# SHOCK THERAPY VERSUS GRADUALISM RECONSIDERED:  LESSONS FROM TRANSITION ECONOMIES AFTER 15 YEARS OF REFORMS
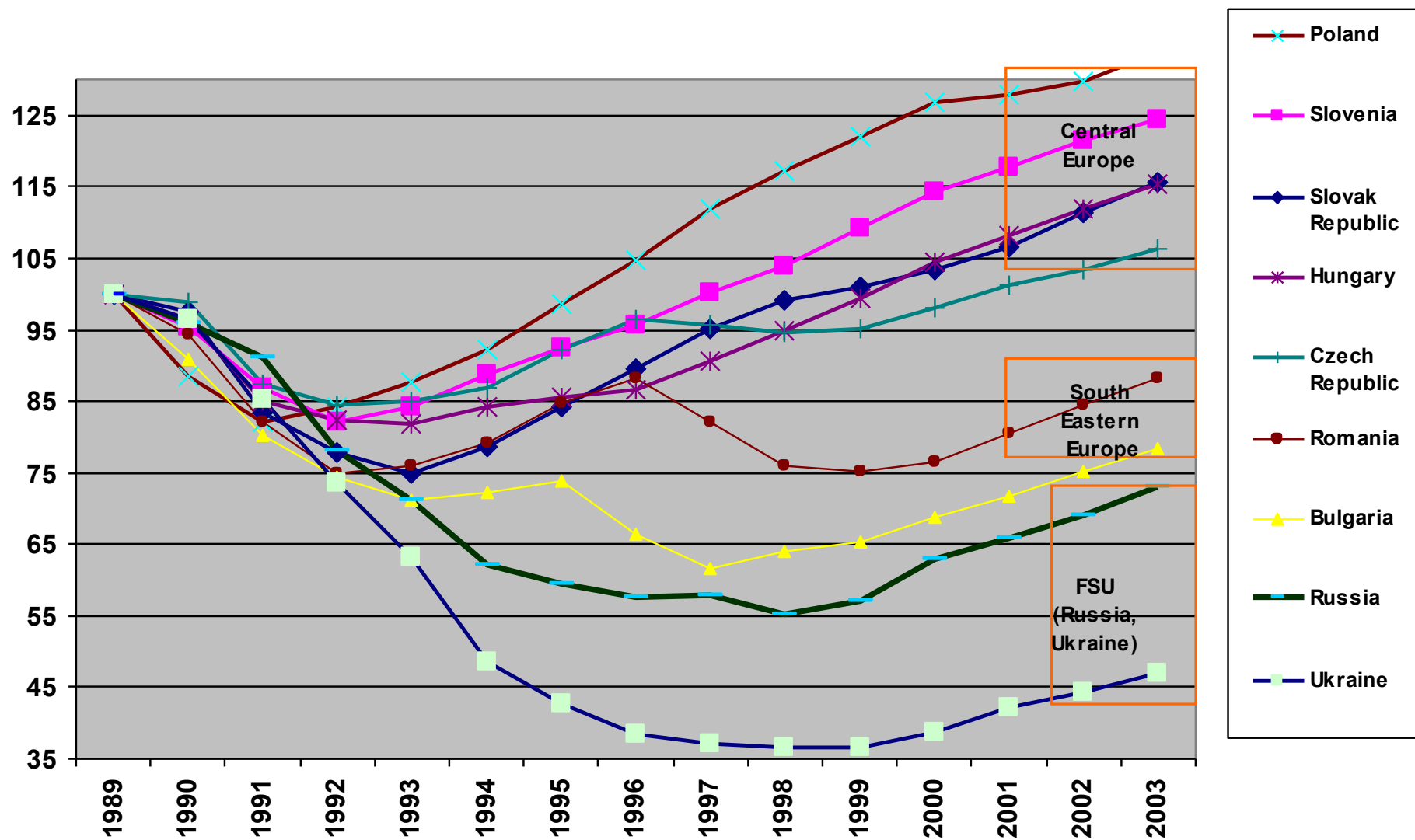
## Vladimir Popov

**This paper is the logical continuation of my earlier article:**

**Shock Therapy versus Gradualism: The End of the Debate (Explaining the Magnitude of the Transformational Recession)**

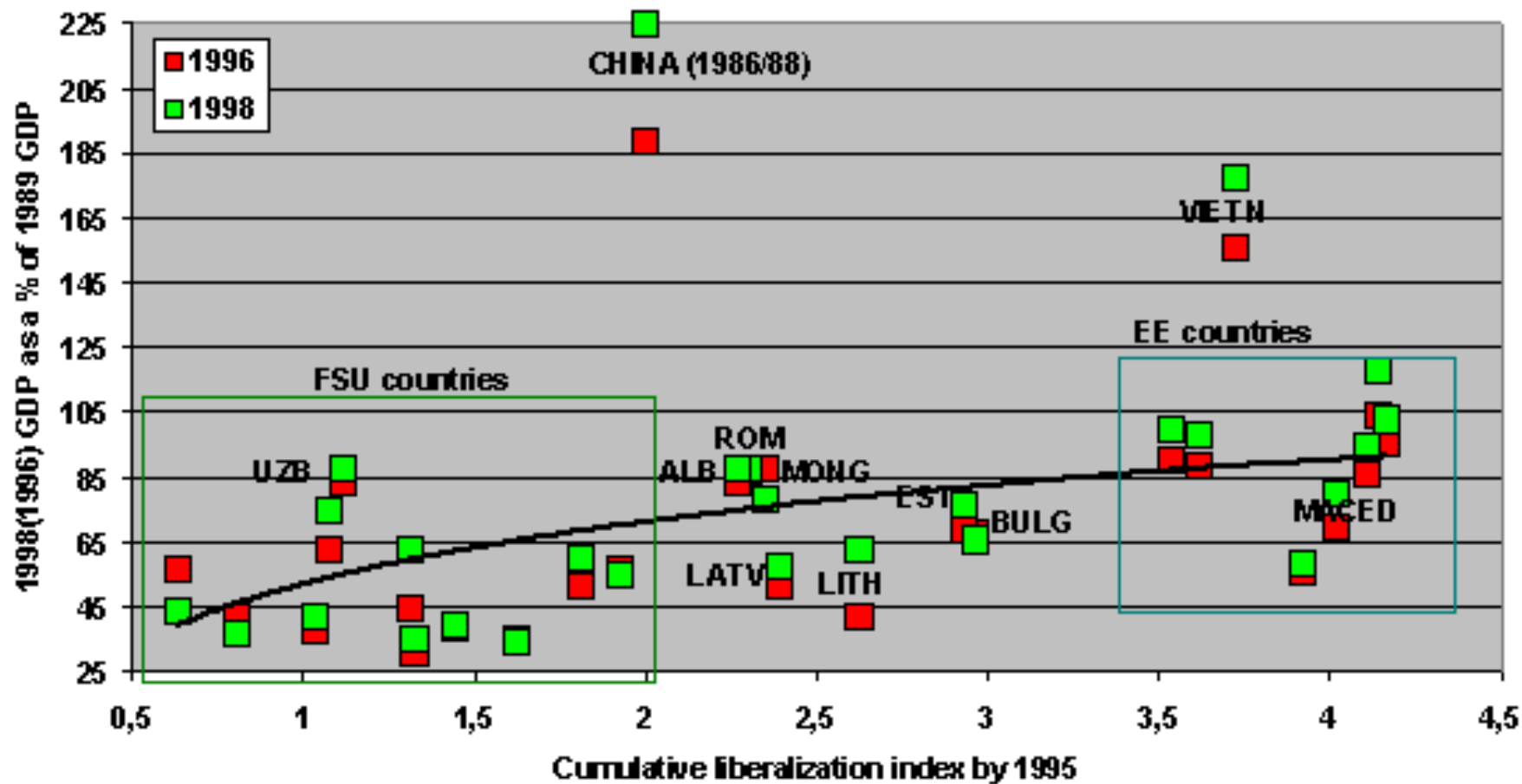*Comparative Economic Studies,* **Vol. 42, No. 1, Spring 2000, pp. 1-57.**

**The arguments of this earlier article, however, are reconsidered in light of new research and evidence.**

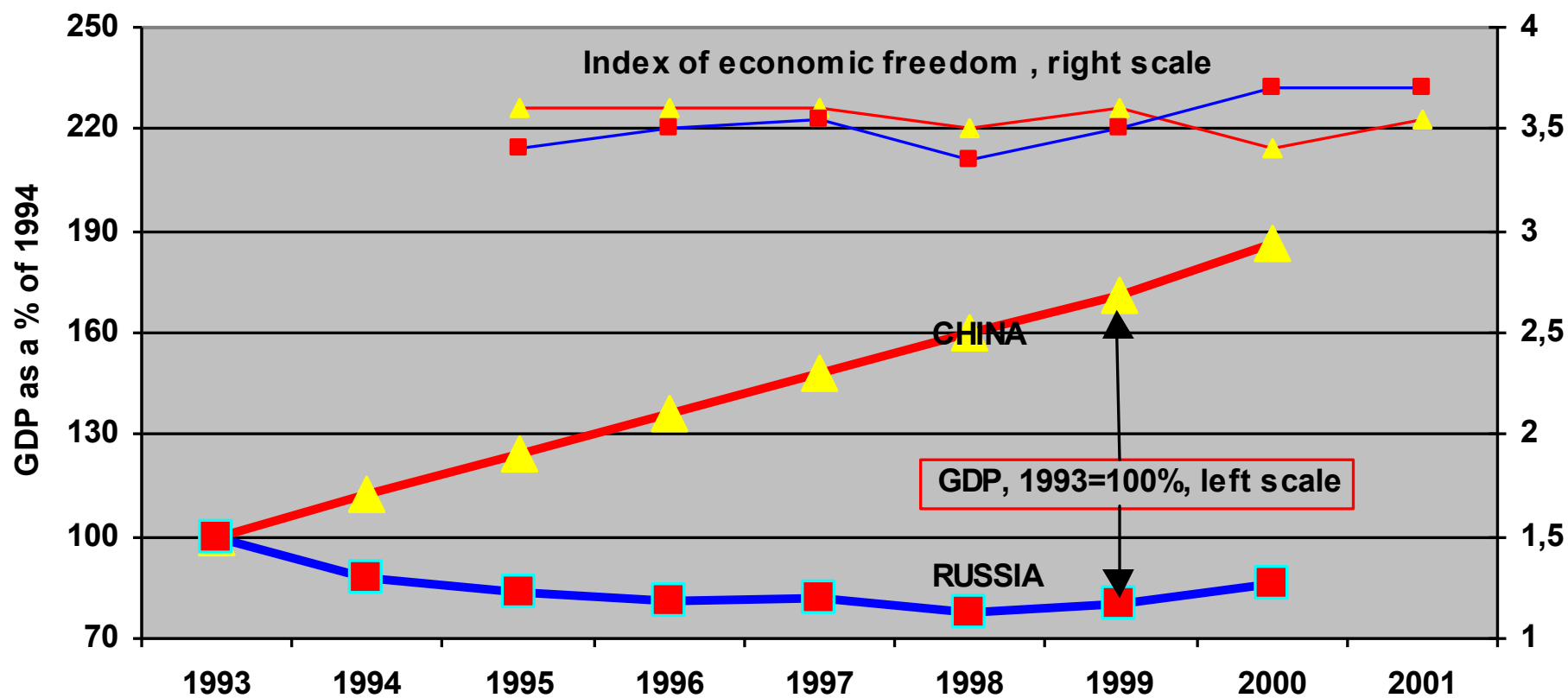# GDP change in selected transition economies, 1989 = 100%

Fig. 2. Liberalization and output change

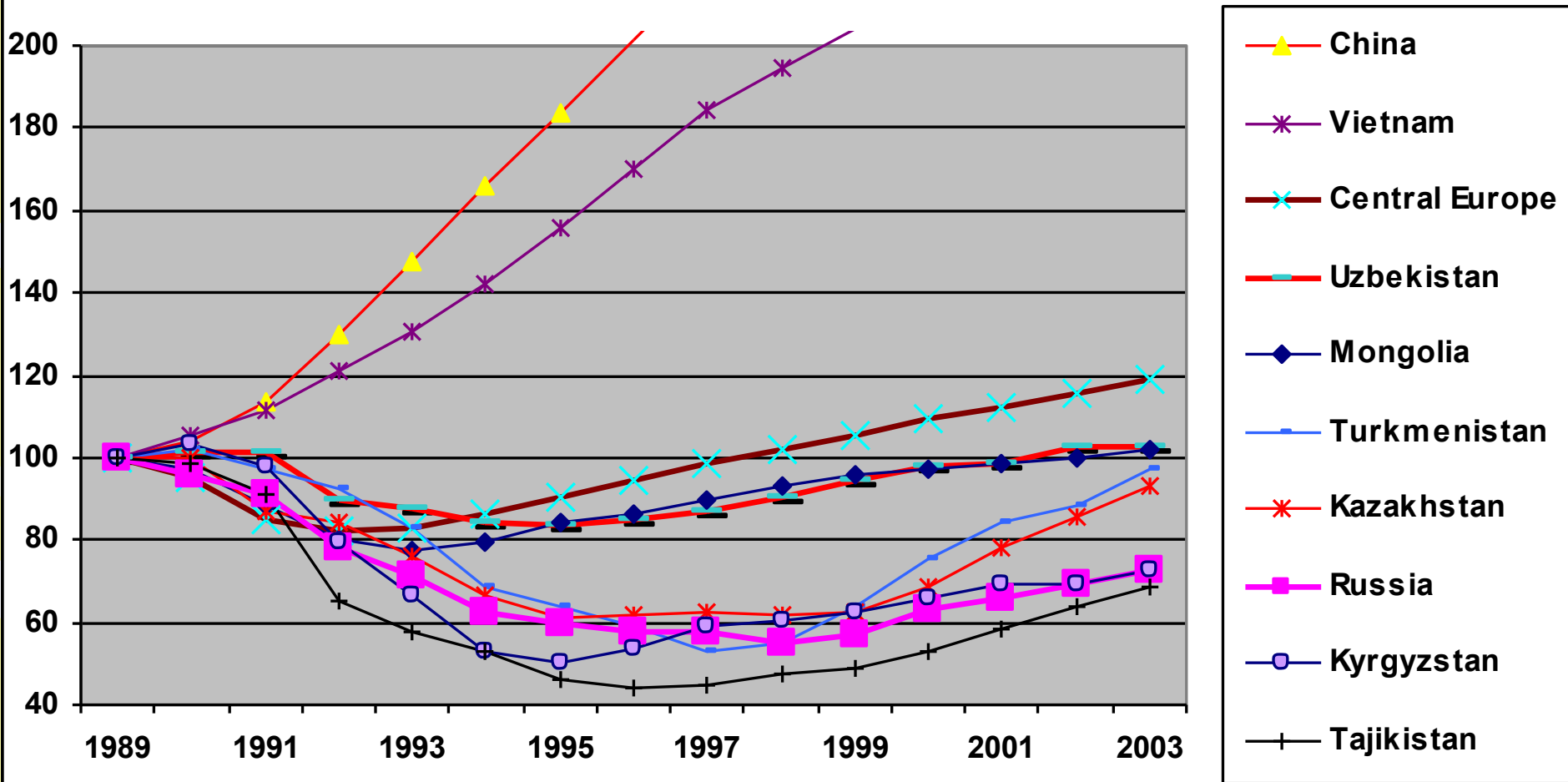# LIBERALISATION AND OUTPUT CHANGE IN CHINA AND RUSSIA



Fig. 3. Indices of economic freedom and GDP growth in Russia and China

# GDP change in Asian economies, 1989 = 100%



Fig. 1b. GDP change in Asian transition economies, 1989 = 100%

Legend:
- China
- Vietnam
- Central Europe
- Uzbekistan
- Mongolia
- Turkmenistan
- Kazakhstan
- Russia
- Kyrgyzstan
- Tajikistan

Source: EBRD, World Bank.

# GDP change in FSU economies, 1989 = 100%



Fig. 2. GDP change in FSU economies, 1989 = 100%
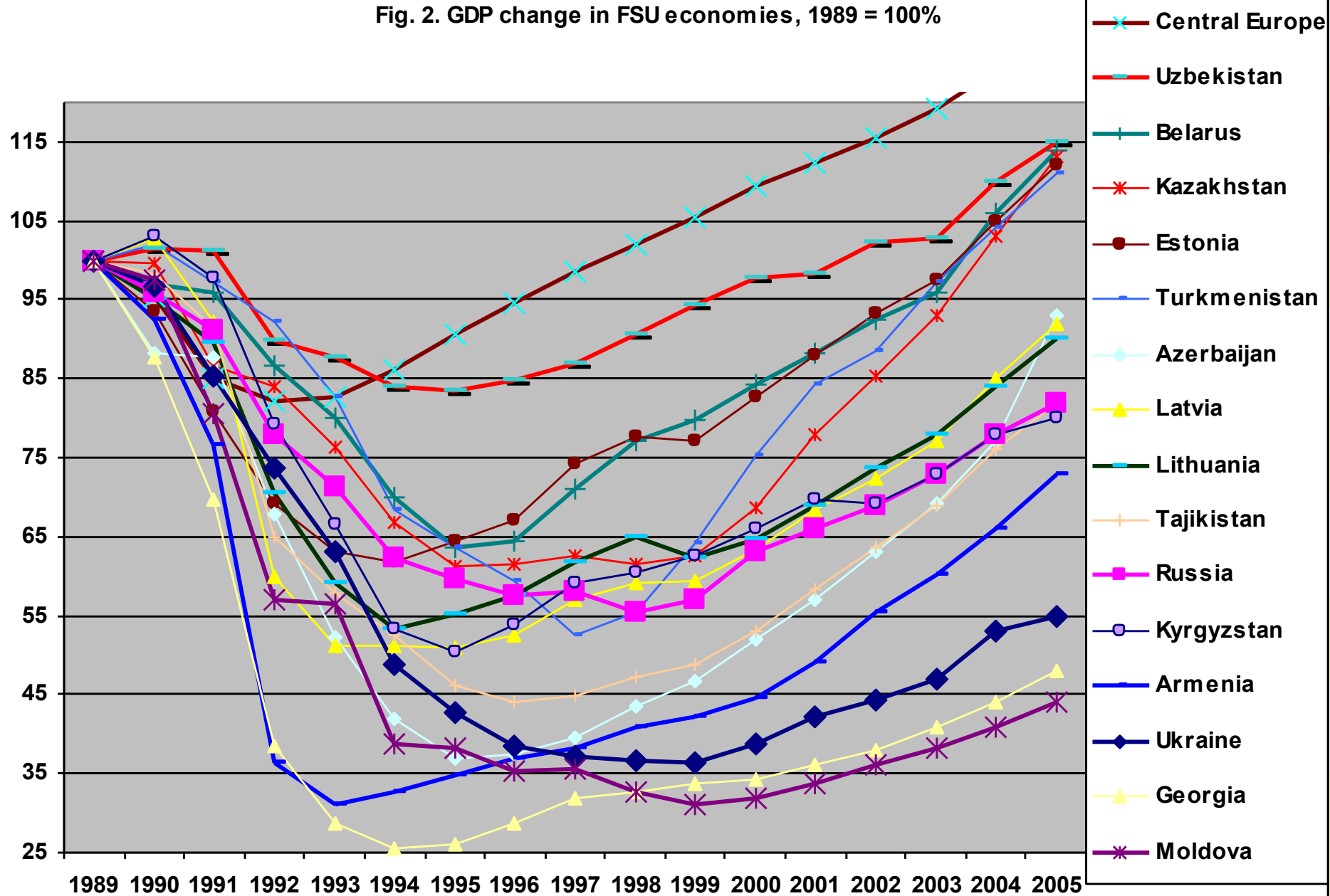
# Russia was leading in economic liberalization, while Belarus was lagging



Private sector share in GDP, %

Legend:
- Russian Federation
- Ukraine
- Belarus
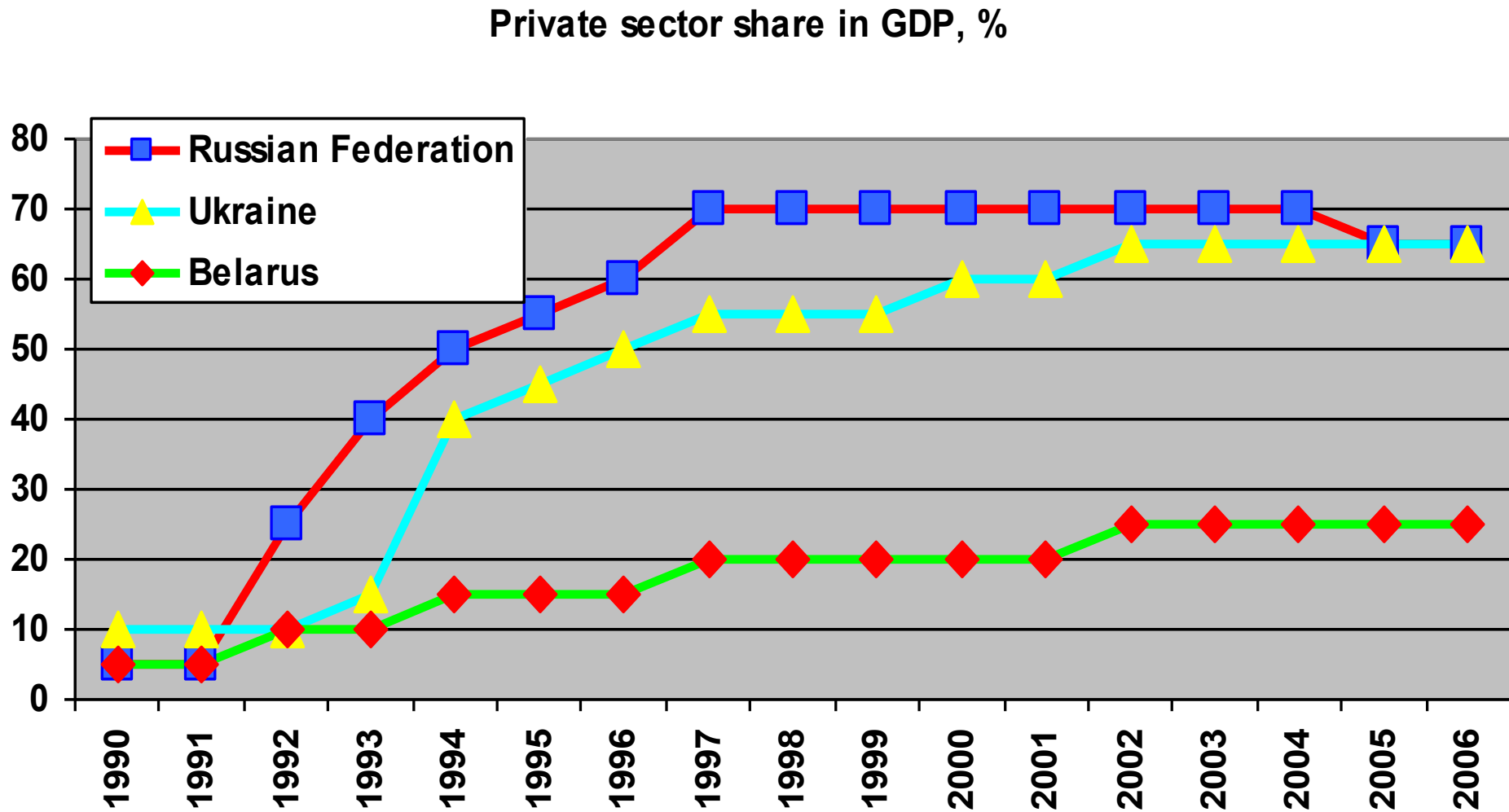
# But Belarus and Uzbekistan are doing better (even though they are net importers of fuel), not to mention net exporters like Azerbaijan, Kazakhstan, Turkmenistan



**GDP in 2006 as a % of 1989**
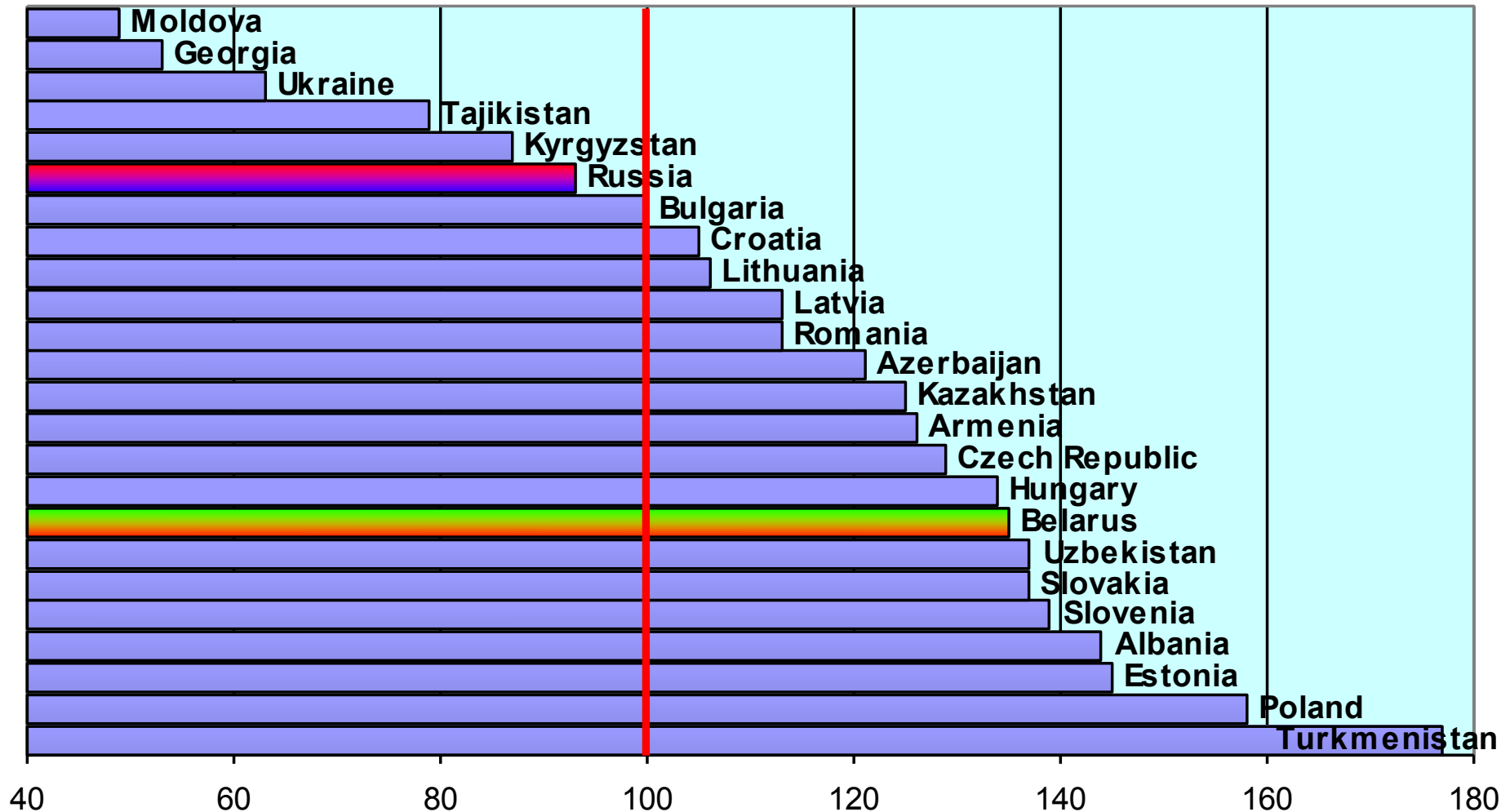
# Russian growth is lagging behind that of oil exporters and some oil importers

**Average annual GDP growth rates in CIS countries in 2000-07, EBRD estimates**
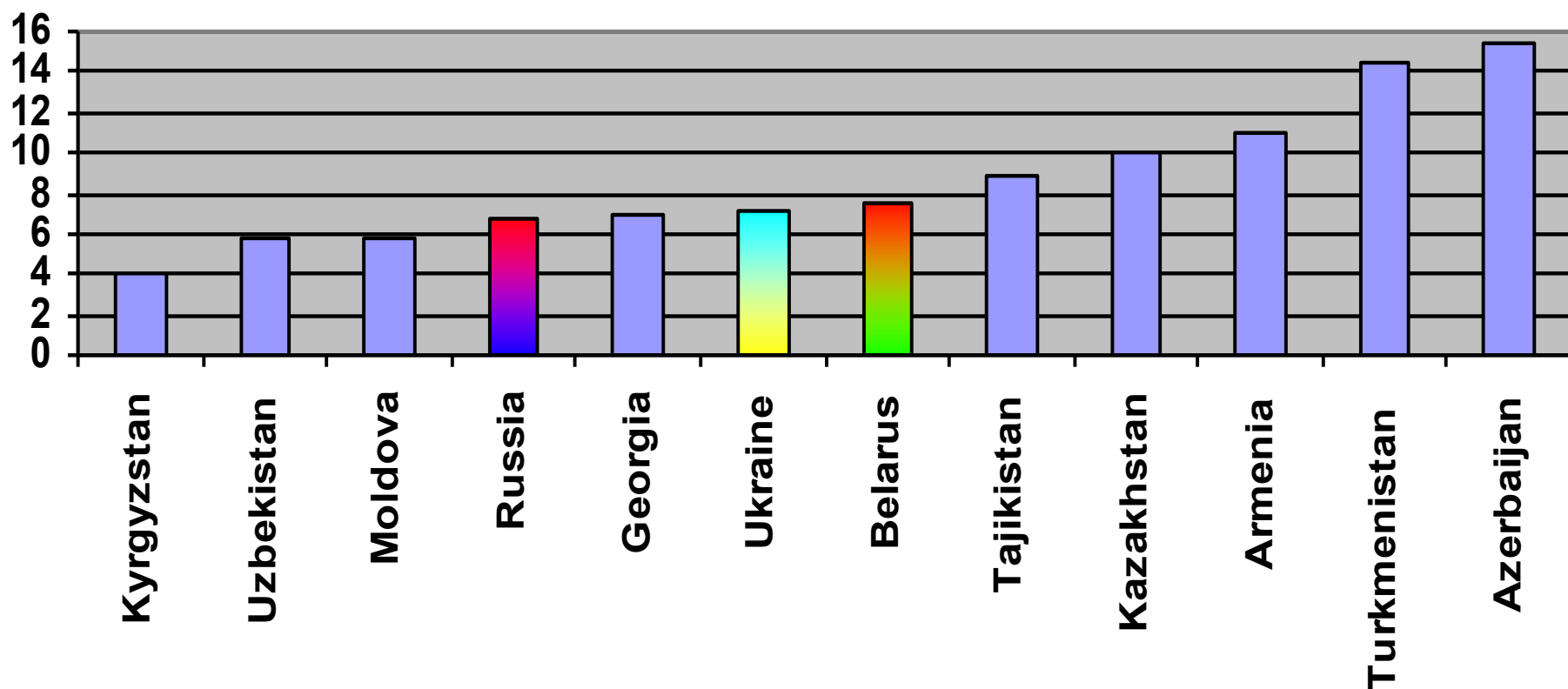
# INITIAL LIBERALIZATION AND OUTPUT CHANGE DURING RECOVERY



Fig. 8. Liberalization index by 1995 and performance in 1994-98
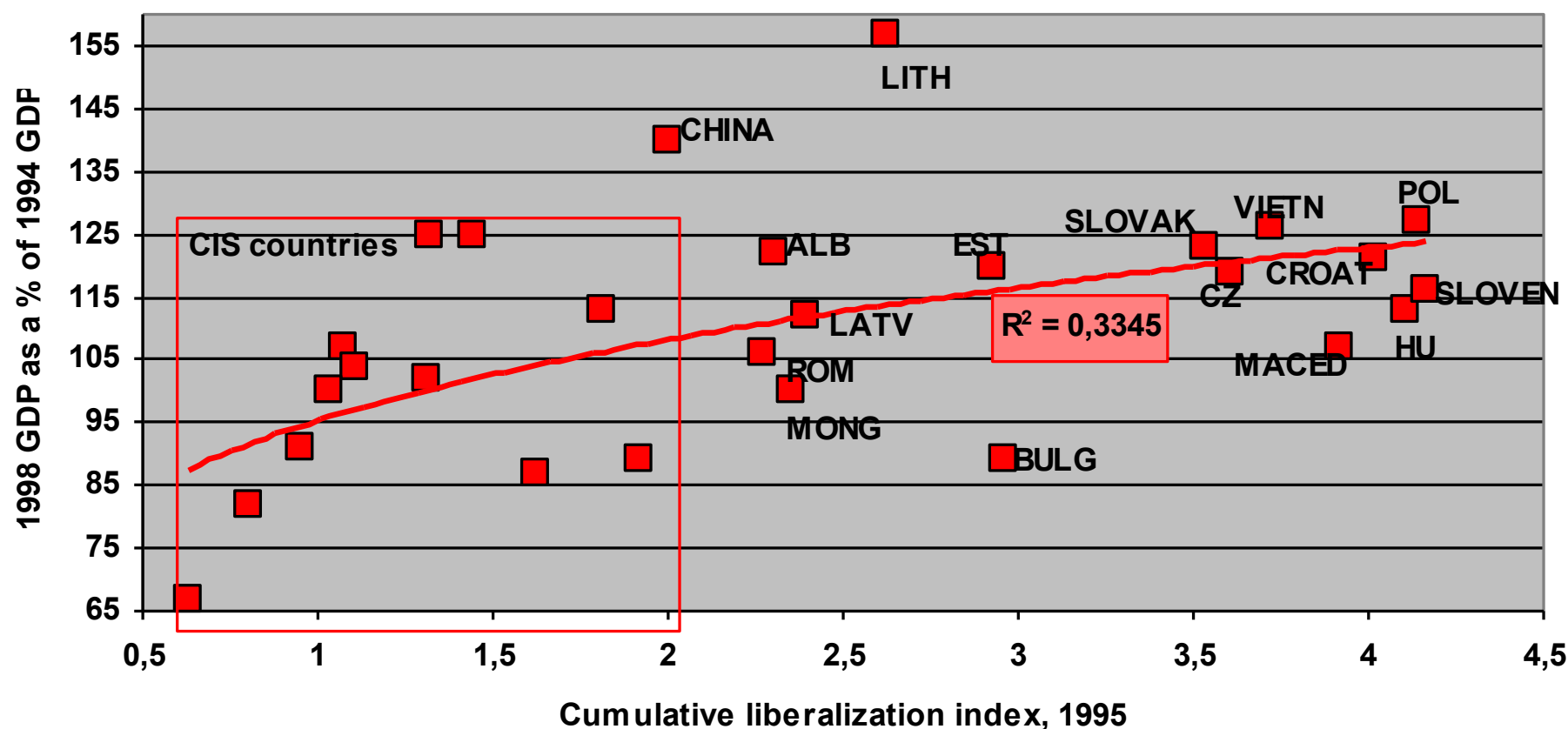
# LIBERALIZATION STOCK AND OUTPUT CHANGE DURING RECOVERY



Fig. 9. Liberalisation and output change in transition economies in 1995-2003

Fig. 10. Liberalisation increase and output change in transition economies in 1995-2003

# Does liberalization matter?

- **Vietnam and China are similar in initial conditions and in transition results (immediate growth of output without transformational recession) despite different reform strategies:**
    - **Chinese reforms are the classical example of gradualism**
    - **Vietnamese reformers introduced shock therapy treatment (instant deregulation of most prices and introduction of convertibility of dong) in 1989**
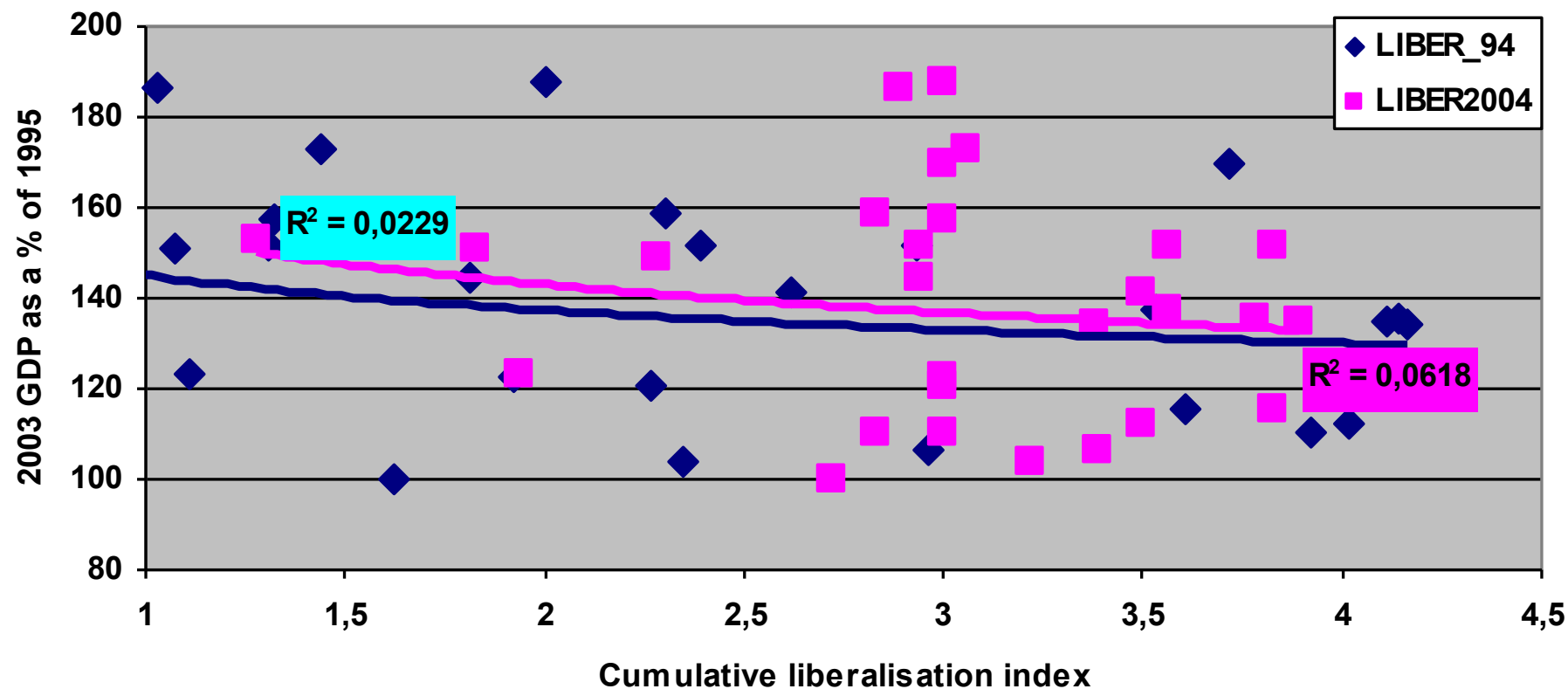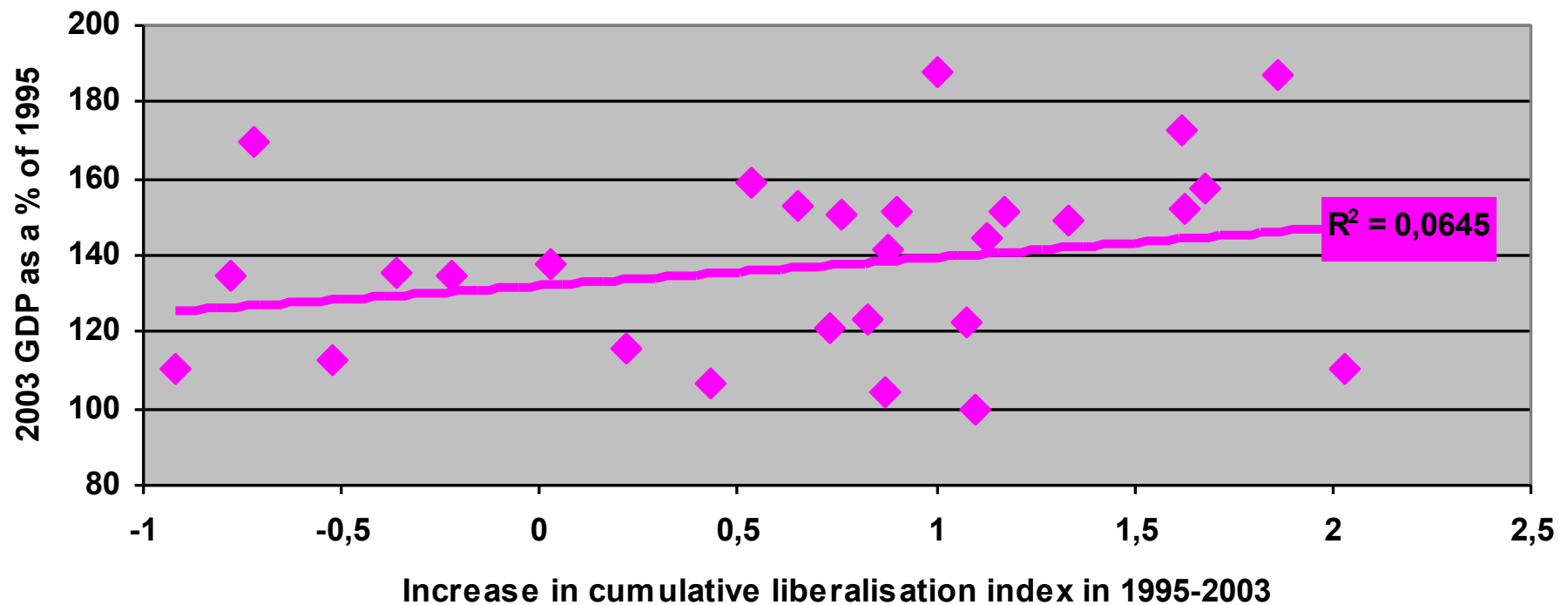- **Differing performance of the former Soviet Union (FSU) states:**
    - **Baltic states are the champions of liberalization and stabilization in the region. In the Baltics, however, output fell in the early 1990s by 36-60% and even in 2005, 10 years after the bottom of the recession was reached, was still below the pre-recession maximum.**
    - **Uzbekistan is commonly perceived to be one of the worst procrastinators. However in Uzbekistan the reduction of output in 1990-95 totaled only 18% and the economy started to grow again in 1996**
    - **By 2005 only two former Soviet republics - Uzbekistan and Turkmenistan - surpassed the pre-recession level of 1989**

# Reasons for recession:
# (1) Supply shock - change in relative prices

**Fig. 4. Change in relative prices and output in 1990-98 in Russian industry**



January 1998 output as a % of January 1990 output (y-axis)

- Electric energy
- Non-ferrous metals
- Steel
- Chemicals
- Fuel
- Wood
- Petrochemicals
- Machinery
- Constr. materials
- Food
- Light

$R^2 = 0,4062$

Ratio of 1998 proices to 1990 prices as a % of industrial average
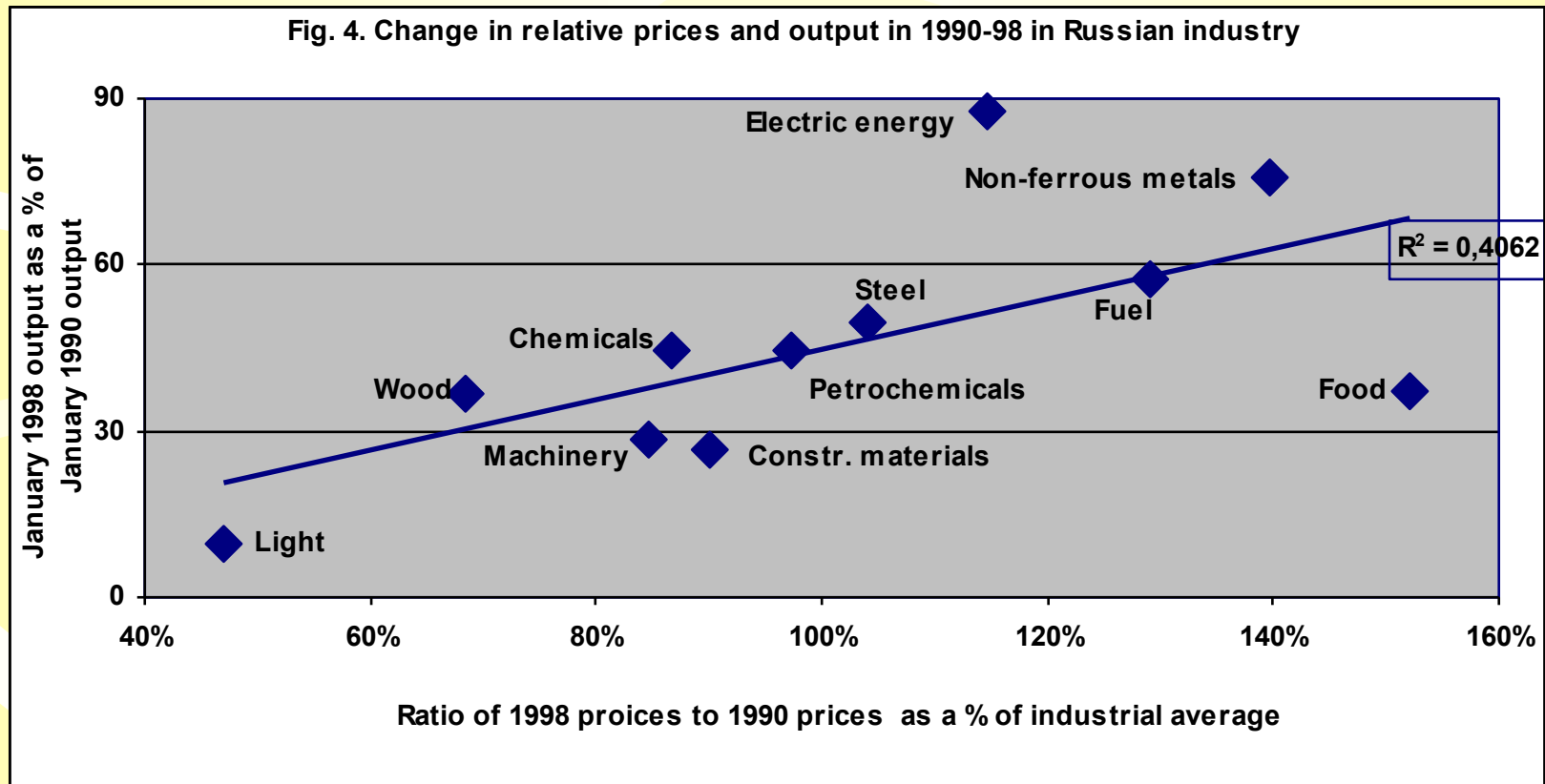
# Industrial structure and external trade distortions



**Fig. 7. Aggregate distortions in industrial structure and external trade before transition and GDP change during transition**
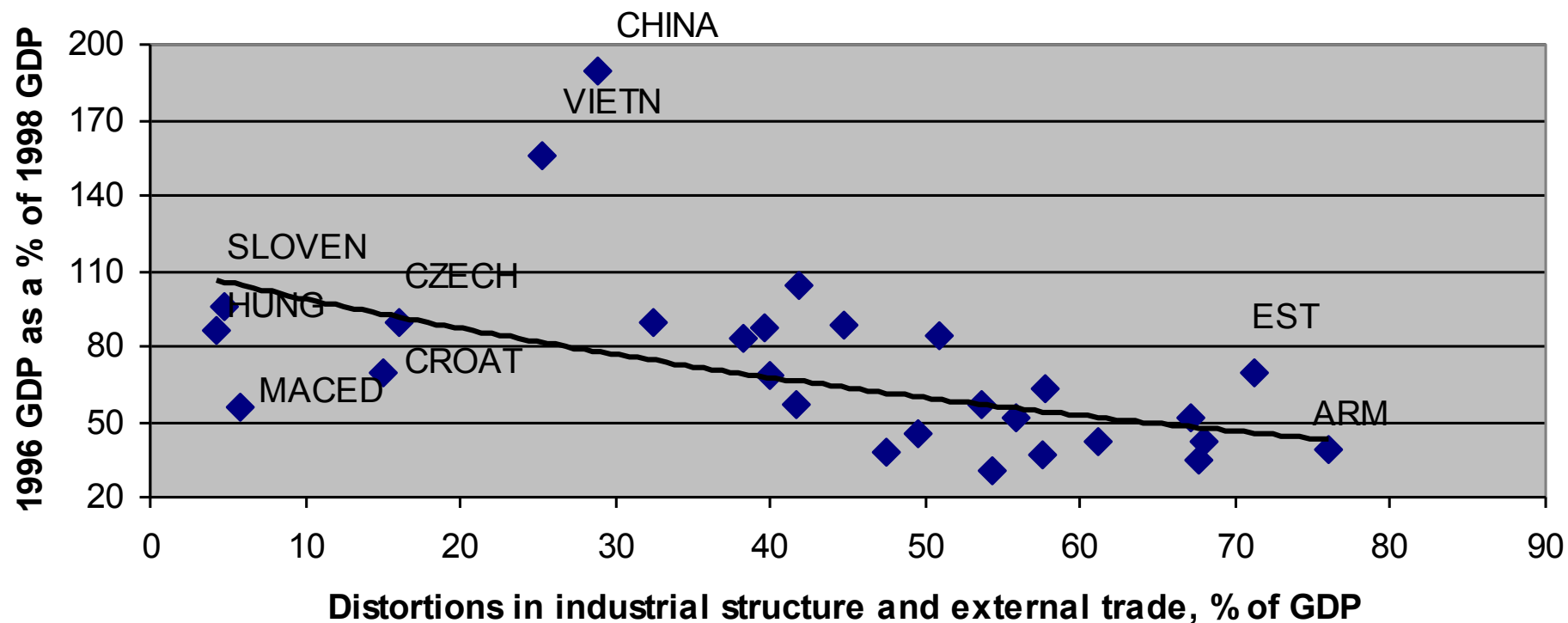
# Reasons for recession:
# (2) Collapse of state institutions - government revenues and expenditure fell in most transition economies



Fig. 13. Consolidated government revenues as a % of GDP
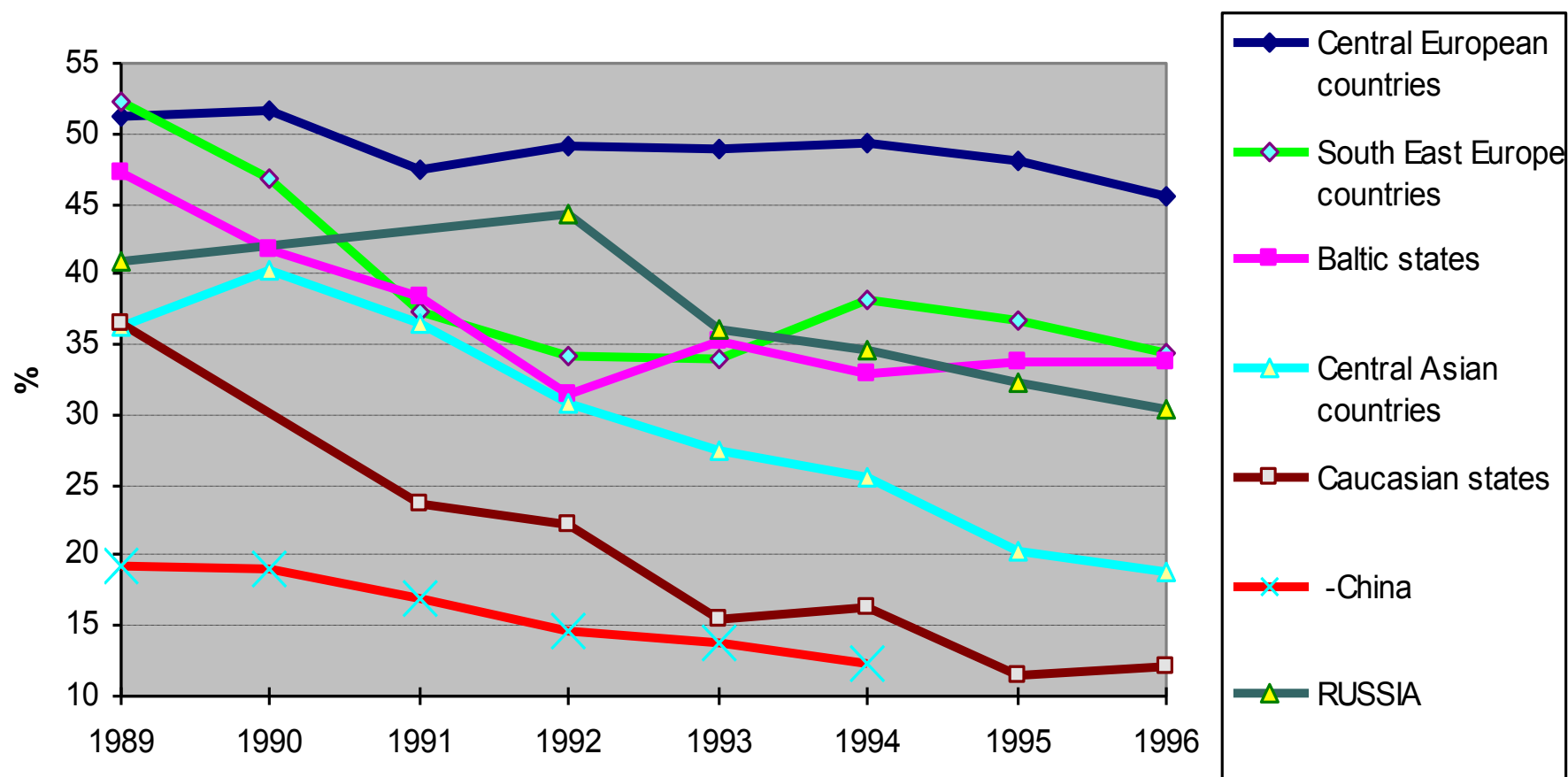
# Three major patterns of change in government expenditures

**Fig. 10. Government expenditure, % of GDP**

# The decline in government revenues is correlated with performance

**Fig. 12. Change in GDP and in the share of government revenues in GDP**

# Impact of initial conditions, institutions, liberalization: 1989-96

**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

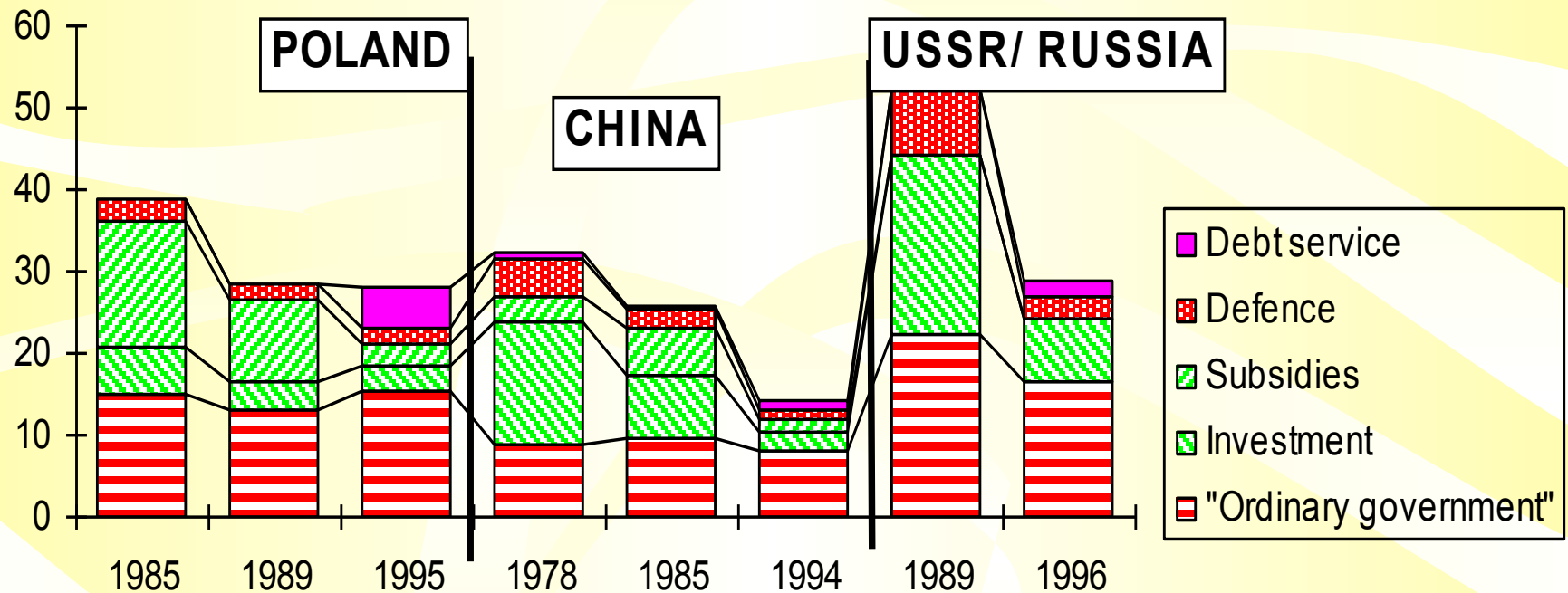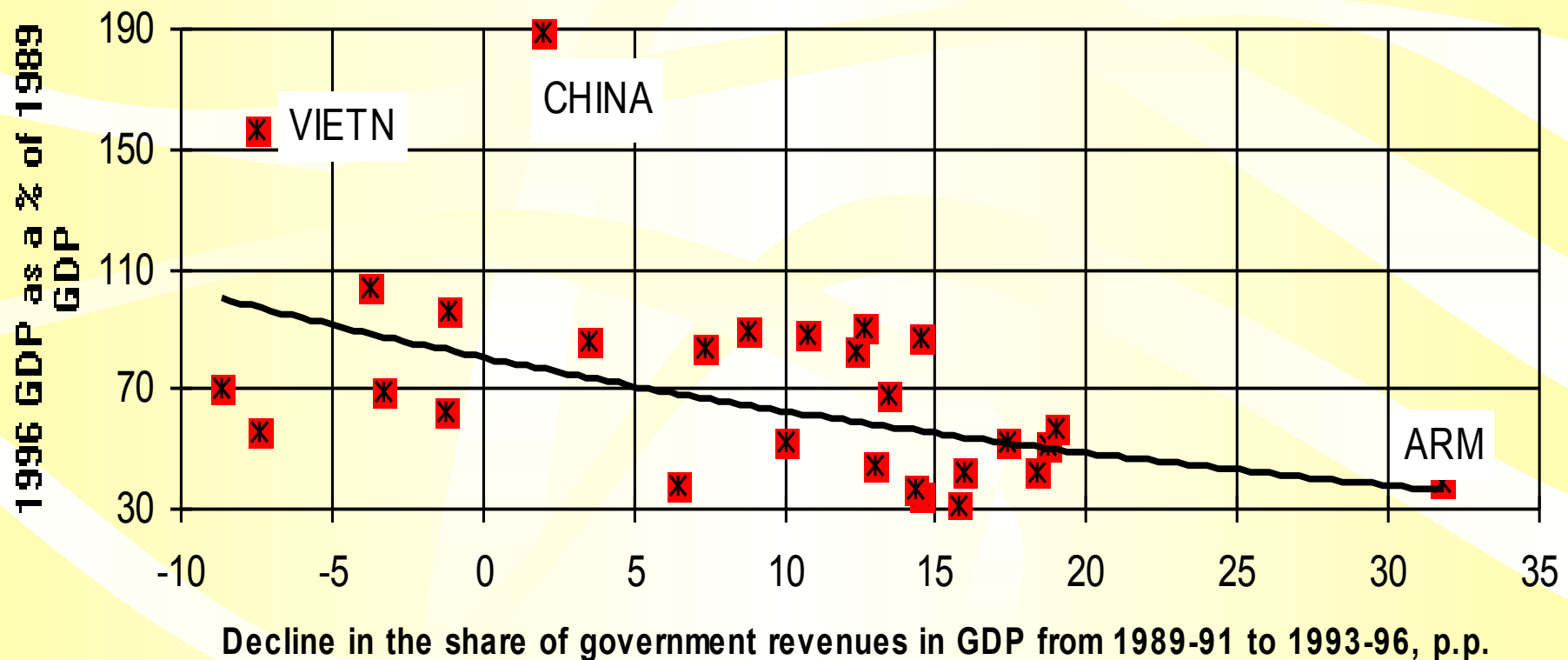| Equations, Number of Observations / Variables | 1, N=28 | 2, N=28 | 3, N=28 | 4, N=28 | 5, N=28 | 6, N=28 | 7, N=28 |
|---|---|---|---|---|---|---|---|
| Constant | 5.3*** | 5.4*** | 5.2*** | 5.4*** | 5.4*** | 5.5*** | 5.7*** |
| Distortions, % of GDP[a] | -.005** | -.005** | -.003 | -.006** | -.007*** | -.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.

# Evaluating the impact of non-policy and policy factors:1989-98

**Dependent variable = log (1998 GDP as a % of 1989 GDP)**
For China - all indicators are for the period of 1979-88 or similar

| Equations, Number of observations / Variables | 1, N=28 | 2, N=28 | 3, N=28 | 4, N=28 | 5, N=17 | 6, N=17 | 7, N=17 | 8, N=17 |
|---|---|---|---|---|---|---|---|---|
| Constant | 5.30 | 4.88 | 5.68 | 5.73 | 5.74 | 5.43 | 5.86 | 6.08 |
| Distortions, % of GDP[a] | -.01 | -.01 | -.01 | -.01 | -.01 | -.01 [c] | (-.00) | (-.00) |
| 1987 PPP GDP per capita, % of the US level | -.01 | -.02 | -.01 | -.01 | -.01 | -.02 | -.01[c] | (-.01) |
| War dummy[b] | -.67 | -.58 | -.38 | -.37 | | | | |
| Decline in government revenues as a % of GDP from 1989-91 to 1993-96 | -.02 | -.01 | -.01 | -.01 | | | | |
| Liberalization index | | (.11) | | (-.01) | | (.11) | | (-.06) |
| Log (Inflation, % a year, 1990-95, geometric average) | | | -.15 | -.15 | | | -.13 | -.16 |
| Shadow economy as a % of GDP in 1994 | | | | | -.02 | -.02 | -.01 | -.02 |
| Adjusted R$^2$, % | 67 | 69 | 80 | 80 | 72 | 73 | 82 | 81 |

[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 Appendix for details).

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

[c]Significant at 8% level.

# Best performance: low distortions, strong institutions
# Worst performance: high distortions, weak institutions

INITIAL CONDITIONS (DISTORTIONS) AND INSTITUTIONS – CLASSIFICATION OF COUNTRIES

| DISTORTIONS / INSTITUTIONAL CAPACITY | LOW | HIGH |
|---|---|---|
| HIGH | CHINA, VIETNAM | EASTERN EUROPE |
| LOW | ALBANIA, MONGOLIA | FSU |

# Explaining the magnitude of recession:

- Differences in performance during transition depend strongly on the initial conditions:

    - The higher the distortions (militarization, over-industrialization, "under-openness" of the economy and the share of perverted trade flows), the worse is the performance

    - 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 to achieve growth

# Explaining the magnitude of recession:

- Macroeconomic stability matters a great deal for economic performance

- Liberalization index does not appear to be important

- Changes in the institutional capabilities of the state have dramatic impact on performance

# By the end of the 1990s most countries were already recovering from recession

**Table 6. Regression of change in GDP in 1994-98 on non-policy and policy-related factors (all coefficients are significant at 15% level except those in brackets)**
**Dependent variable = log (1998 GDP as a % of 1994 GDP)**
For China - all indicators are for the period of 1984-88 or similar

| Equations, Number of Observations / Variables | 1, N=28 | 2, N=28 | 3, N=28 | 4, N=28 | 5, N=28 |
|---|---|---|---|---|---|
| Constant | 4.51 | 4.25 | 4.56 | 4.32 | 4.60 |
| Distortions, % of GDP[a] | | .004 | .005 | .003 | .003 |
| 1987 PPP GDP per capita, % of the US level | | | | | |
| War dummy[b] | | | .15 | | |
| Decline in government revenues as a % of GDP from 1989-91 to 1993-96 | | | | -.003 [c] | -.004 |
| Liberalization index | .07 | .12 | .09 | .10 | .07 |
| Log (Inflation, % a year, 1990-95, Geometric average) | | | -.06 | | .04 |
| Adjusted $R^2$, % | 21 | 27 | 37 | 29 | 33 |

[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 Appendix for details).

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

[c] Significant at 21% level.

# Impact of initial conditions, institutions, liberalization

**Table 2. Regression of change in GDP in 1995-2003 on initial conditions, institutional capacity, liberalization and rule of law and democracy indices, robust estimates**
**Dependent variable = 2003 GDP as a % of 1995 GDP**
For China - all indicators are for the period of 1979-86 or similar

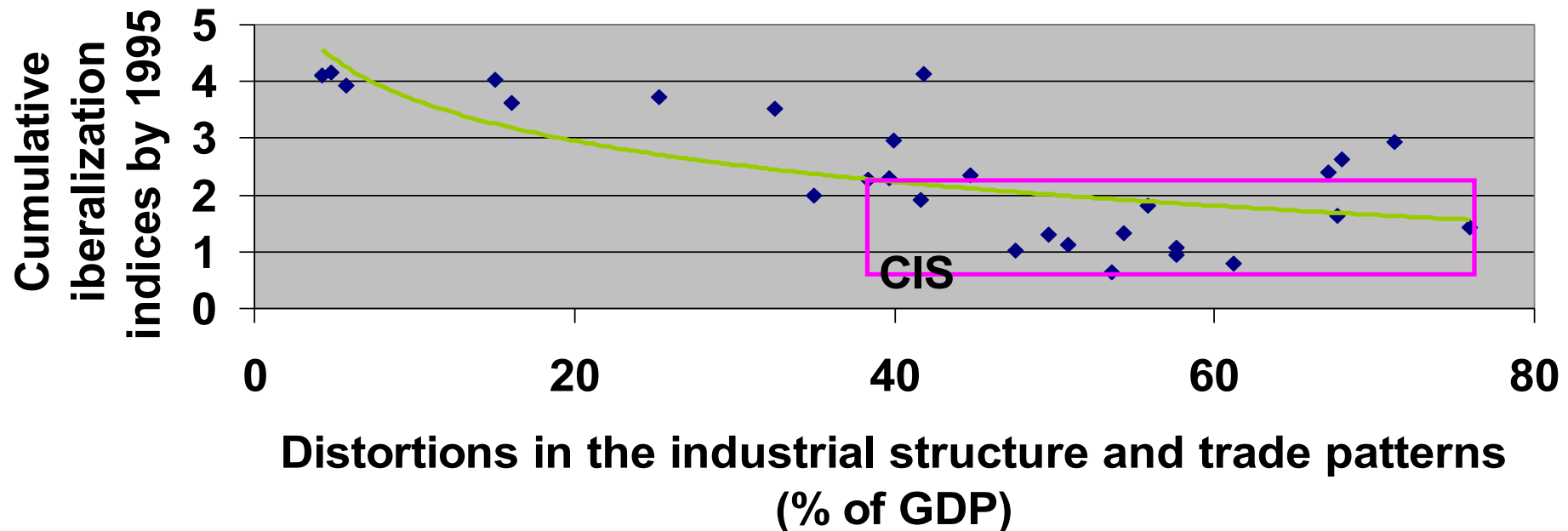| Equations, Number of Observations / Variables | 1, N=28 | 2, N=28 | 3, N=28 | 4, N=28 | 5, N=28 |
|---|---|---|---|---|---|
| Constant | 105*** | 91*** | 99*** | 78*** | 99*** |
| 1996 GDP as a % of 1989 GDP | .33*** | .45*** | .46*** | .24** | |
| 1987 PPP GDP per capita, % of the US level | | | | | |
| War dummy[a] | | 22.9** | 42.3*** | 32.0*** | 19.4* |
| Liberalization index in 1995 | | | -19.9*** | | |
| Increase in the liberalization index in 1995-2003 | 15.3 *** | 16.7 *** | | 17.6*** | 17.6*** |
| Decline in government revenues as a % of GDP from 1989-91 to 1993-96[a] | | | | -.8*** | |
| Rule of law index, average for 1989-97, % | | | .8** | 1.0*** | 1.2*** |
| Democracy index, average for 1990-98, % | | | | -.6*** | -.8*** |
| Adjusted $R^2$, % | 25 | 38 | 45 | 52 | 55 |

*, **, *** - 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.
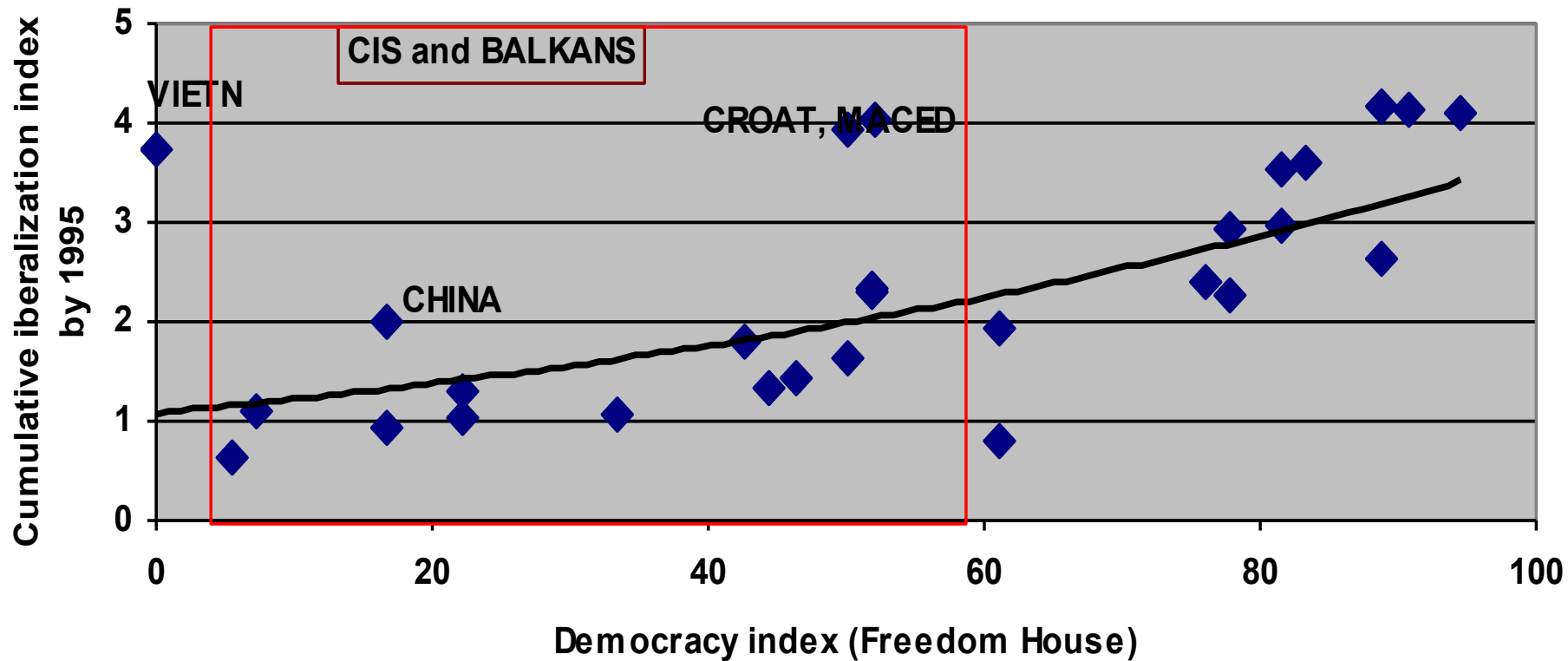
# OBJECTION:
## Speed and extent of liberalization may be endogenous



**Fig. 3. Liberalization indices and distortions in industrial structure and trade patterns**

# Economic liberalization and democratization go hand in hand



Fig. 4. Democracy index (1990-98, average) and economic liberalization index by 1995

# Instrumenting liberalization stock with democracy level variable: 1989-96

**Table 3. 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.

# Instrumenting liberalization change with liberalization stock and FSU dummy variables:1995-2003

**Table 4. 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.

# Conclusions

- 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.

- The reason for the negative impact is most probably associated with limited ability of the economy to adjust to new price ratios

# Conclusions



Fig. 5. Hypothetical trajectories of output (Year "0" = 100%) assuming gradual and instant liberalization
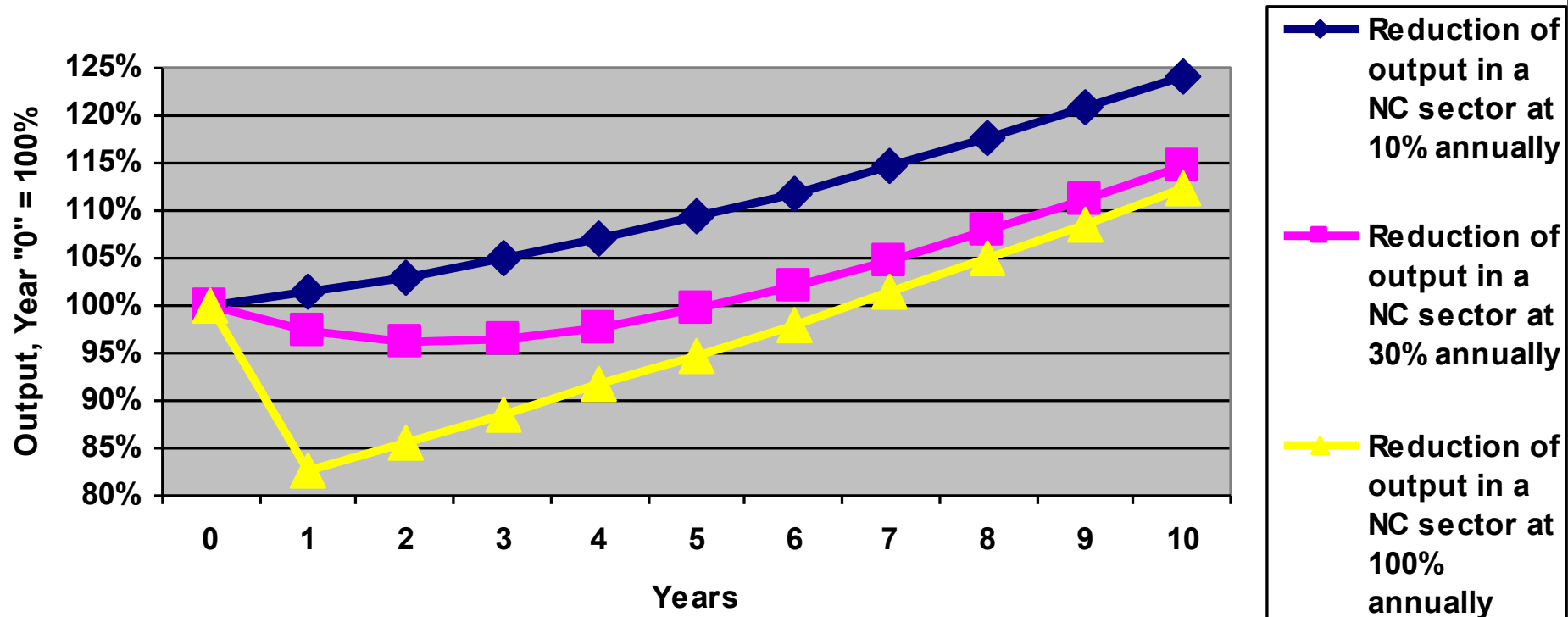
Assumptions: size of non-competitive sector (NC) in the initial year = 20% of total output; net investment (s) = 10% of total output; marginal capital productivity, output increase per unit of net investment (a) = 1/3.

# Conclusions

- 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 at the recovery stage influences performance positively because it creates market stimuli without causing rapid collapse of output of inefficient industries, which cannot be compensated fully by the rise of efficient industries due to investment constraints.