Revision of Leading Indicators for the G7 and Belgium

1. General comments

This document presents the results of the revision of OECD-leading indicators for the following countries: Canada, United States, Japan, France, Italy, United Kingdom and Belgium. The leading indicators for Germany and the United States had already been revised earlier and the new indicators were presented in the Meeting on OECD Leading Indicators in October 1996 (see *An Update of OECD Leading Indicators*, OECD Meeting on Leading Indicators, STD/MEI/LIM96(3)). The coverage of the new leading indicator for United States, however, was regarded as somewhat narrow and consequently an indicator with broader coverage is proposed in this document. In addition, the possibility of including business survey series as component series was not studied during the earlier revision of the leading indicator for the United States. For most of the countries, the performance of the composite index had deteriorated and a number of component series needed to be replaced. This was especially true for many financial series.

The turning points of the reference series and component series have been updated at least once after the publication of OECD LI & BC[1]. In the publication, the last turning point is usually in 1982, but in the parameter lists CYP/*countryname*PAT the most recent turning point is in 1987 or 1988. In some cases the last turning point refers to a minor cycle and may thus have been added purely to improve the fit.

One of the first problems to be solved was the identification of minor and major cycles in the reference series. For some countries this was relatively easy, but for others the task was hampered by the influence of disturbances on the reference series (such as strikes). The chronology of turning points in the reference series was decided after checking them against chronologies presented in various national publications and after consultations with respective country desks.

A problem to which there is no easy solution is the final selection of component series. It is relatively easy to identify the series that need to be replaced, but choosing the correct series as replacements is considerably more difficult. Sometimes replacing poorly performing series with better ones did not improve the overall performance of the composite index.

For some countries like France and Belgium it was more difficult to find good component series than for other countries. There is no obvious explanation for this, one possible reason being that the reference series (industrial production) does not reflect accurately the overall movements in the economy. Sometimes including the leading indicator of a major trading partner or neighbouring country as a component series helps. It may also be justified to include some business survey series as components even if they do not seem statistically significant. By its very definition, a series on the future tendency of production, for example, has to be a leading indicator of industrial production.

In the current system of leading indicators, business survey series are often not detrended before they are used to calculate the composite index. From the theoretic point of view this is correct, since in principle business survey series should not have a trend, and thus they do not need to be detrended. In practice, however, we usually to observe a trend in business survey series and therefore in the revision process all business survey series have been detrended.

As the performance of a series may depend on time, all series were tested over three time periods (the entire period, from 1960 onwards and from 1980 onwards). In general, a series that performed well in one period, also performed satisfactorily in others.

[1] In this document OECD LI & BC refers to the publication OECD Leading Indicators and Business Cycles in Member Countries 1960-1985, Sources and Methods, No. 39, January 1987.

Finally, the notation in this document is somewhat unconventional: lags are presented as positive numbers. This is done merely to maintain consistency with the notation of the excel macros. However, if this notation is seen as misleading, it is fairly easy to change the notation in the macros.

2. Comments on the countries reviewed

CANADA

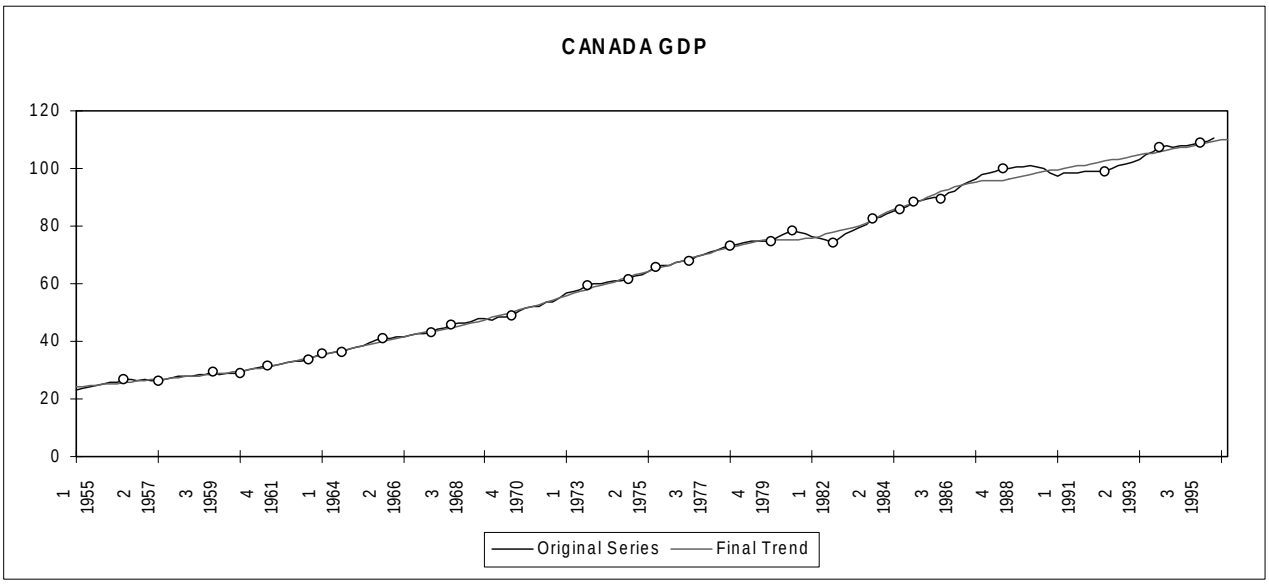
Cycles in the reference series

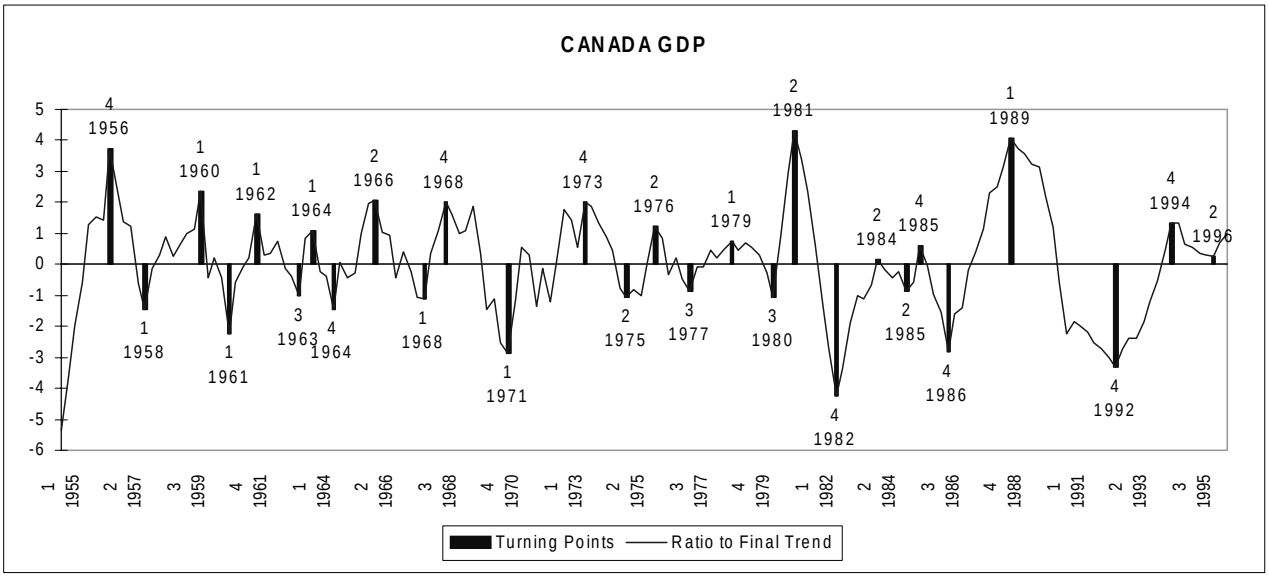
The Canadian cycle is very closely related both in timing and amplitude to the United States one and turning points in the two countries have occurred within a few months of each other. The subcycle of 1977, however, occurred in Canada but not in the United States. The recovery of 1981 was also more strongly marked, the peak of mid-1981 equalling that of 1979 for industrial production and exceeding it for GDP. The recovery after 10/82 was very rapid, the peak in 3/85 is not very pronounced, nor is the trough in 11/86. The peak in 2/89 is followed by a trough in 12/91. This seems to be followed by a peak in 12/94 both in industrial production and GDP, but at present this peak is considered to be part of a minor cycle.

The cyclical characteristics of the reference series are presented in the table below:

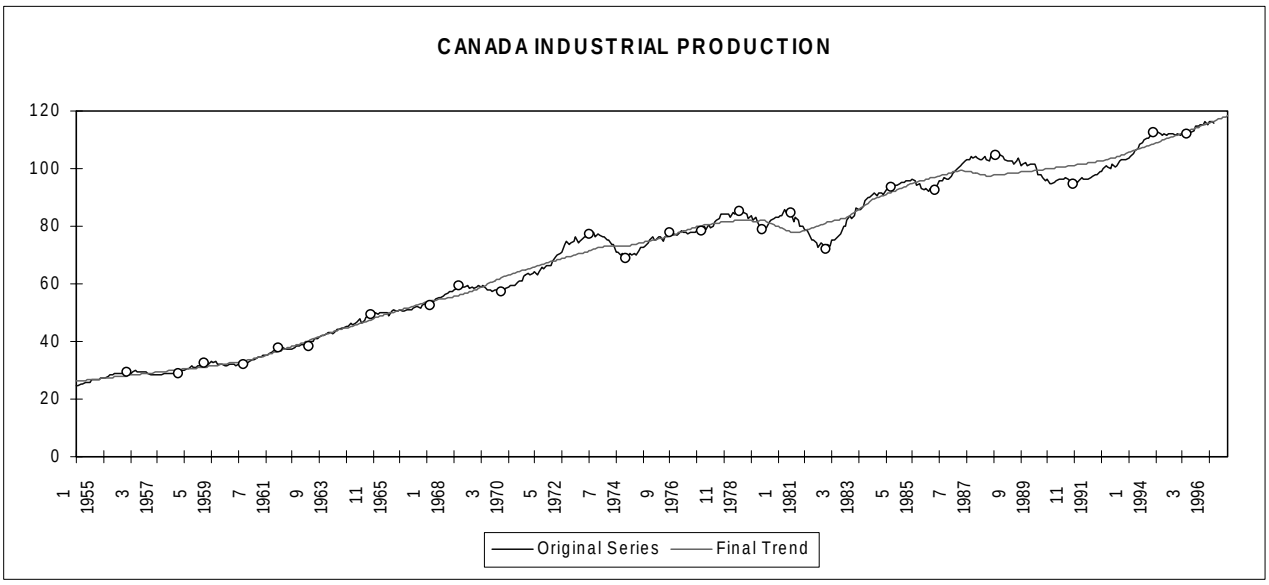
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
4/56		3.75	11/56		5.44
	1/58	-1.46		10/58	-3.60
1/60		2.36	10/59		5.19
	(1/61)	-2.22		(3/61)	-3.31
(1/62)		1.62	(7/62)		2.66
	3/63	-1.01		8/63	-4.09
2/66		2.07	(12/65)		4.12
	1/68	-1.13		(2/68)	-2.34
4/68		2.00	3/69		6.54
	1/71	-2.89		10/70	-8.07
4/73		2.03	1/74		8.41
	2/75	-1.06		5/75	-6.01
(2/76)		1.22	(1/77)		2.01
	(3/77)	-0.89		(3/78)	-2.20
(1/79)		0.76	8/79		3.99
	(3/80)	-1.05		(6/80)	-3.62
2/81		4.32	(7/81)		8.76
	4/82	-4.23		10/82	-10.81
4/85		0.62	(3/85)		2.39
	4/86	-2.82		(11/86)	-4.35
1/89		4.06	2/89		7.25
	4/92	-3.30		12/91	-6.41
(4/94)		1.31	(12/94)		3.91

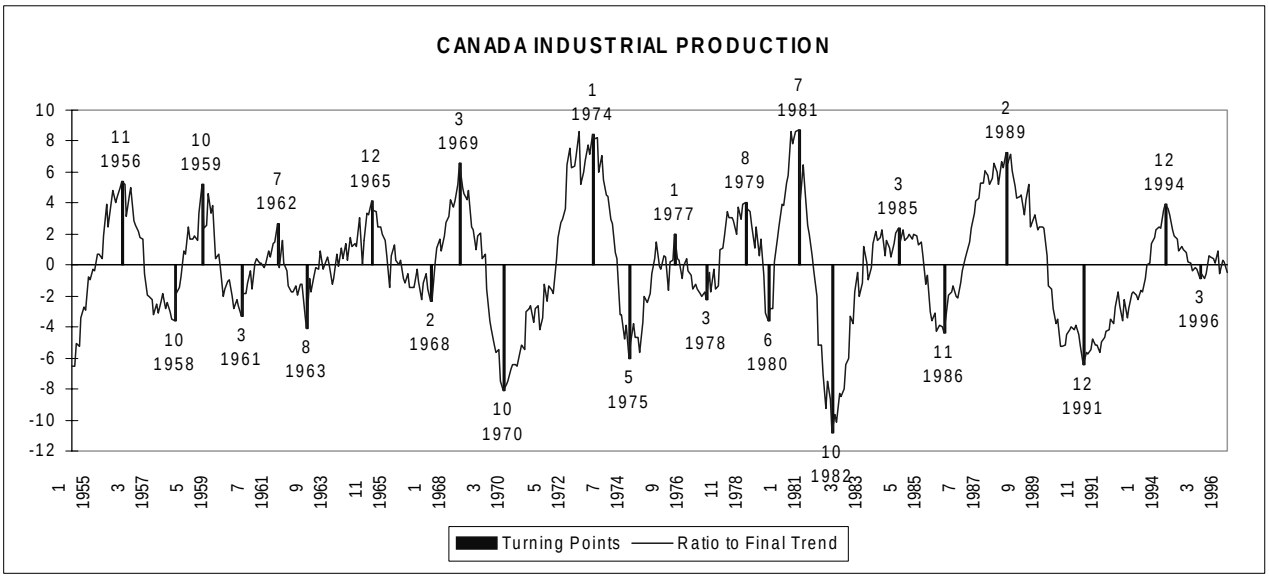
In the OECD LI & BC the last turning point in the reference series is 82M12. The chronology of turning points has been checked against an article[2] by Statistics Canada, where the turning points in GDP are presented.





[2] "Alternative measures of business cycles in Canada: 1947-1992", Canadian Economic Observer, February 1996, Statistics Canada.





The OECD LI & BC lists 12 component series, which are still used to calculate the composite index. Three business survey series (*order inflow: tendency, finished goods stocks: level and production: future tendency*) are used in the composite without being detrended.

The current composite index has the following component series:

300 S90103035000R 0 2 1	CAN STOCKS FIN GOODS:MANUFACTURING
400 S90103037000R 0 2 1	CAN STOCKS INTERMEDIATE GOODS
500 S90103130008R 0 2	CAN CONSTR STARTS LARGE CITIES
600 S90103215000R 0 2	CAN RETAIL SALES MOTOR DEALERS
700 S90104300008R 0 2	CAN WEEKLY HOURS OF WORK:MANUFACTURING
800 S90104602009R 0 2 1	CAN WAGES AND SALARIES COST PER UNIT
900 S90203900200R 0 2	USA COMPOSITE LEADING INDEX
1000 S90105640009R 0 2	CAN SHARE PRICES TORONTO STOCK EXCHANGE
1100 S9010530500DR 0 2	CAN MONEY SUPPLY DEFL CONS PRICE
1200 S9010332490A3 1 2 1	CAN FIN GOODS STOCKS:LEVEL
1300 S9010330590A0 1 2	CAN ORDERS INFLOW:TENDENCY
1400 S9010335190A3 1 2	CAN PRODUCTION:FUTURE TENDENCY

In the 1987 publication the cross correlation between industrial production and the composite index was 0.88. Now the cross correlation between industrial production and the current composite index is 0.82, thus the performance has deteriorated only slightly. With the update of turning points in the reference and component series, the cross correlation increases to 0.87. Thus no series needed to be urgently replaced.

For Canada, the compilation of the new indicator posed no particular problems. Not only are business survey series very good as leading indicators, but also financial series, such as money supply and interest have fairly consistent leads. There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

It is noteworthy that business survey series are quarterly. The performance of series tested as potential components is presented below.

	Delay in release	Comments
Stocks of finished goods	2	Long lead in the end of the period.
Intermediate goods stocks	2	Very long lead.
Construction starts	2	Good.
Retail sales: motor dealers	2	Somewhat uneven lead, but good.
Weekly working hours	2	Somewhat uneven lead, but good.
Wages and salaries	2	Good.
USA leading index	1	Good.
Share prices	1	Good.
Money supply	2	Good, coincident at times.
PPI TOTAL	1	Very long lead in the end.
PPI primary metals	1	Long lead at times.
PPI manufactured goods	1	Very long lead in the end.
PPI paper etc.	1	Long and uneven lead.
CPI all items	1	Short lead in the end.
CPI durable goods	1	Long lead in the end.
Consumer credit outstanding	2	Not good, lagging at times.
Savings deposits chart banks	1	Very uneven lead, lagging at times.
Credit to private sector	1	Not good, mostly lagging.
M1	1	Good.
M2	2	Very long leads in the end.
M2+ (SA)	2	Very long leads in the end.
M3	2	Very long leads in the end.
CAN LEADING INDICATOR		Very uneven lead.
LEADING INDICATOR - FILTERED		Uneven lead.
Passenger car retail sales	2	Lagging or coincident at times, otherwise ok.
Retail sales value index	2	Lagging or coincident at times.
Official discount rate	1	Long lead.
Overnight money market rate	1	Long lead.
90-day deposit receipts	1	Long lead, but good.
Prime corporate paper 90-day	1	Good.
Federal govt bonds	1	Good.
Prime int rate	1	Good.
Retail sales total value	2	Coincident or lagging.
Building permits total	2	Uneven lead, coincident at times.
Building permits resid	2	Uneven lead.
Building permits non-resid.	2	Lagging at times.
Construction starts centres + small sa	2	Good.
New orders manufacturing SA	2	Mostly coincident.
Ratio inventory to shipments	2	Good.
Stocks work in progress	2	Very long lead in the end.
Stocks manufacturing total	2	Longish lead in the end.
Stocks manufacturing durables	2	Longish lead in the end.
Stocks manufacturing non-durables	2	Longish lead in the end.

Deliveries manufacturing total	2	Mostly coincident.
Deliveries mfg durables	2	Mostly coincident.
Deliveries mfg non-durables	2	Uneven lead, lagging at times.
Help wanted advertising	1	Cycles missing, lagging at times.
Short-term unemployment	1	Somewhat uneven lead, otherwise good.
Production of commercial vehicles	2	Coincident or lagging at times.
Production of passenger cars	2	Somewhat uneven lead, coincident at times.
GDP	4	Coincident.
GDP durable goods	4	Coincident.
GDP non-durable goods	4	Coincident.
Terms of trade	2	Coincident or lagging.
BOP trade balance	4	Lagging in the beginning, good performance since 1985.
FTR net trade, Can $	2	Uneven lead at times, otherwise good.
FTR net trade, US $	2	Uneven lead at times, otherwise good.
Hourly earnings manufacturing	2	Uneven leads.
Part-time employment	2	Mostly lagging.
BSS: order books, level	4	Good.
BSS: orders inflow, tendency	4	Good.
BSS: finished goods stocks, level	4	Somewhat uneven lead, but otherwise good.
BSS: Production: future tendency	4	Good.

Some component series, however, may be dropped without any deterioration in the performance of the composite index. For Canada, we could drop the following three series: *Stocks: intermediate goods; Retail sales motor dealers*; and *Weekly hours of work: manufacturing*. The advisory group, however, stressed the importance of *weekly working hours* as a component series and, thus only two series are dropped from the present indicator.

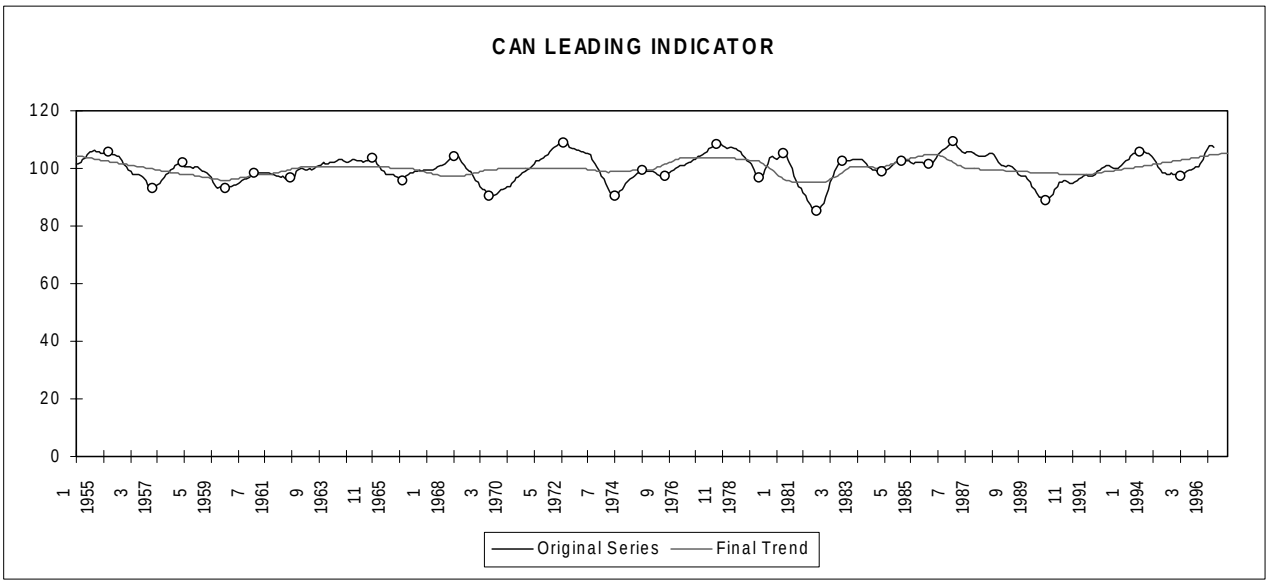
The new composite index is calculated with the following ten component series (programme outi/cancomp):

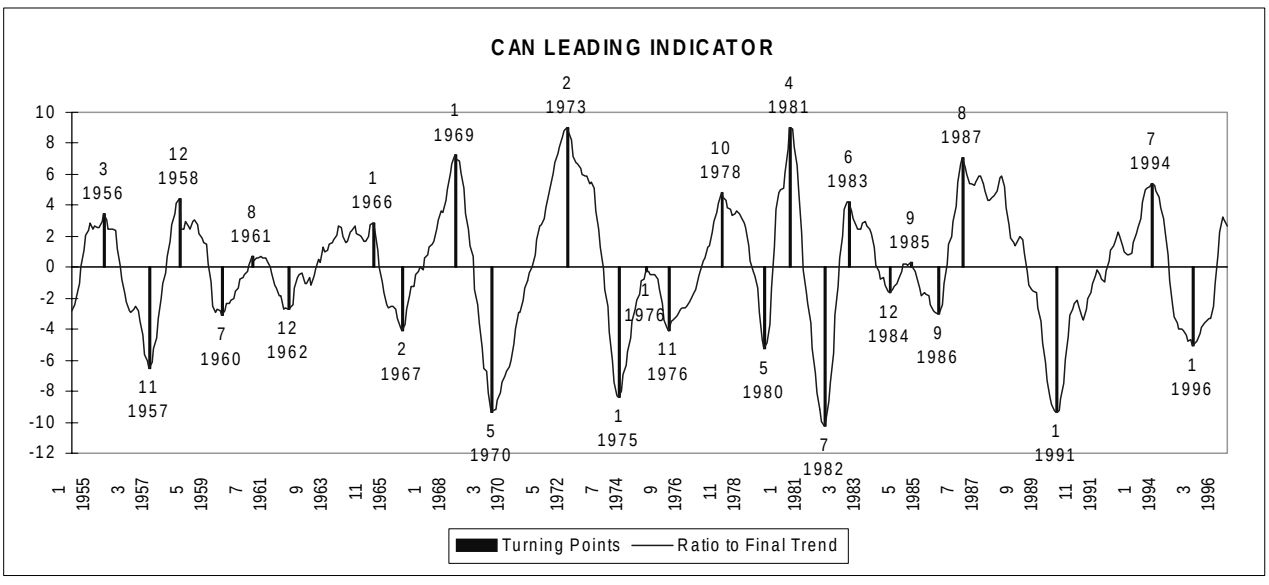
300 S90103035000R 0 2 1	CAN STOCKS FIN GOODS:MANUFACTURING
500 S90103130008R 0 2	CAN CONSTR STARTS LARGE CITIES
700 S90104300008R 0 2	CAN WEEKLY HOURS OF WORK:MANUFACTURING
800 S90104602009R 0 2 1	CAN WAGES AND SALARIES COST PER UNIT
900 S90203900200R 0 2	USA COMPOSITE LEADING INDEX
1000 S90105640009R 0 2	CAN SHARE PRICES TORONTO STOCK EXCHANGE
1100 S9010530500DR 0 2	CAN MONEY SUPPLY DEFL CONS PRICE
1200 S9010332490AR 1 2 1	CAN FIN GOODS STOCKS:LEVEL
1300 S9010330590AR 1 2	CAN ORDERS INFLOW:TENDENCY
1400 S9010335190AR 1 2	CAN PRODUCTION:FUTURE TENDENCY

The cross-correlation of the new leading indicator with the reference series is 0.84 at lags 5 and 6.

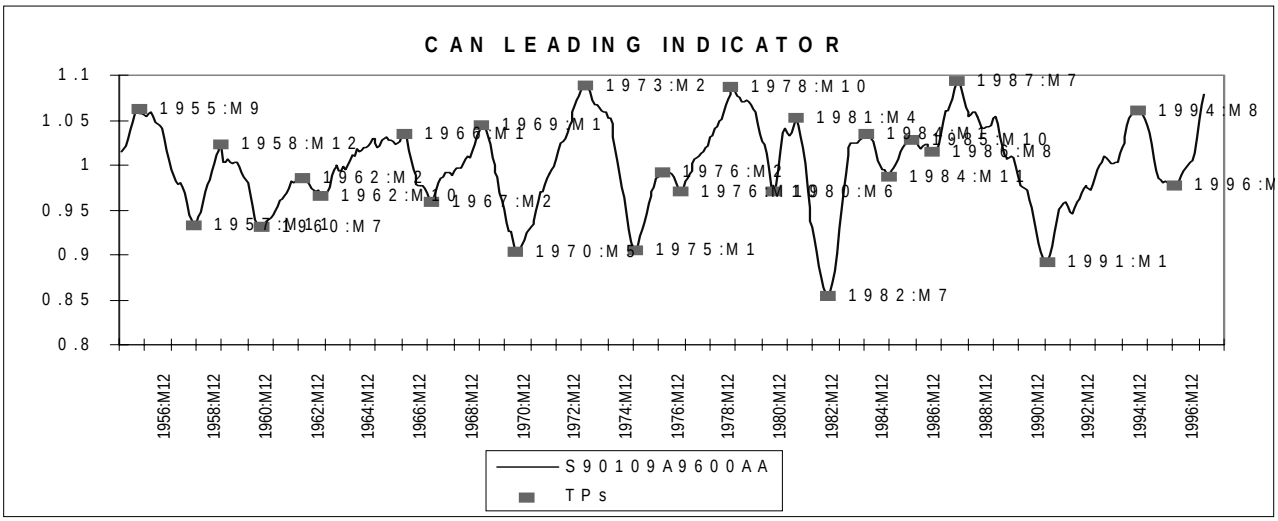
		Extra/ missing cycles compared to all cycles in IP	Extra/ missing cycles compared to major cycles in IP	Mean lead/lag at all T.P.s	Mean lead/lag at peaks	Mean lead/lag at troughs
New composite leading indicator				8.1	8.5	7.6
Stocks of finished goods	counter cyclic	2 (minor) m	1 (minor) x	10.2	9.7	10.8
Construction starts		4 x	3 (minor) x, 4 x	10.9	12.3	9.5
Weekly working hours		3 (minor) m, 1 m	3 (minor) m, 1 m	5.3	6.3	4.3
Wages and salaries	counter cyclic	2 (minor) m	2 (minor) x	3.6	2.5	4.8
USA leading index			3 (minor) x	6.7	6.3	7.1
Share prices		2 x, 1 (minor) m	4 (minor) x, 2 x	6.9	5.7	8.1
Money supply		2 x	3 (minor) x, 2 x	8.8	9.3	8.2
BSS: orders inflow, tendency		1 x	3 (minor) x, 1 x	7.0	8.0	5.8
BSS: finished goods stocks, level	counter cyclic		2 (minor) x	8.2	12.2	3.3
BSS: Production: future tendency		1 x	2 (minor) x, 1 x	6.9	8.6	4.8

	Median lead/lag at all T.P.s	Median lead/lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	No. of turning points	Average deviation from median	Ratio: Median lead/ average deviation from median	Cross-correlation Lag	Coeff.
New composite leading indicator	10.0	10.0	8.0	5.4	4.6	23	4.5	2.2	5-6	0.84
Stocks of finished goods	8.0	8.0	12.0	6.8	5.8	19	5.1	1.6	8-10	-0.62
Construction starts	11.0	14.5	7.0	7.7	6.7	23	6.7	1.6	8	0.46
Weekly working hours	7.0	9.0	5.0	9.9	7.0	14	6.6	1.1	4-5	0.65
Wages and salaries	4.0	4.0	4.0	4.7	3.8	19	3.4	1.2	3-5	-0.73
USA leading index	6.0	5.5	8.0	5.6	4.6	23	4.3	1.4	6	0.67
Share prices	5.0	7.0	5.0	8.7	6.1	21	5.6	0.9	3-4	0.52
Money supply	8.0	10.0	7.0	6.5	5.6	23	5.3	1.5	6-8	0.58
BSS: orders inflow, tendency	7.0	7.5	2.0	7.6	6.0	11	5.5	1.3	2	0.41
BSS: finished goods stocks, level	5.0	6.0	1.0	11.0	7.9	9	6.1	0.8	1	-0.46
BSS: Production: future tendency	6.0	6.0	4.0	7.5	5.7	9	4.8	1.3	1-2	0.56

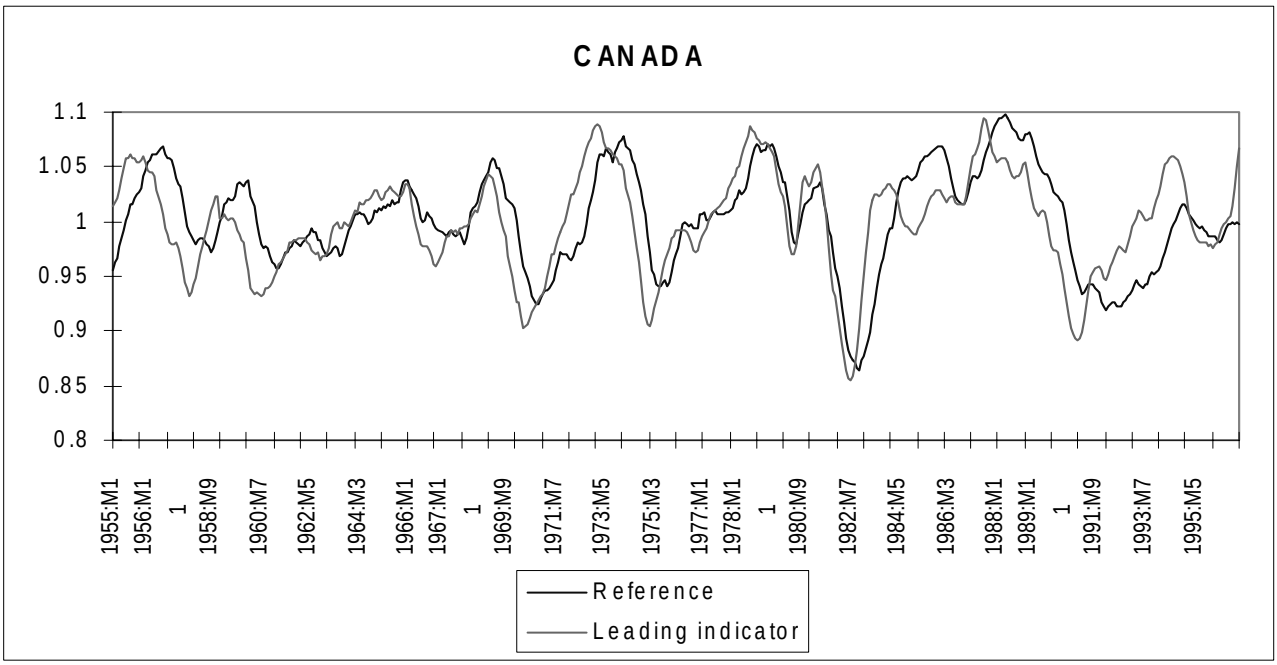




There is hardly any change in the turning point dates when the composite leading indicator is not detrended:



The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:



62 series were tested as potential component series. Several series satisfy the selection criteria (see Canada, Table 1).

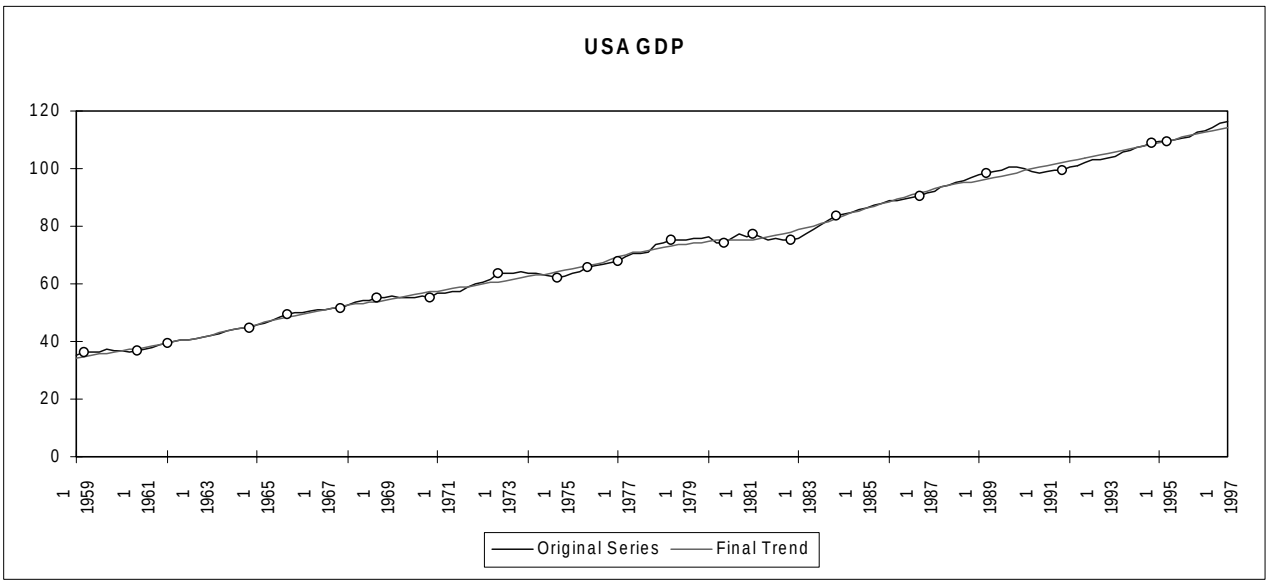
USA

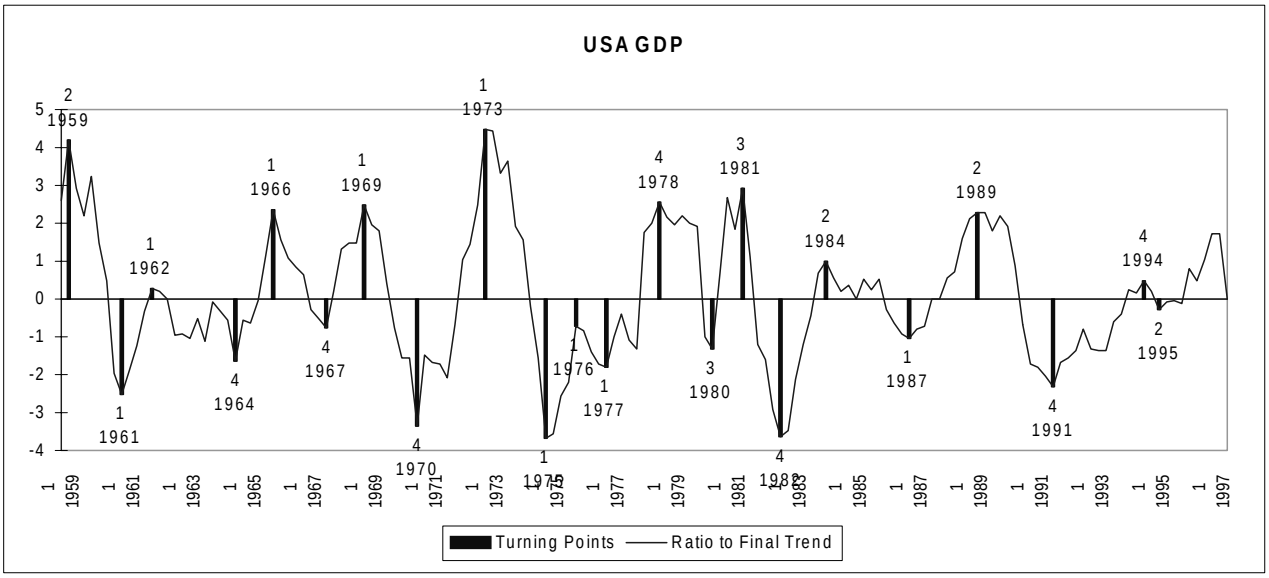
Cycles in the reference series

The cycles were short and mild in the 1960s at the time when the trend growth-rate was strong. The 1969-1970 cycle was the first severe one for a decade. The two oil crisis recessions were of roughly equal magnitude, but the second one, 5/79 - 12/82, was more than twice as long from peak to trough. There is no subcycle in 1977 although this feature occurs almost everywhere else. The subcycle of mid-1980 to mid-1981 is well-defined. The trough in 12/82 is followed by a period of extensive growth, which is only interrupted by the small subcycle in 6/84 - 9/86. The peak in 1/89 is followed by a trough in 3/91, which is the last major turning point. The PAT-programme does detect a small cycle in 1/95 -1/96 in both industrial production and in GDP, but as the programme typically identifies too many turning points, this will probably not be even a subcycle.

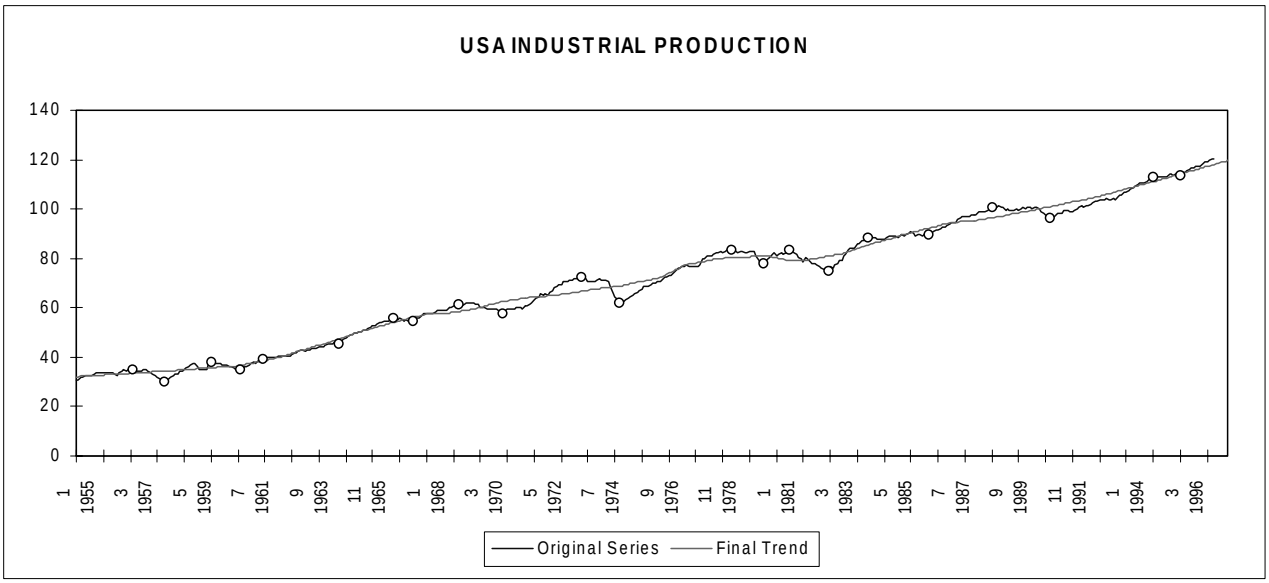
The cyclical characteristics of the reference series are presented in the table below:

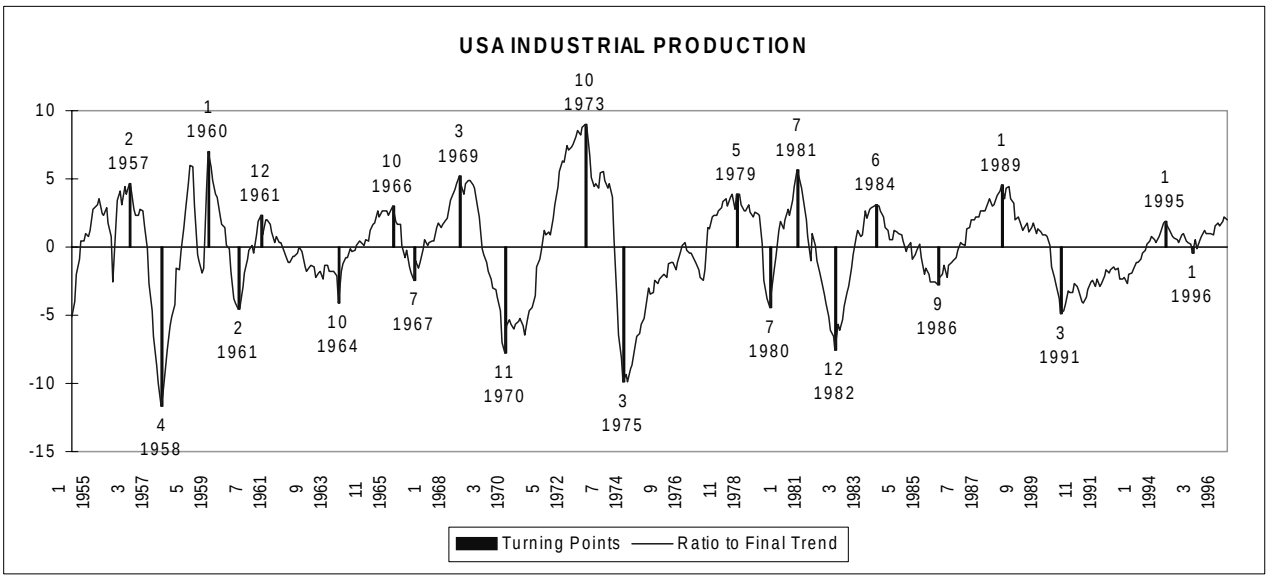
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
			2/57		4.69
				4/58	-11.65
2/59		4.18	1/60		6.98
	(1/61)	-2.51		(2/61)	-4.59
(1/62)		0.28	(12/61)		2.30
	4/64	-1.62		10/64	-4.06
1/66		2.34	10/66		3.03
	4/67	-0.75		7/67	-2.48
1/69		2.48	3/69		5.21
	4/70	-3.35		11/70	-7.75
1/73		4.47	10/73		8.97
	1/75	-3.68		3/75	-9.93
(4/78)		2.56	5/79		3.93
	(3/80)	-1.33		(7/80)	-4.47
3/81		2.90	(7/81)		5.64
	4/82	-3.65		12/82	-7.54
2/84		1.00	6/84		3.06
	1/87	-1.05		9/86	-2.83
2/89		2.29	1/89		4.51
	4/91	-2.32		3/91	-4.84
(4/94)		0.49	(1/95)		1.90





Reference series:





At present we have three different leading indicators for USA. Two component series used in the calculations have been discontinued and thus needed to be replaced. The current leading indicator has the following components:

200 S90209A000000 9 3 1 40 1	USA LEADING INDEX
300 S90203053005R 0 2	USA NET NEW ORDERS DURABLE GOODS
400 S90205602001R 0 2 1	USA TREASURY BILL RATE
500 S90204230008R 0 2 1	USA WEEKLY INITIAL CLAIMS
600 S9020530535DR 0 2	USA MONEY SUPPLY M2 1975 PRICES
700 S90205641009R 0 2	USA SHARE PRICES INDUST(STANDARD & POOR)
800 S90203130008R 0 2	USA CONSTR DWELL STARTED
900 S90203555081R 0 2	USA NET BUSINESS FORMATION (discontinued)
1000 S9020354901CR 0 2	USA CHANGE IN PRICES (CR MAT & SPOT)
1100 S9020355453CR 0 2	USA CHANGE IN CREDIT (BUS & CONS) (discontinued)

In addition, we have a longer leading and a shorter leading indicator with the following components:

1200 S90209L000000 6 3 1 40 1	USA LONGER LEADING INDEX
1300 S90205602001R 0 2 1	USA TREASURY BILL RATE
1400 S90203552021R 0 2	USA CHANGE IN TOTAL LIQ ASSETS
1500 S9020530535DR 0 2	USA MONEY SUPPLY M2 1975 PRICES
1600 S90205641009R 0 2	USA SHARE PRICES INDUST(STANDARD & POOR)
1700 S90203130008R 0 2	USA CONSTR DWELL STARTED
1800 S9020354901CR 0 2	USA CHANGE IN PRICES (CR MAT & SPOT)
1900 S90209S000000 9 3 1 40 1	USA SHORTER LEADING INDEX
2000 S90200452005R 4 2	USA CORPORATE PROFITS AFTER TAX
2100 S90203053005R 0 2	USA NET NEW ORDERS DURABLE GOODS
2200 S90204230008R 0 2 1	USA WEEKLY INITIAL CLAIMS
2300 S90203220006R 0 2	USA SALES RETAIL STORES
2400 S90203555081R 0 2	USA NET BUSINESS FORMATION (discontinued)
2500 S9020355453CR 0 2	USA CHANGE IN CREDIT (BUS & CONS) (discontinued)
2600 S90203040005R 0 2 1	USA STOCKS FIN GOODS
2700 S9020303900CR 0 2 1	USA INV TO SHIPMENT RATIO
2800 S9020332290AR 0 2	USA COMPANIES REPORTING DELIVS

The major revision of the leading indicator for the United States had already been done earlier, thus there was no need do extensive testing on all potential component series. However, as we were especially interested in including business survey series as components and broadening the coverage of the indicator, the following series were tested:

Net new orders	Treasury bill rate	Weekly initial claims	Money supply
Share prices	Construction	Net business formation	Change in prices
Change in credit	Inventory-shipment ratio	Total manufacturing deliveries	Stocks final goods
Net new orders	Corporate profits	Change in total liquid assets	Companies reporting deliveries
Sales of retail stores	Consumer sentiment	BCI Composite index	USA Diffusion index - production
PMI - Employment (NAPM)	PMI - Inventories (NAPM)	PMI - New export orders (NAMP)	PMI - New orders (NAPM)
PMI - Prices (NAPM)	PMI - Production (NAPM)	Contracts and orders	Changes in crude material prices
Prime rate	Federal funds rate	M1	M2
USA Interest rate spread			

The compilation of new indicator for the United States posed no particular problems. There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

The performance of series tested as potential components is presented below.

	Delay in release	Comments
Net new orders	1	Coincident.
Treasury bill rate	1	Longish, a bit uneven lead.
Weekly initial claims	1	Uneven lead
Money supply	1	Few missing cycles, otherwise uneven performance.
Share prices	1	Good in the beginning of th eperiod, uneven performance towards the end.
Construction	1	Somewhat uneven lead, but quite good in the end.
Net business formation	1	Lagging or coincident.
Change in prices	1	Somewhat uneven lead, quite good in the end.
Change in credit	1	Coincident or lagging in the end.
Inventory-shipment ratio	1	Very uneven lead.
Total manufacturing deliveries	1	Lagging or coincident.
Stocks final goods	1	Somewhat uneven lead, but otherwise good.
Net new orders	1	Coincident.
Corporate profits	1	Short lead.
Change in total liquid assets	1	A fairly good indicator in the beginning, lagging in the end.
Companies reporting deliveries	1	A bit uneven lead, but otherwise a good indicator.
Sales of retail stores	1	Coincident or lagging at times, but otherwise good.
Consumer sentiment	1	Good.
BCI Composite index	1	Good.
USA Diffusion index - production	1	Somewhat uneven lead, but otherwise good.
PMI - Employment (NAPM)	1	Good.
PMI - Inventories (NAPM)	1	Lagging at times, otherwise good.
PMI - New export orders (NAMP)	1	Average performance.
PMI - New orders (NAPM)	1	Very good.
PMI - Prices (NAPM)	1	Very uneven lead, lagging at times.
PMI - Production (NAPM)	1	Good, but very short lead in the end.
Contracts and orders	1	Coincident at lagging at times.
Changes in crude material prices	1	Somewhat uneven lead, but good.
Prime rate	1	Very long lead.
Federal funds rate	1	Long lead.
M1	1	Average performance.
M2	1	Missing cycles and sometimes lagging, not good.
USA Interest rate spread	1	Long but somewhat uneven lead.
Sensitive materials	1	At times very long lead.
Contracts and orders	1	Coincident or lagging.

The initially proposed new leading indicator was very simple and had only six component series:

200 S90209A960000 6 3 1 40 1 USA LEADING INDEX (BY OUTI)
300 S90203053965R 0 2 USA NET NEW ORDERS DURABLE GOODS *
400 S90204230968R 0 2 1 USA WEEKLY INITIAL CLAIMS *
500 S90205641969R 0 2 USA SHARE PRICES INDUST(STANDARD & POOR) *
600 S90203130968R 0 2 USA CONSTR DWELL STARTED *
700 S9020354996CR 0 2 USA CHANGE IN PRICES (CR MAT & SPOT) *
800 S9020355796CR 0 2 USA Contracts and orders for plant and equipment *

The new proposed indicator has somewhat broader coverage with the following eight components:

00000200S90209A960000 8 3 1 40 1 USA LEADING INDEX (BY OUTI)
00000300S90203053965R 0 2 USA NET NEW ORDERS DURABLE GOODS *
00000400S90204230968R 0 2 1 USA WEEKLY INITIAL CLAIMS *
00000500S90205641969R 0 2 USA SHARE PRICES INDUST(STANDARD & POOR) *
00000600S90203130968R 0 2 USA CONSTR DWELL STARTED *
00000700S9020354996CR 0 2 USA CHANGE IN PRICES (CR MAT & SPOT) *
00000800S9020355796CR 0 2 USA Contracts and orders for plant and equipment *
00000900S90205602961R 0 2 1 USA TREASURY BILL RATE
00001000S9020334000FR 0 2 USA CONSUMER SENTIMENT *

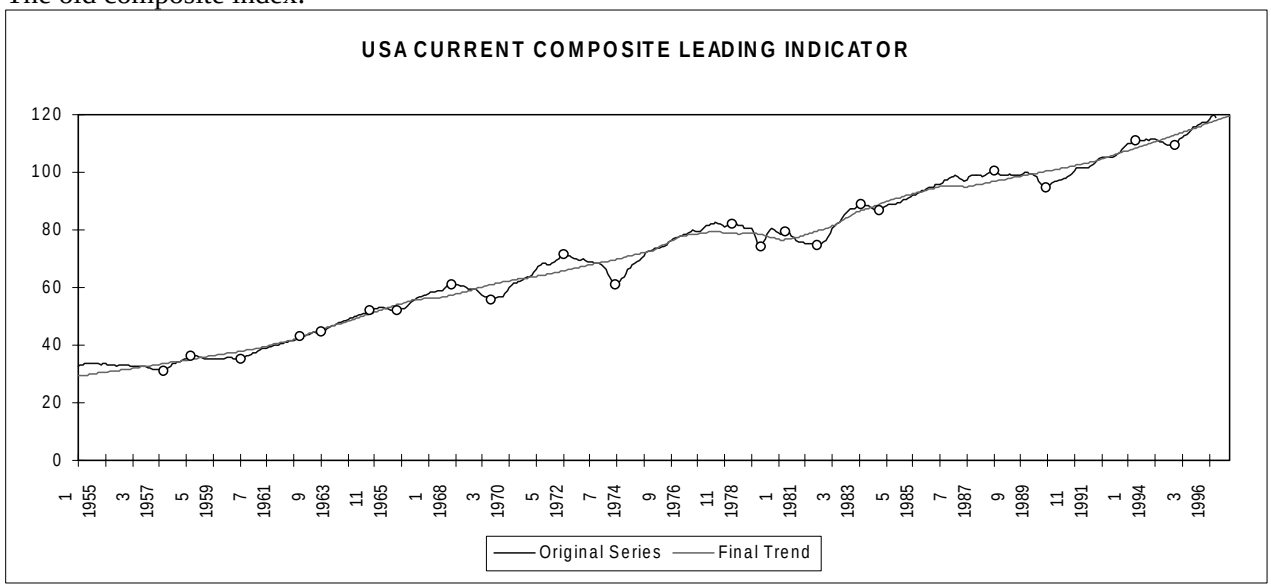
Series marked with * are also included as component series in the leading indicator published by the Conference Board. The price series, however, was dropped by the Conference Board during a recent revision of their leading indicator.

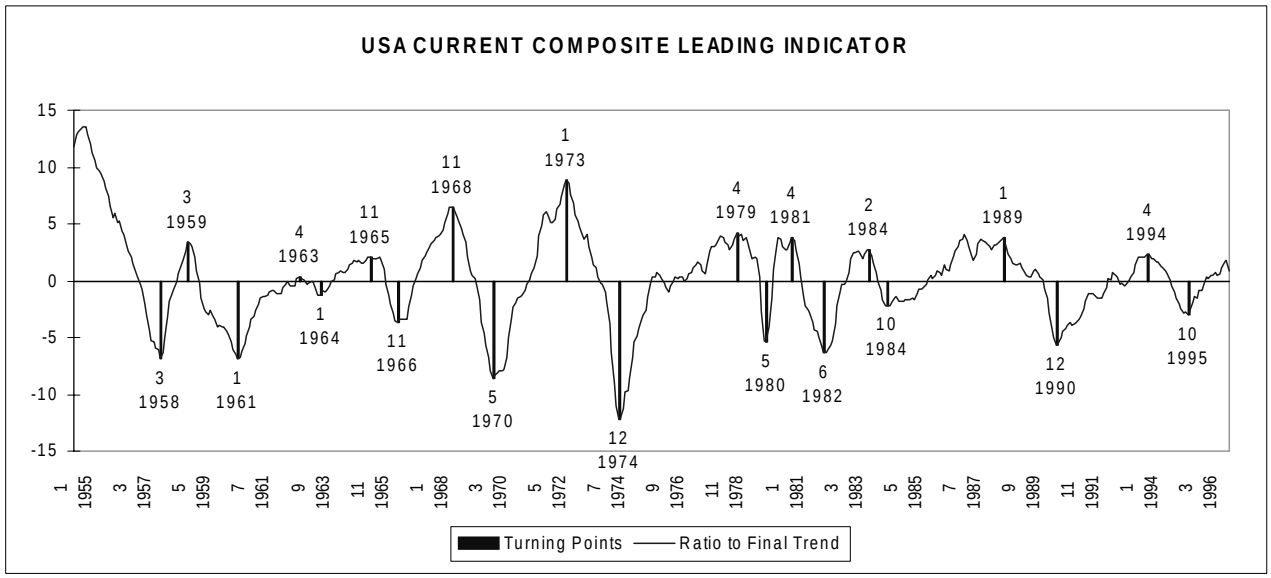
	MCD	Availability	Average lead/lag at all turning points	peaks	troughs
Old leading indicator (1987 publication)	1	2	7	7	6
New leading indicator (proposed)	1	2	6	6	5
Net new orders, durable goods	3	2	2	3	1
Average weekly claims for unemployment benefit	3	2	4	6	2
Share prices	2	2	7	6	8
Housing starts	3	1	3	3	2
Changes in crude material prices, smoothed	5	2	8	7	9
Contracts and orders for plants and equipment	5	2	2	4	0
Treasury bill rate		1	17	20	14
Consumer sentiment		2	4	2	5

	Median lead/lag at all turning points	peaks	troughs	Std dev	Ave. dev. from mean	No. of turning points	Ave. dev. from median	Ratio: median lead/ average deviation from median	Correlation Coefficient	Lead
Old leading indicator (1987 publication)	5	9	3	6	5	22	5	0.99	0.87	6
New leading indicator (proposed)	6	8	3	6	4	23	4	1.40	0.82	5
Net new orders, durable goods	1	3	1	5	3	22	3	0.33	0.78	1
Average weekly claims for unemployment benefit	3	5	2	6	4	24	4	0.79	0.80	2
Share prices	7	9	5	12	8	16	8	0.83	0.52	7
Housing starts	2	5	2	9	6	21	6	0.31	0.63	8

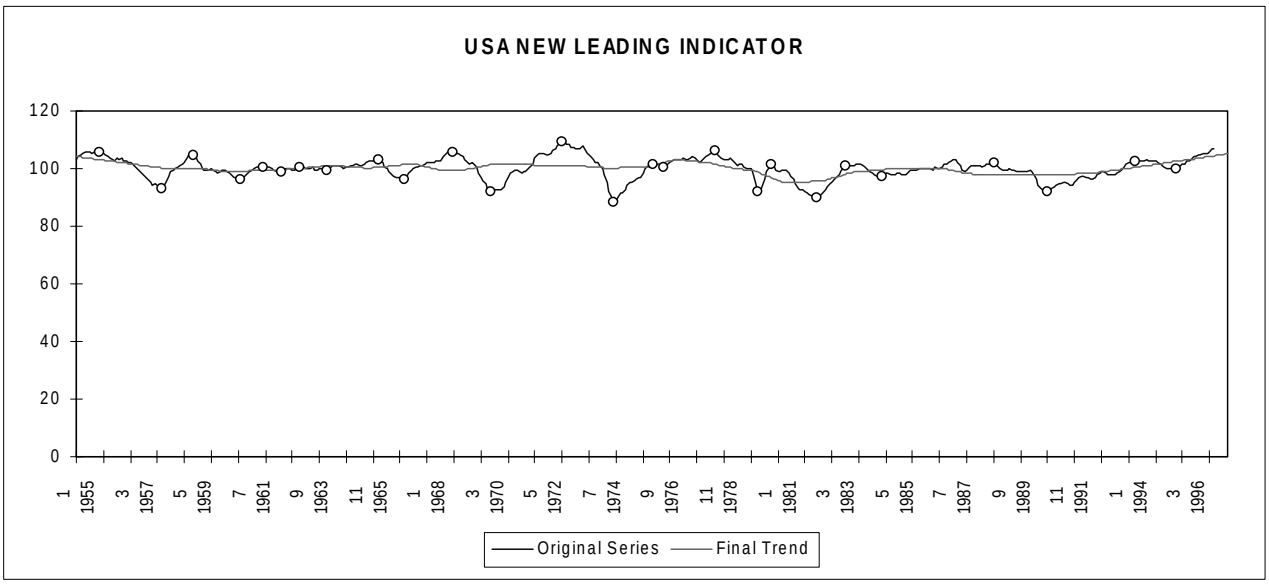
Changes in crude material prices, smoothed	7	6	8	9	7	19	7	1.04	0.38	8
Contracts and orders for plants and equipment	1	3	1	5	4	21	4	0.24	0.66	0
Treasury bill rate	19	20	13	7	6	19	5	3.53	-0.47	19,20
Consumer sentiment	5	2	5	7	5	9	5	1.03	0.48	4-7

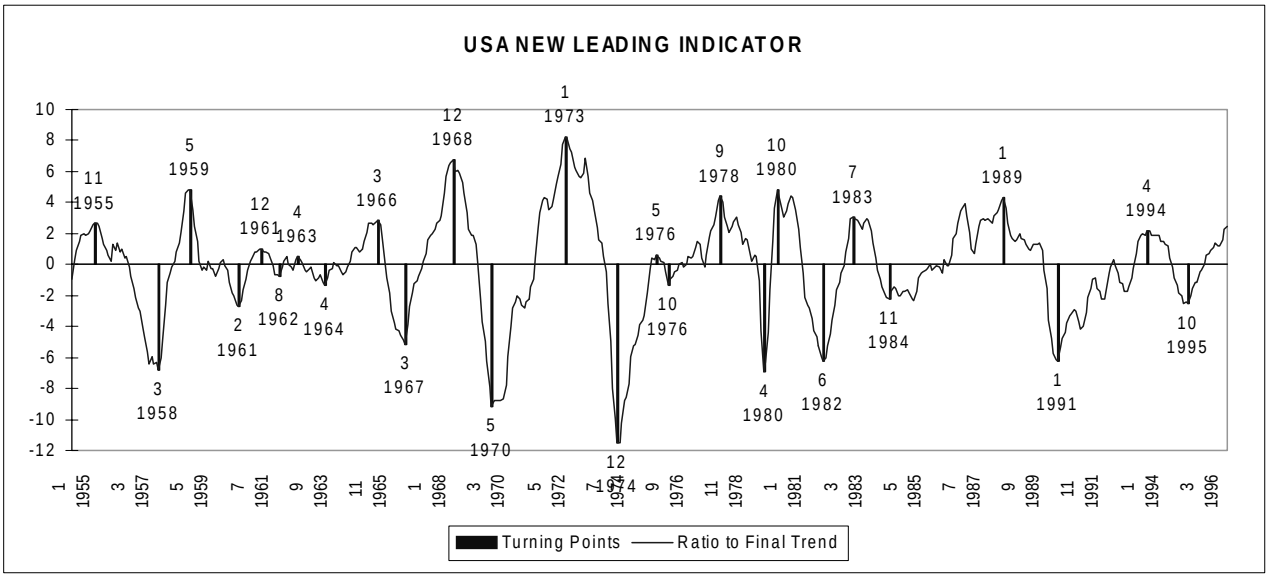
The old composite index:



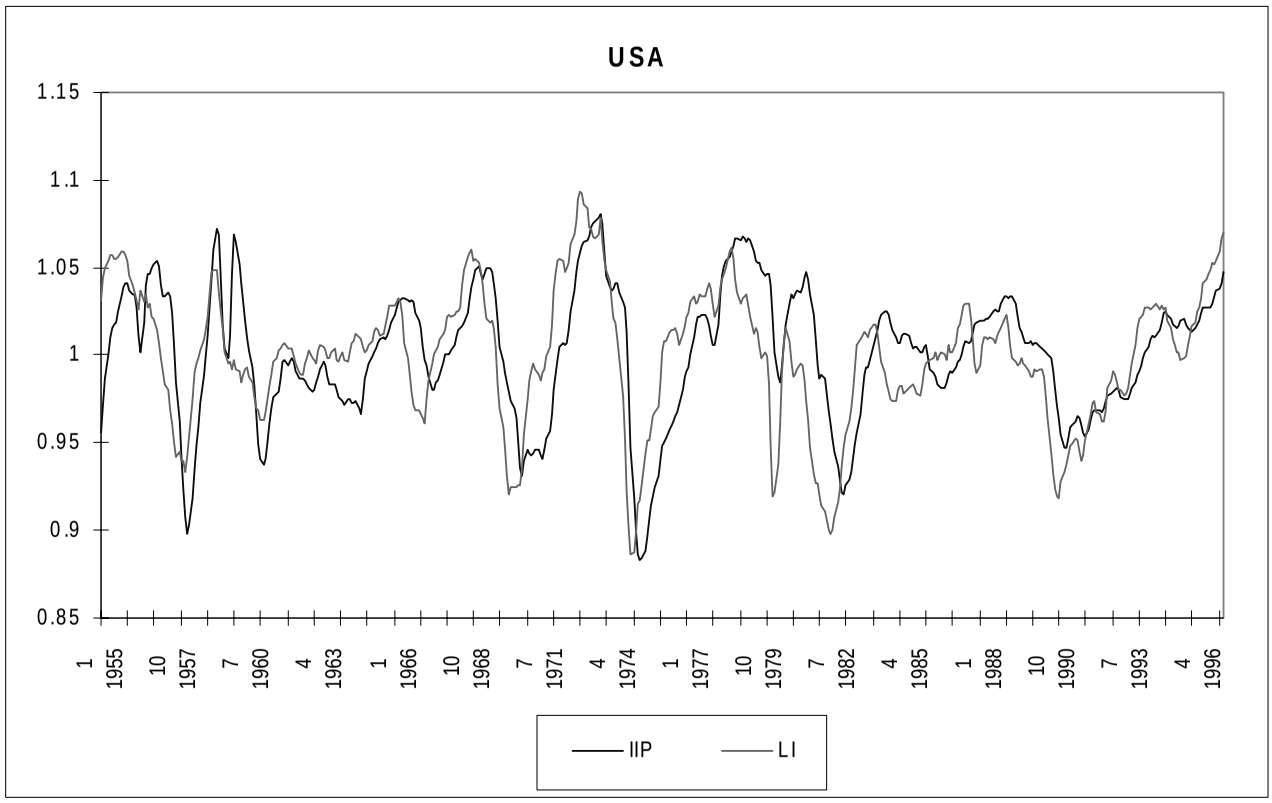


The new composite index:





The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:


USA
1.15
1.1
1.05
1
0.95
0.9
0.85
1 1955
10 1957
7 1960
4 1963
1 1966
10 1968
7 1971
4 1974
1 1977
10 1979
7 1982
4 1985
1 1988
10 1990
7 1993
4 1996
IIP
LI

JAPAN

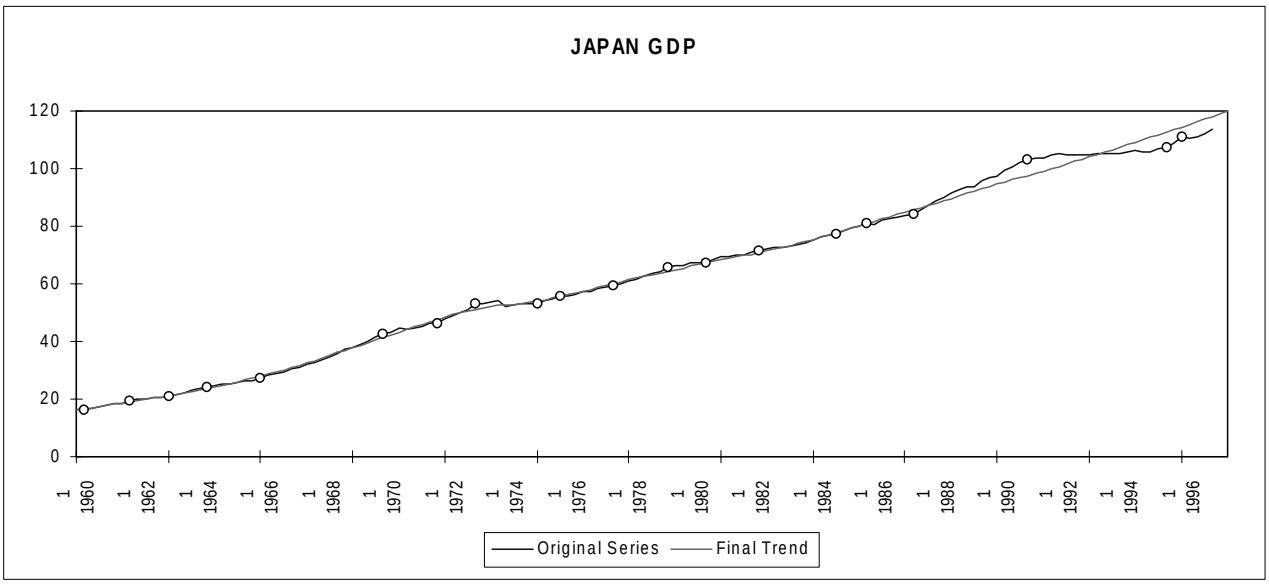
Cycles in the reference series

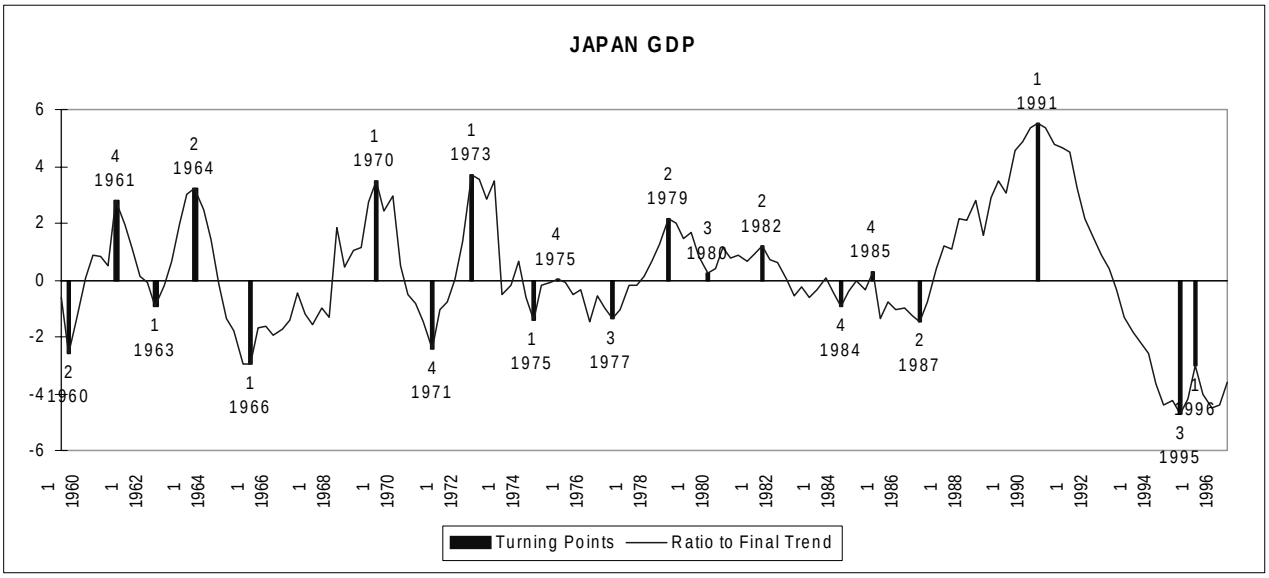
Japan has displayed very clear cycles in output with large amplitudes. For the earlier years in particular, there is no close resemblance with the cycles of other countries: the recession of 1964-1965, for example, occurs almost nowhere else, whereas the late sixties was a period of nearly continuous expansion. The 1977 subcycle occurs only in industrial production and not in GDP and the subcycle in 1980-1981 is scarcely visible. The developments after the trough in 10/82 are similar to those of the other G7-Countries, with a small peak in 10/84 and a pronounced trough in 5/87. The peak in 10/90 occurs in Japan roughly a year later than in other countries and the trough in 10/93 occurs a few months later.

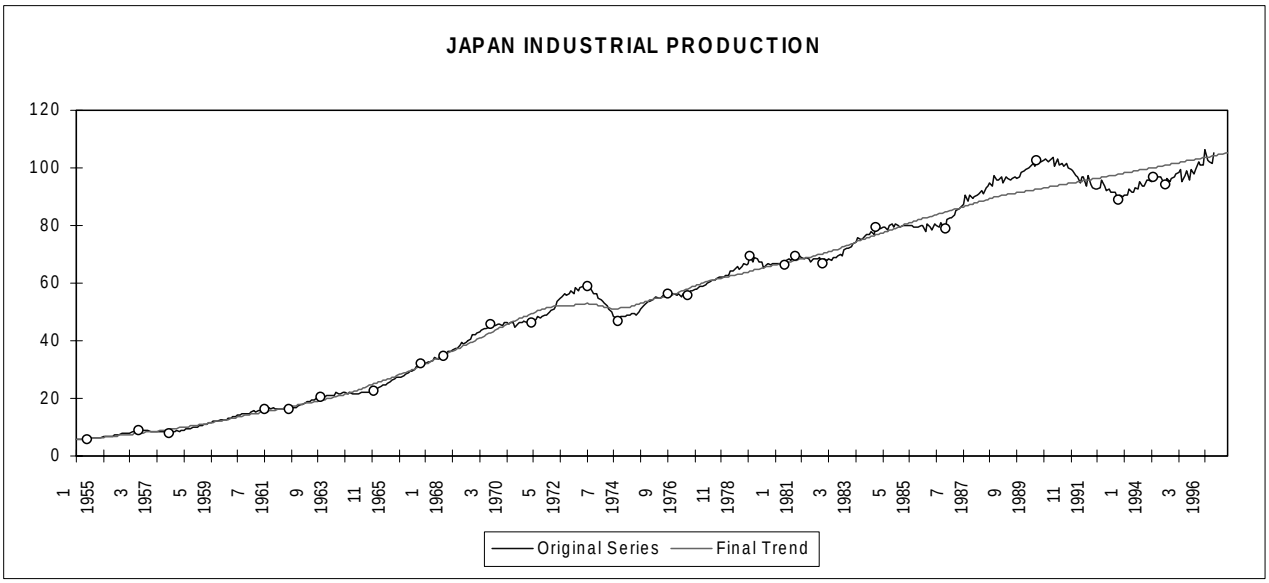
The cyclical characteristics of the reference series are presented in the table below:

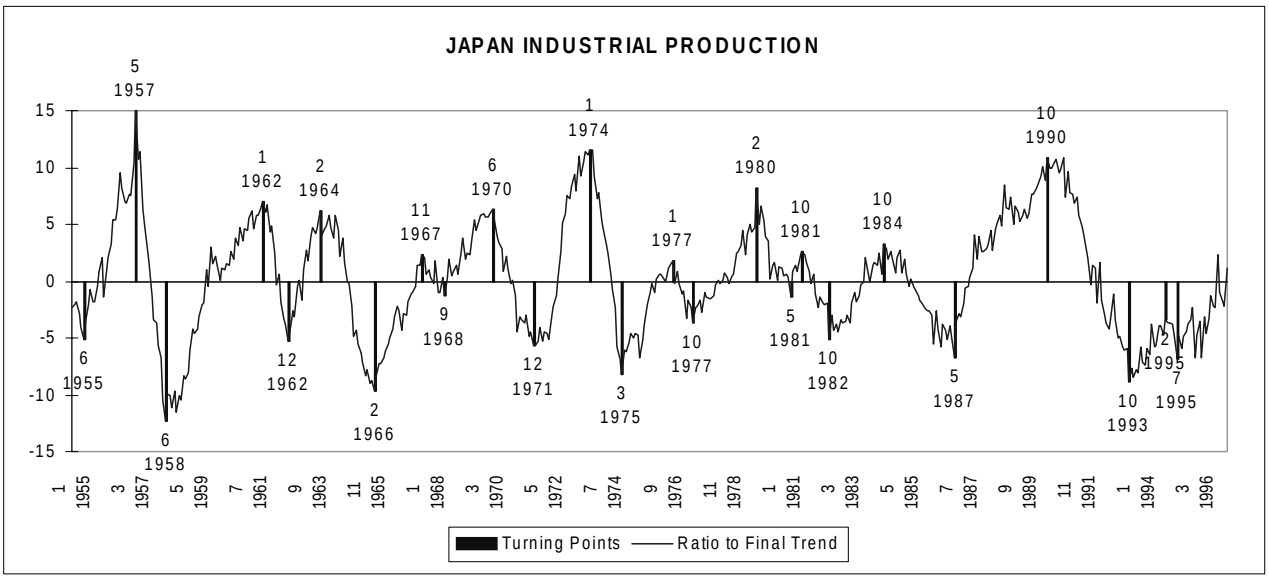
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
			5/57		15.00
	2/60	-2.60		6/58	-12.34
4/61		2.80	1/62		7.03
	1/63	-0.92		12/62	-5.30
2/64		3.23	2/64		6.18
	1/66	-2.98		2/66	-9.62
			(11/67)		2.30
				(9/68)	-1.22
1/70		3.51	6/70		6.39
	4/71	-2.42		12/71	-5.68
1/73		3.69	1/74		11.51
	1/75	-1.42		3/75	-8.17
(4/75)		0.02	(1/77)		1.76
	(3/77)	-1.34		(10/77)	-3.66
2/79		2.17	2/80		8.24
				(5/81)	-1.44
			(10/81)		2.60
	4/84	-0.92		12/82	-5.07
4/85		0.27	10/84		3.22
	2/87	-1.47		5/87	-6.72
1/91		5.51	10/90		10.91
	3/95	-4.72		10/93	-8.84

The OECD LI & BC lists 83M02 as the last turning point. Mr. Kotaro Tsuru from the Japanese desk has reviewed the chronology.


JAPAN GDP
120
100
80
60
40
20
0
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Original Series
Final Trend


JAPAN GDP
6
4
2
0
-2
-4
-6
4 1961
2 1964
1 1970
1 1973
2 1979
3 1980
2 1982
4 1985
1 1991
4 1975
2 1 1960
1 1963
1 1966
4 1971
1 1975
3 1977
4 1984
2 1987
1 1990
3 1995
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Turning Points
Ratio to Final Trend


JAPAN INDUSTRIAL PRODUCTION
120
100
80
60
40
20
0
1 1955
3 1957
5 1959
7 1961
9 1963
11 1965
1 1968
3 1970
5 1972
7 1974
9 1976
11 1978
1 1981
3 1983
5 1985
7 1987
9 1989
11 1991
1 1994
3 1996
Original Series
Final Trend



The following 62 series have been tested as potential component series:

Deliveries mining + manuf. inv.goods	Deliveries mining + manuf. const.materials	Deliveries mining + manuf. total
Deliveries mining + manuf. cons.goods	Deliveries mining + manuf. materials	Deliveries mining + manuf. interm. goods
Stocks mining and manuf, inv. goods	Stocks mining and manuf, cons. goods	Stocks mining and manuf, materials
Stocks mining and manuf, interm. goods	Stocks mining and manuf, const. materials	Stocks manuf. materials
Construction new orders, total	Construction new orders, dwellings	Construction buildings started
Construction dwellings started	Dwelling/construction starts private	Construction starts residential, yen
Construction starts residential, m2	Construction starts res+occup, yen	Construction starts res+occup, m2
Construction starts non-residential, yen	Stocks mining & mfg mat	Non-scheduled hours worked
New vacancies	Retail sales, department stores	Composite index
EPA leading indicator	Monthly hours of work, manufacturing	Unit labour cost
Passenger car registrations	bss capacity utilisation mfg index	bss selling prices: tendency
bss selling prices: future tendency	bss employment: future level	bss future capacity utilisation
bss raw material stocks: future level	Net new orders, machinery	Producer inventory ratio to shipment
Share prices	Excess of exports over imports	Total stocks (manufacturing)
Ratio loans to deposits	Business prospects	Finished goods stocks
New loans for equipment	Call money rate	Official discount rate
Treasury bills	Govt bonds	RET PR TOKYO/ share prices
Terms of trade	M1, YEN	M1, I/90
M1 + quasi money, YEN	M1 + quasi money, I/90	PPI RAW MAT
PPI INTERM. GOODS	PPI CONS GOODS	PPI INVEST. GOODS
PPI MFG INDUSTRY TOTAL	WPI TOTAL	

For Japan, the compilation of the new indicator posed no particular problems. There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

The performance of series tested as potential components is presented below.

	Delay in release	Comments
Deliveries mining + manuf. inv.goods	1	Mostly lagging.
Deliveries mining + manuf. const.materials	1	Uneven lead.
Deliveries mining + manuf. total	1	Coincident.
Deliveries mining + manuf. cons.goods	1	Mostly coincident.
Deliveries mining + manuf. materials	1	Mostly coincident.
Deliveries mining + manuf. interm. goods	1	Mostly coincident.
Stocks mining and manuf, inv. goods	1	Longish lead in the end.
Stocks mining and manuf, cons. goods	1	Good.
Stocks mining and manuf, materials	1	Longish lead in the end.
Stocks mining and manuf, interm. goods	1	Longish lead in the end.
Stocks mining and manuf, const. materials	1	Good.
Stocks manuf. materials	1	Long lead in the end.
Construction new orders, total	2	Mostly lagging, but good lead in the end of the period.
Construction new orders, dwellings	2	Very uneven lead.
Construction buildings started	2	Somewhat uneven lead, potentially good in the end.
Construction dwellings started	2	Uneven lead.
Dwelling/construction starts private	2	Long lead, somewhat uneven.
Construction starts residential, yen	2	Lagging at times, but potentially good in the end.
Construction starts residential, m2	2	Uneven lead.
Construction starts res+occup, yen	2	Missing cycles.
Construction starts res+occup, m2	2	Somewhat uneven lead.
Construction starts non-residential, yen	2	Short lead in the end.
Stocks mining & mfg mat	1	Uneven lead, very long lead in the end.
Non-scheduled hours worked	1	Uneven lead.
New vacancies	1	Good, especially in the end of the period.
Retail sales, department stores	2	Mostly lagging.
EPA leading indicator	2	Uneven lead.
Monthly hours of work, manufacturing	1	Uneven lead.
Unit labour cost	2	Mostly coincident.
Passenger car registrations	1	Uneven lead.
bss capacity utilisation mfg index	4	Coincident.
bss selling prices: tendency	4	Uneven lead, potentially good in the end.
bss selling prices: future tendency	4	Uneven lead, coincident in the end.
bss employment: future level	4	Very long lead in the end.
bss future capacity utilisation	4	Uneven lead, lagging at times.
bss raw material stocks: future level	4	Uneven lead, long lead in the end.
Net new orders, machinery	2	lagging at times, potentially good in the end.
Producer inventory ratio to shipment	2	Good.
Share prices	1	Good.
Excess of exports over imports	1	Uneven lead at times, but otherwise good.
Total stocks (manufacturing)	2	Good, longish lead at times.
Ratio loans to deposits	3	Very good at the beginning, somewhat uneven lead in the end.
Business prospects	1	Uneven lead, lagging at times.
Finished goods stocks	1	Somewhat uneven lead, otherwise good.
New loans for equipment	4	Very long lead at times, otherwise very good.
Call money rate	1	Good in the beginning, very long lead in the end.
Official discount rate	1	Good in the beginning, very long lead in the end.
Treasury bills	1	Uneven lead, very long lead in the end.
Govt bonds	1	Very long lead.
RET PR TOKYO/ share prices	1	Good.
Terms of trade	2	Uneven lead, very long lead in the end.
M1, YEN	1	Good in the beginning, long lead in the end.
M1, I/90	1	Good in the beginning, long lead in the end.
M1 + quasi money, YEN	1	Very uneven lead.
M1 + quasi money, I/90	1	Good in the beginning, uneven lead in the end.
PPI RAW MAT	1	Very long lead in the end.
PPI INTERM. GOODS	1	Very long lead in the end.
PPI CONS GOODS	1	Uneven lead, longish lead in the end.
PPI INVEST. GOODS	1	Uneven lead.
PPI MFG INDUSTRY TOTAL	1	Uneven lead, very long lead at times.
WPI TOTAL	1	Very long lead in the end.

The current leading indicator has the following 11 components:

```
#FILE (STA05)CYP/JPNCOMP ON GLOBALPACK
100 SHORT
200 S90509A000000 11 3 1  40 3          JAP LEADING INDEX
300 S90503038009R 0 2 1            100  JAP INDEX PROD INVENT RATIO TO SHIP
400 S90505641009R 0 2         100  JAP SHARE PRICES TOKYO STOCK EXCHANGE
500 S9050791000CR 0 2              100  JAP EXCESS OF IMPORTS OVER EXPORTS
600 S90503030009R 0 2 1            100  JAP TOTAL STOCKS : MANUFACTURING
700 S90505253001R 0 2 1             50   JAP RATIO LOANS TO DEPOSITS
800 S9050333990AR 2 2               100  JAP BUSINESS SITUATION:PROSPECTS
900 S9050332490AR 2 2 1             100  JAP FIN GOODS STOCKS:LEVEL
1000 S90505203041R 0 2              50   JAP NEW LOANS FOR EQUIPMENT (COMM BANKS)
1100 S90505601001R 0 2 1   72M1 100  JAP CALL MONEY RATE
1200 S90507730009R 0 2     72M1  100  JAP TERMS OF TRADE
1300 S9050530535DR 0 2     72M1 100   JAP M1 + QUASI MONEY DEFL CPI
```

In the 1985 publication the cross correlation between industrial production and the composite index was 0.87. Now the cross correlation between industrial production and the current composite index is 0.76, thus the performance has deteriorated. With the update of turning points in the reference and component series, the cross correlation increases to 0.81. The performance of the financial series had clearly deteriorated and thus several test composite indices with 6 - 12 component series were compiled for Japan. In the end, the following three series were dropped: *Call money rate*, *Terms of trade* and *Money supply*. A new component series on *new vacancies* was added. The new leading indicator thus has the following nine components:

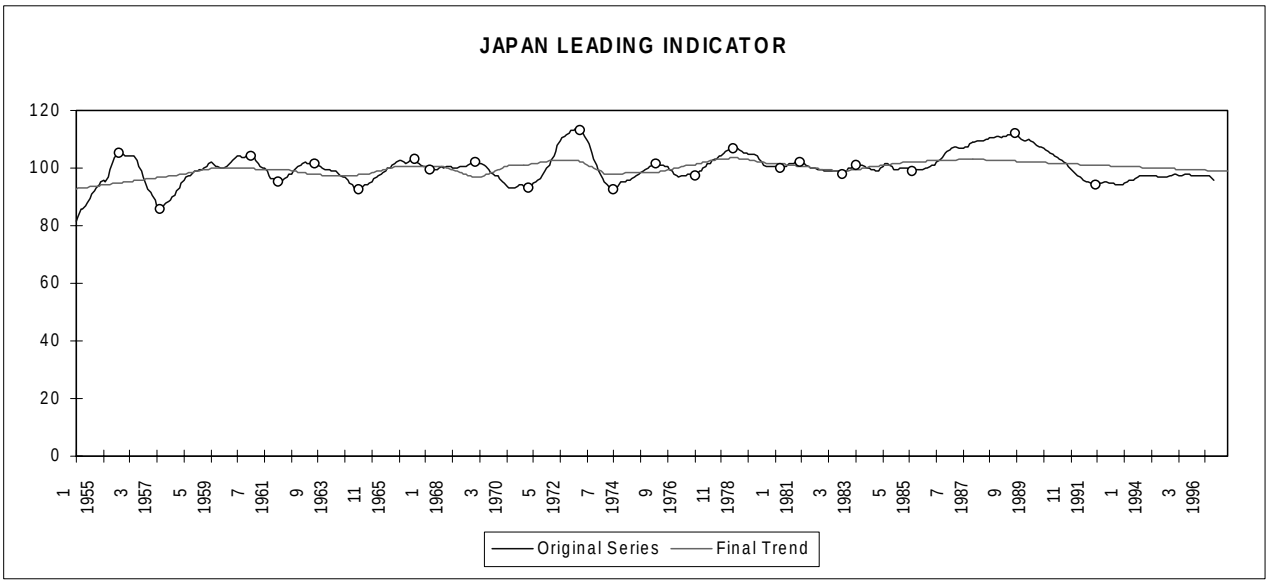
```
#FILE (STA05)OUTI/JPNCOMP3 ON GLOBALPACK
100 SHORT
200 S90509A960000  9 3 1  40 3          JAP LEADING INDEX
300 S90503038969R 0 2 1            100  JAP INDEX PROD INVENT RATIO TO SHIP
400 S90505641969R 0 2              100  JAP SHARE PRICES TOKYO STOCK EXCHANGE
500 S9050791096CR 0 2              100  JAP EXCESS OF IMPORTS OVER EXPORTS
600 S90503030969R 0 2 1            100  JAP TOTAL STOCKS : MANUFACTURING
700 S90505253961R 0 2 1            100  JAP RATIO LOANS TO DEPOSITS
800 S9050333996AR 2 2              100  JAP BUSINESS SITUATION: PROSPECTS
900 S9050332496AR 2 2 1            100  JAP FIN GOODS STOCKS:LEVEL
1000 S90505203961R 0 2             100  JAP NEW LOANS FOR EQUIPMENT (COMM BANKS
1100 S90504250008R 0 2             100  JAP NEW VACANCIES
```

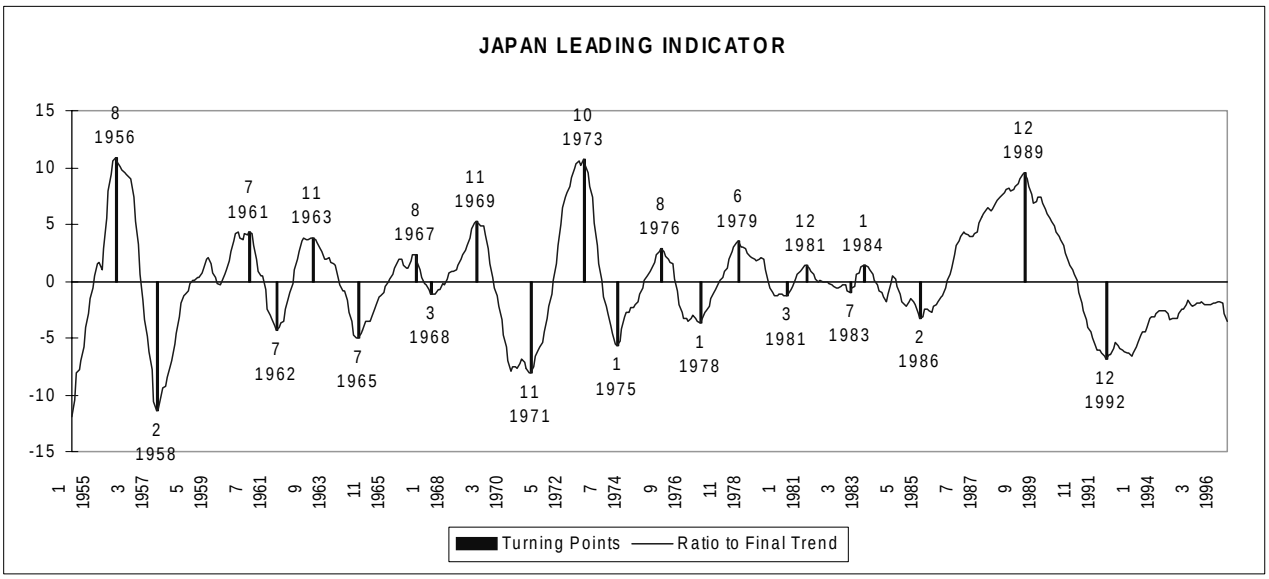
The statistical characteristics of the new composite indicator and the component series are presented in the table below:

	Remarks	Extra or missing cycles	Mean lead/ lag at all T.P.s	Mean lead/ lag at peaks	Mean lead/ lag at troughs
Composite leading indicator			4.6	5.5	3.6
Producer inventory ratio to shipment	counter cyclic	1x	4.2	3.8	4.6
Share prices		2x	8.1	9.4	6.7
Excess of exports over imports		1x, 1m	10.8	13.0	8.5
Total stocks (manufacturing)	counter cyclic	1x, 1m	8.8	7.6	10.0
Ratio loans to deposits	counter cyclic	1m	12.8	12.9	12.7
BSS: Business prospects	Q	1x	2.4	6.0	-1.2
BSS: Finished goods stocks	Q, counter cyclic	-	6.4	6.4	6.4
New loans for equipment		2x	10.3	12.0	8.6

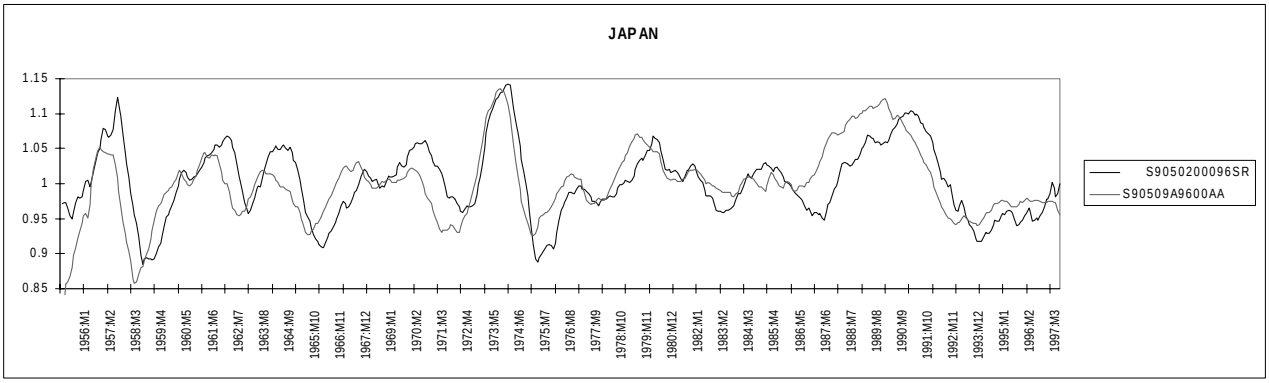
New vacancies				-	4.1	7.0		1.2		

	Median lead/ lag at all T.P.s	Median lead/ lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	No. of turning points	Average deviation from median	Ratio: median lead/ average deviation from median	Cross-correlation Lag	Coeff.
Composite leading indicator	5.0	6.0	4.0	5.1	3.8	22	3.7	1.3	5-7	0.81
Producer inventory ratio to shipment	4.0	4.0	4.0	4.9	3.2	20	3.2	1.3	4-5	-0.76
Share prices	8.0	10.0	7.0	6.0	4.8	18	4.8	1.7	7	0.53
Excess of exports over imports	11.5	10.5	12.5	12.2	7.8	8	7.8	1.5	5-7	0.33
Total stocks (manufacturing)	8.5	8.0	10.0	7.2	5.8	18	5.8	1.5	5-7	-0.54
Ratio loans to deposits	11.5	11.0	12.0	7.8	4.8	18	4.7	2.5	9-10	-0.56
BSS: Business prospects	2.0	5.0	-1.0	6.4	4.9	12	4.9	0.4	1	0.89
BSS: Finished goods stocks	7.0	7.0	6.5	5.8	4.8	15	4.7	1.5	1	-0.77
New loans for equipment	10.5	11.5	6.0	9.3	6.5	20	6.5	1.6	7-9	0.31
New vacancies	4.5	6.0	2.0	7.7	4.8	18	4.8	0.9	3	0.84





The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:



FRANCE

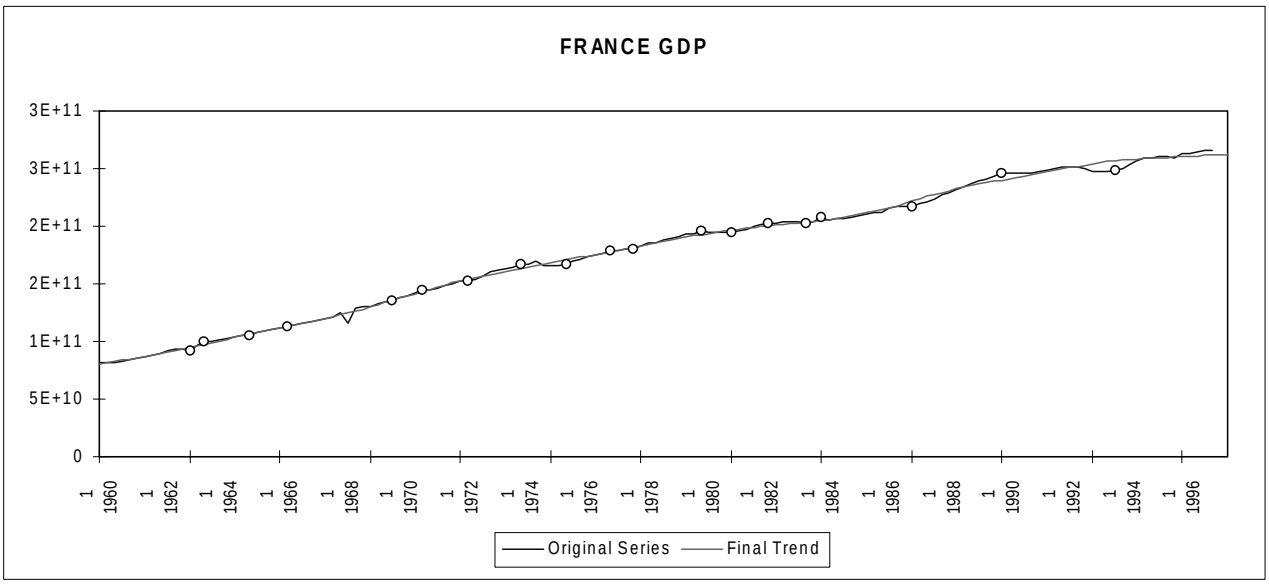
The cyclical pattern of France can also be seen in many other OECD-Countries. Amplitudes have been relatively small, particularly before 1972 and then again in the eighties. The fall following the peak in 8/79 is interrupted by a subcycle, 11/80 - 12/81, which is found both in industrial production and in GDP. A period of slow growth follows the trough in the end of 1982, but the growth is clearly accelerated in the late eighties. The peak in 7/90 is followed by a trough in 8/93, which is also the last turning point detected.

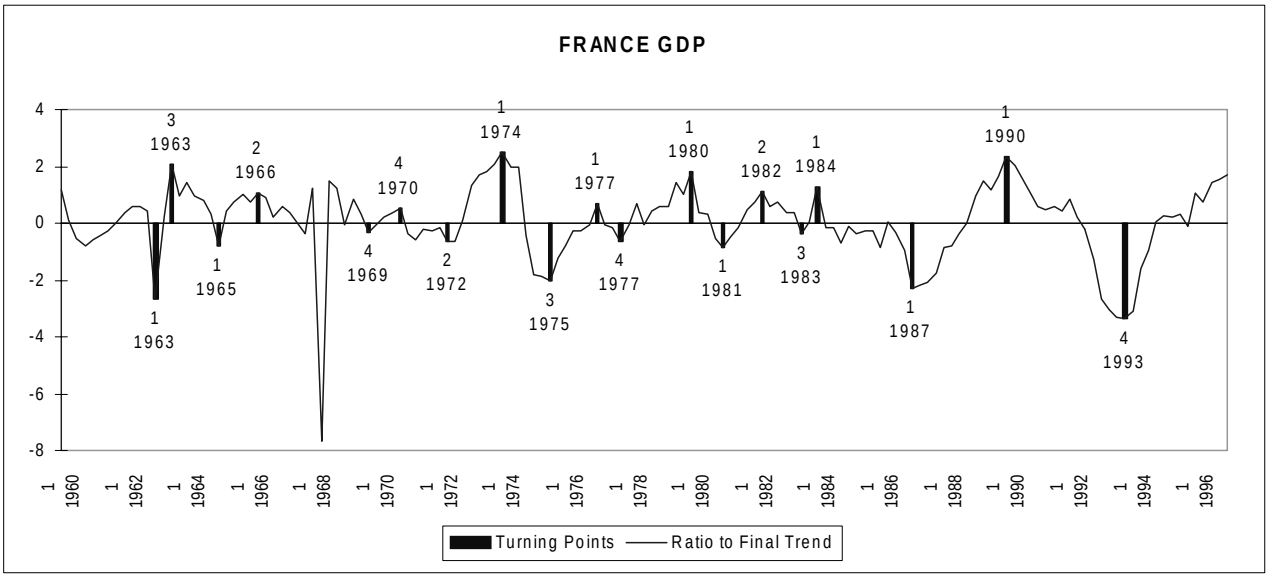
The cyclical characteristics of the reference series are presented in the table below:

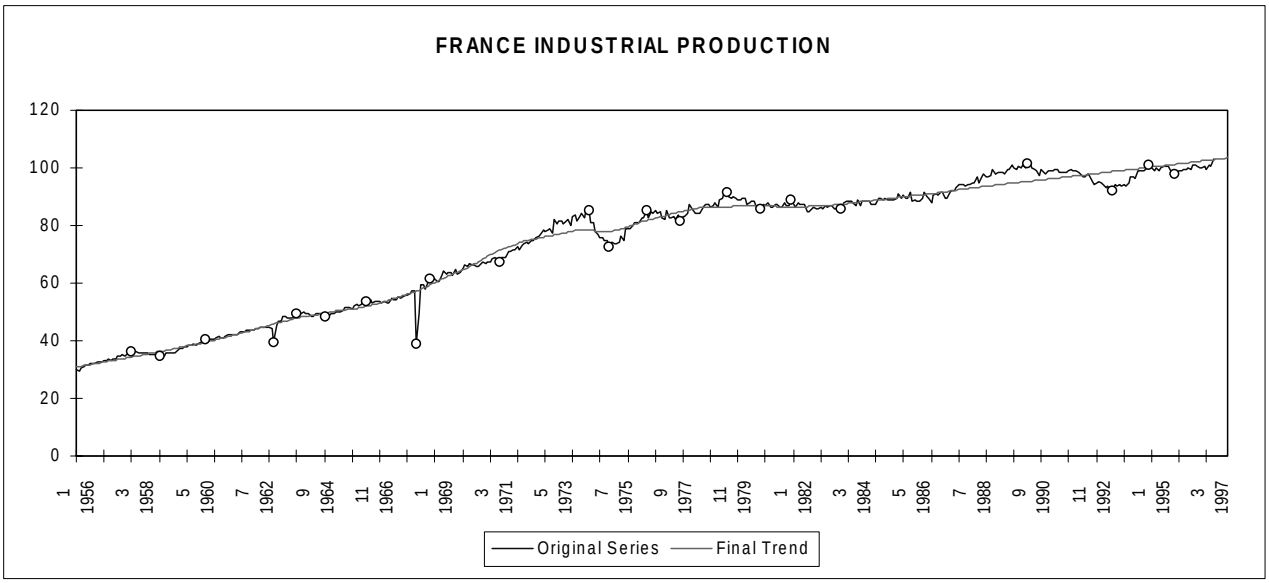
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
			1/58		5.32
				1/59	-4.63
(62)			9/60		2.36
	1/63	-2.66		3/63	-13.71
3/63		2.10	1/64		3.69
	1/65	-0.78		1/65	-2.13
2/66		1.05	7/66		3.83
	4/67	-0.36		10/67	-1.53
3/68		1.52	5/69		3.78
	2/72	-0.62		5/71	-5.53
1/74		2.53	8/74		8.68
	3/75	-2.03		5/75	-6.97
(1/77)		0.69	(9/76)		4.29
	(4/77)	-0.62		(12/77)	-4.03
1/80		1.80	8/79		5.88
	(1/81)	-0.83		(11/80)	-1.21
(2/82)		1.13	(12/81)		2.80
	3/83	-0.35		8/82	-2.05
1/84		1.28			
	1/87	-2.29			
1/90		2.37	7/90		6.62
	4/93	-3.38		8/93	-6.67
			(12/94)		0.71
				(11/95)	-3.30

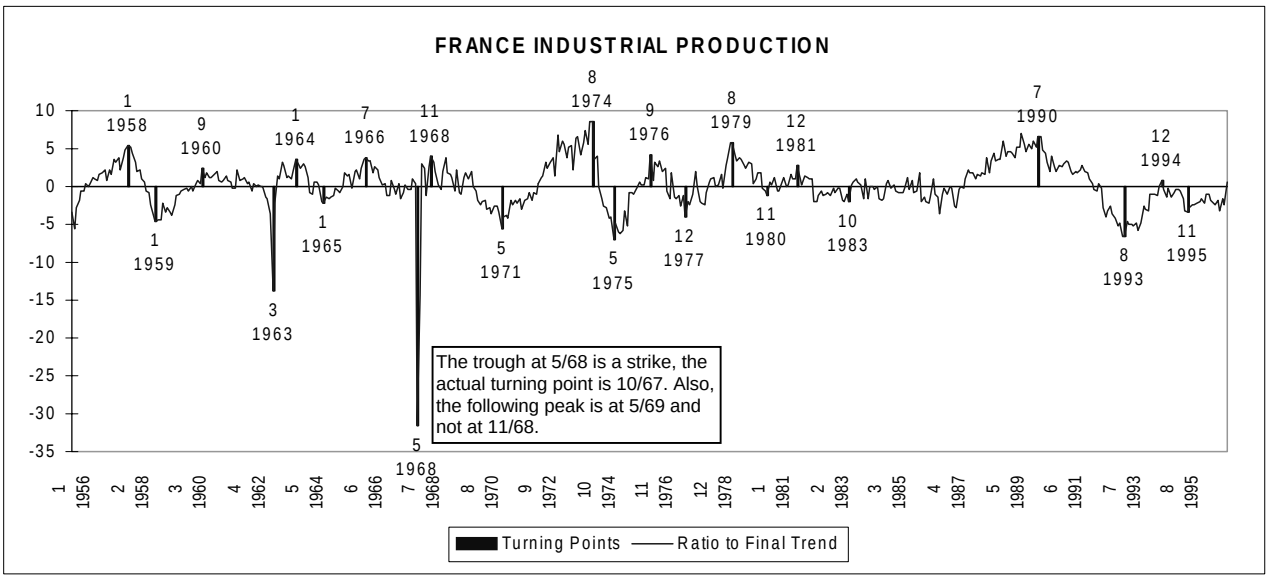
The original composite leading indicator had only six component series as presented in the OECD LI & BC. Since then, 5 new component series had been added and consequently the composite leading indicator has 11 component series at present.

In the OECD LI & BC the last turning point in the reference series is 82M08. The old and revised chronologies of industrial production and GDP series were submitted to Peter Hoeller (French desk) who helped to revise the entire chronology and to identify the new turning points.


FRANCE GDP
3E+11
3E+11
2E+11
2E+11
1E+11
5E+10
0
1 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996
Original Series
Final Trend


FRANCE GDP
4
2
0
-2
-4
-6
-8
3 1963
1 1963
2 1966
1 1965
4 1970
4 1969
2 1972
1 1974
3 1975
1 1977
4 1977
1 1980
1 1981
2 1982
3 1983
1 1984
1 1987
1 1990
4 1993
1 1960 1962 1964 1966 1968 1970 1972 1974 1976 1978 1980 1982 1984 1986 1988 1990 1992 1994 1996
Turning Points
Ratio to Final Trend

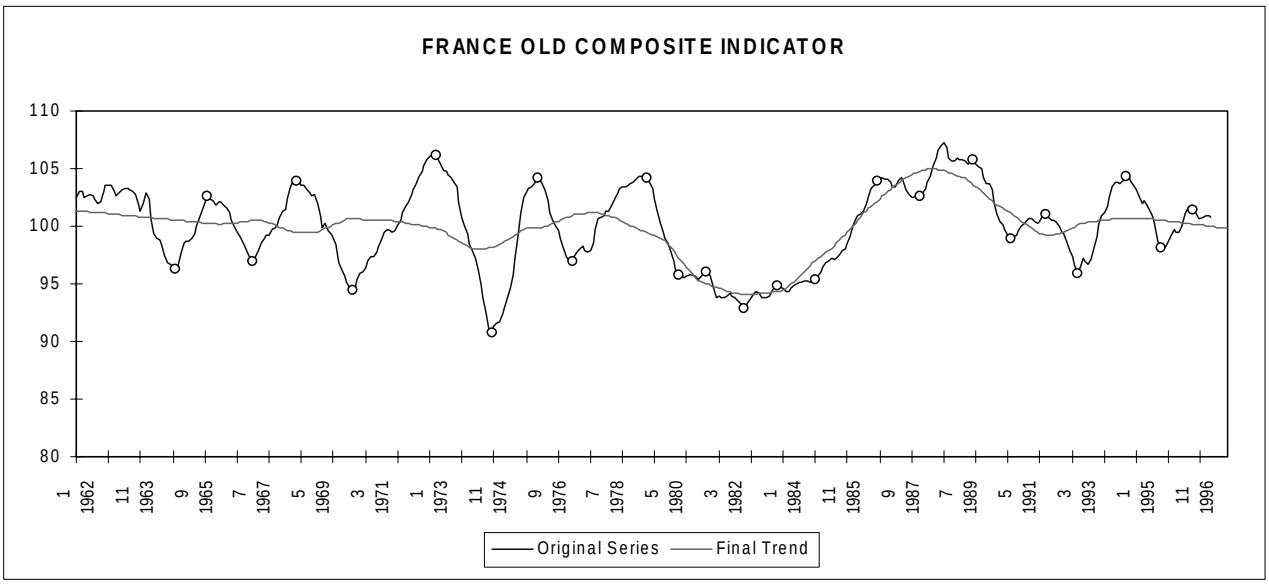

FRANCE INDUSTRIAL PRODUCTION
120
100
80
60
40
20
0
1 1956 3 1958 5 1960 7 1962 9 1964 11 1966 1 1969 3 1971 5 1973 7 1975 9 1977 11 1979 1 1982 3 1984 5 1986 7 1988 9 1990 11 1992 1 1995 3 1997
Original Series
Final Trend

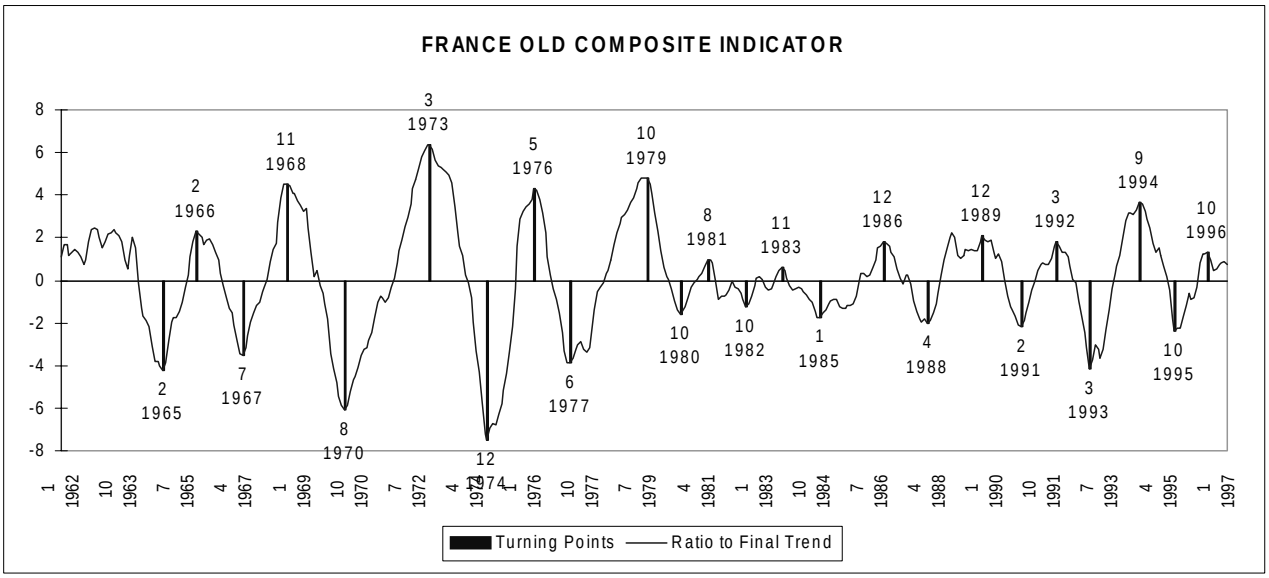


For some reason, it has proved very difficult to assemble a set of useful leading indicator for France. 42 series from the MEI data base were tested as component series.

The old composite leading indicator had the following components:

```
#FILE (STA05)CYP/FRACOMP ON GLOBALPACK
100 SHORT
200 S91509S000000  6 3 1  40 1          FRA LEAD INDEX SHORTER
300 S9150335190AR 0 2                   FRA PRODUCTION:FUTURE TENDENCY
400 S9150332490AR 0 2 1                 FRA FIN GOODS STOCKS:LEVEL
500 S9150337190AR 0 2                   FRA PROSPECTS FOR IND SECTORS
600 S91503215008R 0 2                   FRA PASSENGER CARS REGISTERED
700 S91505641009R 0 2                   FRA SHARE PRICES
800 S91507730009R 0 2     68M6          FRA TERMS OF TRADE
900 S91509L000000  5 3 1  40 1          FRA LEAD INDEX LONGER
1000 S91505305382R 0 2                  FRA M3,RESIDENT
1100 S91504710009R 4 2 1          FRA W.P INDUSTRIAL PRODUCTS
1200 S91505601001R 0 2 1          FRA CALL MONEY RATE
1300 S91505602001R 0 2 1          FRA 3 MTH INTERBK BILLS
1400 S91505622101R 0 2 1          FRA BOND YIELDS ISS GDT BY GVT
1500 S91509A000000  2 3 1 100 1       FRA LEAD INDICATOR
1600 S91509L000000 0 2    6     5       FRA LEADING INDEX  LONGER
1700 S91509S000000 0 2          6   FRA LEADING INDEX  SHORTER
```





There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

	Delay in release	Comments
BSS: Production future tendency SA	1	Good indicator until 1980, after that cycles do not match.
BSS: Finished goods stocks: LEVEL SA	1	Coincident in the beginning, cycles do not match in the end of the period.
New cars	1	Relatively good indicator in the beginning, cycles do not match after 1980.
Prospects for industry	1	Relatively good indicator.
Whole sale prices, industry	1	Cycles do not match.
M3, resident	2	Not a good indicator, after 1980 cycles do not match at all.
Share prices (industrials)	1	Somewhat uneven lead, but otherwise ok.
Terms of trade	3	Somewhat uneven lead, but otherwise ok.
Money call rate	1	Somewhat uneven and long lead, but otherwise good indicator.
3-month interbank loans	1	Good.
Bond yield	1	Good, but very long lead in the end.
Consumer confidence ind (EC) SA	1	Good, uneven lead in the 1980s.
Consumer confidence ind SA	1	Good indicator (very short time series).
BSS: Selling prices: future tendency SA	1	Good indicator, sometimes coincident.
BSS: present level total orders SA	1	Coincident, often lagging.
BSS: Order books: level SA	1	Short lead or lagging.
BSS: Production: tendency SA	1	Short lead or lagging.
BSS: Export order books: level	1	Mostly lagging.
BSS: Gen.ind. price level: fut. tend. SA	1	Mostly lagging.
BSS: Capacity utilisation rate SA	1	Mostly lagging.
BSS: Prospects ind sector SA	1	Good in the beginning, then lagging, potentially good in the nineties.
BSS: Order inflow/demand: tendency sa	1	Coincident or lagging.
BSS: Export order inflow/demand: tend. SA	1	Coincident or lagging.
BSS: Order inflow: future tendency SA	1	Coincident or lagging.
BSS: Finished goods stocks cons. gds: level	1	Good in the beginning, lagging in the middle, good in the end.
BSS: Producer prices: tendency	1	Very long lead or lagging, not good.
BSS: Employment: tendency SA	1	Lagging or coincident.
BSS: Employment: future tend. SA	1	Lagging or coincident.
Germany Composite LI	1	Coincident.
UK Composite LI	1	Uneven lead, very long in the end.
Italy Composite LI	1	Uneven lead.
USA Composite LI	1	Good indicator in the beginning, very long lead in the end.
Share prices (all)	1	Good indicator.
M1	2	Fairly good indicator, somewhat uneven lead.
Imports fob total USD	2	Coincident or lagging.
Net issues shares	2	Somewhat uneven lead, otherwise good.
Yield bonds non-guaranteed by gvt	1	Good.
Public and semi-public sector bonds	1	Good.
Net trade USD SA	2	Coincident or lagging.
Net trade franc SA	2	Coincident or lagging.
Exports FOB incl gold sa	2	Mainly lagging, potentially good in the end of the period.
Imports FOB incl gold sa	2	Mainly lagging.
Production of passenger cars	2	Very uneven lead ranging from long lead to coincident to lagging.
Hourly rates industry sa	2	A lot of missing cycles, long lead in the end.
Retail sales total value sa	1	Lagging since 1980.
Consumption of ind. products vol sa	2	Very uneven lead ranging from long lead to coincident to lagging.
Construction dwelling started	2	Lagging or coincident.
Building permits res sa	1	Very uneven lead, lagging and coincident at times.
CPI all goods excl food	1	Eneven lead, missing cycles.
CPI all items	1	Uneven lead.
CPI fuel and electricity	1	Uneven lead.
PPI energy and fuel sa	1	Uneven lead.

In the 1985 publication the cross correlation between industrial production and the composite index was 0.81 at lag 7. Now the cross correlation between industrial production and the current composite index is 0.75, thus the performance has deteriorated only slightly. The biggest problem, however, in the LI for

France is its instability, as seen in the graph above. Several test composite indices with 6 - 13 component series were compiled for France. Based on these tests, the following minor modifications are proposed:

For the shorter leading indicator, two new series are to be added:
The *USA leading indicator* and *Consumer confidence indicator*.

For the Longer leading indicator: *Whole sale price index* and *money supply M3* should be dropped.

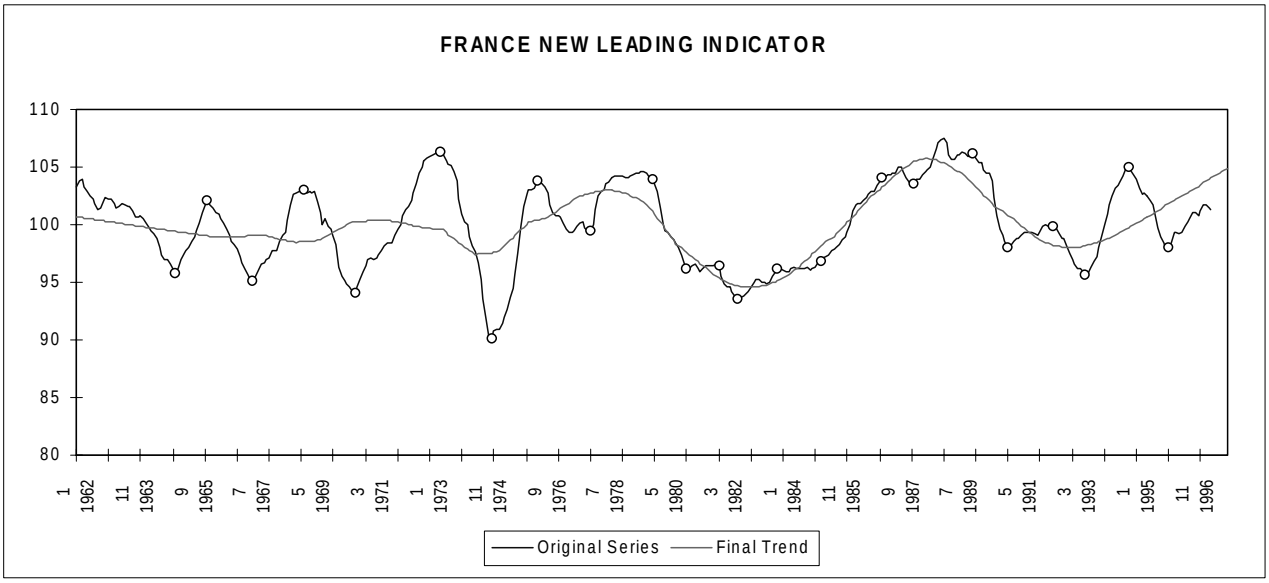
The cross correlation between industrial production and the new composite indicator is 0.78.

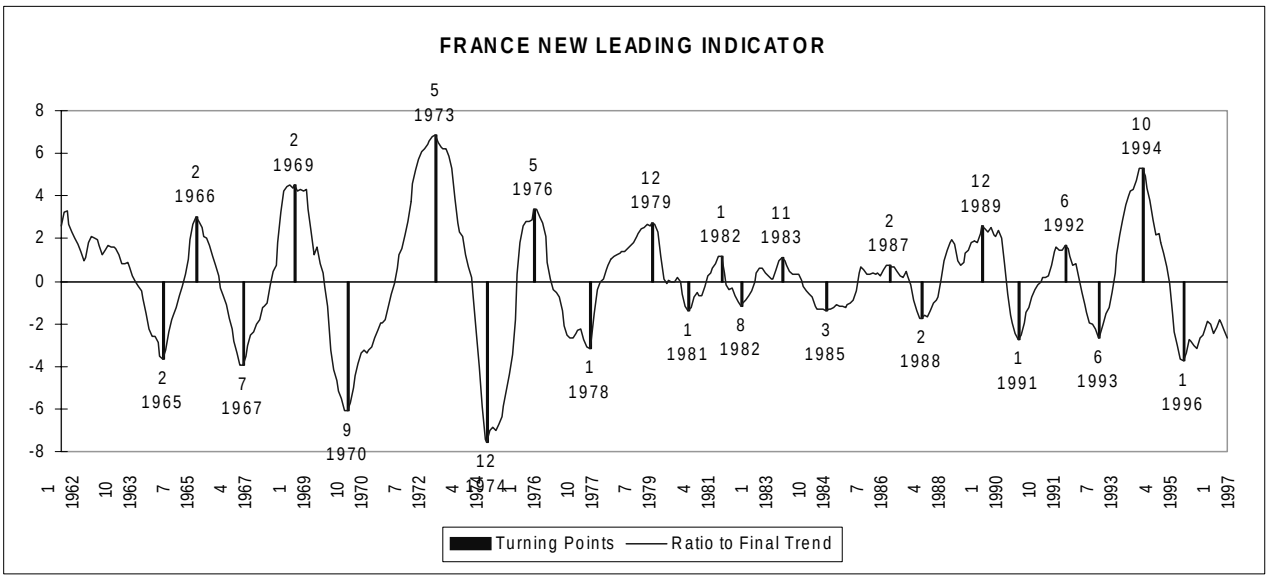
The new leading indicator for France is:

```
#FILE (STA05)OUTI/FRACOMP ON GLOBALPACK
100 SHORT
200 S91509S960000  8 3 1  40 1          FRA LEAD INDEX SHORTER
300 S9150335196AR 0 2                   FRA PRODUCTION:FUTURE TENDENCY
400 S9150332496AR 0 2 1                 FRA FIN GOODS STOCKS:LEVEL
500 S9150337196AR 0 2                   FRA PROSPECTS FOR IND SECTORS
600 S91503215968R 0 2                   FRA PASSENGER CARS REGISTERED
700 S91505641969R 0 2                   FRA SHARE PRICES
800 S91507730969R 0 2     68M6          FRA TERMS OF TRADE
900 S90203900296R 0 2                   USA LEADING INDICATOR
1000 S9150334000AR 0 2            FRA CONSUMER CONFIDENCE IND SA
1100 S91509L960000  3 3 1  40 1         FRA LEAD INDEX LONGER
1300 S91505601961R 0 2 1          FRA CALL MONEY RATE
1400 S91505602961R 0 2 1          FRA 3 MTH INTERBK BILLS
1500 S91505622196R 0 2 1          FRA BOND YIELDS ISS GDT BY GVT
1700 S91509A960000  2 3 1 100 1         FRA LEAD INDICATOR
1800 S91509L960000 0 2    6     3       FRA LEADING INDEX  LONGER
1900 S91509S960000 0 2          8 FRA LEADING INDEX  SHORTER
```

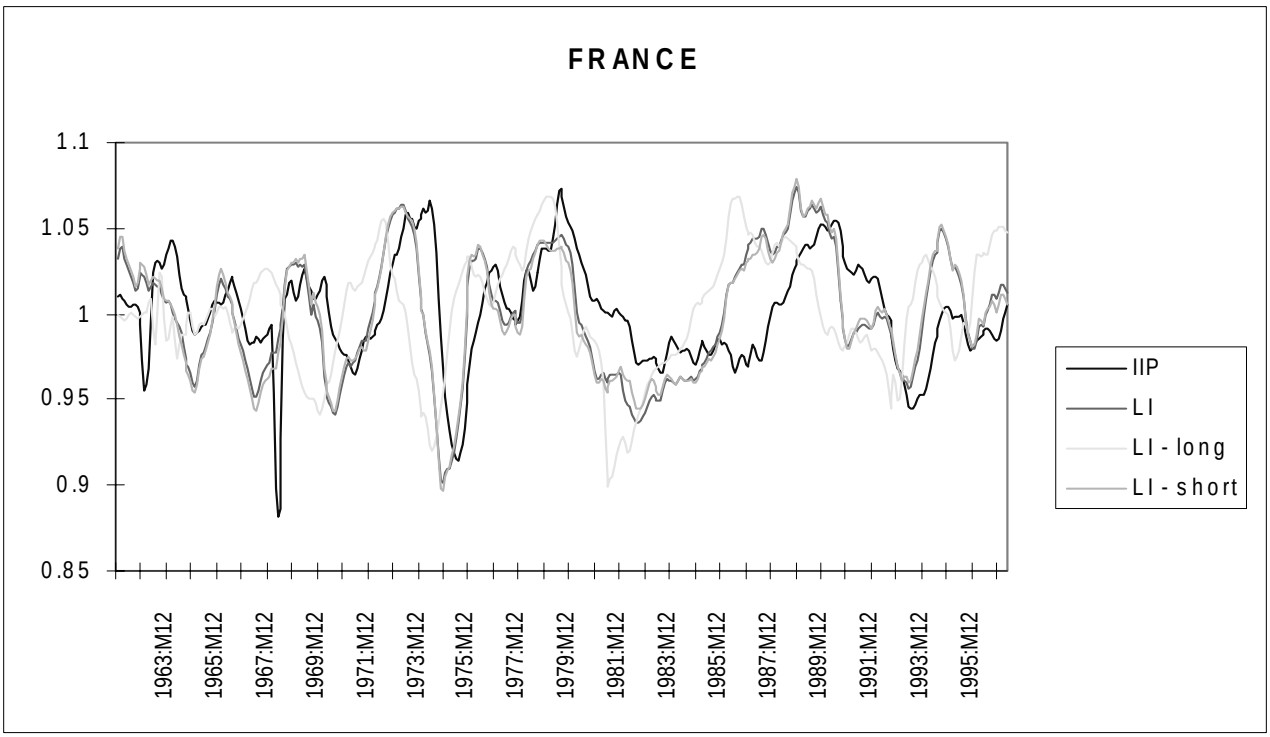
		Missing/ extra cycles compared to all cycles in IP	Missing/ extra cycles compared to MAJOR cycles in IP	Mean lead/ lag at all T.P.s	Mean lead/ lag at peaks	Mean lead/ lag at troughs
NEW LEADING INDICATOR			1 (minor) x	6.2	8.3	4.3
BSS: Production future tendency		2 x	3 (minor) x, 2 x	3.6	6.0	1.3
BSS: Finished goods stocks: level	counter cyclic	1 x	2 (minor) x, 1 x	-1.0	2.7	-4.1
New cars			3 (minor) x	1.5	4.2	-1.0
BSS: Prospects for industry		3 x	3 (minor) x, 3 x	3.2	5.1	1.5
BSS: Consumer confidence ind		1 x	1 x	4.5	6.0	3.0
Share prices (industrials)		3 x, 1 (minor) m	2 (minor) x, 3 x	7.3	10.1	4.5
Terms of trade		3 x, 1m	3 (minor) x, 3 x, 1m	-2.1	-0.9	-3.3
USA Composite LI				10.1	11.8	8.6
Call money rate	counter cyclic	2 x	3 (minor) x, 2 x	10.4	11.2	9.7
3-month interbank loans	counter cyclic	3 x	2 (minor) x, 3 x	12.4	14.8	10.0
Bond yield	counter cyclic	2 x, 2 (minor) m	1 (minor) x, 2 x	10.5	9.6	11.3

	Median lead/ lag at all T.P.s	Median lead/ lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	No. of turning points	Average deviation from median	Ratio: Median lead/ average deviation from median	Cross-correlation Lag	Coeff.
NEW LEADING INDICATOR	5.0	5.5	5.0	6.0	4.2	13	3.9	1.3	6-8	0.75
BSS: Production future tendency	3.5	6.0	2.0	7.0	4.9	16	4.9	0.7	6-7	0.7
BSS: Finished goods stocks: level	-1.0	0.0	-1.0	10.1	5.2	13	5.2	-0.2	3-4	-0.61
New cars	2.0	3.0	0.0	11.2	8.1	19	8.1	0.2	1	0.44
BSS: Prospects for industry	3.0	5.0	1.0	7.1	5.3	15	5.3	0.6	6-8	0.54
BSS: Consumer confidence ind	4.5	6.0	3.0	2.1	1.5	2	1.5	3.0	3	0.6
Share prices (industrials)	7.0	10.5	6.5	8.2	5.6	16	5.6	1.3	6-8	0.34
Terms of trade	0.0	1.0	-1.0	12.6	9.8	18	9.7	0.0	13	0.56
USA Composite LI	7.0	6.5	7.0	9.9	7.4	17	6.2	1.1	8-9	0.44
Call money rate	11.0	15.0	10.5	11.8	7.7	19	7.6	1.4	14-15	-0.5
3-month interbank loans	10.5	11.0	10.0	6.6	5.0	10	4.6	2.3	14-15	-0.69
Bond yield	10.0	10.0	10.0	9.2	6.9	15	6.9	1.5	13-15	-0.5





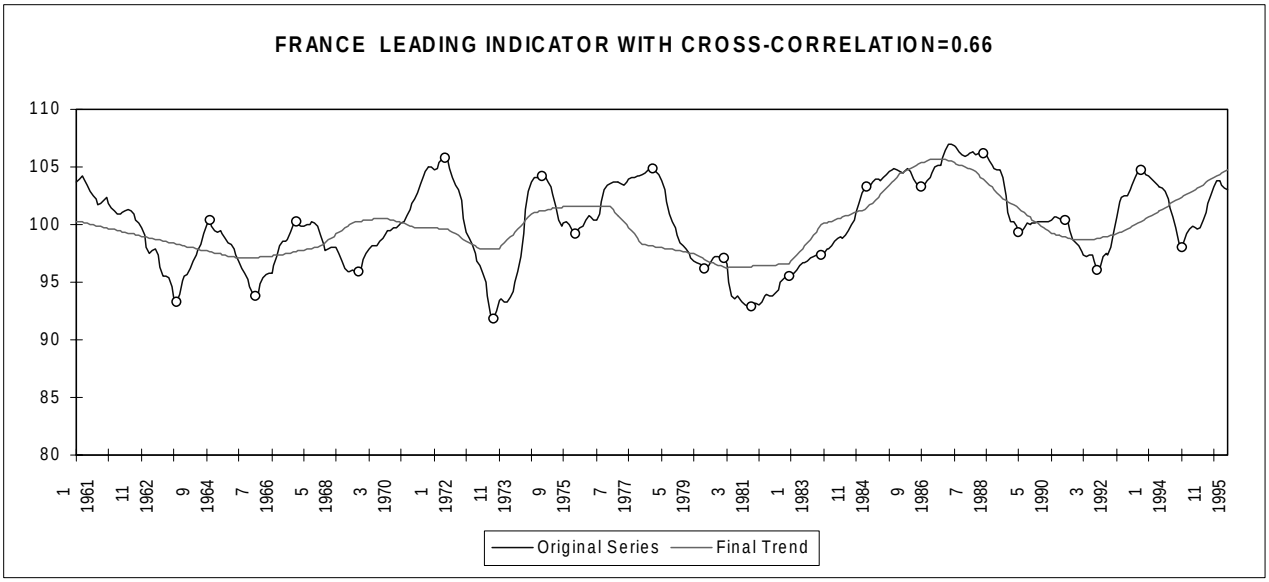
The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:

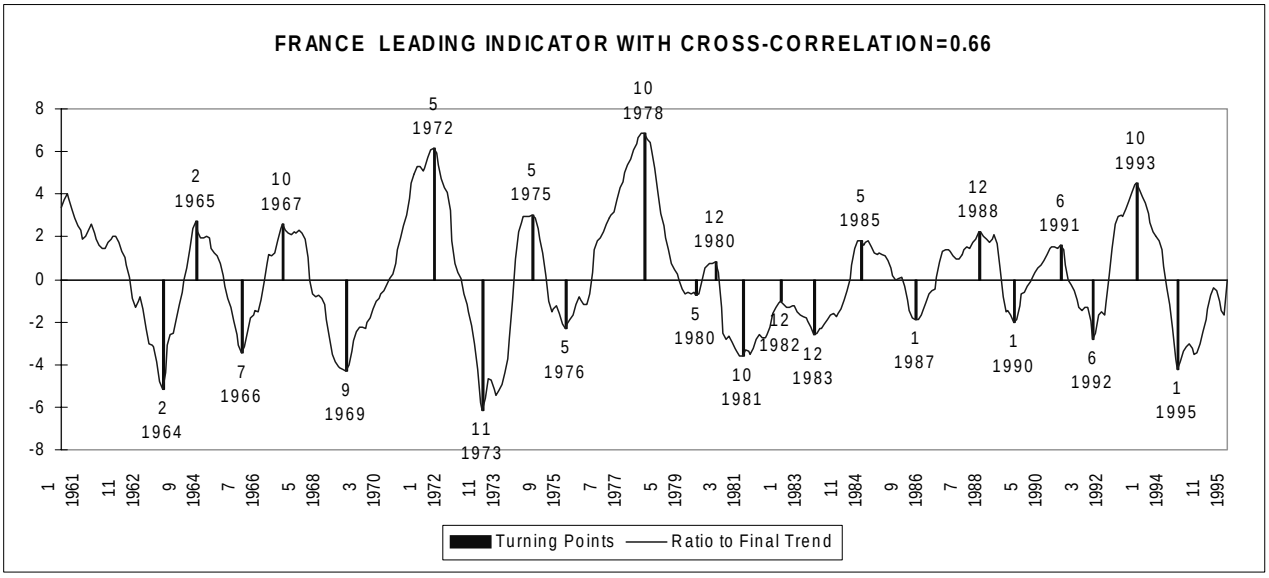


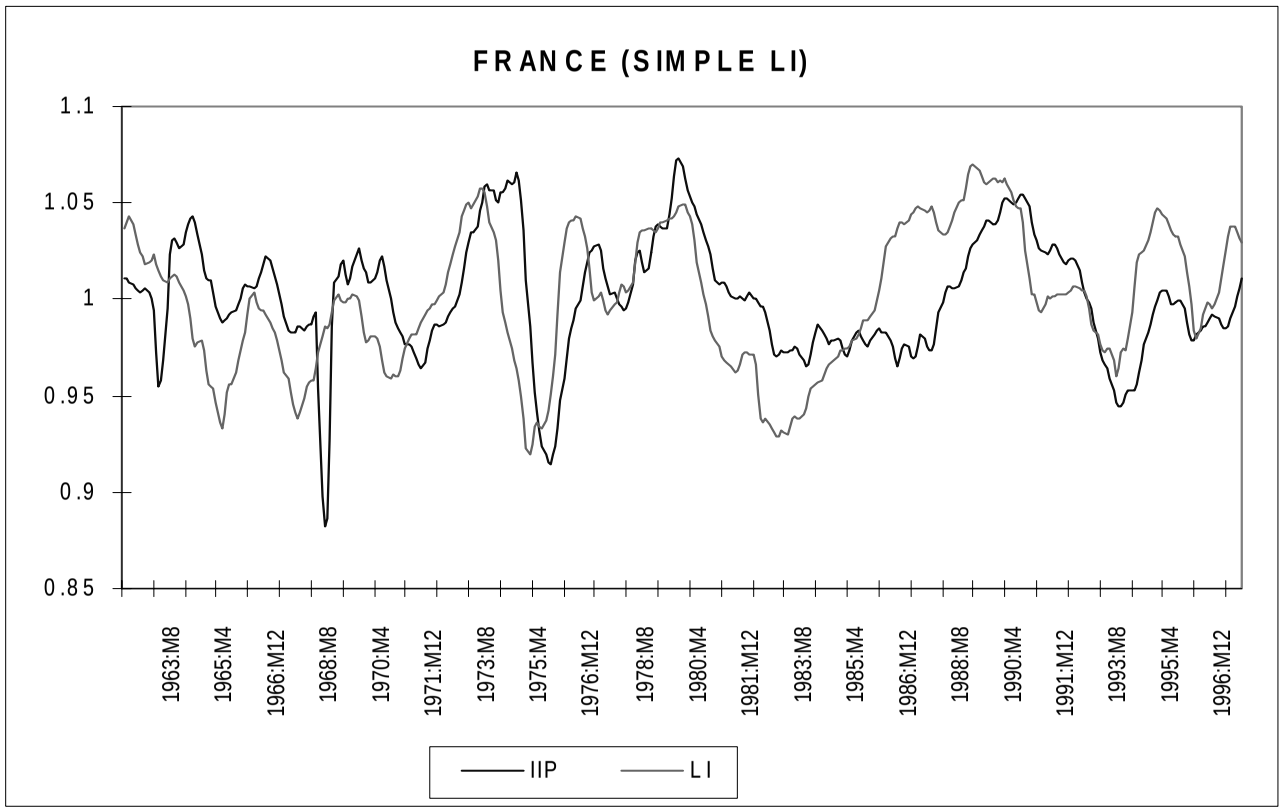
A second, considerably simpler indicator was also compiled for France. This indicator has only seven components, which are:

```
00000100SHORT
00000200S91509A960000  7 3 1  40 1   FRA LEADING INDICATOR
00000300S9150335196AR 0 2             FRA PRODUCTION:FUTURE TENDENCY
00000400S9150337196AR 0 2             FRA PROSPECTS FOR IND SECTORS
00000500S91505641969R 0 2            FRA SHARE PRICES
00000600S91507730969R 0 2    68M6     FRA TERMS OF TRADE
00000700S9150334000AR 0 2             FRA CONSUMER CONFIDENCE IND SA
00000800S91505602961R 0 2 1  9         FRA 3 MTH INTERBK BILLS
00000900S91505601961R 0 2 1  9         FRA CALL MONEY RATE
```

The cross-correlation between the reference series and the leading indicator is 0.66 at lags 7 - 9.






FRANCE (SIMPLE LI)
1.1
1.05
1
0.95
0.9
0.85
1963:M8
1965:M4
1966:M12
1968:M8
1970:M4
1971:M12
1973:M8
1975:M4
1976:M12
1978:M8
1980:M4
1981:M12
1983:M8
1985:M4
1986:M12
1988:M8
1990:M4
1991:M12
1993:M8
1995:M4
1996:M12
IIP
LI

ITALY

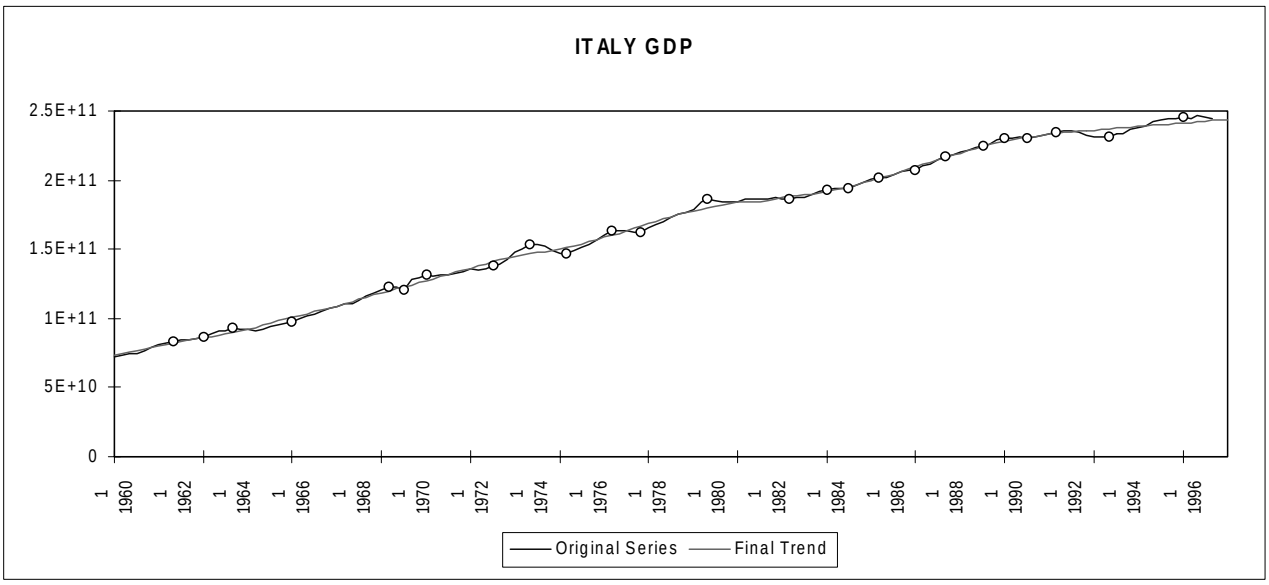
Until 1983 the amplitude of the cycles in Italy clearly exceeds the OECD average. The seventies, in particular, was a period of great cyclical fluctuations. In the 1960s, the Italian cycle ran almost completely counter to the typical European pattern. The European recessions of 1960-1963 and 1966-1967 were expansion periods in Italy, where a significant recession occurred in the end of 1964 and beginning of 1965. From 1970s onwards the cyclical pattern resembles that of other EU Countries, but there seems to be a lag: turnings points occur in Italy a few months later than in other countries. The cycles in the 1980s are not very pronounced: the amplitudes of the troughs in 1983 and 1986 are clearly below that of the subcycle in 1978 and the peak in 8/84 is scarcely visible. The recession following the peak in 12/89 is interrupted by a subcycle in 1991 - 92 both in industrial production and GDP; this cycle is probably caused by the short-lived optimism following the end of the Gulf War. The trough in 12/93 is followed by a peak in 12/95, which is also the last turning point confirmed by the GDP data.

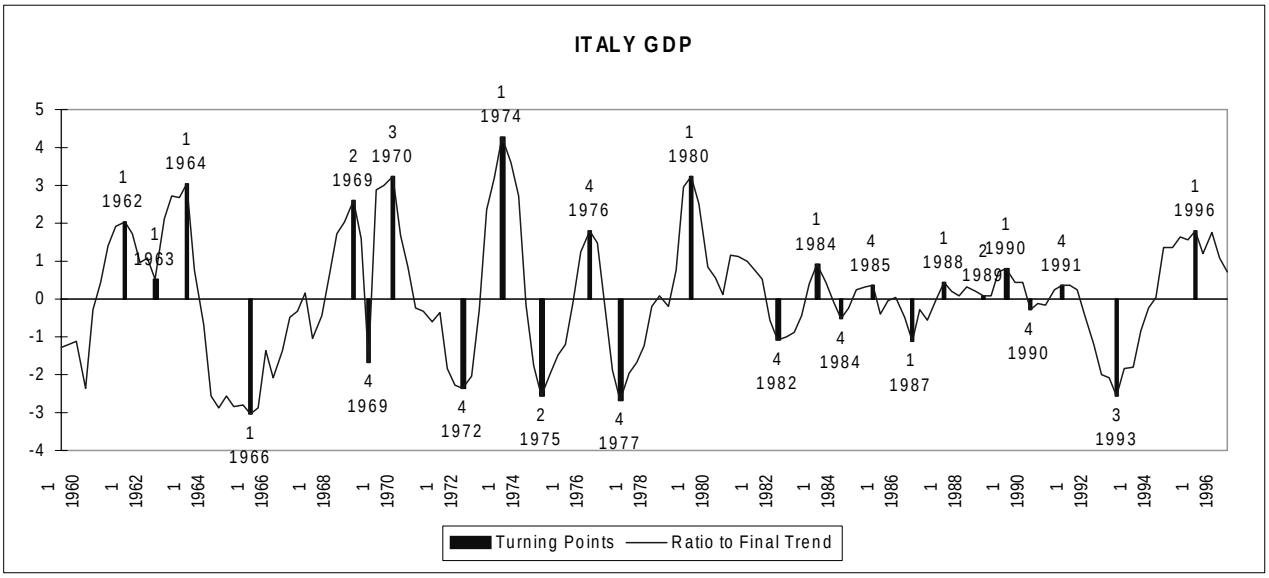
The cyclical characteristics of the reference series are presented in the table below:

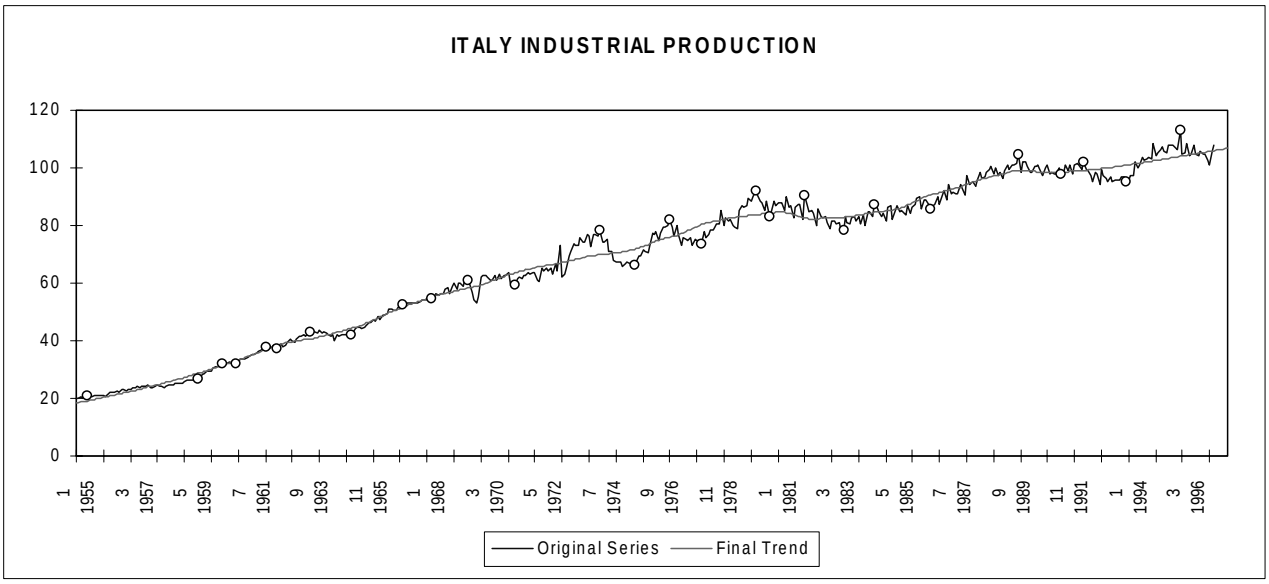
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
				7/59	-7.37
			(6/60)		2.13
				(12/60)	2.00
			(1/62)		2.14
				(6/62)	-2.73
1/64		3.03	9/63		6.31
	1/66	-3.05		3/65	-4.92
2/69		2.61	(2/67)		2.28
	4/69	-1.68		(3/68)	-1.07
3/70		3.23	7/69		5.00
	4/72	-2.37		4/71	-6.85
1/74		4.28	6/74		12.43
	2/75	-2.55		9/75	-7.86
(4/76)		1.81	(1/77)		8.20
	(4/77)	-2.68		(3/78)	-8.19
1/80		3.25	3/80		10.25
				(9/80)	-1.22
			(1/82)		9.47
	4/82	-1.06		6/83	-5.42
1/84		0.94	(8/84)		3.21
	4/84	-0.50			
4/85		0.37			
	1/87	-1.12		(9/86)	-5.26
1/90		0.45	12/89		5.59
	4/90	-0.27		(7/91)	-0.72
4/91		0.38	(5/92)		2.85
	3/93	-2.54		12/93	-5.50
1/96		1.82	12/95		8.72

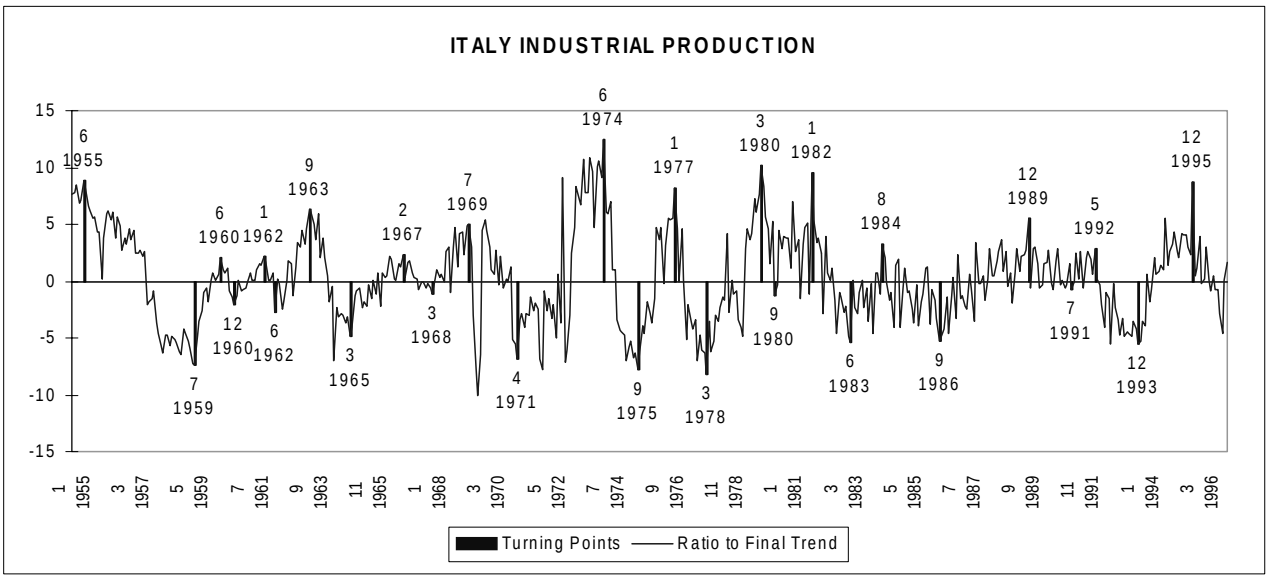
The OECD LI & BC lists 7 component series which are still used to calculate the composite index.

In the OECD LI & BC the last turning point in the reference series is 83M06 (trough). The chronology above is in line with the ISCO chronology.


ITALY GDP
2.5E+11
2E+11
1.5E+11
1E+11
5E+10
0
Original Series
Final Trend


ITALY GDP
Turning Points
Ratio to Final Trend


ITALY INDUSTRIAL PRODUCTION
120
100
80
60
40
20
0
Original Series
Final Trend



The following 34 series from the MEI database were tested as possible component series (component series in the current indicator are circled):

New orders	Finished goods stocks	Production: future tendency
Order books/demand: level	M1 + quasi money	Yield of long term govt bonds
Terms of trade	Passenger car registrations	BSS Consumer confidence
BSS Production level	BSS Export orderbooks/demand: level	BSS orderbooks demand:fut tend
BSS selling prices: fut tend	BSS prospects total economy	Monthly hours of work
Hourly rates industry	PPI total	PPI metals
official discount rate	interbank deposits	6-month treasury bills
3-month treasury bills	total credit to private sector	total domestic credit
Share prices	Construction cost index	ISCO LI
ISCO LI cumulative	Bankruptcies	M1
Net foreign position, all banks	Net new bond issues	Official reserves including IMF
Bond yields		

The compilation of new leading indicator for Italy posed no particular problems. There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

Business survey series were very good as leading indicators, but the performance of many financial series seemed rather erratic towards the end. The performance of the tested series is presented below:

	Delay in release	Comments
BSS New orders	1	Good indicator.
BSS Finished goods stocks, level	1	Good indicator in the beginning of the period, very short lead in the eighties, long lead in the nineties.
BSS Production: future tendency	1	Good indicator, longish lead in the nineties.
BSS Order books/demand: level	1	Good indicator.
M1 + quasi money	3	Average performance until 1980, after that poor performance.
Yield of long term govt bonds	1	Long lead in the beginning, erratic towards the end.
Terms of trade	5	Long lead in the beginning, erratic towards the end.
Passenger car registrations	1	An average lead in the beginning, no lead in the end.
BSS Consumer confidence	1	Longish lead in the beginning, good indicator in the end.
BSS Production level	1	Fairly good indicator.
BSS Export orderbooks demand: level	1	Good indicator.
BSS orderbooks demand:fut tend	1	Good indicator.
BSS selling prices: fut tend	1	Somewhat uneven lead, but otherwise good.
BSS prospects total economy	1	Uneven lead.
Monthly hours of work	6	Cycles missing, somewhat uneven lead.
Hourly rates industry	1	No matching cycles in the nineties.
PPI total	2	No matching cycles.
PPI metals	2	No matching cycles.
official discount rate	1	Quite long, but consistent lead.
interbank deposits	1	Long lead.
6-month treasury bills	1	Lond lead
3-month treasury bills	1	Long lead, otherwise a good indicator.
total credit to private sector	2	No matching cycles.
total domestic credit	2	No matching cycles.
Share prices	1	Very long and inconsistent lead.
Construction cost index	3	No matching cycles.
ISCO LI	2	Longish and uneven lead.
ISCO LI cumulative	2	Longish and uneven lead.
Bankruptcies	4	Short lead in the beginning, no cycles in the end.
M1	1	Uneven lead.
Net foreign position, all banks	3	Uneven lead.
Net new bond issues	1	Very long and uneven lead.
Official reserves including IMF	1	Uneven lead.
Bond yields	1	Long and uneven lead.

Correlation between the reference series and composite indicator is 0.79 at lags 6 and 7. In the 1987 publication the correlation was 0.75 at lag 6.

The current leading indicator has the following components:

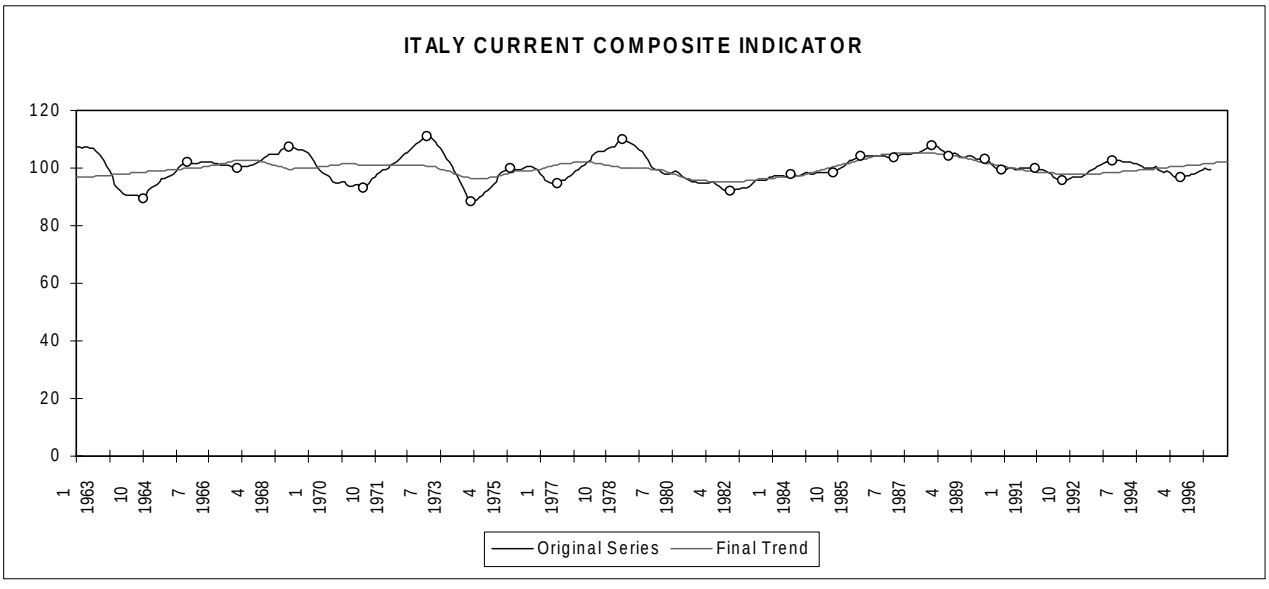
```
200 S92009A000000  7 3 1  40 1          ITA LEADING INDEX
300 S9200305000DR 0 2                   ITA NEW ORDERS TOTAL DEFL CPI
400 S9200332490AR 0 2 1                 ITA FIN GOODS STOCKS:LEVEL
500 S9200332590AR 0 2     63M1          ITA ORDER BOOKS/DEMAND:LEVEL
600 S9200335190AR 0 2     63M1          ITA PRODUCTION:FUTURE TENDENCY
700 S9200530535DR 0 2                   ITA M1+ QUASI MONEY DEFL CPI
800 S92005620001R 0 2 1                 ITA YIELD LONG TERM GOVT BONDS
900 S92007730009R 0 2     71M1          ITA TERMS OF TRADE
```

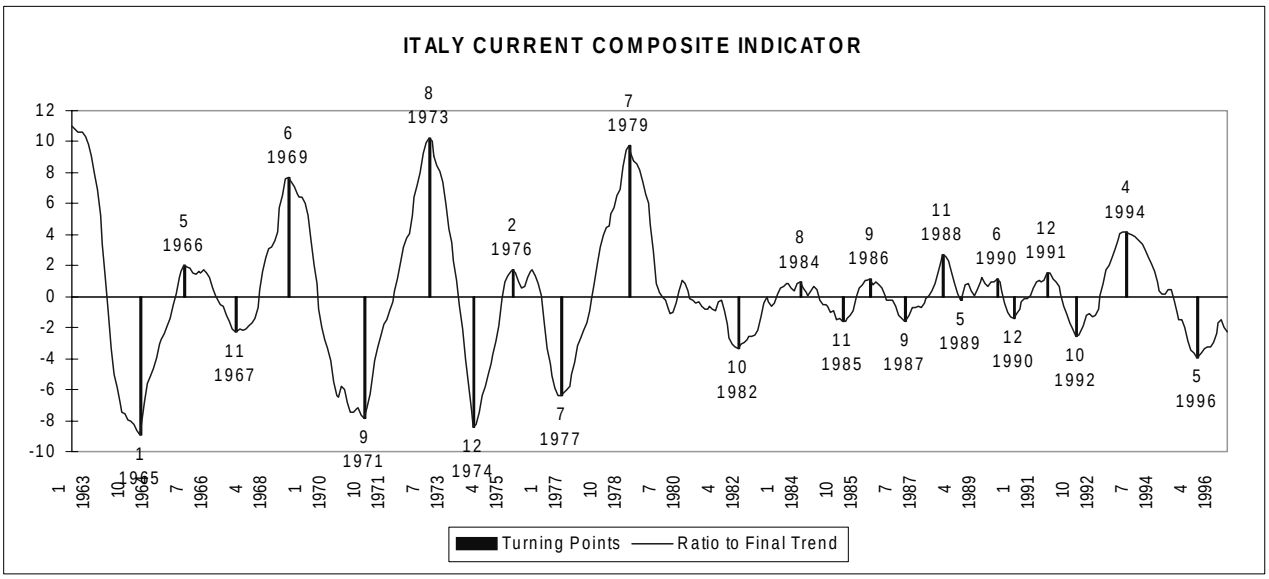
The performance of some of the financial series had deteriorated and consequently *Money supply* was dropped in the revision. The new indicator with six component series has the cross correlation of 0.76 at lags 6 and 7; and the components are:

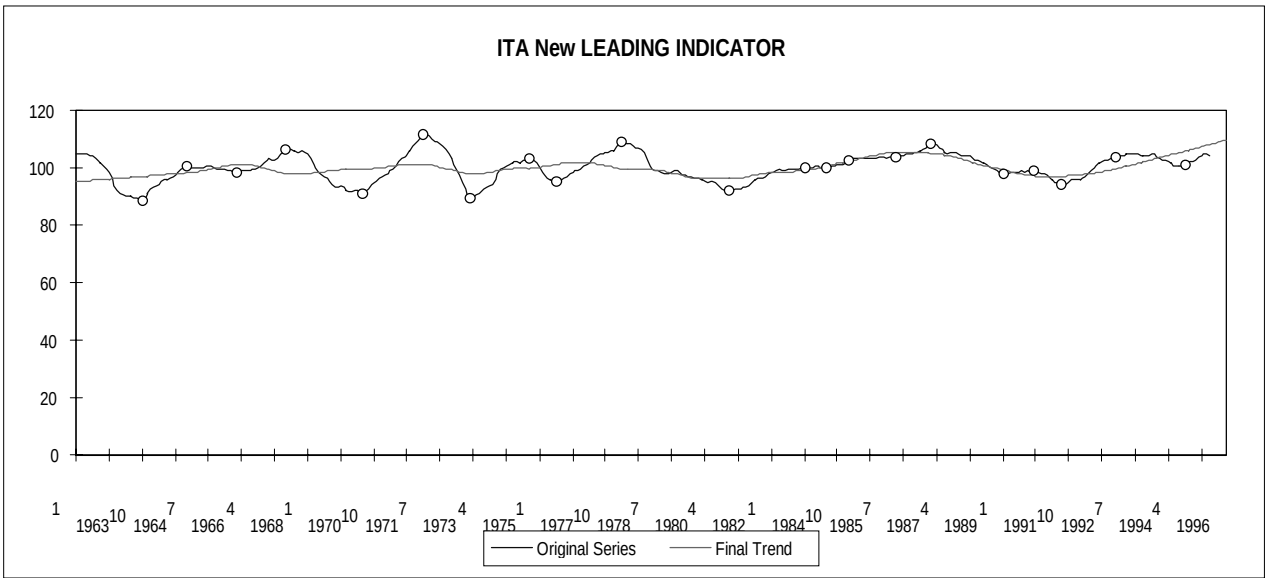
```
00000100SHORT
00000200S92009A960000  6 3 1  40 1      ITA LEADING INDEX
00000300S9200305096DR 0 2               ITA NEW ORDERS TOTAL DEFL CPI
00000400S9200334H00AR 0 2               ITA CONSUMER CONFIDENCE (EC)
00000500S9200335590AR 0 2    63M1       ITA ORDER BOOKS/DEMAND:FUT TEND
00000600S9200335196AR 0 2    63M1       ITA PRODUCTION:FUTURE TENDENCY
00000800S92005620961R 0 2 1             ITA YIELD LONG TERM GOVT BONDS
00000900S92007730969R 0 2    71M1       ITA TERMS OF TRADE
```

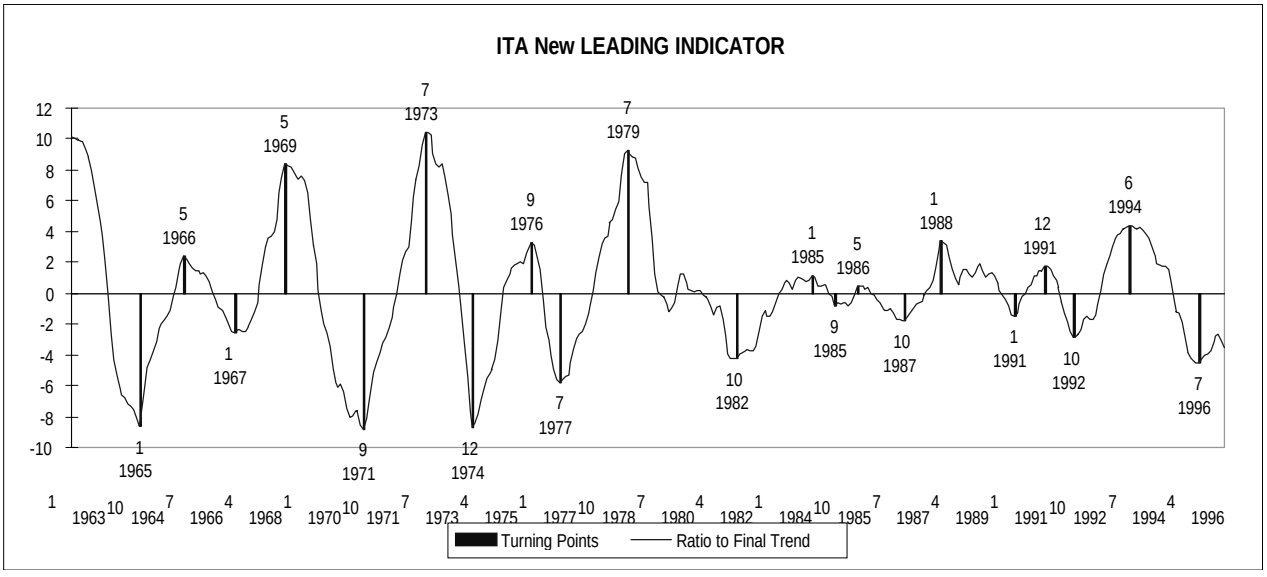
The diagnostics of the new leading indicator and its components are:

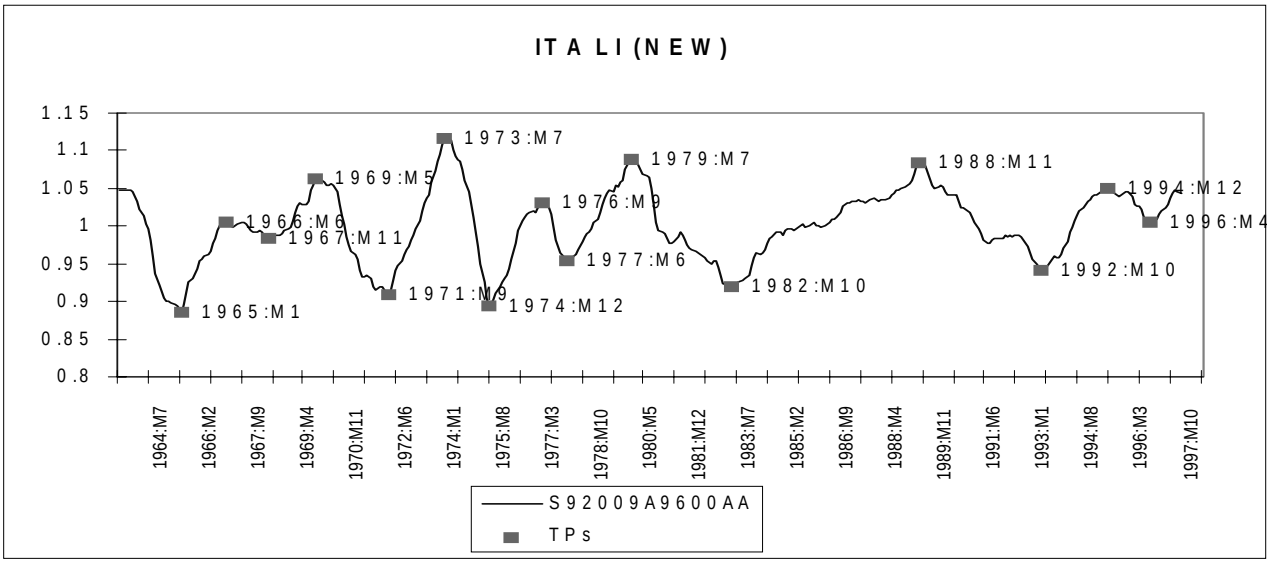
		Mean lead/lag at			Median lead/lag at							Cross correlation	
ITALY	Remarks, missing or extra cycles	All T.P.s	P	T	All T.P.s	P	T	Std dev	Ave dev from mean	No. of T.P.s	Ave dev from median	lag	coef.
New composite indicator	1(minor) x, 1 (minor) m	8.0	8.3	7.6	9.0	9.0	8.5	4.9	3.7	20	3.6	6, 7	0.76
New orders (stock)	1 x, 1 (minor) m	7.5	5.6	9.7	7.0	6.0	7.5	5.5	3.5	13	3.4	3, 4	0.43
Consumer confidence	2 x	7.9	6.7	9.0	8.5	12.0	8.0	6.8	5.2	14	5.1	8-10	0.64
BSS: Order books/demand: future tendency	1 x	7.8	8.4	7.1	9.0	11.0	7.5	5.9	4.8	20	4.7	6-8	0.62
BSS: Production: future tendency	1 x	6.2	4.8	7.5	7.5	7.0	8.0	6.3	5.0	20	4.9	3, 4	0.61
Terms of trade	1 x, 1 m, 2 (minor) m	12.4	12.1	12.7	14.5	11.0	16.0	12.5	9.5	20	9.3	14	0.58
Yield of long term govt bonds	Inverse, 1 x, 2 (minor) m	12.0	11.0	13.1	12.5	12.0	15.0	9.3	6.8	22	6.8	12	-0.53



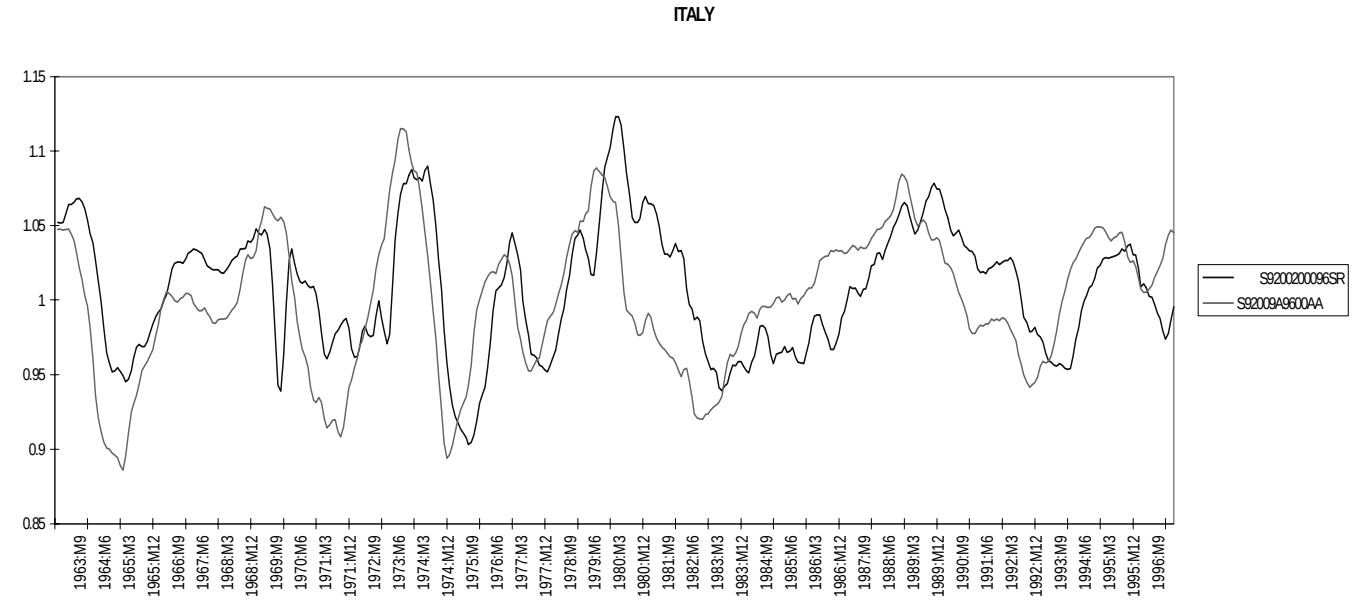

ITALY CURRENT COMPOSITE INDICATOR
Turning Points
Ratio to Final Trend


ITA New LEADING INDICATOR
Original Series
Final Trend


ITA New LEADING INDICATOR
Turning Points
Ratio to Final Trend



The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:



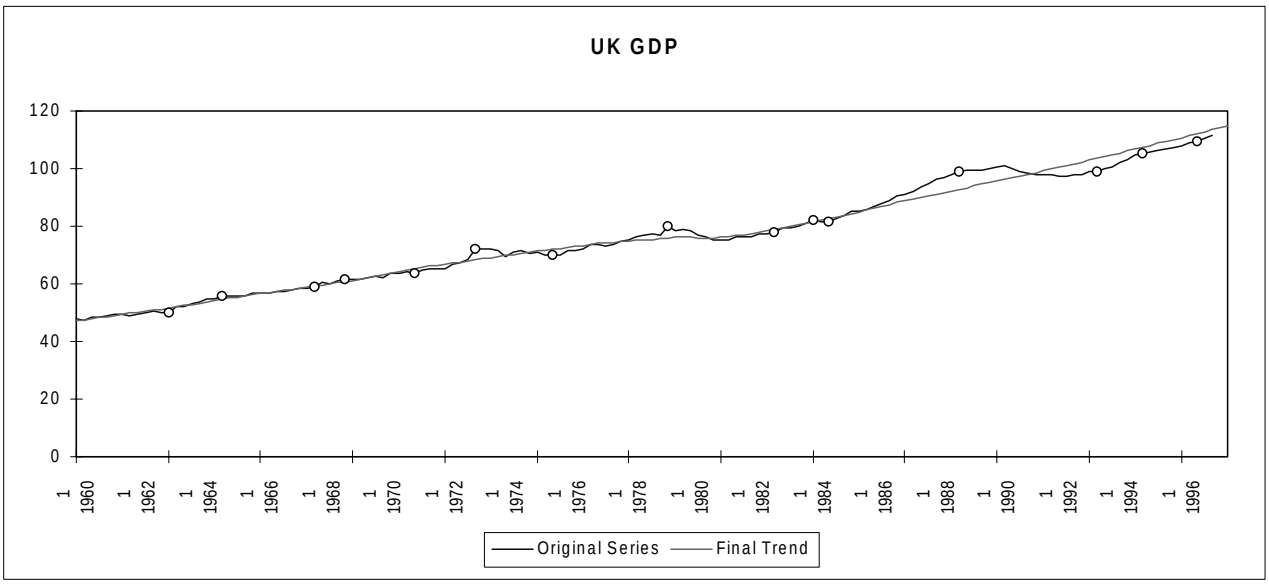
UK

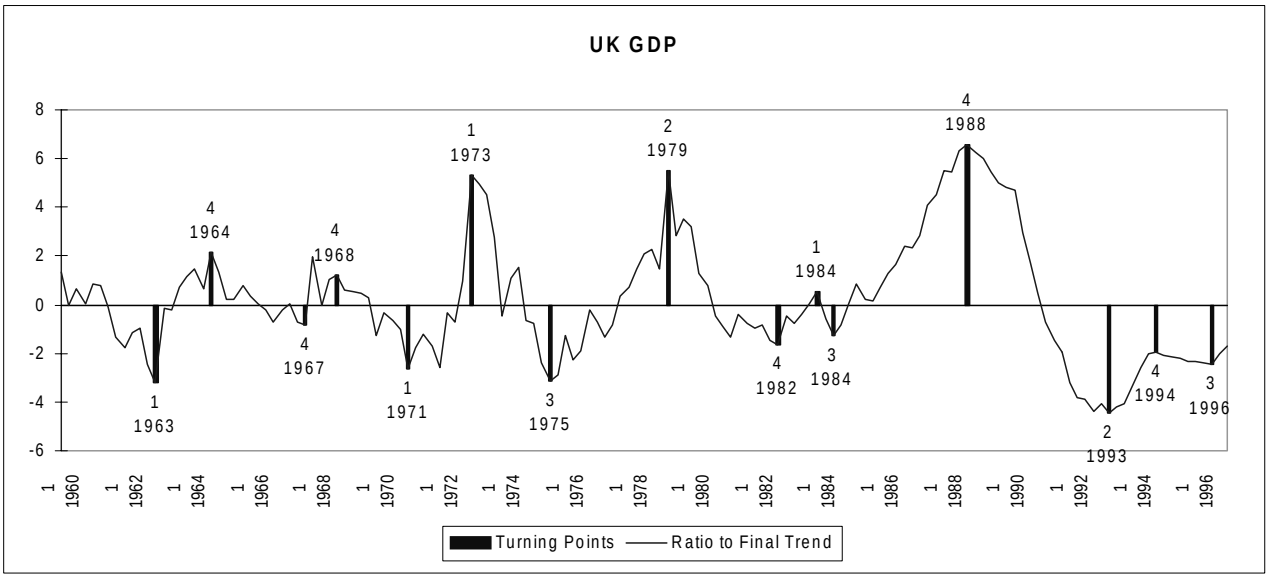
The major cycles in industrial production in the United Kingdom have conformed loosely to the general European pattern. Notable features are the absence of subcycles prior to 1980, the 1976 -77 subcycle, in particular, occurs in almost all other countries except the United Kingdom. Also the post-1979 recession bottoms-out very early (in mid-1981). Since then the expansion is slightly interrupted by a couple of small, short cycles with peaks occurring in 5/82. 1/84 and 6/85. Of these the subcycle is barely visible. The second cycle with peak in 1/84 and a trough in 8/84 occurs both in industrial production and GDP. The last subcycle in 1985 has a pronounced peak, but the trough is scarcely visible. The last major cycle in industrial production has a peak is 9/88 and a trough in 3/93.

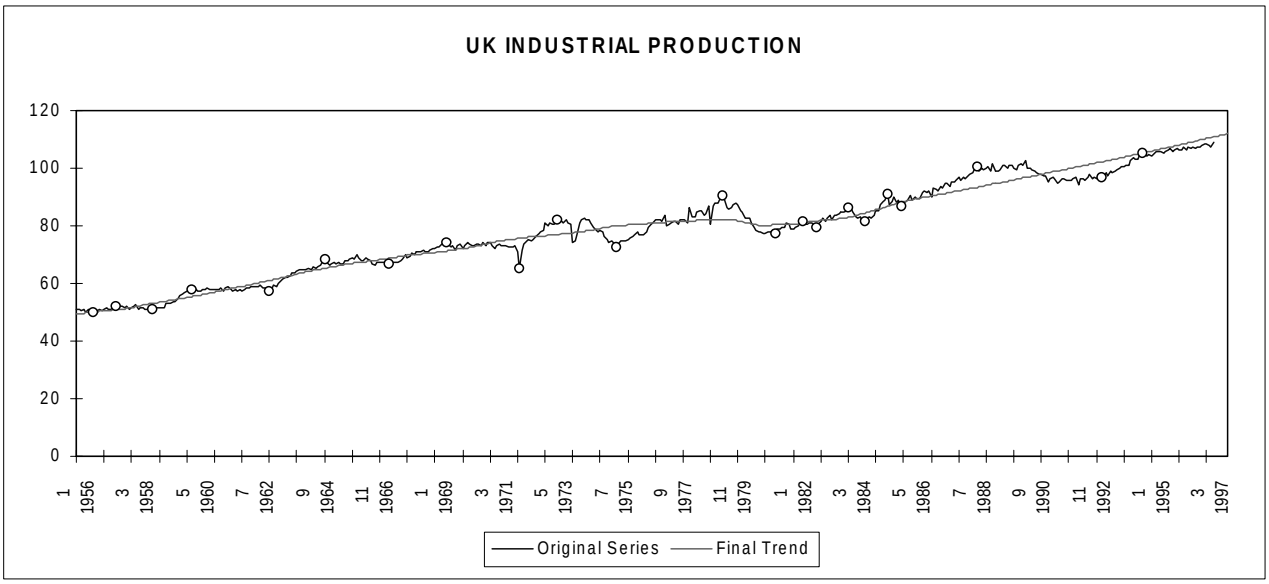
The cyclical characteristics of the reference series are presented in the table below:

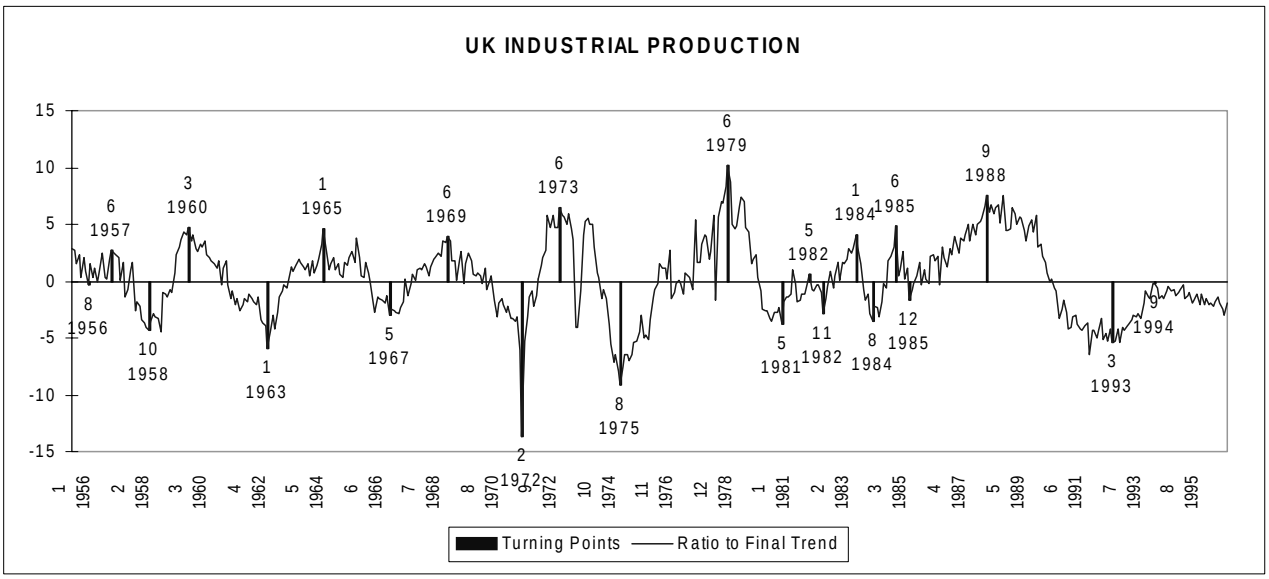
GDP			Industrial production		
Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point
				10/58	-4.34
			3/60		4.71
	1/63	-3.21		1/63	-5.88
4/64		2.15	1/65		4.57
	4/67	-0.81		5/67	-2.98
4/68		1.23	6/69		3.95
	1/71	-2.66		2/72	-13.62
1/73		5.35	6/73		6.49
	3/75	-3.13		8/75	-9.12
2/79		5.52	6/79		10.16
				5/81	-3.86
			(5/82)		0.65
	4/82	-1.66		(11/82)	-2.92
1/84		0.51	(1/84)		4.08
	3/84	-1.26		(8/84)	-3.47
			(1/85)		4.88
				(12/85)	-1.73
4/88		6.60	9/88		7.47
	2/93	-4.44		5/92	**-5.37**

In the OECD LI & BC the last turning point in the reference series is 81M05.


UK GDP
120
100
80
60
40
20
0
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Original Series
Final Trend


UK GDP
8
6
4
2
0
-2
-4
-6
1 1963
4 1964
4 1967
4 1968
1 1971
1 1973
3 1975
2 1979
4 1982
1 1984
3 1984
4 1988
2 1993
4 1994
3 1996
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Turning Points
Ratio to Final Trend


UK INDUSTRIAL PRODUCTION
120
100
80
60
40
20
0
1 1956
3 1958
5 1960
7 1962
9 1964
11 1966
1 1969
3 1971
5 1973
7 1975
9 1977
11 1979
1 1982
3 1984
5 1986
7 1988
9 1990
11 1992
1 1995
3 1997
Original Series
Final Trend



The OECD LI & BC lists 10 component series, of which *consumer credit extended* is no longer used to calculate the composite index. Two business survey series (*finished goods stocks: level* and *production: future tendency*) are used to calculate the composite index but they are not detrended.

The following nine components are used in the old composite index:

```
#FILE (STA05)CYP/GBRCOMP ON GLOBALPACK
100 SHORT
200 S92809A000000  9 3 1  40 3          U.K LEADING INDEX
300 S92805602001R 0 2 1       100       U.K TREASURY BILL RATE(91 DAYS)
400 S92805641009R 0 2         100  U.K FINANCIAL TIMES SHARE INDEX
500 S9280350452DR 4 2         100       U.K NET ACQUIS FIN ASSETS DEFL
600 S9280335190A3 0 2          75       U.K PRODUCTIN:FUTURE TENDENCY ADJ
700 S92803215008R 0 2    61M1 100       U.K NEW CARS REGISTERED
800 S9280350450DR 4 2         100       U.K GROSS TRADING PROFITS DEFL
900 S9280333590AR 0 2          75  U.K ORDER BOOKS/DEMAND:LEVEL ADJ
1000 S9280335494IR 0 2         75  U.K RAW MATERIALS STOCKS:FUTURE TENDENCY
1100 S9280333490A0 0 2 1       75       U.K FIN. GOODS STOCKS:LEVEL
```

In the 1985 publication the cross correlation between industrial production and the composite index was 0.75. Now the cross correlation between industrial production and the composite index is 0.73, thus no major deterioration has occurred.

The compilation of the new indicator for the United Kingdom posed no particular problems. There were no problems with data availability as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

Business survey series were especially good as leading indicators. The performance of the series tested is summarised in the table below:

	Delay in release	Comments
Financial Times share index	1	Somewhat uneven lead, but otherwise good.
Net acquisition of financial assets	1	Uneven lead.
New cars	1	Uneven lead.
New orders	2	Mostly coincident.
Gross trading profits	2	Uneven lead, lagging in the end.
Raw material stocks	2	Uneven lead.
Treasury bill rate	1	Uneven lead.
Con new orders total vol sa	2	Coincident since 1985.
Con new orders res vol sa	2	Uneven lead.
Con orders non-res sa	2	Lagging in the end.
Housing starts private sa	2	Lagging in the end.
Retail sales volume sa	1	Lagging in the end.
Sales engineering total vol sa	1	Mostly lagging.
Sales engineering dom vol sa	1	Mostly lagging.
Sales engineering export vol sa	1	Mostly lagging
New orders engineering tot vol sa	2	Very short lead in the beginning of the period; lagging in the end.
New orders engineering dom vol sa	2	Very short lead in the beginning; lagging in the end.
New orders engineering exp vol sa	2	Very uneven lead, lagging at times.
CPI all items	1	Uneven lead.
PPI mfg output all products	1	Uneven lead.
PPI mfg input raw materials	1	Very long lead in the end of the period.
PPI mfg output total excl food	1	Lagging at times, but otherwise good.
Whole sale prices/ basic metals	1	Very long lead in the end of the period.
Unit wage & salary cost mfg sa	2	Uneven lead, lagging at times.
Weekly hours of work mfg	2	Very uneven performance, lagging at times.
Unfilled vacancies	1	Coincident or lagging at times.
Ftr imports cif total sa	2	Lagging in the end.
Ftr exports fob total sa	2	Mostly lagging.
BOP trade balance sa	4	Uneven lead, lagging at times.
Currency in circulation	1	Mostly lagging.
Overnight interbank rate	1	Uneven lead.
3-month interbank loans	1	Uneven lead.
Prime bank bills (3 months)	1	Good.
Central govt bonds (20 yrs)	1	Uneven lead.
Yield of long-term govt bonds	1	Uneven lead.
10-year govt bonds	1	Uneven lead.
London clearing banks rate	1	Lagging at times.
BSS: Orders inflow: fut tend sa	1	Uneven lead, lagging at times.
BSS: Finished goods stocks: fut tend sa	1	Lagging at times.
BSS: Export deliveries: fut tend sa	1	Uneven lead.
BSS: Skilled labour bottleneck sa	1	Laggisng at times, especially in the end.
BSS: Employment future tend sa	1	Coincident or lagging at times.
BSS: Dom selling prices: fut tend sa	1	Very long lead in the end.
BSS: Business climate sa	1	Good.
BSS: Capacity bottleneck	1	Mostly lagging.
BSS: Prospects for exports 1 yr sa	1	Good.
BSS: Raw material bottlenecks	1	Lagging at times.
BSS: Orders inflow tend sa	1	Lagging at times.
BSS: Finished goods stocks tend sa	1	Good, but very long lead in the end (false signal).
BSS: cap ex(plnt&mach) fut tend sa	1	Good.
BSS: exp deliveries: tend sa	1	Good.
BSS: Employment tendency sa	1	Uneven lead, lagging at times.
BSS: Dom selling prices: tend sa	1	Uneven lead, lagging in the end.
Consumer confidence ind (EC) sa	1	Good, but very long lead in the end.
BSS: Finished goods stocks: level	1	Good, lagging in the beginnig though.
BSS: Production: future tend sa	1	Good.
BSS: Order books demand: level sa	1	Coincident at times.
BSS: Exp order books demand: level sa	1	Good.

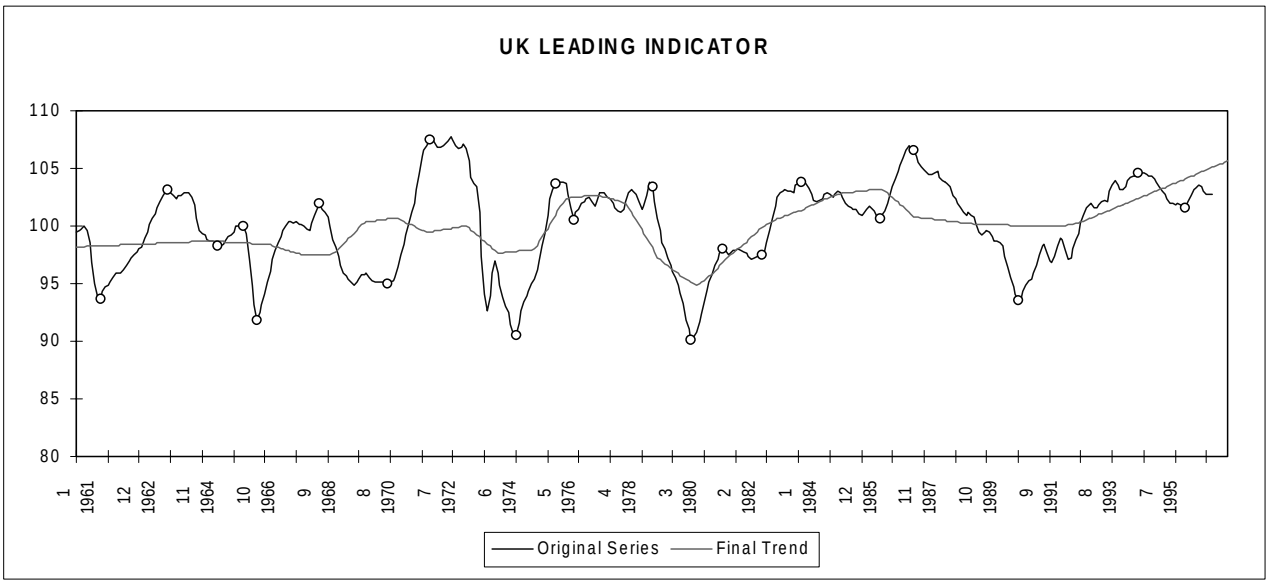
58 series from the MEI database were tested as potential component series. UK seems to be a special case in the sense that a number of potentially interesting series have either been discontinued or contain breaks. Thus they could not be tested. The performance of some of the series included in the current composite index is poor. Notably, the following two series were dropped: *Gross trading profits* and *Net acquisition of financial assets*. Two new series were included: *Prospects for exports (1 yr.)* and *Business climate*. In addition, *Treasury bill rate* was replaced with *Prime bank bill rate*. Thus the new leading indicator has the following component series:

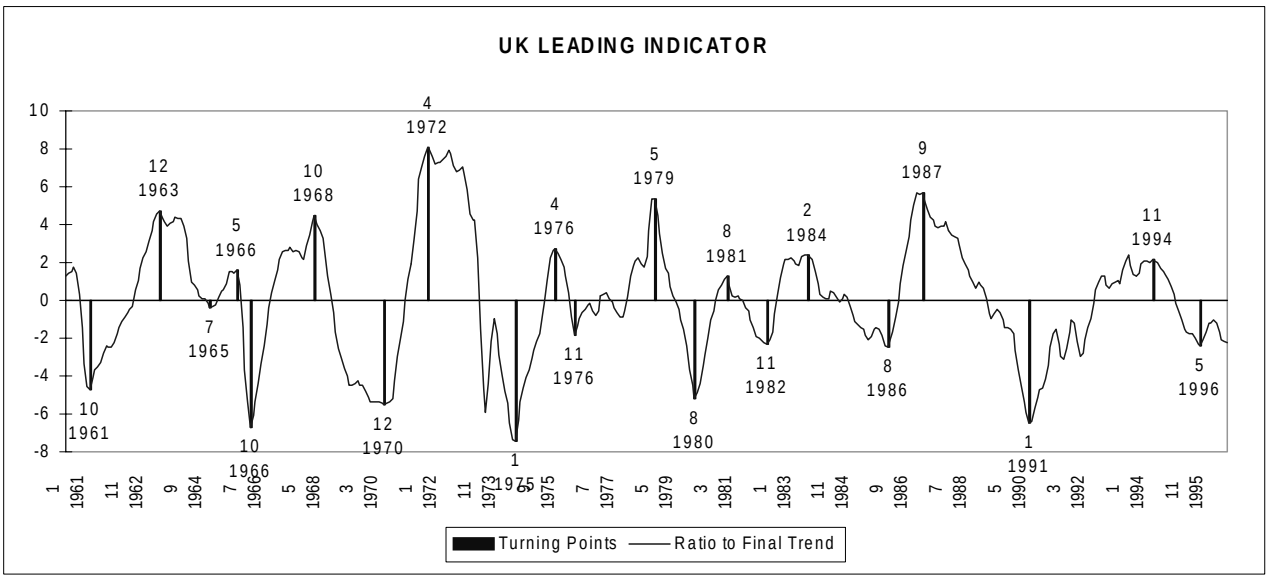
```
00000100SHORT
00000200S92809A960000    9   3   1    40   3    U.K  LEADING INDEX
00000300S92805603001R    0   2   1   100        U.K  PRIME BANK  BILLS (3  MONTHS)
00000400S92805641969R    0   2       100        U.K  FINANCIAL TIMES  SHARE   INDEX
00000500S9280335196AR    0   2       100        U.K  PRODUCTION:FUTURE  TENDENCY    ADJ
00000600S92803215968R    0   2   61M1    100    U.K  NEW CARS REGISTERED
00000700S9280333596AR    0   2       100        U.K  ORDER BOOKS/DEMAND:LEVEL  ADJ
00000800S9280335496IR    0   2       100        U.K  RAW  MATERIALS  STOCKS:FUTURE  TENDENC
00000900S9280333496AR    0   2   1   100        U.K  FIN.  GOODS STOCKS:LEVEL
00001000S9280332992AR    4   2       100        U.K  PROSPECTS FOR  EXPORTS     (1    YR)
00001100S9280333990AR    4   2       100        U.K  BUSINESS CLIMATE
```

	Remarks	Extra/ missing cycles compared to all cycles in IP	Extra/ missing cycles compared to major cycles in IP	Mean lead/lag at all T.P.s	Mean lead/lag at peaks	Mean lead/lag at troughs
NEW LEADING INDICATOR				8.2	7.8	8.6
Current LI			1 (minor) x	10.2	11.0	9.3
Current LI with updated TPs			1 (minor) x	10.7	12.0	9.3
Current LI, updated TPs, major cycles			1 (minor) x	10.2	11.0	9.3
Financial Times share index		5 x	5 x, 1 (minor) x	8.4	9.6	7.3
New cars		1 x	1 x, 1 (minor) x	8.2	6.1	10.3
Raw material stocks		1 x	1 x, 1 (minor) x	4.5	2.4	6.6
Prime bank bills (3 months)	counter cyclic	2 x	2 x, 1 (minor) x	15.7	12.1	18.9
BSS: Business climate sa		1 x	1 x, 1 (minor) x	6.0	6.5	5.5
BSS: Prospects for exports 1 yr sa		5 x	5 x, 1 (minor) x	11.4	9.3	13.0
BSS: Finished goods stocks: level	counter cyclic	3 x	3 x, 1 (minor) x	0.9	4.0	-1.5
BSS: Production: future tend sa		2 x	2 x, 1 (minor) x	4.7	2.7	6.7
BSS: Order books demand: level sa			1 (minor) x	1.7	0.0	3.3

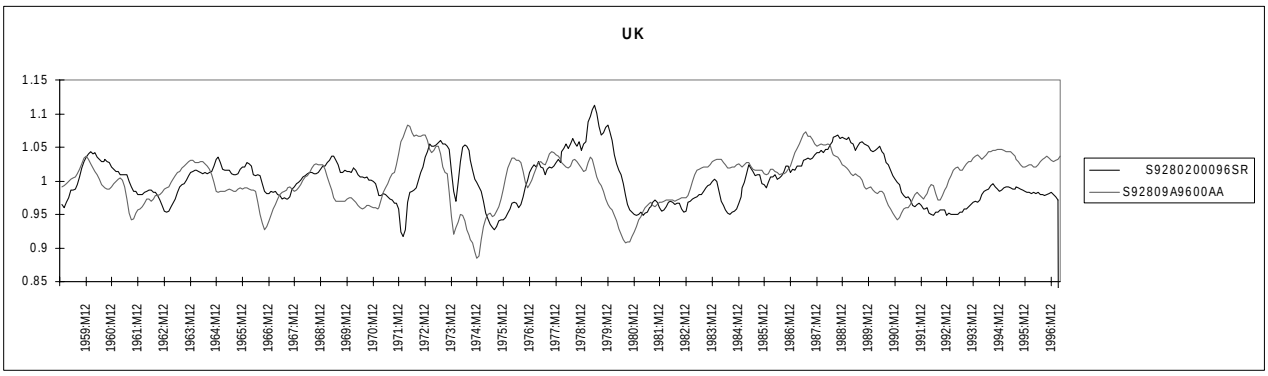
	Median lead/lag at all T.P.s	Median lead/lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	No. of turning points	Average deviation from median	Ratio: Median lead/ average deviation from median	Cross-correlation Lag	Coeff.
NEW LEADING INDICATOR	9.0	10.0	9.0	7.2	5.4	13	5.4	1.7	12	0.71
Current LI	10.5	13.5	8.0	6.8	5.7	12	5.7	1.9		
Current LI with updated TPs	10.5	13.5	8.0	6.1	5.2	12	5.2	2.0		
Current LI, updated TPs, major cycles	10.5	13.5	8.0	6.8	5.7	12	5.7	1.9		
Financial Times share index	7.5	8.5	7.5	7.7	5.8	16	5.7	1.3	10-11	0.57
New cars	6.0	4.0	9.0	10.3	7.8	14	7.6	0.8	7-8	0.52
Raw material stocks	5.5	2.0	7.0	6.8	5.1	14	5.1	1.1	9	0.56
Prime bank bills (3 months)	17.0	13.0	17.0	8.4	6.2	15	6.1	2.8	18-19	-0.55
BSS: Business climate sa	6.5	6.0	7.5	6.6	4.3	8	4.3	1.5	5	0.53

BSS: Prospects for exports 1 yr sa	9.0	8.0	13.5	6.7	5.3	7	5.0	1.8	5-6	0.29
BSS: Finished goods stocks: level	2.0	2.0	1.5	13.2	9.6	7	9.4	0.2	7	-0.72
BSS: Production: future tend sa	4.0	2.0	8.0	6.4	5.0	6	5.0	0.8	15-19	0.63
BSS: Order books demand: level sa	0.0	0.0	5.0	6.3	4.6	6	4.0	0.0	8	0.64





The ratio to trend of the new composite leading indicator and the reference series are presented in the figure below:


UK
1.15
1.1
1.05
1
0.95
0.9
0.85
1959:M12
1960:M12
1961:M12
1962:M12
1963:M12
1964:M12
1965:M12
1966:M12
1967:M12
1968:M12
1969:M12
1970:M12
1971:M12
1972:M12
1973:M12
1974:M12
1975:M12
1976:M12
1977:M12
1978:M12
1979:M12
1980:M12
1981:M12
1982:M12
1983:M12
1984:M12
1985:M12
1986:M12
1987:M12
1988:M12
1989:M12
1990:M12
1991:M12
1992:M12
1993:M12
1994:M12
1995:M12
1996:M12
S9280200096SR
S92809A9600AA

BELGIUM

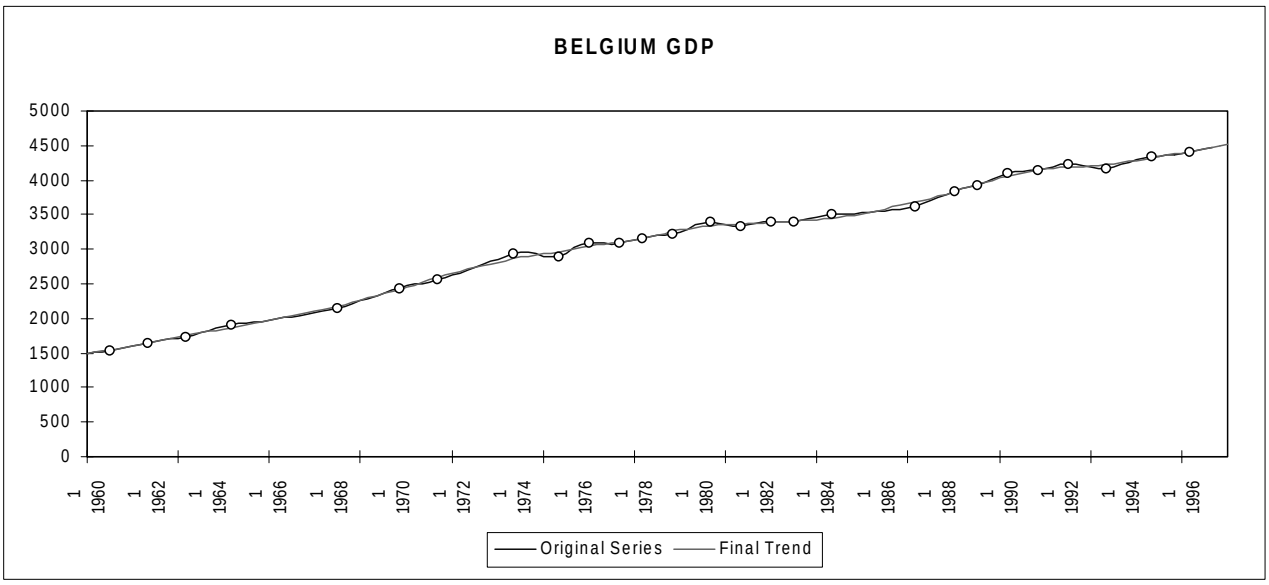
The cycle in Belgium conforms to the typical European pattern. The amplitudes have been around the average for European area, with the 1977 slowdown quite pronounced. The 1980-82 recession bottomed out at the end of 1980, but there was no significant upturn until two years later. The recovery following the 1982 trough is very weak and it is interrupted by a small cycle in 1985-87. It is only after the 1987 trough that the growth accelerates, there is a peak in early 1990 followed by a trough in mid-1993, which is the last turning point detected at present. A word of warning about the GDP series: there is no official quarterly GDP data in Belgium. The data presented here are Secretariat estimates based on annual GDP figures and a number of other series. It is used here for reference only and it is not published by the OECD in any form. Thus, no attention need to be given to the fact that the GDP seems to have some subcycles that are not present in the industrial production series. OECD publishes quarterly GDP data, however, in the MEI: this data is from the central bank of Belgium and the series starts in 1984. A graph showing the cycles of this other GDP series is presented below.

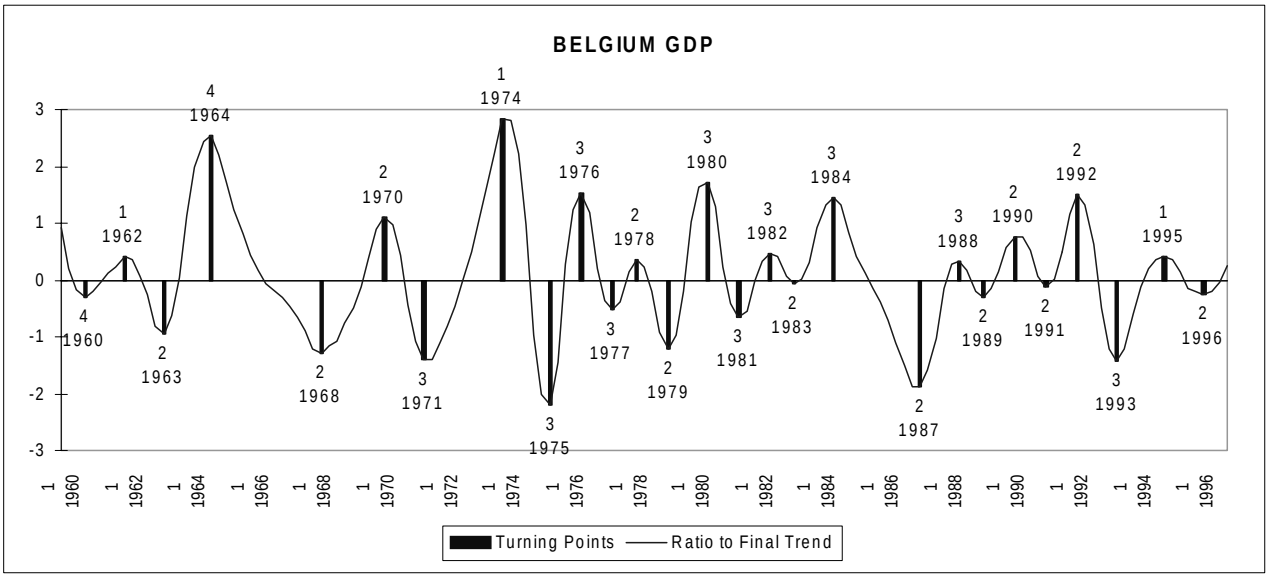
The cyclical characteristics of the reference series are presented in the table below:

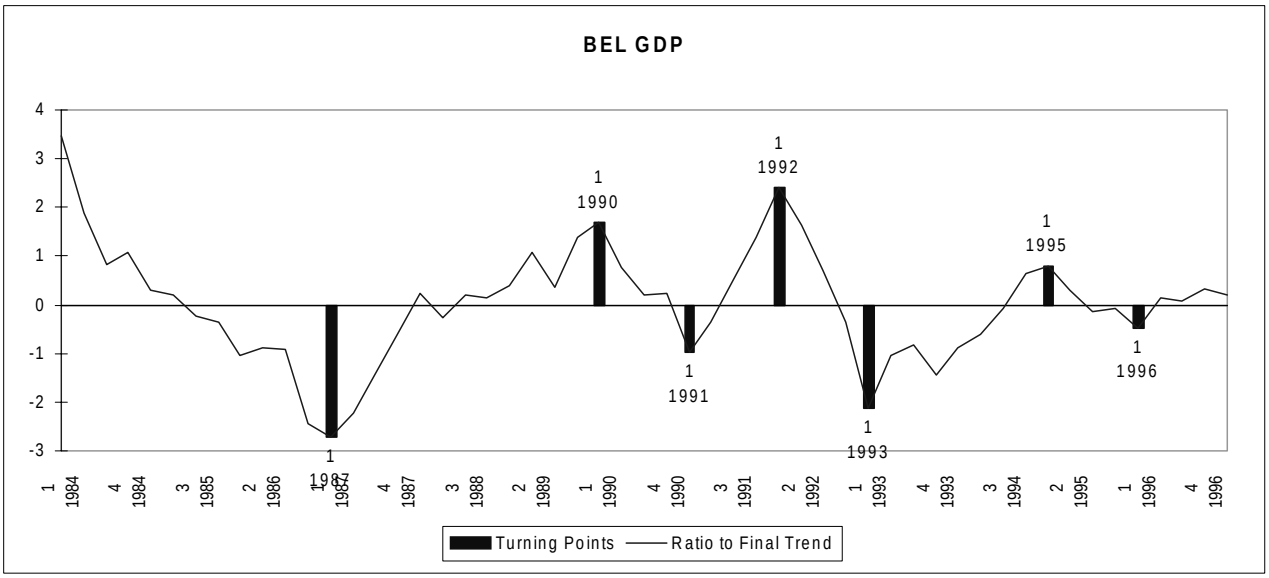
GDP			Industrial production WITHOUT CONSTRUCTION			Industrial production WITH CONSTRUCTION		
Turning point date		Ratio to trend	Turning point date		Ratio to trend	Turning point date		Ratio to trend
P	T	at turning point	P	T	at turning point	P	T	at turning point
			10/56		17.18			
				10/58	-8.34			
1/62		0.40	2/61		6.63			
	2/63	-0.94		1/63	-5.22			
4/64		2.55	7/64		8.57			
	2/68	-1.28		7/68	-6.65			
2/70		1.11	7/69		5.37	10/70		4.02
	3/71	-1.41		5/71	-10.76		7/72	-5.46
1/74		2.84	6/74		9.23	2/74		9.05
	3/75	-2.19		8/75	-7.31		8/75	-9.22
3/76		1.53	10/76		2.65	2/77		3.81
	2/79	-1.20		6/78	-4.67		2/78	-4.62
3/80		1.73	12/79		10.06	2/80		11.90
	3/81	-0.66		(12/80)	-3.18		(12/80)	-8.31
3/82		0.47	(12/81)		1.96	(2/82)		5.85
	2/83	-0.06		8/82	-4.11		7/83	-1.90
3/84		1.45	1/85		3.07	5/84		5.73
	2/87	-1.88		1/87	-5.70		1/87	-9.83
			3/90		10.72	(3/90)		9.34
							(2/91)	-9.14
2/92		1.50				5/92		5.53
	3/93	-1.42		5/93	-5.20		11/93	-8.89

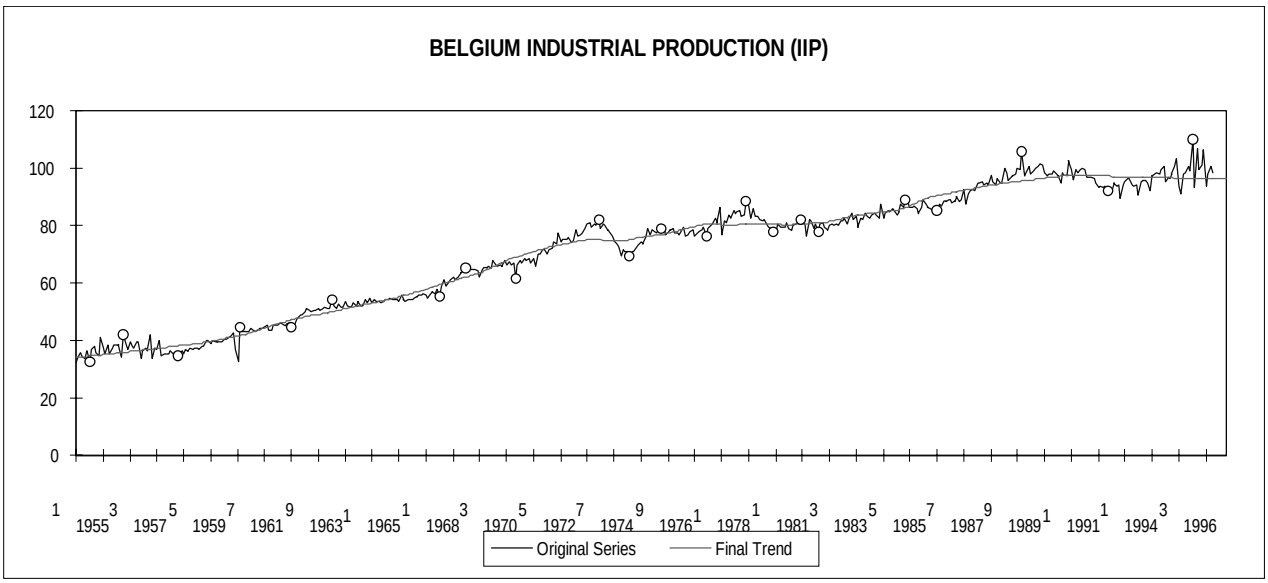
In the OECD LI & BC the last turning point in the reference series is 82M12. The chronology of the turning points in industrial production (IIP) was compared with those of the GDP and total industrial production including construction (IIPC). There is a cycle in GDP in 1991-1992 which is also found in the industrial production series that includes **construction**, but not in the industrial production series that excludes construction. At this stage it seems that that the cyclical pattern of GDP is closer to that of IIPC than the IIP. We compiled two indicators: one for IIP (1965 - 1997) and another for IIPC (1968 -1997).

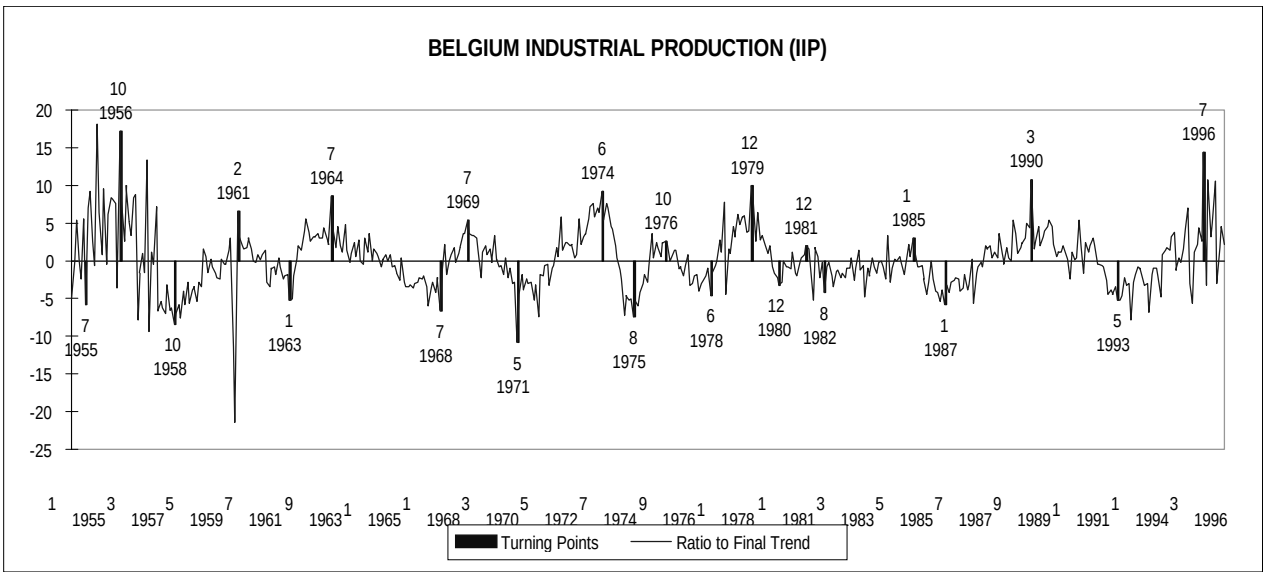
After consultations with the Banque de Belgique it was decided that the total industrial production with construction should be used as the reference series for Belgium.

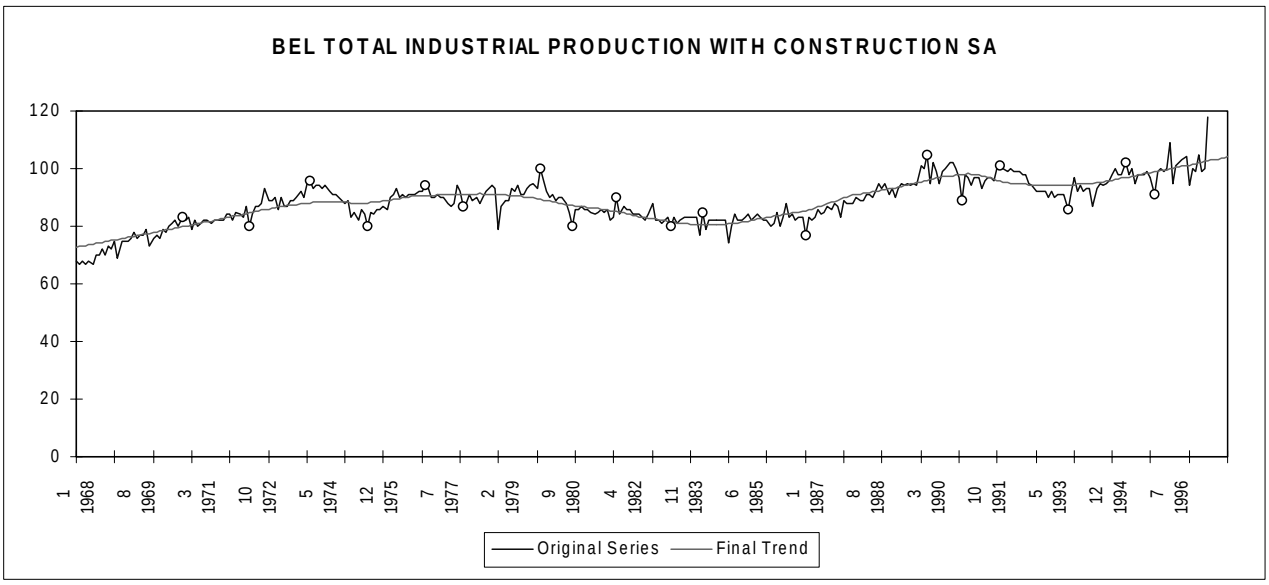

BELGIUM GDP
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Original Series
Final Trend

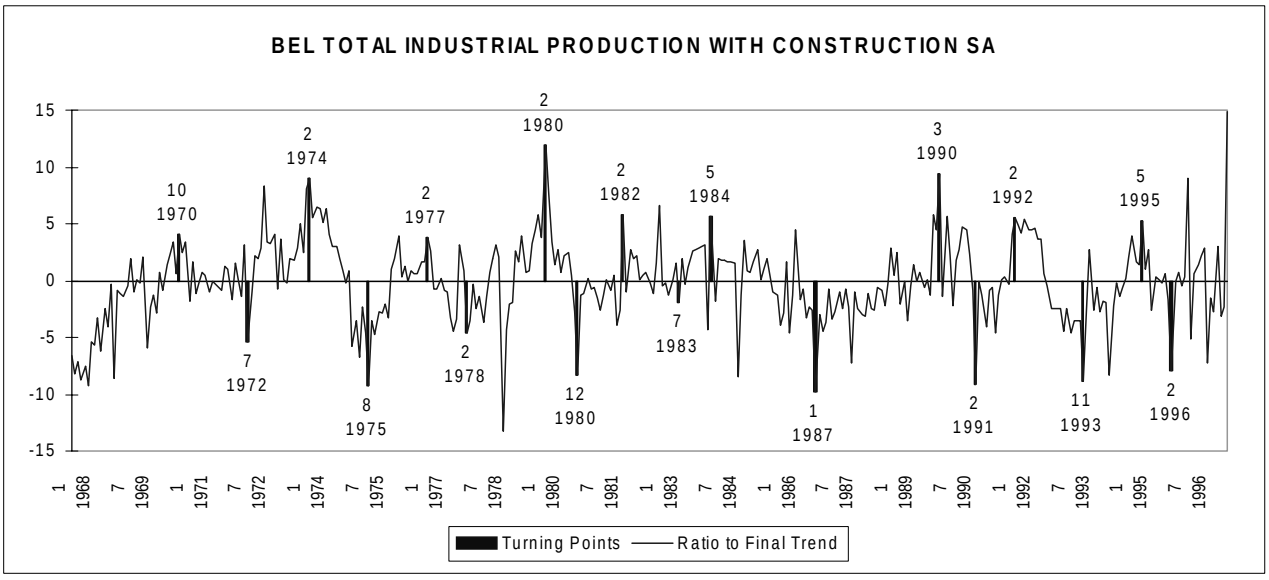

BELGIUM GDP
4 1964
1 1974
3 1976
2 1970
1 1962
3 1980
3 1984
2 1978
3 1982
3 1988
2 1990
2 1992
1 1995
4 1960
2 1963
2 1968
3 1971
3 1975
3 1977
2 1979
3 1981
2 1983
2 1987
3 1989
2 1991
3 1993
2 1996
3
2
1
0
-1
-2
-3
1 1960
1 1962
1 1964
1 1966
1 1968
1 1970
1 1972
1 1974
1 1976
1 1978
1 1980
1 1982
1 1984
1 1986
1 1988
1 1990
1 1992
1 1994
1 1996
Turning Points
Ratio to Final Trend


BEL GDP
1 1990
1 1992
1 1995
1 1991
1 1996
1 1993
4
3
2
1
0
-1
-2
-3
1 1984
4 1984
3 1985
2 1986
1 1987
4 1987
3 1988
2 1989
1 1990
4 1990
3 1991
2 1992
1 1993
4 1993
3 1994
2 1995
1 1996
4 1996
Turning Points
Ratio to Final Trend


BELGIUM INDUSTRIAL PRODUCTION (IIP)
120
100
80
60
40
20
0
1 3 5 7 9 11 1 3 5 7 9 11 1 3 5 7 9 11 1 3
1955 1957 1959 1961 1963 1965 1968 1970 1972 1974 1976 1978 1981 1983 1985 1987 1989 1991 1994 1996
Original Series
Final Trend


BELGIUM INDUSTRIAL PRODUCTION (IIP)
10 1956
2 1961
7 1964
7 1969
6 1974
10 1976
12 1979
12 1981
1 1985
3 1990
7 1996
7 1955
10 1958
1 1963
7 1968
5 1971
8 1975
6 1978
12 1980
8 1982
1 1987
5 1993
20
15
10
5
0
-5
-10
-15
-20
-25
1 3 5 7 9 11 1 3 5 7 9 11 1 3 5 7 9 11 1 3
1955 1957 1959 1961 1963 1965 1968 1970 1972 1974 1976 1978 1981 1983 1985 1987 1989 1991 1994 1996
Turning Points
Ratio to Final Trend





The OECD LI & BC lists 7 component series which are still used to calculate the composite index. The components are the following:

```
#FILE (STA05)CYP/BELCOMP ON GLOBALPACK
100 SHORT
200 S91109A000000  7 3 1  40 1    BEL LEADING INDEX
300 S91103131008R 0 2              BEL CONSTR STARTED RESIDENTIAL
400 S9110330591AR 0 2              BEL DOM ORDERS INFLOW:TENDENCY
500 S9110335190AR 0 2              BEL DEMAND:FUTURE TENDENCY
600 S9110335690AR 0 2              BEL SELLING PRICES:FUTURE TENDENCY
700 S91105315351R 0 2              BEL M1 + QUASI MONEY
800 S91105601001R 0 2 1   66M1   BEL CALL MONEY RATE
900 S91105641009R 0 2              BEL SHARE PRICES INDUSTRIALS
```

In the 1985 publication the cross correlation between industrial production and the composite index was 0.75 at lag 6. Now the cross correlation is 0.77 at lags 6, 7 and 8. The cross correlation alone, however, does not tell the whole truth.

A detailed study of the respective cyclical performance of each component of the leading indicator shows that the ability of financial series to anticipate business cycles deteriorated significantly during the eighties and they are no longer in phase with the growth cycle or exhibit no cyclical pattern at all. In addition, there is a statistical break in the call money rate series. Construction series, on the other hand, often have good leading characteristics, but they have problems with timeliness, i.e. the publication lags tend to be very long.

A number of test composite indicators with 6 - 12 component series were compiled for Belgium. Special attention was given to business survey series even though most of the series demonstrated somewhat irregular leading characteristics. A number of German financial series were also tested as components, but these series induced cycles unrelated to the cycles in industrial production.

The new proposed composite indicator for IIP has the following six components:

Three monthly business survey series: Production: tendency
Domestic orders inflow: tendency
Demand: future tendency

Share prices: industrials
Total exports FOB
Composite leading indicator for the Netherlands

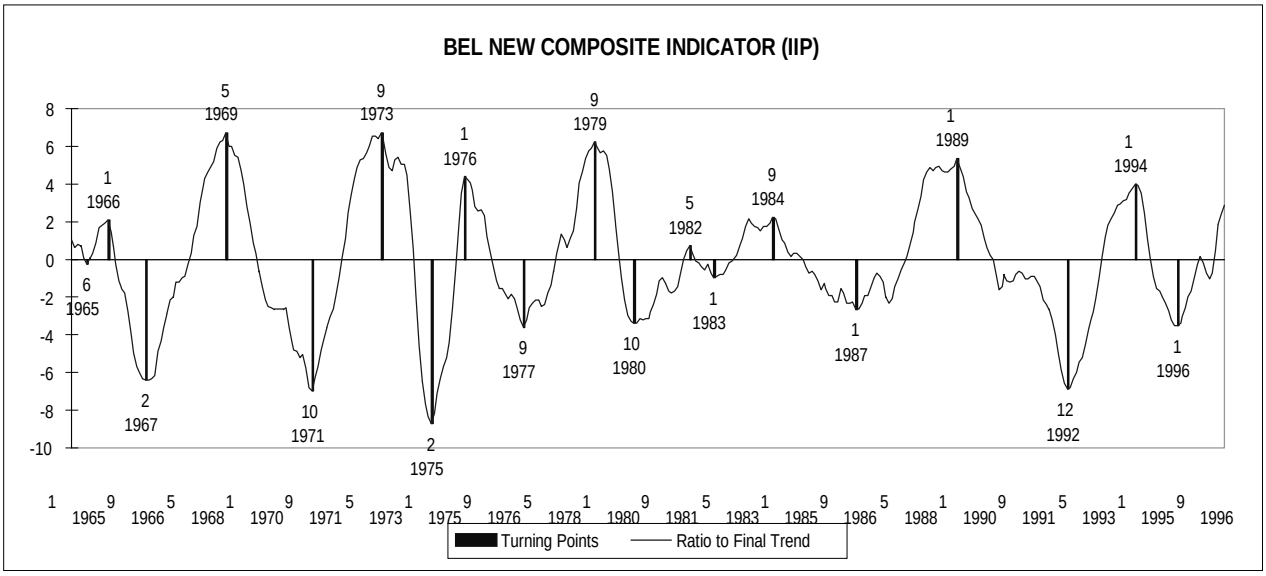
The cross correlation between industrial production and the new composite index is 0.79 at lags 4 and 5.

The parameter list for the new composite is:

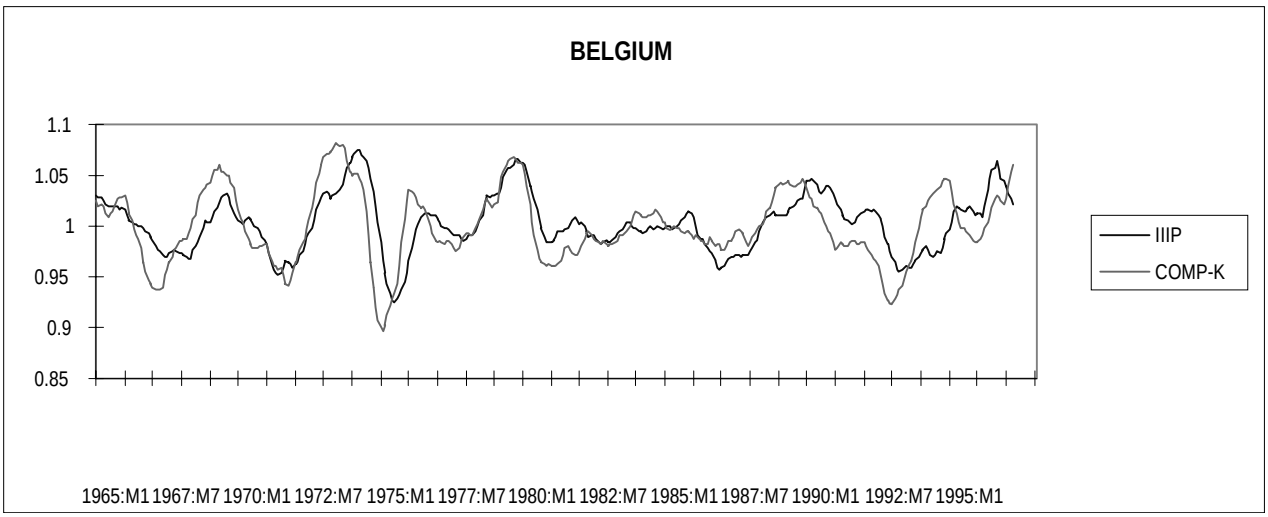
```
00000100SHORT
00000200S91109A960000  6 3 1  40 1 BEL LEADING INDEX
00000300S9110330596AR 0 2          BEL DOM ORDERS INFLOW:TENDENCY
00000400S9110335196AR 0 2          BEL DEMAND:FUTURE TENDENCY
00000500S9110330196AR 0 2          BEL PRODUCTION TENDENCY
00000600S91105641969R 0 2          BEL SHARE PRICES INDUSTRIALS
00000700S92109A00000R 0 2         NET COMPOSITE INDICATOR
00000800S91107200009R 0 2          BEL EXPORTS TOTAL FOB SA
```

Industrial production without construction	Remarks	missing/ extra cycles	Mean lead/lag at all T.P.s	Mean lead/lag at peaks	Mean lead/lag at troughs
New leading indicator			4.3	5.1	3.6
BSS Domestic orders: inflow		1 (minor) m	2.8	3.4	2.3
BSS Demand: future tendency		-	3.2	3.3	3.1
BSS Production tendency		-	3.7	3.9	3.5
Share prices		1x, 1 (minor) m	5.1	4.9	5.2
Total exports, franc			1.8	2.7	0.8
Netherlands composite indicator			8.7	8.9	8.6

Industrial production without construction	Median lead/lag at all T.P.s	Median lead/lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	Number of turning points	Average deviation from median	Ratio: Median lead/ average deviation from median	Cross-correlation Lag	Coeff.
New leading indicator	4.0	4.0	3.5	6.6	5.2	15	5.1	0.8	4	0.7
BSS Domestic orders: inflow	4.0	6.0	2.0	9.4	6.8	15	6.7	0.6	4-5	0.63
BSS Demand: future tendency	3.5	3.5	3.0	9.1	6.3	16	6.3	0.6	5-6	0.70
BSS Production tendency	3.0	4.0	3.0	5.6	4.3	15	4.3	0.7	5-6	0.61
Share prices	4.0	3.0	4.5	7.9	6.5	20	6.4	0.6	7-8	0.31
Total exports, franc	0.0	2.5	-1.0	7.8	6.0	19	5.8	0.0	1	0.46
Netherlands composite indicator	7.0	9.0	7.0	8.5	6.8	15	6.7	1.1	5	0.74



The performance of this new leading indicator in relation to industrial production (IIP) is presented below (detrended and amplitude adjusted series):



The performance is good over the whole period and the indicator anticipates all turning points of the economy. In particular, it gives a clear signal of the 1993-recovery with six months' lead. However, it shows an extra cycle 1994-1996 which is not present in total industrial production. (This cycle with a low amplitude can also be observed in the GDP and in the industrial production series that includes construction as well as in the corresponding series of main trading partners of Belgium.)

The compilation of the new leading indicator for Belgium posed a lot of problems. There were no problems with data availability, however, as data is available on:

- Production, stocks and orders;
- Construction sales and trade;
- Labour force;
- Prices, costs and profits;
- Monetary and financial aggregates;
- Foreign trade; and
- Business surveys.

Some business surveys were very good leading indicators, but most of them were either coincident or had very uneven and inconsistent leads. For a small open economy like Belgium, where foreign trade has a significant role, it was regarded as important to include a number of trade related series as components. The performance of the tested series is summarised below:

	Delay in release	Characteristics of the series:
BSS Production tendency	2	Good.
BSS Export order inflow: tendency	2	Good.
BSS Export orderbks/demand:level	2	Good, but coincident at times.
BSS Order books/demand:level	2	Good, but coincident at times.
BSS Finished goods stocks: level	2	Lagging at times.
BSS Selling prices: tendency	2	Uneven lead.
BSS Prospects for total economy	2	Uneven lead.
BSS Employment: future tend.	2	Coincident at times.
BSS Prospects, manufacturing	2	Uneven lead.
New orders metal prod tot	discontinued	Uneven lead, lot of missing cycles.
New orders metal prod export	discontinued	Uneven lead, lot of missing cycles.
Const/build started /resid	5	Lagging or coincident at times.
Construction permits issued total	5	Very uneven lead, lagging at times.
Construction buildings started total M3	5	Cycles missing, uneven lead.
Housing starts interm.	discontinued	Uneven lead, no cycles in the end.
Const.dwelling started SA	5	Short lead, coincident at times.
Terms of trade	discontinued	Mostly lagging, no cycles in the end.
BSS Dom orders: inflow	2	Uneven lead, lagging at times.
BSS Demand: future tendency	2	Good, but lagging at times.
BSS Selling prices: future tendency	2	Uneven lead, coincident at times.
Money supply M1+quasi money	3	Lagging in the end.
M1	3	Cycles missing, longish lead.
M1+quasi money=broad M	3	Longish lead.
Official reserves including IMF	3	Very long lead in the end.
Official reserves excluding gold	3	Uneven lead, lagging at times.
Call money rate	1	Very long lead in the end.
Official discount rate	1	No cycles since 1985.
3-month treasury bills	1	Very long lead, no cycles in the end.
yield of govt bonds	1	Very long lead.
Share prices	2	Good.
mth hours worked mining+manuf.	discontinued	Very uneven lead, no cycles in the end.
PPI total	2	Uneven lead.
PPI manufactured goods	2	Uneven lead.
PPI investment goods	2	No cycles in the end.
PPI consumer goods	2	Long lead.
PPI intermediate goods	2	Uneven lead, cycles missing.
Unfilled vacancies	5	Mostly lagging.
Passenger car registrations	1	Uneven lead.
Hourly earnings min+mfg+transp	1	Several missing cycles.
Hourly earnings	1	Several missing cycles.
Total exports, franc	3	Missing cycles, may be coincident.
Total exports, us $	3	Uneven lead, coincident in the end.
France composite indicator	2	Potentially good.
Germany composite indicator	2	Very uneven lead.
UK composite indicator	2	Very uneven lead.
Netherlands composite indicator	2	Potentially good, especially in the end.
Italy composite indicator	2	Good.
Short term unemployment	2	Cycles missing, not good.
Effective exchange rate	2	Cycles missing, very uneven lead.
Housing starts (at the moment of data entry)	5	Missing cycles, uneven lead.
Non-residential construction starts (at the moment of data entry)	5	Missing cycles, coincident.
Housing starts (at the exact moment of beginning)	5	Missing cycles, otherwise potentially good.
Non-res construction starts (at the exact moment of beginning)	5	Cycles missing, uneven lead.
Import of goods	discontinued	Cycles missing, uneven lead.
Import of equipment goods	discontinued	Cycles missing, uneven lead.
Import of intermediate goods	discontinued	Cycles missing, uneven lead.
DEU official discount rate	1	Cycles missing, uneven lead.
DEU call money rate	1	Cycles missing, uneven lead.
DEU 3-month fibor	1	Cycles missing, uneven lead.
DEU yield of long term govt bonds	1	Cycles missing, uneven lead.
DEU share price index all shares	1	Cycles missing, uneven lead.

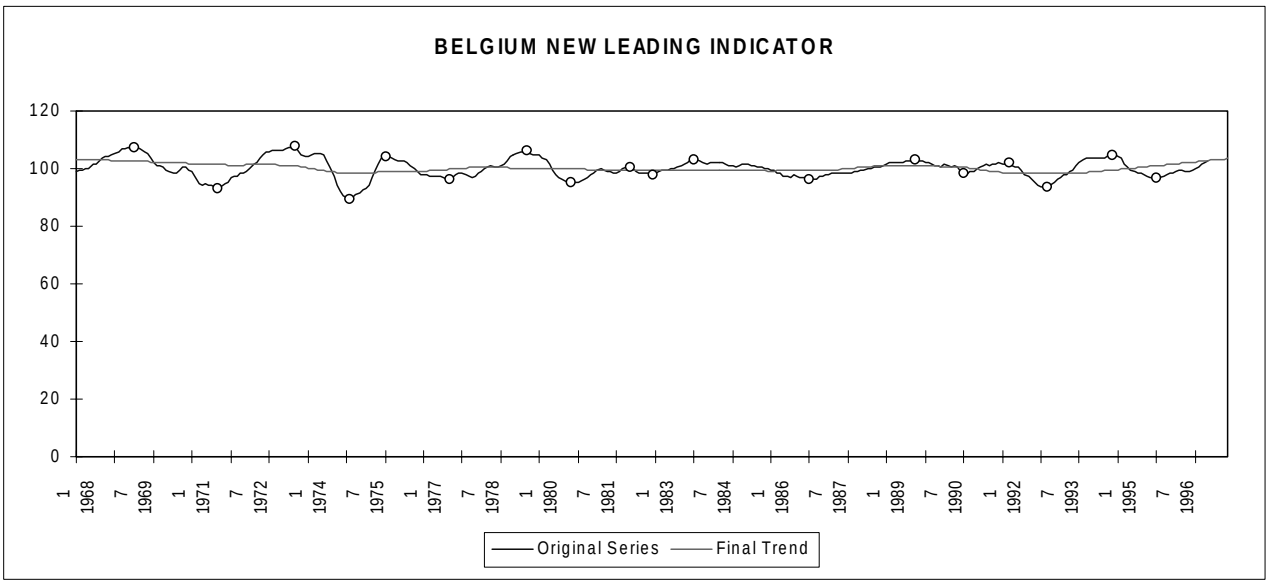
We also have compiled a leading indicator for total industrial production including construction (IIPC); with the following component series:

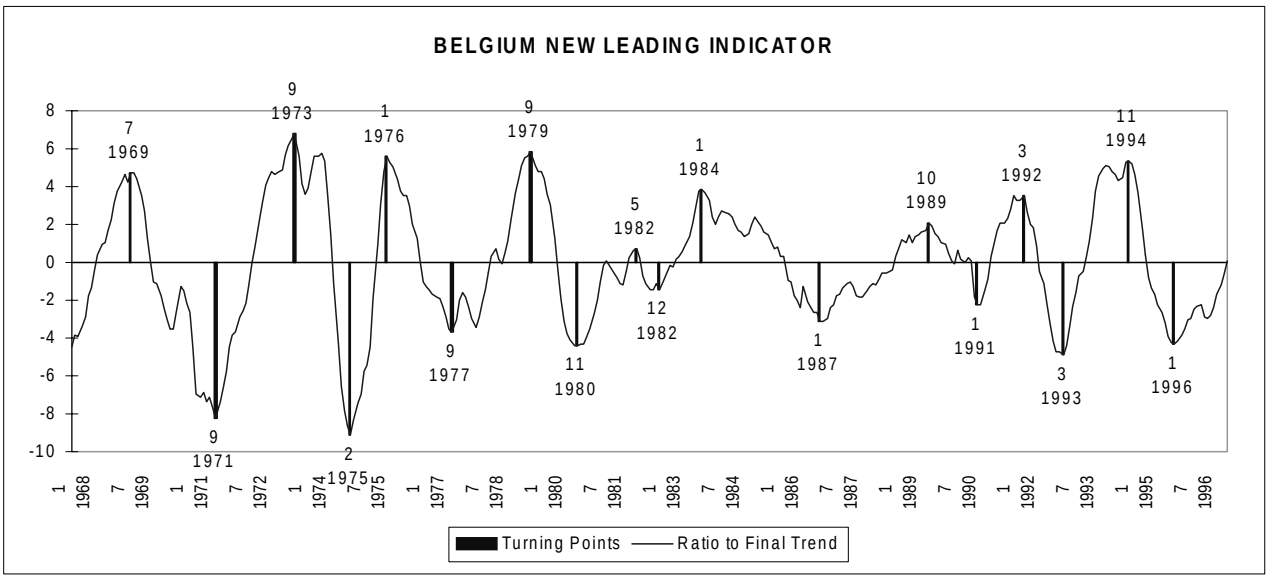
BEL EXPORT ORDERS INFLOW: TENDENCY
BEL PRODUCTION TENDENCY
BEL EXPORTS TOTAL FOB SA
BEL EMPLOYMENT: FUTURE TENDENCY
BEL PASSENGER CAR REGISTRATIONS
BEL DEMAND:FUTURE TENDENCY
NET LEADING INDICATOR

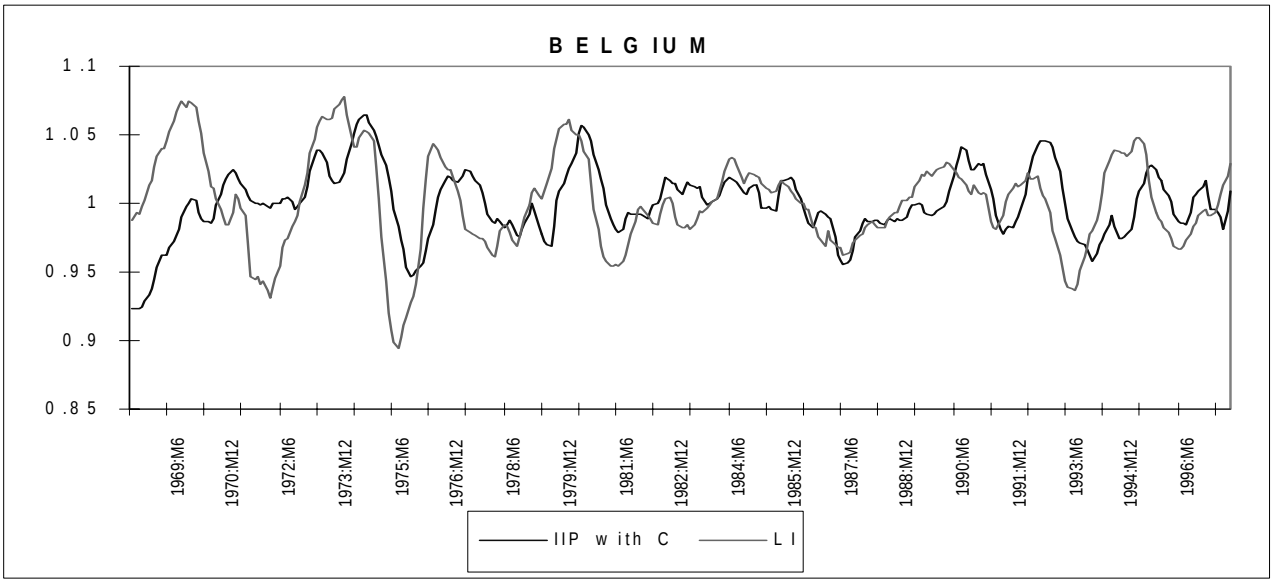
The performance of this indicator is satisfactory, there are no missing or extra cycles. The cross-correlation is somewhat lower than with the indicator presented above, but the performance at the end of the period is better. One particular characteristic is that the performance of the indicator is considerably better at peaks than at troughs.

Industrial production including construction	Remarks/ delay in release (months)	missing/ extra cycles	Mean lead/lag at all T.P.s	Mean lead/lag at peaks	Mean lead/lag at troughs
New composite leading indicator	2	-	4.9	5.4	4.3
BSS Production tendency	1	-	4.6	4.6	4.7
BSS Export order inflow: tendency	1	1 x	6.0	7.0	5.0
BSS Employment: future tend.	1	-	4.9	4.7	5.3
BSS Demand: future tendency	1	-	4.9	5.8	4.0
Total exports, franc	3	2 m	2.2	1.6	3.0
Passenger car registrations	2	3 x, 1 m	6.3	7.6	4.9
Netherlands leading indicator	2	1 x	9.7	8.4	11.0

Industrial production including construction	Median lead/lag at all T.P.s	Median lead/lag at peaks	Median lead/lag at troughs	Standard deviation	Average deviation from mean	Number of turning points	Average deviation from median	Ratio: Median lead/ average deviation from median	Cross-correlation Lag	Coeff.
New composite leading indicator	5.0	5.0	5.0	4.7	3.5	18	3.4	1.5	5	0.73
BSS Production tendency	5.0	6.0	5.0	6.4	4.9	18	4.8	1.0	6-7	0.43
BSS Export order inflow: tend.	6.0	6.0	6.0	3.3	2.2	18	2.2	2.7	6	0.37
BSS Employment: future tend.	5.0	3.0	6.0	4.4	3.6	17	3.6	1.4	6	0.56
BSS Demand: future tendency	4.5	4.0	5.0	5.7	4.1	18	4.1	1.1	6-7	0.44
Total exports, franc	4.0	4.0	2.0	6.5	5.4	13	5.3	0.8	2	0.43
Passenger car registrations	5.0	7.0	5.0	6.3	4.9	15	4.8	1.0	0	0.33
Netherlands leading indicator	9.0	9.0	10.0	3.7	2.8	14	2.7	3.3	7-10	0.31


BELGIUM NEW LEADING INDICATOR
120
100
80
60
40
20
0
1 1968 7 1969 1 1971 7 1972 1 1974 7 1975 1 1977 7 1978 1 1980 7 1981 1 1983 7 1984 1 1986 7 1987 1 1989 7 1990 1 1992 7 1993 1 1995 7 1996
Original Series
Final Trend


BELGIUM NEW LEADING INDICATOR
8
6
4
2
0
-2
-4
-6
-8
-10
7 1969
9 1973
9 1971
2 1975
1 1976
9 1977
9 1979
11 1980
5 1982
12 1982
1 1984
1 1987
10 1989
1 1991
3 1992
3 1993
11 1994
1 1996
1 1968 7 1969 1 1971 7 1972 1 1974 7 1975 1 1977 7 1978 1 1980 7 1981 1 1983 7 1984 1 1986 7 1987 1 1989 7 1990 1 1992 7 1993 1 1995 7 1996
Turning Points
Ratio to Final Trend


B E L G IU M
1 .1
1 .0 5
1
0 .9 5
0 .9
0 .8 5
1969:M6
1970:M12
1972:M6
1973:M12
1975:M6
1976:M12
1978:M6
1979:M12
1981:M6
1982:M12
1984:M6
1985:M12
1987:M6
1988:M12
1990:M6
1991:M12
1993:M6
1994:M12
1996:M6
IIP with C
LI