

# Italian leading indicators

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Istat – Division for data analysis and economic, social and environmental research

Seminar on the Role of National Statistical Offices in the production of Leading,  
Composite and Sentiment Indicators

Geneva, 6-7 July 2017

# Contents

- Short term indicators, forecasting and diffusion indices
- Improve the dissemination of short-term data
- Characteristics of the Italiana leading indicators

# ISTAT ORGANISATION CHART

## Organisation chart LISTEN



Division for data analysis and economic, social and environmental research

# Aim

The **mission of the Italian National Institute of Statistics** is to serve the community by **producing and communicating high-quality statistical information**, **analyses** and **forecasts** in complete independence and in accordance with the strictest ethical and professional principles and most up-to-date scientific standards, in order to develop detailed knowledge of Italy's environmental, economic and social dimensions at various levels of geographical detail and to assist all members of society (citizens, administrators, etc.) in decision-making processes.

## Quarterly national accounts: flash estimate and forecasting (1)

- From 2016 Eurostat has started to publish the flash estimate of GDP at  $t+30$
- This implies that for most of the countries the flash estimate is based on forecasting (for example the last month of IPI that is usually published at  $t+40$ )
- Clear tradeoff problem for national accounts: use the traditional framework for final quarterly national accounts; derive a new and small framework that would be used only for the flash

## Quarterly national accounts: flash estimate and forecasting (2)

- The huge literature on forecasting GDP is mainly oriented on the second approach (do not replicate the national accounts), for example 'Short-term forecasts of Euro area real GDP growth – An assessment of real-time performance based on vintage data' (M. Diron, ECB, WP 2006)
- However few works have followed the other line (Mazzi et al.), Monthly GDP, around 14 thousands of models
- Main point: Built up a relationship between huge amounts of short-term information (business surveys, IPI, retails, car registration, big data, ...) and GDP

But ....Are more data always better...(factor models)

- Starting with large dataset, Stock Watson (Diffusion indeces, 2002), Forni, Hallin, Lippi, Reichlin (The generalised dynamic factor model, 1998)
- Boivin Ng (2005) in simulation depends from the characteristics of the data generation process
- Caggiano et al. 2009 , results for the euro area

Caggiano et al.

- The basic ingredients of these data sets are **109** key macroeconomic series for each country. 6 main European countries + UK
- For all countries, we find that **pre-selection** of variables substantially improves the forecasting performance of the factor-augmented AR model. In particular, we find that the best performance is obtained when factors are extracted from as few as in between 12 (UK) and 22 (Italy) variables:
- in almost all cases and for all forecast horizons, results improve when Rule 2 in Boivin and Ng (2006) is applied, that is, when from the original dataset the series whose error is first or second most correlated with other series is eliminated.

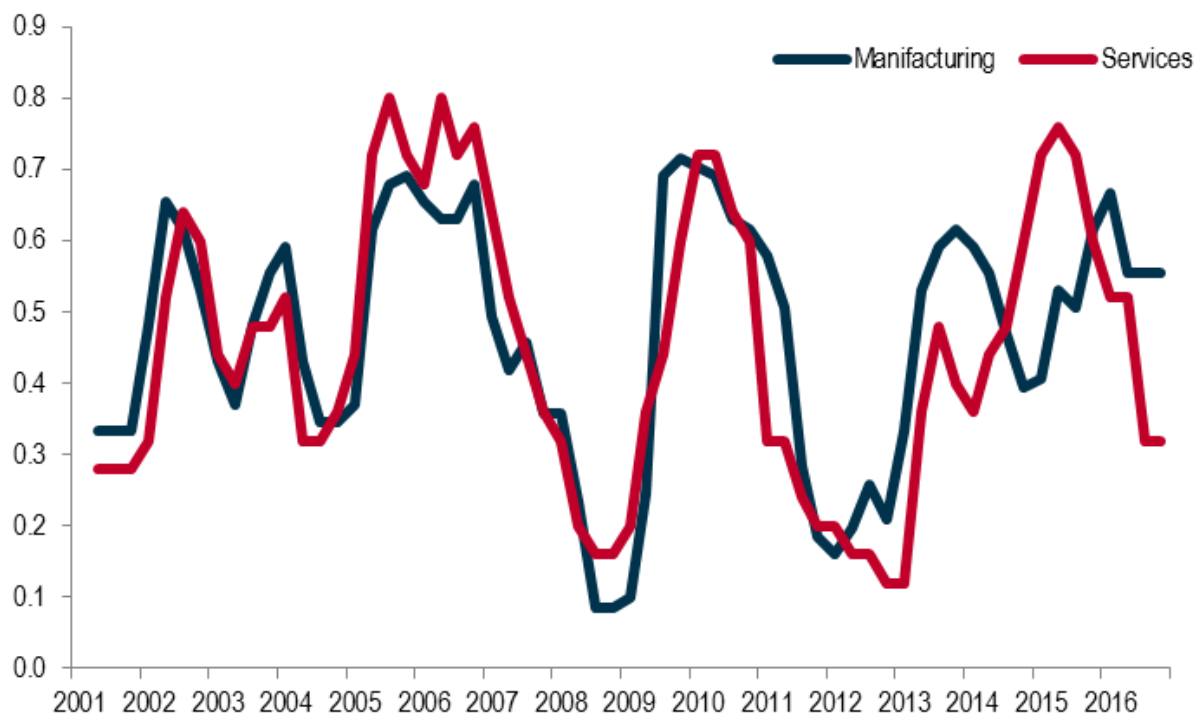


## Different point of view: exploring information from the single survey

- Frale, C., et al. "Survey data as coincident or leading indicators." (2010, JoF)
- Chang and Hwang (2015, RES) Asymmetric phase shift in U.S. **Industrial production** cycles
- Main results:
  - troughs are much more concentrated and sharper than peaks.
  - Occurrences of phase shifts across industries strongly support the spillovers through input-output linkages, a core aspect of multisector models.


... We can extend to IPI and services..

- Italian diffusion indices for IPI and turnover on services



Source: Istat, Rapporto annuale 2016

## 2. Dissemination: Economic Trends

 **Statistics by**

Products Tools Information Search... Territory Theme

		2015 01	2015 02	2015 03	2015 04	2015 05	2015 06	2015 07	2015 08	2015 09	2015 10	2015 11	2015 12	2016 01	2016 02	2016 03	2016 04	2016 05	2016 06	2016 07	2016 08
Confidence	Consumers	4.0	6.4	3.1	-2.3	-1.9	3.6	-2.7	2.5	3.2	3.4	1.1	-0.8	1.0	-3.5	0.4	-0.7	-1.3	-2.0	0.9	-1.8
	Enterprises	2.2	2.6	6.4	-1.6	-0.3	2.9	-0.1	-0.5	2.2	0.7	-0.2	-1.1	-3.8	1.5	-2.7	2.6	0.2	-1.8	1.9	-3.5
Industry	Production	-1.8	1.4	0.5	-0.7	1.3	-0.8	0.9	-0.4	-0.1	0.5	-0.5	-0.7	1.6	-0.8	-0.1	0.4	-0.6	-0.4		
	Industrial orders	-3.7	0.9	-0.9	10.7	-1.9	-1.3	0.3	-5.2	-2.2	4.6	1.4	-3.0	0.4	0.7	-3.4	0.9	-2.8			
Construction	Production	1.2	-2.2	0.1	-0.4	0.9	-1.3	0.7	0.1	-0.9	-0.1	3.0	-0.1	-1.8	0.4	-0.9	2.2	-3.6			
Services	Retail trade	0.5	-0.2	0.3	0.6	-0.3	-0.5	0.5	0.2	-0.1	-0.3	0.3	-0.2	0.0	0.3	-0.6	0.1	0.3	0.2		
Foreign trade	Imports	1.5	0.0	5.3	-1.3	-0.3	3.7	-3.9	-2.6	1.1	0.0	1.1	-2.9	-0.6	0.5	-2.1	4.0	-1.3	0.0		
	Exports	-2.1	1.7	3.0	-2.0	1.1	-0.4	-0.7	-3.3	1.7	-0.3	3.3	-2.1	-2.2	2.3	-1.3	2.9	-0.2	-0.4		
Labour Market	Employment	-0.2	0.2	-0.2	0.4	-0.2	0.3	0.2	0.5	-0.1	-0.1	0.0	-0.2	0.3	-0.2	0.3	0.3	0.1	0.3		
Prices	Consumer prices	-0.4	0.4	0.1	0.2	0.1	0.2	-0.1	0.2	-0.4	0.2	-0.4	0.0	-0.2	-0.2	0.2	-0.1	0.3	0.1	0.2	0.2
	Producer prices	-1.3	0.6	0.0	0.0	0.2	-0.1	-0.5	-0.6	-0.3	-0.2	-0.4	-0.6	-0.7	-0.5	0.2	-0.6	0.5			
		2015 Q1			2015 Q2			2015 Q3			2015 Q4			2016 Q1			2016 Q2				
Services	Turnover in services	0.6			0.8			0.0			0.4			0.4			1.0				
National Accounts	Gross domestic product	0.4			0.2			0.3			0.2			0.3			0.0				

**ECONOMIC TRENDS** ⓘ

<http://www.istat.it/en/economic-trends>

# Economic Trends: Aims

## ECONOMIC TRENDS

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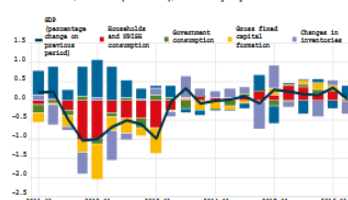
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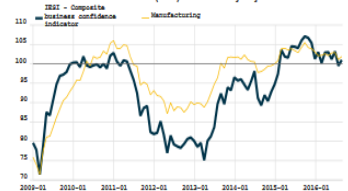
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Quarterly national accounts - GDP quarterly percentage change and contributions, volumes (2010=100), seasonally adjusted data

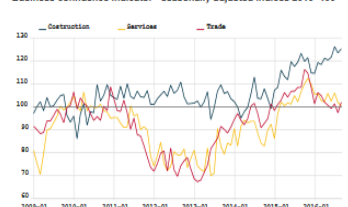


Business confidence indicator (IESI) - seasonally adjusted indices 2010=100



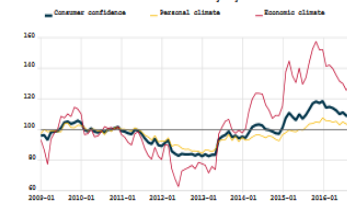
Next update 2016/10/27			
Last month available 2016 Sep.			
Series	Month	Previous month	
Manufacturing	101.5	101.1	
IESI - Composite business confidence indicator	101.0	99.5	

Business confidence indicator - seasonally adjusted indices 2010=100



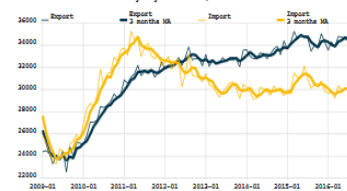
Next update 2016/10/27			
Last month available 2016 Sep.			
Series	Month	Previous month	
Construction	125.3	123.5	
Services	100.3	101.9	
Trade	102.0	97.4	

Consumer confidence indicator - seasonally adjusted indices 2010=100



Next update 2016/10/27			
Last month available 2016 Sep.			
Series	Month	Previous month	
Consumer confidence	103.7	103.1	
Personal climate	102.8	103.6	
Economic climate	126.0	125.7	

External trade - seasonally adjusted data, millions of euro



Next update 2016/10/17				
Last month available 2016 Jul.				
Series	Percentage change compared with the previous period	Percentage change compared with the previous quarter	Percentage change compared with the same quarter of the previous year	
Import	0.5	0.8	-6.3	
Export	-0.6	0.7	-7.3	

Industrial production index - seasonally adjusted indices 2010=100



Next update 2016/11/10				
Last month available 2016 Aug.				
Series	Percentage change compared with the previous period	Percentage change compared with the previous quarter	Percentage change compared with the same quarter of the previous year	
Industrial production (excluding construction)	1.7	0.4	4.1	

# Economic Trends: Analysis

Istat carries out short-, medium- and long-term economic analysis and forecasting activities, whose results are disseminated through different products.

## Monthly report and economic outlook

### Topics

- I National accounts
- I Construction
- I Confidence indicators
- I Services
- I Industry
- I Labour
- I External trade
- I Prices

## Economic trends database

## SDDSPPlus - Economic and financial data

## International analysis and forecasts

## Reading guide

### MONTHLY REPORT

#### Monthly report on Italian economy no. 9/2016

The monthly report on Italian economy for the month of September now online

Date of publication: **Wednesday, 5 October 2016**

#### Monthly report on Italian economy no. 8/2016

The monthly report on Italian economy for the month of August now online

Date of publication: **Monday, 5 September 2016**

#### Monthly report on Italian economy no. 7/2016

The monthly report on Italian economy for the month of July now online

Date of publication: **Friday, 5 August 2016**

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### EURO ZONE ECONOMIC OUTLOOK

#### Euro-zone economic outlook

Growth in the Eurozone improves, following a slowdown in the II and III Quarter

Date of publication: **Tuesday, 11 October 2016**

#### Euro-zone economic outlook

In the Eurozone real GDP growth consolidates

Date of publication: **Tuesday, 12 July 2016**

#### Euro-zone economic outlook

In the Eurozone real GDP grows thanks to domestic demand

Date of publication: **Tuesday, 12 April 2016**

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### ECONOMIC OUTLOOK

#### Italy's Economic Outlook

GDP is expected to increase by 1.1% in 2016 (it grew by 0.8% in 2015)

Date of publication: **Tuesday, 17 May 2016**

#### Italy's Economic Outlook

GDP is expected to increase by 0.9% in 2015, reaching 1.4% in 2016 and 2017

Date of publication: **Thursday, 5 November 2015**

#### Italy's Economic Outlook

GDP is expected to increase by 0.7% in 2015, reaching 1.2% in 2016 and growing by 1.3% in 2017

Date of publication: **Thursday, 7 May 2015**

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# Monthly Report: International Environment

In a context characterized by the slowdown of the US economy and the consolidation of Euro Area growth, the Italian economy accelerates driven by households consumption. Labor market is improving, showing a rise in employment and a significant reduction in unemployment. The inflation rate is slowing down. The leading indicator remains positive.



Executive  
Summary

## International Outlook:

- US, Japan, China,... Economies
- Euro Area Statistics
- European Economic Sentiment Indicator
- World Trade and Exchange Rate

## The international environment

In the first months of 2017, the US economy slowed down according to the second release of GDP estimate for the first quarter (+0.3% compared to +0.5% in Q4, Figure 1). Gross fixed capital formation, household consumption and net exports have been the main drivers of growth while private inventories provided a negative contribution.

In April, non-agricultural workers increased (+211 thousand units) slightly accelerating compared to the previous month. The unemployment rate improved (4.4% in April compared to 4.5% in March). The US economy is expected to continue to grow at moderate rates. According to the Conference Board, in April, the leading indicator improved. Consumer confidence in May was slightly weakened, driven by negative expectations on medium-term economic outlooks.

Economic growth in the Euro Area is getting stronger. In the first quarter of 2017, GDP accelerated compared to the end of 2016 (+0.5% compared to +0.4% in the fourth quarter of 2016). In addition, for some countries, such as France and Italy, the preliminary estimate has been revised upwards.

# Monthly Report: The economic situation in Italy

## The economic situation in Italy

### Businesses

In the first quarter of 2017, gross domestic product, adjusted for calendar and seasonal effects, increased by 0.4% compared to the previous quarter, accelerating with respect to the fourth quarter of 2016 (+0.3%). Domestic demand excluding inventories contributed positively by 0.3 percentage points to GDP growth; net foreign demand provided a negative contribution (0.2 percentage points), with an increase in both imports of goods and services (+1.6%) and exports (+0.7%) in the first quarter compared to the previous quarter.



Businesses



Households

### Households and labour market

In the first quarter of 2017, final consumption accelerated (+0.5%), driven by the increase in both households and government spending (+0.6% and +0.5% respectively Figure 4). Among household expenditure components the sustained progress of the durable goods continued (+1.8%) together with the consolidation in services consumption (+0.4%).

The labor market is improving: the latest figures show that employment in April increased (+0.4% compared to March, 94 thousand more people) after the

### Prices

Preliminary estimates of consumer prices slowed down in May. The consumer price index for the whole nation (NIC) increase by 1.4%, half a percentage point lower than in April, returning to the same rate as in March. Among the components in the basket of the Harmonized Consumer Price Index (HICP), the share of products with more dynamic prices (growth rate more than 2%) dropped to 19.1%, about 5 percentage points less than the maximum registered at the beginning of the year (Figure 5); at the same time, the incidence of products with decreasing prices grew (31.2% from 29.5% in January).



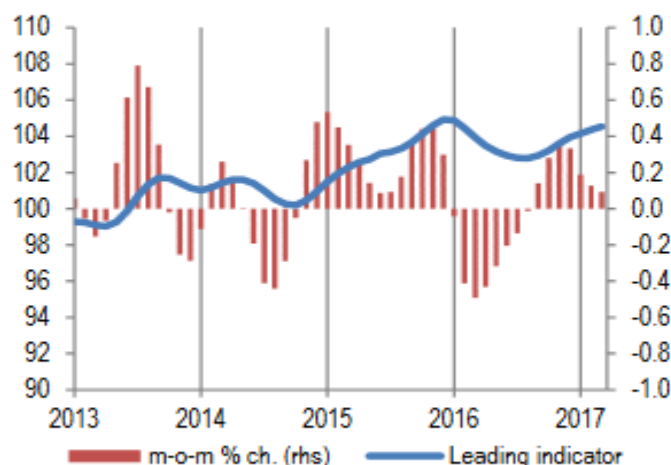
Prices

# Monthly Report: Economic Outlook

## The Outlook

In May, both the index of consumer and business confidence worsened. For consumers all components declined albeit with different intensity. For the second consecutive month, unemployment expectations also increased. Business confidence diminished in manufacturing (with worse both order reviews and production expectations) and services; in construction remained largely stable and in the retail company improved. The leading indicator remains positive (Figure 6).

### 6. Leading indicator (index and % change)



Source: Istat



## Leading Indicator (Altissimo, Marchetti, Oneto 2000)

- Provide a descriptive analysis of the co-movements of a large set of Italian economic indicators and to measure the main features of the business cycle in Italy
- Definition of a system of cyclical indicators that includes both a composite coincident indicator and a composite leading indicator
- Leading indicator might permit the early detection and, if possible, the prediction of upturns and downturns in economic activity

## Methodology

- First step of the process is the investigation of the statistical properties of 183 time series relevant for the Italian economy and the selection of a small set of variables presenting a high degree of conformity and a coincident timing with the aggregate cycle
- These variables can be then aggregated in a new composite coincident indicator which provides the reference variable
- Three different reference variables (GDP, the industrial production index and the ISCO coincident indicator)

## Coincident indicator

- The variables scrutinized include measures of labor market conditions, output and capacity utilization, demand conditions, prices, wages and labor costs, monetary aggregates and interest rates, foreign trade and as well as relevant international variables
- Two measures of comovement at cyclical frequencies of each of the 183 variables scrutinized with respect to each of the reference series (in the frequency domain and in the time domain)
- A first subset of twelve series can be regarded as approximately coincident with the business cycle
- In order to select the final set of coincident indicators evaluation of their comovement properties with the aggregate cycle examining the timing of their turning points: 6 variables

## Composite leading indicator

- Selection of a broad set of variables that appear to be leading according to a number of comovement statistics and testing of predictive power
- Analysis the timing of the turning points and, finally, choice the components of the aggregate leading indicator
- Based on the composite coincident indicator
- Evaluation also of the predictive power of each series with respect to the coincident indicator. A variable is considered leading if, among other properties, it helps to forecast the growth rate of the reference series (Stock and Watson,1991)

## Composite leading indicator: components

- First subset of twenty-six variables that exhibit a high peak of correlation with a lead of at least three months; most of them also feature relatively high coherence and a good forecasting performance in relative terms
- The next step selection of a subset of about ten series to be included in the composite leading indicator. The selection was based on two criteria. A first criterion is clearly that of choosing the series that feature the highest correlation, longest lead and best forecasting properties. However, it is also desirable to construct an indicator as balanced and diversified as possible.

## Composite leading indicator: selected components

- **Labor market:** hours of Wage Supplementation Fund (ordinary) in manufacturing.
- **Measures of industrial activity:** survey data on manufacturing firms' production expectations and inventories of finished goods because of the larger lead and better forecasting performance.
- **Demand indicators:** level of domestic orders of consumer goods reported by industrial firms and households' confidence climate.
- **Credit variable:** bank deposits in real terms and spread between the interest rate on bank loans and the rate on long-term government bonds.
- **Foreign trade indicators:** total merchandise imports
- **International variables:** German industrial production index.

## Composite leading indicator: aggregation

1. Data on single components are transformed and aggregated using an aggregation procedure consistent with the traditional and heuristic NBER techniques.
2. In such way the leading index synthesizes variables accounting for different economic determinants and sources of information.

## Next steps

1. Complete the dissemination for the diffusion indices
2. Revising the selection and the methodology of leading indicators
3. Improve the analysis for survey and sectors introduction new indicators (see Chang, 2015)



# References

Istat economic trends:

<http://www.istat.it/en/economic-trends>

Istat monthly reports archive:

<http://www.istat.it/en/archive/monthly+report>