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SHOCK THERAPY VERSUS GRADUALISM RECON- SIDERED

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SHOCK THERAPY VERSUS GRADUALISM RECONSIDERED: LESSONS FROM TRANSITION ECONOMIES AFTER 15 YEARS OF REFORMS[1]

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ABSTRACT

This paper starts by separating the transformational recession (reduction of output in most transition economies in the first half of the 1990s) from the process of economic growth (recovery from the transformational recession) in 28 transition economies (including China, Vietnam and Mongolia). It is argued that the former (the collapse of output during transition) can be best explained as adverse supply shock caused mostly by a change in relative prices after their deregulation due to distortions in industrial structure and trade patterns accumulated during the period of central planning, and by the collapse of state institutions during transition period, while the speed of liberalization, to the extent it was endogenous, i.e. determined by political economy factors, had an adverse effect on performance. In contrast, at the recovery stage the ongoing liberalization starts to affect growth positively, whereas the impact of pre-transition distortions disappears. Institutional capacity and reasonable macroeconomic policy, however, continue to be important prerequisites for successful performance.

1. Introduction

This paper starts by separating the transformational recession (reduction of output in most transition economies in the first half of the 1990s) from the process of economic growth (recovery from the transformational recession). It is argued that the former (the collapse of output during transition) can be best explained as adverse supply shock caused mostly by a change in relative prices after their deregulation due to distortions in industrial structure and trade patterns accumulated during the period of central planning, and by the collapse of state institutions during transition period, while the speed of liberalization had an adverse effect on performance, if any. In contrast, the latter process (recovery) should be treated as a normal growth process and could be modeled with the tools of conventional growth theory: it could be expected that in the sufficiently long run it would be possible to capitalize on liberalization due to the increase in factors efficiency that would lead to better performance.

Based on previous literature (see Popov, 2000 for the review) the following framework for explaining the collapse of output during transformational recession is accepted. First, transformational recession was caused by the adverse supply shock that resulted from deregulation of prices and change in relative price ratios that created the need for reallocation of resources due to distortions in the industrial structure and external trade patterns that existed before transition. Second, by another adverse supply shock associated with the collapse of state institutions (understood as the ability of the state to enforce its rules and regulations), which occurred in the late 1980s - early 1990s and which resulted in chaotic transformation through crisis management instead of organized and manageable transition. And third, by poor economic policies, which basically consisted of macroeconomic mismanagement, no matter whether the pursued reforms were gradual or radical. Fast speed of reform *per se* (shock versus gradual transition) at the initial stage of transition probably aggravated the reduction of output because immediate deregulation of prices caused the need for restructuring (reallocation of labor and capital) that exceeded the investment potential of the economy.

In the first approximation, economic recession that occurred during transition was associated with the need to reallocate resources in order to correct the industrial structure inherited from centrally planned economy (CPE). These distortions include over-militarization and overindustrialization (resulting in the underdevelopment of the service sector), perverted trade flows among former Soviet republics and Comecon countries, excessively large size and poor

specialization of industrial enterprises and agricultural farms (lack of small enterprises and farms). In most cases these distortions were more pronounced in former Soviet Union countries (FSU) than in Eastern Europe (EE), not to speak about China and Vietnam, – the larger the distortions, the greater was the reduction of output. Transformational recession, to put in economic terms, was caused by adverse supply shock similar to the one experienced by Western countries after the oil price hikes in 1973 and 1979, and similar to post-war recessions caused by conversion of the defense industries.

The additional reason for the extreme depth and length of the transformational recession was associated with the institutional collapse – here differences between EE countries and FSU are striking. The efficiency of state institutions, understood as the ability of the state to enforce its own rules and regulations, resulted in the inability of the state to perform its traditional functions – to collect taxes and to constraint the shadow economy, to ensure property and contract rights and law and order in general (crime rates and corruption increased dramatically during transition as compared to the communist past). Naturally, poor ability to enforce rules and regulations did not create business climate conducive to growth and resulted in the increased costs for companies.

It is precisely this strong institutional framework that should be held responsible for both – for the success of gradual reforms in China and shock therapy in Vietnam, where strong authoritarian regimes were preserved and CPE institutions were not dismantled before new market institutions were created; and for the relative success of radical reforms in EE countries, especially in Central European countries, where strong democratic regimes and new market institutions emerged quickly. And it is precisely the collapse of strong state institutions that started in the USSR in the late 1980s and continued in the successor states in the 1990s that explains the extreme length, if not the extreme depth of the FSU transformational recession.

What lead to the institutional collapse and could it have been prevented? Using the terminology of political science, it is appropriate to distinguish between strong authoritarian regimes (China and Vietnam and to an extent – Belarus and Uzbekistan), strong democratic regimes (Central European countries) and weak democratic regimes (most FSU and Balkan states). The former two are politically liberal or liberalizing, i. e. protect individual rights, including those of property and contracts, and create a framework of law and administration, while the latter regimes, though democratic, are politically not so liberal since they lack strong institutions and the ability to enforce law and order (Zakaria, 1997). This gives rise to the phenomenon of "illiberal democracies"

– countries, where competitive elections are introduced before the rule of law is established. While European countries in the XIX century and East Asian countries recently moved from first establishing the rule of law to gradually introducing democratic elections (Hong Kong is the most obvious example of the rule of law without democracy), in Latin America, Africa, and now in CIS countries democratic political systems were introduced in societies without the firm rule of law.

Authoritarian regimes (including communist), while gradually building property rights and institutions, were filling the vacuum in the rule of law via authoritarian means. After democratization occurred and illiberal democracies emerged, they found themselves deprived of old authoritarian instruments to ensure law and order, but without the newly developed democratic mechanisms needed to guarantee property rights, contracts and law and order in general. No surprise, this had a devastating impact on investment climate and output.

There is a clear relationship between the ratio of rule of law index on the eve of transition to democratization index, on the one hand, and economic performance during transition, on the other. To put it differently, democratization without strong rule of law, whether one likes it or not, usually leads to the collapse of output. There is a price to pay for early democratization, i.e. introduction of competitive elections of government under the conditions when the major liberal rights (personal freedom and safety, property, contracts, fair trial in court, etc.) are not well established.

Finally, performance was of course affected by economic policy. Given the weak institutional capacity of the state, i.e. its poor ability to enforce its own regulations, economic policies could hardly be "good". Weak state institutions usually imply populist macroeconomic policies (budget deficits resulting in high indebtedness and/or inflation, overvalued exchange rates), which have devastating impact on output. On the other hand, strong institutional capacity does not lead automatically to responsible economic policies. Examples range from the USSR before it collapsed (periodic outburst of open or hidden inflation) to such post Soviet states as Uzbekistan and Belarus, which seem to have stronger institutional potential than other FSU states, but do not demonstrate higher macroeconomic stability.

Regressions tracing the impact of all mentioned factors are reported in table 1. If the rule of law and democracy indices (see data section for definitions) are included into the basic regression equation, they have predicted signs (positive impact of the rule of law and negative impact of democracy) and are statistically significant (equation 1), which is consistent with the results

obtained for larger sample of countries[3]. The best explanatory power, however, is exhibited by the index that is computed as the ratio of the rule of law index to democracy index: 83% of all variations in output can be explained by only three factors – pre-transition distortions, inflation, and rule-of-law-to-democracy index (table 1, equation 2). If liberalization variable is added, it turns out to be statistically insignificant and does not improve the goodness of fit (equation 3). At the same time, the ratio of the rule of law to democracy index and the decline in government revenues are not substitutes, but rather complement each other in characterizing the process of the institutional decay. These two variables are not correlated and improve the goodness of fit, when included together in the same regression: R^2 increases to 91% (equation 5) – better result than in regressions with either one of these variables. The liberalization index, when added to the same equation, only deteriorates the goodness of fit, is not statistically significant, and has the "wrong" sign.

To test the robustness of the results, another year for the end of the transformational recession was chosen – 1998, so the period considered was 1989-98 (by the end of 1998 the absolute trough was reached in 24 countries out of 26 that experienced the recession). The adjusted R^2 is slightly lower, but the statistical significance of coefficients remains high (with the exception of the initial GDP per capita). The best equation is shown below:

$$Log(Y98/89)=5.8-.006DIST-0.005Ycap87-0.39WAR-0.01GOVREVdecline -0.17logINFL -.003DEM$$
$$(-2.48) \quad (-0.09) \quad (-3.22) \quad (-2.94) \quad (-4.60) \quad (-1.74)$$

(N= 28, Adjusted R^2 = 82%, T-statistics in brackets, all variables are shown in the same order as in equation 7 from table 1 (liberalization variable is omitted).

Once again, if liberalization variable is introduced in this equation, it turns out to be insignificant.

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[3] For a larger sample of countries (all developing and developed countries, not only transition economies), the result is that there is a threshold level of the rule of law index: if it is higher than a certain level, democratization affects growth positively, if lower – democratization impedes growth (Polterovich, Popov, 2005). For the regressions reported in table 1 (to explain changes in output in 1989-96) averages of rule of law and democracy indices were used for the longer period (1989-98) to account for the fact that business agents often anticipate changes in business climate that are captured in experts' estimates only later.

Table 1. Regression of change in GDP in 1989-96 on initial conditions, policy factors, and rule of law and democracy indices, robust estimates
Dependent variable = log (1996 GDP as a % of 1989 GDP)
For China - all indicators are for the period of 1979-86 or similar

Equations, Number of Observations / Variables	1, N=28	2, N=28	3, N=28	4, N=28	5, N=28	6, N=28	7, N=28
Constant	5.3***	5.4***	5.2***	5.4***	5.4***	5.5***	5.7***
Distortions, % of GDP[a]	-.005**	-.005**	-.003	-.006**	-.007***	-.007***	-.007***
1987 PPP GDP per capita, % of the US level	-.009**	-.006*	-.007**	-.007**	-.009***	-.008***	-.008***
War dummy[b]				-.19[c]	-.36***	-.37***	-.45***
Decline in government revenues as a % of GDP from 1989-91 to 1993-96					-.011***	-.011***	-.011***
Liberalization index			.05			-.02	.03
Log (Inflation, % a year, 1990-95, geometric average)	-.16***	-.20***	-.18***	-.17***	-.13***	-.13***	-.14***
Rule of law index, average for 1989-97, %	.008***						
Democracy index, average for 1990-98, %	-.005***						-.003**
Ratio of the rule of law to democracy index		.07***	.07***	.06***	.05***	.05***	
Adjusted R^2, %	82	83	83	85	91	91	90

*, **, *** - Significant at 1, 5 and 10% level respectively.

[a]Cumulative measure of distortions as a % of GDP equal to the sum of defense expenditure (minus 3% regarded as the 'normal' level), deviations in industrial structure and trade openness from the 'normal' level, the share of heavily distorted trade (among the FSU republics) and lightly distorted trade (with socialist countries) taken with a 33% weight – see (Popov, 2000) for details.

[b]Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries.
[c] Significant at 13% level.

This latter conclusion still remains most controversial – the emerging consensus today, if any, seems to be that performance is largely determined by the institutional capacity (the factor that was overlooked in the earlier debates), but economic liberalization still matters a great deal (Demelo et al., 1997; Havrylyshyn and van Rooden, 2003). The theoretical argument in favor of the positive impact of liberalization on performance is quite strong: market economy should be more efficient than the centrally planned economy, so there is a "marketization dividend" to be reaped, and the faster economic liberalization occurs, the better should be the performance. However, there are a number of obvious facts that do not fit into the scheme.

First, China – the only country that carried out classical gradual transition (with slow deregulation of prices – dual track price system) outperformed impressively all other transition economies, and of course Chinese example is too important to ignore. *Second*, the comparison of Vietnam and China - two countries that shared a lot of similarities in initial conditions and achieved basically the same results (immediate growth of output without transformational recession) despite different reform strategies. While Chinese reforms are a classical example of gradualism, Vietnamese reformers introduced Polish style shock therapy treatment (instant deregulation of most prices and introduction of convertibility of dong) even before Poland did, in 1989, and still managed to avoid the reduction of output[4]. *Third*, differing performance of the former Soviet Union (FSU) states. The champions of liberalization and stabilization in the region were definitely Baltic states (cumulative liberalization index by 1995 - 2.4-2.9), whereas Uzbekistan (with the same index of 1.1) is commonly perceived to be one of the worst procrastinators. But in Uzbekistan the reduction of output in 1990-95 totaled only 18% and the economy started to grow again in 1996, while in the Baltics output fell in the early 1990s by 36-60% and even in 1996, two years after the bottom of the recession was reached, was still 31% to 58% below the pre-recession maximum.

FIG.1

Fig. 1. GDP in 2004 as a % of 1989

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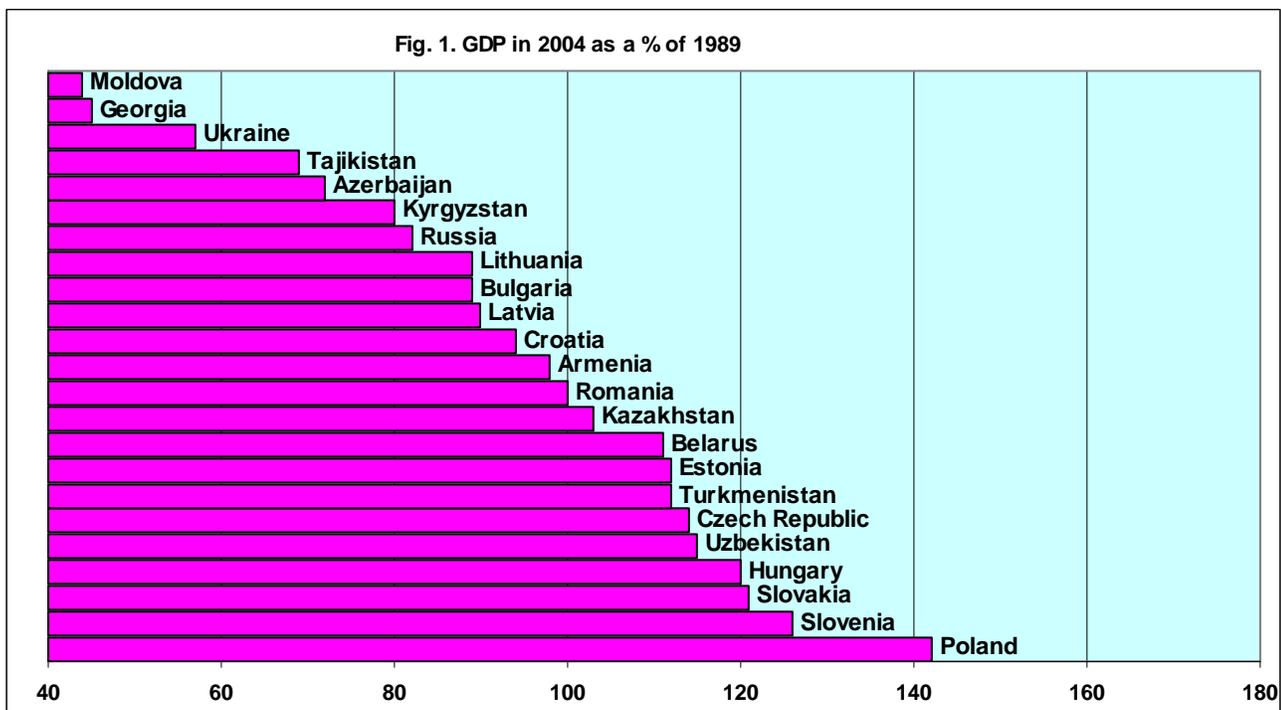
[4] While Vietnamese industry, excluding constantly and rapidly growing oil production, experienced some downturn in 1989-90 (-6% in 1989 and 0% in 1990) agricultural growth remained strong, so that GDP growth rates virtually did not

FIG.2

Fig. 2. GDP change in FSU economies, 1989 = 100%
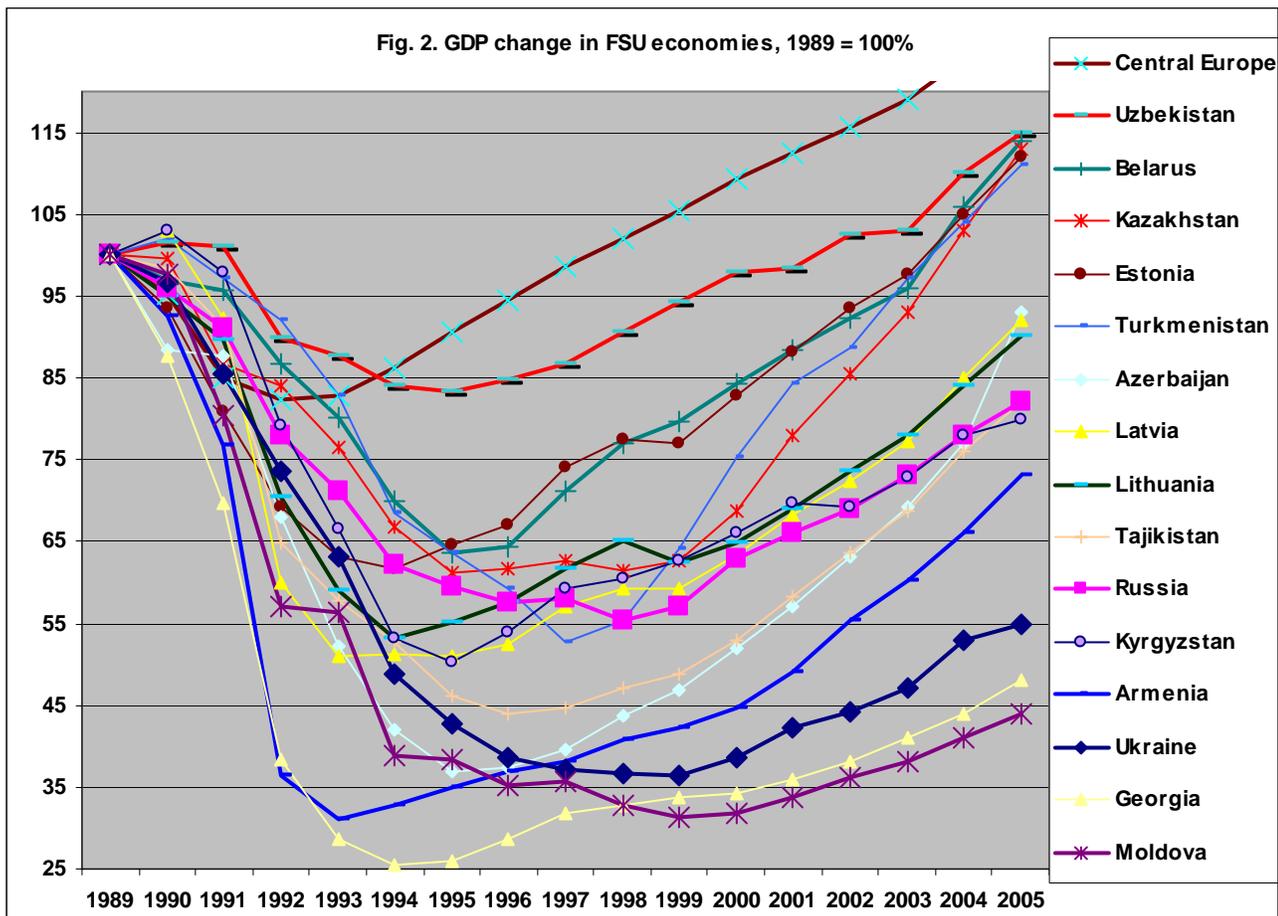
In 2004-2005, the list of countries that exceeded the pre-recession level of output in 1989 looked very much like a list of procrastinators in terms of economic liberalization and non-democratic regimes in terms of political liberalization: in addition to 5 central European countries and Estonia, there were also Turkmenistan, Uzbekistan, Belarus and Kazakhstan (see fig. 1, 2)[5], not to speak about China and Vietnam. Thus, the case for gradual, Chinese-type reforms remains very strong and is very much favored by many academics and policy makers – see (Kolodko, 2000) for an extensive summary of the debate.

fall (5-6% a year).

[5] Fig. 1 is based on GDP indices (2004 as a % of 1989) reported in the EBRD Transition Report 2005, whereas fig. 2 reports chain indices (based on annual growth rates) from the same source. The discrepancies are not that substantial.

2. The hypothesis – why shock therapy may lead to worse performance than gradual transition

There are now quite a number of papers that offer the models explaining why gradual transition may lead to a better performance as compared to the shock therapy – see (Popov, 2000) and (Roland, 2000) for a survey. Murphy, Shleifer and Vishny (1992) claimed that, if the weakening state is not able to enforce production quotas under the system of dual pricing, transfer of resources to the private sector with market prices creates bottlenecks and shortages in the state sector, resulting in the fall of total output. Friedman and Johnson (1995) argued that in the presence of complementarities between government policies and enterprise attributes and convex adjustment costs for enterprises (i.e. costs increasing with the speed of reforms) radical "big bang" reforms might not necessarily be optimal. It was also argued (Li, 1996) that in the absence of competitive product markets (monopolization) on the outset of the reforms shock therapy can only lead to the reduction of output, while incremental reforms, such as Chinese type dual track pricing system forcing enterprises to meet production quotas, but allowing them to sell above-the-plan output at market prices, may contribute to the expansion of output. Lau, Qian, and Roland (1997) showed that if state firms are allowed to choose between market and centrally planned prices (for both - inputs and outputs), then not only the Pareto optimality is guaranteed at the end of the process, but also – with the appropriate state allocation of cheap resources and production quotas – it could be ensured that at every stage of the transition process no one is going to be worse off and at least someone is constantly made better off. Blanchard and Kremer (1997) suggested a disorganization explanation: they assumed that state enterprises make a "take it or leave it" proposals on prices of resources, that there are costs of finding partners, and that production stops, if the critical resource is lacking. Roland and Verdier (1999) also focused on disorganization and showed that investment and output may fall as a result of immediate price deregulation due to the need to find new partners (disorganization effect) and that under gradual dual track price liberalization it is possible avoid this effect. Atkeson and Kehoe (1996) suggested that the increase in unemployment creates a need for higher taxes to finance unemployment insurance payments and that higher taxes depress output.

The problem with these explanations, however, is that although theoretically plausible, they do not seem to capture the basic stylized facts of transition, but at best – only marginal effects. It was neither the disorganization, nor unemployment insurance payments, nor monopolization effects that drove output down in transition economies during the transformational recession. As was

argued earlier, the nature of the recession was basically an adverse supply shock caused by the change in relative prices. The evidence for all transition economies is in table 1: the reduction of output by country is well explained by the indicator of distortions in industrial structure and trade patterns (it remains statistically significant no matter what control variables are added). The magnitude of distortions, in turn, determines the change in relative prices, when they are deregulated. As fig. 3 shows, the reduction of output in Russia during the transformational recession was to a large extent structural in nature: industries with the greatest adverse supply shock (deteriorating terms of trade – relative price ratios for outputs and inputs), such as light industry, experienced the largest reduction of output.

FIG. 3

Fig. 3. Change in relative prices and output in 1990-98 in Russian industry
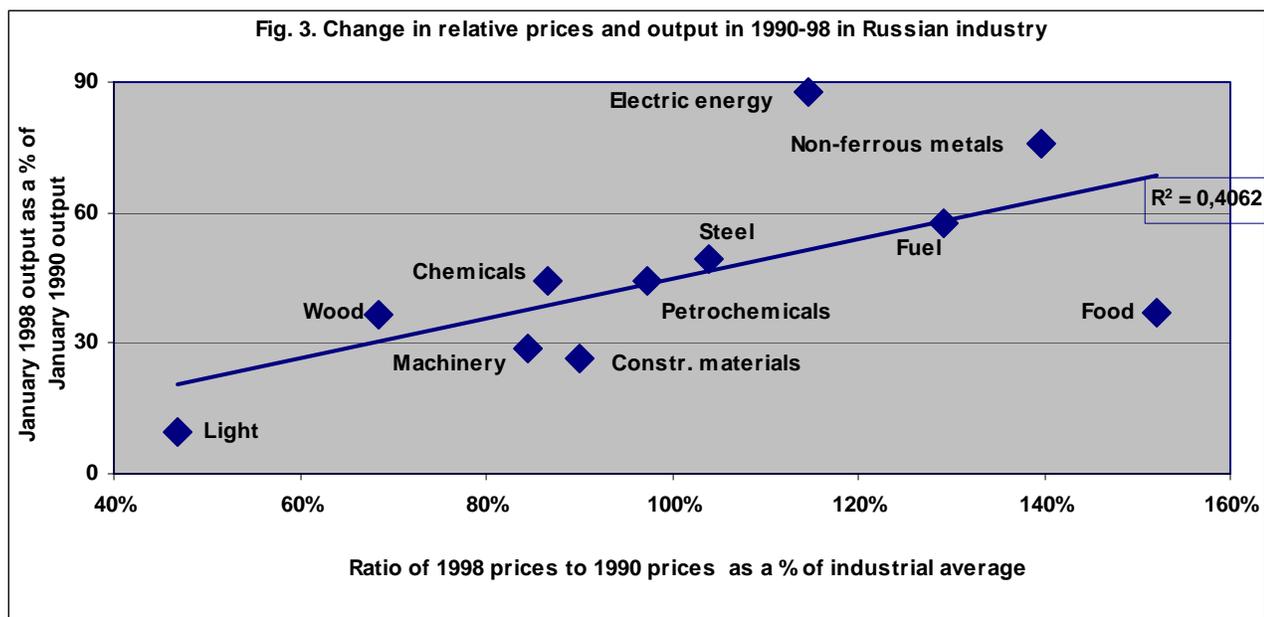
The adverse supply shock due to deregulation of prices framework allows to explain the varying impact of economic liberalization on performance at the recession stage and during economic recovery. Consider a country where deregulation of prices (or elimination of trade tariffs/subsidies) leads to a change in relative price ratios and thus produces an adverse supply shock for at least some industries. Capital should be reallocated from industries facing declining relative prices and profitability to industries with rising relative prices. Assume that 20% of the total output is concentrated in non-competitive industries: this whole sector should disappear either

gradually or at once depending on how fast relative prices will change; capital is not homogeneous and cannot be moved to the competitive sector, whereas labor can be reallocated to the competitive sector without costs. Marginal capital productivity in the competitive sector is higher than in the non-competitive and is equal to 1/3. Assume further that all investments go into the competitive sector, and that net investment is equal to 10% of GDP. Under these simple assumptions we get output trajectories shown at fig. 4[6].

FIG. 4

Fig. 4. Hypothetical trajectories of output (Year "0" = 100%) assuming gradual and instant liberalization

Assumptions: size of non-competitive sector (NC) in the initial year = 20% of total output; net investment (s) = 10% of total output; marginal capital productivity, output increase per unit of net investment (a) = 1/3.

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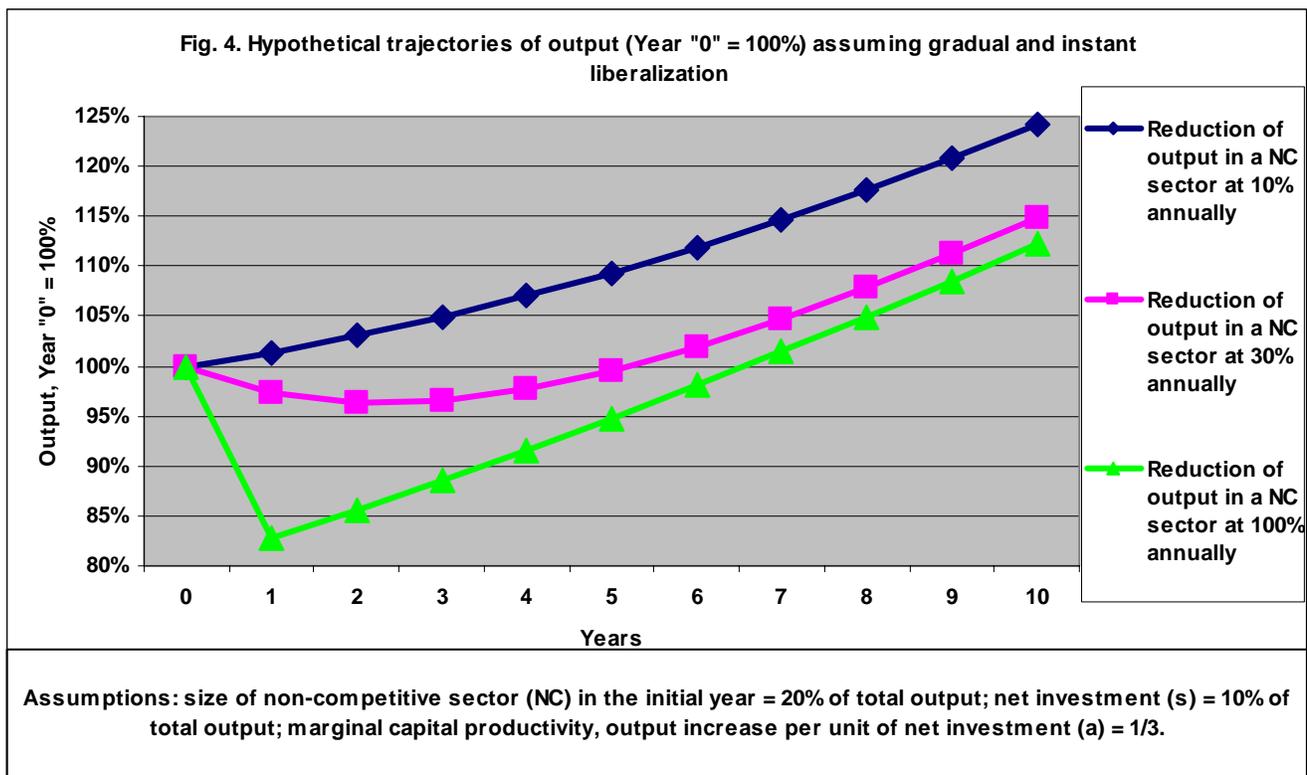
[6] Total output consists of output of competitive and non-competitive sectors: $Y_n = (Y_n^C + Y_n^{NC})$ and is equal to 1 or 100% in the initial year. Output in the non-competitive sector in the year n, Y_n^{NC}, is equal to the share of the non-competitive sector in total output in the initial year, NC, multiplied by $(1-\alpha)^n$, where α is the rate of reduction of output in the non-competitive sector determined by the speed of deregulation: $Y_n^{NC} = (1-\alpha)^n * NC$. Output in the competitive sector in the year n is equal to the output of the preceding year, Y_{n-1}^C, plus the increase in output equal to

If reforms are carried out instantly, then output in the unprofitable sector, accounting, say, for 20% of total output, falls immediately and savings for investment are generated only by the competitive sector, so that it takes 7 years to reach the pre-recession level of output. However, assume that reforms are carried out slowly (gradual price deregulation or elimination of tariffs/subsidies), so that every year output in the non-competitive sector falls by 30%. In this case transformational recession is milder, total output recovers by the 5th year

The best trajectory, of course, is the one with such a speed of deregulation that leads to the reduction of output in the non-competitive sector at a natural rate, i.e. as its fixed capital stock retires in the absence of new investment. If the retirement rate of fixed assets in the non-competitive sector is 10%, so that output there falls by 10% annually, there would be no reduction of output at all. On the contrary, growth rates would increase constantly approaching the steady state 3.4% annually by the year 25. The slower rate of deregulation implying a more gradual output reduction in the non-competitive industries would require some investment into supporting capital stock and output in the non-competitive sector. This is clearly a sub-optimal option (if the goal is to achieve highest productivity) since productivity of this investment in non-competitive sector is lower than elsewhere by definition. However, it allows to employ to slow down the speed of restructuring (reallocation of labor force).

The example illustrates that there is a limit to the speed of reallocating capital from non-competitive to competitive industries, which is determined basically by the net investment/GDP ratio (gross investment minus retirement of capital stock in the competitive industries, since in non-competitive industries the retiring capital stock should not be replaced anyway). It is not reasonable to wipe away output in non-competitive industries faster than capital is being transferred to more efficient industries. If there are other factors of production (labor) that can be transferred faster than capital, there is a trade-off between using labor in non-competitive industries, but with high capital/labor ratios, and transferring this same labor to competitive industries, but without much capital (low capital/labor ratios) for the time being. But the same logic that applies to physical capital could be applied to human capital as well.

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marginal capital productivity, a, multiplied by the share of net investment in GDP, s, multiplied by total output:

$Y_n^C = Y_{n-1}^C + a*s*(Y_n^C + Y_n^{NC})$. Solving for total output, we get: $Y_n = \dfrac{Y_{n-1}^C + (1-\alpha)^n * NC}{1 - as}$.

Market type reforms in many post-communist economies created exactly this kind of a bottleneck. Countries that followed shock therapy path found themselves in a supply-side recession that is likely to become a textbook example: an excessive speed of change in relative prices required the magnitude of restructuring that was simply non-achievable with the limited pool of investment. Up to half of their economies was made non-competitive overnight, output in these non-competitive industries was falling for several years and fell in some cases to virtually zero, whereas the growth of output in competitive industries was constrained, among other factors, by the limited investment potential and was not enough to compensate for the output loss in the inefficient sectors (Popov, 2000)[7].

Hence, at least one general conclusion from the study of the experience of transition economies appears to be relevant for the reform process in all countries: *provided that reforms create a need for restructuring (reallocation of resources), the speed of reforms should be such that the magnitude of required restructuring does not exceed the investment potential of the economy*. In short, the speed of adjustment and restructuring in every economy is limited, if only due to the limited investment potential needed to reallocate capital stock. This is the main rationale for gradual, rather than instant, phasing out of tariff and non-tariff barriers, of subsidies and other forms of government support of particular sectors (it took nearly 10 years for the European Economic Community or for NAFTA to abolish tariffs). This is a powerful argument against shock therapy, especially when reforms involved result in a sizable reallocation of resources. For Western countries with low trade barriers, low subsidies, low degree of price controls, etc. even fast, radical reforms are not likely to require restructuring that would exceed the limit of investment potential. But for less developed countries with a lot of distortions in their economies supported by explicit and implicit subsidies, fast removal of these subsidies could easily result in such a need for restructuring that is beyond the ability of the economy due to investment and other constraints.

However, such a reduction of output due to the inability of the economy to adjust rapidly to new price ratios is by no means inevitable, if the deregulation of prices proceeds gradually (or if

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[7] The problem is still there for many transition economies, since many domestic price ratios are quite different from those of the world market. Fuel and energy prices, for instance, in most cases are still way below the world market prices. To cite one example, in Russia electricity tariffs at the end of the 1990s were about 1 US cent per kw-h, whereas in Western and even in Central European countries they amounted to 10 cents (EBRD, 2001). Meanwhile, the 3rd most important Russian export commodity (after oil and gas) was extremely energy intensive aluminum, produced out of largely imported bauxite. If Russian electric energy prices are increased to the world level instantly, investment required

losses from deteriorating terms of trade for most affected industries are compensated by subsidies). The pace of liberalization had to be no faster than the ability of the economy to move resources from non-competitive (under the new market price ratios) to competitive industries.

Therefore, it should be expected that regression analysis would reveal the negative relationship between performance and the speed of liberalization at the stage of the reduction of output and the positive impact of liberalization on performance at the stage of recovery. It should be also expected that the larger magnitude of distortions in industrial structure and trade patterns would lead to the greater reduction of output during the transformational recession, but would not have much of an impact on performance during the recovery stage (after the noncompetitive sector would be shut down completely). In both cases – at the recession stage and in the recovery period – the institutional capacity and the quality of macroeconomic policy should be expected to have a positive impact on performance.

3. The data

The description of the data and the sources is in table 2 that is largely self-explanatory. There is one issue though that deserves a closer scrutiny – the criteria for distinguishing between the recession and recovery periods.

In FSU states (fig. 1) recession started in most cases in 1990 (for Latvia, Kyrgyzstan, Turkmenistan and Uzbekistan – in 1991), whereas the bottom of the recession was reached in 1993-95 in some countries (Armenia, Belarus, Estonia, Georgia, Latvia, Lithuania, Uzbekistan), but more often later – in 1996-99 (Moldova and Ukraine were the last countries to bottom out in 1999). So, in fact recession lasted from 3 to 10 years. In East European countries similar variations are observed (fig. 5): recession lasted 2 years in Poland (1990-91), 3-4 years in other Central European countries, 5 years in the Baltic states, 8 and 10 years respectively in Bulgaria and Romania. China and Vietnam did not experience any recession – their growth rates for the period of reforms were always positive, whereas in Mongolia recession bottomed out in 1993, like in most East European countries.

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to create jobs just for the workers of going out of business aluminum smelters and other energy intensive enterprises may exceed the meager investment potential of the whole national economy.
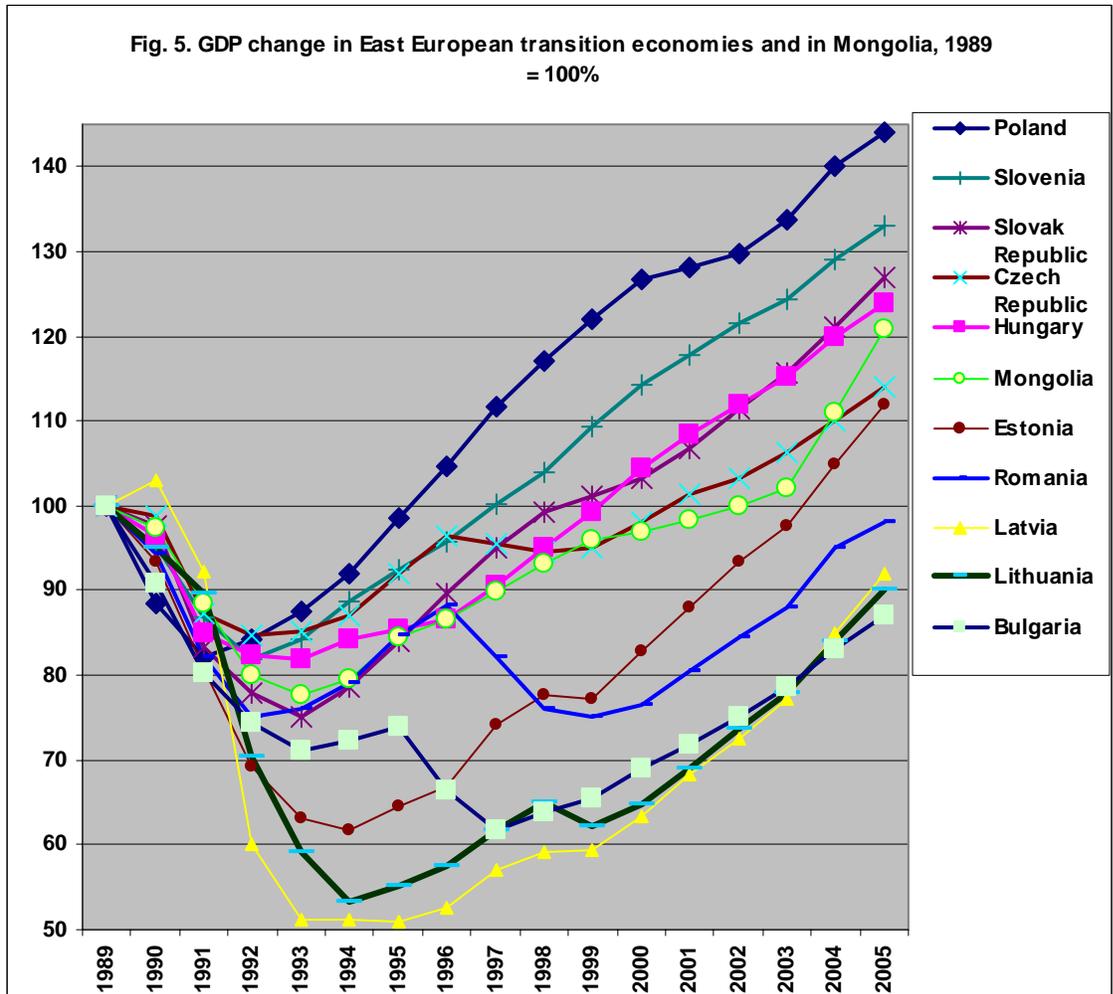
Table 2. Description of the data and sources (indicators for China are always for the period 10 years earlier)

Indicator	Comments	Sources
Real GDP change	Recession – 1989-96; Recovery 1995-2003	EBRD (Transition Reports)
Pre-transition distortions	Differences in industrial and external trade structure between centrally planned and market economies	Data and explanations are in Popov (2000)
PPP GDP per capita in 1987		(De Melo, Denizer, Gelb, 1996)
War dummy	Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries	
FSU dummy	Equals 1 for 15 FSU countries and 0 for all other countries	
Decline in government revenues as a % of GDP from 1989-91 to 1993-96	Difference between the average share of government revenues in GDP in 1989-91 and this same average share in 1993-96, p.p.	EBRD Transition Reports for FSU and EE countries, Asian Development Bank for China (adjusted as explained in Popov, 2000), Mongolia, Vietnam
Increase in the share of shadow economy in GDP in 1989-94, p.p.	Estimates based on electricity consumption – conservative elasticity scenario	Kaufmann and Kaliberda (1996)
Rule of law index, average for 1989-97, %	The rule of law index is taken from the International Country Risk Guide and calibrated, so that 100% corresponds to the highest possible rule of law.	(Campos, 2000; International Country Risk Guide)
Democracy index, average for 1990-98, %	The democracy index is the average of Freedom House political rights index for 1990-98, but inverted and calibrated, so that complete democracy coincides with 100%, whereas complete authoritarianism with 0%.	Freedom House (http://www.freedomhouse.org/rankings.pdf)
Cumulative economic liberalization index by 1995[8]	Experts' estimate of the level of liberalization achieved by 1995 on a 1 to 4.5 scale (highest liberalization – 4.5 – is in OECD countries)	De Melo et al. (1996)
Increase in economic liberalization index in 1995-2003	The level of index in 2003 minus it's level in 1995 (negative sign indicates strengthening of regulations)	EBRD Transition Reports; conservative estimates for China, Vietnam, Mongolia

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[8] This liberalization index is constructed as explained earlier in De Melo et al. (1996) as the sum of liberalization "flows" for 6 years (1989-94 for all countries, except China, for which the period in 1979-84). Assuming that before transition the level of liberalization in communist economies was negligible, the 1995 liberalization index can be interpreted as the cumulative "stock" of liberalization by 1995 or as the total "flow" of liberalization in the first six years of reforms.

Annual average inflation in 1990-95	Log (inflation, % a year, 1990-95, geometric average)	World Development Indicators

FIG. 5

Fig. 5. GDP change in East European transition economies and in Mongolia, 1989 = 100%

To make things even more complicated, in some countries there were interruptions of growth after the recession seem to have ended. Romania and Bulgaria that experienced currency crises are most notable examples (fig. 5), but similar interruptions occurred in Czech Republic in 1997-99, in Estonia and Lithuania, Kazakhstan and Russia in 1998. (fig. 5). In most, if not all cases, these growth reversals were caused by poor macroeconomic policy (exchange rate overvaluation) before and during the East Asian (1997) and Russian (1998) currency crisis. These episodes can hardly be treated as the continuation of transformational recession. Considering these reversals as the 'ordinary" (non-transformational) recessions, the average (unweighted) year for the end of

recession for 26 countries that experienced downturns associated with deregulation of prices (excluding China and Vietnam) is between 1995 and 1996.

Most authors, while explaining the comparative performance of transition economies, use the most transparent and conventional measure – GDP in the recent year as compared to the pre-recession period (1989 or 1990). There was an attempt to account not only for the varying depth, but also for the different length of the recession by computing the integral loss of output (World Bank, 1996), but this measure was never widely accepted. My own calculations (Popov, 1998) show that the cumulative decline in output (from peak to trough), computed as the sum of non-discounted deviations of output for every single year of recession in 1989-96 period from 1989 level, is very correlated with the conventional measure of performance – 1996 GDP as a % of 1989 GDP (fig. 6)[9].

FIG. 6

Fig. 6. Cumulative GDP loss from peak to trough (%) and 1996 GDP as a % of 1989
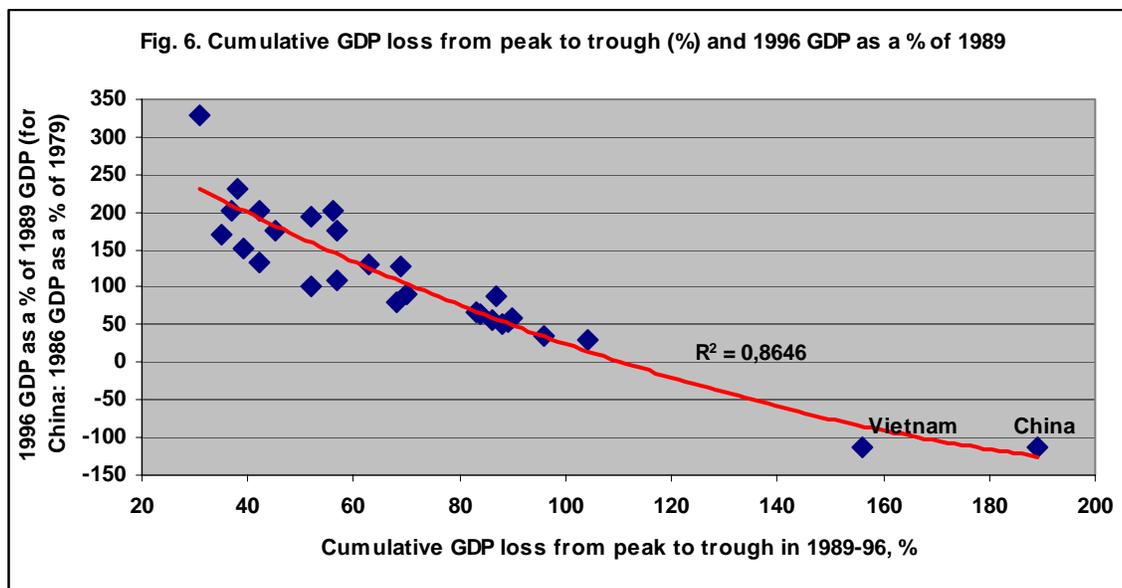
In view of the above, both measures of the magnitude of recession were used in regressions for 1989-96 period, and it turned out that there are no any major differences in signs and statistical significance of explanatory variables. So, for this paper 1996 was chosen as the year of the bottom of the recession for 1989-96 regressions (to capture the declines in output in FSU states). In turn,

1995 was selected as the year that immediately preceded recovery (to capture the new declines in output that occurred in Czech Republic and Bulgaria in 1996-99 and that were caused most probably by macroeconomic mismanagement, so cannot be treated as the continuation of the transformational recession). To test the robustness of results, the alternative year – 1998 – was chosen as the year of the trough and all regressions were recalculated for the periods of 1989-98 (recession) and 1998-2005 (recovery) – the results were virtually unchanged (see section 1 and Appendix).

It remains to be said that all indicators for China are for the period of 10 years earlier (1979-86) because the market oriented reforms started in this country in 1979[10]. This approach, however, is also not crucial: Chinese growth was rather even since 1979, so the major results stand, no matter what period is chosen for China. On top of that, if China and Vietnam are excluded from the regressions, the goodness of fit and statistical significance of explanatory variables usually improves. This suggests that there are other factors (export oriented industrial policy, probably) that contributed to rapid growth of these Asian transition economies and that are not accounted for in regressions, which is a separate story, of course (Polterovich, Popov, 2002; 2004). The point to make here, however, is that the regression results reported in this paper are quite robust to the timing of transformational recession and subsequent recovery, as well as to the inclusion/exclusions of observations on China and Vietnam.

4. Post-recession recovery

Factors that determine performance in the recovery period, i.e. after the transformational recession is over, are somewhat different from the factors affecting performance during transformational recession. First, cumulative levels of liberalization achieved by 1995 appear to play a positive role at the initial stage of recovery, 1994-98 (fig. 7). At the subsequent stages the level of cumulative liberalization achieved by the mid 1990s does not seem to be important (fig.8), but the progress in liberalization (increase in its level during recovery) appears to affect performance positively (fig. 9). This result is confirmed by the regression analysis (table 3) – in

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[9] The cumulative decline of output for many countries is higher than 100% because the output losses for a number of years are summed up. For China and Vietnam the cumulative decline in output is negative, i.e. should be interpreted as cumulative gain in GDP for the period.

most specifications the increase of liberalization during the recovery, in 1995-2005, has a positive and significant effect on economic growth (although the *level* of liberalization by the mid 1990s is either insignificant or affects growth negatively[11]).

FIG. 7

Fig. 7. Liberalization index by 1995 and performance in 1994-98

FIG. 8

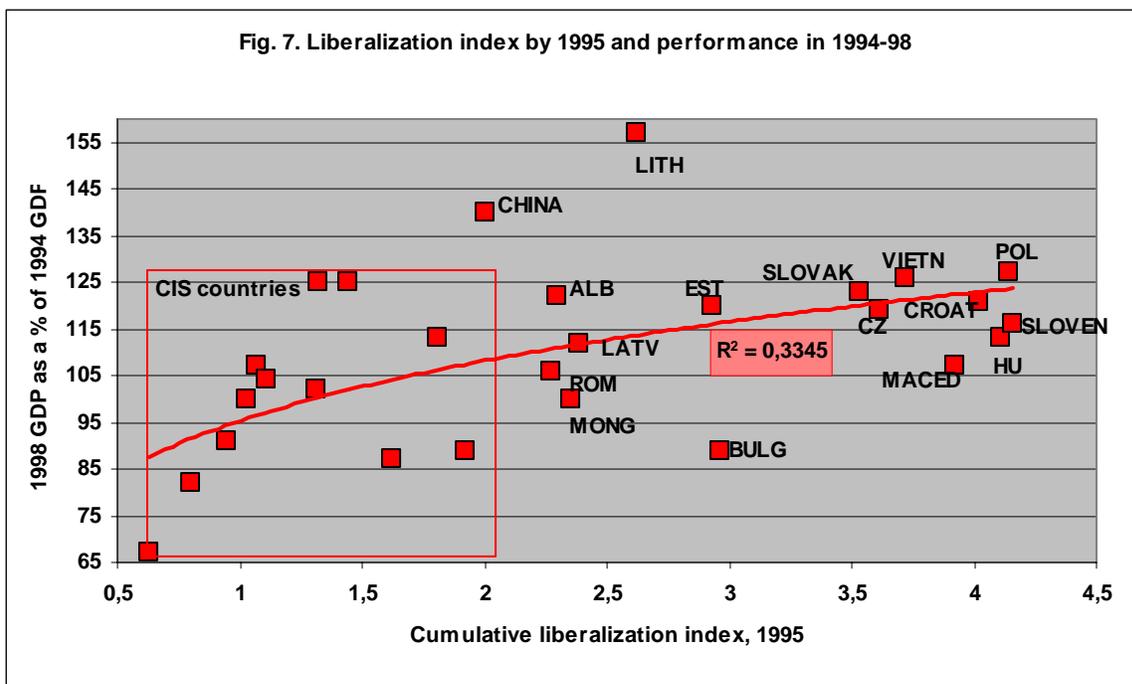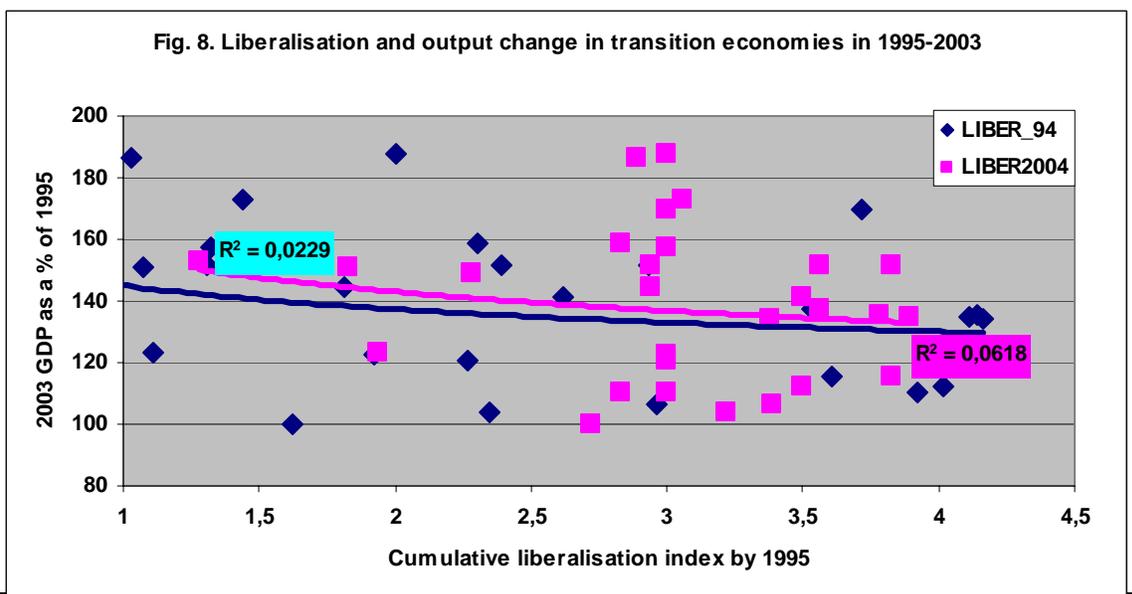Fig. 8. Liberalisation and output change in transition economies in 1995-2003

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[10] In Vietnam economic reforms started in 1986 ("don moi" course), they resembled very much Gorbachev type marginal reforms in the same period, and it was not until 1989 that most prices were deregulated that caused some reduction of output in non-oil industry, but not in other sectors, so GDP growth rates did not decline.

FIG. 9

Fig. 9. Liberalisation increase and output change in transition economies in 1995-2003
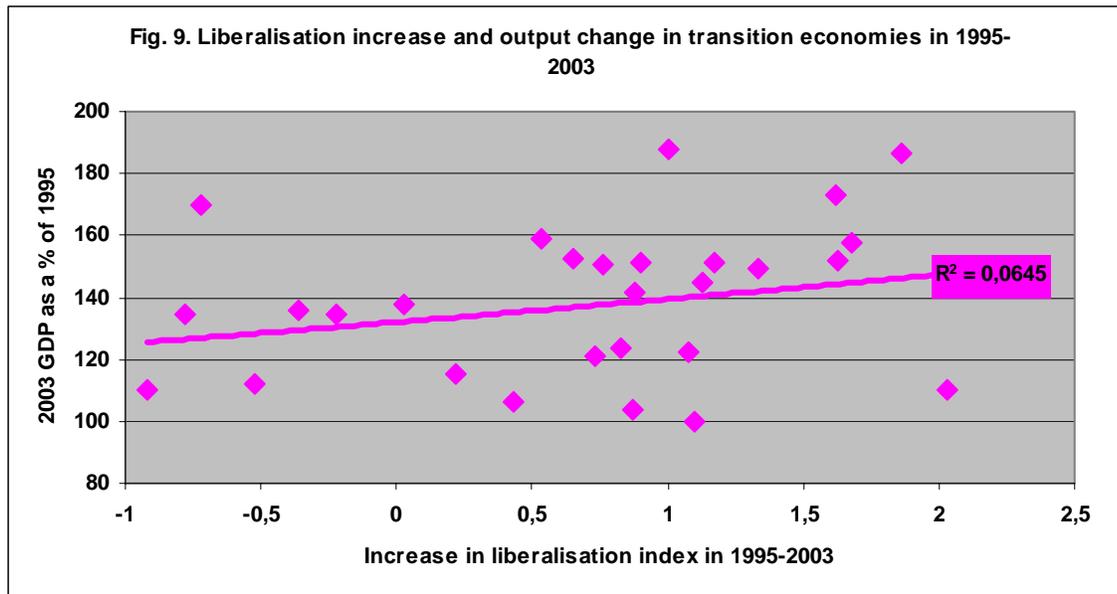
Second, pre-transition distortions and pre-transition level of GDP per capita do not play any significant role in explaining performance in the recovery period – the coefficients of these variables are not statistically significant in any of the specifications[12]. The war dummy variable is always significant, but acquires a positive sign (unlike for the recession period, when it was negative) suggesting that countries that suffered from wars in the first part of the 1990s recovered faster in the second half of the decade benefiting from the effects of post-war reconstruction.

And finally, third, indicators that determine institutional capacity, such as the rule of law index (positively), the decline in the ratio of government revenues in GDP and democratization (negatively), continue to affect performance during recovery in the same way they affected performance during the transformational recession.

These results are very consistent with intuition and previous explanations. During the transformational recession the reduction of output was determined by the magnitude of the pre-transition distortions and by the collapse of institutions, whereas the speed of liberalization did not have any significant impact on performance. In, the impact of the speed of liberalization was very

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[11] The level of the liberalization by 1995 is negatively correlated with the increase of the liberalization index in 1995-2003, so both indices cannot be included into the same regression (when both are included, one or both become insignificant).

[12] This is consistent with the result obtained in (Popov, 2000) and Godoy and Stiglitz (2004).

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likely negative, if any – rapid deregulation of prices caused an adverse supply shock that was beyond the ability of the economy to reallocate resources. The reason, why this negative impact of immediate deregulation of prices does not show up in regressions is that indices of liberalization only partially reflect the speed of price deregulation and, besides, there was in fact only one country (China) that carried out price deregulation gradually via the dual track price system. The other possible reason is the endogeneity of liberalization variable – the issue is dealt with in the next section.

Table 3. Regression of change in GDP in 1995-2005 on initial conditions, institutional capacity, liberalization and rule of law and democracy indices, robust estimates
Dependent variable = 2005 GDP as a % of 1995 GDP
For China - all indicators are for the period of 1979-86 or similar

Equations, Number of Observations / Variables	1, N=28	2, N=28	3, N=28	4, N=28	5, N=28	6, N=28
Constant	114***	90***	113***	150***	74***	102***
1996 GDP as a % of 1989 GDP	.39***	.59***	.58***		.33**	
War dummy[a]		38.1***	64.8.4***	41.8**	49.8***	32.5**
Liberalization index in 1995			-30.4***	-25.3***		
Increase in the liberalization index in 1995-2003	26.0 ***	28.3***			29.4 ***	29.4***
Decline in government revenues as a % of GDP from 1989-91 to 1993-96				-1.13***		-1.03***
Rule of law index, average for 1989-97, %			1.13**	1.86***	1.26***	1.60***
Democracy index, average for 1990-98, %				-.70***	-.73***	-.99***
Adjusted R^2, %	30	48	52	56	60	63

*, **, *** - Significant at 1, 5 and 10% level respectively.
[a]Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries.

During the recovery stage, after the inefficient enterprises were shut down in the course of the transformational recession, the pre-transition distortions do not affect performance any longer, but liberalization increases start to matter and to pay off. Controlling for the country effects via introducing the indicator of previous performance (GDP change in 1989-96), we get positive correlation between increases in liberalization and performance in 1995-2005. This result is fully consistent with theory (marketization dividend), but it is observed only at the stage of recovery, when the decline of the inefficient sectors of the economy comes to a halt.

And the impact of institutional capacity of the state on performance is the same at both stages – during transformational recession and during the post-recession recovery. Democratization without rule of law undermines institutional capacity, which has a devastating impact on output (Polterovich, Popov, 2005). This mechanism of the weakening of the institutional capacity in illiberal democracies is only partly associated with the reduction of the size of the state, i.e. decline in the share of state revenues in GDP. The other part of the process is the decrease in the efficiency of the provision of the public goods – even controlling for the decline in the ratio of state revenues to GDP, the positive impact of rule of law on growth and the negative impact of democratization persists.

To test the robustness, another dependent variable was used – GDP in 2003 as a % of 1995 (because at the time of writing 2005 GDP figures were still preliminary, whereas 2004 figures were expected to be revised). The results however were virtually unchanged – in all regressions statistical significance of the independent variables remained high. Another robustness test – the use of 1998 as the year of the beginning of the recovery: by this time all countries, except Moldova and Romania, reached the absolute bottom of output for 1898-5005 period. The difference in this case is that the control variable for the output change during the recession period (1989-96) becomes insignificant and the significance of the war dummy variable falls to 10% level. The equation 5 from table 3, for instance, takes the following form:

$$Y2005/98 = 118.48 + 17.9WAR - .068DEM + 0.82RULEofLAW + 20.95LIBER$$
$$(6.77) \quad (1.75) \quad (-3.96) \quad (2.44) \quad (4.43)$$

N=28, Adjusted R^2 = 58%, T-statistics in brackets.

5. Dealing with the endogeneity

Many authors (Heybey, Murrell, 1999; Krueger, Ciolko, 1998; Denizer, Gelb, De Melo, Tenev, 2001; Godoy, Stiglitz, 2004) have pointed out to the endogeneity of liberalization variable: not only performance is explained by the speed of liberalization, but also liberalization itself is a function of performance (if performance is poor, it is more difficult for the government to push market reforms further). Krueger and Ciolko (1998) demonstrated through constructing the instrumental variable (by linking liberalization to initial conditions specified only as the pre-

transition share of exports in GDP) that the hypothesis of the endogeneity of the liberalization variable cannot be rejected. The worse initial conditions for transformation, the greater the probability of the deep transformational recession, and hence the more likely delays in liberalization. Godoy and Stiglitz (2004) examined the impact of the speed of privatization variable on performance: they instrumented this variable using the variables of pre-transition distortions from Popov (2000) and other measures of initial conditions and concluded that, after controlling for the *level* of privatization, the *speed* (increment) of privatization adversely affected growth in the 1990s.

If there is endogeneity in the regressions presented in previous sections, the estimates cannot be considered correct, so it is necessary to resort to 2SLS estimation. Thus, first, the impact of liberalization on performance during recession (1989-96) is examined, and later – the impact of the level and change in liberalization indices on performance during recovery (1995-2003) is analyzed. Liberalization index in 1995 is strongly correlated with the level of democracy in 1990-98 (R=60%), while the level of democracy itself is not correlated with GDP growth in 1989-96 (R=5%), so liberalization can be instrumented with the democracy level variable. Economic interpretation of this correlation is rather obvious – it is well established that market type reforms went hand in hand with democratic reforms in post-communist countries (EBRD, 1999, chapter 5). The results are presented in table 4, where the rule of law and democracy indices are used separately (so that the liberalization index can be instrumented with the democracy level variable). In addition to the rule of law index, the indicator of the increase in the share of shadow economy is used to account for the decline in the institutional capacity of the state. This is the objective measure of state capacity defined as the ability of the government to enforce rules and regulations[13].

The new result here is that the coefficient of liberalization level in 1995 is negative and statistically significant in most specifications: the more liberalized was the economy by 1995, the larger was the reduction of GDP in 1989-96, during the transformational recession. This result is different from the previous regressions: when liberalization variable was not instrumented, it turned out to be insignificant.

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[13] The number of observations in this case is only 17 (lack of data on shadow economy). Because the increase in the share shadow economy is strongly correlated with the decline in the ratio of government revenues to GDP (Popov, 2000) these two indicators are included into the right hand side of the equation separately (to avoid multicolinearity).

Table 4. 2SLS robust estimates – regression of change in GDP in 1989-96 on initial conditions, institutional capacity, liberalization and rule of law and democracy indices (Liberalization index instrumented with the democracy level variable)
Dependent variable = Log (1996 GDP as a % of 1989 GDP)
For China - all indicators are for the period of 1979-86 or similar

Equations, Number of Observations / Variables	1, N=28	2, N=28	3, N=17	4, N=17
Constant	6.4***	6.3***	6.0***	6.0***
Pre-transition distortions, % of GDP	-.01***	-.02***		-.004
1987 PPP GDP per capita, % of the US level	-.007**	-.01***		
War dummy[a]	-.45***	-.29[b]		
Liberalization index in 1995	-.18**	-.39*	-.19***	-.19***
Decline in government revenues as a % of GDP from 1989-91 to 1993-96	-.02***	-.02***		
Log (Inflation, % a year, 1990-95, geometric average)	-1.7***	-.22***	-.22***	-.19***
Rule of law index, average for 1989-97, %		-.01[c]		
Increase in the share of shadow economy in GDP in 1989-94, p.p.			-.02***	-.015***
R^2, %	86	77	88	90

*, **, *** - significant at 1, 5 and 10% level respectively.

[a] Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries.

[b] Significant at 12% level.

[c] Significant at 16% level.

Choosing another year for the end of the recession, 1998, and considering the period of 1989-98, the results (R^2 and T-statistics) worsen somewhat, but still hold. The first equation from table 4 takes the form:

Log(Y98/89) = 6.76 - .41WAR – .01DIST - .02GOVREVdecline - .23Log(INFL) - .253LIBER
$\quad\quad\quad$ (11.51) $\quad$ (-3.23) $\quad\quad$ (-2.58) $\quad\quad\quad\quad$ (-3.11) $\quad\quad\quad\quad$ (-6.27) $\quad\quad\quad$ (-2.26)
Liberalisation index by 1995 is instrumented with the democracy index variable.
N=28, R^2 = 69%, T-statistics in brackets.

Equation 3 from table 4 takes the following form:

Log(Y98/89) = 6.14 - .015SHADecon - .23Log(INFL) - .21LIBER
$\quad\quad\quad$ (13.62) $\quad$ (-3.36) $\quad\quad\quad\quad$ (-4.06) $\quad\quad\quad$ (-2.30)
Liberalisation index by 1995 is instrumented with the democracy index variable.
N=17, R^2 = 78%, T-statistics in brackets.

If distortions variable is added to the to this equation, it turns out to be insignificant (the farther away the year of the bottom of the recession is moved, the more insignificant it is), but the

variable characterizing the decline in government revenues in the beginning of the 1990s is significant even together with the shadow economy indicator:

$Log(Y98/89) = 6.02 - .012SHADecon - .014GOVREVdecline - .21Log(INFL) - .18LIBER$

$\quad\quad\quad\quad\quad$ (14.94) $\quad$ (-2.95) $\quad\quad\quad\quad$ (-1.75) $\quad\quad\quad\quad\quad\quad$ (-3.93) $\quad\quad\quad\quad$ (-2.21)

Liberalisation index by 1995 is instrumented with the democracy index variable,

(N=17, R^2=87%, T-statistics in brackets).

On the contrary, for the recovery period, instrumentation of the liberalization variable does not lead to different conclusions, but only strengthens previously obtained results. Here it is the *increase* in liberalization during the recovery that needs to be instrumented, because the *level* of the liberalization in 1995, before the recovery, becomes just one of the initial conditions.

Two variables are good candidates for the instruments – the FSU dummy (membership in the former Soviet Union) and the preceding level of liberalization, i.e. liberalization in 1995. Both variables are strongly correlated with increase in liberalization in 1995-2003 (R is equal to 0.76 and -0.86 respectively), but not correlated with the GDP change in 1995-2003 (R is 0.24 and -0.28), so they could be used as an instruments for the change in the liberalization index in 1995-2003. The economic interpretation of this correlation is that countries of the former Soviet Union in general liberalized their economies more slowly than other (East European) transition economies, so that liberalization index by 1995 was rather low and the bulk of liberalization occurred later than in EE countries, i.e. in 1995-2003; besides, the more liberalized were transition economies by 1995, the shorter was part of the road to achieve full liberalization, so the relationship between liberalization stock by 1995 and subsequent liberalization increment is, as expected, negative. The results are in table 5 and are no different from those reported in table 3, describing regressions without the instrumentation of liberalization change variable: in fact, the coefficient of instrumented liberalization change variable is higher and no less significant than without instrumentation.

To test the robustness, another periods for the economic recovery were selected (1995-2005 and 1998-2005, figures for 2005 are preliminary). The results are even stronger than before – R^2 and T-statistics are generally better even without the control variable that was used previously – GDP change in 1989-96 (this latter variable becomes insignificant). For the 1998-2005 period the variable characterizing the decline in government revenues becomes insignificant as well and the

significance of war dummy variable declines (from 5 to 10% level in most regressions). These results are reported in table 6.

Table 5. 2SLS robust estimates – regression of change in GDP in 1995-2003 on initial conditions, institutional capacity, liberalization and rule of law and democracy indices
Dependent variable = 2003 GDP as a % of 1995 GDP
For China the indicator is for the period 10 years earlier.

Equations, Number of Observations / Variables	1, N=28	2, N=28	3, N=28	4, N = 28
Instruments for liberalization change in 1995-03 variable	LIBER95	FSU	LIBER95 and FSU	LIBER95 and FSU
Constant	97.8***	95.8***	97.7***	79.5***
1996 GDP as a % of 1989 GDP				.18*
War dummy[a]	19.5*	19.8**	19.5*	25.0**
Increase in liberalization index in 1995-2003	18.2***	19.2**	18.3***	22.9***
Decline in government revenues as a % of GDP from 1989-91 to 1993-96	-.76***	-.78**	-.76***	-.65***
Rule of law index, average for 1989-97, %	1.24***	1.28***	1.25***	1.13***
Democracy index, average for 1990-98, %	-.76***	-.76***	-.76***	-.62***
R^2, %	55	54	55	56

*, **, *** - significant at 1, 5 and 10% level respectively.

[a]Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries.

Table 6. 2SLS robust estimates – regression of change in GDP in 1995-2005 on initial conditions, institutional capacity, liberalization and rule of law and democracy indices
For China the indicator is for the period 10 years earlier.

Dependent variable	2005 GDP as a % of 1995			2005 GDP as a % of 1998		
Equations, Number of Observations / Variables	1, N=28	1, N=28	3, N = 28	4, N=28	5, N=28	6, N=28
Instruments for liberalization change in 1995-03 variable	LIBER95	FSU	LIBER95 and FSU	LIBER95	FSU	LIBER95 and FSU
Constant	101.2***	98.6***	101.1***	112.8***	115.1***	112.9***
War dummy[a]	32.6**	32.9**	32.6**	19.3*	18.7*	19.3*
Increase in liberalization index in 1995-2003	29.8***	31.2***	29.9***	23.3***	22.4***	23.3***
Decline in government revenues as a % of GDP from 1989-91 to 1993-96	-1.03***	1.06***	-.1.03***			
Rule of law index, average for 1989-97, %	1.61***	1.65***	1.61***	0.90***	0.87***	0.90***
Democracy index, average for 1990-98, %	-.99***	-1.00***	-.99***	-.70***	-.69***	-.70***

R^2, %		63	63	63	63	64	63

*, **, *** - significant at 1, 5 and 10% level respectively.

^{a}Equals 1 for Armenia, Azerbaijan, Croatia, Georgia, Macedonia, and Tajikistan and 0 for all other countries.

So what needs to be explained is the negative impact of "liberalization stock", accumulated by 1995, on economic performance in 1989-96 – this negative impact becomes visible only when liberalization is instrumented via democracy level indicator, whereas without instrumentation this impact is insignificant. The interpretation of this result is quite straightforward. Liberalization is best explained by the democratization process (it pushes liberalization forward) and pre-transition distortions (large distortions force policy-makers to slow down liberalization because they are afraid of the collapse of output). Democratization pushes liberalization forward too much, even accounting for other factors that influence liberalization, such as the negative impact of pre-transition distortions, so liberalization, inasmuch as it is determined endogenously, has a negative impact on performance. The impact of residual liberalization (i.e. inasmuch as it is *not* determined within the specified model) is positive, but insignificant. Including the residual liberalization into the right hand side of the regression equation is equivalent to including actual liberalization together with democracy variable (see table 1, equation 7 – liberalization impact is positive, but insignificant).

The negative impact of fast liberalization is associated with the rapid decline of the non-competitive industries that is not counterweighed by the rise of competitive sectors. The speed of the transfer of resources from non-competitive to competitive sectors is not infinite, it depends on a flow of new investment, so when fast liberalization creates a need for restructuring that exceeds the investment potential of the economy, there is a general reduction of output – a typical supply-side recession that could have been avoided with slower pace of liberalization.

6. Concluding remarks

Differences in performance during the initial stage of transition (transformational recession) depend strongly on the initial conditions – pre-transition levels of GDP per capita and distortions in industrial structure and external trade patterns. The higher the distortions (militarization, overindustrialization, "under-openness" of the economy and the share of perverted trade flows), the worse the performance as measured by the GDP change. And the higher was GDP per capita before

transition, the greater were distortions embodied in fixed capital stock, the more difficult it was to overcome these distortions (because more investment was needed) to achieve growth.

By focusing on liberalization and macroeconomic stabilization as key policy variables in transition economies the conventional wisdom overlooked the impact of strong institutions. Accounting for uneven initial conditions sheds new light on the relative importance of various policy factors. Macroeconomic stability continues to matter a great deal – the inclusion of the inflation variable improves goodness of fit, but liberalization index in the initial period of transition (during the transformational recession that continued in most countries until mid 1990s) does not appear to be important – the coefficient is not statistically significant and in most cases has unexpected sign. On the contrary, changes in the institutional capacity of the state have dramatic impact on performance. It follows that the debate about the speed of the liberalization (shock therapy versus gradualism) was to a large extent misfocused, whereas the crucial importance of strong institutions for good performance was overlooked.

After allowing for differing initial conditions, it turns out that the fall in output in transition economies was associated mostly with poor business environment, resulting from institutional collapse. Liberalization alone, when it is not complemented with strong institutions, can not ensure good performance. Institutional capacities in turn, depend to a large extent on the combination of the rule of law and democracy: the data seem to suggest that both authoritarian and democratic regimes can have strong rule of law and can deliver efficient institutions, whereas under the weak rule of law authoritarian regimes do a better job in maintaining efficient institutions than democracies. To put it in a shorter form, the record of illiberal democracies in ensuring institutional capacities is the worst, which predictably has a devastating impact on output.

Moreover, the impact of the speed of liberalization at the initial stage of transition, i.e. during the transformational recession, appears to be negative, if any. To the extent the speed of liberalization was endogenous, i.e. inasmuch as it was determined by political economy forces, pushing it forward (like democratization) or holding it back (like pre-transition distortions that could have led to the collapse of output during liberalization and hence frightened policymakers), it turns out that the impact of liberalization was negative, rather than positive. The reason for the negative impact is most probably associated with limited ability of the economy to adjust to new price ratios that emerge after rapid liberalization, and in particular – with investment constraints that

do not allow to transfer rapidly capital stock from inefficient to efficient industries and to compensate the fall in output in non-competitive sectors by the rise in competitive sectors.

To conclude, the process of the collapse of output in transition economies is best described by the supply side recession model, where the key determinants are initial conditions and the strength of institutions, whereas the speed of liberalization, to the extent it was endogenous, i.e. driven by political economy factors, had an adverse effect on performance.

At the recovery stage liberalization starts to affect growth positively, whereas the impact of pre-transition distortions disappears. Institutional capacity and macroeconomic policy continue to be important prerequisites for successful performance. Liberalization, which proceeds much more slowly at the recovery stage (and for some countries is even negative – see fig. 9) influences performance positively because it creates market stimuli without causing rapid collapse of output in inefficient industries, which cannot be compensated fully by the rise of efficient industries due to investment constraints.

To be sure, these factors are not sufficient to explain an "economic miracle", like in China, which remains an outlier in all regressions. Very rapid growth is virtually always associated with the increase in export/GDP ratio, i.e. it is an export-led growth, and it requires export-oriented industrial strategy. The key and most efficient instrument of this export-oriented industrial strategy appears to be undervalued exchange rate that is maintained through accumulation of foreign exchange reserves (Polterovich, Popov, 2002).

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APPENDIX. Determining the year of the end of the recession and the start of the recovery

The determination of the exact date of the trough of the downturn and the start of recovery for all 26 countries that experienced transformational recession (China and Vietnam are excluded from the sample) poses some problems. Assigning a specific trough for each and every country is problematic because the cross-country comparison in this case will ignore the length of recession (which lasted from 2 years in Poland to 10 years in Moldova – see fig. 1A).

Formal methods to determine a single year for all countries give different results. The unweighted average of GDP indices for 26 countries bottoms out in 1994, whereas the parabolic approximation of panel data (GDP by year and by country as a % of 1989 level) determines the year of the bottom of the recession as in between 1996 and 1997[14] (fig. 1A). The use of more sophisticated methods of finding the structural break in the series is also questionable: the choice of any single year will overestimate the length of the recession in some countries and/or underestimate the length of the recession in the other.

Hence, the approach chosen in this paper is to use several alternative years of the end of the recession and the start of the recovery and to show that the results hold, no matter which particular year is chosen. For the recession trough 1996 and 1998 were used, so the periods considered were 1989-96 and 1989-98. The absolute trough was reached before the end of 1994 in 14 countries out of 26, by the end of 1996 – in 21 countries, and by the end of 1998 – in 24 countries. For the start of the recovery the year 1994 was used in the earlier article (Popov, 2000), so the period considered was 1994-98. In the current article the years 1995 and 1998 were assumed to be the start of the recovery and three periods were considered – 1995-2003, 1995-2005 and 1998-2005. The results were generally unchanged, but weakened somewhat when the period of recession was stretched forward by 2 years (from 1989-86 to 1989-98) and when the period of the beginning of recovery was stretched backwards (from 1998 to 1995). The best results were obtained for the recession period 1989-96 and for the recovery period 1998-2005, which is quite consistent with intuition.

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[14] Output = 2110067 + 0.5292629 (YEAR)^2 – 2113.523 (YEAR),
       (11.65)   (11.64)   (-11.64)
N = 442 (17 years and 26 countries), R^2 = 23, T-statistics in brackets.
F.O.C. allow to determine the exact year of the minimum – it is 1996.7.

Fig. 1A. GDP in EE and FSU economies and Mongolia, 1989=100%