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Flash Estimates of Quarterly GDP in China

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Summary

This paper briefly introduces the compiling methods of flash estimates of quarterly GDP from production approach, associating problems and future development measures in China.

Under the impact of the financial crisis starting from the US, the GDP growth rate in the fourth quarter of 2008 dropped sharply from 9 per cent in the third quarter to 6.8 per cent. The Chinese government reacted quickly to the crisis by formulating in time a series of stimulating measures including the 4-trillion-yuan fiscal stimulus package and the Revitalizing Plan for the Ten Major Economic Sectors, which led to a rebound and a gradually accelerating growth trend of the Chinese economy from the second quarter of 2009. In order to keep track more timely and accurately on the effects of these stimulating measures, the NBS of China decided at the end of 2008 that ten-day reports be conducted in addition to monthly reports for some sectors and a number of ad-hoc surveys be added when necessary. This provides good data basis for compilation of flash estimates of quarterly GDP in China.

This paper will introduce China's practice of flash estimation of quarterly GDP. As China is still at experimental stage of compiling quarterly GDP by expenditure approach, the paper will focus on quarterly GDP compilation by production approach.

After the first economic census, we break down all industries into 9 sectors for quarterly GDP compilation by production approach. Their calculation methods, existing problems and improvement measures are briefly introduced below:

A. Rapid estimation methods of quarterly GDP

Agriculture, forestry, animal husbandry and fishery: value added at current prices is calculated by production approach and VA at constant prices is by single-deflation approach. Price indices

adopted are the production price index for agriculture products of the correspondent category. The growth rates of agriculture, forestry, animal husbandry and fishery at current and constant prices are provided by the Department of Agriculture Statistics of NBS.

Industry: First, the growth rate of total industrial value added at constant prices of the reporting period is calculated according to the growth rates of industrial value added for firms both above and below a cut-off level and their composition of the same period of the previous year. Then, the total industrial value added at current prices is obtained by means of the industrial ex-factory price index provided by the Department of Urban Statistics of NBS.

Construction: the total output of construction is the total value of construction goods and services produced within the reporting period by construction enterprises, establishments and individual business, including output value of construction projects, installation projects and others. According to the qualification grades of construction units, output can be classified into total output of construction enterprises with qualification grades and that without qualification grades. The total output of construction is calculated according to the shares of total output of construction enterprises with qualification grades (=total output of general and specializing contractors + total output of services subcontractors) and total output of construction enterprises with qualification grades of the economic census year in the total output of construction. Then the construction value added at current prices is estimated according to the ratio of value added of the previous year. Last, the construction value added at constant prices is obtained by means of the price index for construction and installation projects. At present, the quarterly value added of construction at current prices is provided by the Department of Fixed-Asset Investment Statistics, and the price index for construction and installation projects is provided by the Department of Urban Statistics of NBS.

Transport, storage, post and telecommunication: first, the growth rate of transport, storage, post and telecommunication is calculated according to the growth rate of passenger-kilometers and freight ton-kilometers by railway, road, water transport, harbour and civil aviation and the growth rate of total business volume of post and telecommunication services and their composition at the same period of the previous year. Then this growth rate is multiplied by an adjusting coefficient

(=growth rate of real value added of transport, storage, post and telecommunication in the previous year/ volume growth rate of proxy indicator in the previous year) to obtain the growth rate of value added at constant prices, which is then used to extrapolate the value added at constant prices of the reporting period. Last, the price index for service items in the consumer price index is used to obtain the value added at current prices through re-inflation. It should be noted that, when calculating the growth rate of passenger-kilometers and freight ton-kilometers, the coefficients used to turn passenger-kilometers into freight ton-kilometers are: railway 1:1, road: 10:1, water transport 2:1; aviation 13.7:1.

Wholesale and retail: first, the growth rates of wholesale and retail of the accounting period in question is estimated by the growth rate of total wholesale and retail sales of consumer goods at current prices. Then by multiplying with an adjusting coefficient (=growth rate of nominal value added of whole and retail in the previous year/ nominal growth rate of wholesale and retail sales in the previous year), we obtain the value added at current prices of the accounting period in question. Last, the retail price index is used to obtain the value added at constant prices.

Accommodation and catering: First, the value added of accommodation and catering at current prices of the accounting period in question is estimated respectively by multiplying the growth rates of turnover of accommodation and catering with an adjusting coefficient (=growth rate of nominal value added of the sector in the previous year/growth rate of turnover of the sector in the previous year). Then the value added of accommodation and catering at constant prices is obtained by means of the corresponding price index, of which a simple average of the price index for hotels and price index for other types of accommodation is adopted as the price index for accommodation, and the price index for eating-out is used for catering.

Finance and insurance: finance is composed of banking, securities, insurance and other financial activities. The nominal value added of banking in the accounting period in question is estimated by multiplying the simple average growth rate of deposit and loan in both domestic and foreign currencies with an adjusting coefficient (= growth rate of value added of banking at current prices in the previous year/growth rate of deposit and loan in both domestic and foreign currencies in the previous year). The value added of insurance at current prices of the accounting period is

estimated by multiplying the growth rate of premium with an adjusting coefficient (= growth rate of value added of insurance at current prices in the previous year/growth rate of premium in the previous year). The value added of securities at current prices of the accounting period in question is estimated by multiplying the growth rate of stock transaction volume with an adjusting coefficient (= growth rate of value added of securities at current prices in the previous year/growth rate of stock transaction volume in the previous year). By adding the value added of the above three sectors, we have the value added of finance and insurance at current prices, which is then deflated by correspondent price index to obtain the value added of finance and insurance at constant prices. The price index used for deflation is weighted average indexes of consumer price index and price index for investment in fixed assets.

Deflation index = $\frac{\text{consumer price index} \times [\text{final consumption expenditure} + \text{gross fixed capital formation}] + \text{price index for investment in fixed assets} \times [\text{gross fixed capital formation}]}{\text{final consumption expenditure} + \text{gross fixed capital formation}}$

Real estate? The coverage of annual value added of real estate includes real estate development, property management, real estate brokerage, household owner-dwelling services and other activities of real estate, while that of quarterly value added of real estate just includes real estate development, household owner-dwelling services and other activities of real estate due to the constraint of data sources. Using the growth rate of floor space of sold commercial houses multiplying by an adjusting coefficient (=growth rate of real value added of real estate in the previous year/growth rate of floor space of sold commercial houses in the previous year), we may extrapolate the real value added of real estate of the accounting period in question, then derive its nominal value added by means of the weighted price index of real estate development and operation (=house sale price index \times commercial house sales / (the sum of commercial house sales, land transfer incomes and house rentals) + land transaction price index \times land transfer incomes / (the sum of commercial house sales, land transfer incomes and house rentals) + house leasing price index \times house rentals / (the sum of commercial house sales, land transfer incomes and house rentals)). Constrained by data sources, we could not accurately estimate the depreciation (i.e.

value added) of household owner-dwelling services, hence assume subjectively that the real value added of them in the accounting period in question equals to the real value added of them in the same period of the previous year multiplying by 1.05, then derive their nominal value added by means of house leasing price index. Using the growth rate of labour compensation of real estate provided by the Department of Population and Employment Statistics, multiplying by an adjusting coefficient (=growth rate of nominal value added of other activities of real estate in the previous year/growth rate of labour compensation of real estate in the previous year), we may extrapolate the nominal value added of other activities of real estate in the accounting period in question, then derive the real value added of them by means of CPI.

Other services: they cover Information Transmitting, Calculator Service and Software; Leasing and Business Service; Scientific Research; Technical Service; Geological Survey; Water Conservancy, Environment and Infrastructure Management; Household Service and Other Services; Education, Healthcare, Social Security and Welfare; Culture, Sports and Recreation; Public Administration and Social Groups. Basing on the labour compensation by sector provided by the Service Survey Center, the labour compensation by sector provided by the Department of Population and Employment Statistics and the turnover taxes by sector provided by the National Taxation Bureau, using the growth rate of a relevant indicator multiplying an adjusting coefficient, we may get the nominal value added of each sub-sector of other services, then derive its real value added by means of the service price index of CPI separately, finally the nominal and real value added of other services as a whole by pooling them up. In principle, for non-market service sectors, the indicators such as labour compensation should be adopted as far as possible; while for market service sectors, the indicators such as turnover or turnover taxes should be adopted as far as possible.

B. Main Problems associated with Flash Estimates of Quarterly GDP

The main problems associated with flash estimates of quarterly GDP in China are as follows:

- (i) The existing too much aggregated breakdown of industry could not satisfy fully the demands of quarterly macro-economic analysis and monitoring.

(ii) Limited by data sources and time lag of data available, quarterly GDP accounting by production approach has to heavily depend on various assumptions and estimations, so their accuracy leaves much to be desired.

(iii) Quarterly GDP estimation is on a cumulative basis rather than discreet basis so far, so the data on period-to-period growth rate of seasonally adjusted quarterly GDP which are essential for judging the macroeconomic trend are not available. Compared with the cumulative basis, the discreet basis gives a better indication of economic trends (especially the turning points) in the quarter and provides important and timely information for short term macro-economic analysis and policy making, as well is helpful for making international comparison. Therefore, we recognize that it is more valuable than cumulative quarterly GDP estimation. The reason of continuing to publish cumulative quarterly GDP estimations in China is that basic statistics at hand do not meet the requirement for discreet quarterly GDP estimation, especially, there is no discreet quarterly data on fixed assets investment (for estimating value added of Construction) and some price indices are also lacking.

(iv) Quarterly GDP is only estimated using the production approach, there is no formal approach of the quarterly expenditure components of GDP up to now. Quarterly GDP estimation by expenditure reflects the movement of quarterly final demands of an economy such as consumption demand, investment demand and net export demand. We know that the information provided by quarterly expenditure components of GDP is as important as quarterly production GDP to macro-economy analysts and policy makers. Starting in 2000, the NBS conducted some pilot estimation of quarterly expenditure GDP. However, there are limitations in data sources and inconsistencies between production and expenditure data sources, resulting in that we still do not produce nor publish any formal quarterly expenditure GDP estimates.

C. Key Future Development Measures

So far, most of the basic data necessary for compiling the flash estimates of quarterly GDP from production approach may be available on monthly or quarterly basis. In general, we can compile the flash estimates of quarterly GDP from production approach in 10 days or so after the end of each quarter, and release them to the public in 15 days or so after the end of each quarter, then

release the first round results revised basing on more comprehensive basic data available in 45 days or so (now changing to 100 days or so) after the end of each quarter, finally the final results benchmarked on the final estimates of yearly GDP.

Usually the relatively short time lag of production of flash estimates of quarterly GDP in China can meet basically the demands of quarterly macroeconomic analysis, however we also need to forecast the flash estimates of quarterly GDP in advance in some special cases. For an example, in order to deal with the financial crisis broken out in USA in October 2008, the NBS quickly built up a GDP forecasting team consisting of backbone professional staff of related subject-matter Departments, and conducted the estimation of the impacts of fiscal stimulus packages on economic growth. As the real value added of Industry accounting for 40% or so of GDP at constant prices, the movement of value added of Industry above the cut-off level dominates that of GDP. Consequently, to accurately grasp the movement (particularly turning points) of monthly real value added of Industry above the cut-off level is fundamental to grasp the movement of quarterly GDP at constant prices. In order to find out the movement of monthly real value added of Industry above the cut-off level as early as possible, apart from using the short term quantitative indicators, we also need to make full use of Business Tendency Survey indicators such as PMI, the Economist Confidence Index and Leading Index and so on, the movement of which are highly correlated with the movement of growth rate of value added of Industry at the cut-off level.

In order to further improve the quality of flash estimates of quarterly GDP, besides broadening the new data sources (i.e. administrative records), improving the quality of basic data necessary for compiling flash estimates of quarterly GDP as well as the compiling methods, we will still double our efforts on the following two aspects:

First, regarding the problems of insufficient data sources for the calculation of discreet quarterly GDP, we need to establish corresponding discreet quarterly sectoral statistics step by step, especially discreet quarterly fixed assets investment statistics and discreet quarterly prices indices. Discreet quarterly GDP estimation will be set up based on these new statistics. Now the NBS is conducting a pilot estimation of discreet quarterly GDP, and cooperating with Nankai

University to jointly develop a software of seasonal adjustment with Chinese characteristics (basing on the X12-ARIMA, introducing some adjustments with regard to China's own holidays and working days), and expect to disseminate the estimates of discreet quarterly GDP from the end of first quarter of next year on, including the data on seasonally adjusted discreet quarterly GDP and its period-to-period growth rate.

Second, after having systematically summarized the experiences of expenditure-based quarterly GDP estimation in the past years, regarding the lack of data sources and the poor data quality, we will plan to establish and improve specific statistics and departmental administrative statistics as well as the quality of data sources in order to realize the alignment of data sources from production and use including the alignment of price deflators from production and use, finally establish the formal accounting regime of expenditure-based quarterly GDP. When the discrepancy between the quarterly estimates of GDP from production and expenditure side is kept under control, we will release the data on expenditure-based quarterly GDP, including its nominal and real level and growth rate.