Contact:
Planning and Research Division, Department of National Account, Economic Research Institute
Phone: 03-3581-0631, e-mail: sna.g2@epa.go.jp

The Recent Opinions on Japan's GDP Figures and Our Approach

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Economic Research Institute
Economic Planning Agency

I. Introduction

1. The Recent Opinions on QE

We have neutrally and impartially compiled the preliminary estimation of quarterly GDP (QE) purely from the standpoint of statisticians. We have disclosed how to estimate QE figures through the publication of its commentary "QE Handbook" and our Website. In addition, we held the explanatory meetings on System of National Accounts (SNA) last summer.

Recently, however, the mass media and international organizations have made various criticisms of QE. They can be categorized as follows:

(1) The household consumption estimate is based on "Family Income and Expenditure Survey (FIES)" whose number of samples are limited and whose samples do not include single-person households.

(2) The seasonal adjustment method is old-fashioned one and it does not take into account the leap-year effect etc., and its figures fluctuate significantly.

(3) The QE figures can be considerably revised when the annual estimates are released.

(4) Trends in the QE figures are not consistent with those of other supply-side statistics.

(5) Spending on computer software is not included in capital formation.

(6) Improvement in the quality of computers, including PCs, is not reflected in the deflator.

(7) The basic data for public investment are not apparent, and the method of estimation is also unclear.

These criticisms, however, are not always based on a sufficient understanding of our method of estimation. In this document, we will briefly explain the basis and ideas for our method of estimation, and the planned improvements.

2. The Basic Method of QE Estimation

The original QE series is basically estimated by extrapolating the benchmark of the previous year by the year-over-year growth rate obtained from various basic demand-side statistics,

such as FIES (see Figure 1). The data for previous year are estimated using the "Commodity Flow Method" (see Note 1) which is the international standard for the SNA estimation, and those figures are highly accurate because they use various surveys with wide coverage as basic statistics including "Census of Manufactures."

However, the above-mentioned surveys that are used in the annual estimation are the annually released statistics and lack timeliness. Therefore, focusing on the timely dissemination of QE, we principally make use of demand-side statistics which are available timely and quarterly.

(Note 1) The "Commodity Flow Method" is the method that captures total supply by good and service and that then distributes those values to intermediate demand and final demand such as private consumption expenditure. The estimation of the rate for the distribution is based on "Input-Output Table" information of the benchmark year.

II. Our Standpoint toward Each Criticism

1. The Use of Family Income and Expenditure Survey

(1) Detailed information on household consumption, including services, are continuously available from FIES conducted on a monthly basis. As FIES records consumer spending regardless of where consumers buy goods and services, purchases from newly-developed businesses such as E-commerce which are significantly emerging can be included.

(2) On the other hand, FIES has its own limitations arising from the fact that it is a sample survey. It is the problem in estimating QE that there might be fluctuations due to changes in the samples regarding goods with a low frequency of purchase such as automobiles, and that single-person households whose consumption are recently rising stably are excluded from FIES samples.

(3) Thus, the current QE is estimated by using the supply-side statistics for the number of newly-registered cars for estimating automobile consumption. In addition, the movement of single-person households' consumption is estimated by using consumer spending of the waged-workers' households living in the cities with population of fifty thousand (50,000) or more in FIES as a proxy. Furthermore, it should be noted that the concept of private final consumption expenditure is different from that of FIES consumption in that the former concept includes imputed rents for owner-occupied houses and medical insurance benefits in accordance with the international standards on SNA while the latter excludes them.

(4) We are now considering the availability of the quarterly single-person households' consumption newly released by Management and Coordination Agency in QE estimation. In the medium and long term, after the consideration by the workshop for the improvement of capturing the trend in consumer spending which is the ongoing co-project of the Management and Coordination Agency

and Economic Planning Agency come to a conclusion, we will consider how to apply the conclusion.

2. Seasonal Adjustment

(1) The U.S. Census Bureau X-11 system is adopted as the current seasonal adjustment method for QE. This is because, according to the results of the trial test for introducing X-12ARIMA system conducted in 1997, the leap year effect on private final consumption was not statistically significant and the revision by extrapolating some time series of one quarter was more unstable than that using X-11.

(2) Because the data for additional four years (including this leap year) become available after the above test, we are undertaking to review the performance of adopting X-12ARIMA system.

3. The Revision from QE Figures to Annual Estimation Figures

(1) As mentioned above, while the benchmark of QE estimation is the previous year's data in annual estimation, the year-over-year growth rates of QE mainly depend on demand-side statistics. On the other hand, the annual estimation employs the supply-side statistics with a wider coverage, such as "Census of Manufactures." As QE and annual estimation are different both in basic statistics and the method of estimation, those figures do not necessarily coincide. In order to divide the annually estimated data into four quarters, however, the quarterly pattern observed in QE is used.

(2) In the annual estimation for an fiscal year, the figures from the year 1955, adding the data for four quarters of the fiscal year in question, are seasonally readjusted. Therefore, the figures are retroactively revised.

(3) While the revision of the GDP quarter-to-quarter growth rate from QE to annual estimation in Japan is larger than that in the U.S., the revision rate of GDP levels in both countries are not much different (see Table 1 & 2).

Table 1 The Revision of the GDP Growth Rate in Japan and the U.S. from QE to annual estimates (Average)

(Unit: % point)

	U.S.	Japan
Revision	0.25	0.37

(Note 1) The revision is defined as the absolute figure average of the difference between QE and annual estimates seasonally adjusted real GDP growth rate on a quarter-to-quarter basis.

(Note 2) When we calculate the difference between QE and annual estimates, the following periods is employed for each country since it is appropriate to compare them using the same base years.

Japan: 30 periods from '90 Q3 to '94 Q1 and from '95 Q3 to '99 Q1.

U.S. : 18 periods from ’92 Q2 to ’94 Q1 and from ’95 Q4 to ’98 Q1.

Table 2 The Revision rate of the GDP levels in Japan and the U.S. from QE to annual estimates

(Unit: %)

	U.S.	Japan
Average Revision Rate	0.78	0.76

(Note 1) Revision rate = (QE value – annually estimated value) / annually estimated value * 100

(Note 2) The period employed for each country is the same as in Table 1.

4. Discrepancy between QE and Supply-Side Statistics

(1) Direct comparison between QE and IIP (index of industrial production) or other supply-side statistics is inherently difficult for the following reasons; (i) the coverage of the two statistics are different, (ii) the latter is the statistics based on fixed weight and (iii) the former is the statistics on an amount basis while the latter on a volume basis.

(2) It is currently difficult to estimate QE based mainly on the supply-side statistics because the quarterly statistics that cover the whole economy are hardly available, especially for consumption of services, also because it is hard to divide the data of the existing sales statistics into corporate demand and household demand, and the sales statistics might not cover all of the newly-developing businesses.

(3) However, we recognize the need to continuously consider the utilization of these supply-side statistics, especially those of the durable goods, taking into account the improvement in their coverage.

5. Treatment of Computer Software

(1) Computer software purchase by enterprises etc. is recorded as intermediate consumption under the current SNA (68SNA), and thus is not a component of GDP. However, since one or two years ago, European countries and the U.S. have begun to shift to 93SNA which treats software as an intangible fixed asset and purchase of it as a part of the gross fixed capital formation.

(2) In Japan, the software installed in personal computers has been deemed as a part of computers and as a result, already counted as part of fixed capital formation. As we shift to 93SNA with the base year revision by the end of this October, order-made software will be recorded as intangible fixed assets, and thus its purchase as a part of fixed capital formation (see Figure 2). In-house and general application software, however, will not be included in capital formation due to the lack of basic data that could be directly utilized.

6. Reflection of the Computer Performance Enhancement in Deflators

(1) The performance of computers, especially personal computers, has been improving significantly. For example, the performance drastically improves in a short time without changes in price. Thus, the real values of personal computers might be underestimated unless we use a deflator that discounts the quality improvement of personal computers.
(2) The wholesale price index is employed in QE as a deflator corresponding to computers (including PCs). Its price index takes into account changes in quality through adopting the Hedonic Approach (see Note 2) so that the real value of the item should not be understated.

(Note 2) The Hedonic Approach is the method that adjusts the prices for improvements in quality by calculating the relation between the prices and the difference in the performance of each sample through regression analysis.

7. The Method of Estimating Public Investment

(1) At first the expected settlements of accounts for a fiscal year of the central and local government are estimated, based on the current budgetary expenditure for the fiscal year that are heard quarterly from the government sector. Then the quarterly figures of public investment are estimated considering trends in Ministry of Construction's "Integrated Statistics on Construction Works (public construction, progress basis)." The figures as a whole are revised in the stage of annual estimation, using the fixed settlement accounts of the central and local government.
(2) We recognize that QE figures of public investment are inferior in accuracy to those in annual estimation for the following two reasons; (i) we use the 'expected' settlement accounts in QE estimation as mentioned in (1), (ii) the basic data do not cover all the public organizations. In addition, we do not currently open the basic data used in QE estimation because of internal affairs of the relevant public organizations.
(3) We have asked Ministry of Finance and Ministry of Home Affairs to supply more accurate basic data on public works by the central and local government. We will analyze the property of the data supplied by them and consider how to utilize them in QE estimation as soon as they become available.

III Conclusion

Regarding the important comments from various parties, we have already planned to revise the estimation methods or have begun to consider the measures to improve the data quality. In the meantime, the current methods employed are described in detail in the "QE Handbook" published in March 2000, and its English version is to be released in the near future. Furthermore, we will make efforts to disclose the expected changes in the estimation methods, if any, in a timely

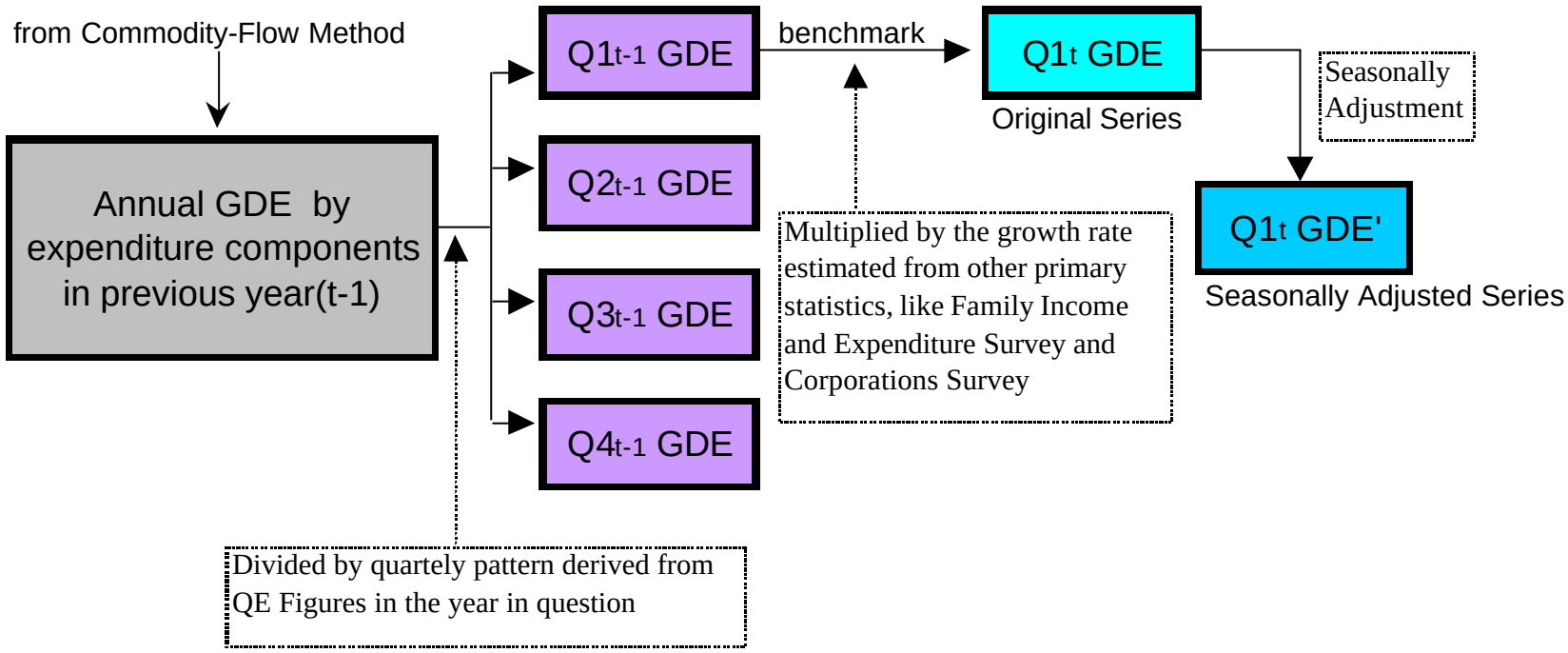
fashion.

From the viewpoint of ensuring the continuity and the reliability of the statistics, ad hoc changes in the method of estimation is undesirable, and it is necessary to establish a stable estimating method after a thorough consideration, taking future changes of the economic structure into account. Having, therefore, established the "Working Group on Preliminary GDP Figures" comprised of statisticians from academic circles, we are making continuous efforts toward improving the accuracy of QE. Concretely, we plan to conclude whether we can introduce a new seasonal adjustment method and utilize the statistics on single-person households and PC sales this fall, and will release the results of consideration as soon as possible.

We profoundly hope that our approach, aimed at improving and disclosure of the methods of estimation, can be more deeply understood.

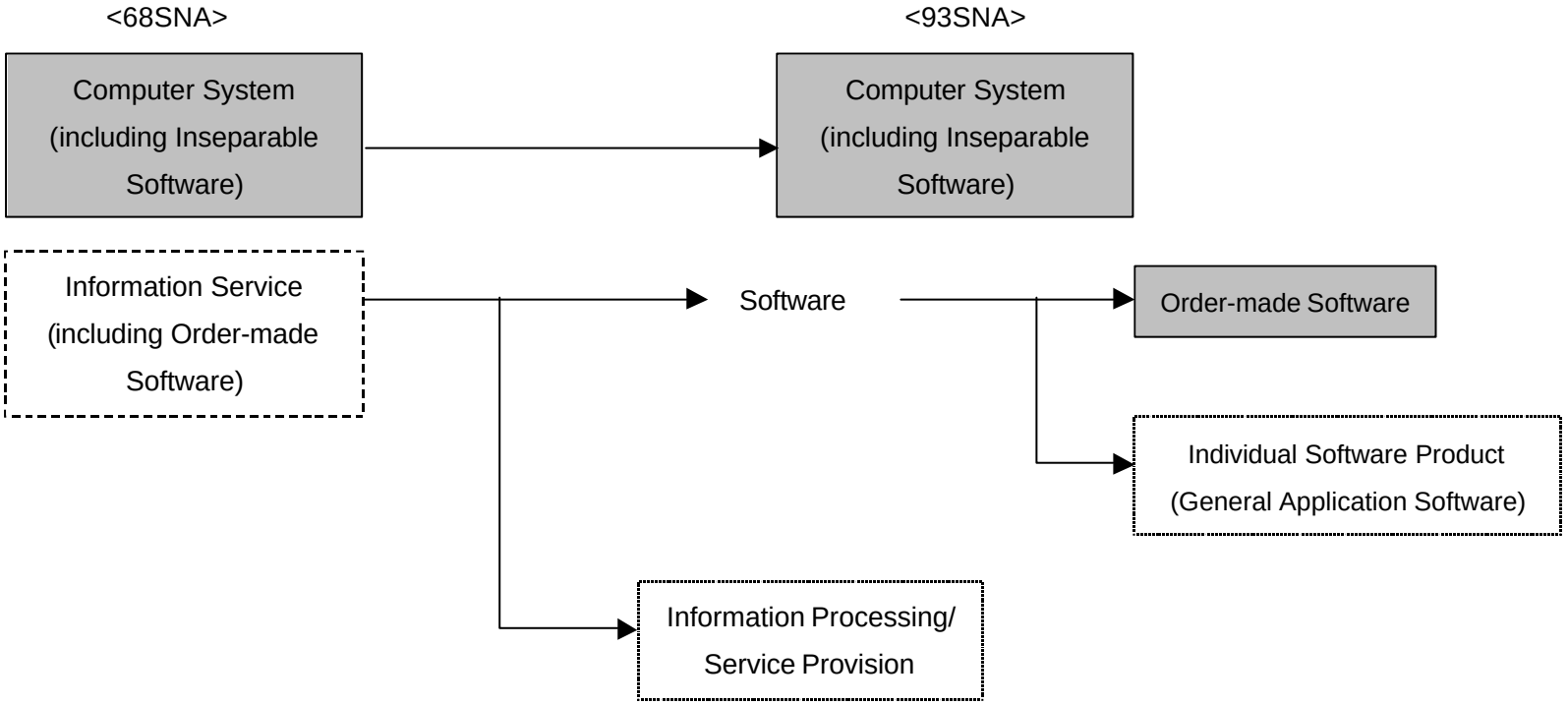
(Figure 1)

Quarterly Estimation (QE Method)



(Figure 2)

Treatment of Computer Software



* ▭ is counted as fixed assets, gross fixed capital formation. (Only order-made software is counted as intangible fixed assets.)
▭ is counted as intermediate consumption when purchased by enterprises, as final consumption when purchased by households.