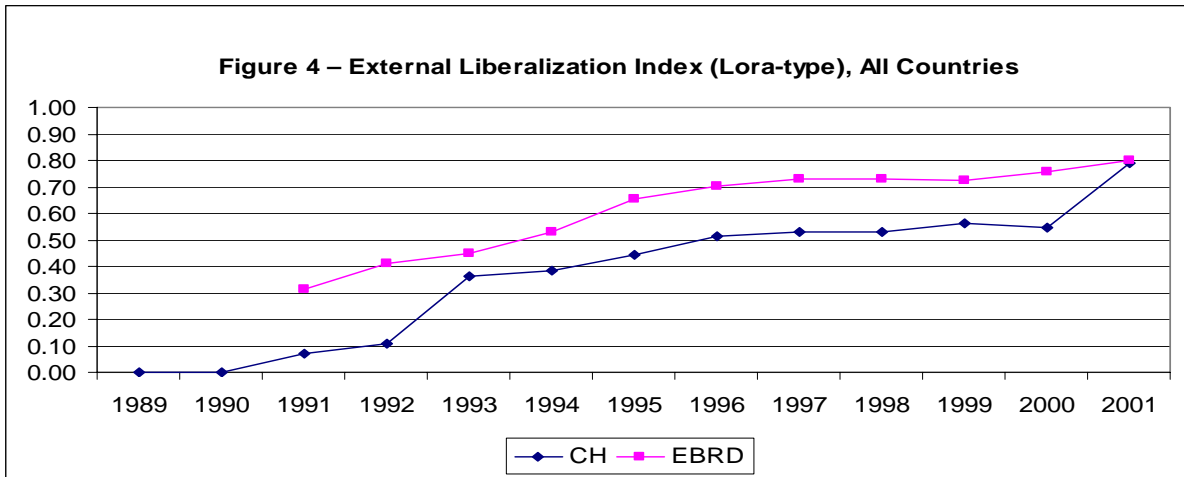
- FISCHER, STANLEY, AND RATNA SAHAY, 2004. "Transition Economies: The Role of Institutions and Initial Conditions," Festschrift in Honour of Guillermo A. Calvo, International Monetary Fund, April 15–16, 2004.
- FRYE, TIMOTHY, AND ED MANSFELD, 2004. "Timing is Everything: Elections and Trade Liberalization in the Post-Communist World," *Comparative Political Studies*, 37, 371–398.
- HELLMAN, JOEL S., 1998. "Winners Take All: The Politics of Partial Reform in Postcommunist Transitions," *World Politics*, 50, 203–234.
- HEYBEY, BERTA, AND PETER MURRELL, 1999. "The Relationship between Economic Growth and the Speed of Liberalization During Transition," *Journal of Policy Reform*, 3(2) 121–137.
- HOFF, KARLA, SHALE HOROWITZ AND BRANKO MILANOVIC, 2005. "Transition from Communism: Political Alternation as a Restraint in Investing in Influence," mimeo.
- KAMINSKY, GRACIELA, AND SERGIO SCHMUKLER, 2003. "Short-Run Pain, Long-Run Gain: The Effects of Financial Liberalization," IMF Working Papers 03/34, International Monetary Fund.
- KIM, BYUNG-YEON, AND JUKKA PIRTILA, 2003. "The Political Economy of Reforms: Empirical Evidence from Post-Communist Transition in the 1990s," BOFIT Discussion Papers No. 4, Bank of Finland.
- KRUEGER, GARY, AND MAREK CIOLKO, 1998. "A Note on Initial Conditions and Liberalization during Transition," *Journal of Comparative Economics*, 26(4), 718–734.
- KUCZYNSKI, PEDRO-PABLO, AND JOHN WILLIAMSON (EDS.), 2003. *After the Washington Consensus: Restarting Growth and Reform in Latin America*, Washington D.C.: IIE.
- LIPTON, DAVID, AND JEFFREY SACHS, 1990. "Creating a Market Economy in Eastern Europe: The Case of Poland," *Brookings Papers on Economic Activity*, 1990 (1), 75–133.
- LOAYZA, NORMAN, AND RAIMUNDO SOTO, 2004. "On the Measurement of Market-Oriented Reforms," World Bank Policy Research Working Paper Series No. 3371.
- LOAYZA, NORMAN, ANA OVIEDO AND LUIS SERVEN, 2005. "Regulation and Macroeconomic Performance," World Bank WPS 3469.
- LORA, EDUARDO, 1997. "What Makes Reforms Likely? Timing and Sequencing of Structural Reforms in Latin America," Inter-American Development Bank, Working Paper 424.
- LORA, EDUARDO, 2001. "Structural Reforms in Latin America: What Has Been Reformed and How to Measure It," Inter-American Development Bank, Working Paper 466.
- MARTINELLI, CESAR, AND MARIANO TOMMASI, 1998. "Sequencing of Economic Reforms in the Presence of Political Constraints," in M. Tommasi and F. Sturzenegger (eds.): *The Political Economy of Economic Reforms*, MIT Press.
- MORLEY, SAMUEL, ROBERTO MACHADO AND STEFANO PETTINATO, 1999. "Indexes of Structural Reform in Latin America," *CEPAL Serie Reformas Economicas*, 12.

- MEGGINSON, WILLIAM, AND JEFFREY NETTER, 2001. "From State to Market: A Survey of Empirical Studies on Privatization," *Journal of Economic Literature*, 39(2), 321–389.
- MERLEVEDE, BRUNO, 2003. "Reform Reversals and Output Growth in Transition Economies," *Economics of Transition*, 11(4), 597–751.
- MURPHY, KEVIN, ANDREI SHLEIFER AND ROBERT VISHNY, 1992. "The Transition to a Market Economy: Pitfalls of Partial Reform," *Quarterly Journal of Economics*, 107(3), 889–906.
- NAVIA, PATRICIO, AND ANDRES VELASCO, 2003. "The Politics of Second Generation Reforms," in P.-P. Kuczynski and J. Williamson (eds.): *After the Washington Consensus – Restarting Growth and Reform in Latin America*. Washington DC: Institute for International Economics.
- NICOLETTI, GIUSEPPE, AND STEFANO SCARPETTA, 2003. "Regulation, Productivity and Growth: OECD Evidence," *Economic Policy*, April 18 (36), 9–72.
- PERSSON, TORSTEN, AND GUIDO TABELLINI, 2000. *Political Economics: Explaining Economic Policy*, MIT Press.
- POMFRET, RICHARD, 2000. "The Uzbek Model of Economic Development 1991–99" *Economics of Transition*, 8(3), 733–748.
- RODRIK, DANI, 1996. "Understanding Economic Policy Reform," *Journal of Economic Literature*, 34(1), 9–41.
- RODRIK, DANI, 2005. "Why We Learn Nothing from Regressing Economic Growth on Policies," mimeo, Harvard University.
- ROLAND, GERARD, 2000. *Politics, Firms, Markets: Transition and Economics*, MIT Press.
- SCHRODER, PHILIPP, 2001. "On the Speed and Boundaries of Structural Adjustment When Fiscal Policy is Tight," *Economic Systems*, 25(4), 345–364.

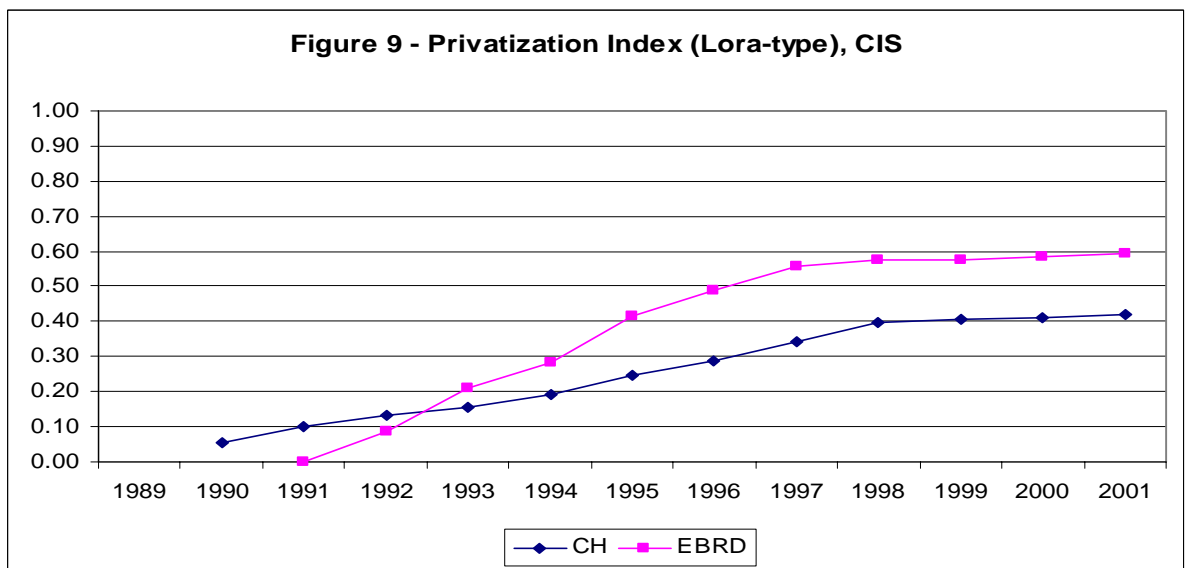
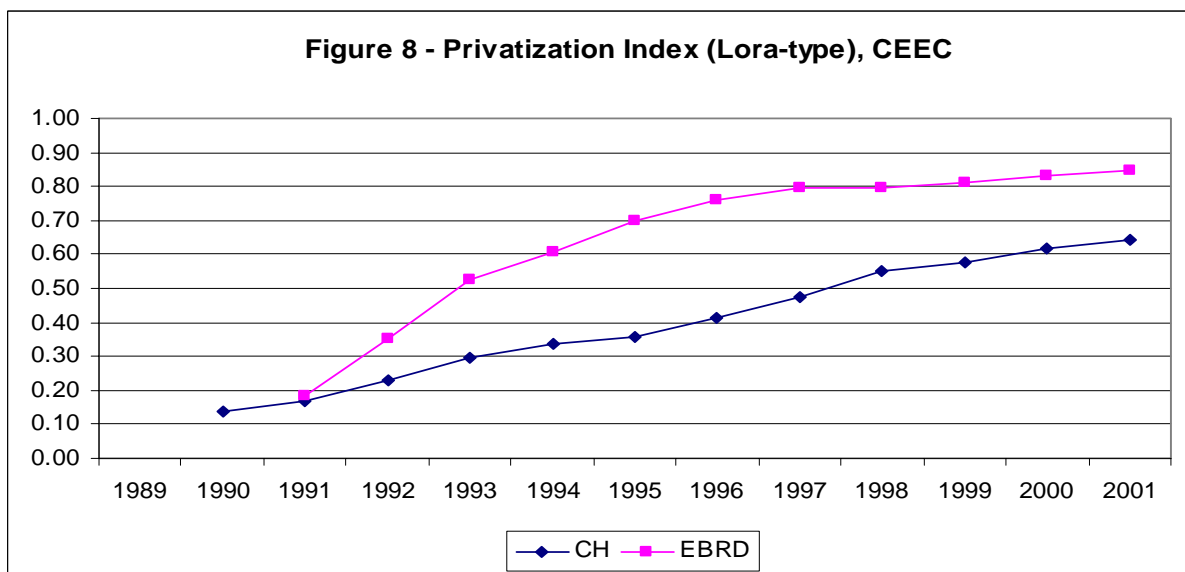
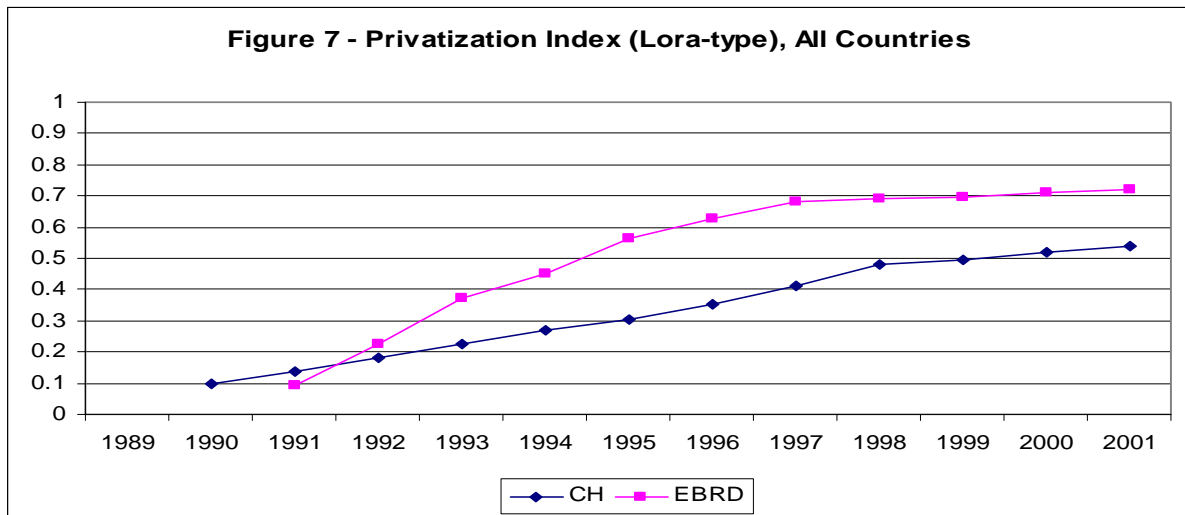
Appendix



Notes: CH stands for the reform indicator developed in this paper, CEEC refers to the Central and Eastern European and Baltic countries, while CIS refers to the former Soviet Union countries.



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Table 1: Variables Underlying Each of the Reform Indexes

Reform Inputs	Reform Outcomes
Internal Liberalization Index	
1. Number of goods subject to price regulation (basket of 15 goods)	3. Share of administered prices in CPI
2. Wage regulation	
External Liberalization Index	
1. Compatibility with Article VIII	
2. Controls on commercial credit	25. Share of trade with non-transition countries
3. Controls on foreign direct investment	26. Openness
4. Controls on liquidation of FDI	27. Import duties as % of tax revenue
5. Documentation requirements for release of foreign exchange for imports	28. Tariff revenues as % of imports and taxes on international trade
6. Exchange rate taxes	29. Tax revenues from international trade
7. Export duties as % of tax revenue	
8. Export licences	
9. Export taxes	
10. Import licences and quotas	
11. Import tariff rate	
12. Interest rate liberalization	
13. Investment transactions	
14. Multiple exchange rates	
15. OECD membership	
16. Permission for foreign exchange accounts held abroad by residents	
17. Permission for foreign exchange accounts held domestically by residents	
18. Permission of foreign exchange accounts for non-residents	
19. Repatriation requirements	
20. Repatriation requirements for invisible transactions	
21. Surrender requirements	
22. Surrender requirements for invisible transactions	
23. Tariff code lines	
24. WTO membership	
Privatization Index	
1. Privatization revenues	
2. Share of small firms privatized	9. Private sector share in GDP
3. Asset share of private-owned banks (in %)	10. Credit to private sector
4. Total number of enterprises privatized	11. Private sector investment as % of GDP
5. Total number of small and medium-sized enterprises privatized	
6. Total number of large enterprises privatized	
7. Share of foreign-owned banks in total number of banks	
8. Total number of private enterprises	

Table 2: What Drives Reform? Panel Estimates

	CH Index Internal Liberalization			CH Index External Liberalization			CH Index Privatization		
GDP growth	0.01*** 0	0.01*** 0	0.02*** (0.01)	0.01*** 0	0.01*** 0	0 0	0 0	0.02*** 0	0 0
Unemployment	-0,01 (0.01)	0 (0.01)	0.02* (0.01)	0.01* (0.01)	0.01** (0.01)	0.01*** (0.01)	0.01*** (0.01)	0 (0.01)	0.01*** (0.01)
Democracy	-0.09*** (0.03)	-0.06* (0.03)	-0,03 (0.04)	-0.09*** (0.02)	-0.05** (0.02)	-0.05** (0.02)	-0.05** (0.02)	-0.06** (0.02)	-0.05** (0.02)
Initial conditions		-0.01* (0.01)	-0.02*** (0.01)		-0.01*** 0	-0,01 (0.01)	-0,01 (0.01)		-0,01 (0.01)
Herfindahl index			-0.50** (0.25)						
OECD growth						0.11** (0.04)	0.11** (0.04)		0.11** (0.04)
Observations	237	237	176	218	218	218	218	214	218
No. of countries	25	25	22	25	25	25	25	24	25

Notes: Robust standard errors in brackets. * Statistically significant at 10% level, ** Statistically significant at 5% level, *** Statistically significant at 1% level.

Table 3: What Explains Reform Reversals? Panel Logit Estimates

	CH Index Internal Reversal			CH Index External Reversal			CH Index Privatization Reversal		
Unemployment	0.045 [0.030]	0.050 [0.040]	0.038 [0.041]	0.062** [0.026]	0.007 [0.027]	0.038 [0.048]	0.024 [0.027]	0.028 [0.031]	-0.029 [0.031]
GDP growth	0.042 [0.028]	0.052* [0.031]	0.058* [0.031]	0.11** [0.054]	0.031 [0.025]	0.002 [0.034]	-0.016 [0.021]	-0.012 [0.029]	-0.001 [0.029]
Democracy	-0.042 [0.109]	-0.092 [0.110]	-0.076 [0.041]	-0.265 [0.213]	0.011 [0.086]	0.058 [0.151]	0.062 [0.097]	-0.029 [0.120]	-0.028 [0.125]
Labour strikes		0.825** [0.335]							
Labour strikes*Unempl.			0.112** [0.040]						
Growth OECD					1.28*** [0.325]	1.572*** [0.576]			
Terms of trade						-0.022* [0.012]			
FDI								-0.229** [0.117]	-0.230** [0.119]
EU negotiations									-0.026 [0.868]
Observations	260	232	233	250	243	147	228	175	175
No. of countries	25	24	24	23	25	25	25	25	25
McFadden R-squared	0.13	0.24	0.25	0.41	0.25	0.69	0.10	0.33	0.33
Method	RE	RE	RE	FE	RE	RE	RE	RE	RE
Hausman test	0.52	2.15	1.38		3.89	3.77	3.91	9.63	4.90
(p-value)	(0.92)	(0.71)	(0.85)	---	(0.42)	(0.58)	(0.27)	(0.05)	(0.43)

Robust standard errors in brackets. * Statistically significant at 10% level, ** Statistically significant at 5% level, *** Statistically significant at 1% level. Fixed effects estimates reported if consistency of random effects is rejected by Hausman test at 5% level.

Table 4: What Explains the Persistence of Reform Reversals? Negative Binomial Estimates

	CH Index Internal			CH Index External			CH Index Privatization		
Unemployment	0.038	0.027	0.027	0.093*	0.001	0.019	0.023	0.023	0.023
	[0.030]	[0.066]	[0.036]	[0.048]	[0.021]	[0.041]	[0.026]	[0.026]	[0.026]
GDP growth	0.032	0.038	0.048*	0.079***	0.052**	0.013	-0.009	-0.003	-0.033
	[0.026]	[0.032]	[0.028]	[0.024]	[0.022]	[0.031]	[0.019]	[0.025]	[0.025]
Democracy	-0.053	-0.319*	-0.088	-0.150	0.055	0.098	0.600	-0.109	-0.021
	[0.016]	[0.193]	[0.013]	[0.174]	[0.075]	[0.132]	[0.093]	[0.103]	[0.107]
Labour strikes		0.647**							
		[0.261]							
Labour strikes*Unempl.			0.08***						
			[0.014]						
Growth OECD					0.816***	1.21**			
					[0.253]	[0.497]			
Terms of trade						-0.014			
						[0.01]			
FDI								-0.239**	-0.238**
								[0.109]	[0.111]
EU negotiations									-0.044
									[0.784]
Observations	260	172	233	250	243	147	228	175	175
No. of countries	25	17	24	23	25	25	25	25	23
McFadden R-squared	0.09	0.25	0.24	0.41	0.22	0.72	0.11	0.35	0.34
Method	RE	FE	RE	FE	RE	RE	RE	RE	RE
Hausman test	0.22	---	7.01	---	7.11	3.77	5.14	4.85	4.99
(p-value)	(0.97)	---	(0.14)	---	(0.13)	(0.58)	(0.16)	(0.30)	(0.42)

Notes: Robust standard errors in brackets. * Statistically significant at 10% level, ** Statistically significant at 5% level, *** Statistically significant at 1% level. Fixed effects estimates reported if consistency of random effects is rejected by Hausman test at 5% level.

Table 5: Joint Estimation of Reform and Growth: Reform Stage Panel Results

	Heybey Murrell		Merlevede		Falcetti et al.		Kim Pirrttila	
	Original	With CH reform indexes	Original	With CH reform indexes	Original	With CH reform indexes	Original	With CH reform indexes
Growth	0.006*** [0.002]	0.006 [0.03]	0.056*** [0.004]	0.035*** [0.001]	0.08*** [0.01]	0.36*** [0.05]	0.002 [0.002]	0.003** [0.001]
Growth – lagged			-0.003 [0.002]	-0.011*** [0.004]	-0.01*** [0.004]	-0.12*** [0.04]		
Time*IC1			-0.34*** [0.091]	0.004 [0.005]	-0.02*** [0.007]	0.004 [0.04]		
Time*IC2			-0.12 [0.12]	0.0001 [0.005]				
Freedom House	0.008 [0.005]	-0.014 [0.1]	0.81*** [0.32]	-0.049*** [0.014]	-0.15*** [0.06]	-0.05*** [0.01]		
Industry	0.13* [0.07]	0.35 [0.62]						
Lib. index 1989	-0.2*** [0.05]	-0.63*** [0.23]						
Inflation							0.007 [0.01]	-0.007 [0.02]
Unemployment							-0.03*** [0.01]	0.02*** [0.007]
Gov. balance							0.002 [0.002]	0.002 [0.003]
R-2/Chi-sqr. Estimation	0.48 3SLS	0.35 3SLS	770*** 3SLS	123*** 3SLS	434*** 3SLS	123*** 3SLS	0.59 2SLS	0.23 2SLS

Notes: Robust standard errors in brackets. * Statistically significant at 10% level, ** Statistically significant at 5% level, *** Statistically significant at 1% level.

Table 6: Joint Estimation of Reform and Growth: Growth Stage Panel Results

	Fidrmuc		Falcetti et al.		Merlevede		Kim Pirttila	
	Original	With CH reform indexes	Original	With CH reform indexes	Original	With CH reform indexes	Original	With CH reform indexes
Liberalization	23.3*** [6.65]	26.3*** [4.1]	-13.3 [8.26]	-48.6*** [13.5]	-8.35 [10.84]	-73.2*** [19.1]	-0.86 [0.81]	2.16 [1.74]
Lib. index (lag)			10.84*** [3.99]	52.7*** [11.6]	10.79** [4.82]	75.1*** [16.7]		
Time*IC1			0.27*** [0.09]	0.06 [0.09]	0.78*** [0.16]	0.12 [0.1]		
Time*IC2					0.11 [0.23]	-0.09 [0.12]		
Fiscal	0.073 [0.11]	0.16 [0.11]	0.34*** [0.12]	0.09 [0.08]	0.22** [0.1]	0.08 [0.1]	0.38*** [0.13]	-0.09 [0.1]
School	0.019 [0.137]	-0.02 [0.04]						
Investment	0.104 [0.244]	0.001** [0.0003]					0.24*** [0.05]	-0.0001 [0.0002]
War	-5.97*** [1.729]	-12.7*** [2.99]						
Reform reversal					25.47* [13.55]	111.7*** [28.1]		
Growth – lagged							0.37** [0.11]	0.29*** [0.1]
Cum lib. index							9.04*** [3.4]	3.07* [1.46]
Fiscal – lagged							-0.92 [0.89]	0.55*** [0.21]
Inflation – lagged							0.52 [1.13]	0.01 [0.16]
R2/Chi-squared Estimation	0.76 FE	0.28 FE	241*** 3SLS	196*** 3SLS	411*** 3SLS	170*** 3SLS	3263*** AB	1238*** AB

Notes: Robust standard errors in brackets. * Statistically significant at 10% level, ** Statistically significant at 5% level, *** Statistically significant at 1% level. AB stands for Arellano-Bond estimator.

Table A2: Index of Internal Liberalization, Averaged. Input-only versus Indexes Combining Inputs and Outcomes (Lora Transformation). Whole Period versus Late Transition

Country	Combining Inputs and Outcomes		Input-only	
	1989-2001	1997-2001	1989-2001	1997-2001
Albania	0.44	0.92	0.44	0.92
Armenia	0.70	0.94	0.69	0.95
Azerbaijan	0.69	0.78	0.58	0.70
Belarus	0.40	0.44	0.39	0.30
Bulgaria	0.59	0.59	0.57	0.47
Croatia	0.78	0.82	0.74	0.74
Czech Rep.	0.69	0.91	0.66	0.93
Estonia	0.91	0.85	0.94	0.90
Georgia	0.66	0.97	0.65	0.98
Hungary	0.84	0.94	0.85	1.00
Kazakhstan	0.94	0.87	0.92	0.80
Kyrgyzstan	0.74	0.97	0.75	0.97
Latvia	0.67	0.88	0.69	0.93
Lithuania	0.56	0.93	0.56	0.93
Macedonia	0.80	0.85	0.80	0.85
Moldavia	0.17	0.17	0.17	0.17
Poland	0.63	0.70	0.49	0.58
Romania	0.46	0.69	0.33	0.59
Russia	0.47	0.91	0.47	0.91
Slovakia	0.52	0.72	0.48	0.67
Slovenia	0.53	0.57	0.42	0.43
Tajikistan	0.71	0.80	0.61	0.70
Turkmenistan	0.60	0.55	0.42	0.37
Ukraine	0.56	0.87	0.56	0.87
Uzbekistan	0.65	0.47	0.65	0.47

Table A3: Input-only Index of External Liberalization for 25 Transition Economies (Lora Transformation)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average
Albania	0	0	0	0	0.4	0.38	0.5	0.588	0.526	0.526	0.5	0.526	0.75	0.36
Armenia	0	0	0	0	0.5	0.35	0.412	0.611	0.7	0.81	0.8	0.8	0.75	0.44
Azerbaijan	0	0	0	0	0.31	0.33	0.316	0.421	0.5	0.5	0.5	0.412	0.5	0.29
Belarus	0	0	0	0	0.24	0.19	0.313	0.25	0.143	0.095	0.095	0.095	0	0.11
Bulgaria	0	0	0	0.33	0.5	0.47	0.471	0.5	0.476	0.571	0.571	0.7	1	0.43
Croatia	0	0	0	0	0.39	0.44	0.5	0.556	0.667	0.619	0.667	0.667	1	0.42
Czech Rep.	0	0	0.25	0.25	0.5	0.5	0.688	0.778	0.762	0.81	0.75	0.75	1	0.54
Estonia	0	0	0	0.33	0.19	0.56	0.688	0.833	0.857	0.857	0.952	0.895	1	0.55
Georgia	0	0	0	0.33	0.47	0.47	0.471	0.706	0.762	0.714	0.762	0.632	1	0.49
Hungary	0	0	0.25	0.25	0.56	0.53	0.588	0.765	0.619	0.571	0.667	0.6	1	0.49
Kazakhstan	0	0	0	0	0.33	0.32	0.368	0.579	0.571	0.571	0.476	0.45	0.75	0.34
Kyrgyzstan	0	0	0	0	0.8	0.81	0.938	0.875	0.85	0.857	0.81	0.842	1	0.60
Latvia	0	0	0.33	0.33	0.77	0.84	0.842	0.85	0.857	0.857	0.95	0.947	1	0.66
Lithuania	0	0	0	0	0.56	0.63	0.611	0.632	0.684	0.667	0.667	0.7	1	0.47
Macedonia	0	0	0	0	0	0.28	0.278	0.278	0.476	0.524	0.571	0.55	0.75	0.28
Moldova	0	0	0	0	0.38	0.28	0.389	0.389	0.381	0.381	0.429	0.421	1	0.31
Poland	0	0	0.33	0.25	0.33	0.33	0.474	0.526	0.571	0.571	0.55	0.55	1	0.42
Romania	0	0	0	0	0.44	0.38	0.438	0.438	0.5	0.55	0.524	0.526	1	0.37
Russia	0	0	0	0	0.25	0.25	0.235	0.368	0.4	0.35	0.3	0.263	0.75	0.24
Slovakia	0	0	0.25	0.25	0.38	0.47	0.588	0.556	0.524	0.571	0.619	0.579	1	0.44
Slovenia	0	0	0.33	0.33	0.47	0.47	0.588	0.6	0.476	0.476	0.524	0.667	1	0.46
Tajikistan	0	0	0	0	0	0	0	0.25	0.25	0.25	0.25	0.5	0.5	0.15
Turkmenistan	0	0	0	0	0	0	0	0	0	0	0.5	0.25	0.25	0.08
Ukraine	0	0	0	0	0.06	0.11	0.222	0.222	0.4	0.3	0.35	0.25	0.75	0.21
Uzbekistan	0	0	0	0	0.2	0.19	0.176	0.316	0.238	0.238	0.238	0.1	0	0.13

Table A4: Index of External Liberalization, Averaged. Input-only versus Indexes Combining Inputs and Outcomes (Lora Transformation). Whole Period versus Late Transition

<i>Country</i>	<i>Combining Inputs and Outcomes</i>		<i>Input-only</i>	
	<i>1989-2001</i>	<i>1997-2001</i>	<i>1989-2001</i>	<i>1997-2001</i>
Albania	0.34	0.49	0.36	0.57
Armenia	0.41	0.65	0.44	0.77
Azerbaijan	0.31	0.45	0.29	0.48
Belarus	0.21	0.18	0.11	0.09
Bulgaria	0.50	0.57	0.43	0.66
Croatia	0.47	0.63	0.42	0.72
Czech Rep.	0.50	0.70	0.54	0.81
Estonia	0.54	0.79	0.55	0.91
Georgia	0.46	0.66	0.49	0.77
Hungary	0.54	0.60	0.49	0.69
Kazakhstan	0.35	0.53	0.34	0.56
Kyrgyzstan	0.54	0.74	0.60	0.87
Latvia	0.59	0.76	0.66	0.92
Lithuania	0.44	0.64	0.47	0.74
Macedonia	0.32	0.51	0.28	0.57
Moldavia	0.34	0.51	0.31	0.52
Poland	0.39	0.55	0.42	0.65
Romania	0.42	0.53	0.37	0.62
Russia	0.28	0.41	0.24	0.41
Slovakia	0.43	0.59	0.44	0.66
Slovenia	0.46	0.57	0.46	0.63
Tajikistan	0.22	0.45	0.15	0.35
Turkmenistan	0.15	0.26	0.08	0.20
Ukraine	0.22	0.38	0.21	0.41
Uzbekistan	0.15	0.20	0.13	0.16

Table A5: Input-only Index of Privatization for 25 Transition Economies (Lora Transformation)

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	Average
Albania		0.21	0.62	0.66	0.47	0.40	0.40	0.39	0.40	0.43	0.52	0.55	0.46
Armenia			0.09	0.16	0.25	0.32	0.38	0.43	0.53	0.66	0.70	0.73	0.43
Azerbaijan	0.29		0.16	0.14	0.16	0.14	0.19	0.24	0.34	0.35	0.31	0.31	0.24
Belarus		0.00	0.02	0.03	0.12	0.08	0.11	0.15	0.16	0.17	0.19	0.28	0.12
Bulgaria	0.00	0.00	0.05	0.17	0.18	0.24	0.25	0.37	0.47	0.55	0.68	0.72	0.31
Croatia		0.01	0.15	0.26	0.24	0.21	0.29	0.27	0.45	0.45	0.61	0.66	0.33
Czech Rep.		0.02	0.13	0.38	0.39	0.41	0.41	0.50	0.52	0.56	0.63	0.74	0.43
Estonia		0.16	0.26	0.30	0.27	0.33	0.34	0.37	0.49	0.51	0.60	0.62	0.39
Georgia	0.02	0.08	0.22	0.17	0.23	0.33	0.46	0.54	0.62	0.68	0.69	0.71	0.40
Hungary	0.19	0.09	0.15	0.23	0.36	0.64	0.78	0.89	0.87	0.90	0.94	0.90	0.58
Kazakhstan		0.41	0.36	0.13	0.18	0.33	0.38	0.43	0.59	0.64	0.69	0.68	0.44
Kyrgyzstan	0.00	0.01	0.15	0.22	0.21	0.26	0.41	0.49	0.53	0.49	0.53	0.53	0.32
Latvia					0.27	0.29	0.33	0.50	0.60	0.62	0.64	0.67	0.49
Lithuania			0.06	0.16	0.19	0.17	0.26	0.31	0.50	0.49	0.55	0.58	0.33
Macedonia			0.35	0.52	0.37	0.22	0.35	0.35	0.63	0.61	0.72	0.76	0.49
Moldova			0.14	0.06	0.13	0.17	0.22	0.41	0.49	0.55	0.62	0.62	0.34
Poland	0.63	0.22	0.32	0.16	0.21	0.26	0.30	0.36	0.48	0.59	0.67	0.69	0.41
Romania		0.01	0.15	0.08	0.14	0.18	0.22	0.29	0.37	0.49	0.54	0.57	0.28
Russia			0.02	0.03	0.24	0.23	0.19	0.41	0.40	0.35	0.07	0.08	0.20
Slovakia		0.62	0.34	0.31	0.34	0.43	0.50	0.62	0.62	0.63	0.64	0.80	0.53
Slovenia		0.01	0.08	0.17	0.20	0.27	0.20	0.26	0.26	0.28	0.30	0.27	0.21
Tajikistan		0.00	0.08	0.06	0.08	0.28	0.40	0.40	0.46	0.53	0.51	0.52	0.30
Turkmenistan				0.00	0.06	0.18	0.15	0.18	0.22	0.18	0.13	0.13	0.14
Ukraine			0.02	0.01	0.02	0.03	0.05	0.26	0.34	0.36	0.37	0.39	0.18
Uzbekistan		0.00	0.20	0.23	0.22	0.21	0.18	0.24	0.26	0.29	0.17	0.09	0.19

Table A6: Index of Privatization, Averaged. Input-only versus Indexes Combining Inputs and Outcomes (LoraTransformation). Whole Period versus Late Transition

Country	Combining Inputs and Outcomes		Input-only	
	1989-2001	1997-2001	1989-2001	1997-2001
Armenia	0.33	0.47	0.43	0.61
Azerbaijan	0.22	0.33	0.24	0.31
Belarus	0.12	0.19	0.12	0.19
Bulgaria	0.33	0.54	0.31	0.56
Croatia	0.35	0.52	0.33	0.49
Czech Rep.	0.46	0.66	0.43	0.59
Estonia	0.41	0.57	0.39	0.52
Georgia	0.36	0.59	0.40	0.65
Hungary	0.58	0.84	0.58	0.90
Kazakhstan	0.37	0.55	0.44	0.61
Kyrgyzstan	0.31	0.47	0.32	0.52
Latvia	0.38	0.58	0.49	0.61
Lithuania	0.32	0.50	0.33	0.48
Macedonia	0.41	0.54	0.49	0.61
Moldova	0.29	0.48	0.34	0.54
Poland	0.42	0.56	0.41	0.56
Romania	0.32	0.46	0.28	0.45
Russia	0.26	0.39	0.20	0.26
Slovakia	0.52	0.73	0.53	0.66
Slovenia	0.33	0.46	0.21	0.27
Tajikistan	0.26	0.43	0.30	0.49
Turkmenistan	0.12	0.16	0.14	0.17
Ukraine	0.20	0.36	0.18	0.34
Uzbekistan	0.22	0.30	0.19	0.21

Sensitivity Analysis

Table B1: The Determinants of Internal Liberalization. Random-effects Panel Estimates

GDP growth	0.003 (-0.002)	0.005 (-0.004)	0.003 (0.002)+	0.003 (0.002)+	0.004 (0.002)**	0.002 (-0.002)	0.003 (0.002)**	0.003 (0.002)+	0.003 (0.002)+
Unemployment	0.009 (0.005)+	0.002 (-0.006)	0.01 (0.005)**	0.011 (0.005)**	0.012 (0.005)**	0.009 (0.005)+	0.008 (-0.005)	0.011 (0.005)**	0.011 (0.005)**
Freedom H. Index	-0.04 (0.013)*	0.0001 (-0.017)	-0.041 (0.013)*	-0.037 (0.013)*	-0.038 (0.013)*	-0.016 (-0.014)	-0.024 (-0.015)	-0.04 (0.013)*	-0.039 (0.012)*
Log of inflation	-0.006 (-0.011)								
Financial crisis indicator		0.047 (-0.403)							
Fiscal deficit			0.001 (-0.003)						
EU negotiations				0.044 (-0.03)					
Electoral calendar					0.012 (-0.011)				
Leadership changes						0.107 (0.026)*			
Political alternation							0.079 (0.030)*		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									0.0001 (0.001)
Constant	0.789 (0.098)*	0.707 (0.099)*	0.771 (0.087)*	0.732 (0.079)*	0.713 (0.078)*	0.511 (0.098)*	0.613 (0.093)*	0.734 (0.092)*	0.731 (0.077)*
Observations	256	169	255	262	257	262	262	262	262
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B2: The Determinants of External Liberalization. Random-effects Panel Estimates

GDP growth	0.007 (0.002)*	0.011 (0.002)*	0.011 (0.001)*	0.01 (0.001)*	0.01 (0.001)*	0.009 (0.001)*	0.01 (0.001)*	0.01 (0.002)*	0.01 (0.002)*
Unemployment	0.01 (0.003)*	0.003 -0.003	0.013 (0.003)*	0.012 (0.003)*	0.015 (0.004)*	0.011 (0.004)*	0.01 (0.004)**	0.014 (0.004)*	0.013 (0.004)*
Freedom H. Index	-0.061 (0.009)*	-0.067 (0.013)*	-0.055 (0.010)*	-0.05 (0.009)*	-0.057 (0.009)*	-0.028 (0.010)*	-0.034 (0.010)*	-0.061 (0.009)*	-0.06 (0.009)*
Log of inflation	-0.031 (0.007)*								
Financial crisis indicator		-0.076 -0.558							
Fiscal deficit			-0.001 -0.002						
EU negotiations				0.153 (0.035)*					
Electoral calendar					0.012 (0.007)+				
Leadership changes (cum.)						0.134 (0.018)*			
Political alternation (cum.)							0.119 (0.024)*		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									0.0001 (0.001)
Constant	0.722 (0.068)*	0.726 (0.071)*	0.56 (0.063)*	0.532 (0.060)*	0.531 (0.068)*	0.282 (0.071)*	0.374 (0.070)*	0.54 (0.073)*	0.6 (0.070)*
Observations	258	169	257	264	259	264	264	264	264
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B3: The Determinants of Privatization. Random-effects Panel Estimates

GDP growth	0.002 (0.001)**	0.008 (0.003)*	0.008 (0.001)*	0.008 (0.001)*	0.007 (0.001)*	0.006 (0.001)*	0.007 (0.001)*	0.008 (0.001)*	0.008 (0.001)*
Unemployment	0.004 -0.002	0.006 (0.003)**	0.008 (0.002)*	0.006 (0.002)**	0.008 (0.002)*	0.008 (0.002)*	0.004 (0.002)+	0.008 (0.002)*	0.008 (0.002)*
Freedom H. Index	-0.031 (0.008)*	-0.045 (0.011)*	-0.031 (0.008)*	-0.016 (0.008)**	-0.034 (0.008)*	-0.004 -0.009	-0.005 -0.009	-0.032 (0.008)*	-0.032 (0.008)*
Log of inflation	-0.044 (0.005)*								
Financial crisis indicator		0.859 (0.363)**							
Fiscal deficit			0.001 -0.002						
EU negotiations				0.228 (0.028)*					
Electoral calendar					0.009 -0.006				
Leadership changes (cum.)						0.119 (0.016)*			
Political alternation (cum.)							0.126 (0.020)*		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									0.0001 (0.001)
Constant	0.604 (0.048)*	0.483 (0.057)*	0.422 (0.047)*	0.34 (0.049)*	0.404 (0.048)*	0.13 (0.057)**	0.195 (0.058)*	0.464 (0.058)*	0.399 (0.049)*
Observations	243	168	245	247	242	247	247	247	247
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B4: The Determinants of Internal Liberalization Reversals. Random-effects Panel Estimates

GDP growth	0.058	0.006	0.045	0.052	0.057	0.05	0.05	0.052	0.052
	-0.036	-0.049	-0.033	(0.031)+	(0.032)+	-0.032	-0.031	(0.031)+	(0.031)+
Unemployment	0.065	0.055	0.053	0.05	0.052	0.051	0.04	0.049	0.05
	-0.041	-0.048	-0.041	-0.04	-0.04	-0.04	-0.041	-0.04	-0.04
Freedom H. Index	-0.12	0.032	-0.081	-0.091	-0.071	-0.048	-0.004	-0.092	-0.092
	-0.117	-0.147	-0.111	-0.121	-0.113	-0.147	-0.14	-0.11	-0.11
Strikes	0.826	2.042	0.822	0.825	0.823	0.823	0.735	0.825	0.822
	(0.340)**	(0.694)*	(0.337)**	(0.336)**	(0.341)**	(0.336)**	(0.350)**	(0.335)**	(0.338)**
Log of inflation	0.1								
	-0.138								
Financial crisis indicator		51.428							
		-38.022							
Fiscal deficit			0.024						
			-0.046						
EU negotiations				0.004					
				-0.549					
Electoral calendar					0.015				
					-0.143				
Leadership changes (cum.)						0.124			
						-0.28			
Political alternation (cum.)							0.275		
							-0.264		
Distance between capital cities								0.0001	
								(0.001)	
FSU vs. non-FSU									0.0001
									-0.002
Constant	-2.462	-2.508	-2	-2.054	-2.143	-2.422	-2.629	-2.039	-2.033
	(0.806)*	(0.796)*	(0.660)*	(0.697)*	(0.692)*	(1.062)**	(0.872)*	(0.965)**	(0.751)*
Observations	228	161	231	232	227	232	232	232	232
No. of countries	24	20	24	24	24	24	24	24	24

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B5: The Determinants of External Liberalization Reversals. Random-effects Panel Estimates

GDP growth	0.052 (0.029)+	0.042 -0.038	0.032 -0.025	0.03 -0.025	0.031 -0.025	0.033 -0.025	0.029 -0.025	0.033 -0.025	0.027 -0.025
Unemployment	0.02 -0.029	0.001 -0.029	0.005 -0.027	0.007 -0.027	0.004 -0.027	0 -0.028	0.015 -0.028	0.004 -0.027	0.009 -0.027
Freedom H. Index	0.014 -0.09	-0.026 -0.113	0.023 -0.087	0 -0.095	0.005 -0.088	-0.073 -0.125	-0.067 -0.112	0.012 -0.086	0.011 -0.086
OECD growth	1.367 (0.331)*	0.927 (0.374)**	1.314 (0.331)*	1.296 (0.331)*	1.29 (0.329)*	1.347 (0.336)*	1.329 (0.331)*	1.268 (0.326)*	1.321 (0.334)*
Log of inflation	0.155 -0.115								
Financial crisis indicator		-8.547 -8.027							
Fiscal deficit			-0.024 -0.035						
EU negotiations				-0.148 -0.551					
Electoral calendar					0.025 -0.104				
Leadership changes (cum.)						-0.233 -0.254			
Political alternation (cum.)							-0.276 -0.258		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									-0.006 (0.003)**
Constant	-5.84 (1.250)*	-3.737 (1.251)*	-5.186 (1.151)*	-4.951 (1.098)*	-4.988 (1.126)*	-4.438 (1.228)*	-4.557 (1.157)*	-4.353 (1.304)*	-4.4 (1.139)*
Observations	237	151	236	243	241	243	243	243	243
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B6: The Determinants of Privatization Reversals. Random-effects Panel Estimates

GDP growth	-0.02	-0.045	-0.015	-0.012	-0.012	-0.011	-0.013	-0.003	-0.008
	-0.033	-0.051	-0.03	-0.029	-0.029	-0.03	-0.029	-0.03	-0.029
Unemployment	0.005	0.04	0.028	0.029	0.029	0.021	0.035	0.02	0.024
	-0.036	-0.041	-0.031	-0.031	-0.032	-0.032	-0.033	-0.032	-0.032
Freedom H. Index	-0.025	-0.099	-0.025	-0.028	-0.033	-0.115	-0.09	-0.016	-0.026
	-0.123	-0.208	-0.12	-0.125	-0.126	-0.159	-0.153	-0.122	-0.121
FDI	-0.24	-0.42	-0.228	-0.23	-0.229	-0.198	-0.219	-0.228	-0.228
	(0.127)+	(0.195)**	(0.116)**	(0.119)+	(0.117)**	(0.119)+	(0.117)+	(0.116)**	(0.116)+
Log of inflation	-0.092								
	-0.16								
Financial crisis indicator		40.373							
		-34.376							
Fiscal deficit			0.015						
			-0.038						
EU negotiations				0.026					
				-0.868					
Electoral calendar					0.014				
					-0.133				
Leadership changes (cum.)						-0.288			
						-0.345			
Political alternation (cum.)							-0.223		
							-0.353		
Distance between capital cities								0.0001	
								(0.001)	
FSU vs. non-FSU									0.005
									-0.005
Constant	-0.651	-0.693	-1.13	-1.198	-1.208	-0.479	-0.797	0.315	-1.694
	-1.005	-0.96	-0.724	(0.720)+	(0.717)+	-1.1	-0.932	-1.153	(0.852)**
Observations	172	126	175	175	175	175	175	175	175
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B7: The Determinants of the Persistence of Internal Liberalization Reversals. Random-effects Panel Estimates

GDP growth	0.058 (0.032)+	-0.006 -0.043	0.039 -0.03	0.043 -0.029	0.046 -0.029	0.039 -0.029	0.039 -0.028	0.042 -0.029	0.042 -0.029
Unemployment	0.056 -0.035	0.043 -0.041	0.047 -0.038	0.046 -0.039	0.047 -0.038	0.044 -0.038	0.027 -0.037	0.045 -0.038	0.048 -0.039
Freedom H. Index	-0.172 (0.103)+	0.004 -0.133	-0.14 -0.108	-0.15 -0.112	-0.131 -0.109	-0.074 -0.136	-0.024 -0.122	-0.147 -0.107	-0.146 -0.107
Strikes	0.896 (0.179)*	1.39 (0.242)*	0.824 (0.259)*	0.804 (0.250)*	0.813 (0.254)*	0.81 (0.242)*	0.768 (0.198)*	0.811 (0.247)*	0.788 (0.252)*
Log of inflation	0.156 -0.109								
Financial crisis indicator		16.879 -12.974							
Fiscal deficit			0.012 -0.045						
EU negotiations				-0.071 -0.464					
Electoral calendar					0.027 -0.128				
Leadership changes (cum.)						0.203 -0.237			
Political alternation (cum.)							0.383 (0.213)+		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									-0.001 -0.002
Constant	-1.401 -0.862	-0.693 -1.141	-0.665 -0.921	-0.624 -0.938	-0.736 -0.955	-1.192 -1.152	-1.464 -0.916	-0.973 -1.09	-0.49 -0.992
Observations	228	161	231	232	227	232	232	232	232
No. of countries	24	20	24	24	24	24	24	24	24

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B8: The Determinants of the Persistence of External Liberalization Reversals. Random-effects Panel Estimates

GDP growth	0.072 (0.024)*	0.069 (0.033)**	0.049 (0.022)**	0.052 (0.022)**	0.051 (0.022)**	0.053 (0.022)**	0.051 (0.022)**	0.054 (0.027)**	0.05 (0.022)**
Unemployment	0.012 -0.021	-0.003 -0.025	0 -0.021	0.001 -0.021	-0.004 -0.021	-0.003 -0.022	0.006 -0.021	0.087 (0.051)+	0.002 -0.021
Freedom H. Index	0.051 -0.066	0.032 -0.092	0.063 -0.067	0.055 -0.075	0.05 -0.067	0.015 -0.096	0 -0.085	-0.094 -0.204	0.057 -0.067
OECD growth	0.888 (0.250)*	0.534 (0.283)+	0.817 (0.249)*	0.816 (0.253)*	0.819 (0.251)*	0.847 (0.255)*	0.848 (0.252)*	0.688 (0.268)**	0.831 (0.251)*
Log of inflation	0.155 (0.084)+								
Financial crisis indicator		-7.438 -6.433							
Fiscal deficit			-0.002 -0.03						
EU negotiations				0.002 -0.422					
Electoral calendar					0.006 -0.081				
Leadership changes (cum.)						-0.113 -0.2			
Political alternation (cum.)							-0.202 -0.201		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									-0.004 (0.002)+
Constant	4.858 -48.102	12.532 -667.583	9.736 -510.242	10.497 -474.889	5.239 -66.19	9.444 -561.459	2.861 -20.573	4.843 -195.138	10.616 -442.249
Observations	237	151	236	243	241	243	243	231	243
No. of countries	25	21	25	25	25	25	25	23	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Table B9: The Determinants of the Persistence of Privatization Reversals. Random-effects Panel Estimates

GDP growth	-0.011 (-0.028)	-0.018 (-0.042)	-0.006 (-0.025)	-0.003 (-0.025)	-0.003 (-0.025)	-0.002 (-0.025)	-0.004 (-0.025)	0.002 (-0.026)	0.001 (-0.025)
Unemployment	0.005 (-0.032)	0.033 (-0.035)	0.022 (-0.026)	0.023 (-0.026)	0.022 (-0.027)	0.017 (-0.026)	0.03 (-0.027)	0.017 (-0.026)	0.019 (-0.027)
Freedom H. Index	-0.012 (-0.108)	-0.051 (-0.175)	-0.017 (-0.104)	-0.02 (-0.107)	-0.015 (-0.109)	-0.09 (-0.133)	-0.089 (-0.13)	-0.011 (-0.104)	-0.017 (-0.105)
FDI	-0.256 (0.118)**	-0.406 (0.171)**	-0.238 (0.109)**	-0.238 (0.111)**	-0.239 (0.109)**	-0.209 (0.111)+	-0.226 (0.108)**	-0.232 (0.112)**	-0.238 (0.109)**
Log of inflation	-0.089 (-0.136)								
Financial crisis indicator		32.118 (-28.317)							
Fiscal deficit			0.013 (-0.033)						
EU negotiations				-0.044 (-0.784)					
Electoral calendar					-0.014 (-0.112)				
Leadership changes (cum.)						-0.249 (-0.293)			
Political alternation (cum.)							-0.265 (-0.311)		
Distance between capital cities								0.0001 (0.001)	
FSU vs. non-FSU									0.004 (-0.004)
Constant	11.788 -737.865	14.803 (1,153.991)	11.931 -769.76	11.784 -657.948	11.755 -762.545	12.693 -714.062	12.821 (1,024.420)	3.52 -6.657	13.55 -496.707
Observations	172	126	175	175	175	175	175	175	175
No. of countries	25	21	25	25	25	25	25	25	25

Notes: Robust standard errors in parentheses. + significant at 10%; ** significant at 5%; * significant at 1%

Description of Variables Underlying the Reform Indexes

Internal Liberalization

As concerns internal liberalization, the following data were collected (in alphabetical order):

1. Number of goods subject to price regulation – EBRD basket

Source: EBRD

Coding: Gives the number of goods which are subject to price regulation based on the EBRD basket. The EBRD basket contains 15 goods. It is indicated if the price of a particular good is regulated in a given year (any regulation = 1, no regulation = 0). These goods are: flour/bread, meat, milk, gasoline/petrol, cotton textiles, shoes, paper, cars, TV sets, cement, steel, coal, wood, rent and intercity bus services.

2. Share of administered prices in CPI

Source: EBRD Transition Report, various years

Coding: Gives the weight of administered (regulated) prices in the consumer price index (CPI).

3. Wage regulation

Source: EBRD Transition Report, various years

Coding: No regulation = 0, any regulation = 1

External Liberalization

As concerns external liberalization, the following data were collected (in alphabetical order):

1. Compatibility with Article VIII

Source: IMF web site

Coding: Date from which the country is compatible with Article VIII (current account convertibility). We assign 0 for compatible, 1 otherwise.

2. Controls on commercial credit

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No controls = 0, any controls = 1

3. Controls on foreign direct investment

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No controls = 0, any controls = 1

4. Controls on the liquidation of foreign direct investment

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No controls = 0, any controls = 1

5. Documentation requirements for release of foreign exchange for imports

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No requirement = 0, any requirements = 1

6. Exchange taxes

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No taxes = 0, any taxes = 1

7. Export duties as a percentage of tax revenue

Source: World Bank's World Development Indicators

Coding: Gives the ratio of export duties to tax revenues in percentages

8. Export licences

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No licences = 0, any licences = 1

9. Export taxes

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No taxes = 0, any taxes = 1

10. Import duties as a percentage of tax revenue

Source: World Bank's World Development Indicators

Coding: Gives the ratio of import duties to tax revenues in percentages

11. Import licences and quotas

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No licences and quotas = 0, any licences and quotas = 1

12. Import tariff rate

Source: UNCTAD Handbook of Statistics

Coding: Gives the weighted average of import tariff rates on non-agricultural and non-fuel products (i.e. manufactured products, ores and metals); the duty type is effectively the applied rate (AHS); also differentiates the rates according to region; distinguishes the rates applied to the world, developed countries, developing countries, Eastern Europe and least developed countries. We use the rates applied to the world in the empirical estimations.

13. Interest rate liberalization

Source: EBRD Transition Reports, various years

Coding: Distinguishes between limited de jure, limited de facto and full liberalization. For computation purposes, full = 0, 1 otherwise.

14. Investment transactions

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions

Coding: No regulation = 0, any regulation = 1

15. Multiple exchange rates

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions

Coding: Yes – for multiple exchange rates and de facto multiple exchange rates, no for single rate. We assign 1 for multiple rates, 0 otherwise

16. OECD membership

Source: OECD web site

Coding: gives the date when the country became an OECD member. We assign 0 for being a member, 1 otherwise.

17. a) Openness of the country – 1

Source: Penn World Tables, Alan Heston, Robert Summers and Bettina Aten, Penn World Table Version 6.1, Center for International Comparisons at the University of Pennsylvania (CICUP), October 2002.

Coding: Gives the ratio of the sum of imports and exports to GDP for the individual country, all in constant USD.

17. b) Openness of the country – 2

Source: World Bank's World Development Indicators

Coding: Gives the ratio of the sum of imports and exports to GDP for the individual country, all in constant USD.

18. Permission for foreign exchange accounts held abroad by residents

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: Fully permitted = 0, any restriction = 1

19. Permission for foreign exchange accounts held domestically by residents

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: Fully permitted = 0, any restriction = 1

20. Permission of foreign exchange accounts for non-residents

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: Fully permitted = 0, any restriction = 1

21. Repatriation requirements

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No requirements = 0, any requirements = 1

22. Repatriation requirements for invisible transactions

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No requirements = 0, any requirements = 1

23. Share of trade with non-transition countries

Source: EBRD Transition Report, various years

Coding: Gives the proportion of trade (merchandise exports + imports) to GDP that goes out of 27 transition countries

24. Surrender requirements

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No requirements = 0, any requirements = 1

25. Surrender requirements for invisible transactions

Source: IMF Annual Report on Exchange Arrangements and Exchange Restrictions, adapted from ELITE database

Coding: No requirements = 0, any requirements = 1

26. Tariff code lines

Source: UNCTAD Handbook of Statistics

Coding: Gives the ratio of the number of duty-free lines to the number of all tariff lines (number of duty-free lines and all tariff lines available also separately). However, most data are not available and we do not use this variable.

27. Tariff revenues as a percentage of imports

Source: EBRD Transition Report, various years

Coding: It seems that for some of the countries, there was analytical break in the data. For instance, the Albanian authorities revised the data for the period 1995–2002 in 2003. Only old estimates are thus available for the prior period. In this case, only reliable data are used (we do not use the data for Albania in 1992–1994, Azerbaijan in 1991–1994 and Bulgaria in 1991–1994).

28. Taxes on international trade (per cent of current revenue)

Source: World Bank's World Development Indicators

Coding: Gives the ratio of taxes on international trade as percentage of current revenue

29. WTO membership

Source: WTO web site

Coding: Gives the date when the country became a WTO member. Also indicates whether a non-member country has the status of observer. Otherwise, the country is assigned "no membership". For the empirical estimation, we assign 0 for being a member, 1 otherwise.

Privatization

Regarding privatization, the following variables were collected (the coding of these variables is obvious from their names):

1. Asset share of private banks in total bank assets

Source: EBRD survey of central banks

2. Credit to private sector (as a percentage of GDP)

Source: IMF International Financial Statistics. Some missing values (for the interval 1991–1996) have been filled in using the WB's ECSPF database. Where conflicting data values appeared, the most recent data (EBRD Transition Report) were used.

3. Number of large enterprises privatized (cumulative) (normalized by real GDP in \$)

Source: WB's ECSPF data

4. Number of small and medium-sized enterprises privatized (cumulative)

Source: WB's ECSPF; source for Albania: Iraj Hashi and Lindita Xhillari: Privatisation and Transition in Albania, Post-Communist Economies, Vol. 2, No. 1, 1999. For Azerbaijan, the statistical office is used.

5. Private sector investment as a percentage of GDP

Source: WB's ECSPF data

6. Private sector share in employment

Source: EBRD staff estimates. Prior to 1994, the source is IMF staff estimates. Where the EBRD data conflicts with national sources, priority is given to national sources: Albania: Albanian Institute of Statistics, Annual Report 2003; Georgia: Georgian Institute of Statistics; Azerbaijan: State Statistical Committee

7. Private sector share in GDP

Source: EBRD staff estimates. Prior to 1994, the source is IMF staff estimates.

8. Privatization revenues (as a percentage of GDP)

Source: National authorities and IMF country reports

9. Share of foreign banks in total number of banks

Source: EBRD survey of central banks

10. Share of small firms privatized (in total small firms available for privatization)

Source: EBRD survey of national authorities and EBRD staff assessments

11. Total number of enterprises privatized (cumulative) (normalized by real GDP in \$)

Source: WB's ECSPF data

12. Total number of private enterprises (normalized by real GDP in \$)

Source: WB's ECSPF data. National sources (statistical institutes) have been used to fill in the missing values or to correct the ECSPF data where conflicts appear (Georgia, Romania and Ukraine)

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