



Focus on

## **Leading Indicators: the OECD CLI**

February, 11<sup>th</sup> 2010

### **1. Introduction**

In these uncertain times forward looking and so-called leading indicators are examined with particular attention. In this short note we point out the main characteristics of the OECD Composite Leading Indicators (CLIs) which so often make it to front pages of important newspapers – and which are also part of the information set provided regularly by SESO in the Economic Profile series. We also argue that they are often misinterpreted so that in fact they offer misleading information.

Statistically we can see that there is a relationship between GDP growth and CLIs which can be tighter or weaker depending on the country. Overall, CLIs capture turning points relatively well although not in quantitative terms. The cyclical information offered appears to be applied also to construction cycles, which is not surprising given that the latter is strictly dependent on overall economic activity. In short, CLIs are fairly good qualitative indicators which at the current juncture point to a recovery in the business cycle but say nothing about its strength and sustainability.

### **2. Main Properties of the CLIs**

Without delving into the technicalities of the OECD CLIs, we explain very briefly what they actually are and their main characteristics. CLIs are built using a number of country specific variables and aim at providing early signs of turning points in business cycles, defined as fluctuations of economic activity around its long term potential. GDP potential output is the total output which an economy can theoretically produce if all production inputs (primarily, capital and labour) are fully used, given the state of technology and of economic institutions, and which does not lead to inflationary pressures. Note that the long term potential is a matter of estimate and can vary as the related economies gain or lose productive potential over time. It follows that CLIs' fluctuations may to a certain extent reflect also a changing potential output. This is particularly true in the current economic phase given that the deep recession suffered by major countries has negatively impacted on their potential output, lowering the available amount of some production inputs (e.g. higher medium term unemployment coupled with lower participation to the labour market, or idle capacity which will be never reactivated). Hence the gap between actual and potential output has narrowed. In its June 2009 forecasting exercise the OECD revised downward the potential output growth of all the major economies for 2010 with Italy suffering the largest revision (-1.7%), compared to -1.4% for Spain, -1.1% for Germany, -0.9% for the US, -0.7% for France, and -

0.6% for Japan. Incidentally, the larger potential revision for Italy may in part explain the comparatively steeper rise in Italy's CLI in recent months.

Components of the CLIs are of four types:

- a) "early stage" indicators measuring conditions in the initial stages of production (i.e. new orders, order books, construction approvals);
- b) "rapidly responsive" indicators which respond quickly to changes in the economic climate (e.g. hours worked, stock markets);
- c) "expectation-sensitive" indicators which reflect qualitative and subjective statements regarding the economic juncture (typically, confidence indicators);
- d) "prime movers" indicators related to monetary policy and foreign developments (i.e., interest rates, money supply, terms of trade).

The actual choice of indicators for each country is obviously mandated by the availability and reliability of indicators of the four above categories, which should in principle be all represented in a well balanced way<sup>1</sup>. The chosen components are then treated statistically in order to remove factors, such as seasonal patterns, trends, outliers, that may disturb the reading of the underlying cycle. Once normalised in order to make them independent of their unit base, the component series are then aggregated with equal weight<sup>2</sup>. In this regard, the OECD carries out a painstaking process in order to select the indicators that best reflect cyclical profiles.

The resulting CLI is focused thus on turning points and does not provide quantitative information on short term developments. In this regard, four cyclical phases may be identified:

- a) expansion, when the CLI is increasing and above 100;
- b) downturn, when the CLI is decreasing and above 100;
- c) slowdown, when the CLI is decreasing and below 100;
- d) recovery, when the CLI is increasing and below 100.

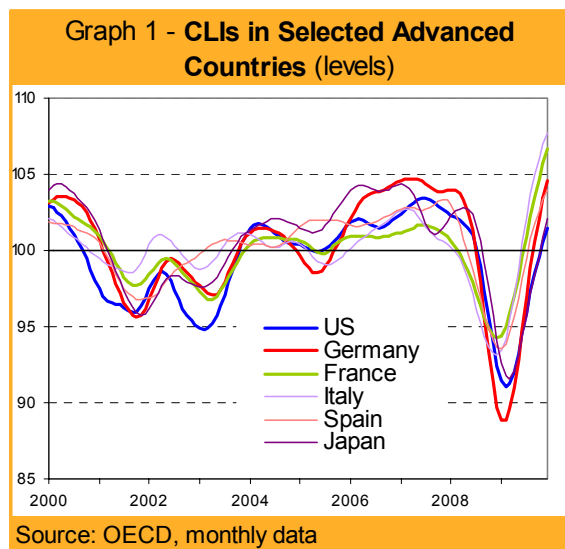
The usefulness of the CLIs is related to the timeliness of the information regarding the cycle and to their higher frequency than GDP; as a matter of fact, GDP data are typically released with a longer lag and on a quarterly basis, while CLIs are released monthly.

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<sup>1</sup> To give an idea, the followings are the component series for four main ITC Group countries. For the **US**: number of dwelling started, net new orders for durable goods, share prices (NYSE composite index), consumer sentiment indicator, purchasing managers index, manufacturing weekly hours of work, and spread of interest rates. For **France**: new passenger car registrations, new job vacancies, consumer confidence indicator, future tendency in manufacturing production (qualitative survey), prospects for industrial sector (qualitative survey), finished goods stock level (qualitative survey), EONIA interest rate, spread of interest rates, share prices (SBF 250 index), terms of trade. For **Italy**: consumer confidence indicator, 3-months euribor, future tendency in manufacturing production (qualitative survey), future tendency in manufacturing order books or demand (qualitative survey), deflated net new orders, terms of trade. For **Spain**: future tendency in manufacturing production (qualitative survey), future tendency in manufacturing order books or demand (qualitative survey); finished goods stock levels (qualitative survey); number of nights spent by tourists; yields of government bonds with maturity less than 2 years.

<sup>2</sup> This, in our opinion, introduces some distortion in that some indicators are more solid than others.

### 3. Main Evidence



In graph 1 the CLIs of some major advanced economies are displayed showing that all of them (Germany, France, Italy and Spain for the euro area, and the US and Japan) are now firmly in an expansion phase after hitting the bottom between December 08 (France and Italy) and March 09 (Japan). Speed and timing of GDP recovery, however, have not been the same for these countries. France recovered positive quarter-on-quarter growth as early as in Q2/09, while Italy had to wait for the third quarter and Spain has yet to enter positive territory. Japan's GDP, on the contrary, the last in time

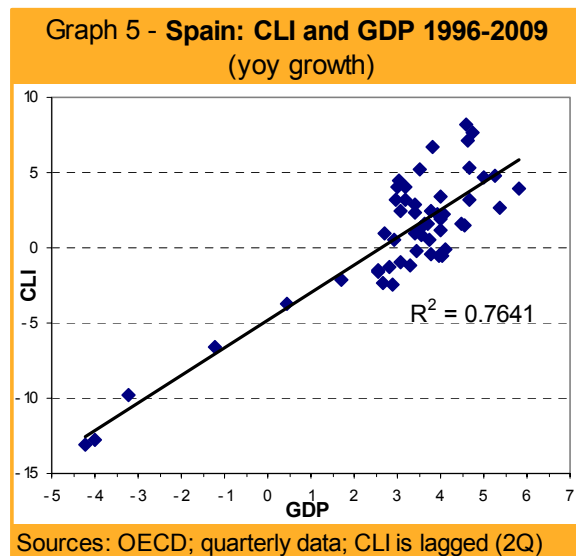
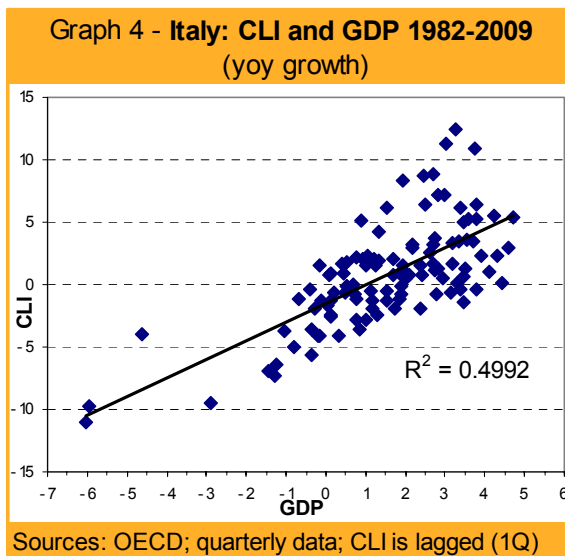
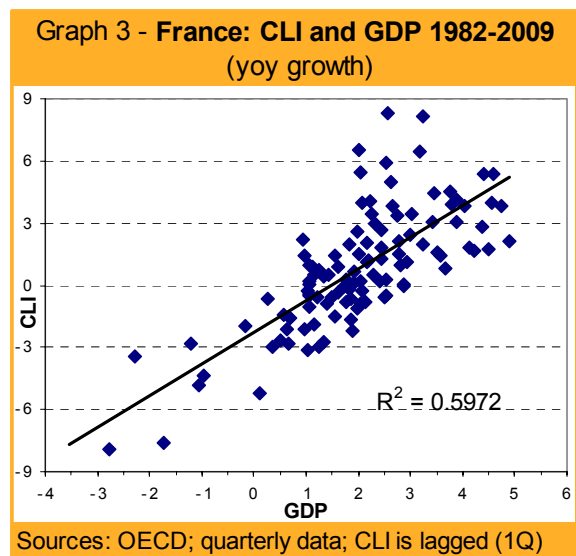
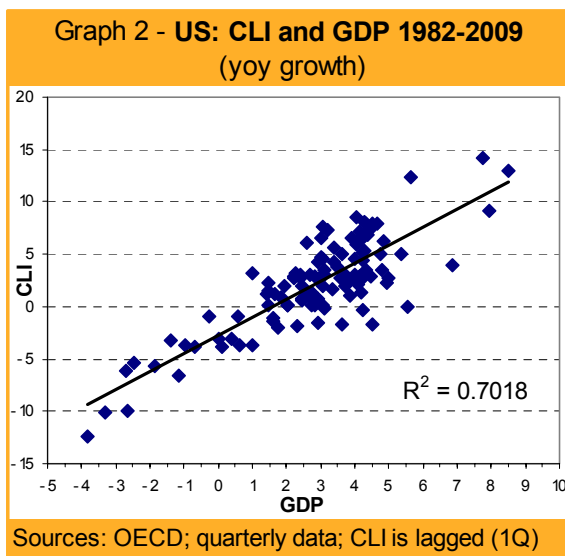
to show rising CLIs, was expanding already in Q2/09. The other two remaining countries, the US and Germany, whose CLI's bottomed in February, recorded positive quarter-on-quarter GDP growth in Q3/09 and Q2/09, respectively.

The subsequent graphs concern only the major ITC Group countries (US, France, Italy, and Spain). Graphs 2-5 show the varying degree of correlation between CLI's and GDP growth in the above countries. In the case of the US, France, and Italy the correlation is stronger when we test the relationship between GDP and the CLI of the previous quarter, while for Spain the correlation is higher with the CLI lagged two quarters. This demonstrates the leading property of CLIs. Correlation is relatively high for the US, thanks to a more solid CLI (and admittedly to more reliable statistical information), and for Spain, which - given the composition of Spain's CLI - is somewhat surprising (three out of five CLI components are qualitative survey's results). Italy performs worse probably because of the relative poorer quality of its CLI's components (particularly confidence indicators).

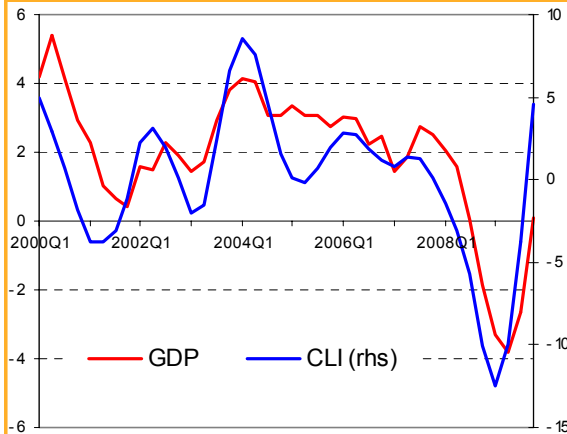
Graphs 6-13 depict the relationship between CLIs and GDP and between CLIs and industrial production. Note that for statistical reasons the OECD recommends that the year-on-year rate of change of the CLI should be compared to the year-on-year rate of change of the reference series. Given a predominance of manufacturing/industry indicators among the component series of CLIs (particularly in the case of Italy) the ability of the CLI to capture turning points in the business cycle appears much stronger for industrial production than it is for GDP. It is also evident that the amplitude in CLIs' swings is not necessarily the same as in the reference series, which strongly confirms the qualitative nature of these indicators. CLI's lead property relative to industrial production, i.e. the number of months between the turning point in CLIs and that in industrial production, is more varied. Looking at the current juncture it is just two months in the US and Spain, four months in France and Italy.

The relationship between CLIs and construction investment, housing starts and permits issued is clearly weaker than that with GDP (graphs 14-20). However, in

some cases the former have correctly anticipated cyclical turning points for the construction sector, see the US and France. The Italian case is abnormal and CLI is of little help in trying to interpret such a volatile and unstable pattern in construction developments. If we look at most recent data the indication of a turnaround also in the construction sector is rather clear in the US while it is still not evident in France and Italy. For Spain construction investment may have bottomed out in Q3/09. Note that in the Spanish case the strong contribution of construction investment to the long expansion phase of the 2000s is reflected in a relatively good correlation of CLI with construction investment. In many countries information relevant to the construction sector is limited, but CLIs seem to perform similarly to sectoral leading indicators such as housing starts or building permits (where available, e.g. 15, 17 and 20). Bearing this in mind, CLIs could be looked at as indirect indicators for construction given they track turning points in the overall economy which then translate also to the construction sector.

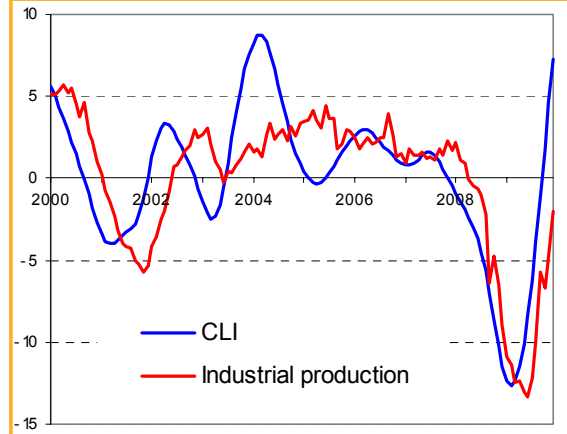


**Graph 6 - US: CLI and GDP 2000-2009**  
(yoy growth)



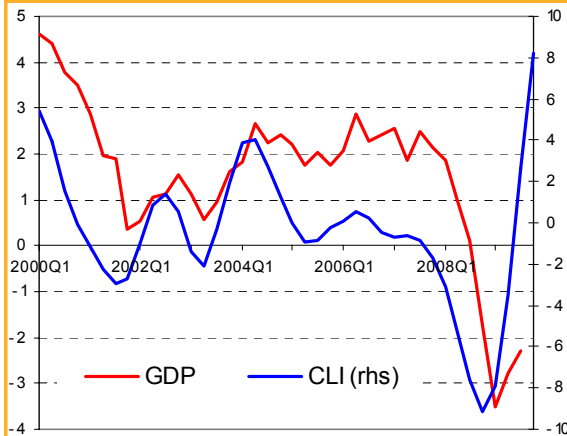
Sources: OECD; quarterly data

**Graph 7 - US: CLI and Industrial Production**  
2000-2009 (yoy growth)



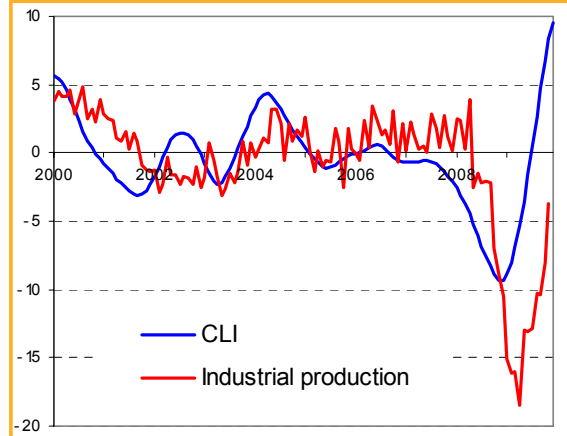
Source: OECD, monthly data

**Graph 8 - France: CLI and GDP 2000-2009**  
(yoy growth)



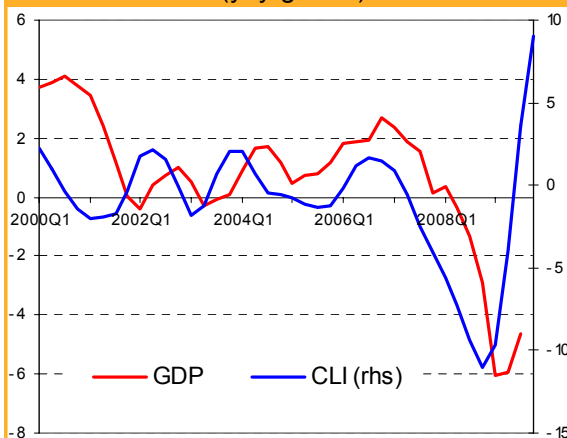
Sources: OECD; quarterly data

**Graph 9 - France: CLI and Industrial Production**  
2000-2009 (yoy growth)



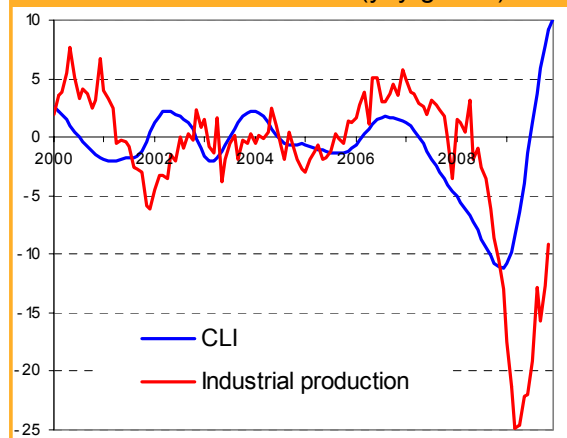
Source: OECD, monthly data

**Graph 10 - Italy: CLI and GDP 2000-2009**  
(yoy growth)



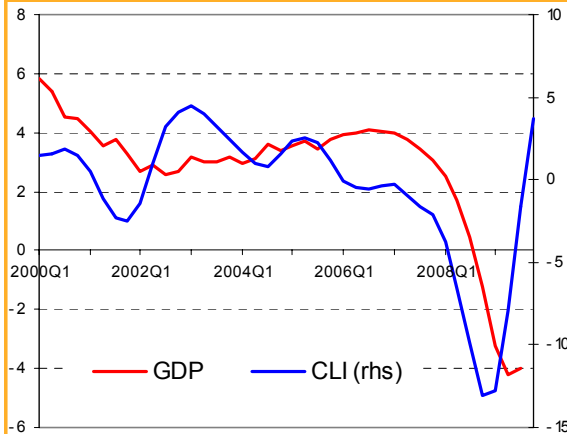
Sources: OECD; quarterly data

**Graph 11 - Italy: CLI and Industrial Production**  
2000-2009 (yoy growth)



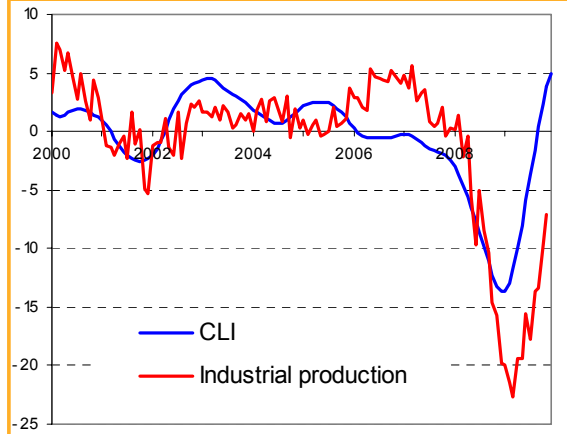
Source: OECD, monthly data

**Graph 12 - Spain: CLI and GDP 2000-2009 (yoy growth)**



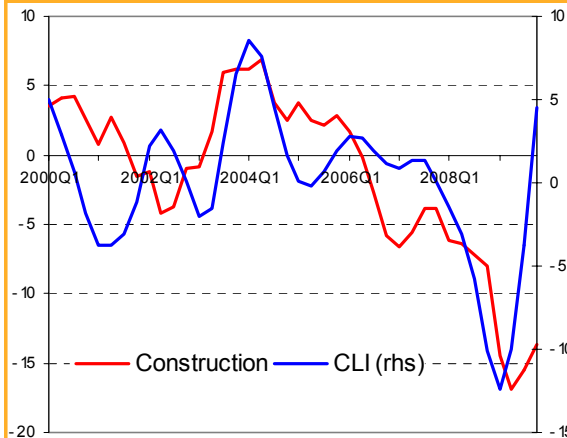
Sources: OECD; quarterly data

**Graph 13 - Spain: CLI and Industrial Production 2000-2009 (yoy growth)**



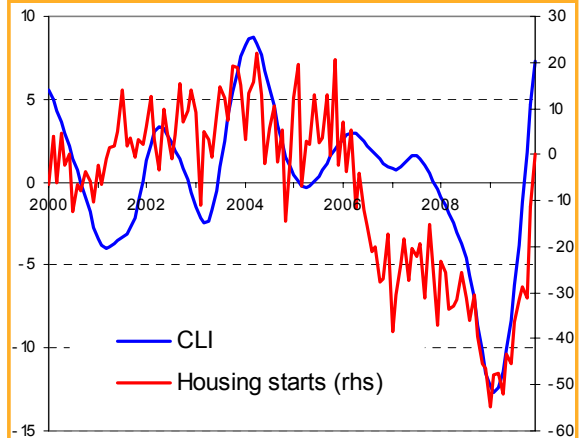
Source: OECD, monthly data

**Graph 14 - US: CLI and Construction Investment 2000-2009 (yoy growth)**



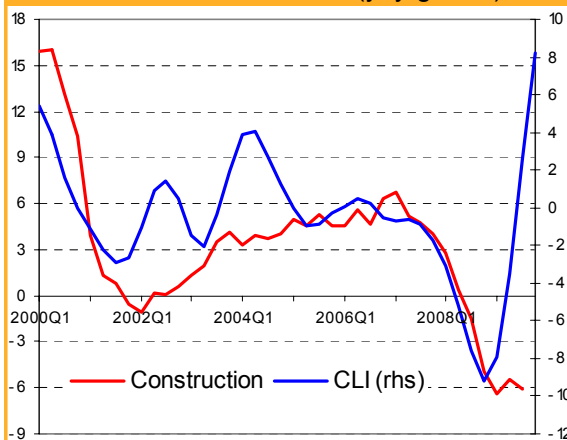
Sources: OECD; quarterly data

**Graph 15 - US: CLI and Housing Starts 2000-2009 (yoy growth)**



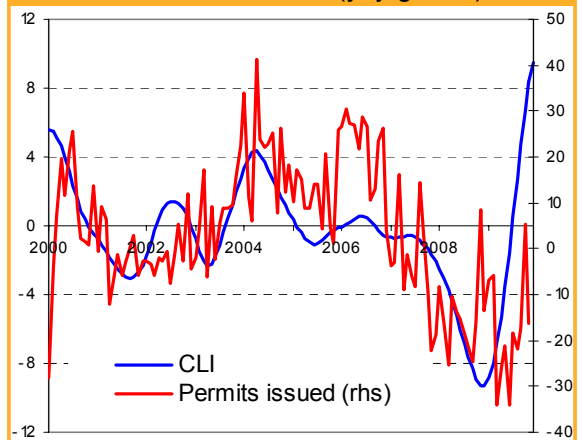
Sources: OECD; monthly data

**Graph 16 - France: CLI and Construction Investment 2000-2009 (yoy growth)**



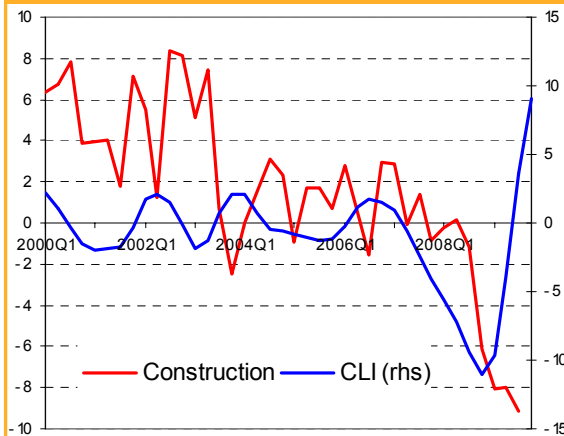
Sources: OECD; quarterly data

**Graph 17 - France: CLI and Residential Permits 2000-2009 (yoy growth)**



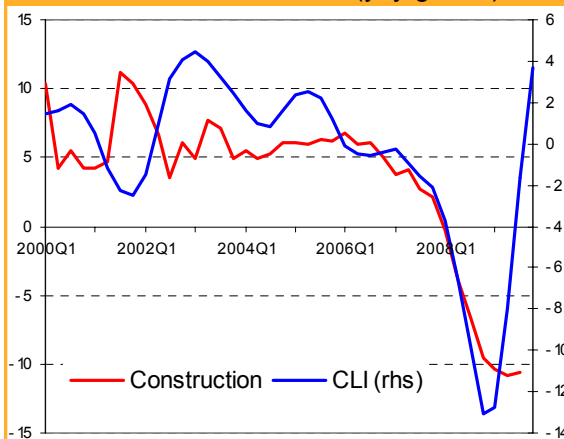
Sources: OECD; monthly data

**Graph 18 - Italy: CLI and Construction Investment 2000-2009 (yoy growth)**



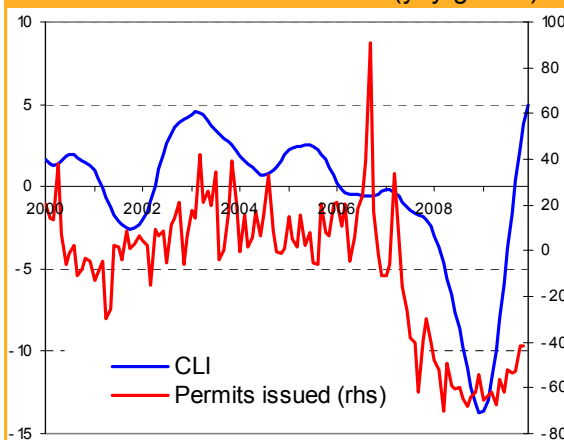
Sources: OECD; quarterly data

**Graph 19 - Spain: CLI and Construction Investment 2000-2009 (yoy growth)**



Sources: OECD; quarterly data

**Graph 20 - Spain: Residential Permits and Construction Inv. 2000-2009 (yoy growth)**



Sources: OECD; monthly data

## 4. Concluding Remarks

The purpose of this short note is to make the OECD composite leading indicator look less exoteric to our readers, who regularly see them in our Economic Profile series, and often also in the general press and media, given that they appear some times “mis-used”.

We have shown that this indicator conveys a qualitative reading on incoming turning points in the business cycle. No quantification may instead be inferred from them, so that any cross-country comparison in terms of magnitude makes no sense whatsoever. In addition, the composition of CLIs is country-specific which makes them more or less accurate by country. Looking at historical series CLIs tend to be good anticipators of turning points in industrial production, although the time lead is rather uncertain, while the relationship with GDP cycles may be somewhat weaker. To the extent that construction activity is not uncorrelated with the overall economic cycle, the cyclical information provided by CLIs could be extended to all economic sectors, including construction; cycles in the latter could however be longer than in – hence, disentangled from – other sectors.

In conclusion, CLI represent a useful tool, taking however into account all the above *caveat*.