



OECD Composite Leading Indicators: methodology and practice

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Outline

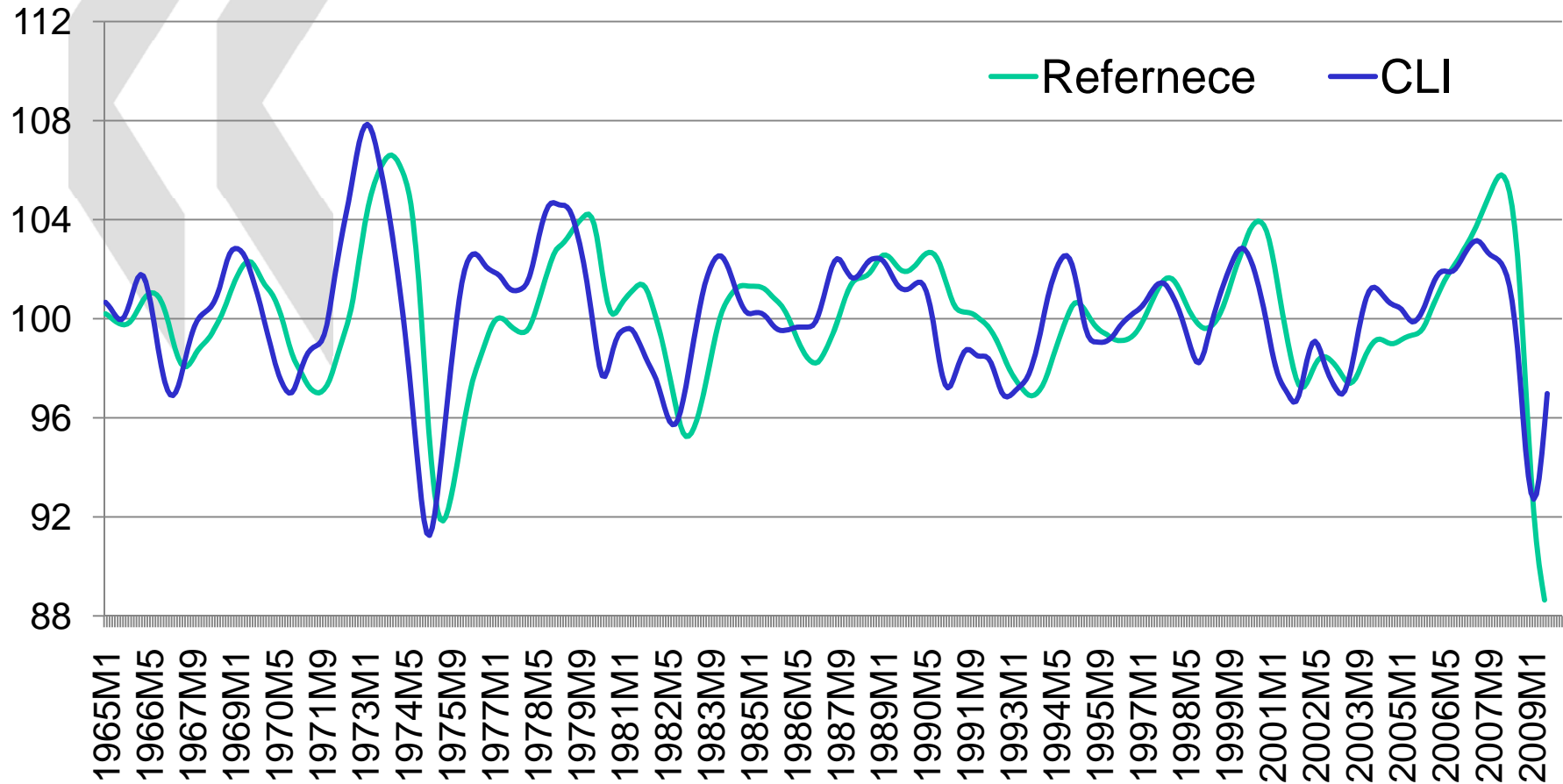
- The OECD CLI – main characteristics
- The building blocks
- Quality and performance
- The production system
- Forecasting with the CLIs

Main characteristics of the CLI system

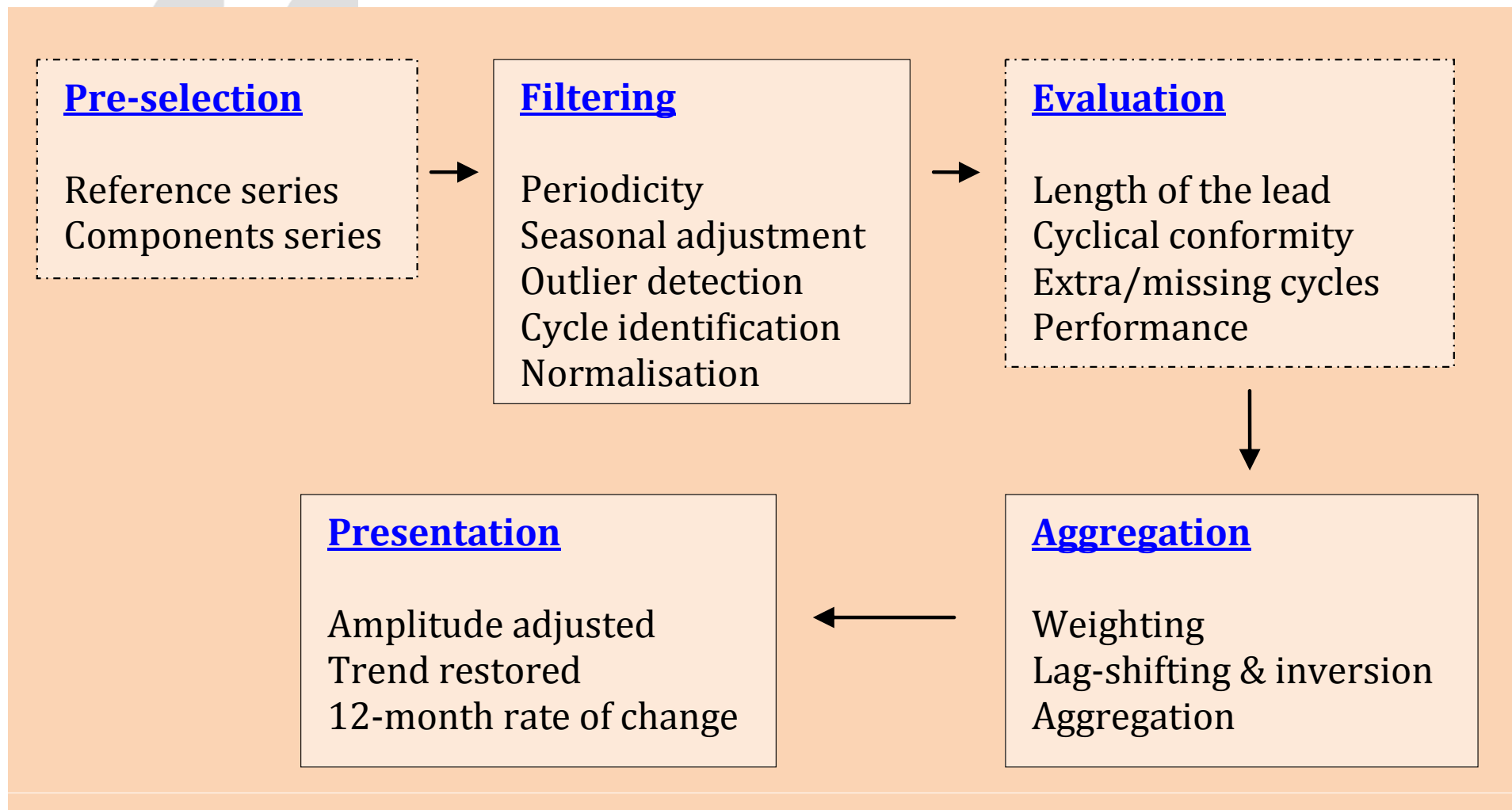
- The goals:
 - Draw a broad brush picture of the economic (production) outlook
 - Serve as benchmark
- As a consequence:
 - Focus on turning-points
 - Robust, non-parametric, non-optimizing

The CLI for OECD

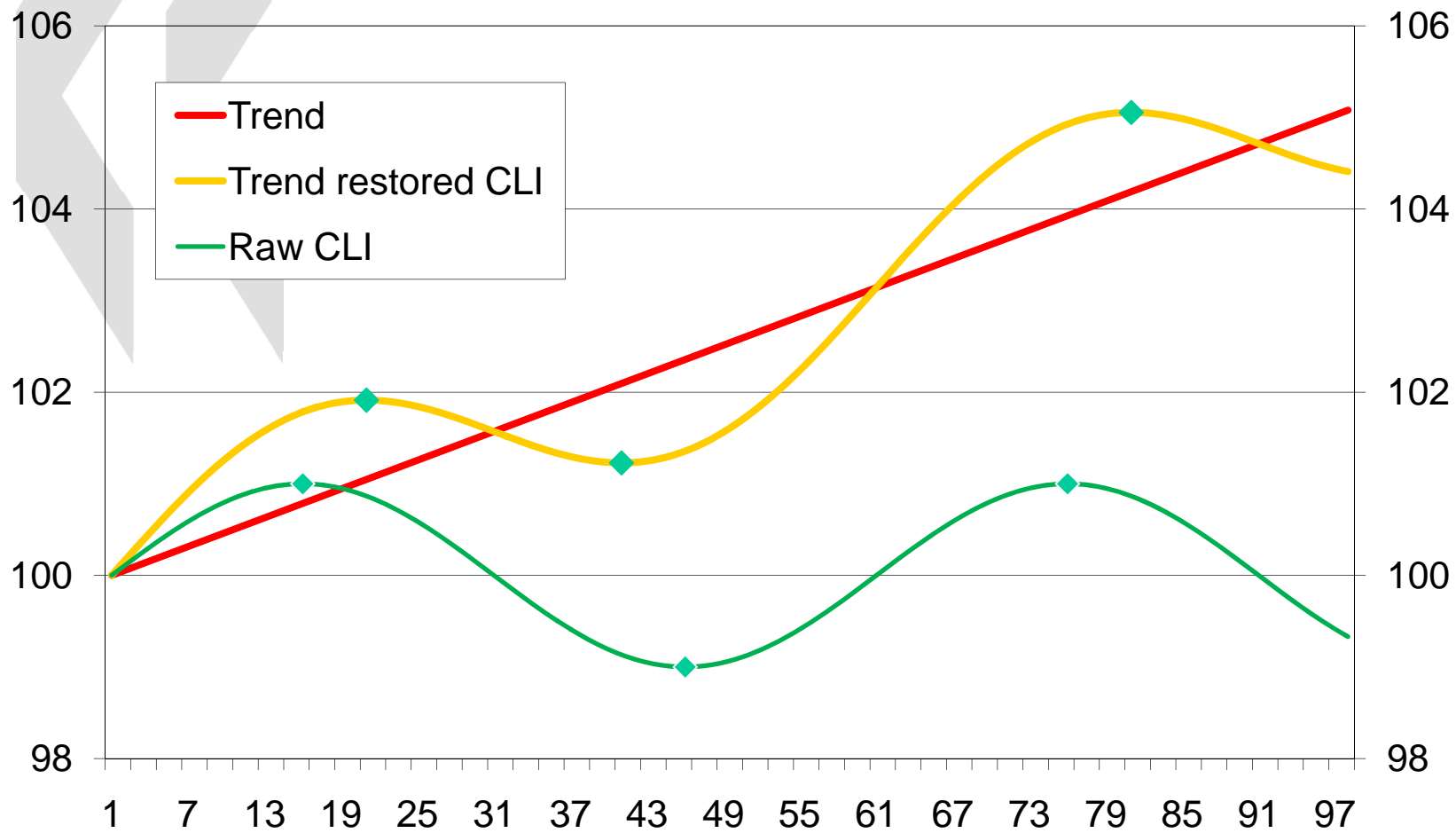
(Jul 2009)



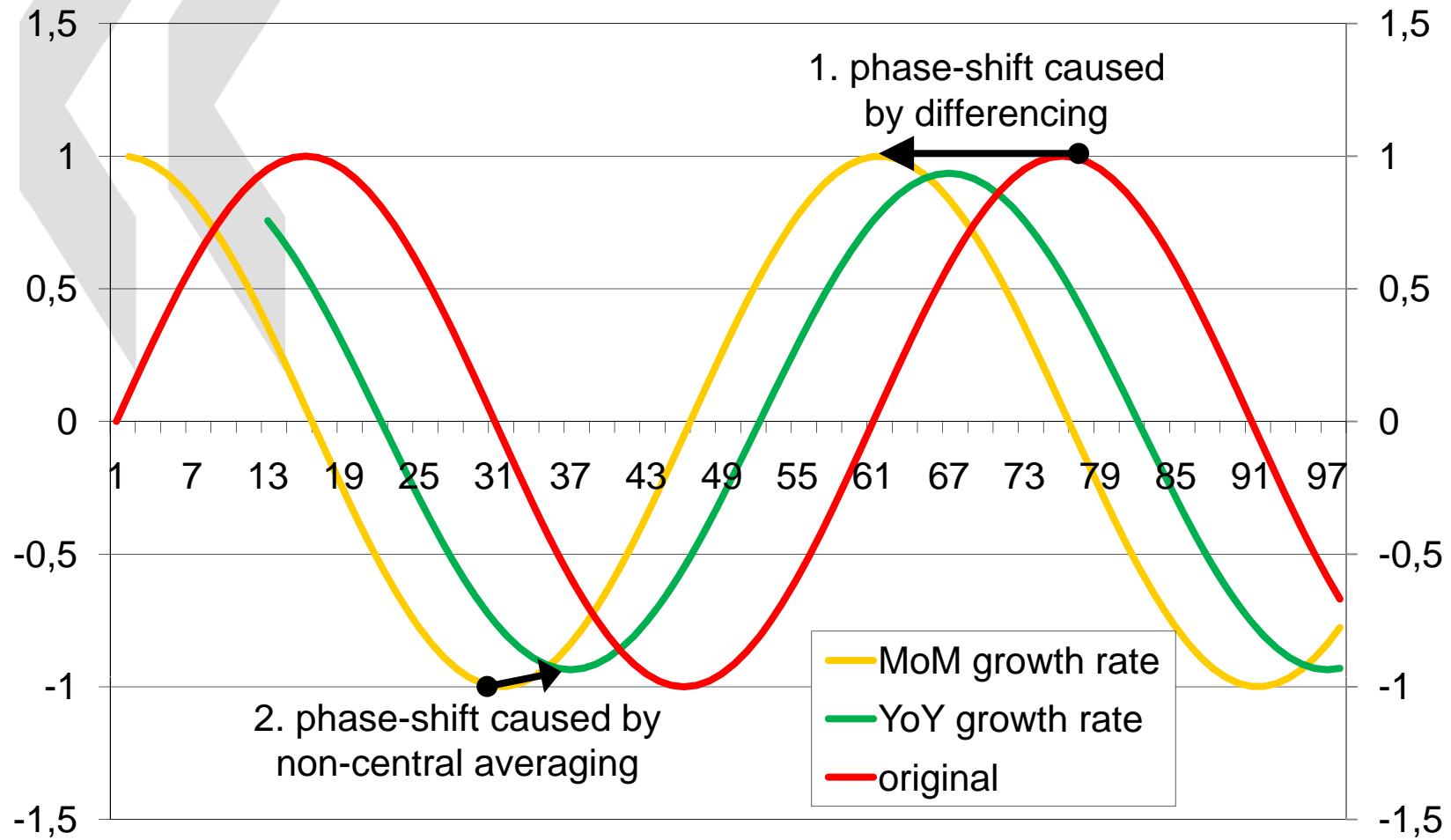
Building blocks



Trend restored vs. original CLI



Raw CLI vs. the YoY growth rate





Quality and performance

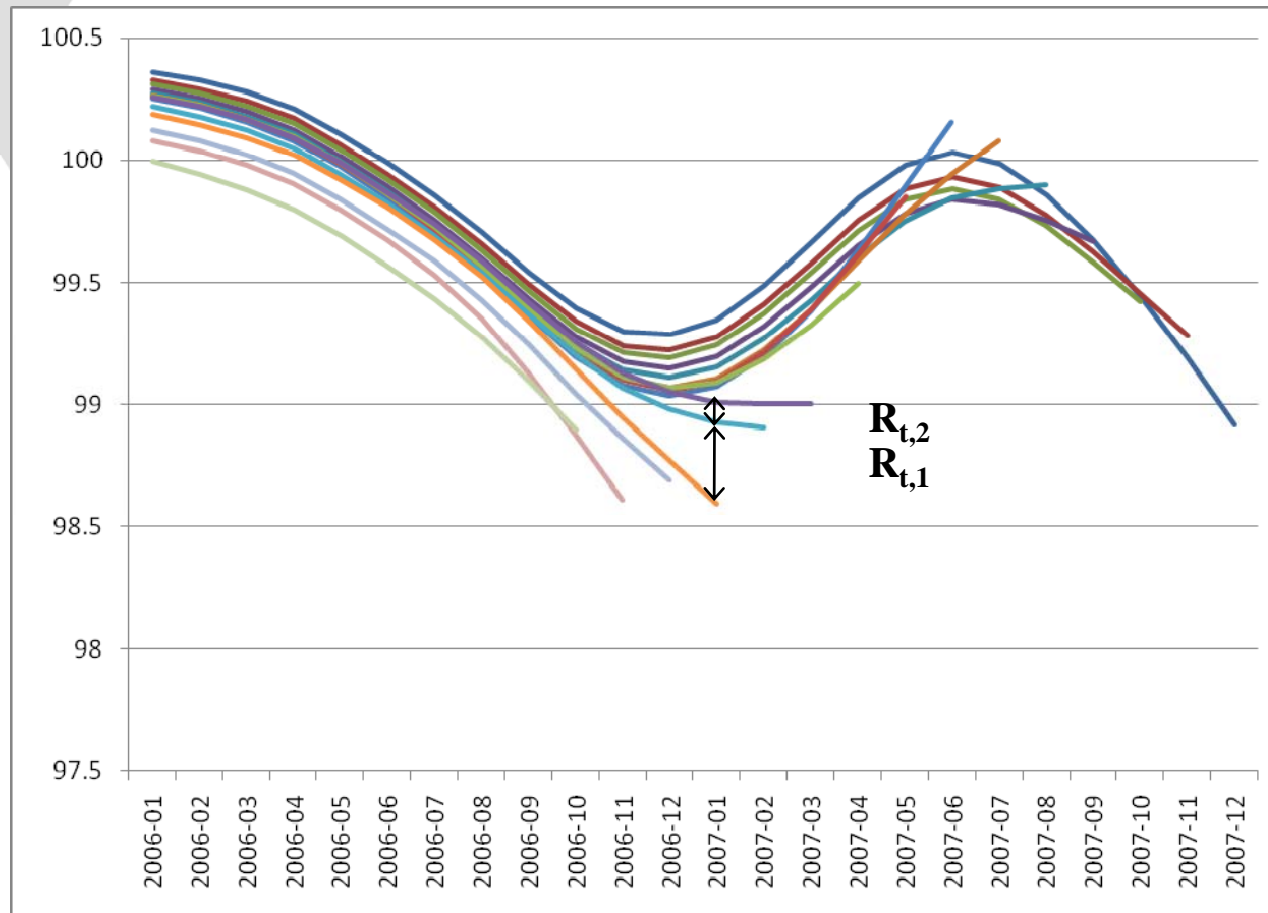
- Turning-point correspondence:
 - Missing and extra turning points
 - Average lead, and lead stability
 - Peak lead, and cross correlation at peak lead
- Revision characteristics
 - Revision size
 - Bias
 - Signal stability

Turning point correspondence

Country	Starting date	Quality statistics						Action needed
		New CLI	Total	Miss	Extra	Mean Lead	Peak Lead (correl)	
Brazil	1978	15	1	4	2.43	3 (0.53)	5.26	I
Canada	1956	20	2	5	7.61	7 (0.781)	2.95	OK
China	1983	11	3	5	3.38	4 (0.674)	4.15	R
Germany	1961	22	4	8	6.00	6 (0.752)	4.22	I
France	1962	20	3	8	6.12	8 (0.734)	5.26	I
United Kingdom	1957	19	4	6	7.67	11 (0.719)	5.42	I
India	1994	7	0	0	4.43	3 (0.796)	5.53	OK
Italy	1973	19	3	3	5.38	7 (0.764)	5.28	I
Japan	1959	21	7	5	7.43	6 (0.815)	4.66	R
Russia	1994	7	2	2	3.20	5 (0.809)	3.87	OK
United States	1955	23	5	5	4.33	6 (0.827)	2.69	OK
South Africa	1975	14	4	3	5.60	7 (0.806)	4.78	I

Revision patterns

An illustration: The HP filtered Business Climate Indicator (USA)

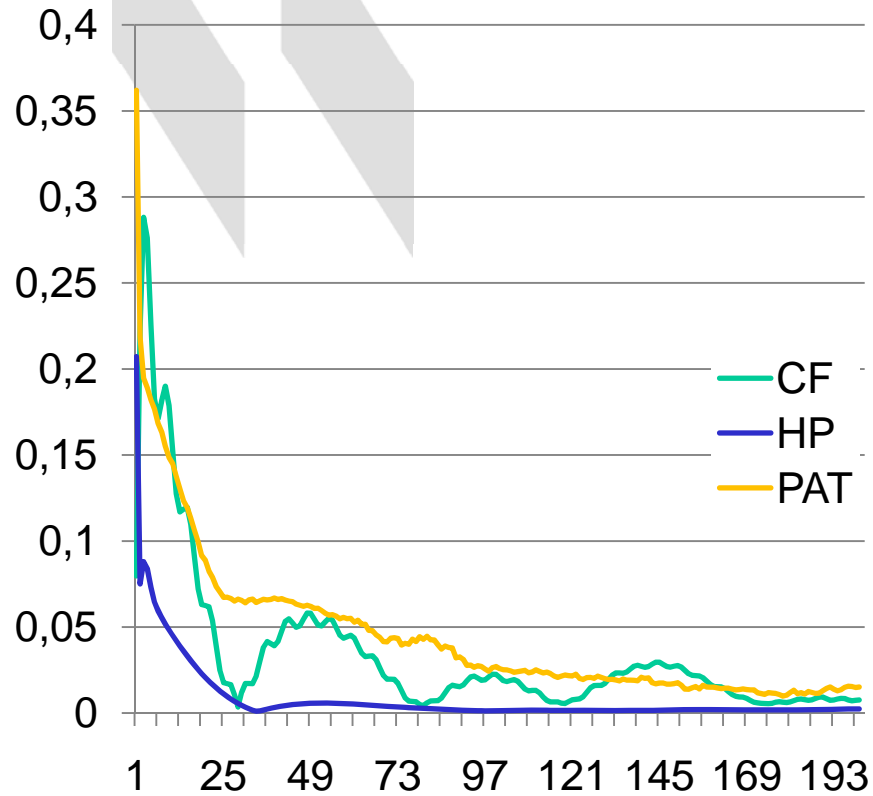


Overall revision size

(Net New Orders USA)

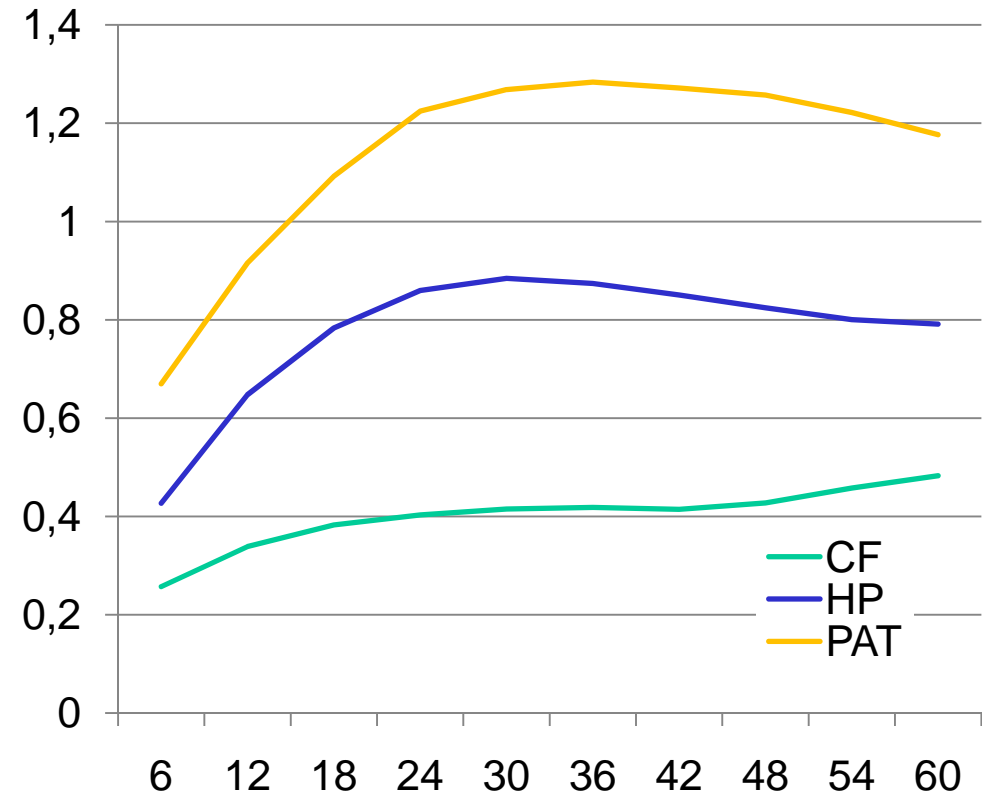
Mean absolute revision

HP smallest revisions



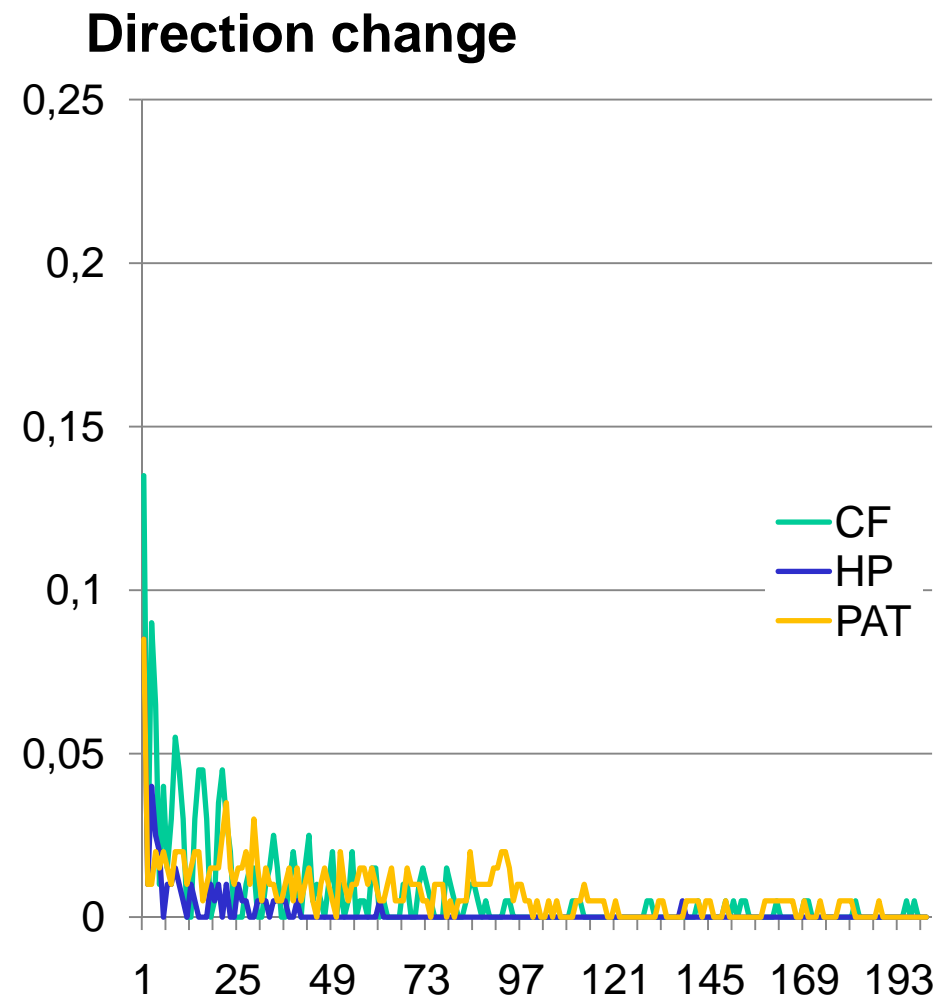
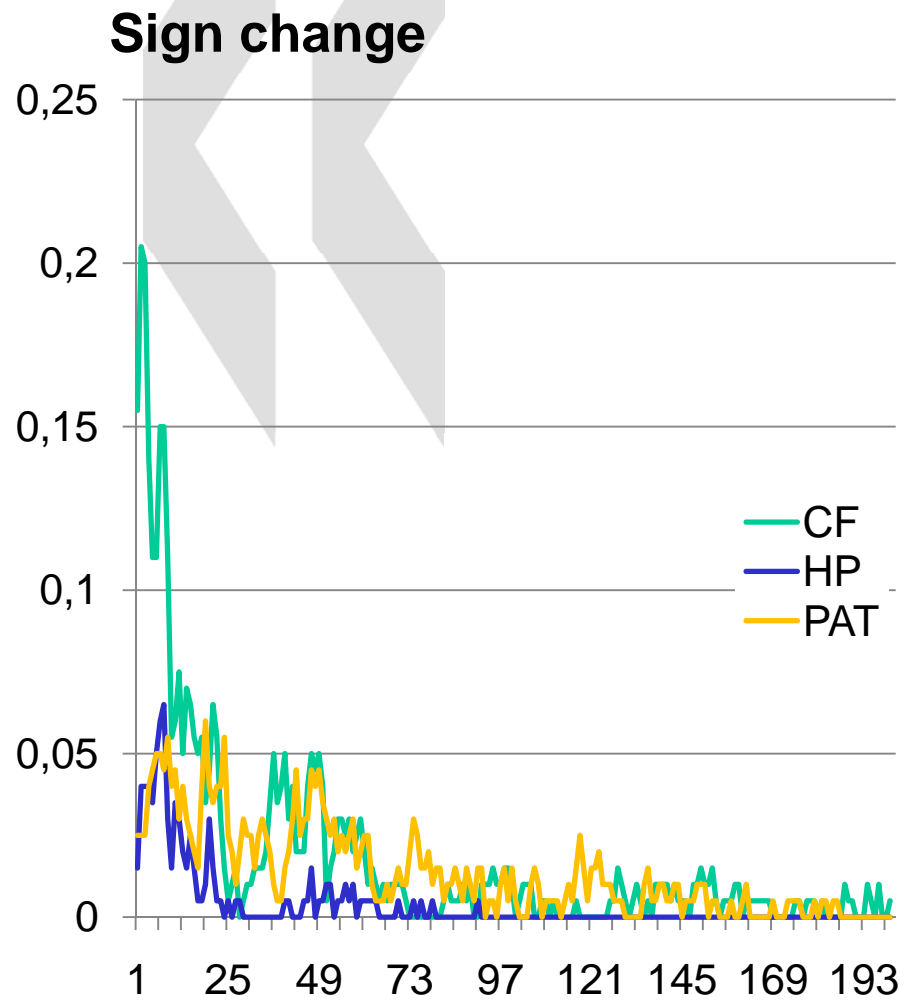
Cumulated absolute revisions

CF smallest cumulated revision



Revision to Cyclical Signal

(Net New Orders USA)



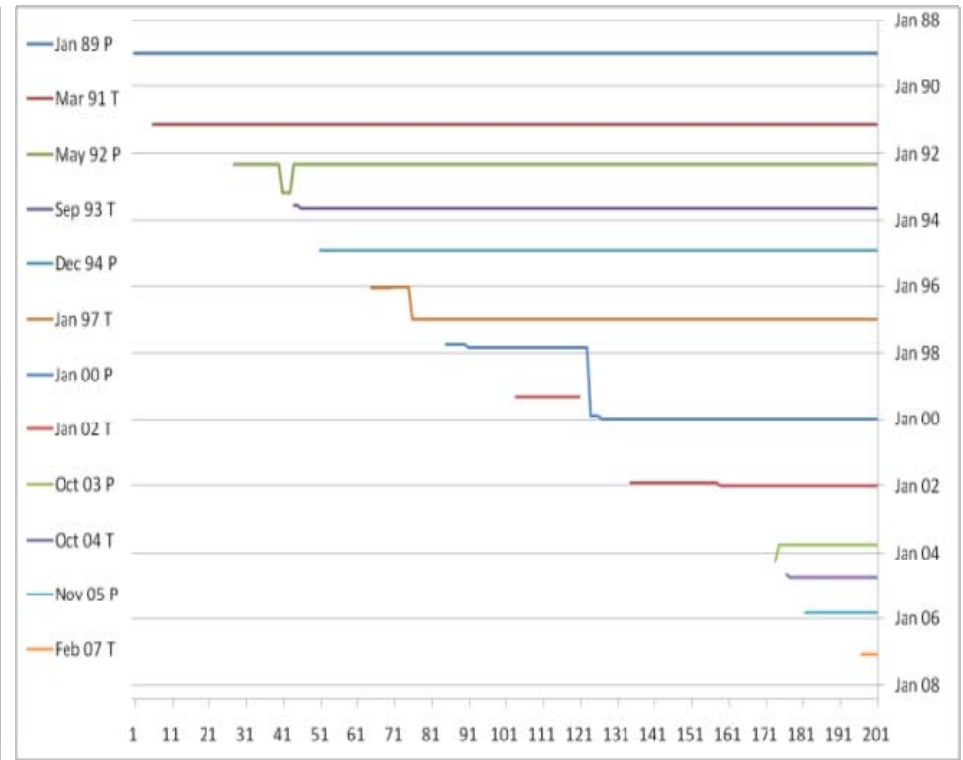
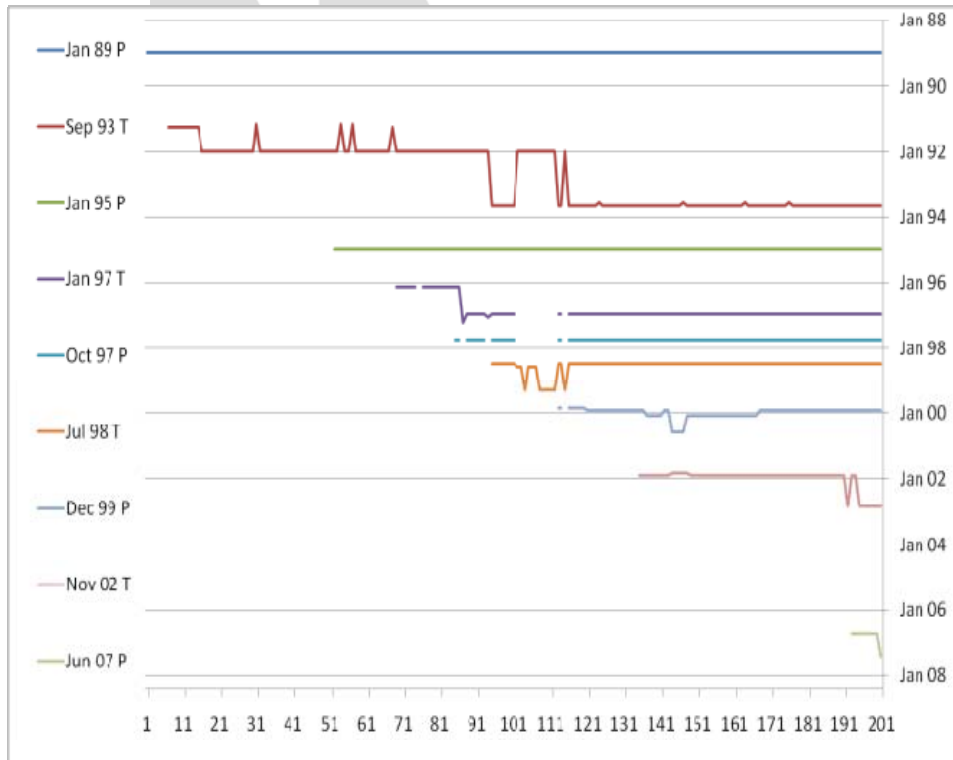
Turning-point estimation history (Net New Orders USA)

PAT

TP estimates often change

HP

Fewer large jumps,
no oscillations



The CACIS Software

The screenshot displays the CACIS software interface. At the top, the title bar reads "CACIS - Cyclical Analysis and Composite Indicators". Below the title bar, there are menu options "Project Setup" and "Help". A series of tabs are visible: "Project Setup", "Conversion", "Detrending", "Aggregation", "Turning-point Detection", and "Update MEI".

The main workspace is divided into two primary sections. On the left, a tree view under "Sourcefiles" shows a folder "ESP_CLI.xls!RawData_L" containing several sub-items: "ESP.LOCNIG07.ST.2.M", "ESP.LOCNK207.STSA.2.M", "ESP.LOCNNH07.MLSA.2.M", "ESP.LOCNO207.STSA.2.M", "ESP.LOCNS307.STSA.2.M", and "ESP.LOREKP07.IXOBSA.2.M".

On the right side, there are three buttons: "Add Source File", "Remove Source File", and "Open in Excel". Below these buttons is a "Time Series Information" section containing a table with the following data:

Property	Value
Series Name:	ESP.LOCNNH07.MLSA.2.M
Frequency:	Monthly
Start Year/Period:	1966/1
End Year/Period:	2009/6
Has Missing Values:	0 out of 522

Below the table is a line graph showing the time series data. The y-axis ranges from 3E+6 to 2.4E+7. The x-axis shows dates: 1-1966, 10-1974, 7-1983, 4-1992, and 1-2001. The graph shows a clear upward trend with some fluctuations.

At the bottom of the window, a status bar indicates "Status: Loading finished; (27/08/2009 16:50:16)".

The CACIS Software

CACIS - Cyclical Analysis and Composite Indicators

Project Setup Help

Project Setup Conversion Detrending Aggregation Turning-point Detection Update MEI

Series Name	Frequency	Alignment	OutlierFilter	Forecast	No. of Outliers	Model
ESP.LOCNIG07.ST.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	0	Multiplicative
ESP.LOCNK207.STSA.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	2	Additive
ESP.LOCNNH07.MLSA.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	7	Multiplicative
ESP.LOCNQ207.STSA.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	4	Additive
ESP.LOCNS307.STSA.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	1	Additive
ESP.LOREKP07.IXOBSA.2.M	Monthly	0	<input checked="" type="checkbox"/>	1	1	Multiplicative

Process All

Forecast Series

Forecast Series

Outlier Settings

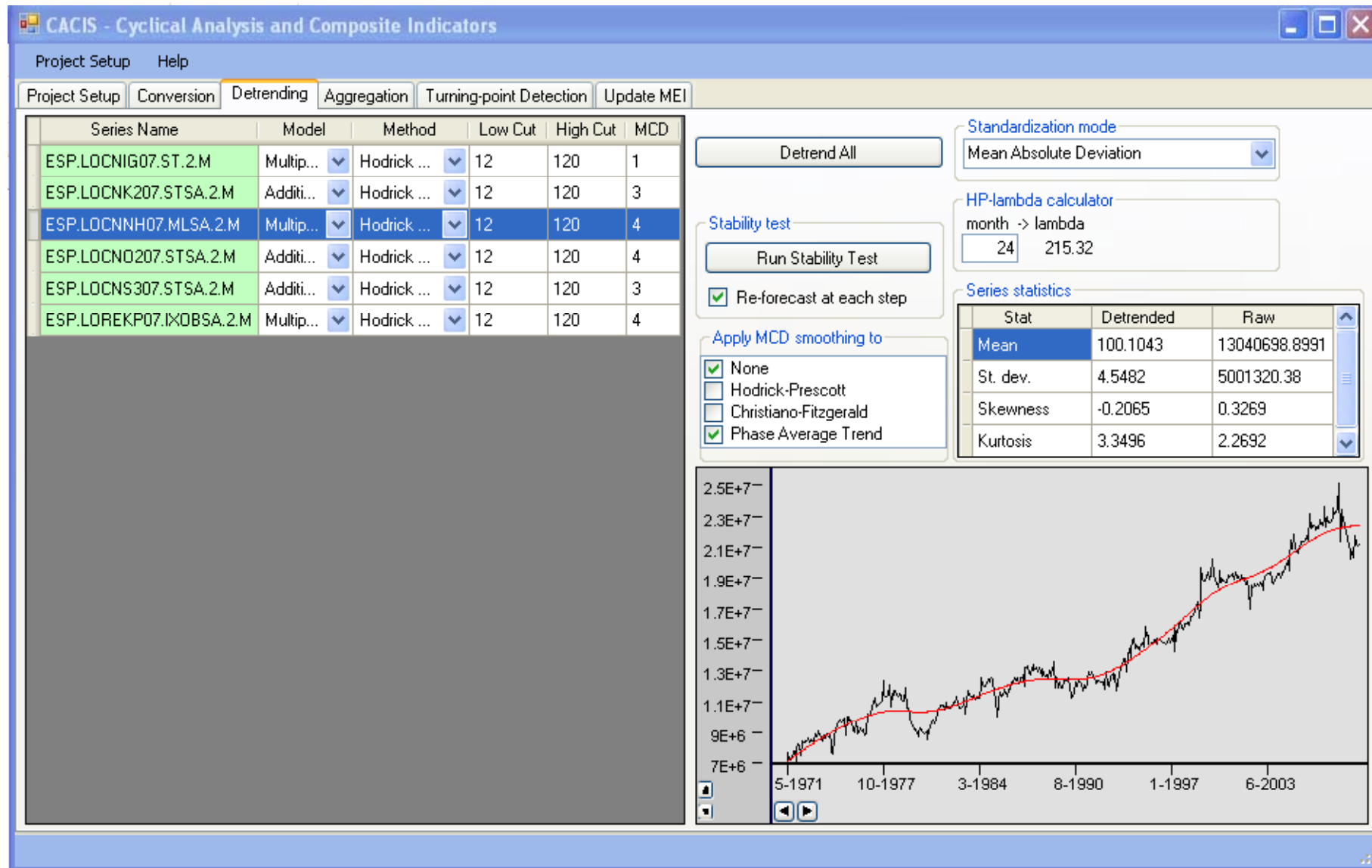
AD
 LS
 TC
 Hi Fi

Outlier Results

ESP.LOCNNH07.MLSA.2.M
 Model (pdq)(PDQ): (0 1 1)(0 0 1)
 Log transform used
 Outliers found: 7
 AD, Position: 1978/9, tstat: -5.9991
 AD, Position: 1967/3, tstat: -6.1194
 AD, Position: 1970/2, tstat: 5.8264
 AD, Position: 1990/3, tstat: 5.6118
 AD, Position: 1986/3, tstat: -4.7337
 AD, Position: 2005/3, tstat: -4.6112

Status: Conversion page initialized with 0 series added, 0 series refreshed and 0 series removed.; (27/08/2009 17:10:15)

The CACIS Software



The CACIS Software

CACIS - Cyclical Analysis and Composite Indicators

Project Setup Help

Project Setup Conversion Detrending Aggregation Turning-point Detection Update MEI

Inc	Series Name	Weight	Lag	Inversion	IsRef
<input checked="" type="checkbox"/>	ESP.LOCNIG07.ST.2...	20	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ESP.LOCNK207.STS...	20	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ESP.LOCNNH07.ML...	20	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ESP.LOCND207.STS...	20	0	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/>	ESP.LOCNS307.STS...	20	0	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	ESP.LDREKP07.IXD...	0	0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	CLI	C	0	<input type="checkbox"/>	<input type="checkbox"/>

Availability threshold: 60

Create aggregate

Recalculate weights Calculate aggregate

Name and save

Remove aggregate

Weights handling

Equal weights

Proportional redistribution

Composite Indicator: CLI

Components (Multiple selection enabled.)

Status: Aggregation page initialized with 0 series added, 7 series refreshed and 0 series removed.; (27/08/2009 17:48:14)

The CACIS Software

CACIS - Cyclical Analysis and Composite Indicators

Project Setup Help

Project Setup Conversion Detrending Aggregation **Turning-point Detection** Update MEI

IsRef	IsInv	Series Name
<input type="checkbox"/>	<input checked="" type="checkbox"/>	ESP.LOCNIG07.ST.2.M
<input type="checkbox"/>	<input type="checkbox"/>	ESP.LOCNK207.STSA....
<input type="checkbox"/>	<input type="checkbox"/>	ESP.LOCNNH07.MLSA...
<input type="checkbox"/>	<input type="checkbox"/>	ESP.LOCNO207.STSA....
<input type="checkbox"/>	<input checked="" type="checkbox"/>	ESP.LOCNS307.STSA....
<input checked="" type="checkbox"/>	<input type="checkbox"/>	ESP.LOREKP07.IXOB...
<input type="checkbox"/>	<input type="checkbox"/>	CLI

Simplified Bry-Boschan params

Peak Area: 5
 Minimum Phase: 9
 Minimum Cycle: 24

Calculate All TPs ->

Turning points list

TP	Year	Month
pe...	1964	6
tro...	1967	11
pe...	1969	9
tro...	1970	12

Match reference turning points

TP	Year	Month	Lead
pe...	1961	11	x
tro...	1963	7	x
pe...	1966	4	x
tro...	1968	4	5

Turning points list

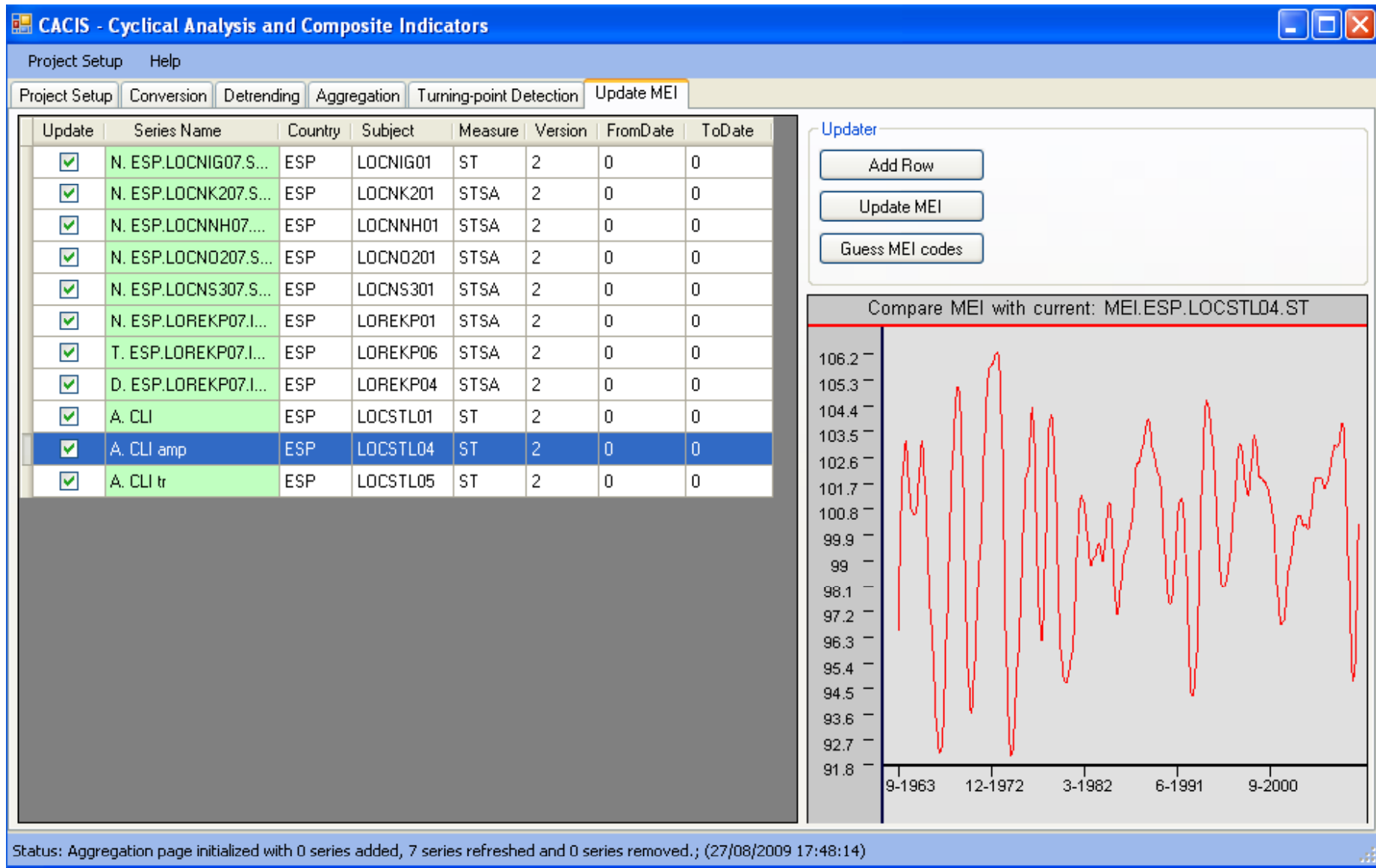
SeriesName	Targeted	Missed	Extra	Mean Lead	Peak Lead	St. Dev.	IsInv
ESP.LOCNIG07....	9	5	6	8	18 (0.397)	6.12	<input checked="" type="checkbox"/>
ESP.LOCNK207....	19	4	11	5.27	4 (0.716)	4.86	<input type="checkbox"/>
ESP.LOCNNH07...	18	7	6	2.09	3 (0.355)	6.76	<input type="checkbox"/>
ESP.LOCNO207....	19	4	11	7.33	6 (0.604)	5.92	<input type="checkbox"/>
ESP.LOCNS307....	19	4	7	3.6	2 (0.687)	3.76	<input checked="" type="checkbox"/>
ESP.LOREKP07....	21	0	0	0	0 (1)	0	<input type="checkbox"/>
CLI	19	3	8	4.19	5 (0.695)	4.67	<input type="checkbox"/>

Cross correlation: CLI vs. ESP.LOREKP07.IXOBSA.2.M

Turning-points: CLI

Status: Aggregation page initialized with 0 series added, 7 series refreshed and 0 series removed.; (27/08/2009 17:48:14)

The CACIS Software



Forecasting with the CLIs

- Targeting the CLI reference series:
 1. Providing turning-point forecasts or turning-point probability forecasts
 2. Quantitative forecasts of the cyclical component of the reference series (univariate/multivariate framework in the time domain or frequency domain techniques.)
- Picking a different target (e.g. GDP growth rate):
 3. Using the corresponding CLI variant (12 month growth rate of the trend restored CLI) to build a univariate forecasting equation

Forecasting scenarios

