BANCA D'ITALIA
EUROSISTEMA

The macroeconomic developments in China: the statistical challenges

Francesco Zollino (jointly with Marco Marini, ISTAT)

Bank of Italy – Economic Outlook and Monetary Policy Research

The Chinese economy

25-27 November 2010

Venice International University – Isola di San Servolo

Outline of the talk

"…*numbers are reality and anything not in numbers is not in reality*"

Pitagora – VI BC

- Motivation: economic growth vs progress in statistics in China
- Generals on the Chinese system of national accounts in current times
- Main issues concerning QNA and short term indicators:

  Supply vs demand based GDP
  Cumulative data
  Moving holidays and calendar effects

- Progress recently made to improve the quality of QNA
- Challenges remaining for future activity

Economic growth in China and higher demand for statistics

A notoriously extraordinary growth performance, in both intensity and duration:

9.5% average progress in GDP in the last twenty years,

with the trend proved resilient to the global recession in years 2008-09

and expected to continue in next years

As the main driver of growth, the wide-based process of institutional reforms has been pushing the transition from a planned to a market oriented economy, with a remarkable impact on both the domestic and the international side

In the domestic economy:

rapid accumulation in fixed assets and in human capital

massive migration from rural to urban areas

restructuring of the public sector

strong labour productivity growth,

with increasing social disparities, but declining poverty

and sizeable changes in the composition of total value added

Economic growth in China and higher demand for statistics

The international impact of the transformation of Chinese economy has been remarkable too,

for both structural…

> the rapid integration in the world economy amid massive inflows of foreign direct investment and, partly as a related second round effect, a particularly strong and prolonged increase in exports

…and cyclical factors

> with additional momentum in recent years as the recession deepened in the advanced countries and, in the aftermath, China is confirming a key driver of the prospects of the global recovery

Accordingly, the international community has been focusing an increasing attention on both the medium and short-term developments in China and demand for timely and reliable economic short term indicators has become more urgent

A portrait of the current statistical system in China

Between the middle eighties and the early nineties of the last century, the statistical system in China abandoned the material product approach to the GDP measurement and started receiving the guidelines for the compilation of national accounts set by the international community.

Since mid nineties the only official accounting system in China has become the SNA93, and since then massive efforts have been put forward in the revision of source data, basic methodologies and accountability of the statistical process.

Convergence to the international standards is however still under way:

i) quality enhancements concentrated in annual accounts, as quarterly national accounts and short term indicators largely lagging behind the users' demand

A portrait of the current statistical system in China

ii) source data are more detailed and advanced on the supply side, with important gaps still remaining for aggregate demand

iii) for both annual and quarterly accounts deflation is often problematic, as price indices are occasionally missing or incomplete, and they frequently do not match the related activity or expenditure category

(as most information is originally gathered at current prices, this may further limit the quality of constant price estimates)

iii) the issue of deflation is particularly severe for the quarterly national accounts, as constant price estimates are officially missing for industry breakdown of GDP and even a scarcer reporting concerns the demand components.

iv) the dissemination of source data (e.g. short term indicators) is also very limited, with a negative impact on the users's ability to perform business cycle analysis and their confidence on the quality of QNA in China.

A portrait of the current statistical system in China

However, according to our direct experience the variety of short term indicators available for internal use at the NBS is very promising and their coverage proves sometime peculiar compared with common practice in the international statistical community

For example, very detailed data are compiled about the housing sector, with indicators ranging from prices, capital formation, to floor space under construction and business climate:

only a few European countries could share the same variety of information (and Italy is surely not in the list!).

Also the dissemination of the monthly value of fixed asset investment is a clear advancement with respect to the common practice to estimate capital formation only at the quarterly frequency and based on indirect methods

A portrait of the current statistical system in China

The main issue is the fragmented design by which most short term indicators are currently collected at the NBS or retrieved from other government agencies and administrative sources

The indicators frequently cover extensively the production and expenditure of largest companies, which are mostly made by cooperatives and state owned enterprises, with the risk of neglecting the cyclical fluctuations in the more market oriented activities of the private sector.

Although the majority of indicators are collected since the early nineties, they often show important break in the source and basic methodology, and data are occasionally missing for some periods.

Moreover, for the services sector the coverage of (internally) available indicators is very incomplete in terms of activities and time span (often not longer than 5 years).

The issue of cumulative reporting

Since NBS of China started the release of quarterly GDP in 1992, infra-annual data have been compiled covering in succession:

the first quarter,

the sum of first and second quarter,

the sum of the first, second and third quarter

and finally the overall year

This practice is an inheritance of the users' demand in a planned economy: cumulative reporting meets the demand by the officials of local and central governments to monitor the progress achieved step by step towards the yearly targets for production identified within the five-year plan

For the business cycle analysis, it implies the important limitations that: i) only yearly analysis across the same periods may be pursued; ii) the sequence of infra-annual data is not really a time series (periods last differently over the year), thus preventing the use of the usual tool box for short term analysis.

The issue of cumulative reporting

Solving the issue of cumulative reporting in QNA is not trivial as most source data are cumulated too, thus offering a limited room for indirect estimation of discrete QNA.

Based on indicators currently available, for industry the source data would allow indirect estimation of discrete quarterly value added at current and constant prices, even if the time length risks to be too short for a sound identification of calendar and seasonal effects (estimate could start from 2003 Q1).

For the remaining sectors the picture looks by large more controversial as discrete available indicators are fraught with incomplete coverage of activities or with cut-off level in recording (so excluding large part of the private sector); these issues add to the occasionally short time coverage and controversial deflation.

In this framework, an essential ingredient in the process from cumulative to discrete data is searching for new and complementary source data, that however require some time to be developed

The issue of cumulative reporting

An appealing shortcut, often followed by private analysts, is to obtain discrete data by simply subtracting the cumulated data conecerning two successive periods (*residual approach*).

This practice however fails to identify the possible revisions implied in the cumulative reporting and/or to assign them to the right quarter.

Such revisions may be due to several and unknown reasons occurring with a systematic or irregular pattern at every year, and with possible changing intensities across sectors and geographic areas.

Based on (current prices) data provided by NBS, we applied the residual approach to a variety of industries, with the results that:

i) infra-annual developments shows large variation across sectors and, for some of them, over time

ii) most industries share however the common feature of a significantly and regularly expansion of the activity in the final quarter.

Cumulative reporting and seasonal adjustment

The common peak at the end of the year shows that all the revisions occurred for any reason in the previous quarters are regularly reported into the figures for January to December.

With regard to seasonal adjustment, the residual approach could then guarantee sensible results as the regular peak would be easily detected as a seasonal movement and smoothed away.

Even if the corrections are systematic, the infra-annual analysis could still be affected by the artificial smoothing over the year of such a spurious (and possibly sizeable) seasonal component.

As a first attempt to remove seasonality, we applied a simple filter (a centred four-term moving average) to discrete data retrieved by the residual approach.

Cumulative reporting and seasonal adjustment

As expected, the s.a. decumulated series display a much smoother infra-annual developments for all industries

and all GDP components present a seasonal peak in the fourth quarter, with the exceptions of transport and finance service activities

(or the activities whose data are collected by sample surveys recently started to fill the information gap in the usual sources)

Also the size of the “spurious” seasonal component proves particularly strong in some industries and in some quarters, likely beyond an economic rationale thus confirming the risk that

a biased reporting implicit in the source data limits the reliability of the residual approach to obtain discrete data for the purpose of business cycle analyisis

The issue of calendar effects and moving holidays

Although the People's Republic of China uses the Gregorian calendar for civil purposes, the Chinese calendar is used for determining national holidays. This causes additional difficulties for seasonal adjustment.

There are currently seven official public holidays, following a major reform in 2008. Three of them are holidays that move between two solar months:

the Chinese New Year (1st day of 1st lunar month), moving between January and February;

the Dragon Boat Festival (5th day of 5th lunar month), moving between May and June;

the Mid-Autumn Festival (15th day of 8th lunar month), moving between September and October.

For the quarterly series only the Mid-Autumn festival is potentially significant (as it is the only moving between two quarters), but for monthly indicators all moving holidays are relevant.

The issue of calendar effects and moving holidays

If not removed, the effects of moving holidays across two adjacent periods might hamper the short-term analysis of the Chinese economy; alike the “Easter effect” in Western countries, a feasible approach - currently tested at NBS - is to use regressors for each holiday to distinguish the effects before, during and after it.

Even more challenging, the system of statutory holidays in China has been radically reformed in the last ten years:

i) in April 1995, working time has reduced from 6 days to 5 days per week.

ii) the golden week was introduced in October 1999.

iii) a major reform in 2008 abolished the Labour Day Golden Week and added three traditional Chinese holidays (Qing Ming festival, Dragon Boat festival, and Mid-Autumn Festival).

These temporal breaks of the calendar need to be accounted for in the regressors, in order to avoid under- or over-estimation of the effects during the sample period, and this make more problematic a sound adjustment

Recent statistical progress and future challenges

In the last ten years important progress has been achieved in China towards a closer convergence of the domestic statistics to the standards set by the SNA93. Source data, classifications, basic methodology and dissemination strategy have been under a strict review, often upon the support of the international cooperation.

A major step in the development of the statistical system in China was marked in 2003, as a system of 5-year period economic census was established in order to fill the information gap that in the past prevented a sound estimation of non-material activities and of components of aggregate expenditure,

The first economic census in 2004 provided the most comprehensive data set in the history of China, covering industry, construction and all service activities (but some related to agriculture), and allowed a radical revision of the statistical process under many respects

Recent statistical progress and future challenges

As a result, GDP figure for 2004 was revised upwards by around 15% with the highest contribution coming from value added in service activities (by about 90% of total increase) on the supply side, and from household consumption and gross fixed capital formation (for almost 65% and 35%, respectively) on the demand side

Beside the establishment of a system of periodic economic census, the production of regular statistics has been progressively improving in recent years, too (in particular in the field of service activities).

BUT most progress have been achieved in the field of the annual national accounts, as the compilation of quarterly national accounts and short term indicators is still largely lagging behind the needs of both domestic and international users

Recent statistical progress and future challenges

Very recently discrete series has started to be regularly released only for the year-on-year change of quarterly GDP at constant prices - with the underling deflator not available yet - and for a number on monthly indicators (such as value added in industry and volumes of transport, post and communication), for which discrete estimates of levels are also available.

Experimental production of discrete series is currently under validation for value added in main industries and GDP at current prices, and calendar and seasonally adjustment has been tested for some monthly indicators(e.g. industrial production and retail sales), for which a long enough time series is already available.

Trials are still in middle way as for discrete estimates of quarterly main expenditure components, as the source data suffer from incomplete or inconsistent coverage with respect to the aggregate to be estimated, and discrepancies between demand and supply estimates of GDP proves very high.

Recent statistical progress and future challenges

In our view the key issue for increasing the coverage and reliability of quarterly accounts in China relates to the controversial quality and coherence observed in the system of short term indicators.

The priority is to remove the possible bias coming from cumulative reporting in the process of producing discrete data.
Indeed, discrete data based on the simple residual approach upon the current reporting practice could heavily affect their reliability for short term analysis and a sound detection on infra-annual developments.

It would be necessary to switch to a discrete *reporting*,
which requires not only the retraining the statistical staff,
but also redesigning the reporting forms by which data are currently collected.

Recent statistical progress and future challenges

In addition, the opportunity to start new sample surveys for a selection of key economic indicators and to extend them also to economic population already covered by administrative registers could be carefully considered.

.

A fruitful example comes from the new household survey, that was started almost five years ago to overcome the biased information content of the indicator of retail sales of consumer goods.

The switch to a discrete reporting could take time to be completed, and it is urgent to start with. Only as the current limitations in the basic statistics are gradually overcome, we could reasonably expect a tangible progress in the quality and reliability of quarterly national accounts in China.

Thank you for your attention

Sector composition of total value added

(share of GDP at current prices; percentage values)

Years	Agriculture	Industry	Construction	Transport, Storage and Post	Wholesale and Retail	Hotel and Restarant	Finance	Real Estate	Others
1991-95	21.5	39.0	5.6	6.2	8.3	2.1	4.8	3.9	8.8
1996-00	17.4	40.7	5.9	5.6	8.1	2.1	4.4	3.9	11.9
2001-05	13.3	40.5	5.5	6.0	8.0	2.3	3.7	4.5	16.3
2006-09	11.3	43.0	5.6	5.7	7.4	2.2	4.9	4.5	15.3

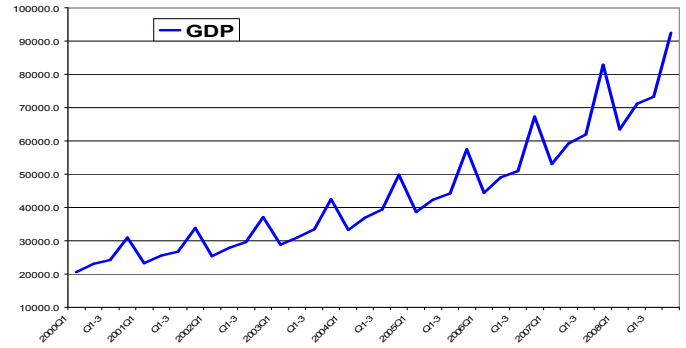
Source: elaborations based on NBS data.

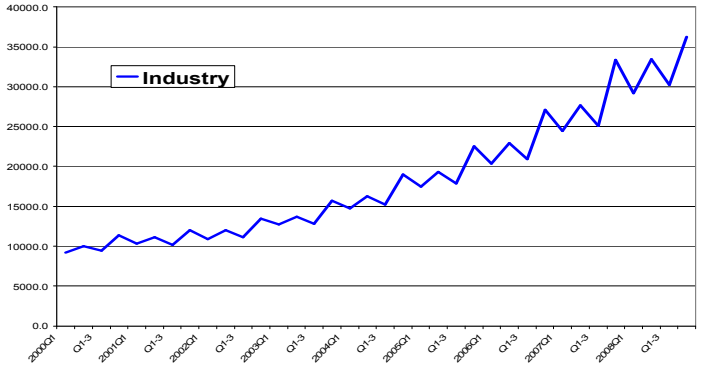
Decline in the share of agriculture (from around 21% of GDP in the first half of the nineties to around 11% in years 206-09) against increase in the industry (from 39 to 43%) and in services (from 34 to 40%).

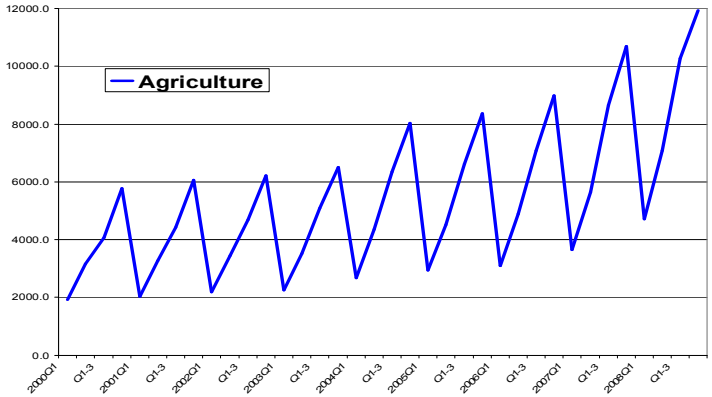
back

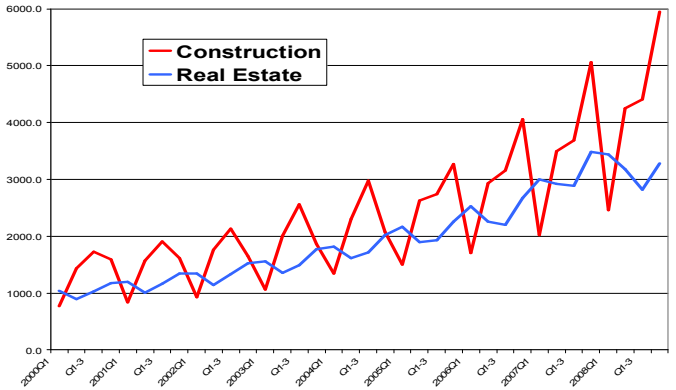
Quarterly discrete data in total economy and main industries

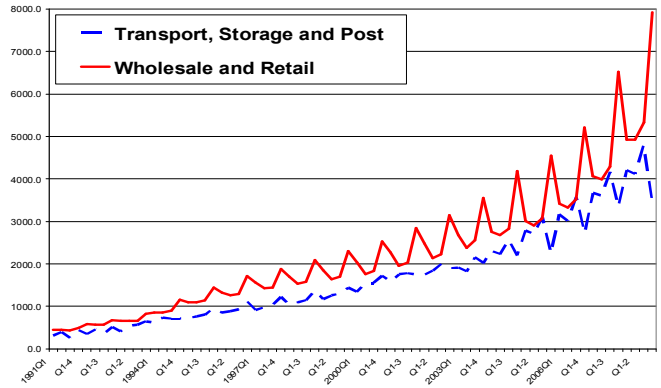
(millions of local currency at current prices; residual approach)

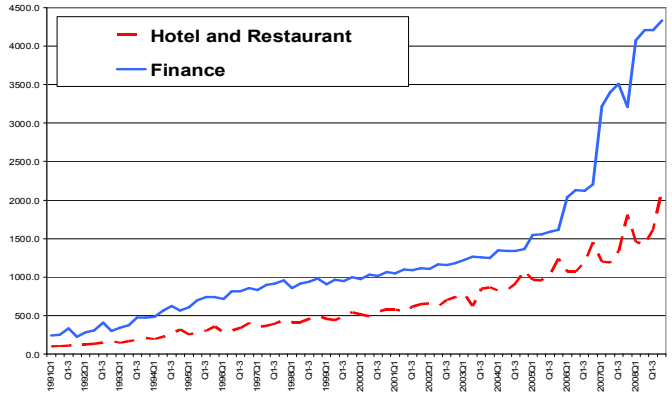








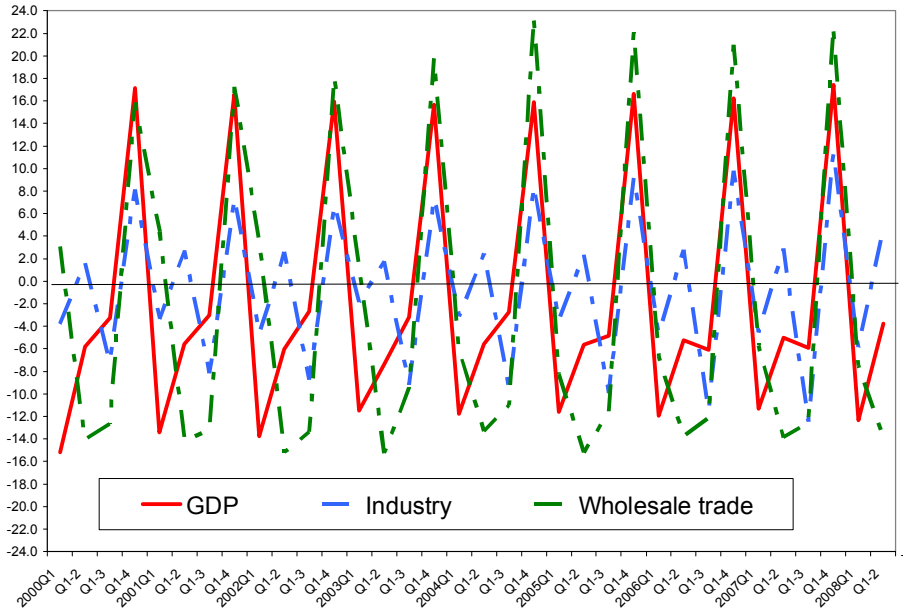


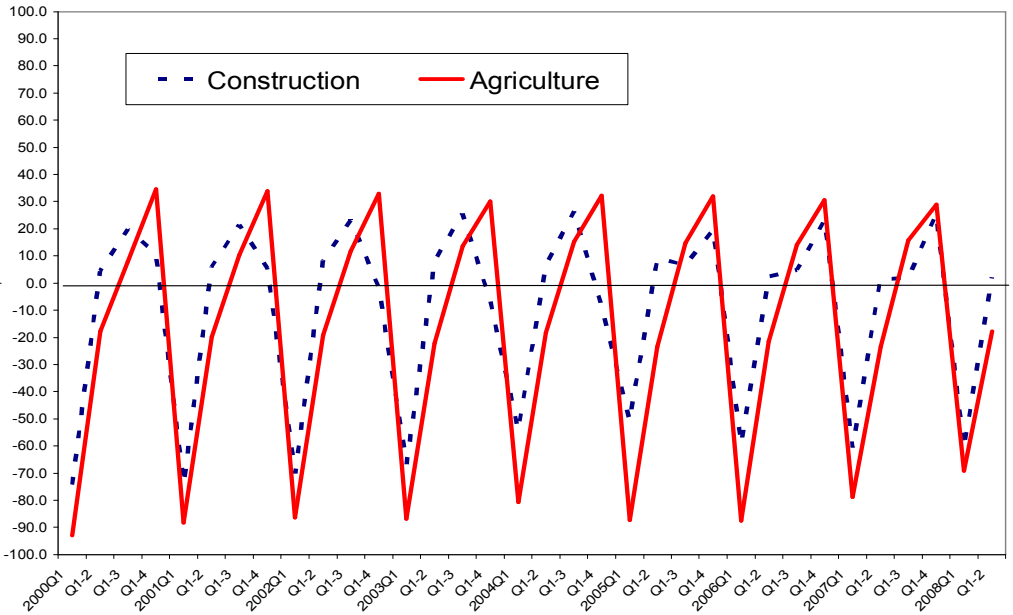


back

Seasonal components in quarterly discrete data

(percentages of raw series; based on centred moving average)





back

Seasonal components in quarterly discrete data

(percentages of raw series on average 1995Q1-2008Q4 ; based on centred moving average)

	GDP	Industry	Agriculture	Construction	Real Estate	Transport, Storage	Wholesale and Retail	Hotel and Restaurant	Finance
Q1	-14.8	-2.9	-99.7	-64.9	5.2	-3.3	0.0	-4.1	-1.7
Q2	-5.4	3.5	-23.4	4.4	-10.6	-1.1	-11.4	-8.2	1.6
Q3	-3.1	-9.5	12.0	18.3	-5.4	2.7	-10.9	0.2	0.5
Q4	17.0	7.0	34.6	9.4	7.0	-1.8	16.5	9.3	-2.7

back