Economic Sentiment Indicator and Confidence Indicator in Services in the new weight System

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- Presentation of experimental calculations of ESI with new weights, included also CI in services
- Time series of indicator in services - only from year 2002
- We ask Infostat – Institute of Informatics and Statistics for retropolation and extension of time series up to 1997 retrospectively
- In this work, we try to present results of this reconstruction.
The current situation

Economic Sentiment Indicator as composite indicator is calculated on a monthly base since 1997

- aggregated from results of processing of BTS in industry, construction, retail trade and consumers
- calculated as weighted arithmetic mean of four confidence indicators in industry, construction, retail trade and consumers:

\[ IES = a \times ICI + b \times BCI + c \times RCI + d \times CCI \]

\[ a, b, c, d = \text{weights} \]
Weights of Confidence Indicators

- ICI - Industry 40 %
- BCI - Construction 20 %
- RCI - Retail trade 20 %
- CCI - Consumer 20 %
Experimental calculations including services

ESI has begun to be calculated at the end of 2004

- as weighted arithmetic mean from five partial components – confidence indicators in industry, construction, retail trade, services and consumer by the following formula:

\[ \text{IES} = a \times \text{ICI} + b \times \text{BCI} + c \times \text{RCI} + d \times \text{SCI} + e \times \text{CCI} \]

\[ a, b, c, d, e = \text{weights} \]
New weights of Confidence Indicators

- ICI - Industry 40 %
- BCI - Construction 5 %
- RCI - Retail trade 5 %
- SCI – Services 30 %
- CCI - Consumer 20 %
Comparison of results

Economic sentiment indicator incl. services

2000 = 100

Average 1997 - 2005
Economic sentiment indicators

Economic sentiment indicator

ESIN in SR inc.
services
(2000=100)

ESIN in SR w.
services
(2000=100)

CI in Industry and GDP

Confidence Indicator in Industry and GDP (quarterly)
CI in construction and GDP

Confidence indicator in Construction and GDP
(quarterly)

CI in BUI
GDP

99,0 100,0 101,0 102,0 103,0 104,0 105,0 106,0 107,0 108,0 109,0
-80,0 -70,0 -60,0 -50,0 -40,0 -30,0 -20,0 -10,0 0,0 10,0 20,0
CI in retail trade and GDP

Confidence indicator in Retail Trade and GDP (quarterly)

CI in RET

GDP


2006
CI in services and GDP

Confidence indicator in Services and GDP (quarterly)

CI in SER

GDP

2006
Consumer CI and GDP

Consumer’s confidence indicator and GDP (quarterly)

CCI
GDP


99,0 100,0 101,0 102,0 103,0 104,0 105,0 106,0 107,0 108,0 109,0 110,0

99,0 100,0 101,0 102,0 103,0 104,0 105,0 106,0 107,0 108,0 109,0 110,0
Conclusions

From January 2007

- new publication of official results of IES
- with inclusion of confidence indicator in services
- contemporaneously with previous weights we will maintain the original time series of IES some period of time.
- we release new weight system and methodology of calculation
- we will inform economic public about this measures in advance
Composite indicators and econometric models

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- the research in regard to the construction and use of models has for a long time been carried out by INFOSTAT. From the methodological point of view there are econometric models.

Since 2005, their development has received a further stimulus in the fact that the SO SR

- is obliged to compute and publish in advance a flash estimate of GDP and total employment – always by 45 days after the end of each quarter.

- It is in this context that model tools for computing flash estimates of these indicators were created and applied during the course of 2005.

- ESI is considered as a reference indicator for its growth (compared to the same period of the previous year).
Modelling of GDP based on ESI

As the starting hypothesis about the functional form of the model relationship can be formulated differently, model tools presented here have different form as well.

Either it is a classical econometric model (not affected by error correction term) or it is a model relationship in the form of ECM.
Modelling of GDP based on ESI

The results of estimation are based

- on original (not seasonally adjusted) time series of relevant quantitative and qualitative indicators in combination with seasonal dummies
- the quarterly time series of the ESI was created by transformation from its original, i.e. monthly time series
- parameters of model relationships are estimated by means of methods using EViews 5
Correlation between ESI and GDP

Model relationship without error correction term

Based

- on the starting hypothesis that the ESI is considered as a reference indicator for GDP in constant prices
- to be more precise, it is assumed that there exists statistically significant dependency between the percentage growth rate of GDP (compared to the same quarter of the previous year) and the ESI
- the hypothesis formulated in this way was tested using quarterly time series of these indicators for the period 1st quarter 1996 to 4th quarter 2005, i.e. from 40 observations. Figure 1 presented below shows that a close relationship exists between the evolution of the ESI (expressed in balances) and the growth of GDP (in %):
Model relationship without error correction term

GDP growth, % (RHS scale)
Economic sentiment indicator, balance (LHS scale)
The construction of the model relationship is based

- on a modified starting hypothesis according to which GDP grows at a basically constant pace, however, under the effect of changes in the ESI, its pace becomes variable
- the hypothesis so formulated results in a following model relationship that is assumed to be long-term one:
  \[ GDP = \alpha \cdot e^{b \cdot \text{TIME}} + c \cdot \text{ESI} \]

or

\[ \log(GDP) = a + b \cdot \text{TIME} + c \cdot \text{ESI} \]
Model relationship in ECM form

![Graph showing model relationship in ECM form]

- Residual
- Actual
- Fitted

Conclusions

The ESI

- can be considered as statistically significant indicator of GDP development
- it may be used to construct model relationships for flash estimates of GDP
- a comparison of the statistical characteristics shows their different explanatory power, significantly higher for the ECM model
- to make GDP flash estimates more reliable, depends above all on expanding the ESI with the confidence indicator in services
- the services sector accounts for more than 50% of GDP in Slovakia
ESI, CI and models in Slovakia

Thank you for your attention