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Structural Changes in Transition Economies:

Breaking the News or Breaking the Ice?

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Abstract

This paper extends the existing literature in structural breaks in transition economies in Central and Eastern Europe, analyzing structural breaks in the volatility of monthly key macroeconomic variables, such as industrial production, inflation, monetary aggregates, nominal exchange rates and series related to the labor market. Using the Iterated Cumulative Sums of Squares (ICSS) algorithm developed by Inclán and Tiao (1994) and the Bayesian procedure developed by Wang and Zivot (2000), we provide strong evidence in favor of structural breaks in the variance of the series under investigation. The instability found has important implications for macroeconometric modeling.

JEL classification: C11, E31, E51, F31, J21, J30, P0

Keywords: Transition countries; structural break; volatility

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1 Introduction

Structural changes in macroeconomic data frequently correspond to instabilities in the real economy. Often, empirical research seeks to detect structural changes in the mean of the series but pays little attention to the variability. However, variability of data has been long recognized as an important source of information that helps to better analyze economic reality.

The quest for determining changes in volatility of diverse macroeconomic series has shown that significant changes -mostly a decrease- in the volatility of a large number of macroeconomic fundamentals has taken place in industrialized countries, chiefly over the past quarter century, because considerable reforms have influenced the institutional framework, markets, and the functioning of monetary and fiscal policies. These developments have been cited, among others, by Stock and Watson (2002) and Sensier and van Dijk (2004)[1] for the U.S.A., and by Mills and Wang (2003), Blanchard and Simon (2001) and Smith and Summers (2002) for other developed countries. According to van Dijk, Osborn and Sensier (2002), it appears that breaks in volatility are not primarily due to structural breaks in the conditional mean or to business cycle nonlinearities but rather to domestic phenomena, whose magnitude and timing depend on the specific conditions and policies in each country. Nevertheless, seeking explanations of entirely domestic origin might ignore the fact that volatility reductions have occurred in a number of countries.

Very little empirical research of this issue has been conducted with respect to transition economies of Central and Eastern Europe (CEE). This is somewhat surprising, bearing in mind the often abrupt structural changes due to the shift from plan to market. For instance, Fidrmuc and Tichit (2004) and Kočenda (2005) provide abundant evidence of breaks in the mean at the

[1] Stock and Watson (2002) and Sensier and van Dijk (2004) investigate 168 quarterly and 214 monthly U.S. macroeconomic series. Kim and Nelson (1999), McConnell and Pérez-Quirós (2000) and Koop and Potter (2000) concentrate on U.S. output growth while McConnell, Mosser and Pérez-Quirós (1999), Chauvet and Potter (2001) and Ahmed, Levin and Wilson (2001) analyze employment, consumption and income series.

macroeconomic level and for exchange rate series in the CEE countries, respectively, but they do not deal with breaks in volatility. By contrast, Égert and Morales-Zumaquero (2005) analyze structural changes in the volatility of nominal and real exchange rate series in the CEE countries.

We extend the previous literature in two ways. First, we analyze the structural changes of a large number of key macroeconomic data series in ten CEE countries. Second, contrary to the focus in earlier studies on structural breaks in CEE countries, which have been focused on breaks in the mean, we focus on the existence of structural breaks in volatility controlling for shifts in the level and the trend, and we connect these breaks found with the most important facts occurs in these countries.[2]

The paper is organised as follows. Section 2 describes our data and the techniques used to detect structural breaks in variability. Section 3 interprets the empirical findings. Section 4 draws some concluding remarks.

2 Data and Econometric Issues

2.1 Data

The dataset used in this study covers a score of commonly used macroeconomic variables of ten CEE countries: Bulgaria, Croatia, the Czech Republic, Hungary, Poland, Romania, Russia, Slovakia, Slovenia and Ukraine. The monthly series under study include industrial production and production in the construction sector, price series such as the consumer and producer price indices, monetary aggregates (M1, M2, M3), nominal exchange rates against the U. S. dollar for Russia and Ukraine and against the euro for the remaining countries, labor market indicators (employment and unemployment) and gross and net nominal wages. The dataset begins in January 1990 at the earliest and ends in

[2]The only exception is Égert and Morales-Zumaquero (2005), who conclude that while major changes in the exchange rate regime are usually matched by breaks in exchange rate volatility, exchange rate volatility breaks more often than the foreign exchange regime alters.

December 2004. The data is drawn from the monthly database of The Vienna Institute for Comparative Economic Studies (wiiw). A detailed description of the series is given in the data appendix.

2.2 Methodology

Several techniques have been developed in the literature for testing and locating structural breaks in the intercept and trend (see, for example, Bai and Perron, 1998, 2003). However, only few have been focused on testing and locating breaks in the variance (see, for example, Inclán and Tiao, 1994, McConnell and Pérez-Quirós, 2000, and Wang and Zivot, 2000). The possibility of the existence of several breaks in the time series considered leads not to perform the McConnell and Pérez-Quirós (2000) methodology, which has been developed to detect only the existence of one break in volatility. Thus, we perform the Inclán and Tiao test (1994) and the Bayesian technique developed by Wang and Zivot (2000), which were developed for detecting several structural breaks in volatility. While the former considers breaks only in the unconditional variance, the latter allows us to detect multiple structural breaks in the level, trend and variance at the same time.

Therefore, the methodology used in this study to detect structural breaks in the volatility of the time series considered is based on the Bayesian procedure developed by Wang and Zivot (2000). Additionally, we also report the Iterated Cumulative Sums of Squares (ICSS) algorithm developed by Inclán and Tiao (1994).

Wang and Zivot (2000) develop a Bayesian procedure for estimating the existence of structural changes in level, trend and variance at the same time. They consider a segmented deterministically trending and heteroscedastic au-

toregressive model of the form:

$$y_t = a_t + b_t t + \sum_{i=1}^{k} \phi_i y_{t-i} + s_t u_t, \tag{1}$$

for $t = 1, 2, ..., T$, where $u_t|\Omega_t \sim iid.N(0,1)$ and Ω_t denotes the information set at time t. They assume that the parameters a_t, b_t and s_t are subject to $m < T$ structural changes, m initially known, with break dates $k_1, k_2, ..., k_m$, $1 < k_1 < k_2 ... < k_m \leq T$, so that the observations can be separated into $m+1$ regimes. Let $k = (k_1, k_2, ..., k_m)$ denote the vector of break dates. For each regime i $(i = 1, 2, ..., m+1)$, the parameters a_t, b_t and s_t are given by

$$a_t = \alpha_i, \ b_t = \beta_i, \ s_t = \sigma_i \geq 0$$

for $k_{i-1} \leq t < k_i$ with $k_0 = 1$ and $k_{m+1} = T + 1$.

Let I_A denote an indicator variable such that I_A is equal to one if the event A is true and zero otherwise. Then (1) can be re-written as

$$y_t = \sum_{i=1}^{m+1} I_{\{k_{i-1} \leq t < k_i\}} (\alpha_i + \beta_i t) + \sum_{i=1}^{k} \phi_i y_{t-i} + s_t u_t, \tag{2}$$

Given the assumption of normality of the errors , Wang and Zivot (2000) obtain the likelihood function of (2). The estimation of the model is possible by use of the Gibbs sampler. Wang and Zivot (2000) determine the number of breaks and the form of the breaks on the basis of model selection using marginal likelihoods and the Bayesian Information Criterion (BIC criterion) to select the most appropriate model from the data.

To test the null hypothesis of constant unconditional variance, Inclán and Tiao (1994) propose the statistic given by the following formula:

$$IT = \sup_k \sqrt{\frac{n}{2}} |D_k|, \tag{3}$$

where $D_k = \frac{C_k}{C_n} - \frac{k}{n}$ and $C_k = \sum_{t=1}^{k} \varepsilon_t^2$, $k = 1, ..., n$ is the cumulative sum of squares of ε_t. Under the assumption that $\varepsilon_t \sim iidN(0, \sigma^2)$, asymptotically D_k behaves as a Brownian bridge. If the series under study has multiple breaks points, the function alone is not enough because of the masking effects. To avoid this problem, Inclán and Tiao (1994) design an algorithm that is based on successive evaluations of D_k at different parts of the series, dividing consecutively after a possible change point is found.

3 Empirical results

The ICSS and the Bayesian approach devised by Wang and Zivot are applied to the monthly data series covering industrial production, prices, nominal exchange rates, the labor market and nominal wages. The results, displayed in Table 1, indicate that breaks in volatility occur, sometimes quite often, across all investigated series and countries. It is not unusual for series to exhibit multiple breaks,[3] although there is great deal of heterogeneity regarding the number of breaks across different series and countries under study. For instance, multiple breaks can be frequently observed in inflation and in nominal exchange rate series for countries such as Russia, Ukraine, Bulgaria and also perhaps the Czech Republic while breaks are not unusual on the labor market, in particular in employment and unemployment rates, in Romania and Slovakia. Moreover, the obtained breakpoints from the alternative methods do not always fully overlap regarding the number and the precise dates of possible breaks in the time series, which is not surprising since Wang-Zivot test also accommodates for a shift in the level and/or the trend.

The results reveal that there is occasionally some overlap between the structural breaks and the breakpoints suggested by changes in data collection methodologies of the national statistical offices (see last column of Table 1).

[3]Note that multiple breaks are detected close to one another in the event of a gradual change. In such a case, the tests capture several very close break points.

This may be so for two reasons. First, the methodological changes may truly alter the underlying data generating process. Second, and fairly interestingly, changes in the methodology occur sometimes at the same moment when an important change in the macroeconomic environment happens, as it did for instance in 1997 in Bulgaria and in the Czech Republic and in 1995 in Hungary. In other words, adaptations of the statistical standards may accompany more fundamental changes in the policy environment (more reforms) triggered by a crisis or of a danger of a crisis. Hence, these two processes can interact with one another and amplify changes in the variability of the series. Nevertheless, some of the officially announced changes in the methodology are not really reflected in structural breaks. And perhaps more importantly, the observed number of breaks is often considerably higher than the number of methodological changes. Thus, observed structural breaks are often not merely statistical artifacts but are related to the actual behavior of the given series and the underlying part of the economy instead.

We observe that most of the structural breaks found are clearly associated with landmark events at the macro level, such as the occurrence of currency, financial and banking crises or changes in the macroeconomic environment driven by the alteration of the macroeconomic policy framework or external conditions. The Russian crisis (August 1998), the crisis of the Czech koruna (May 1997) and the Bulgarian banking crisis unfolding in 1996 and 1997 can be particularly well matched with breakpoints in price and exchange rate series and also in the real economy. Changes in the exchange rate regimes resulting in wider fluctuation bands in Hungary (May 2001), Poland (after 1997) and Slovakia (autumn 1998) are also found to be linked to break points.[4] Furthermore, the introduction of a heterodox stabilization program in Hungary

[4]Note also that breakpoints for the exchange rate series can be observed in 1994 and 1996 for the two Commonwealth o Independent States (CIS) countries, reflecting efforts and changes in the disinflation strategy (introduction of different types of exchange rate regimes). The fact that breakpoints in Ukraine are strongly correlated with those found in Russia is due to the fact that Ukraine pretty much shadowed macroeconomic policy in Russia for most of the last decade. Consequently, this also shows up in the macroeconomic series.

(March 1995), the acceleration of economic reforms after 1998 due to political changes in Slovakia and the more hawkish stance of monetary policy in Poland from 1999-2000 on all seem to have left their marks on the real economy, in particular on the labor market.

Furthermore, the credit for another part of structural changes goes to some progressive changes in the economic environment and the policy framework. Taking the example of inflation for Croatia, the Czech Republic, Slovakia and Slovenia (PPI), the obtained breakpoints refer to the early 1990s, which marked the successful stemming of very high inflation or even hyperinflation in the aftermath of the first wave of economic reforms. For Romania, the numerous breakpoints for inflation obtained on the basis of the Wang-Zivot method might reflect the cyclical upsurge of high inflation throughout the 1990s.[5] Another point in case are the results for industrial production for which structural breaks occurred either in the early 1990s, reflecting the beginning of the large transitional recession from 1991 to around 1994, or during the late 1990s, in particular for Hungary and Poland, when economic growth started to slow down after the strong recovery of the mid-1990s.

Finally, a score of structural breaks cannot be clearly accounted for by any of the aforementioned factors (statistics, crises, domestic macro events). This leaves some room for the interpretation that successful economic reforms implemented both at the micro and at the macro level creep slowly into economic behavior, which becomes evident to us only with some delay.

[5]For monetary aggregates, it turns out that some of the numerous breakpoints overlap with breakpoints obtained for the price series while others are unrelated, although breaks in monetary aggregates occur more frequently, at least for some of the countries, and independently from changes in the prices series.

Table 1. Results: Detected Breaks in Volatility

	Nb	ICSS	Nb	Wang-Zivot	Nb	Methodological changes
Prices & Monetary Aggregates						
PPI						
Bulgaria	2	1996.12, 1997.3	3	1996.4, 1997.3, 1997.5	2	1997, 2000
Croatia	2	1992.12, 1994.3	1	1993.12	0	-
Czech Republic	0	-	1	1991.5	0	-
Hungary	1	1994.12	1	1994.12	0	-
Poland	2	1997.1, 2000.11	1	2004.2	2	1996, 2000
Romania	1	1997.2	4	1993.5, 1996.6, 1997.3, 1998.12	0	-
Russia	3	1993.9, 1997.2, 2003.8	3	1994.12, 1998.9, 2002.4	0	-
Slovakia	3	1993.1, 1993.2, 1994.8	1	1994.9	1	1997
Slovenia	2	1991.10, 1992.6	1	1992.4	0	-
Ukraine	0	-	2	1998.9, 2003.11	0	-
CPI						
Bulgaria	3	1996.12, 1997.1, 1999.7	4	1994.3, 1996.4, 1997.2, 1997.3	1	1995
Croatia	3	1993.3, 1993.9, 1993.11	2	1993.6, 1993.12	1	2001
Czech Republic	2	1992.10-1993.1	0	-	0	-
Hungary	1	1994.12	1	1994.12	0	-
Poland	0	-	0	-	0	-
Romania	0	-	4	1993.6, 1996.4, 1997.4, 1999.3	0	-
Russia	4	1995.1, 1996.5, 1998.8, 1999.1	4	1994.10, 1998.7, 1998.12, 1999.1	0	-
Slovakia	3	1993.1, 1993.2, 1999.6	2	1993.2, 1999.6	2	1997, 2001
Slovenia	0	-	0	-	0	-
Ukraine	0	-	4	1995.9, 1998.9, 1999.11, 2004.9	0	-
Ukraine	2	2000.8, 2003.11	1	2000.4	0	-
M2						
Bulgaria	4	1996.12, 1997.7, 2000.6, 2004.11	2	1996.2, 1996.10	1	1995:12
Czech Republic	1	1992.12	1	1992.3	1	2002:1
Hungary	1	1997.11	3	1991.12, 1995.6, 2001.8	2	1992:1, 1998:1
Poland	2	1996.11, 2004.9	4	1994.6, 1996.12, 1998.12, 2001.11	1	1996:12
Romania	3	2000.10, 2002.10, 2004.11	4	1993.11, 1996.9, 1998.11, 2002.11	0	-
Russia	2	2002.11, 2004.11	3	1995.7, 1998.9, 2002.12	0	-
Slovakia	1	2000.6	1	1991.7	0	-
Slovenia	1	2001.9	1	2001.9	1	1995
Ukraine	1	2002.11	1	2001.11	0	-
Nominal Exchange Rates (EUR/USD, period average)						
Euro (USD) Ave						
Bulgaria	3	1996.4, 1996.11, 1997.7	3	1991.5, 1996.5, 1996.12	1	1996:12
Croatia	0	-	1	1994.3	0	-
Czech Republic	3	1993.7, 1996.12, 1999.2	4	1993.8, 1996.5, 1999.2, 1999.6	0	-
Hungary	1	2001.4	3	1990.3, 1999.12, 2001.4	0	-
Poland	3	1993.8, 1993.9, 1997.10	1	1997.11	0	-
Romania	1	1996.11	1	1998.8	1	1993:12
Russia (USD)	4	1998.8, 1999.1, 2000.7, 2003.1	3	1994.8, 1998.7, 1999.1	0	-
Slovakia	3	1993.9, 1997.1, 2002.10	3	1996.12, 1997.2, 1998.8	0	-
Slovenia	2	1999.12, 2003.8	2	1993.3, 1998.8, 1998.10	0	-
Ukraine (USD)	3	1998.8, 1998.10, 2000.3	1	2002.2	0	-
Industrial Production						
Bulgaria	0	-	0	-	1	2000
Croatia	1	1999.7	1	1994.2	0	-
Czech Republic	1	1991.5	1	1991.5	1	1997:1
Hungary	1	1999.5	2	1991.8, 1998.12	0	-
Poland	1	1999.2	2	1991.3, 1999.3	1	2000:1
Romania	0	-	2	1992.4, 1997.12	0	-
Slovakia	1	2002.8	1	2000.1	1	1999:1
Slovenia	0	-	0	-	0	-
Labor Market						
Total Employment						
Bulgaria	2	1992.1, 1997.12	2	1997.12, 1998.1	1	1998
Croatia	3	1996.3, 1998.1, 1998.3	2	1997.12, 1998.2	2	1996:1, 1998:1
Poland	1	1999.12	2	1999.12, 2000.1	1	2000:1
Romania	1	2002.3	2	1997.12, 2002.3	2	1998:1, 2000:1
Russia	2	1997.1, 1999.3	2	1996.12, 1999.4	2	2000, 2003:8
Slovenia	0	-	1	1997.4	1	1997:1,
Unemployment rate						
Bulgaria	0	-	1	1994.3	1	2002:6
Croatia	1	1999.9	1	2002.3	1	1996:1
Czech Republic	2	1992.6, 1998.6	1	1997.5	1	2004:6
Hungary	1	1995.5	3	1993.3, 2004.1, 2004.5	1	1995:5
Poland	0	-	1	1998.8	1	2002:1
Romania	2	2001.11, 2002.5	4	1994.12, 1996.3, 2001.12, 2002.5	0	-
Russia	0	-	1	1996.4	1	2003:8
Slovakia	3	1992.1, 2000.7, 2001.5	2	1996.1, 2000.7	1	1995, 1997:12,
Slovenia	1	1996.7	1	1992.3	0	-
Ukraine	0	-	2	1998.5, 1999.1	0	-

Note: ICSS denotes the ICSS algorithm by Inclán and Tiao (1994). Numbers standing before the dates of break indicate the total number of breaks for a given country and series. Nb refers to the number of structural breaks.

4 Concluding remarks

Our findings are hardly breaking news in the sense that structural breaks are natural and are to be expected in economic transition. However, we hope that they break the ice in the empirical literature dealing with transition economies as regards structural breaks, which might have important implications for macro-econometric modeling in CEE economies. The fact that most empirical studies dealing with prices, money demand, productivity, the labor market or exchange rates in the economies of Central and Eastern Europe do not take care of the presence of structural breaks in the variance of the series studied could imply the bad performance of univariate and multivariate econometric models. Furthermore, ignoring structural breaks might have also important implications regarding the stability of the investigated relationships between variables with multiple breaks, the validity of the results and the ensuing recommendations for economic policy. Thus, to avoid such fallacies, we are all well advised to employ methods robust to structural breaks.

References

Ahmed, S., A. Levin and B.A. Wilson, 2001, "Recent US Macroeconomic Stability: Good Luck, Good Policies, or Good Practices?", International Finance Discussion Paper 730, Federal Reserve Board of Governors.

Bai, J. and Perron, P. (1998), "Estimating and testing linear models with multiple structural changes", Econometrica 66, 47-78.

Bai, J. and Perron, P. (2003), "Computation and analysis of multiple structural change models", Journal of Applied Econometrics 18, 1-22.

Blanchard, O. and J. Simon, 2001, "The Long and Large Decline in US Output Volatility", Brookings Papers on Economic Activity 1, 135-164.

Chauvet, M. and S. Potter, 2001, "Recent Changes in the US Business Cycle", Manchester School 69, 481-508.

Égert, B. and A. Morales-Zumaquero, 2005, "Exchange Rate Regimes, Foreign Exchange Volatility and Export Performance in Central and Eastern Europe: Just Another Blur Project?", William Davidson Institute Working Paper 782.

Sensier, M. and D.J. van Dijk, 2004, "Testing for Volatility Changes in U.S. Macroeconomic Time Series", The Review of Economics and Statistics 86(3), 833-839.

Fidrmuc, J. and A. Tichit, 2004, "Mind the Break! Accounting for Changing Patterns of Growth during Transition", William Davidson Institute Working Paper 643.

van Dijk, D.J., D.R. Osborn and M. Sensier, 2002, "Changes in Variability of the Business Cycle in the G7 Countries", Econometric Institute Report 282, Erasmus University Rotterdam, Econometric Institute.

Inclán, C. and Tiao, G.C., 1994, "Use of Cumulative Sums of Squares for Retrospective Detection of Changes of Variance", Journal of the American Statistical Association 89(427), 913-23.

Kent, Chris, Kylie Smith and James Holloway, 2005, "Declining Output

Volatility: What Role for Structural Change?" Mimeo.

Kim, C.J. and C.R. Nelson, 1999, "Has the U.S. Economy Become More Stable? A Bayesian Approach based on a Markov-Switching Model of the Business Cycle", Review of Economics and Statistics 81, 608-616.

Kim, C.J., C.R. Nelson and J.M. Piger, 2003, "The Less Volatile US Economy: A Bayesian Investigation of Timing, Breadth, and Potential Explanations", Journal of Business and Economic Statistics, to appear.

Kočenda, E., 2005, "Beware of Breaks in Exchange Rates: Evidence from European Transition Countries", Economic Systems 29(3), 307-324.

Koop, G. and S.M. Potter, 2000, "Nonlinearity, Structural Breaks or Outliers in Economic Time Series?, in W. A. Barnett, D. F. Hendry, S. Hylleberg, T. Teräsvirta, D. Tjøstheim and A. H. Wurtz (eds.), Nonlinear Econometric Modeling in Time Series Analysis, Cambridge: Cambridge University Press, 61-78.

Lundbergh, S., T. Teräsvirta and D. van Dijk, 2003, "Time-varying Smooth Transition Autoregressive Models", Journal of Business & Economic Statistics 21, 104-121.

McConnell, M.M. and G. Pérez-Quirós, 2000, "Output Fluctuations in the United States: What has Changed Since the Early 1980s?", American Economic Review 90, 1464-1476.

McConnell, M.M., P.C. Mosser and G. Pérez-Quirós, 1999, "A Decomposition of the Increased Stability of GDP Growth", Federal Reserve Bank of New York Current Issues in Economics and Finance 5(13).

Mills, Terence C. and P. Wang, 2003, "Have Output Growth Rates Stabilised? Evidence from the G-7 Economies", Scottish Journal of Political Economy 50(3), 232-46.

Smith, P. and P.M. Summers, 2002, "Regime Switches in GDP Growth and Volatility: Some International Evidence and Implications for Modelling Business Cycles", Melbourne Institute Working Paper Series 21.

Stock, J.H. and M.W. Watson, 2002, "Has the Business Cycle Changed and Why?, NBER Macroeconomics Annual.

Wang, J. and Zivot, E., 2000, "A Bayesian Time Series Model of Multiple Structural Changes in Level, Trend and Variance", Journal of Business and Economics 18, 374-386.

5 Data Appendix

	wiiw code	start	methodological changes
Industrial production (real, cumulated, first data point=100)			
Bulgaria	ba111tsb	Jan 1999	From 2000 new calculations for output.
Croatia*	ka111tsbx	Feb 92	In business entities with more than 20 persons employed.
Czech Rep	ca111tsbx	Feb 90	From January 1997 new methodology
Hungary	ha111tsbx	Feb 90	-
Slovakia	va111tsbx	Feb 93	From January 1999 according to EU methodology, revised schema of 2000.
Slovenia	la111tsbx	Feb 92	-
Poland*	pa111gsbx	Feb 90	Enterprises employing more than 5 persons, from January 2000 enterprises employing more than 9 persons.
Romania	ra111gsb	Jan 1991	-
Employment, total economy (1000 persons)			
Croatia	ke41_ta	Jan 1992	From October 1996 including persons employed at the Ministry of Defense and Ministry of Internal Affairs.
Russia E	se51_te	Mar 92	According to LFS methodology from 2000. From August 2003 revised according to census 2002.
Slovenia	le41_ta	Jan 1997	-
Bulgaria	be11_ta	Jan 1991	Up to 1997 public sector.
Croatia*	ke11_ga	Jan 1992	Up to 12/1995 business entities with more than 10 persons, from 1996 estimates for business entities with less than 10 persons. From January 1998 data include number on employees in the police and defense.
Poland*	pe11_ga	Jul 92	Enterprises employing more than 5 persons, from January 2000 enterprises employing more than 9 persons.
Romania E	re11_te	Jan 1994	From January 1998 and January 2000 according to new sample.
Slovenia	le11_ga	Jan 1991	Up to 1996 excluding employees by self employed persons. From January 1997 according to NACE Classification. 1991-1996: Enterprises with 3 and more employees, from 1/97 including enterprises with 1-2 employees.
Unemployment rate			
Bulgaria	beu1_tp	Jan 1991	From July 2002 according to new labor force bases.
Croatia	keu1_tp	Jan 1992	(from 10/1996 incl. persons employed at the Ministry of Def., Ministry of Internal Affairs)
Czech Rep.	ceu1_tp	Jan 1991	From July 2004 calculated with a share of disposable number of registered unemployed persons.
Hungary	heu1_tp	May 91	From May 1995 methodological changes.
Poland	peu1_tp	Jan 1991	The verified unemployment rate for December 1993 was 16.4% (due to the correction of the number of employed in individual agriculture). From January 2002 revised to census 2002.
Romania	reu1_tp	Dec 91	-
Russia	seu1_tp	Jan 1992	From August 2003 revised according to census 2002.
Slovakia	veu1_tp	Jan 1991	Ratio of unemployed calculated to the economically active population in 1992, from 1995 calc. on the basis of econ. active as of previous year. From December 1997 calculated as a share of disposable number of registered unemployment to the economically active persons of the previous year. From 1 August 2000 new low on unemployment benefits.
Slovenia	leu1_tp	Jan 1992	-
Ukraine	ueu1_tp	Dec 96	-

	wiiw code	Start	methodological changes
Producer price index (cumulated, first data point=100)			
Bulgaria	bp1p3tsb	Jan 1992	From January 1997 revised data according to new methodology for calculations From 2000 recalculated based on year 2000 as average.
Croatia	kp1p3tsb	Jan 1992	-
Czech Rep.	cp1p3tsbx	Feb 91	-
Hungary	hp1p3tsb	Jan 1992	-
Poland*	pp1p3gsb	Jan 1991	Enterprises employing more than 5 persons, from January 2000 enterprises employing more than 9 persons. Price indices calculated at 1992 weights, from 1996 at 1995 weights.
Poland	rp1p3tsb	Oct 90	-
Russia	sp1p3tsb	Jan 1991	-
Slovakia	vp1p3tsbx	Feb 92	From January 1997 revised index schema. From January 1999 revised index schema of 2000, excluding VAT and excise taxes
Slovenia	lp1p3tsb	Jan 1991	-
Ukraine	up1p3tsb	Jan 1995	-
Consumer price index (cumulated, first data point=100)			
Bulgaria	bp1p1tsb	Jan 1991	From January 1995 according to standardized EU methodology.
Croatia	kp1p1tsb	Jan 1992	From 1992 up to 2001 retail prices. From August 2001 adjustment lowering telecom prices.
Czech Rep.	cp1p1tsb	Jan 1992	-
Hungary	hp1p1tsb	Jan 1990	-
Poland	pp1p1gsb	Jan 1991	-
Romania	rp1p1tsb	Nov 90	-
Russia	sp1p1tsb	Jan 1991	-
Slovakia	vp1p1tsb	Jan 1992	From January 1997 revised index schema. From January 2001 recalculated by using the revised consumer basket 2000.
Slovenia	lp1p1tsb	Jan 1993	-
Ukraine	up1p1tsb	Jan 1995	-
M2 (end of period, NCU)t			
Bulgaria	bfm21tn	Jan 1991	Up to Nov 1995 money + quasi money, from Dec 1995 according to ECB methodology.
Czech Rep.	cfm21tn	Dec 91	Revised from Jan 1993 according to methodology starting January 2002 - excluding Extra budgetary funds. Recalculated from January 2002 according to ECB monetary standards.
Hungary	hfm21tn	Mar 90	Methodological break Dec 1991/ Jan 1992. Up to Dec 1997 money + quasi money, from Jan 1998 according to ECB methodology.
Poland	pfm21tn	Dec 91	Up to Nov 1996 money + quasi money, from Dec 1996 according to ECB methodology.
Romania	rfm21tn	Jan 1991	M1 + Quasi money.
Russia	sfm21tn	Jun 95	Data are presented in the new Russian rouble (1 RUB = 1000 RUR).
Slovakia	vfm21tn	Jan 1991	At fixed exchange rates.
Slovenia	lfm21tn	Jan 1995	From 1995 national definition of ECB methodology.
Ukraine	ufm21tn	Jan 1996	M1 + Quasi money.
Nominal exchange rate (NCU/FCU, period average)			
Bulgaria	bp2xea	Feb 91	wiiw calculated up to 11/1996.
Croatia	kp2xea	Jan 1994	-
Czech Republic	cp2xea	Jan 1991	-
Hungary	hp2xea	Jan 1990	-
Poland	pp2xea	Jan 1993	-
Romania	rp2xea	Jan 1991	wiiw calculated up to 11/1993.
Russia (USD)	sp2usa	Jan 1991	Data are presented in the new Russian rouble (1 RUB = 1000 RUR).
Slovakia	vp2xea	Jan 1993	-
Slovenia	lp2xea	Jan 1992	-
Ukraine (USD)	up2usa	Jan 1996	-

Note: * indicates the exclusion of small firms; euro: up to December 1998 ECU; USD for Russia and Ukraine.