



Third International Seminar on Early Warning and Business Cycle Indicators

**17 – 19 November 2010
Moscow, Russian Federation**

Russian Cyclical Indicators: Their Usefulness in ‘Real Time’

**Sergey Smirnov
Higher School of Economics, Moscow, Russia**

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Session 3:
Composite Indicators

Russian Cyclical Indicators: Their Usefulness in ‘Real Time’

Sergey V. Smirnov

Higher School of Economics, ‘Development Center’ Institute. Moscow, Russia

Abstract

For years anyone interested in Russia had access to a full set of common tools for business cycle analysis: several versions of Composite Leading Index, a Purchasing Managers' Index, Enterprise and Consumer Sentiment Indexes, etc. However the recent world crisis has spread throughout Russia quite unexpectedly for most politicians, businessmen and experts alike. Is it possible that none of existing indexes were able to say anything about the approaching decline? In reality this is not the case. So then why did a more or less definite forecast provided by some indexes have no consequences for common economic sentiments in Russia? The paper gives some answers for this question.

Key Words: Cyclical Indicators, Leading Indicators, Russia

JEL Classification: E32 - Business Fluctuations; Cycles

1 Introduction

For years anyone interested in Russia had access to a full set of common tools for business cycle analysis: several versions of Composite Leading Index, a Purchasing Managers' Index, Enterprise and Consumer Sentiment Indexes, etc. However the recent world crisis has spread throughout Russia quite unexpectedly for most politicians, businessmen and experts alike. Is it possible that none of existing indexes were able to say anything about the approaching decline? In reality this is not the case. So then why did a more or less definite forecast provided by some indexes have no consequences for common economic sentiments in Russia?

There are several reasons for this.

First is that during a long period of economic expansion there were few chances to calibrate leading indexes for their real leading qualities. So, when some of them began to signal future decline (of course, the various indexes did this with variable clarity) there was no reason to trust any particular indicator more than the other. Now, more than two years after the pre-crisis peak and a year and a half after the last trough, it is time to compare the predictive powers of various cyclical indicators and choose the best ones.

The second reason has to do with more than just formal statistical criteria. Contemporary economic life is measured in days and hours, but most usual economic indicators have inevitable lags of months and sometimes quarters. Moreover, the real-time picture of economic dynamics may differ in some sense from the same picture in its historical perspective (because all fluctuations receive their proper weights only in the context of the whole). Therefore it's important to understand if monthly leading indicators are really capable of providing important information to decision-makers in Russia.

The next part of the article describes all leading indexes available in Russia and reveals five of the most suitable for practical usage (including one proposed by the author). These indexes' predictive power is discussed afterwards. The final section outlines usefulness of various cyclical indicators in Russia and prospects for their practical use. In this context the need of some weekly leading indicator is discussed.

2 Composite Cyclical Indicators for Russia

2.1 A Full Spectrum of Composite Cyclical Indicators for Russia

The full list of available Russian cyclical indicators is shown in Table 1.

Table 1 Russian Composite Cyclical Indicators

Indicator	Producer	Fatal Shortcomings
Purchasing Managers' Index (PMI)	Markit Economics	No
Composite Leading Index (CLI)	OECD	No
Composite Leading Index (CLI)	Development Center (DC)	No
Composite Leading Index (CLI)	Institute of Economy (IE), Russian Academy of Science	Figures never published
Industrial Confidence Indexes (ICI)	Higher School of Economics (HSE)	No

Indicator	Producer	Fatal Shortcomings
Industrial Confidence Indexes (ICI)	Rosstat	Too short comparable time-series for comparison. Cyclical trajectory is quite similar to ICI's by HSE
Industrial Optimism Indexes (IOI)	The Institute for the Economy in Transition (IET)	No
Leading GDP Indicator	Renaissance Capital - New Economic School (RenCap-NES)	Too short of a history. The indicator's form (GDP forecasts for a pair of quarters) rules out any ordinary comparisons with monthly cyclical indicators
Business Activity Index (BIF)	"Finance." (one of Russian business journals)	Irregular news-releases. Too large of a publication lag (up to 3 months).
Business Activity Index (The Barometer)	"Business Russia" Association ("Delovaya Rossiya")	Too tangled methodology. Incomparability of neighboring observations. Short history.
Business Activity Index	The Russian Managers Association & Kommersant Newspaper	Too tangled methodology. Discontinued in April 2009.

Source: Smirnov (2010)

A brief overview of this information suggests that only five out of eleven cyclical indicators for Russia are meaningful for evaluation and comparison with each other. They are: PMI by Markit; CLI by OECD; CLI by DC; ICI by HSE; IOI by IET. All others are not fully suitable for business cycle monitoring simply because there are no available, comparable, and regularly published monthly figures for them.

All available composite cyclical indicators for Russia are described in details in Smirnov (2010). Here we will focus only on five indicators that are suitable for forecasting cyclical turning points from a practical point of view.

2.2 Five Most Useful Composite Cyclical Indicators for Russia

2.2.1 Composite Leading Index (CLI) by OECD

OECD is well known as an authoritative producer of CLI's for various countries and regions. Russian CLI is the only one of 42 OECD's indexes constructed by unified methodology which is well documented and doesn't need any additional description. But since components of a CLI for each country are different, we will focus on this particular point.

From April 2006 the list of components of the Russian CLI included the following five:¹

- Order books in manufacturing: level (% balance, sa)

¹ See Nilsson (2006), p.11.

- Stock prices: RTS index (2000 = 100)
- World market price crude oil (2000 = 100)
- Monetary aggregate M2, sa
- Foreign trade balance (f.o.b – c.i.f.), sa

We couldn't find the exact moment when one additional indicator was introduced:

- Level of finished goods stocks (inverted).

In February 2010 the Russian CLI (as well as some others) was revised. First three of its components were retained, but the last three were replaced by:²

- US imports from Russia (inverted);
- Production trend observed in manufacturing in recent months (% balance, sa);
- Assessment of present level of export order-books in manufacturing (% balance).

As a source of BTS data OECD began to use polls by the Institute for the Economy in Transition (IET) instead of the Centre for Economic Analysis (CEA). Since then the trajectory of OECD's Russian CLI has changed significantly. Before this it had changed substantially in December 2008, after modification of the OECD's procedure for all CLI calculations.³ It had also changed slightly every month as a result of seasonal adjustments and re-estimations with one more observation.

In Figure 1 several consecutive revisions of Russian CLI by OECD are plotted against official estimate of Y-o-Y outputs' growth rates for "basic" branches of economy.⁴

OECD publishes all its CLI's between 5-th and 11-th of a month, around 35-40 days after the end of the month in question. Russian CLI was released for the first time in April 2006.⁵ Now it is published in two forms: "trend restored" and "amplitude adjusted" (an index numbers "2005=100" and "long-term trend = 100", respectively). Since the end of 2008 the OECD's headline indicator is the amplitude adjusted CLI. It allows to identify four qualitatively different cyclical phases:

- expansion - CLI increasing and above 100;
- downturn - CLI decreasing and above 100;
- slowdown - CLI decreasing and below 100;
- recovery - CLI increasing and below 100.

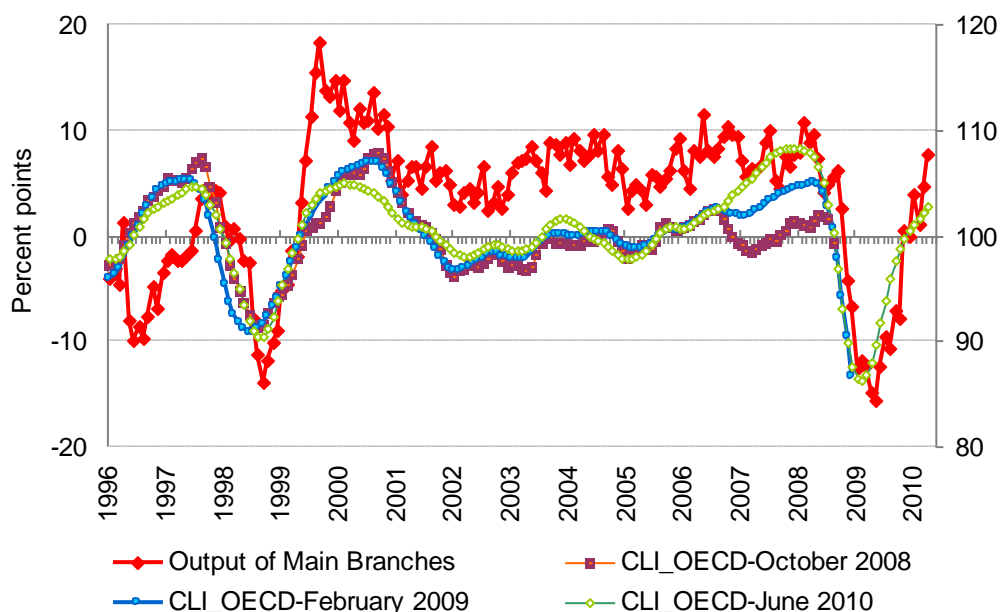
² For historical drift in the list of Russian OECD CLI's components see: Kitrar et al (2003), Nilsson and Brunet (2006), Nilsson (2006), OECD (2010).

³ Gyomai and Guidetti (2008).

⁴ The "basic" branches are the following: agriculture; mining; manufacturing; electricity and public utilities; construction; transportation; retail trade; wholesale trade. In the remaining part of our paper all other cyclical indicators are also plotted against these growth rates for main branches of the economy.

⁵ We mean the beginning of regular monthly publications. Very preliminary calculations were first published in 2003. See Kitrar et al (2003).

Figure 1 OECD Amplitude Adjusted CLI's for Russia



Sources: Rosstat; OECD

2.2.2 CLI and Other Cyclical Indicators by The Development Center (DC)⁶

The system is based on the concept of “growth cycles” and includes not only leading, but also coincident and lagging composite indicators as well.

For coincident indicators, indexes of physical output for the following sectors are taken:

- Mining;
- Manufacturing;
- Agriculture;
- Construction;
- Freight transportation;
- Retail trade;
- Paid services.

These industries account for about half of Russia's GDP. The weighted average Y-o-Y % changes of these seven indexes can be quite adequately used as the *Composite Coincident Indicator (CCI)*. It is available on a monthly basis with just a three week delay after the end of each month, while GDP is calculated only on a quarterly basis and has a two or three month lag after the end of each quarter.

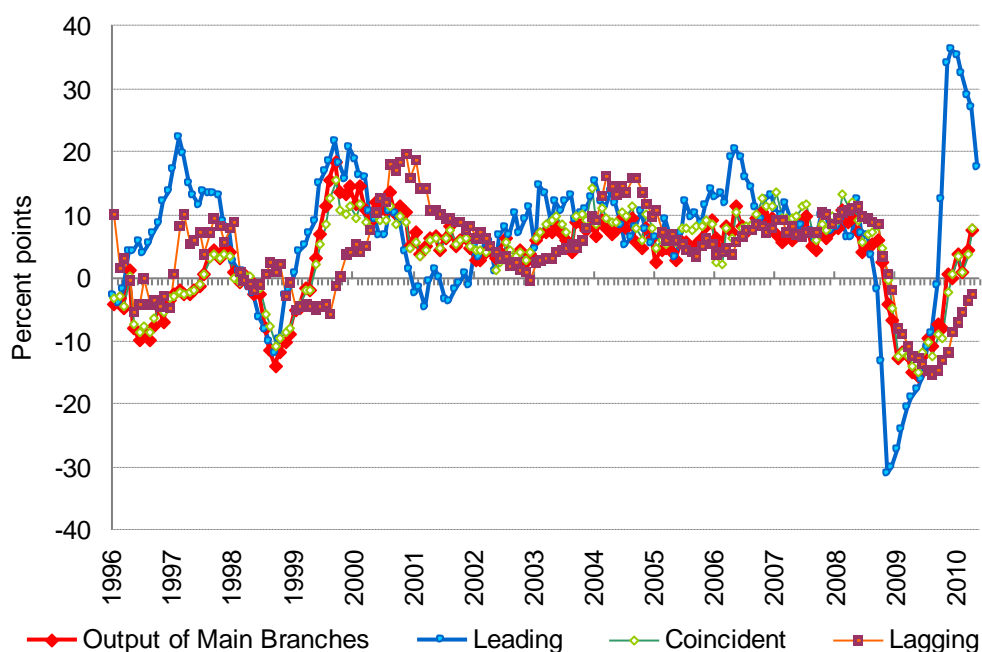
For leading indicators, we use the following seven series:

⁶ For the first version of this system see the author's paper at the 28-th CIRET Conference: Smirnov (2006).

- Average monthly price of Urals brand crude oil;
- The ratio of enterprises facing increased or stable domestic demand (IET Surveys);
- The ratio of enterprises having no excessive inventories of finished goods (IET Surveys);
- Nominal money aggregate M2;
- The (reverse) index of the real effective exchange rate of a ruble against a basket of currencies of Russia's trade partners (calculated by the Bank of Russia);
- The RTS stock price index;
- Interbank interest rates (MIACR-overnight)

The *Composite Leading Indicator (CLI)* is calculated as a weighted average Y-o-Y % change of these variables (Y-o-Y differences of some variable is expressed in percent points).

Figure 2 Composite Cyclical Indexes by the Development Center (DC)



Sources: Rosstat; The Development Center

For lagging indicators, we take the following six items:

- Average price of dwelling space per 1 square meter in Moscow (in US\$);
- Number of imported autos;
- Number of officially registered unemployed (in reciprocal form);
- Fixed capital investments;
- Credits to enterprises and organizations (as a % of total assets of banking sector);
- Foreign currency reserves of the Bank of Russia (excluding gold).

The *Composite Lagging Indicator (CLGI)* is calculated as a weighted average Y-o-Y % change of these variables.

The system of cyclical indicators by the Development Center was first introduced in May 2006.⁷ Since then only three minor revisions of the methodology took place: one variable was deleted and two replaced by the others.⁸ The indexes are published monthly with average publication lag of 10-15 days for CLI and 40-45 days for CCI and CLGI.

2.2.3 Purchasing Managers' Index (PMI) by Markit Economics

Another well known cyclical indicator is the Purchasing Managers' Index. Markit Economics calculates these indexes for 26 main countries and key regions and Russia is one of them. The method for constructing the indexes is universal for all countries.⁹ Manufacturing PMI is based on a poll of around 300 Russian purchasing managers from this sector which were asked to compare current situation at their unit with the situation one month before. There are five parameters for comparison:

- new orders received (0.30);
- production/output (0.25);
- employment (0.20);
- suppliers' delivery times, volume weighted (0.15)¹⁰;
- stocks of purchases, in units (0.10).

Based on the answers for each of these questions a diffusion index is calculated as a sum of all positive ("improvement/increase") and half of neutral ("no-change") answers in percent to the whole number of respondents. After seasonal adjustments, five diffusion indexes are averaged into the composite PMI with the weight shown in brackets. If 100% of the survey panel report an "increase", the index would read 100. If 100% reported "decrease" the index would read 0. Thus, the index equal to 50 corresponds to a "no change" situation in manufacturing, more than 50 - to growth, and less than 50 to a decline in this sector.

A PMI for Services is one more indicator calculated by Markit for Russia. It uses similar methodology though slightly different wording of questions. Also the GDP Indicator is derived from PMI surveys of business conditions in the manufacturing and service sectors of Russia by weighting together the output measures from these surveys.

Manufacturing PMI has been calculated since September 1997, Services PMI and GDP indicator since October 2001. All of these indexes are published monthly: manufacturing PMI – on the first

⁷ For six years before 2006 we had used a CLI with another set of components. For details see Smirnov (2000, 2002).

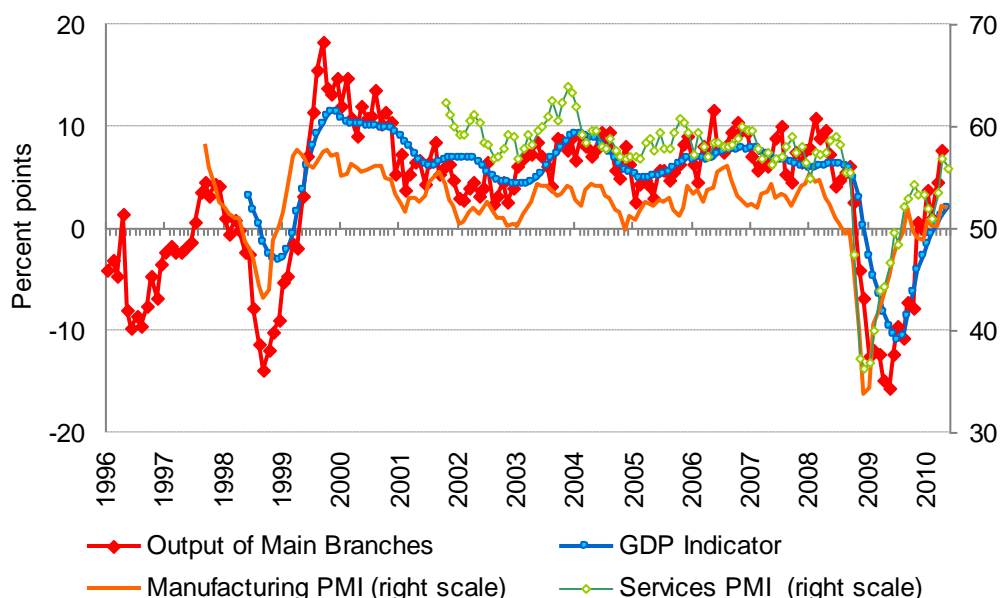
⁸ Non-weighted average of three indexes of physical output (for trucks, lumber, synthetic resins and plastics) did not work as a leading indicator and was deleted in January 2008. Average price of domestic car VAZ-2110 charged by five large-scale Moscow dealers (in US\$) was replaced by a number of imported autos in December 2007; money aggregate M2X which includes both ruble and foreign currency components was replaced by ruble money aggregate M2 in August 2008.

⁹ For details, see Markit Economics (2010). For years Russian PMI was usually named "the VTB Capital PMI" as the Russian company "VTB Capital" was the sponsor of this product. Since Summer 2010 it got a new sponsor – HSBC; so, now it is called "HSBC Russia Manufacturing PMI".

¹⁰ The Suppliers' Delivery Times diffusion index is inverted to move in a comparable direction.

working day of a month following the month under consideration, other indexes on the third and fourth working days. Usually there are no revisions to PMI's after first publication.¹¹

Figure 3 Manufacturing & Services PMI's for Russia



Sources: Rosstat; Markit Economics

2.2.4 Industrial Confidence Indexes by Higher School of Economics

Industrial Confidence Index (ICI) by HSE is often seen as one harmonized with European Commission's methodology.¹² It's based on answers of top-managers of about 600 "main" industrial plants to the following three questions:

- How do you expect your production to develop over the next 3-4 months? It will...: increase/ remain unchanged/ decrease;
- Do you consider current overall demand for your production (order books) to be...?: more than sufficient (above normal)/ sufficient (normal for the season)/ not sufficient (below normal);
- Do you consider your current stock of finished products to be...?: too large (above normal)/ adequate (normal for the season)/ too small (below normal)

The questionnaire was adapted for Russia by the Centre of Economic Analysis in 1995. This Centre estimated the seasonally adjusted ICI until July 2009. Since August 2009 this project was relocated to the Higher School of Economics.

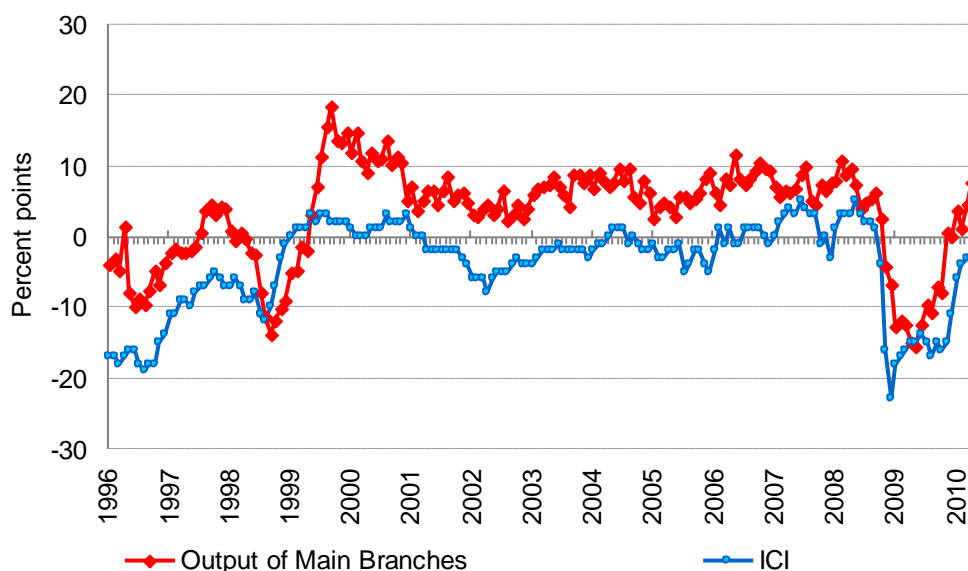
The ICI equals a simple arithmetic average of balances (differences between "positive" and "negative" answers, all in percentage points); the last of three balances is taken with inverted sign. The ICI's value more than zero means increase of confidence in industry, value less than zero means

¹¹ This is, in fact, quite surprising as any procedure of seasonal adjustment requires some re-estimations from time to time.

¹² European Commission (2007).

decrease of confidence. Theoretically a value of ICI may fluctuate between -100 and +100, when in fact the range is much narrower.

Figure 4 Industrial Confidence Index by HSE



Sources: Rosstat; Higher School of Economics (HSE)

There are similar confidence indexes by HSE for three other sectors of Russian economy (construction, retail trade and wholesale trade) but up until this moment they are quarterly, not monthly. Since then it makes little sense to use them in real-time analyses of business cycle.

The ICI by HSE is published monthly, before the 5th working day of a next month.¹³

2.2.5 Industrial Optimism Index by the Institute for the Economy in Transition (IET)

The IET has been conducting surveys of industrial enterprises (around 700-800 per month) since March 1992 but introduced its Industrial Optimism Index only in the end of October 2008. Before this they preferred to analyse all variables in the questionnaire separately, without combining them into a single number. But the beginning of the most acute phase of the last crisis has changed their minds, as it fueled common interest for this special kind of statistical information.

The Industrial Optimism Index is calculated as a simple average of four "balances":

Change of demand comparing with the previous month: % growth - % decline (sa);

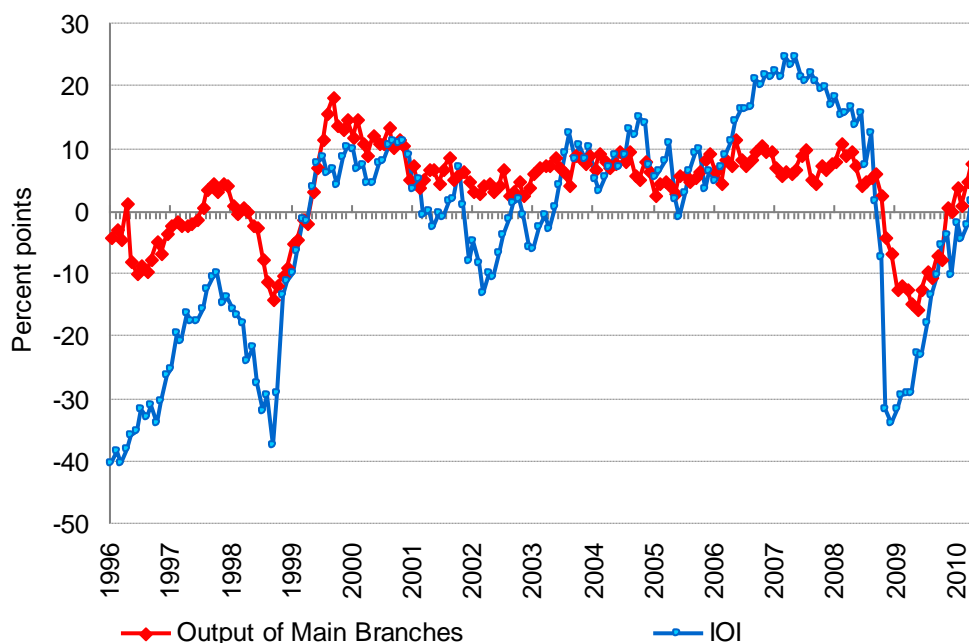
Demand assessments: % above normal + % normal - % below normal:

- Finished goods inventories: % above normal + % normal - % below normal (with inverted sign);
- Physical output, anticipated changes for the next 2-3 months: % growth - % decline (sa).

¹³ See: <http://www.hse.ru/news/monitorings/>.

The IOI may vary between -100 and +100. At the moment of introduction it was calculated back up until January 1995. Ordinary figures are usually published after 25th of the current month on the IET site.¹⁴

Figure 5 Industrial Optimism Index by IET



Sources: Rosstat; The Institute for the Economy in Transition (IET)

3 Russian Cyclical Indicators: Qualitative Comparisons

3.1 Some preliminary considerations

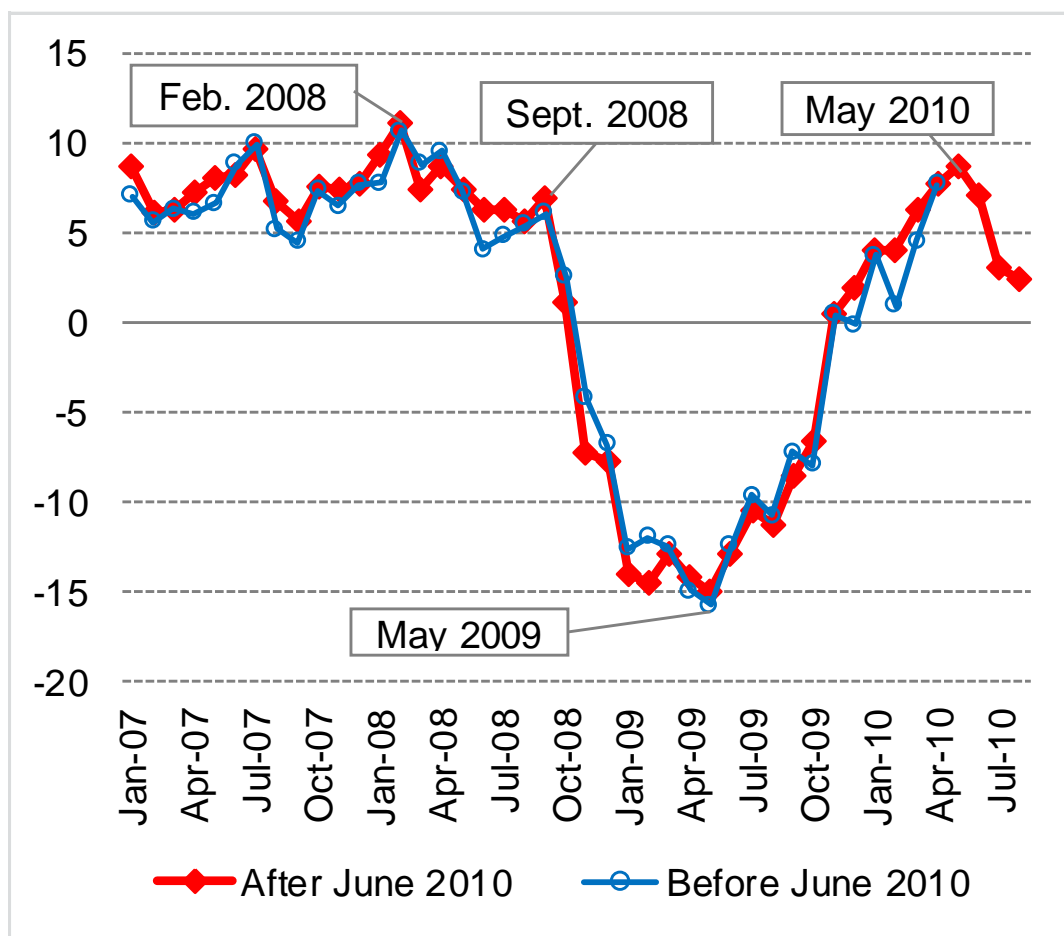
In this section the main question for us can be formulated in the following way: “Was it actually possible to predict a turning point some months before it occurred – relying on the dynamics of one or another leading indicator?”

Before answering we must make four more or less technical remarks. First, all our calculations are based on the concept of ‘growth rate cycles’ (not classic ‘business cycles’). Second, Y-o-Y percent changes (‘a month to the same month of the previous year’) are considered as an indicator of growth rates. Thus, all extremely complicated problems related to seasonal adjustment procedures (they are not fully solved for Russia yet) are avoided. Third, for all comparisons official ‘basic branches of economy’ index by Rosstat is used as a proxy for coincident cyclical index (CCI). And at last, all our calculations are limited to 2007-2010 - the years of the last crisis and neighboring. No ‘real time’ comparisons for the previous Russian crisis (1998) are meaningful as in fact three of our five indicators were introduced only after 2000.

¹⁴ See: http://www.iet.ru/index.php?option=com_bibiet&Itemid=50&catid=298&lang=en&task=showallbib.

The dynamic of basic branches' output is plotted on Figure 6. One can see three definite critical points: September 2008 (the last month from the 'horizontal trend' period, or pre-crisis peak); May 2009 (the bottom or the trough of the crisis); May 2010 (the post-crisis peak in growth rates). One should also keep in mind that information about each month became available one month later. For example, in the end of October 2008 (which was definitely crisis month), one could learn that only (because of two months lag) in August growth rate of basic branches had *risen* (and according to the 'real-time' information it had risen for the second month in a row). This is really not a very valuable piece of information for any kind of forecasting!

Figure 6 Output of Basic Branches (2007-2010), Y-o-Y % Change



Source: Rosstat

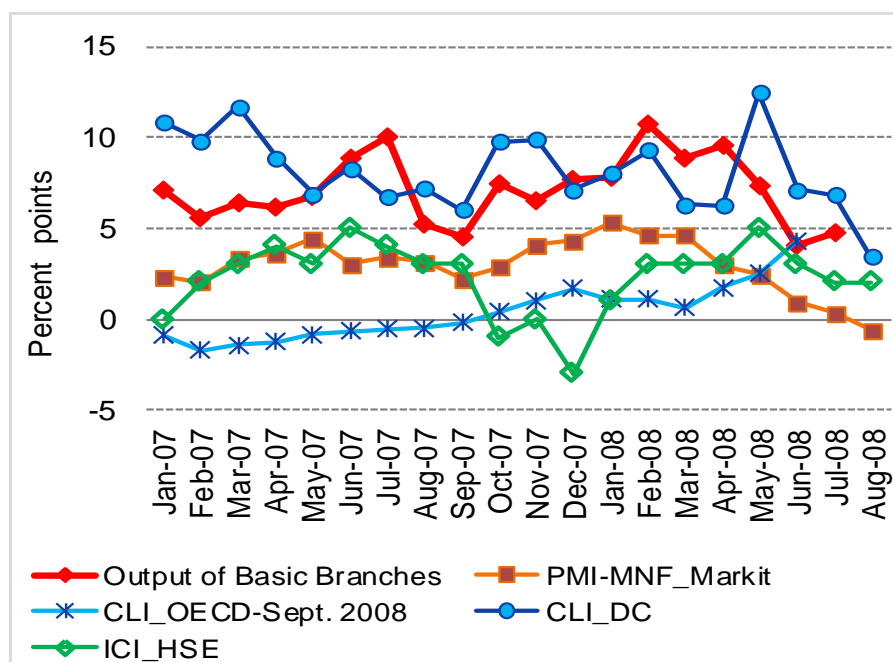
3.2 What the main cyclical indicators have told about the recent crisis?

Now let's look at the situation as it appeared at various moments in the past, namely in mid September 2008 (just before Lehman Brothers' collapse); February 2009 (near the trough); July 2009 (shortly after the trough); April 2010 (before the post-crisis peak); and October 2010 (last month for which all regular vintages of statistics are available).¹⁵

¹⁵ To simplify graphic comparisons we deducted 50 from PMI and 100 from OECD's amplitude adjusted CLI.

In mid September 2008 'an observer' could see (as on Figure 7) that the macroeconomic dynamics have not yet showed clear indications of decline: in July percent Y-o-Y change of basic industries' output increased.

Figure 7 Cyclical Dynamics as It Appeared in September 2008



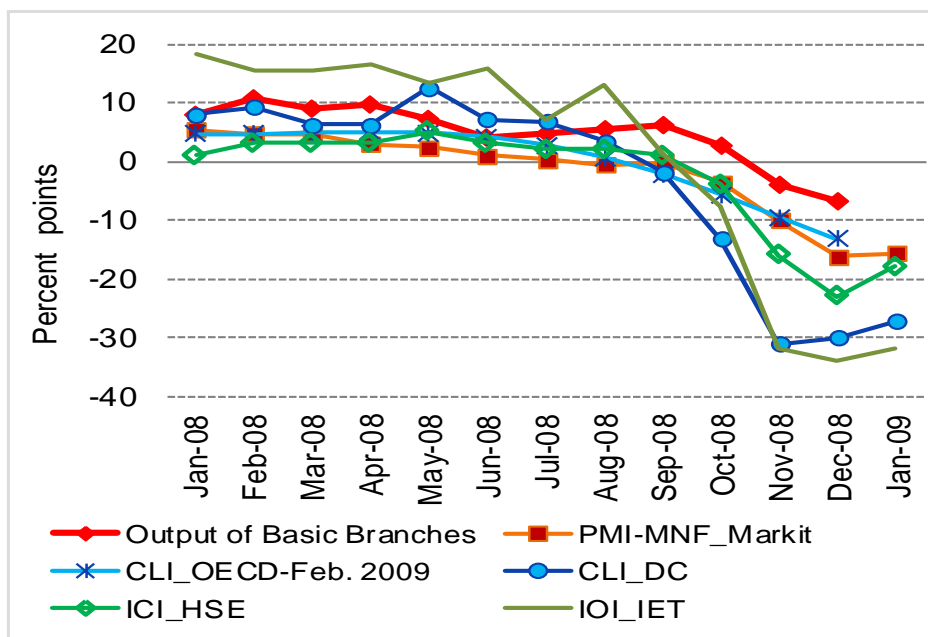
Sources: Rosstat; Markit Economics; OECD; DC; HSE

The only cyclical indicator which showed undeniable signs of an approaching crisis was PMI by Markit: although the August figure was just slightly below the critical level, this happened for the first time in almost ten years. Forecasting crisis using CLI by DC was much more risky: the drop in August was quite sharp but only a month long fall did not seem enough to warn of recession. The evolution of ICI by HSE did not permit to forecast the forthcoming fall of production: although this indicator has decreased for three months (in June-August 2008) the depth of the drop in the fourth quarter of the previous year was much more prominent but wasn't followed by any output contraction.¹⁶ On the contrary CLI by OECD was misleading as it grew until June 2008 (the last point available at the time) and the fifth indicator (IOI by IET) was not yet introduced.

In mid February 2009 a decline of basic branches' output looked quite definite (see Figure 8) but CLI by DC (especially), ICI by HSE and may be IOI by IET showed a possibility of an approaching turning point (the first indicator had two months of increasing growth rates in its record to the date). PMI by Markit rather pointed to stabilization of growth rates and CLI by OECD continued to fall.

¹⁶ One can notice that the OECD's indexes have one specific disadvantage: due to calculation and publication lags they fall behind other indicators for one month at any moment..

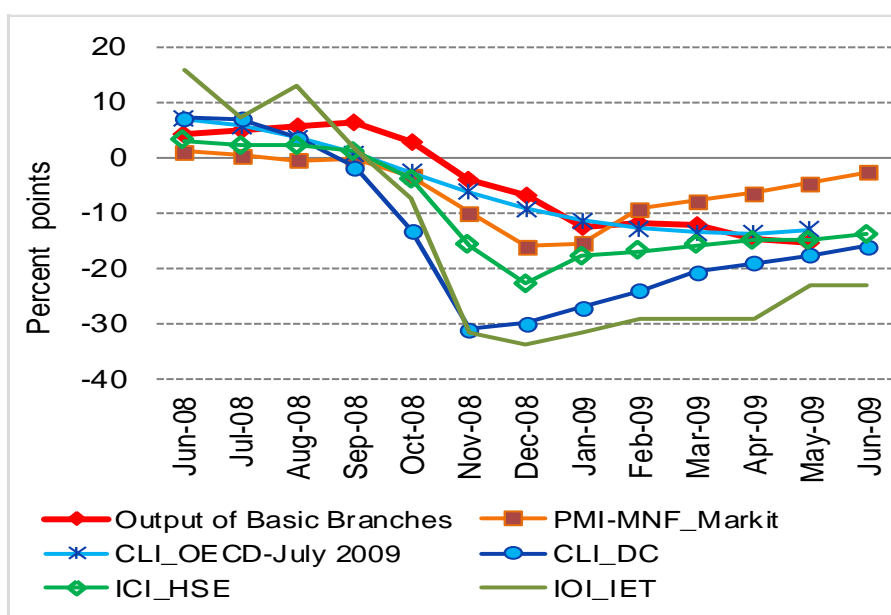
Figure 8 Cyclical Dynamics as It Appeared in February 2009



Sources: Rosstat; Markit Economics; OECD; DC; HSE; IET

In mid July 2009 growth rates of main branches' output was known only for May and they continued to fall (see Figure 9). At the same time, almost all leading indicators showed an ascending trend with the only exception being CLI by OECD which have stabilized up to this moment. Therefore the probability of a "trough" appeared to be very high.

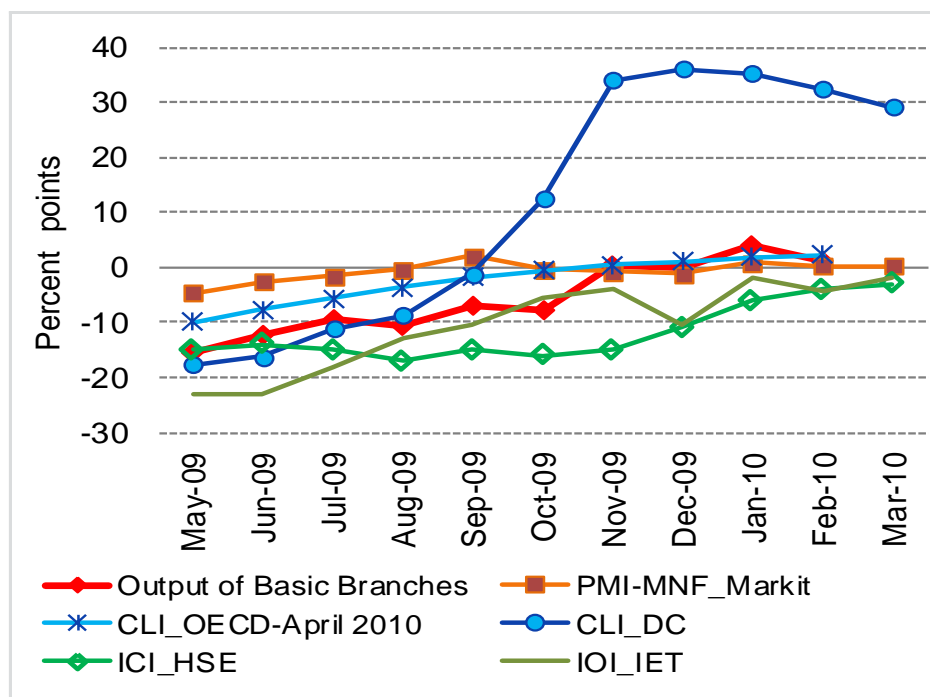
Figure 9 Cyclical Dynamics as It Appeared in July 2009



Sources: Rosstat; Markit Economics; OECD; DC; HSE; IET

In mid April 2010 only CLI by DC shows a turning point. All others indicate stabilization or further increase in growth rates (see Figure 10).

Figure 10 Cyclical Dynamics as It Appeared in April 2010



Sources: Rosstat; Markit Economics; OECD; DC; HSE; IET

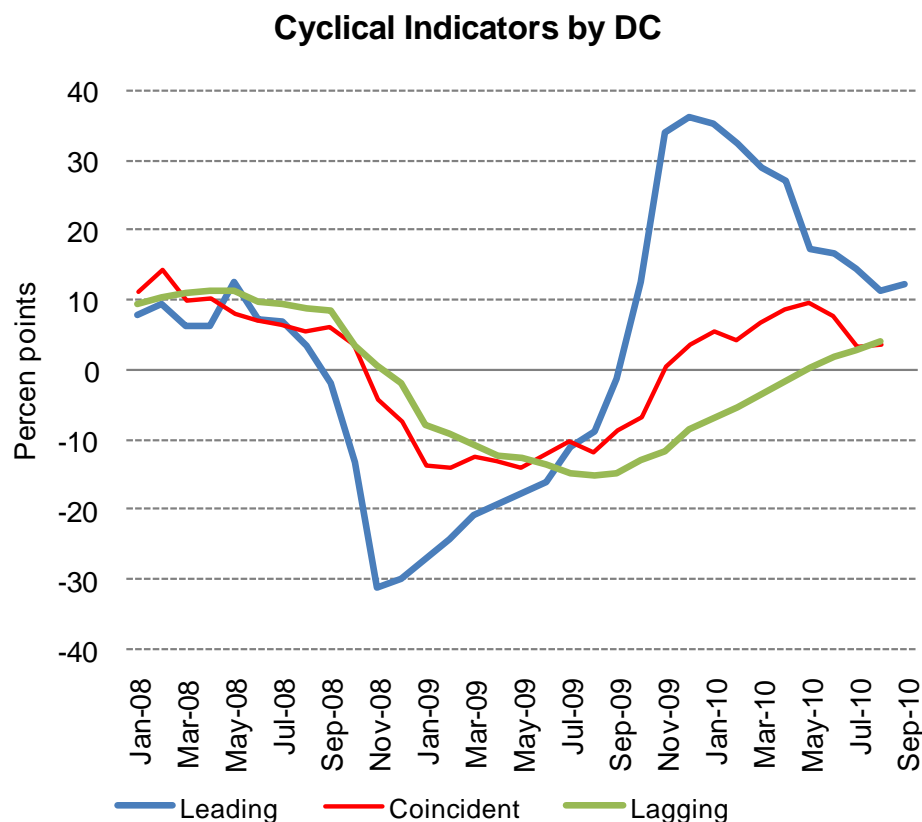
3.3 What Cyclical Indicators were Useful for Predicting Turning points in 2008-2010? A summary.

Was one or the other indicator useful in forecasting approaching turning points at different phases of the crisis? The answers to this question are summarized in Table 2.

Table 2 Was an Indicator Useful to Forecast Approaching Turning Point?

Indicator	Sept. 2008	Febr. 2009	July 2009	April 2010
PMI by Markit	Yes	Barely	Yes	No
CLI by OECD	No	No	Barely	No
CLI by DC	May be	Yes	Yes	Yes
ICI by HSE	No	May be	Yes	No
IOI by IET	Not introduced	May be	Yes	No

One could pay attention to the three and a plus 'Yes' for CLI by DC and three and a plus 'No' for CLI by OECD. Other leading indicators are more or less useful but their track records are not very impressive. At the same time the trajectory of CLI by DC during this crisis looks as if it was taken from a textbook: the leading indicator leads the economy and the lagging indicator lags behind it (see Figure 11). Of course there is no guarantee that this will be ongoing.



4 Russian Cyclical Indicators: More Formal Comparisons

More formal comparisons of cyclical indicators are highly complex for two reasons. First, they those indicators are *not* designed for forecasting growth rates *per se* but only *turning points* in growth rates cycles. Since then, all ordinary measures of similarity between two time-series (like SSE, partial correlations, etc.) are inappropriate: two indicators may have quite different slopes of trajectories but are alike turning points (and *vice versa*). Second, and most important: if one analyses 'real-time' prediction power of an indicator which is *usually revised* he can't use any single statistical measure for a 'final' time-series because there is no 'final' one: it will be changed in the next month. In some sense a researcher has not a single indicator in sequential moments of time but different indicators for each moment. For example an indicator *A* may be better than indicator *B* for moment *t* and month of revision *i* but worse for the same *t* and different month of revision *j*.

Taking this into account we tried a very simple method for quantitative comparisons of various composite cyclical indicators. In Table 3 one can see a number of months (from 6 months span *before* each turning point) when a cyclical indicator changed in proper direction ('down' before a peak and 'up' before a trough). For example PMI by Markit had decreased all 6 month before September 2008 (March - August 2008); CLI by OECD – 1 months, etc. In the last column an average for all

observations is given.¹⁷ If this average is equal to 1 then the respective indicator *always* changes in proper direction, if an average is equal to 0 then the indicator *never* changes in proper direction.

Table 3 Proportion of Changes in 'Proper' Direction Before Turning Points

Indicator	Sept. 2008 (peak)	May 2009 (trough)	May 2010 (peak)	Average ¹
Output of Basic Branches	3	0	2	0.28
PMI by Markit	6	4	4	0.78
CLI by OECD	1	0	0	0.06
CLI by DC	5	5	4	0.78
ICI by HSE	4	4	0	0.44
IOI by IET	-	4	2	0.50

Notes: 1. See explanations in the text.

Once again, CLI by DC and PMI by Markit is among the leaders: in around 75% of events they properly predict a forthcoming turning point. On the contrary, CLI by OECD is among the outsiders: as a rule it gives no useful information for predicting turning points in real-time. This is quite unexpected because this indicator has a good trajectory when you look back. But as our formal and informal analyses showed it says almost nothing when you are looking for an early sign of a turning point. Maybe an "excessive" time-series smoothing is the main reason for this failure.

5 Conclusions

Two years have passed since the beginning of the Russian crisis and one still couldn't say with certainty what leading composite index is worthy enough to be trusted. This might be the cause for pessimism. Another reason for pessimism is that during the most acute phase of crisis monthly periodicity of an indicator is too infrequent and weekly figures are surely preferable. But these weekly indicators (and to be honest, monthly indicators as well) have almost no interest for private and government's experts during the usually long periods of steady economic growth.¹⁸

On the other hand, some composite cycle indicators do contain useful leading information. Since then, more efforts must be utilized for construction and careful calibration of various leading indexes, monthly as well as weekly. Current crisis is a very suitable period to perform this task.

And finally. To our mind a similar audit of leading indicators for large countries (for example, for United States, Germany and some others) will be of great interest and of practical use.

¹⁷ As a rule 18 observations (one 6-months span for each of 3 turning points) but 12 observations for IOI by IET.

¹⁸ In October 2008 – November 2009 in respond to common interest IET produced its IOI figures weekly. Then it preferred mostly bi-weekly release schedule, and now gradually returns to monthly schedule. No demand, then no supply!

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