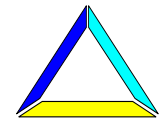


# The Usefulness of Business Tendency Survey Data for Short-Term Forecasting in the Post-Transition Economy: The Case of Ukraine

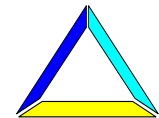
Comparison of the Business Tendency Survey Results with  
Quantitative Statistics

**Oksana Kuziakiv,**  
**Executive Director, Institute for Economic  
Research and Policy Consulting, Kyiv, Ukraine**



# Content:

1. **Business Survey Data (BTS):**
  1. **What is it?**
  2. **Qualitative vs. quantitative**
  3. **Why it is useful for economic forecasting**
2. **BTS in Ukraine: source of data**
3. **BTS in Ukraine: data description**
4. **BTS in Ukraine: agenda for Leading Indicator (LI) construction:**
  1. **Correlation between ex post and ex ante**
  2. **BTS vs. "real life" data**
  3. **LI: Principal Component Analysis (PCA)**
5. **Conclusion**

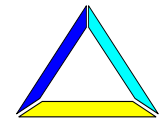


# BTS data: what is it?

**Business tendency surveys (BTS)** are the source of information about the state and future progress of the economic situation of a sector or overall economy.

**BTS data** called “qualitative” statistics bases on the enterprise managers’ opinions and expectations.

**BTS data** is not substitute for quantitative statistics but rather serve as complement.



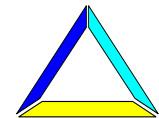
# BTS data: qualitative vs. quantitative

- Quantitative statistics answers question “how many”

**Example:** *Volume of production, turnover or incoming orders (in physical or monetary units) by company X*

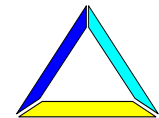
- Qualitative statistics answers question “in which way”, “what is the main tendency”

**Example:** *Answers to questions about production or demand tendency (increase/no change/decrease) or judgment on business situation (good/satisfactory/bad) or on stocks (too large/sufficient/too small)*



# BTS data: why it is useful for economic forecasting?

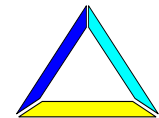
1. Often contain information on variables not covered by quantitative statistics (inventories, capacity utilization, investment plans, etc.)
2. Give insight into process of change in judgments and anticipations that generally forerun variables covered by usual economic statistics (demand, production, sales, etc.)
3. **Available in real time** in contrast official statistics which are published with considerable lag



# BTS data: why it is useful for economic forecasting?

## BTS provide information about:

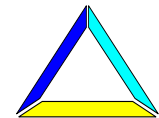
- Concise picture of economy or single branch
- Leading “hints” concerning economic tendency in short- or middle-run for whole economy or single branch.
- “Turning points” of the business cycle.



# **BTS data: why it is useful for economic forecasting?**

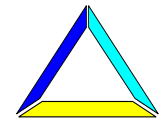
**The Leading Indicator constructed based on BTS data is the important tool for getting advantages for BTS data for economic forecasting.**

**Based on BTS data in Ukraine we try to construct the Leading Indicator for Industrial Sector.**



# **BTS in Ukraine: sources of data**

- 1. Business tendency project of the Institute for Economic research and Policy Consulting (since 1996).**
- 2. Business survey of National Bank of Ukraine (since 2006, methodology differs from EU Harmonized).**
- 3. Statistic Service of Ukraine (since 1997, no public available data).**





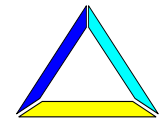
# **BTS in Ukraine: sources of data**

**The Institute for Economic Research and Policy Consulting (IER) has the longest time series of aggregated qualitative data (industrial sector)**

**[http://www.ier.com.ua/en/proekt\\_dilova\\_dumka/](http://www.ier.com.ua/en/proekt_dilova_dumka/)?**

**Quarterly Enterprise Survey (since 1996)**

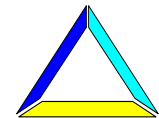
**Quarterly Bank Survey (since 2007)**



# **BTS in Ukraine: Data description**

## **Data received from the Business Tendency Project of the IER:**

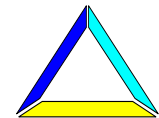
- **Time-series data collected from 1998 quarterly. Some time series are collected since 1996**
- **The panel sample includes 300 enterprise located in the East, West, Central and East regions of Ukraine**
- **The content and interpretation of the QES indexes is the same as balance percents**



# BTS in Ukraine: Data description

Data presented is seasonally adjusted by Census Method I (the ratio-to-moving-average method, the additive approach for modeling the seasonal factors):

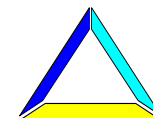
- a series into a seasonal component,
- a combined trend and
- cycle component, and
- an "error" component.



# **BTS in Ukraine: agenda for LI construction**

- 1. BTS Data should be consistent (to check correlation between assessments and expectations with shift by one period ahead)**
- 2. BTS Data should correlate with “real life” data**

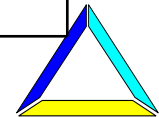
**If these two preconditions are true the Leading Indicator might be constructed using BTS data.**



# Correlation between assessment and expectations

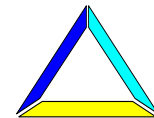
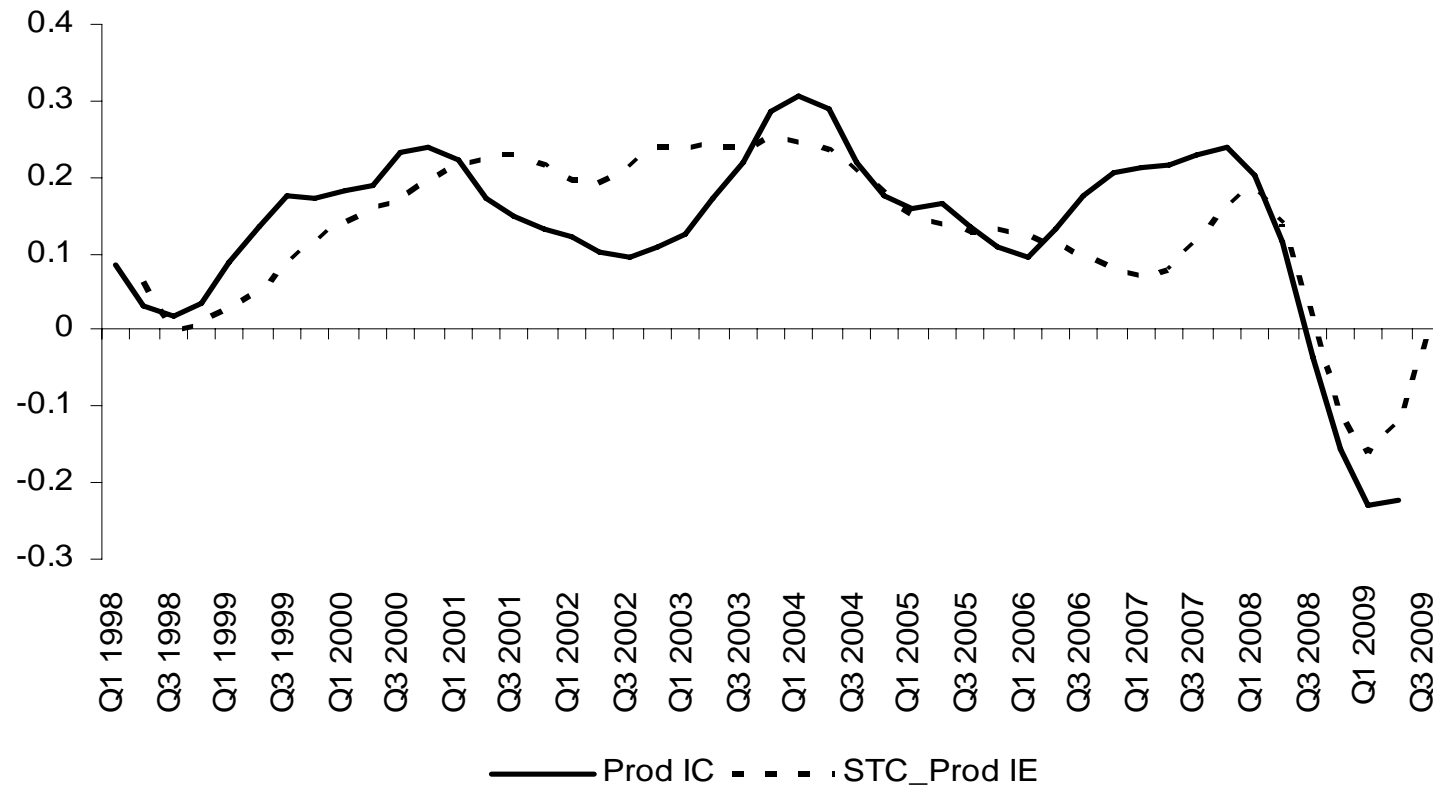
The data are rather consistent: *ex post* and *ex ante* (shifted by quarter ahead) variables have relatively high correlation

Period	Correlation
1996-1999 (recession)	0.251
2000-2004 (first period of growth)	0.824*
2005-2007 (period of growth after change of political regime)	0.894*
1996-2007	0.612*
1998-2007	0.826*
*. Correlations significant at the 0.01 level (2-tailed)	



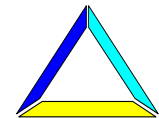
# Correlation between assessment and expectations

BTS indexes: Production and Production Expectations, Seasonally Adjusted



## **BTS vs. "real life" data**

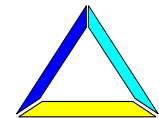
**To quantify consistence between qualitative and quantitative variables by the Pearson's coefficient of correlation and as result, to find the BTS variables which are the most correlate with reference data**



# BTS vs. "real life" data

## Quantitative ("real life") data in Ukraine:

- lack of all required data for all period of Ukrainian economic history
- even the required data is found it might be calculated by different way in different periods of time





# BTS vs. "real life" data

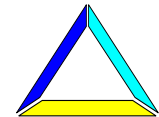
## Quantitative data used for analysis:

### Proposed:

- rate of growth of value added (VA),
- rate of growth of industrial output (IOP),
- rate of growth of consumer price (CPI)
- rate of growth manufacturing output (MOP)

### Used:

- rate of growth of value added (VA),



# BTS vs. "real life" data

## BTS used for analysis

### 3 months expectations:

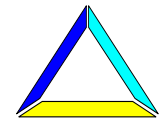
- production,
- sale,
- stock of raw materials,
- new order,
- domestic demand,
- capacity utilization,
- selling prices,
- purchasing prices,
- employment (number of workers),
- profitability

### 6 months expectations:

- index of overall business climate expectations
- index of the expected firm's business situation

### Three component index:

- Industrial confidence indicator (*production expectations, current order books and current stock of finished goods*)



# BTS vs. "real life" data

## Results of cross correlation between BTS and quantitative data:

The highest correlations are recorded for the both type (ex post and ex ante) of such variables as

capacity utilization

sale,

new orders,

domestic demand,

foreign demand,

production,

export,

employment,

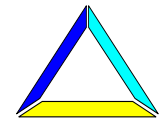
Profitability etc

**Strong correlation with reverse sign is recorded for**

inter enterprise arrears,

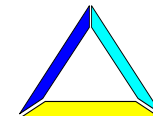
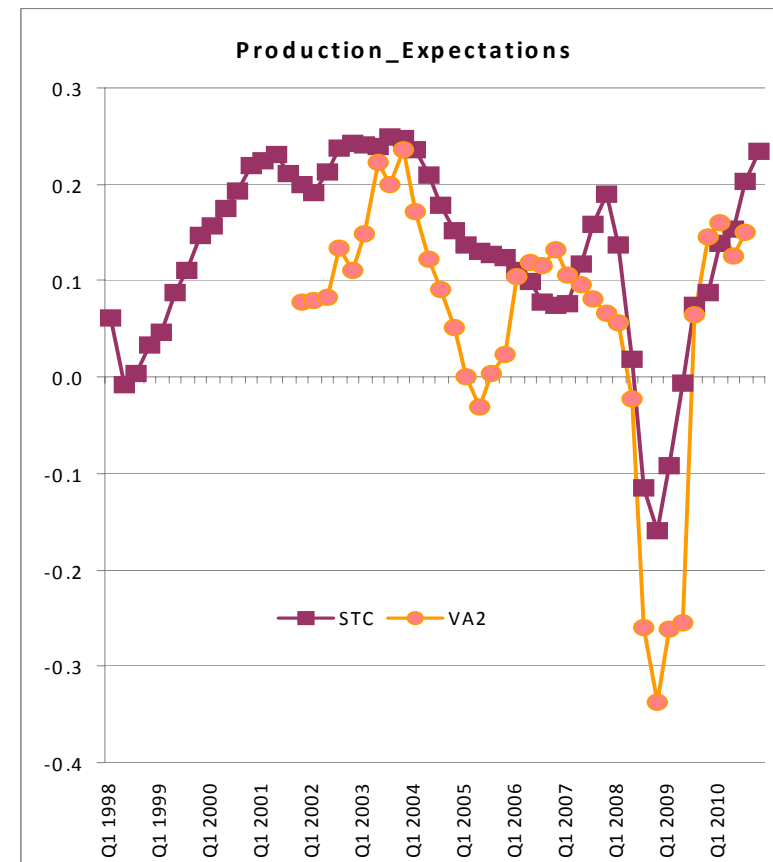
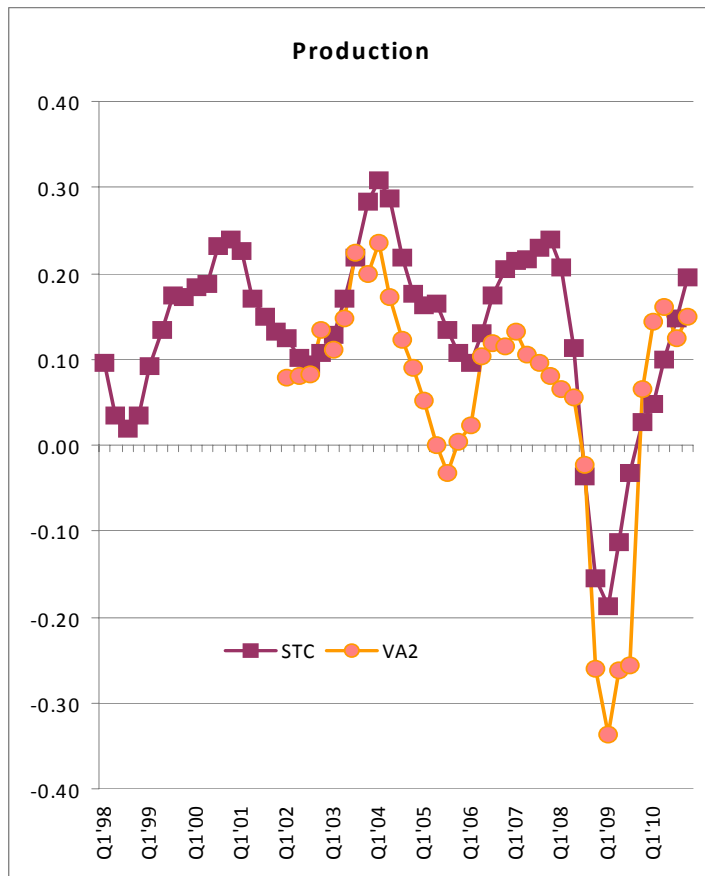
tax and wage arrears

part-time employment.



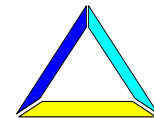
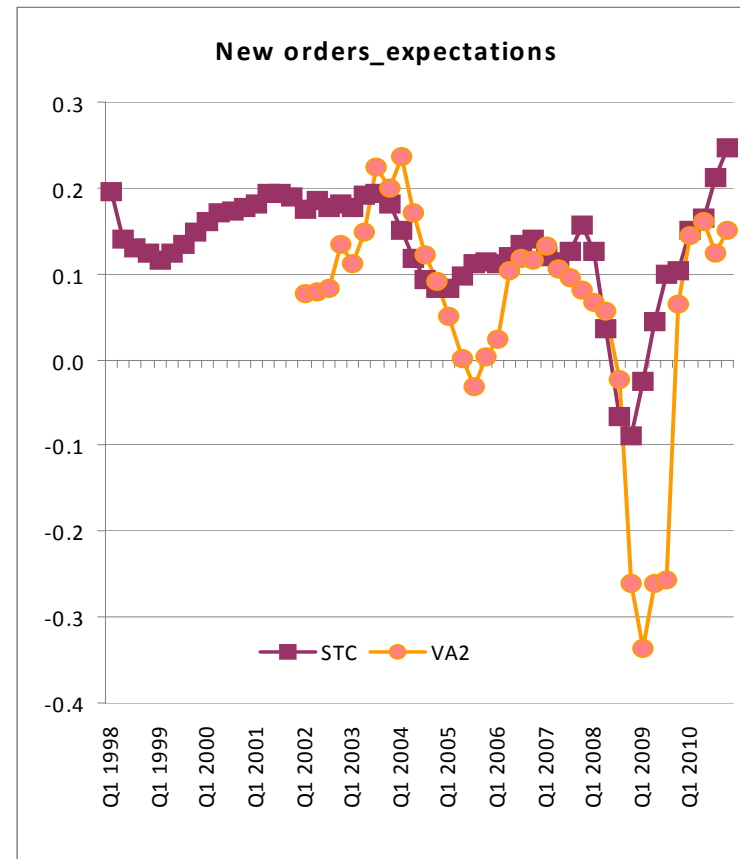
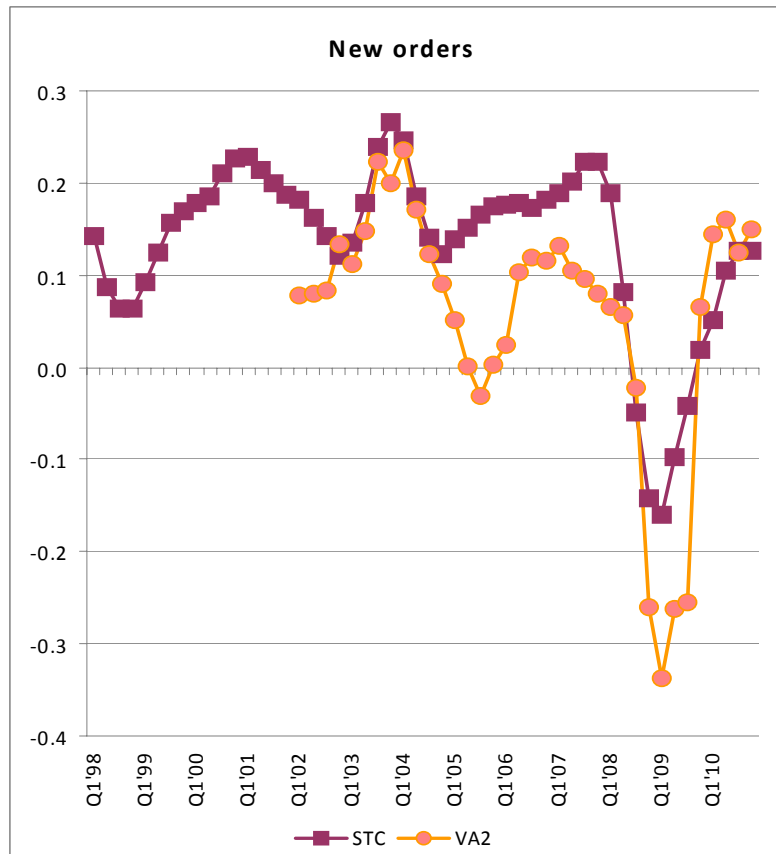
# BTS vs. "real life" data

## Results of cross-correlation



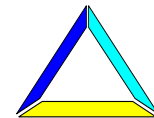
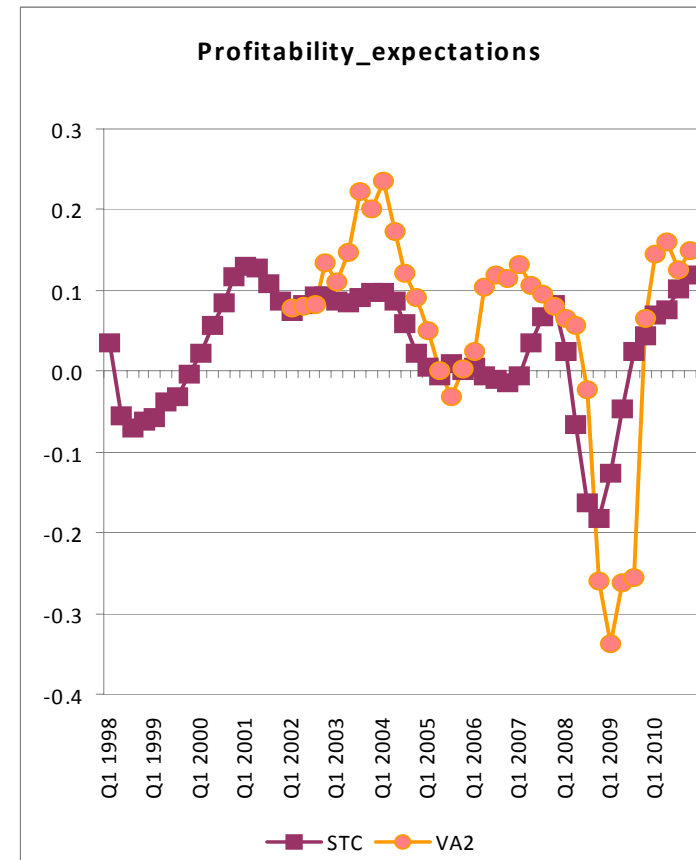
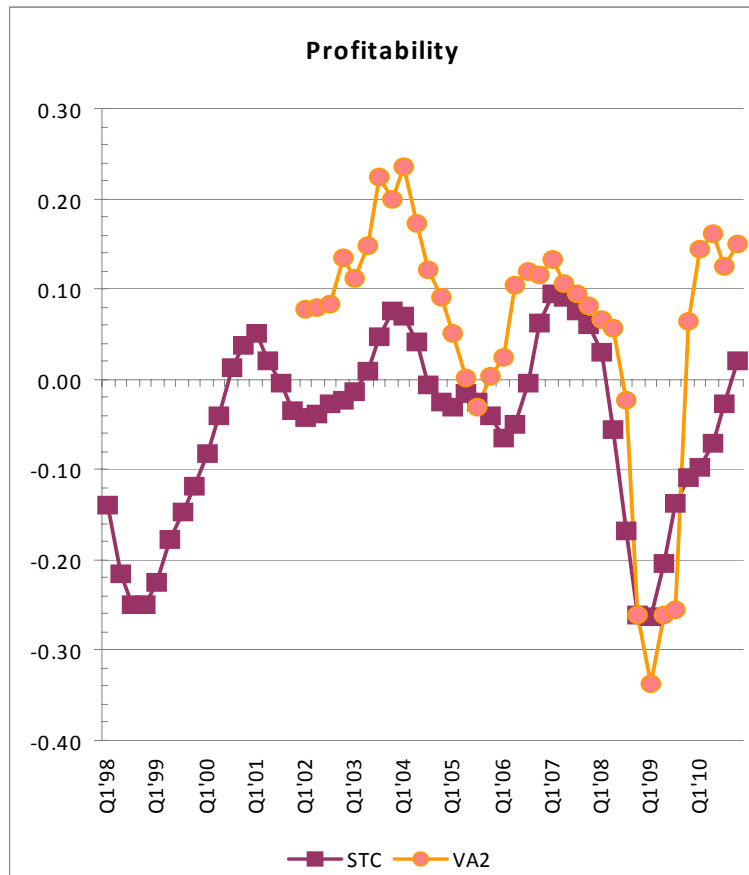
# BTS vs. "real life" data

## Results of cross-correlation



# BTS vs. "real life" data

## Results of cross-correlation



# Leading Indicator

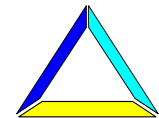
**BTS data is:**

- Consistent
- Have a high correlation to “real life” statistics

**As results:**

**Construction of the Leading Indicator**

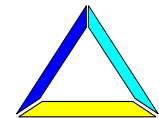
**METHOD: Principal component analysis  
(PCA)**



# Leading Indicator

The ideology of contrition of the Leading Indicator is:

*“If variance of given set of pre-selected variables, which are closely correlated to a given reference series, can reasonably well be represented by one principle component only, this component will serve e as basis to derive the final indicator” (Graff, Etter 2010)*

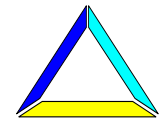




# Leading Indicator: PCA

## Variables selected for PCA:

- Production
- Sale
- Capacity utilization
- New orders
- Domestic Demand
- Number of workers
- Profit



# Leading Indicator: PCA

Explained variance by the first component

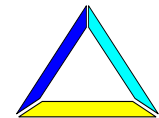
– Ex past

0.837 (SA)      0.907 (TC)

- Ex – ante

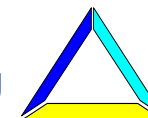
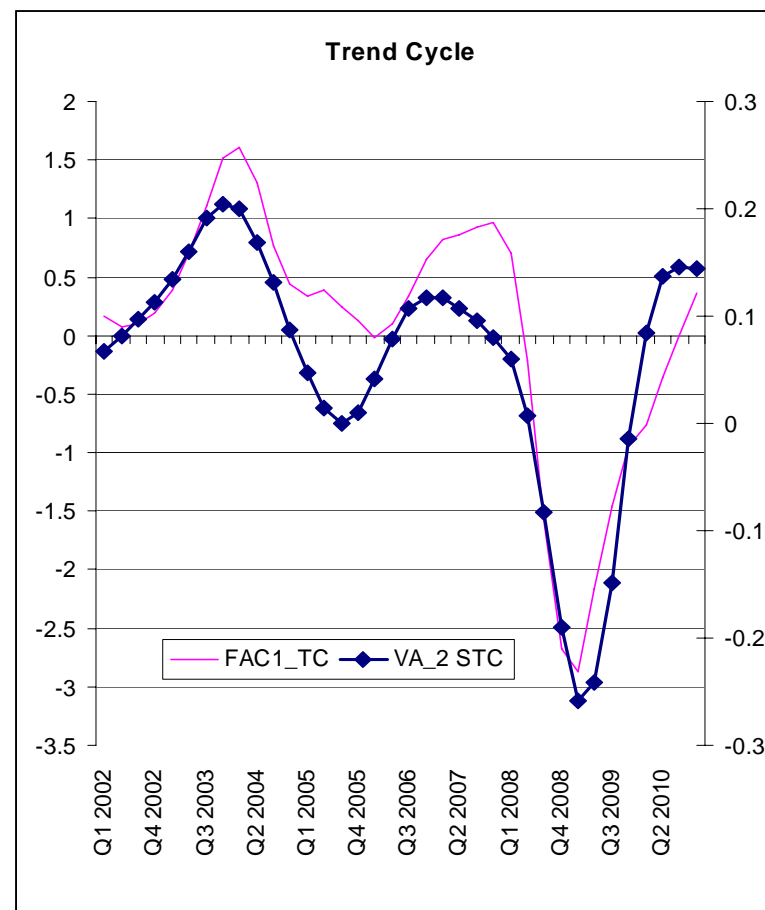
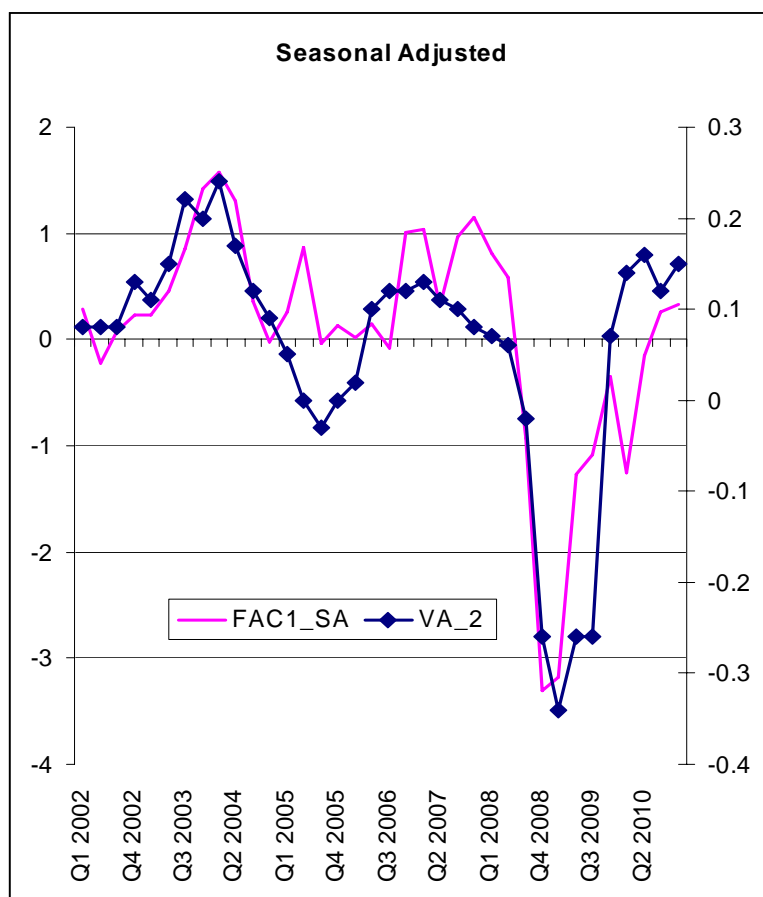
0.897 (SA)      0.907 (TC)

The cross-correlation between the indicator derived from selected *ex-ante* variables with reference series *y-o-y VA* is higher than with *ex-past* ones



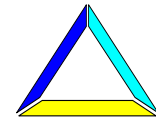
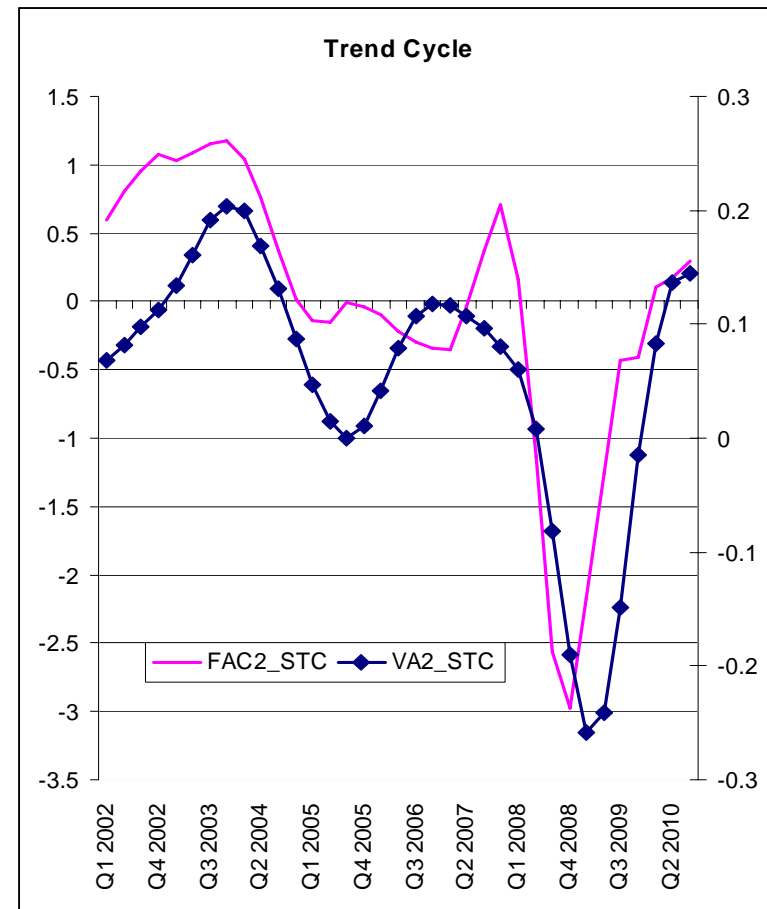
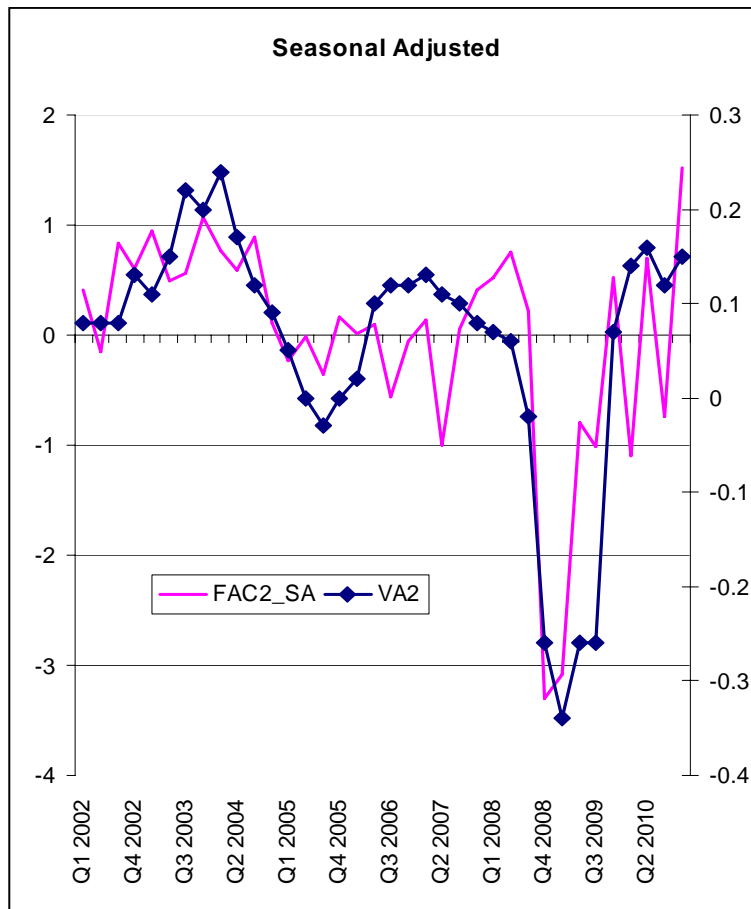
# Leading Indicator: PCA

## LI (Ex post variables) vs Quantitative data (VA\_2)



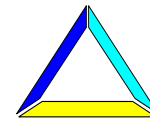
# Leading Indicator: PCA

## LI (*Ex ante* variables) vs Quantitative data (VA\_2)



# Conclusions

1. In Ukraine the business tendency survey data have a quite high correlation with corresponding quantitative statistic data
2. The Principal Component Analysis (PCA) of selected variables sets perform well as composite indicators in ex post comparison with their reference series
3. Special attention should be paid on quality of quantitative statistics.



# Conclusion

**Thank you very much for attention!**

