

# CERGE-EI FORECASTING MODEL

<http://www.cerge-ei.cz/forecast/>

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Institute

# Challenges and objectives

## Objectives:

- Precise
- Real time
- Cheap

## Challenges:

- short time series
- structural changes
- poor quality of data

# Countries

- Belarus
- Bulgaria
- Croatia
- Czech Republic
- Estonia
- Hungary
- Latvia
- Lithuania
- Poland
- Russia
- Slovakia
- Slovenia
- Ukraine.

# Conceptual framework

- Use variety of uni- and multivariate methods
- Combine data of different frequencies (monthly, quarterly)
- Incorporate competitors' forecasts
- Pool across forecasts
- Use experts' judgment

# Core variables

- Real GDP growth
- CPI inflation rate
- Unemployment rate
- Exchange rate
- Money growth rate

# Data sources

- National statistical agencies
- Central banks
- IMF International Financial Statistics
- OECD
- Own calculation/reconstructed series

# Variables

- Core
- Balance of payment
- Financial (mainly interest rates)
- Government
- Real (e.g., industrial production)

# Methods

- VAR - in levels and in differences, state space, Bayesian
- Exponential Smoothing
- Diffusion index
- Discounted LS
- Forecasts on forecasts
- ARIMA, Rolling Regression



# Country differences

- Same core specifications
- Dummies variables for special events
- Definitions of variables
- Exogenous variables (e.g., oil for Russia)

# FLOW OF INFORMATION

## **Exogenous variables**

### **External:**

oil prices  
USD/EURO exchange rate  
EURO-area real GDP  
EURO-area CPI

### **Internal:**

dummy for crises  
dummy for new/modified taxes  
dummy for redefinitions of variables  
dummy for a change in regime

## FLOW OF INFORMATION

### Core variables

Exchange rate:  
USD/local currency  
EURO/local currency

Real GDP

Consumer price index

Unemployment rate

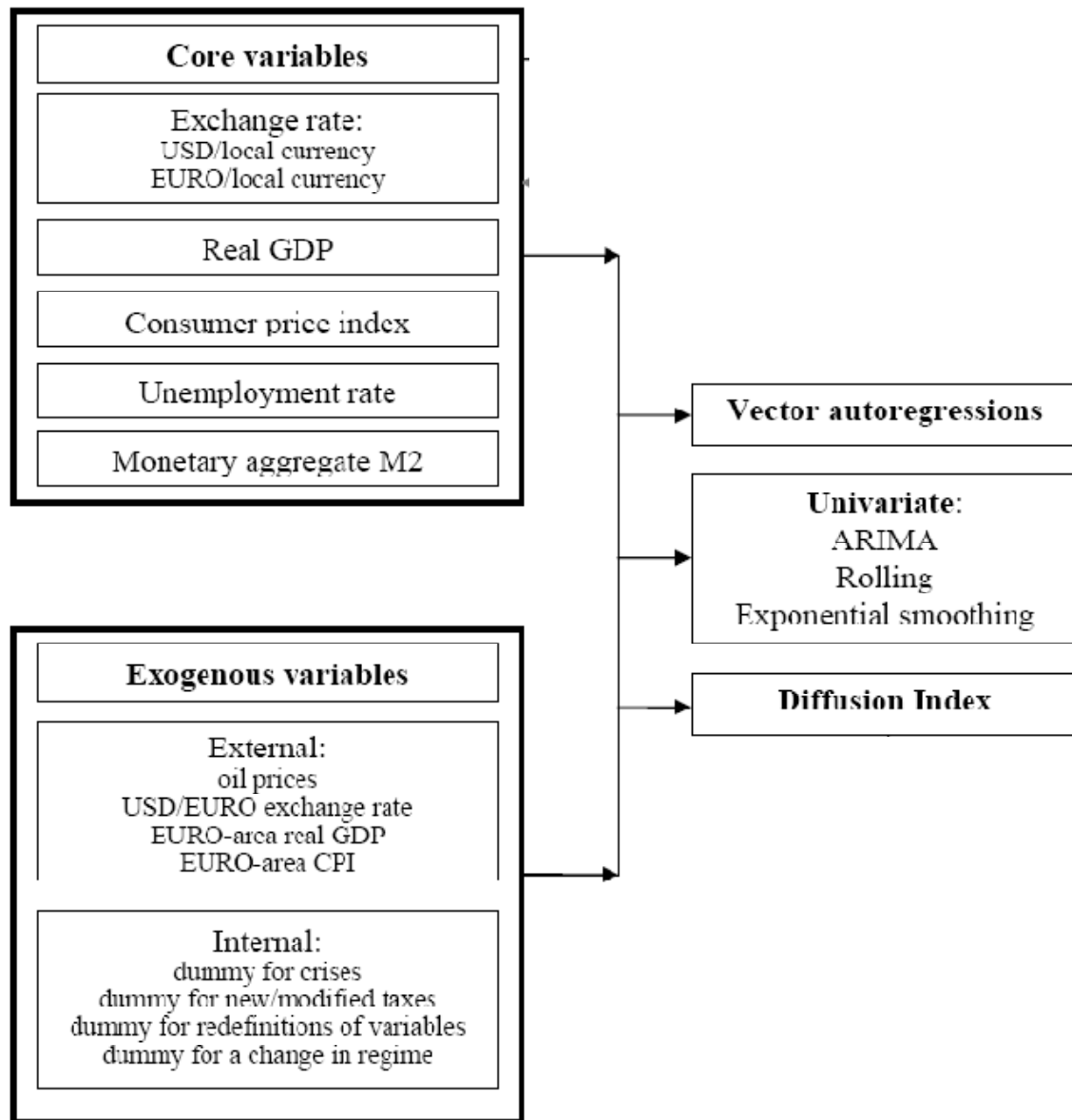
Monetary aggregate M2

### Exogenous variables

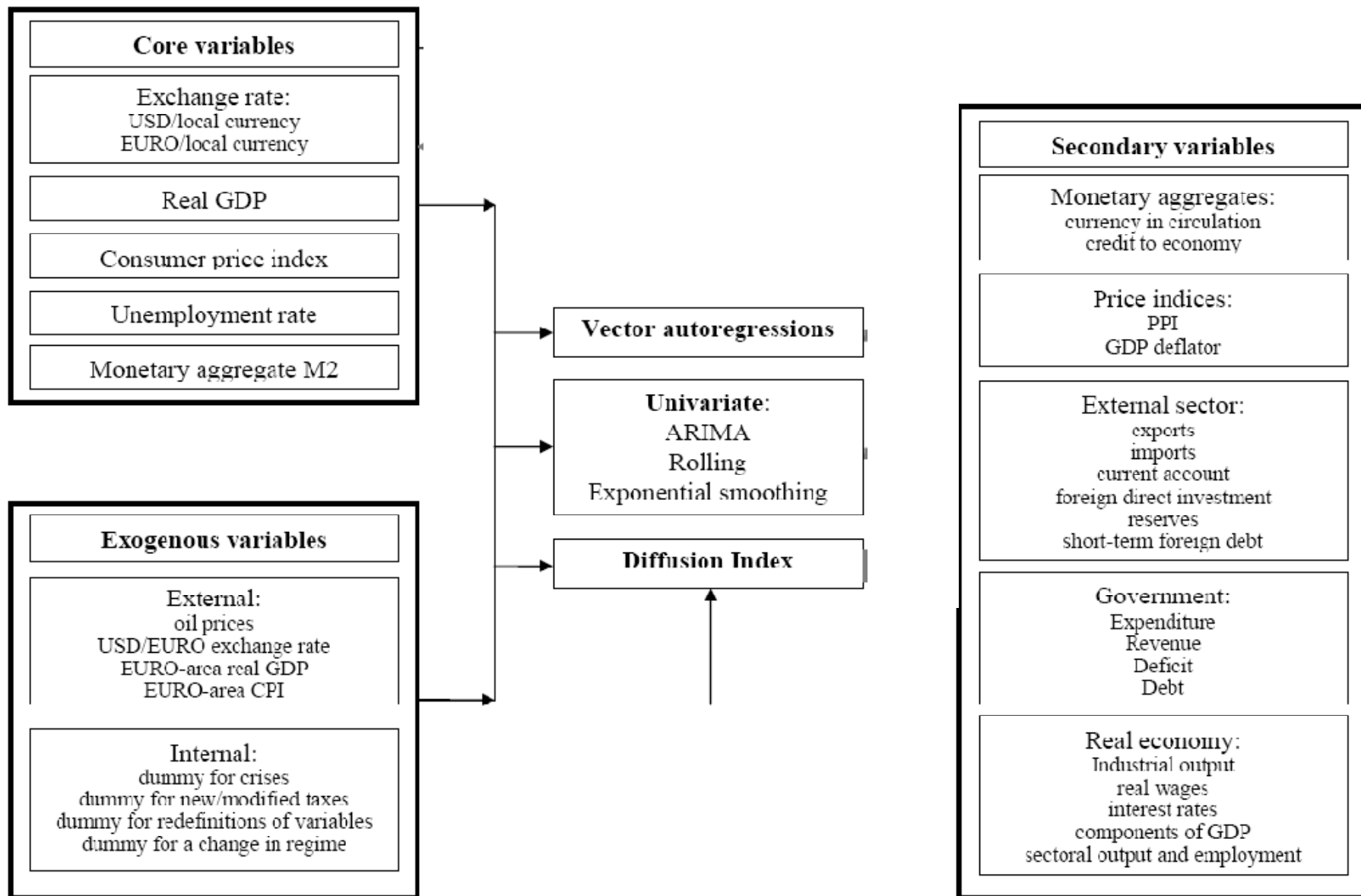
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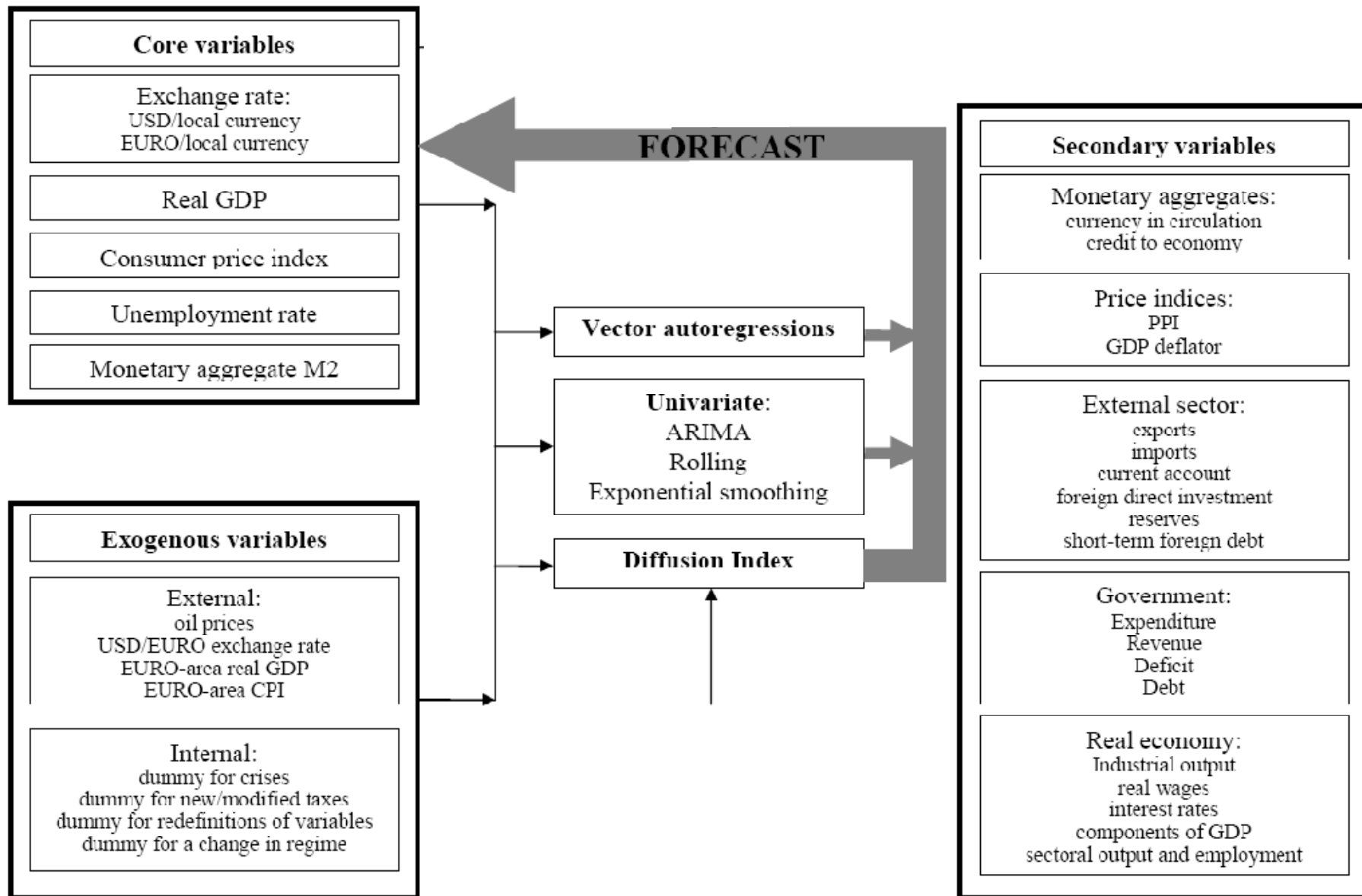
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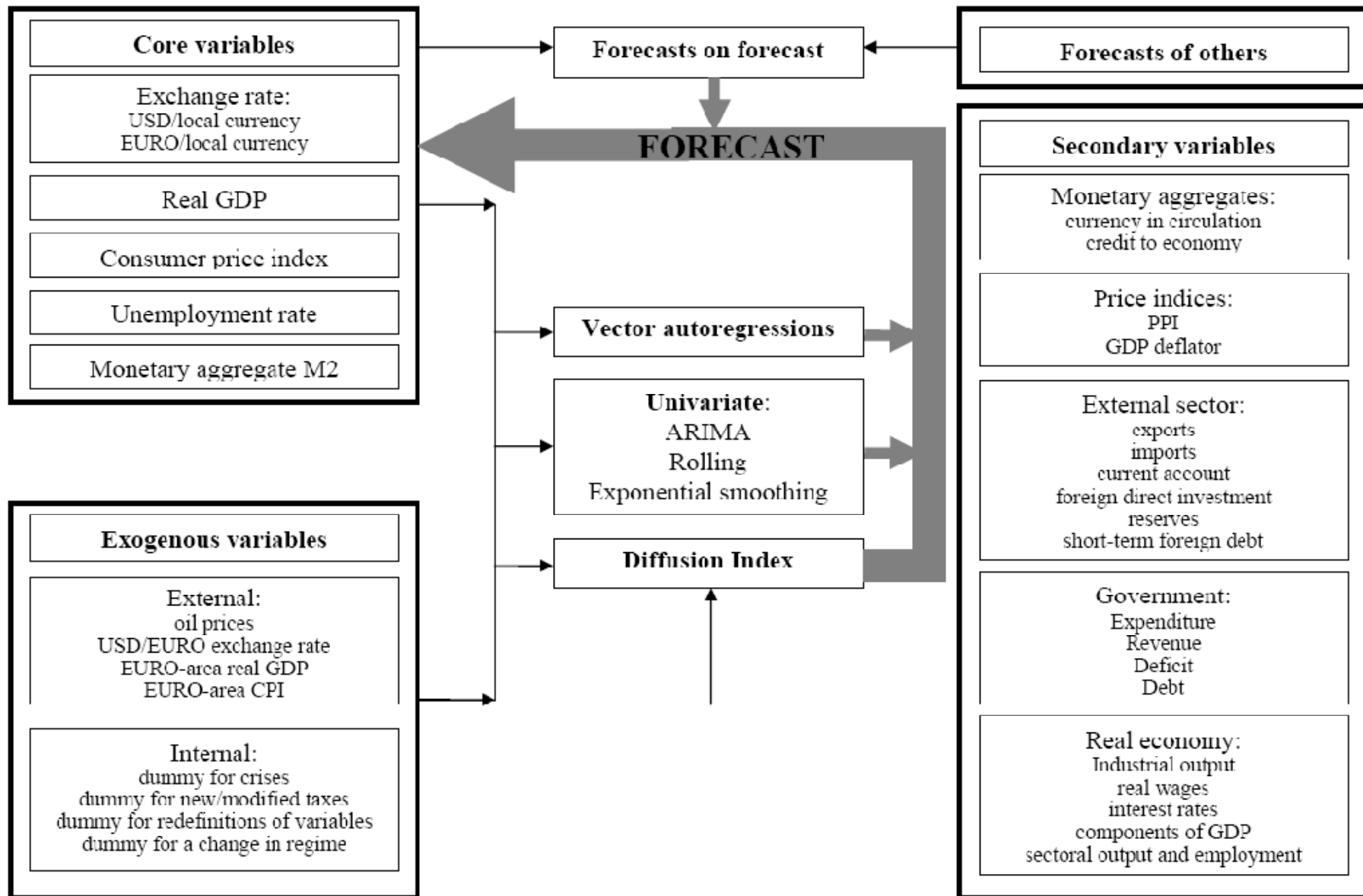
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# Pooling forecasts

- Pooled forecasts perform better
- Attenuates misspecification
- Methods
  - Simple average
  - Weighted average with inverse standard errors as weights



# Performance

Forecasting agency	Inflation		GDP	
	Average rank	Rank	Average rank	Rank
WDI	2.5	1	4.1	3
WDI (unadjusted)	7.0	8	5.7	8
EBRD	3.0	2	4.8	6
OECD	7.8	10	4.6	4
IMF	4.5	4	3.5	2
Ec. Int. Unit	5.2	5	4.7	5
DRI	6.0	7	6.5	9
IWH	7.7	9	7.6	12
Kopint-Dator	8.4	13	5.4	7
WIIW	7.9	11	7.0	10
CSFB	4.3	3	9.0	13
JP Morgan	5.6	6	3.0	1
Dan&Brradstreet	8.0	12	7.1	11

## Forecasts on forecasts

### Specification:

projection on forecasts of other agencies and own lags  
(univariate)

### Data preparation

transform series to match available forecasts  
(growth rates, level, etc)

### Estimation:

projection on leads, lags and current values of forecasts plus  
own lags.

### Forecast:

dynamic forecast  
asymptotic standard errors

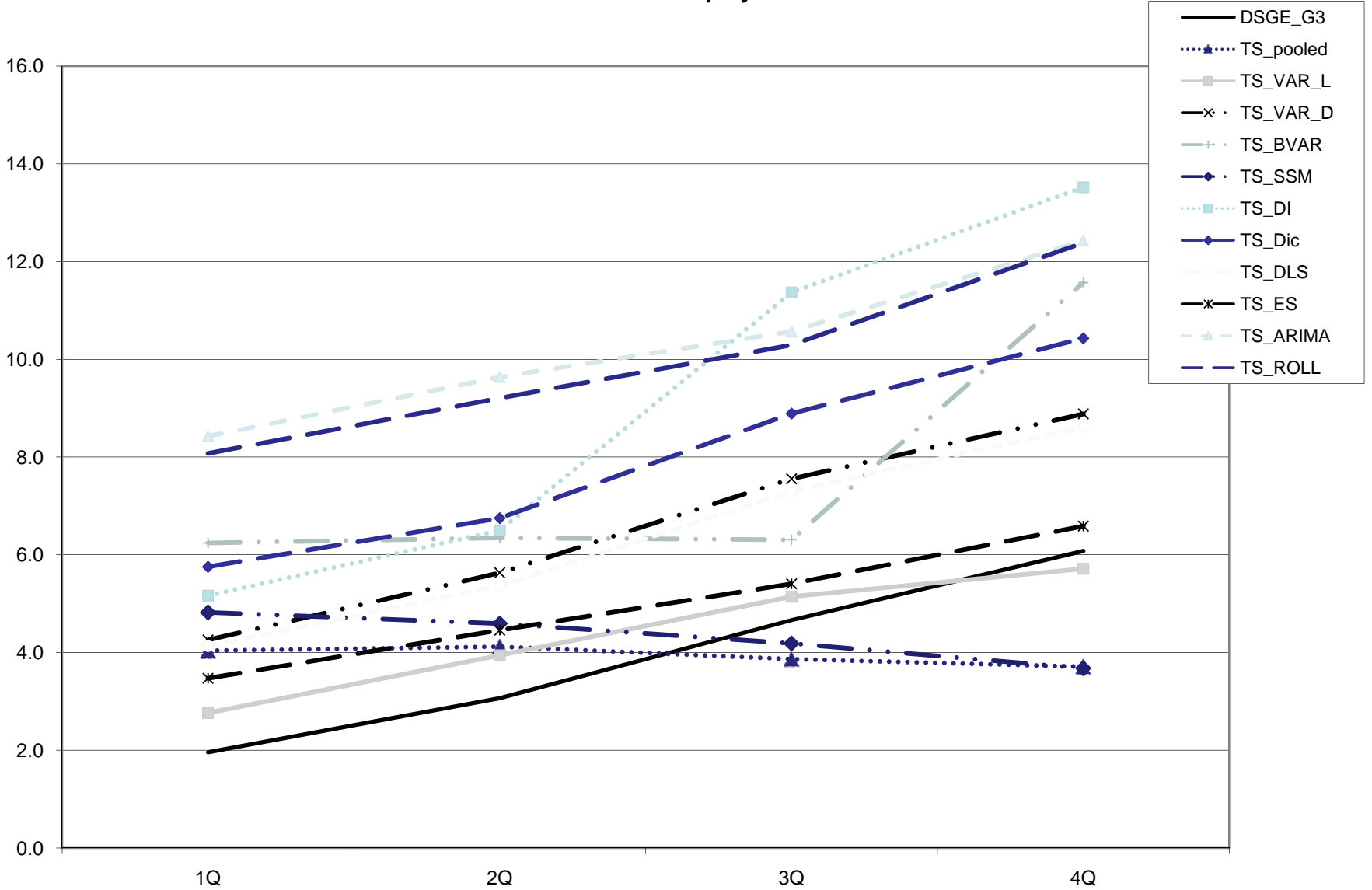
## CERGE-EI Macroeconomic Forecasts

*released on December 7, 2009*

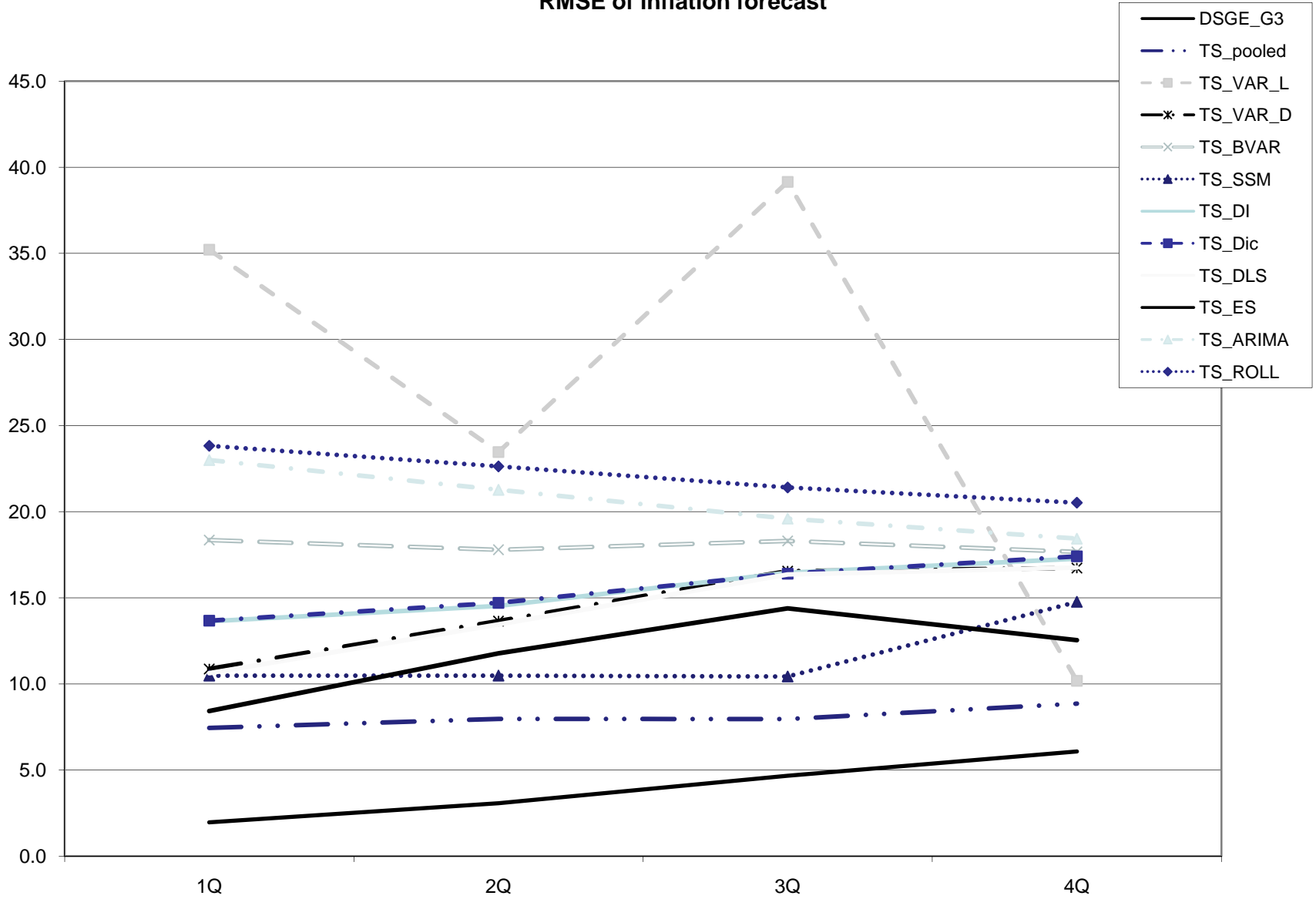
	Annual growth, %				Inflation, %				Unemployment, %			
	2009Q4	2010Q1	2010Q2	2010Q3	2009Q4	2010Q1	2010Q2	2010Q3	2009Q4	2010Q1	2010Q2	2010Q3
<b>Bulgaria</b>	-0.4	8.7	-0.4	9.1	4.3	3.3	2.0	3.6	7.9	8.3	8.8	8.4
<b>Croatia</b>	3.5	0.1	-4.2	0.7	2.4	1.3	0.6	0.5	14.8	15.5	15.8	14.5
<b>Czech Republic</b>	-2.8	-0.4	-5.1	-1.0	0.7	0.4	0.2	0.8	7.0	7.0	6.9	6.4
<b>Estonia</b>	-6.5	6.4	-5.2	-4.1	0.4	0.0	0.7	1.3	12.1	14.1	12.4	11.0
<b>Hungary</b>	2.2	-2.8	-6.9	2.5	2.7	2.3	2.0	2.2	8.4	8.8	9.6	8.9
<b>Latvia</b>	-17.0	-7.2	-1.0	2.6	4.9	2.7	2.2	1.3	13.8	14.8	14.3	12.2
<b>Lithuania</b>	-8.5	-10.8	-2.3	-4.9	7.3	6.1	4.6	3.2	11.8	13.9	12.9	12.4
<b>Poland</b>	0.0	-0.9	1.5	1.3	2.8	2.6	2.3	2.0	9.9	10.7	11.3	10.3
<b>Romania</b>	-9.7	-8.2	-0.2	0.5	5.5	4.6	3.8	3.8	6.5	7.7	8.6	7.6
<b>Russia</b>	-2.7	4.3	-3.4	5.1	11.3	10.9	10.3	10.1	9.3	9.9	9.6	7.7
<b>Slovakia</b>	-4.8	-2.9	6.9	5.6	2.6	2.0	1.9	1.7	10.5	9.6	11.6	11.7
<b>Slovenia</b>	-8.0	-4.8	0.6	0.9	1.2	0.5	0.3	1.0	8.0	8.4	9.1	8.3
<b>Ukraine</b>	-17.3	-6.4	5.3	5.2	16.1	14.2	12.4	13.9	3.7	4.3	4.6	4.5

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RMSE of unemployment forecast



RMSE of inflation forecast



# RMSE of GDP forecast

