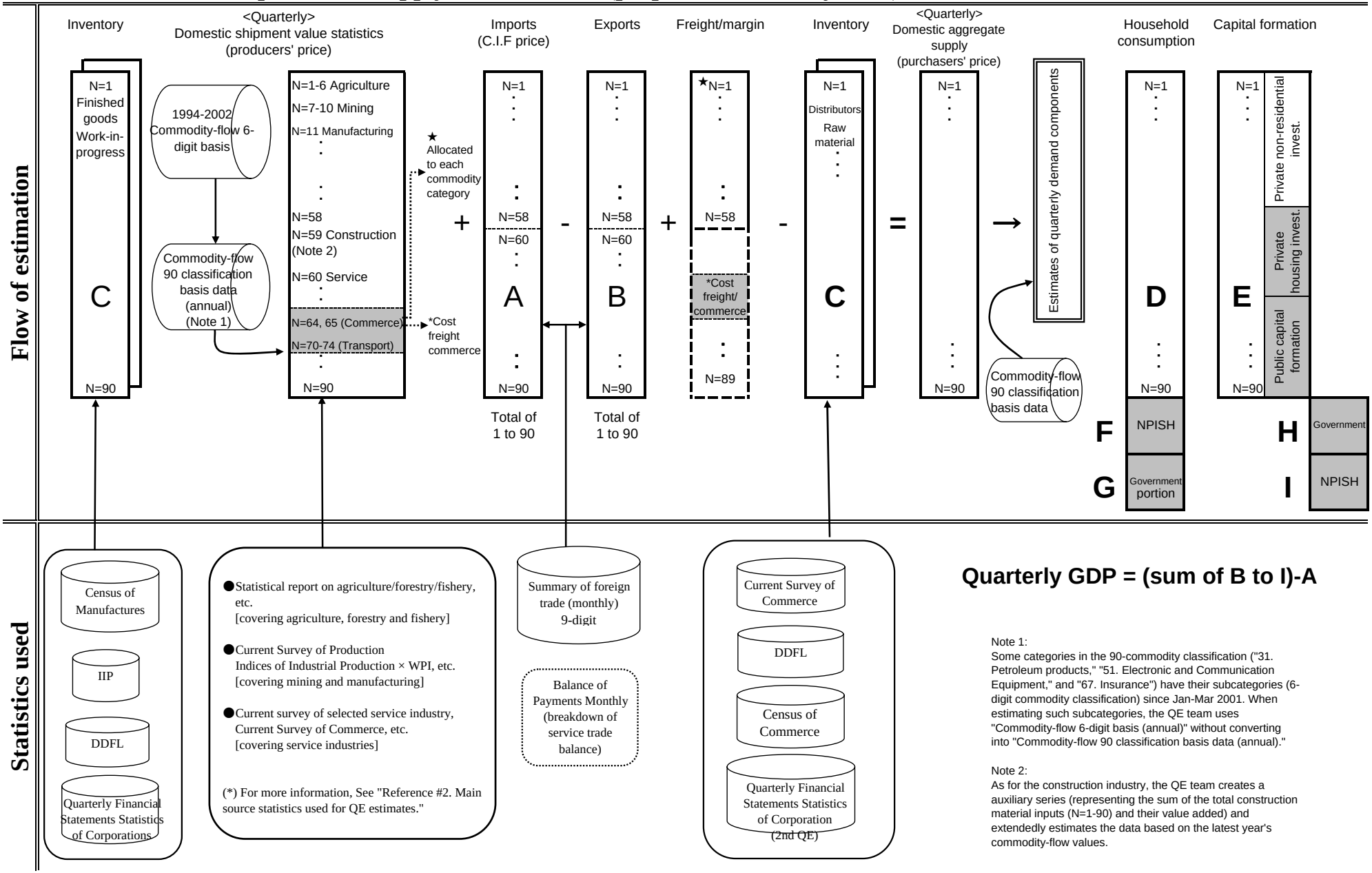
Reference #1. Concept chart of supply-side estimates (prepared in January 2004)

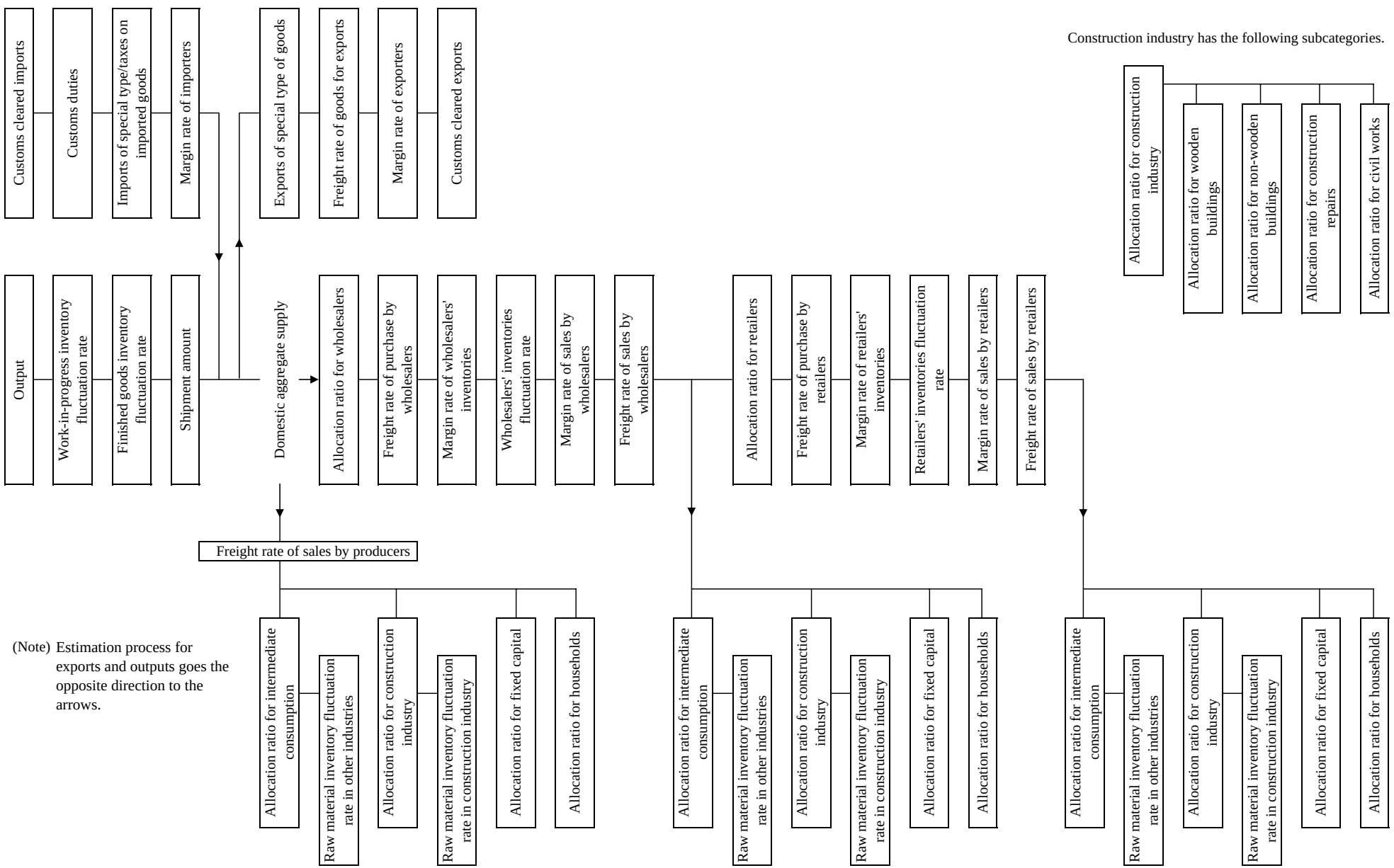


Quarterly GDP = (sum of B to I)-A

Note 1:
Some categories in the 90-commodity classification ("31. Petroleum products," "51. Electronic and Communication Equipment," and "67. Insurance") have their subcategories (6-digit commodity classification) since Jan-Mar 2001. When estimating such subcategories, the QE team uses "Commodity-flow 6-digit basis (annual)" without converting into "Commodity-flow 90 classification basis data (annual)."

Note 2:
As for the construction industry, the QE team creates a auxiliary series (representing the sum of the total construction material inputs (N=1-90) and their value added) and extendedly estimates the data based on the latest year's commodity-flow values.

Annex. distribution channel of commodity-flow method



(Note) Estimation process for exports and outputs goes the opposite direction to the arrows.

Reference #2. Allocation ratio for each demand component (90 categories, including subcategories; 2003)
(prepared in January 2005)

90 Classification		Name	Household Consumption	Gross Fixed Capital Formation
1		Rice and wheat	0.0000	0.0000
2		Other Crop Farming	0.5102	0.0053
3		Livestock Farming	0.0787	0.0423
4		Agricultural services	0.1931	0.0000
5		Forestry	0.1990	0.0000
6		Fisheries	0.3369	0.0000
7		Metal Mining	0.0000	0.0000
8		Non-Metal Mining	0.0000	-0.0008
9		Coal and Lignite Mining	0.0000	0.0000
10		Crude Petroleum and Natural Gas	0.0000	0.0000
11		Livestock Products	0.6267	0.0000
12		Seafood Products	0.7646	0.0000
13		Flour and Grain Mill Products	0.6528	0.0000
14		Agricultural Products	0.8549	0.0000
15		Other food	0.6147	0.0000
16		Beverages	0.7218	0.0000
17		Animal Feeds and Organic Feedstuff	0.3331	0.0000
18		Tobacco Manufactures	0.9455	0.0000
19		Spinning Mills	0.0380	0.0000
20		Fabric Mills and Others	0.0994	0.0663
21		Apparel and other personal items	0.8611	0.0135
22		Lumber and wood products	0.0278	0.0019
23		Furniture and Fixtures	0.1952	0.2208
24		Pulp and paper	0.0250	0.0000
25		Paper Products	0.0849	0.0000
26		Publication and Printing	0.1770	0.0000
27		Basic Chemical Products	0.0021	0.0000
28		Chemical Fibers	0.0000	0.0000
29		Drug and Medicines	0.1302	0.0000
30		Chemical Final Products	0.4489	0.0000
31		Petroleum Products	— (Note 1)	— (Note 1)
	01	Gasoline	0.5344	0.0000
	02	Jet Fuel Oil	0.0000	0.0000
	03	Kerosene	0.5164	0.0000
	04	Deisel oil	0.0719	0.0000
	05	A-grade Heavy Oil	0.0000	0.0000
	06	B-grade and C-grade Heavy Oil	0.0000	0.0000
	07	Naphtha	0.0000	0.0000
	08	LPG	0.3904	0.0000
	09	Other Petroleum Products	0.0785	0.0000
32		Coal Products	0.0008	0.0000
33		Plastic Products	0.0956	0.0000
34		Rubber Products	0.1877	0.0000
35		Leather Products	0.8402	0.0000
36		Glass and its Products	0.0571	0.0000
37		Cement and its Products	0.0004	0.0000
38		Pottery and Related Products	0.1403	0.0000
39		Other Ceramics, Stone and Cray Products	0.1180	0.0000
40		Iron and Steel	-0.0034	-0.0200
41		Steel Products	0.0000	0.0000
42		Nonferrous Metals Refining	0.0274	-0.0547
43		Nonferrous Metal Products	0.0032	0.0475
44		Metal Products for Construction / Building	0.0092	0.0037
45		Other Metal Products	0.0669	0.0311
46		General Industry Machinery and Equipment	0.0017	0.5348
47		Special Industry Machinery and Equipment	0.0026	0.7964
48		Other General Industry Machinery and Equipment	0.0003	0.5267
49		Office and Service Industry Equipment	0.0017	0.6285

50		Household Electric Appliances	0.7238	0.0417
90 Classification		Name	Household Consumption	Gross Fixed Capital Formation
51		Electronic and Communication Equipment	— (Note 1)	— (Note 1)
	01	Computers and Attached Equipment	0.1209	0.7788
	02	Wire Communication Equipment	0.0622	0.9252
	03	Wireless Communication Equipment	0.2168	0.6691
	04	Other Communication Equipment	0.0000	0.6710
	05	Electronic Applied Equipment	0.0000	0.8886
	06	Electric Measuring Equipment	0.0000	0.9239
	07	Semiconductor Devices and ICs	0.0000	0.0000
	08	Electron Tubes	0.0000	0.0000
	09	Liquid Crystal Element	0.0000	0.0000
	10	Magnetic Tapes and Magnetic Discs	0.5343	0.0000
	11	Other Electronic Components	0.0000	0.0000
52		Heavy Electrical Equipment	0.0000	0.7284
53		Other Electric Machinery and Equipment	0.1296	0.0367
54		Motor Vehicles	0.2604	0.1884
55		Shipbuilding and Repairing	0.0164	-0.2555
56		Other Transportation Equipment and Repairing	0.0595	0.3524
57		Precision Instrument and Machinery	0.2713	0.5017
58		Other Manufacturing	0.4429	0.0891
59		Construction	0.0000	0.9118
60		Electricity	— (Note 2)	0.0000
61		Gas and Heat Supply	0.4271	0.0000
62		Water Supply	— (Note 2)	0.0000
63		Waste Disposal	0.1130	0.0000
64		Wholesale	0.0000	0.0000
65		Retail	0.6111	0.3889
66		Finance	0.0401	0.0000
67		Insurance	— (Note 1)	— (Note 1)
	01	Life Insurance	1.0000	0.0000
	02	Non-life Insurance	0.3490	0.0000
68		Brokers and Lessors of Real Estate	0.0595	0.0000
69		House Rents	— (Note 2)	0.0000
70		Railway Transport	0.5665	0.0000
71		Road Transport	0.6429	0.0000
72		Water Transport	0.0727	0.0000
73		Air Transport	0.5799	0.0000
74		Other Transport	0.2438	0.0000
75		Telecommunication	0.4372	0.0000
76		Postal Service	0.2160	0.0000
77		Education	0.6520	0.0000
78		Scientific Research	0.0000	0.0000
79		Medical, Health Care and Welfare	— (Note 2)	0.0000
80		Other Public Services	0.0000	0.0000
81		Advertising, Research and Information Services	0.0029	— (Note 3)
		(Software new orders)	— (Note 3)	0.8020
82		Goods Rental and Leasing	0.1282	0.0000
83		Automobile and Machine Repair	0.2046	0.0000
84		Other Business Services	0.0044	0.1356
85		Broadcasting	0.2856	0.0000
86		Amusement and Hobbies	0.7589	0.0000
87		Eating and Drinking Places	0.6205	0.0000
88		Hotels and Other Accommodations	0.6400	0.0000
89		Other Personal Services	0.9201	0.0000
90		Unable to Classify	0.0000	0.0000

(Note 1) For QE purpose, the “Petroleum Products,” “Electronic and Communication Equipment” and “Insurance” categories have their subcategories since FY2001. (See the text, p. 12.)

(Note 2) “Electricity,” “Water Supply,” “House Rents” and “Medical, Health Care and Welfare” are subject to demand-side estimation as a common estimate item. (See the text, p. 22.)

(Note 3) The software new orders portion in the “Advertising, Research and Information Services” category is estimated separately. (See the text p. 26.)

Reference #3. Value of weight k (prepared in August 2002)

Domestic final consumption expenditure of households: $k = 0.5271$

Private non-residential investment: $k = 0.5801$

Gross fixed capital formation $k_a = 0.5801$ $k_b = 1.000$
(See Reference #6. 1. (2) for the formula.)

Reference #4. Regression formula for estimating private inventory increase (prepared in August 2002)

(1) Net increase in work-in-progress inventory

	Constant term	Rate of increase/decrease (capital ¥1 billion or more)	Season dummy 1	Season dummy 2	Season dummy 3	Consumption tax dummy (0,1)
Coefficient	-2.34	0.75	3.07	2.51	3.76	1.32
t-value	-2.59	12.82	2.00	3.12	2.67	1.71

Modified R^2: 0.994

(Consumption tax dummy stands at 0 for Q1 1997 and 1 for Q2 1997.)

(2) Net increase in distributors' inventory

<Wholesale>

	Constant term	Rate of increase/decrease (on-hand merchandise)	Season dummy 1	Season dummy 2	Season dummy 3	Consumption tax dummy (0,1)
Coefficient	-1.42	0.09	1.99	1.32	2.13	1.40
t-value	-2.56	1.04	2.45	1.56	2.75	0.85

Modified R^2: 0.187

<Retail>

	Constant term	Rate of increase/decrease (on-hand merchandise)	Season dummy 1	Season dummy 2	Season dummy 3	Consumption tax dummy (0,1)
Coefficient	-4.78	0.10	5.68	3.42	10.24	1.85
t-value	-3.53	1.17	3.33	3.02	3.74	1.64

Modified R^2: 0.962

(3) Net increase in raw material inventory

	Constant term	Rate of increase/decrease (capital ¥1 billion or more)	Season dummy 1	Season dummy 2	Season dummy 3
Coefficient	-0.28	0.63	-0.04	-0.64	1.16
t-value	-0.59	6.19	-0.06	-0.97	1.61

Modified R^2: 0.789

Reference #5. List of ARIMA models used for seasonal adjustment

1. GDP demand components (from Jan-Mar 1994 to the most recent quarter)

The following seasonal adjustment models are applicable to quarterly GDP official series (from Jan-Mar 1994 to the most recent quarter). (Disclosed: December 2004)

(1) Components released for QE

Series (nominal and real)	ARIMA model	Leap year adjustment (lpyear)	Outlier, level shift	
			Type, term	Background
Domestic final consumption expenditure of households (excluding imputed rent)	**(0 1 0)(2 1 2)**	×	VAT97 (Note)	The consumption tax hike in April 1997 resulted in widespread last-minute purchasing behaviors (in the Jan-Mar 1997) and subsequent reactionary fall (in the Apr-June 1997). The QE team set up a regression variable that would quantitatively work conversely for the last-minute demand period and the reactionary period.
Domestic final consumption expenditure of households (the imputed rent portion)	**(0 1 0)(0 1 1)**	×	（N.A）	
Direct purchase abroad by resident households	**(0 1 0)(0 1 1)**	×	AO2001.4	As the 9-11-2001 attacks on the U.S. has pushed down the number of Japanese people visiting overseas in the Oct-Dec 2001, the QE team set up additive outlier.
			AO2003.2	Because the war against Iraq sent down the number of Japanese people visiting overseas in the Apr-June 2003, the QE team set up additive outlier.
Direct domestic purchase by non-resident households	**(0 1 0)(0 1 1)**	×	AO2003.2	The war against Iraq also resulted in decreased number of foreigners visiting Japan. in the Apr-June 2003, the QE team set up additive outlier.
			LS2003.1	In the Jan-Mar 2003, Ministry of Finance modified the calculation approach for “Placement of Payment on Travel.” The QE team set up level-shift variable.
Government individual consumption expenditure	**(1 1 2)(0 1 1)**	×	LS1997.3	Due to the medical service reform in September 1997, the team set up level-shift variable.
			LS2000.2	Due to the launch of the nursing care insurance system in FY2000, the nursing care-related payments were earmarked in the government budget in the Apr-Jun 2000 for the first time. In line with this, the QE team set up level-shift variable, which is applicable from .the Apr-Jun 2000 quarter onward.
			LS2002.4	With the medical service reform in October 2002, the team set up level-shift variable.
Government collective consumption expenditure	**(1 1 0)(0 1 0)**	×	（N.A）	
Private housing investment	**(0 1 1)(0 1 1)**	×	（N.A）	
Private non-residential investment	**(0 1 0)(0 1 1)**	×	（N.A）	
Public housing investment	**(0 1 1)(1 1 0)**	×	（N.A）	
Public non-residential investment	**(0 1 1)(0 1 1)**	×	（N.A）	
General government gross fixed capital formation	**(2 1 1)(1 1 0)**	×	（N.A）	
Private finished goods inventory increase	**(2 1 2)(0 1 2)**	×	VAT97 (Note)	The consumption tax hike in April 1997 resulted in widespread last-minute purchasing behaviors (the Jan-Mar 1997: a decrease in inventory) and subsequent reactionary fall (the Apr-June 1997: an increase in inventory). The QE team set up a regression variable that would quantitatively work conversely for the last-minute demand period and the reactionary period.
Private work-in-progress inventory increase	**(1 1 0)(1 1 2)**	×	（N.A）	
Private distributors’ inventory increase	**(0 1 0)(0 1 2)**	×	（N.A）	
Private raw material inventory increase	**(0 1 1)(0 1 1)**	×	（N.A）	
Public enterprises inventory increase	**(0 1 1)(0 1 0)**	×	（N.A）	
General government inventory increase	**(0 1 2)(0 1 0)**	×	（N.A）	
Exports of goods and services (except for direct domestic purchase by nonresident households)	**(0 1 0)(0 1 1)**	×	（N.A）	
Imports of goods and services (except for direct overseas purchase by resident households)	**(0 1 2)(2 1 0)**	×	（N.A）	
Income from the rest of the world	**(0 1 0)(2 1 1)**	×	LS1996.1	“Balance of Payments” provides the data in estimating payments to the rest of the world, but up until 1995 it did not technically grasp “derivatives,” which should be deducted from this account. As a result, the 1995 data is not compatible with the 1996 data. The QE team sets up a variable to address such data incompatibility.
Payment to the rest of the world	**(0 1 0)(0 1 1)**	×	LS1996.1	“Balance of Payments” provides the data in estimating payments to the rest of the world, but up until 1995 it did not technically grasp “derivatives,” which should be deducted from this account. As a result, the 1995 data is not compatible with the 1996 data. The QE team sets up a variable to address such data incompatibility.

(Note) VAT97 represents the variables defined by the QE team and stands at 1 for January 1997, -1 for February 1997 and 0 for other periods.

The seasonal adjustment takes an additive approach for inventory-related series and a multiplicative approach for other series.

In order to address outliers or level shifts, ARIMA models would be applicable from January 1994 to April 2003 in relation with “Direct purchase abroad by resident households,” “Direct domestic purchase by non-resident households” and the government individual consumption expenditure. As for other series, ARIMA models would work from January 1994 to April 2002.

As for private non-residential investment and general government fixed capital formation, the government has purchased considerable amount of assets from the private sector. For this reason, the QE team applies seasonal adjustment calculation after removing this asset purchase.

The seasonal adjustment models listed above are also applicable to real values of reference series, such as the real values from the fixed-base year (1995) approach, as well as those from the Jan-Mar 1994 quarter to the most recent quarter.

The QE team plans to review the current seasonal adjustment approach on a regular basis and will add new data or modify calculation approach if deemed necessary.

(2) Series requiring X-12-ARIMA seasonal adjustment for QE purpose

Series	ARIMA model	Leap year adjustment (lpyear)	Outlier, level shift	
			Type, term	Background
Private non-residential investment (supply-side estimate)	**(1 1 0)(2 1 2)**	×	(N.A)	
Private non-residential investment (demand-side estimate)	**(0 1 0)(2 1 0)**	×	(N.A)	

(Note) ARIMA model would be effective from January 1994 to April 2002.

2. Nominal series for "Compensation for Employees" (Jan-Mar 1980 to the most recent quarter)

The following seasonal adjustment models are applicable to quarterly GDP official series (from Jan-Mar 1980 to the most recent quarter). (Disclosed: December 2004)

Series	ARIMA model	Leap year adjustment (lpyear)	Outlier, level shift	
			Type, term	Background
Wages, salaries	**(2 1 2)(0 1 1)**	×	(N.A)	
Employers' actual social contribution	**(0 1 1)(0 1 0)**	×	(N.A)	
Employers' imputed social contribution	**(1 1 1)(1 1 1)**	×	(N.A)	

(Note) ARIMA model would be effective from January 1980 to April 2002, without retroactive projection.

3. GDP demand components (from Jan-Mar 1980 to Oct-Dec 1993)

The following seasonal adjustment models are applicable to quarterly GDP official series (from Jan-Mar 1980 to Oct-Dec 1993). (Disclosed December: 2003)

Series (nominal and real)	ARIMA model	Leap year adjustment (lpyear)	Outlier, level shift	
			Type, term	Background
Domestic final consumption expenditure of households (excluding imputed rent)	**(2 1 2)(0 1 1)**	○	VAT89	The introduction of consumption tax in April 1989 resulted in widespread last-minute purchasing behaviors (in the Jan-Mar 1989) and subsequent reactionary fall (in the Apr-June 1989). The QE team set up a regression variable that would quantitatively work conversely for the last-minute demand period and the reactionary period.
Domestic final consumption expenditure of households (the imputed rent portion)	**(0 1 0)(0 1 1)**	×	(N.A)	
Direct purchase abroad by resident households	**(0 1 0)(0 1 1)**	×	(N.A)	
Direct domestic purchase by non- resident households	**(0 1 1)(1 1 1)**	×	(N.A)	
Government individual consumption expenditure	**(0 1 1)(2 1 1)**	×	LS1984.4	The October 1984 medical service reform required corporate employees to pay 10% of their medical costs by themselves. As this reform has pushed down the government medical care expenses, the QE team adjusted the related data.
Government collective consumption expenditure	**(0 1 1)(2 1 2)**	×	AO1986.2 AO1986.4 AO1991.1	The government minted significant amount of gold coins, which might have significant impacts on this account. In response to it, the QE team set up proper outliers.
Private housing investment	**(0 1 1)(1 1 2)**	×	(N.A)	
Private non-residential investment	**(2 1 2)(1 1 2)**	×	(N.A)	
Public housing investment	**(2 1 0)(1 1 0)**	×	(N.A)	
Public non-residential investment	**(0 1 0)(2 1 2)**	×	LS1985.2 LS1987.2	The government reduced its capacity investments due to privatization of NTT and JT (in Apr-Jun 1985) and JR East (in Apr-Jun 1987). The QE team adjusted data in line with the decrease in government's capacity investments.
General government gross fixed capital formation	**(0 1 0)(0 1 0)**	×	(N.A)	
Private enterprises inventory increase	**(0 1 1)(0 1 1)**	×	(N.A)	
Public enterprises inventory increase	**(1 1 1)(0 1 1)**	×	(N.A)	
General government inventory increase	**(0 1 1)(2 1 0)**	×	(N.A)	
Exports of goods and services (except for direct domestic purchase by nonresident households)	**(0 1 2)(2 1 0)**	×	(N.A)	
Imports of goods and services (except for direct overseas purchase by resident households)	**(1 1 0)(2 1 1)**	×	(N.A)	
Income from the rest of the world	**(2 1 2)(0 1 0)**	×	(N.A)	
Payment to the rest of the world	**(1 1 0)(0 1 2)**	×	(N.A)	

(Note) VAT89 represents the variables defined by the QE team and stands at 1 for January 1989, -1 for February 1989 and 0 for other periods.
The seasonal adjustment takes an additive approach for inventory-related series and a multiplicative approach for other series.
ARIMA models would be applicable from January 1980 to April 1993.

(Reference) Example of spec file (domestic final consumption expenditure of households (except for imputed rent))

```
  series { start =1994.1
           span  =(1994.1,2004.3)
           modelspan =(1994.1,2004.3)
           period=4
           decimals =1
           precision =1}
transform {  function=log  }
arima {  model = ( 0 1 0 )( 2 1 2 )    }
forecast {  maxlead = 8
            maxback = 20  }
regression {
user = ( vat97 )
file ="xxxxxxxxxxxxxxxxxxxxxxxxx"
}
estimate  { maxiter = 20000 }
x11{  savelog = q
      appendfcst = yes
      save = ( d11 d16 )   }
```

Reference #6. Integration of demand-side and supply-side estimates: Concepts

(prepared in August 2002)

1. Concepts

(1) Domestic final consumption expenditure of households

When we have two independent observed values, C_d (demand-side estimate) and C_s (supply-side estimate) for value C (Domestic Final Consumption Expenditure of Households),

$$kC_d + (1-k)C_s \quad \text{where} \quad k = \frac{\sigma_s^2}{\sigma_d^2 + \sigma_s^2}$$

(σ_d^2 and σ_s^2 are variance of C_d and C_s)

is the Best Linear Unbiased Estimate. (Note 1)

(2) Fixed capital formation

When we have three independent observed values a (value estimated principally from "Financial Statements Statistics of Corporations"), b (value estimated from "Integrated Statistics on Construction Work") and c (value estimated from supply side), each standing for A (private non-residential investment), B (public fixed capital formation), C (sum of the two), satisfying the relation A+B=C,

$k_a a + (1-k_a)(c-b)$ for A

$k_b b + (1-k_b)(c-a)$ for B, and

$(2-k_a-k_b)c + (k_a+k_b-1)(a+b)$ for C, where

$$k_a = \frac{\sigma_b^2 + \sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2} \qquad k_b = \frac{\sigma_a^2 + \sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}$$

(σ_a^2, σ_b^2 and σ_c^2 are variance of a, b and c)

are the best linear unbiased estimate (BLUE). (Note 2)

2. Method of estimating variance of observed values

Based on the concepts in 1, the weight in integrating the two observed values (demand-side and supply-side estimates) is calculated. There are two specific methods of calculation: a method that obtains the weight in a theoretical approach based on the design of the source statistics, and an empirical method that checks the proximity of each value (its annual total) of the demand-side estimates and the supply-side estimates to the past revised values. The former method is described below.

Variance is estimated by the following formula, using the standard error rate for the proportion of quarterly value to the value of preceding calendar year in the principal basic statistics used for estimating each item:

Variance of QE estimates of the current quarter
= (standard error of estimates)^2
= (calendar-year value of QE × standard error rate for the proportion of quarterly value to the value of preceding calendar year in the principal basic statistics)^2

Supply-side and demand-side estimates are calculated by adding, subtracting, multiplying or dividing a plural number of items; therefore, standard errors relating to the estimates are also calculated according to the formula. In concrete terms, on each individual item, standard deviations were calculated on a monetary basis by using the following formula:
"QE value of preceding calendar year × standard error rate for the proportion of quarterly value to the value of preceding calendar year in the principal basic statistics"
Then, obtained amounts are combined to calculate the standard error relating to the whole amount. In this process, observation errors of different statistics are assumed to be independent.

3. Method of estimating standard error rate for the proportion of the value to the value of preceding calendar year in the main source statistics

(1) Demand-side estimates

1) Domestic final consumption expenditure of households

"Family Income and Expenditure Survey" is one of the main source statistics for domestic household final consumption expenditure and does provide information on the standard error rate for all households (0.4% in annual average). If standard error rate is available for a calendar year, it is calculated in the following formula (Note 3):

Standard error rate for the proportion of quarterly value to the value of preceding calendar year
= Standard error rate on annual basis × $\sqrt{5}$

Therefore, according to "Family Income and Expenditure Survey," standard error rate for the proportion of quarterly value to the value of preceding calendar year is $0.4 \times \sqrt{5} = 0.894\%$.

2) Private non-residential investment

a) Non-financial corporations

In respect of "Financial Statements Statistics of Corporations" as principal basic statistics on non-residential investment of non-financial corporations, numbers of samples collected are shown by sector and capital size in the materials of Statistics Council (Enterprise Statistics Working Group, the 62nd meeting). Using corporate financial data and Survey on Service Industries, the QE team calculates coefficients of variation relating to non-residential investment for each category, regards them as coefficients of the parent population, and then estimates standard error rate for the observed value, paying attentions to the number of samples collected. The standard error rate for whole non-financial corporations is estimated by combining them with the non-residential investment data in "Financial Statements Statistics of Corporations."

First, coefficients of variation on non-residential investment under each industrial category of "Financial Statements Statistics of Corporations" are calculated, using "Corporate financial data bank 1999 of Development Bank of Japan." Here, “increase in tangible fixed assets + accumulated depreciation” is assumed to be the non-residential investment amount, negative values being excluded. Coefficients of variation are estimated on the rank with less than 1000 million yen capitals; if effective samples are not obtained on such rank, estimates of the rank with 1000 million yen capital or more are used for substitution.

For some service industries (business establishments services, hotels and other accommodations, personal services, movies and entertainment industry, broadcasting, other service industry), coefficients are calculated using information on distribution of per-company non-residential investment data available from "Survey on Service Industries" issued by Ministry of Internal Affairs and Communications. (Note 4)

Above values are deemed as coefficients of the parent population and applied to each industry and capital size category of "Financial Statements Statistics of Corporations" and the standard error rate for each category is computed in the following formula: (Note 5)

Standard error rate for each category

$$= \text{coefficient of variation for parent population} / \sqrt{\text{number of samples collected}}$$

In this formula, common values are applied as coefficients of variation to each scale of capital base as long as they belong to the same industry category. As "Financial Statements Statistics of Corporations" covers all corporations with 1000 million yen capitals or more, the standard error rate for such corporations is deemed to be none.

Next, the standard error rate for the whole is obtained by integrating standard error rate using as weight the actual non-residential investment that corresponds to each classification by capital size and industry appearing in "Financial Statements Statistics of Corporations." For the actual non-residential investment, the average of 5 years data (1996 through 2000) is used to avoid yearly variation.

Standard error rate relating to the whole

$$= \frac{\sqrt{\Sigma \left(\text{standard error ratio for each category} \times \text{amount of non-residential investment}\right)^2}}{\text{total of non-residential investment}}$$

The standard error rate estimated for the whole from above calculation is 1.048% (Annexed table 1). This is the standard error rate for source statistics on an annual basis. The ratio for the proportion of quarterly value to the value of preceding calendar year is estimated at 2.344% ($=1.048\times\sqrt{5}$).

b) Financial institutions

Relating to "Business and Investment Survey of Incorporated Enterprises" that composes main source statistics for financial institutions' non-residential investment data, the standard error rate stands at 6.0% for the non-manufacturing industries of the April-June 1999 quarter, as shown in "Report of the study on business outlook survey" forming a part of the Report issued in December 2000 by Survey Technique Development Subcommittee of Statistics Council.

The standard error rate being 3.0% ($=6.0/\sqrt{4}$) on an annual basis, the ratio for the proportion of quarterly value to the value of preceding calendar year is estimated at 6.7% ($=3.0\times\sqrt{5}$).

(2) Supply-side estimates

"Current Survey of Production" and "Current Survey of Selected Service Industry" that form main source statistics for supply-side estimates are based either on a complete enumeration or a survey of judgment samples (survey on business establishments with xx or more employees, or establishments among the top xx % in terms of sales, etc.).

The topics section in the 1999 "Census of Manufactures" provides information on distribution of shipment value as compared with the value of the previous year relating to the manufacturing industry as a whole and some other industries. Now let the distribution be deemed to be that of the parent population and the year-to-year change in shipment value of each firm be assumed to occur according to the distribution; then, coefficients of variation are estimated for each industrial category in the case where the year-to-year change in shipment value of some establishments is assumed to be the change of the whole.

The year-to-year change in the current year shipment value as actually observed on a given

industrial category is a linear combination of the year-to-year change rate of each establishment using as weight the preceding year shipment value of each establishment's shipment value.

$$\hat{r} = \sum_{i=1}^{n} y_i / \sum_{i=1}^{n} x_i = \sum_{i=1}^{n} x_i r_i / \sum_{i=1}^{n} x_i$$

$\hat{r}$ is estimate of year-to-year change in shipment value in of a given industry;
y_i is shipment value of the current year of the establishment i;
x_i is the shipment value of preceding year; and r_i is year-to-year change in shipment value.

Assuming that the year-to-year variation $V(\hat{r})$ of the parent population is constant, the estimate $\hat{r}$ would have the following calculation of variation:

Variation $V(\hat{r})$:

$$V(\hat{r}) = V(\sum_{i=1}^{n} x_i r_i / \sum_{i=1}^{n} x_i) = \frac{1}{(\sum_{i=1}^{n} x_i)^2} V(\sum_{i=1}^{n} x_i r_i) = \frac{\sum_{i=1}^{n} x_i^2}{(\sum_{i=1}^{n} x_i)^2} V(r)$$

Standard deviation $\sigma(\hat{r})$:

$$\sigma(\hat{r}) = \sqrt{V(\hat{r})} = \frac{\sqrt{\sum_{i=1}^{n} x_i^2}}{\sum_{i=1}^{n} x_i} \sigma(r) \quad (\sigma(r) = \sqrt{V(r)})$$

Coefficient of variation:

$$\frac{\sigma(\hat{r})}{r} = \frac{\sqrt{\sum_{i=1}^{n} x_i^2}}{\sum_{i=1}^{n} x_i} \frac{\sigma(r)}{r}$$

Thus, the coefficient of variation relating to the estimate of year-to-year change on each industry is the multiplication of the coefficient of the parent population by the following:

$$\frac{\sqrt{\sum_{i=1}^{n} x_i^2}}{\sum_{i=1}^{n} x_i}$$ (hereinafter called "multiplier")

As values are read from the chart of distribution of year-to-year change relating to the total of the manufacturing industry, transportation machinery industry, electric machinery industry, general machinery industry and food industry listed in the 1999 "Census of Manufactures," coefficients of variation are 0.26 to 0.29. Let them be deemed as coefficients of variation of the parent population. Each applicable value is applied to the corresponding industrial category. For other industry categories, the data for the manufacturing industries are applicable.

Coefficients of variation relating to year-to-year change in shipment value

	Average	Variance	Standard deviation	Coefficient of variation
Transport machinery industry	96.89	615.6234	24.81	0.2561
Electric machinery industry	97.80	800.2520	28.29	0.2893
General machinery industry	91.52	640.4209	25.31	0.2765
Food industry	89.49	557.2252	23.61	0.2638
Total mfg. industry	107.27	790.9485	28.12	0.2622

Next, "multiplier" for each industrial category is calculated.

If the main source statistics of each industrial category is "Current Survey of Production," multipliers are calculated using the statistical tables classified by the number of employees of "Census of Manufactures." In the event that relevant statistics concern business establishments having 30 or more employees, multipliers are calculated based on the number of such establishments and their shipment value. Regarding IIP, similar calculations are made on "Current Survey of Production" that serves as source statistics. If the relevant statistics are based on a complete enumeration, coefficients of variation are deemed zero.

If the main source statistics of an industrial category is "Current Survey of Selected Service Industry," which covers the establishments included in the top 70% of sales, multipliers are calculated using the number of establishments in the income bracket of Survey on Service Industries, corresponding to the top 70% in terms of income.

Coefficients of variation for estimates on each industry are estimated by multiplying the coefficients of variation relating to year-to-year change in shipment value of the parent population obtained from above process by the multipliers.

Regarding the construction industry, goods and services that are input are regarded as included in other categories. Regarding other industries that have source statistics based on a complete enumeration, coefficients of variation are regarded zero; and to the industries with no information available, the maximum value of the corresponding coefficient is applied.

The coefficients thus obtained relating to the estimates on each industrial category are given a weighted average using as weight nominal values of the year 2000 relating to household expenditure and gross fixed capital formation, and this way, the standard error rate for the estimates of the whole is estimated. Resulting estimates are 0.472% for household expenditure and 0.388% for gross fixed capital formation. This is a rate on an annual basis. On a quarterly basis, coefficients are 0.944% ($=0.472\times\sqrt{4}$) and 0.775%($=0.388\times\sqrt{4}$) . (Annexed **Table 2**).

(3) Public fixed capital formation

In "Survey of Construction Work Orders Received," which serve as source statistics of "Integrated Statistics on Construction Works," standard error rate is announced (annual average 2.5%, standard error rate for annual estimates of contract amount of individual public works (civil engineering machinery/equipment works)). Let the standard error rate for "Survey of Construction Works Started," which serves as source statistics for the construction portion of "Integrated Statistics on Construction Works" be deemed zero; based on it the standard error rate for the proportion of quarterly value to the value of preceding fiscal year is estimated at 4.77% ($2.13\%\times\sqrt{5}$ when construction portion is considered).

(Note 1) Method of calculating the best linear unbiased estimate (BLUE) of domestic household final consumption expenditure

The estimated value $\tilde{C}$ of C is estimated by the linear combination of C_d and C_s.
The following assumptions are made :

$$C_d = C + \varepsilon_d$$

$$C_s = C + \varepsilon_s$$

$$E(\varepsilon_d) = E(\varepsilon_s) = 0.$$

Here, if we let the estimate of C be

$$\tilde{C} = k_d C_d + k_s C_s,$$

we have the following equation:

$$\begin{aligned} E(\tilde{C}) &= k_d (C + \varepsilon_d) + k_s (C + \varepsilon_s) \\ &= (k_d + k_s) C \end{aligned}.$$

In order for the above to always be congruent with C (unbiasedness),

$$k_d + k_s = 1$$

is necessary and sufficient. Here, if we have $k_d = k$, then $k_s = 1 - k$.

Next, we have the following equation on variance of $\tilde{C}$:

$$\begin{aligned} V(\tilde{C}) &= E\left\{(\tilde{C} - C)^2\right\} \\ &= E\left[\{kC_d + (1-k)C_s - C\}^2\right] \\ &= E\left[\{k(C + \varepsilon_d) + (1-k)(C + \varepsilon_s) - C\}^2\right] \\ &= E\left[\{k\varepsilon_d + (1-k)\varepsilon_s\}^2\right]. \end{aligned}$$

Here let ε_d and ε_s be assumed to be independent from each other, and their variance to be σ_d^2 and σ_s^2, respectively; then we have the following:

$$V(\tilde{C}) = k^2 \sigma_d^2 + (1-k)^2 \sigma_s^2.$$

It takes at $k = \dfrac{\sigma_s^2}{\sigma_d^2 + \sigma_s^2}$,

the minimum value $\dfrac{\sigma_d^2\sigma_s^2}{\sigma_d^2+\sigma_s^2}$ (best estimate).

The above gives the best linear unbiased estimates of C as follows:

$$\tilde{C} = kC_d + (1-k)C_s \qquad k = \frac{\sigma_s^2}{\sigma_d^2+\sigma_s^2}.$$

(Note 2) Method of calculating the best linear unbiased estimate on fixed capital formation

A's estimated value $\tilde{A}$ is estimated by linear combination of a, b and c. The following assumptions are made:

$$a = A + \varepsilon_a$$
$$b = B + \varepsilon_b$$
$$c = C + \varepsilon_c$$
$$E(\varepsilon_a) = E(\varepsilon_b) = E(\varepsilon_c) = 0.$$

Here, let the estimate of A be

$$\tilde{A} = k_a a + k_b b + k_c c.$$

Then, we have

$$\tilde{A} = k_a(A+\varepsilon_a) + k_b(B+\varepsilon_b) + k_c(C+\varepsilon_c)$$
$$= k_a(A+\varepsilon_a) + k_b(B+\varepsilon_b) + k_c(A+B+\varepsilon_c)$$
$$= (k_a+k_c)A + (k_b+k_c)B + k_a\varepsilon_a + k_b\varepsilon_b + k_c\varepsilon_c.$$

Therefore,

$$E(\tilde{A}) = (k_a+k_c)A + (k_b+k_c)B.$$

In order for the above to always be congruent with A (unbiasedness), the following is necessary and sufficient:

$$k_a + k_c = 1 \quad \text{and} \quad k_b + k_c = 0.$$

Next, we have the following equation on variance of $\tilde{A}$

$$V(\tilde{A}) = E\left\{(\tilde{A}-A)^2\right\}$$
$$= E\left[\left\{(k_a a + (1-k_a)(c-b) - A)\right\}^2\right]$$

$$= E\left[\left\{k_a\varepsilon_a + (1-k_a)(\varepsilon_c - \varepsilon_b)\right\}^2\right].$$

Here let ε_a, ε_b and ε_c be assumed to be independent from each other, and their variance be expressed as σ_a^2 , σ_b^2 and σ_c^2,

$$V(\tilde{A}) = k_a^2\sigma_a^2 + (1-k_a)^2(\sigma_b^2 + \sigma_c^2).$$

It takes at $k_a = \dfrac{\sigma_b^2 + \sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}$, the minimum value $\dfrac{(\sigma_b^2 + \sigma_c^2)\sigma_a^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}$ (best estimate).

The above gives the best linear unbiased estimate on A as follows:

$$\tilde{A} = k_a a + (1-k_a)(c-b) \qquad k_a = \frac{\sigma_b^2 + \sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}.$$

Similar calculations give the best linear unbiased estimates on B and C as follows:

$$\tilde{B} = k_b b + (1-k_b)(c-a) \qquad k_b = \frac{\sigma_a^2 + \sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}$$

$$\tilde{C} = (1-k_c)c + k_c(a+b) \qquad k_c = \frac{\sigma_c^2}{\sigma_a^2 + \sigma_b^2 + \sigma_c^2}$$

where $k_c = k_a + k_b - 1$. Therefore, we have the following expression:

$$\tilde{C} = (2-k_a-k_b)c + (k_a + k_b - 1)(a+b).$$

It also confirms $\tilde{A} + \tilde{B} = \tilde{C}$ (additive consistency).

(Note 3) Method of estimating standard error rate for the proportion of quarterly value to the value of preceding calendar year

Let the quarterly value of the current period be B and the value of the preceding calendar year be A. If A and B are independent from each other, variance of B/A (quarter-to-calendar year change) is calculated as follows:

$$V\left(\frac{B}{A}\right)=V\left(\frac{\overline{B}\left(1+\frac{\delta B}{\overline{B}}\right)}{\overline{A}\left(1+\frac{\delta A}{\overline{A}}\right)}\right) \fallingdotseq \left(\frac{\overline{B}}{\overline{A}}\right)^2 V\left(1+\frac{\delta B}{\overline{B}}-\frac{\delta A}{\overline{A}}\right)=\left(\frac{\overline{B}}{\overline{A}}\right)^2\left(\left(\frac{\sigma_A}{\overline{A}}\right)^2+\left(\frac{\sigma_B}{\overline{B}}\right)^2\right).$$

Therefore, standard error rate for B/A is calculated as follows:

$$\sigma\left(\frac{B}{A}\right)/\left(\frac{\overline{B}}{\overline{A}}\right)=\sqrt{V\left(\frac{B}{A}\right)}/\left(\frac{\overline{B}}{\overline{A}}\right)=\sqrt{\left(\frac{\sigma_A}{\overline{A}}\right)^2+\left(\frac{\sigma_B}{\overline{B}}\right)^2}\ .$$

Here if we use the relation of the standard error rate on a quarterly basis being twice as much as the rate on an annual basis, quarterly values being independent from each other and variance being constant, then we have the following expression:

$$\sigma\left(\frac{B}{A}\right)/\left(\frac{\overline{B}}{\overline{A}}\right)=\sqrt{\left(\frac{\sigma_A}{\overline{A}}\right)^2+\left(2\frac{\sigma_A}{\overline{A}}\right)^2}=\sqrt{5}\times\left(\frac{\sigma_A}{\overline{A}}\right).$$

(Note 4) Method of estimating coefficients of variation for non-residential investment of service industries

On some of service businesses, distribution of non-residential investment on a business establishment basis is provided in MIC, "Survey on Service Industries." It permits coefficients of variation to be estimated.

The number of business establishments by rank of non-residential investment is provided in Table 20 in Survey on Service Industries. Let the establishments be assumed uniformly distributed within each rank to calculate variation of the whole non-residential investment (total of square sum of deviation from average). On the rank having 100 million yen capital or more, the sum of non-residential investment of the rank below 100 million yen capital (calculated by "median number of each rank * number of establishments") is subtracted from the overall non-residential investment of Table 18, then divided by the number of establishments of the rank with 100 million yen or more of capital to estimate the average value; and then calculation is made assuming that the investment is distributed equally around the average.

"Financial Statements Statistics of Corporations" make stratified sampling by the rank of capital as well as by sector; therefore, in estimating coefficients of variation within each stratum, variations between different strata should be subtracted from variations of the whole. Non-residential investment by rank of capital and the number of establishments are known from Table 19 and Table 9 of Survey on Service Industries, respectively; they are integrated in conformity to the ranks of capital of "Financial Statements Statistics of Corporations" and the coefficient of variation within each stratum is estimated as follows (Table 19 does not contain the number of establishments with "capital rank unknown" nor "foreign companies," while Table 9 contains establishments with "non-residential investment unknown." Therefore, they are prorated to adjust their level to Table 20).

Variation within stratum: $S_{[INS]} = \sum_{j=1}^{m_1}(x_{1j} - \bar{x}_1)^2 + ... + \sum_{j=1}^{m_n}(x_{nj} - \bar{x}_n)^2$

Variation between different strata: $S_{[BTW]} = m_i(\bar{x}_1 - \bar{x})^2 + ... + m_n(\bar{x}_n - \bar{x})^2$

(assumption is made that there are n capital ranks, the number of establishments belonging to them is m_i, non-residential investment of each establishment is $\bar{x}_{ij}$, the average amount of non-residential investment is $\bar{x}_i$, and the average of the total non-residential investment is $\bar{x}$).

When total variation$= S_{[INS]} + S_{[BTW]}$,

assuming that variation in each stratum is equivalent (=r), variance in stratum i is computed as follows:

$\sigma_i^2 = \frac{1}{m_1 - 1}\sum_{j=1}^{m_i}(x_{ij} - \bar{x}_i)^2 = \bar{x}_i^2 r^2$, $\sum_{j=1}^{m_i}(x_{ij} - \bar{x}_i)^2 = (m_i - 1)\bar{x}_i^2 r^2$.

Therefore,

$S_{[INS]} = r^2\sum_{i=1}^{n}(m_i - 1)^2\bar{x}_i^{\,2} = S - S_{[BTW]}$. Consequently, $r = \sqrt{\frac{S - S_{[BTW]}}{\sum_{i=1}^{n}(m_i - 1)^2\bar{x}_i^{\,2}}}$.

(Note 5) Equation for computing standard error rate by industry and capital rank

Relating to observed value x of the parent population of which average is μ and variation is σ^2, let us suppose that $x = \mu + \varepsilon$, $E(\varepsilon) = 0$ and $V(\varepsilon) = \sigma^2$. Variance of average value of x_i, when n samples （$x_1, ..., x_n$） are abstracted from their parent population is:

$V(\frac{1}{n}\sum_{i=1}^{n}x_i) = E(\frac{1}{n}\sum_{i=1}^{n}x_i - \mu)^2 = E(\frac{1}{n}\sum_{i=1}^{n}\varepsilon_i)^2 = \frac{\sigma^2}{n}$;

thus, standard error rate is $\frac{1}{\sqrt{n}}\frac{\sigma}{\mu}$, standing at $\frac{1}{\sqrt{n}}$ times as much as the coefficients of variation of the parent population.

Annexed Table 1. Estimated standard error ratio on Incorporated Enterprises Statistics (prepared in August 2002)

	Coefficient of variation	Samples collected	Samples collected by rank of capital					Standard error ratio by rank of capital (annual total)					
	(annual)		10-20 million	20-50 million	50-100 million	100-1,000 million	Over 1,000 million	Total	10-20 million	20-50 million	50-100 million	100-1,000 million	Over 1,000 million
All industries		18,519	1,871	2,340	1,681	7,417	5,210	0.01048	0.06795	0.05203	0.07392	0.03628	0
18.Foodstuff	1.1741	638	41	55	49	288	205	0.03142	0.18337	0.15832	0.16773	0.06919	0
20.Textiles	1.5225	189	19	23	34	66	47	0.05078	0.34929	0.31746	0.26111	0.18741	0
21.Clothes, other textile	0.7918	138	20	30	40	26	22	0.06209	0.17706	0.14457	0.12520	0.15529	0
22.Lumber, wood products	0.6967	142	28	27	50	25	12	0.05189	0.13166	0.13408	0.09853	0.13934	0
24.Pulp, paper, paper artifacts	0.5814	202	28	31	43	50	50	0.01708	0.10987	0.10442	0.08866	0.08222	0
25.Publication, printing	0.9617	248	30	39	37	99	43	0.04379	0.17559	0.15400	0.15811	0.09666	0
26.Chemicals	1.7154	669	18	28	43	258	322	0.02663	0.40433	0.32418	0.26160	0.10680	0
27.Petroleum/ccoal products	*2.2156*	150	33	45	21	17	34	0.02588	0.38568	0.33027	0.48347	0.53735	0
30.Ceramics, stone products	1.5371	312	29	33	46	115	89	0.05769	0.28544	0.26758	0.22664	0.14334	0
31.Steel	1.0326	220	12	20	35	77	76	0.01240	0.29810	0.23091	0.17455	0.11768	0
32.Nonferrous metals	1.0132	256	22	39	43	72	80	0.01368	0.21602	0.16224	0.15451	0.11941	0
33.Metal products	1.0080	388	46	47	35	159	101	0.05383	0.14862	0.14703	0.17038	0.07994	0
34.General machinery and equipment	1.0523	559	37	49	34	212	227	0.03820	0.17301	0.15034	0.18048	0.07228	0
35.Electric machinery and equipment	0.8174	856	34	47	45	345	385	0.00923	0.14019	0.11924	0.12186	0.04401	0
36.Transport machinery and equipment	0.9529	441	25	42	48	153	173	0.01372	0.19058	0.14704	0.13754	0.07704	0
37.Precision machinery and equipment	0.6434	236	24	35	43	63	71	0.01599	0.13133	0.10876	0.09812	0.08106	0
38.Ships and vessels, repairs	1.2830	98	31	16	14	24	13	0.01993	0.23043	0.32074	0.34289	0.26188	0
39.Other manufacturing	0.9354	583	64	57	45	248	169	0.02751	0.11692	0.12389	0.13944	0.05940	0
01.Agriculture	*1.3399*	109	28	30	24	20	7	0.13277	0.25322	0.24463	0.27351	0.29961	0
06.Forestry	*1.3399*	73	17	26	7	21	2	0.17003	0.32497	0.26278	0.50644	0.29239	0
08.Fishery	*1.0632*	74	25	20	16	9	4	0.12218	0.21265	0.23775	0.26581	0.35441	0
10.Mining	*1.6630*	213	28	36	30	28	91	0.10331	0.31428	0.27717	0.30362	0.31428	0
15.Construction	1.2435	1,730	254	618	156	416	286	0.02476	0.07803	0.05002	0.09956	0.06097	0
40.Wholesale	1.6194	2,216	246	274	162	1,033	501	0.03505	0.10325	0.09783	0.12723	0.05038	0
49.Retail	1.1741	1,654	231	153	124	726	420	0.02373	0.07725	0.09492	0.10544	0.04358	0
59.Real estate	2.1985	1,527	126	112	94	780	415	0.06330	0.19585	0.20774	0.22675	0.07872	0
61.Land transport	0.9098	483	43	85	50	175	130	0.02010	0.13875	0.09869	0.12867	0.06878	0
64.Water transport	1.6078	218	32	27	35	77	47	0.12457	0.28423	0.30943	0.27177	0.18323	0
69.Other transport and communication	2.2187	588	30	34	44	285	195	0.00827	0.40507	0.38050	0.33448	0.13142	0
70.Electricity industry	*0.8795*	47	2	1	0	8	36	0.00075	0.62187	0.87945	0.00000	0.31093	0
71.Gas, heat supply, water supply	*1.1142*	153	8	24	25	62	34	0.02338	0.39391	0.22743	0.22283	0.14150	0
74.Business establishment services	2.2840	982	89	71	50	490	282	0.03844	0.24210	0.27106	0.32300	0.10318	0
75.Hotels and other accommodations	4.2233	430	21	25	27	210	147	0.46030	0.92160	0.84466	0.81278	0.29144	0
76.Personal services	3.1578	163	28	30	26	61	18	0.26896	0.59677	0.57654	0.61930	0.40432	0
76.Movies, entertainment industry	1.9803	454	24	27	37	246	120	0.16180	0.40422	0.38111	0.32556	0.12626	0
81.Broadcasting	1.2047	412	15	18	26	178	175	0.02745	0.31105	0.28394	0.23626	0.09029	0
89.Other service industries	2.3321	668	83	66	43	295	181	0.10861	0.25598	0.28706	0.35564	0.13578	0

(Remarks)

1. In terms of "74.Business establishment service" and other industries appearing below in the list, the coefficients of variation were estimated from the 1999 Survey on Service Industries. For other industry categories, the coefficients were estimated from the Corporate Financial Databank of Development Bank of Japan (listed companies as of 1999).
2. In this list, non-residential investment means the sum of increase in the tangible fixed assets (from the Corporate Financial Databank of Development Bank of Japan) and depreciation. Negative values are excluded. Coefficients of variation were estimated on the capital base categories of less than 1,000 million yen. Where effective samples were not available for such corporate categories, estimates relating to the rank with 1000 million yen or more were used in substitution (italicized values). As effective samples were not available for "06. Forestry," the data on "01. Agriculture" are used as substitute.
3. Samples collected represent the data as of the Oct-Dec quarter 2000, as stated in the materials prepared for the 62nd Corporate Statistics Meeting of the Statistics Council.

Annexed Table 2. Estimated standard error ratio on supply-side estimates (prepared in August 2002)

		Coefficient of year-to-year variation relating to population	Multiplier	Coefficient of year-to-year variation relating to estimate on each commodity	Ratio in domestic final consumption to a total of 10000	Standard deviation	Ratio in gross fixed capital formation to a total of 10000	Standard deviation	Remarks
1	Rice and wheat	—	—	—	—	—	—	—	Excluded (no allocation)
2	Other Crop Farming	—	—	*0.0482*	263	12.69	26	1.28	
3	Livestock Farming	—	—	*0.0482*	19	0.93	14	0.67	
4	Agricultural services	—	—	*0.0482*	7	0.33	0	0.00	
5	Forestry	—	—	0.0000	12	0.00	1	0.00	Complete count survey
6	Fisheries	0.2622	0.1429	0.0375	55	2.07	0	0.00	Multiplier is estimated with the number of samples
7	Metal Mining	—	—	—	—	—	—	—	Excluded (no allocation)
8	Non-Metal Mining	—	—	0.0000	0	0.00	102	0.00	Complete count survey
9	Coal and Lignite Mining	—	—	—	—	—	—	—	Excluded (no allocation)
10	Crude Petroleum and Natural Gas Production	—	—	—	—	—	—	—	Excluded (no allocation)
11	Livestock Products	—	—	0.0000	333	0.00	0	0.00	Complete count survey
12	Seafood Products	0.2638	0.1826	0.0482	409	19.68	0	0.00	Multiplier is estimated with the number of samples
13	Flour and Grain Mill Products	—	—	0.0000	143	0.00	0	0.00	Complete count survey
14	Agricultural Products	0.2638	0.1826	0.0482	500	24.07	0	0.00	Multiplier is estimated with the number of samples
15	Other food	—	—	0.0000	388	0.00	0	0.00	Complete count survey
16	Beverages	0.2638	*0.0320*	0.0084	550	4.64	0	0.00	
17	Animal Feeds and Organic Fertilizers	—	—	*0.0482*	34	1.62	0	0.00	
18	Tobacco Manufactures	0.2638	*0.0320*	0.0084	269	2.27	0	0.00	
19	Spinning Mills	0.2622	0.0869	0.0228	1	0.02	0	0.00	
20	Fabric Mills and Others	0.2622	0.0361	0.0095	14	0.13	28	0.27	
21	Apparel and other personal items	0.2622	0.0263	0.0069	870	6.00	41	0.29	
22	Lumber and wood products	0.2622	0.0522	0.0137	9	0.12	354	4.85	
23	Furniture and Fixtures	0.2622	0.0621	0.0163	51	0.83	211	3.43	
24	Pulp and paper	—	—	0.0000	10	0.00	4	0.00	Complete count survey
25	Paper Products	0.2622	0.0285	0.0075	23	0.17	48	0.36	
26	Publication and Printing	—	—	0.0000	155	0.00	23	0.00	Complete count survey; but part of consumption not applicable (common)
27	Basic Chemical Products	—	—	0.0000	2	0.00	5	0.00	Complete count survey
28	Chemical Fibers	—	—	—	—	—	—	—	Excluded (no allocation)
29	Drug and Medicines	0.2622	*0.0320*	0.0084	74	0.62	0	0.00	
30	Chemical Final Products	0.2622	0.0757	0.0198	245	4.87	47	0.93	
31	Petroleum Products	—	—	0.0000	319	0.00	156	0.00	Complete count survey
32	Coal Products	—	—	0.0000	0	0.00	59	0.00	Complete count survey
33	Plastic Products	0.2622	0.0360	0.0094	75	0.71	130	1.23	
34	Rubber Products	0.2622	0.0797	0.0209	42	0.89	20	0.42	
35	Leather Products	0.2622	0.0405	0.0106	122	1.29	0	0.00	
36	Glass and its Products	—	—	0.0000	8	0.00	28	0.00	Complete count survey

		Coefficient of year-to-year variation relating to population	Multiplier	Coefficient of year-to-year variation relating to estimate on each commodity	Ratio in domestic final consumption to a total of 10000	Standard deviation	Ratio in gross fixed capital formation to a total of 10000	Standard deviation	Remarks
37	Cement and its Products	0.2622	0.0355	0.0093	0	0.00	532	4.95	
38	Pottery and Related Products	0.2622	0.1428	0.0374	9	0.35	41	1.55	
39	Other Ceramics, Stone and Cray Products	—	—	0.0000	19	0.00	122	0.00	Complete count survey
40	Iron and Steel	—	—	0.0000	-1	0.00	-13	0.00	Complete count survey
41	Steel Products	—	—	0.0000	0	0.00	165	0.00	Complete count survey
42	Nonferrous Metals Refining	—	—	0.0000	6	0.00	-22	0.00	Complete count survey
43	Nonferrous Metal Products	0.2622	0.1002	0.0263	1	0.03	117	3.08	
44	Metal Products for Construction / Building	0.2622	0.0623	0.0163	4	0.06	668	10.92	
45	Other Metal Products	0.2622	0.0392	0.0103	39	0.40	232	2.38	
46	General Industry Machinery and Equipment	0.2765	0.0836	0.0231	1	0.02	564	13.03	
47	Special Industry Machinery and Equipment	0.2765	0.0577	0.0160	2	0.03	837	13.37	
48	Other General Industry Machinery and Equipment	0.2765	0.0719	0.0199	0	0.00	210	4.16	
49	Office and Service Industry Equipment	0.2765	0.1250	0.0346	1	0.04	236	8.15	
50	Household Electric Appliances	0.2893	0.0869	0.0252	414	10.42	67	1.69	
51	Electronic and Communication Equipment	0.2893	0.0434	0.0126	105	1.32	1,769	22.20	
52	Heavy Electrical Equipment	0.2893	0.0879	0.0254	0	0.00	346	8.80	
53	Other Electric Machinery and Equipment	0.2893	0.0775	0.0224	42	0.94	84	1.88	
54	Motor Vehicles and Repairing	0.2561	0.0735	0.0188	—	—	682	12.84	Consumption not applicable (common)
55	Shipbuilding and Repairing	0.2561	0.1201	0.0307	1	0.02	-3	-0.08	
56	Other Transportation Equipment and Repairing	0.2561	0.1725	0.0442	15	0.68	115	5.06	
57	Precision Instrument and Machinery	0.2622	0.0863	0.0226	99	2.23	245	5.55	
58	Other Manufacturing	0.2622	0.0738	0.0193	239	4.62	122	2.35	
59	Construction	—	—	—	—	—	—	—	Excluded (construction commodity)
60	Electricity	—	—	0.0000	—	—	47	0.00	Complete count survey; but consumption not applicable (common)
61	Gas and Heat Supply	—	—	0.0000	66	0.00	8	0.00	Complete count survey
62	Water Supply	—	—	*0.0482*	—	—	6	0.30	Consumption not applicable (common)
63	Waste Disposal	—	—	*0.0482*	14	0.69	6	0.29	
64	Wholesale	—	—	—	—	—	—	—	Excluded(no allocation)
65	Retail	—	—	*0.0482*	24	1.13	26	1.24	
66	Finance	—	—	*0.0482*	—	—	28	1.36	Consumption not applicable (common)
67	Insurance	—	—	*0.0482*	—	—	24	1.18	Consumption not applicable (common)
68	Brokers and Lessors of Real Estate	—	—	*0.0482*	—	—	32	1.54	Consumption not applicable (common)
69	House Rents	—	—	—	—	—	0	0.00	Consumption not applicable (common)
70	Railway Transport	—	—	*0.0482*	208	10.05	15	0.72	Part of consumption not applicable (common)
71	Road Transport	—	—	*0.0482*	226	10.91	21	1.02	Part of consumption not applicable (common)
72	Water Transport	—	—	*0.0482*	6	0.28	1	0.04	
73	Air Transport	—	—	*0.0482*	115	5.53	4	0.18	
74	Other Transport	0.2622	0.1414	0.0371	105	3.89	0	0.00	Multiplier is estimated with the number of samples

		Coefficient of year-to-year variation relating to population	Multiplier	Coefficient of year-to-year variation relating to estimate on each commodity	Ratio in domestic final consumption to a total of 10000	Standard deviation	Ratio in gross fixed capital formation to a total of 10000	Standard deviation	Remarks
75	Telecommunication	0.2622	0.0854	0.0224	404	9.06	81	1.82	Multiplier is estimated with the number of samples
76	Postal Service	—	—	0.0000	26	0.00	9	0.00	Complete count survey
77	Education	0.2622	0.0055	0.0014	37	0.05	1	0.00	Multiplier is estimated with the number of samples
78	Scientific Research	0.2622	0.0055	0.0014	0	0.00	5	0.01	Multiplier is estimated with the number of samples
79	Medical, Health Care and Welfare	—	—	—	—	—	0	0.00	Consumption not applicable (common)
80	Other Public Services	—	—	*0.0482*	0	0.00	9	0.45	
81	Advertising, Research and Information Services	0.2622	0.0164	0.0043	3	0.01	46	0.20	Software of gross fixed capital formation not applicable (common)
82	Goods Rental and Leasing	0.2622	0.0248	0.0065	44	0.29	7	0.05	
83	Automobile and Machine Repair	—	—	0.0000	181	0.00	64	0.00	Complete count survey
84	Other Business Services	0.2622	0.0110	0.0029	8	0.02	1,004	2.89	
85	Broadcasting	—	—	*0.0482*	51	2.48	0	0.00	
86	Amusement and Hobbies	0.2622	0.0111	0.0029	614	1.79	0	0.00	
87	Eating and Drinking Places	0.2622	0.0798	0.0209	930	19.46	0	0.00	Multiplier is estimated with the number of samples
88	Hotels and Other Accommodations	0.2622	0.1414	0.0371	294	10.89	0	0.00	Multiplier is estimated with the number of samples; part of consumption not applicable (common)
89	Other Personal Services	0.2622	0.0169	0.0044	644	2.85	1	0.01	
90	Unable to Classify	—	—	*0.0482*	0	0.00	139	6.69	
	Total				10,000	47.21	10,000	38.77	
	Standard error rate for aggregative value (90 commodities)					0.00472		0.00388	
	Standard error rate for aggregative value (quarterly)					0.00944		0.00775	

(Remarks)

1. If main source statistics are based on a complete count survey, the coefficient of variation relating to year-to-year change was assumed to be zero.
2. Coefficients of variation of the parent population relating to the year-to-year change in shipment value are: 0.2638 for categories 11-18 (food manufacturing industry) 0.2765 for categories 46-49 (general machinery/equipment manufacturing industry); 0.2893 for categories 50-56 (electric machinery/equipment manufacturing industry); 0.2561 for categories 54-56 (transport machinery/equipment industry); and 0.2622 for other categories (whole manufacturing industry).
3. Italicized multipliers were substituted with the average (0.0320) when source statistics is IIP.
4. Where distribution of shipment value is not available, only number of samples being available, multipliers were estimated by (1/square root of number of samples).
5. If the standard error rate is in Italic, the maximum value of standard error ratio (0.0482) is used as substitute because multiplier is not available .
6. The following categories are excluded from estimation: the school textbook purchase portion in "26. Publication, printing" of the household consumption (common estimate item); "54.Automobiles and their repairs"; "60. Electricity"; "62. Water supply"; "66. Finance"; "67. Insurance"; "68. Brokers and Lessors of Real Estate"; "69. House rents"; the “contribution for free train/boat ride for war-injured/diseased” portion in "70. Railroad transport" and "71. Road transport"; "79. Medical care/insurance"; the board and lodging portion in "88. Hotels and other accommodations" and "81.Advertisement/investigation/information service" of gross fixed capital formation (portion other than the construction commodity-flow method).
7. Items that are not allocated neither to Domestic Final Consumption Expenditure nor to Gross Fixed Capital Formation were excluded from the estimates.
8. Construction was excluded because the input goods and service are considered included in other items.
9. Composition ratio (to a total of 10,000) for Domestic Final Consumption of Households and Gross Fixed Capital Formation are as of the year 2000.

Reference #7. Main source statistics used for QE estimates (prepared in January 2005)

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
1	Rice and wheat	Index Numbers of Commodity Price of Agriculture (MAFF)	Rice	Late next month		3
		Monthly Statistical Reports on Agriculture, Forestry and Fisheries (MAFF)	Sales of rice for domestic staple food	Middle of month after next	A	
2	Other Crop Farming	Survey on Flowers Wholesale Markets (MAFF)	Cut flowers, pot flowers, seedlings for flowerbeds, wholesale amounts	Middle of month after next	A	2
		Statistical Survey on Vegetables and Fruits (MAFF)	Total quantity of vegetables, imported vegetables, domestic fruits, wholesale amounts	Late next month		
3	Livestock Farming	Statistical Survey on Meat Marketing (MAFF)	Total traded value of dressed carcasses of pigs and adult cattle	Late next month		6
		Monthly Report on Beef Calf Market (ALIC)	Number of calves traded; average price	Late next month		
		Statistical Survey on Milk and Milk Products (MAFF)	Production quantity of raw milk	Late next month		
		Statistical Survey on Hen Eggs Marketing (MAFF)	Shipment quantity of hen eggs	Middle of month after next	C	
		Index Numbers of Commodity Price of Agriculture (MAFF)	Hen eggs, raw mil	Late next month		
4	Agricultural services	Substituted for series of stockbreeding and sericulture				
5	Forestry	Inspection of sawmill sample (MAFF)	Received quantity of materials for sawmilling domestic lumber	Early month after next	A	3
		Domestic Corporate Goods Price Index (BOJ)	Forest products	Early next month		
6	Fisheries	Statistical Survey on Marketing quantity of Fishery Products in Landing Areas (MAFF)	Listed received quantity, prices	Late next month		3
7	Metal Mining	Indices of Producers Shipments (METI)	Gold mines	Preliminary (late next month) Revised (middle of month after next)		3
		Import price index (BOJ)	Metallic materials	Early next month		
8	Non-Metal Mining	Indices of Producers Shipments (METI)	Silica rocks, limestone	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Stone materials, aggregates, other mineral materials	Early next month		
9	Coal and Lignite Mining	* Quantity is estimated by the Cabinet Office.				3
		Domestic Corporate Goods Price Index (BOJ)	Coal products	Early next month		

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
10	Crude Petroleum and Natural Gas Production	Indices of Producers Shipments (METI)	Crude oil, natural gas	Preliminary(late next month) Revised(middle of month after next)		3
		Import price index (BOJ)	Crude oil	Early next month		
11	Livestock Products	Indices of Producers Shipments (METI)	Meat products, dairy products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Meat products, dairy products	Early next month		
12	Seafood Products	Indices of Producers Shipments (METI)	Fishery products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Processed marine products	Early next month		
13	Flour and Grain Mill Products	Indices of Producers Shipments (METI)	Flour milling, flour products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Farina, farina products	Early next month		
14	Agricultural Products	Indices of Producers Shipments (METI)	Vegetable and fruit products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Agricultural processed food	Early next month		
15	Other food	Indices of Producers Shipments (METI)	Fats and oils, condiments, other foodstuffs	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Edible fats and oils, other prepared food	Early next month		
16	Beverages	Indices of Producers Shipments (METI)	Alcohols, soft drinks	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Alcohols, soft drinks	Early next month		
17	Animal Feeds and Organic Feedstuff	Actual condition survey of commercial feed price (MAFF)	Production quantity of mixed feed, formula feed	Late month after next	A	3
		Domestic Corporate Goods Price Index (BOJ)	Feed, fertilizers	Early next month		
18	Tobacco Manufactures	*Quantity is estimated by the Cabinet Office.				6
		Domestic Corporate Goods Price Index (BOJ)	Tobacco	Early next month		
19	Spinning Mills	Indices of Producers Shipments (METI)	Spinning	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Raw yarn	Early next month		
20	Fabric Mills and Others	Indices of Producers Shipments (METI)	Woven products, dyeing, other textile products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Woven and knitted fabrics, other textile products	Early next month		

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
21	Apparel and other personal items	Indices of Producers Shipments (METI)	Apparel	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Apparel	Early next month		
22	Lumber and wood products	Current Survey of Production (METI)	Monthly statistical report of ceramics and building materials (sales amount)	Revised(middle of month after next)	A	2
23	Furniture and Fixtures	Current Survey of Production (METI)	Monthly statistical report of ceramics, building materials, sundry goods (sales amount)	Revised(middle of month after next)	A	2
24	Pulp and paper	Current Survey of Production (METI)	Monthly statistical report of paper, pulp, plastic and rubber (sales amount)	Revised(middle of month after next)	A	2
25	Paper Products	Current Survey of Production (METI)	Monthly statistical report of paper, pulp, plastic and rubber (sales amount)	Revised(middle of month after next)	A	2
26	Publication and Printing	Indices of Producers Shipments (METI)	Newspaper, printing industry	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Publications, printed materials	Early next month		
27	Basic Chemical Products	Current Survey of Production (METI)	Monthly statistical report of chemical industry (sales amount)	Revised(middle of month after next)	A	2
28	Chemical Fibers	Indices of Producers Shipments (METI)	Chemical fibers	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Synthetic fiber, staple fiber	Early next month		
29	Drug and Medicines	*Quantity is estimated by the Cabinet Office.				6
		Domestic Corporate Goods Price Index (BOJ)	Drug medicine	Early next month		
30	Chemical Final Products	Current Survey of Production (METI)	Monthly statistical report of chemical industry (sales amount)	Revised(middle of month after next)	A	2
31	Petroleum Products	Indices of Producers Shipments (METI)	Gasoline, jet fuel oil, kerosene, diesel oil, A-grade heavy oil, B/C-grade heavy oil, naphtha, petroleum products, lubricants, asphalt	Preliminary (late next month) Revised(middle of month after next)		6
	(subcategories estimated)	Domestic Corporate Goods Price Index (BOJ)	Gasoline, jet fuel oil, kerosene, diesel oil, A-grade heavy oil, C-grade heavy oil, naphtha, LPG, lubricants and other petroleum	Early next month		
32	Coal Products	Indices of Producers Shipments (METI)	Coal products	Preliminary (late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Coal products	Early next month		
33	Plastic Products	Current Survey of Production (METI)	Monthly statistical report of paper, pulp, plastic and rubber (sales amount)	Revised(middle of month after next)	A	2
34	Rubber Products	Current Survey of Production (METI)	Monthly statistical report of paper, pulp, plastic and rubber (sales amount)	Revised(middle of month after next)	A	2
35	Leather Products	Current Survey of Production (METI)	Monthly statistical report of fiber and sundry goods (sales amount)	Revised(middle of month after next)	A	2
36	Glass and its Products	Current Survey of Production (METI)	Monthly statistical report of ceramics and building materials, (sales amount)	Revised(middle of month after next)	A	2

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
37	Cement and its Products	Current Survey of Production (METI)	Monthly statistical report of ceramics and building materials (sales amount)	Revised(middle of month after next)	A	2
38	Pottery and Related Products	Current Survey of Production (METI)	Monthly statistical report of ceramics and building materials (sales amount)	Revised(middle of month after next)	A	2
39	Other Ceramics, Stone and Cray Products	Current Survey of Production (METI)	Monthly statistical report of ceramics, building materials and chemical industry (sales amount)	Revised(middle of month after next)	A	2
40	Iron and Steel	Indices of Producers Shipments (METI)	Raw products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Ferroalloy, pig iron	Early next month		
41	Steel Products	Indices of Producers Shipments (METI)	Hot-rolled steel products, steel pipes, cold-finished steel products, coated steel products, cast or forged products	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Ordinary steel products, special steel products, other steel	Early next month		
42	Nonferrous Metals Refining	Indices of Producers Shipments (METI)	Nonferrous bare metals	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Bare metals	Early next month		
43	Nonferrous Metal Products	Indices of Producers Shipments (METI)	Rolled copper, rolled aluminum, electric cables, cables, nonferrous cast metals	Preliminary(late next month) Revised(middle of month after next)		3
		Domestic Corporate Goods Price Index (BOJ)	Rolled nonferrous metals, electric cables, cables, nonferrous cast metals	Early next month		
44	Metal Products for Construction / Building	Current Survey of Production (METI)	Monthly statistical report of ceramics and building materials (sales amount)	Revised(middle of month after next)	A	2
45	Other Metal Products	Current Survey of Production (METI)	Monthly statistical report of ceramics, building materials, steel, nonferrous metal, metal products (sales amount)	Revised(middle of month after next)	A	2
46	General Industry Machinery and Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery, steel, nonferrous metal, and metal products (sales amount)	Revised(middle of month after next)	A	2
47	Special Industry Machinery and Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2
48	Other General Industry Machinery and Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery, steel, nonferrous metal, and metal products (sales amount)	Revised(middle of month after next)	A	2
49	Office and Service Industry Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2
50	Household Electric Appliances	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2
51	Electronic and Communication Equipment (subcategories estimated)	Current Survey of Production (METI)	Monthly statistical report of machinery (production/sales amount)	Revised(middle of month after next)	A	6
52	Heavy Electrical Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery (production amount)	Revised(middle of month after next)	A	2
53	Other Electric Machinery and Equipment	Current Survey of Production (METI)	Monthly statistical report of machinery (production/sales amount)	Revised(middle of month after next)	A	2
54	Motor Vehicles	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
55	Shipbuilding and Repairing	Indices of Producers Shipments (METI)	Ships and vessels, engines	Preliminary(late next month) Revised(middle of month after next)		3
		* Price index estimated by the Cabinet Office.				
56	Other Transportation Equipment and Repairing	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2
57	Precision Instrument and Machinery	Current Survey of Production (METI)	Monthly statistical report of machinery (sales amount)	Revised(middle of month after next)	A	2
58	Other Manufacturing	Current Survey of Production (METI)	Monthly statistical report of machinery, fiber and sundry goods (sales amount)	Revised(middle of month after next)	A	2
59	Construction(value-added) **Output value is of input cost-type	Monthly Labor Survey (MHLW)	Regularly paid cash salary (construction industry: business establishment with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		3
		Labor Force Survey (MIC)	Construction industry: total number of employees	Late next month		
60	Electricity	Monthly Report on Electric Power Statistics (Agency for Natural Resources and Energy)	Electric power generation record of power generators (electric energy volume) (Price index is estimated by the Cabinet Office.)	Middle of month after next	A	3
61	Gas and Heat Supply	Current Survey of Production (gas) (Agency for Natural Resources and Energy)	Gas production volume (Price index is estimated by the Cabinet Office.)	Middle of month after next	A	3
62	Water		See the "B. Estimates on Demand Components" section.			5
63	Waste Disposal	Monthly Labor Survey (MHLW)	Index of regular employment, index of regularly paid cash salary(waste disposal facilities with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		3
64	Wholesale	Current Survey of Commerce (METI)	Commercial sales amount by sector (wholesale)	Preliminary(late next month) Revised(middle of month after next)		4
		Financial Statements Statistics of Corporations by Industry (quarterly version) (MOF)	Sales, cost of sales (wholesale)	Early third month	D	
		Report on Basic Survey on Commercial and Manufacturing Structure and Activities (METI)	Differential margins: sales, cost of sales (wholesale)	Every five years		
65	Retail	Current Survey of Commerce (METI)	Commercial sales amount by sector (retail)	Preliminary(late next month) Revised(middle of month after next)		4
		Financial Statements Statistics of Corporations by Industry (quarterly version) (MOF)	Sales, cost of sales (retail)	Early third month	D	
		Report on Basic Survey on Commercial and Manufacturing Structure and Activities (METI)	Differential margins: sales, cost of sales (retail)	Every five years		
66	Finance (commission only)	Monthly statistics report (Tokyo Stock Exchange)	Traded value of stocks at stock exchanges nationwide	Early next month		6
67	Insurance (subcategories estimated)	Web site of Life Insurance Association of Japan	Premiums received, insurance payment, pension, etc.	After 3 months	A	6
		Monthly Economic Report on Land Infrastructure and Transport (MLIT)	Number of registered cars	After 3 months	B	
		Consumer Price Index (MIC)	Automobile insurance premiums (liability insurance and voluntary insurance)	Late next month		

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
68	Brokers and Lessors of Real Estate	Monthly Labor Survey (MHLW)	Index of regular employment, index of regularly paid cash salary (real estate agents with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		3
69	House Rents		See the "B. Estimates on Demand Components" section.			5
70	Railway Transport	Monthly Economic Report on Land Infrastructure and Transport (MLIT)	JR passengers, private railroad company passengers, rail cargo	Late month after next (partly 3 months after)	A (partly B)	6
71	Road Transport	Monthly Economic Report on Land Infrastructure and Transport (MLIT)	General truck cargo, special combined truck cargo, taxi passengers, bus passengers (Price index is estimated by the Cabinet Office)	After 3 months	B	6
72	Water Transport	Monthly Economic Report on Land Infrastructure and Transport (MLIT)	Coastwise maritime transport cargo (Price index is estimated by the Cabinet Office)	After 3 months	B	6
		The Summary Report on Trade of Japan (MOF)	Tonnage of export and import cargo (Price index is estimated by the Cabinet Office)	End of next month		
73	Air Transport	Monthly Economic Report on Land Infrastructure and Transport (MLIT)	Domestic flight passengers, international flight passengers, domestic air cargo, international air cargo	Late month after next	A	6
		Cooperate Service Price Index (BOJ)	International air cargo, domestic air cargo, international flight passengers, domestic flight passengers	Late next month		
74	Other Transport	Quick report on condition of major 50 travel agencies' travel sales (MLIT)	Total sales (domestic travels, overseas travels, foreign travelers)	Early month after next	A	2
75	Telecommunication	Communications industry survey	Telecommunication industry (1st class, 2nd class) total sales	After 3 months (provisional value used)	A	1
76	Postal Service	Post and telecommunications administrations statistics (MIC)	Number of mails accepted by category (ordinary, new-year mail, parcels, international mail sent out) (Price index is estimated by the Cabinet Office)	Early month after next	A	3
77	Education	Monthly Labor Survey (MHLW)	Index of regular employment, index of regularly paid cash salary (education: establishment with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		3
78	Scientific Research	Monthly Labor Survey (MHLW)	Index of regular employment, index of regularly paid cash salary (academic research institutes with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		3
79	Medical, Health Care and Welfare		See the "B. Estimates on Demand Components" section.			5
80	Other Public Services		The latest revised annual data is used (after dividing it by four).			6
81	Advertising, Research and Information Services	Current Survey of Selected Service Industries (METI)	Sales of advertising industry, sales of information service industry (new orders for software)	Preliminary(early month after next) Revised(middle of month after next)	A	6
82	Goods Rental and Leasing	Current Survey of Selected Service Industries (METI)	Amount of lease contracts, rental sales	Preliminary(early month after next) Revised(middle of month after next)	A	2
83	Automobile and Machine Repair	Monthly Economic Report on Land Infrastructure and Transport (MLIT)	Number of registered cars (Price index is estimated by the Cabinet Office)	After 3 months	B	3
84	Other Business Services	Current Survey of Selected Service Industries (METI)	Domestic order receipts of engineering industry	Preliminary(early month after next) Revised(middle of month after next)	A	6
		Monthly Labor Survey (MHLW)	Index of regular employment, index of regularly paid cash salary (professional service, other services: establishments with 5 or more employees)	Preliminary(late next month) Revised(middle of month after next)		

No.	90-category	Name of Statistics	Summary of Source Statistics Used for Estimates	Timing of Publication	Method of Extrapolation for Missing Month	Pattern of Estimates
85	Broadcasting	Web site of NHK	Number of subscribers (Price index is estimated by the Cabinet Office)	Early month after next	A	6
		Communications industry survey (MIC)	Sales of broadcasting industry (private broadcasting networks)	After 3 months(provisional values are used)	A	
86	Amusement and Hobbies	Current Survey of Selected Service Industries (METI)	Total sales of hobby- or entertainment-related industries (movie theaters, performance halls, golf courses, golf practice fields, bowling alleys, amusement parks, theme parks and pachinko halls)	Preliminary(early month after next) Revised(middle of month after next)	A	2
87	Eating and Drinking Places	Survey of food service industry activities (JFnet)	Year-on-year compassion of sales	Late next month		1
88	Hotels and Other Accommodations	Quick report on condition of major 50 travel agencies' travel sales (MLIT)	Sales of domestic travels	Early month after next	A	1
89	Other Personal Services	Current Survey of Selected Service Industries (METI)	Total sales of culture- and life-related industries (funeral service, wedding halls, foreign language schools, culture centers, fitness	Preliminary: early month after next; Revised: middle of month after next	A	2
90	Unable to Classify		The latest revised annual data is used (after dividing it by four).			6

* BOJ modified its price index calculation criteria in 2000 and replaced “Wholesale Price Index” with “Corporate Goods Price Index.”

Patterns of estimating shipment value

1	An auxiliary series are derived entirely from a series.
2	An auxiliary series are created by totaling two or more series.
3	An auxiliary series are calculated as " Quantity×price (index)."
4	((sales -cost of sales) / sales + differential margins(*))× sales
5	Demand-side estimates are used
6	Combination of above methods

(*) Differential margin adjusts difference in a margin rate obtained from "Basic Survey on Commercial and Manufacturing Structure and Activity" and a margin rate obtained from "Quarterly Financial Statements Statistics of Corporation."

Methods of extrapolating for missing months

A	Year-over-year change rate of the first 2 months is used as that of the entire quarter.
B	Year-over-year change rate of the first month is used as that of the entire quarter.
C	Values of the same quarter in the preceding year are used.
D	As for the wholesale/retail margin derived from "Quarterly Financial Statements Statistics of Corporation," recent values are extrapolated in line with 1-year (4-quarter) average of the margin rates.

B. Estimates on Demand Components

1. Private final consumption expenditure

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Domestic final consumption expenditure of households	Family Income and Expenditure Survey (except for agricultural households) (MIC)	For demand-side estimates (consumption per non-agricultural household)	All households: early month after next	—
	Family Income and Expenditure Survey (including agricultural households) (MIC)	For demand-side estimates (per-commodity allocation rate of agricultural households)	All households: middle of month after next	Calculate how much the preceding year latest month's per-commodity consumption data (except for agricultural households) have increase/decrease from the same month a year ago; and then multiply the data by the calculated increase/decrease rate
	Survey of Household Economy (except for agricultural households) (MIC)	For demand-side estimates (consumption per non-agricultural household)	All households: early month after next	—
	Survey of Household Economy (including agricultural households) (MIC)	For demand-side estimates (per-commodity allocation rate of agricultural households)	All households: middle of month after next	Calculate how much the preceding year latest month's per-commodity consumption data (except for agricultural households) have increase/decrease from the same month a year ago; and then multiply the data by the calculated increase/decrease rate
	National Survey of Family Income and Expenditure (MIC)	For demand-side estimates (consumption per non-agricultural household)	Every five years	—
	Monthly Report on Current Population Estimates (MIC)	For demand-side estimates (number of households)	Approximate values: late same month; Revised values: about 4 months after	—
	National Census (MIC)	ditto	Every five years	—
	Census of Agriculture (MAFF)	ditto	Every five years	—
	Statistics on Building Construction Starts (MLIT)	For estimate of house rents	Late next month	—
	Building Loss Statistics Survey (MLIT)	ditto	Middle of fourth month (using the preceding quarter's data)	—
	Consumer Price Index (MIC)	ditto	Late next month	—
	Housing and Land Statistical Survey (MIC)	ditto	Every five years	—
	Survey of Construction Work Started (MLIT)	For estimate of imputed rent	Late next month	—
	Survey on Medical Expense of National Health Insurance (All-Japan Federation of National Health Insurance Organizations)	For estimate of medical service	Late month after next	Estimate the current quarter data by multiplying the preceding year's same quarter data by a (adjusted(*)) year-on-year increase/decrease rate of the 1st month (or the sum of the 1st and 2nd months, in case of 2nd QE). (*) Adjustment factor: the average gap in a year-on-year increase/decrease rate between the first month's data (or the first 2 month's data) and the whole quarter's data.
	Monthly Report on Fund (Social Insurance Medical Fee Payment Fund)	ditto	Late month after next	ditto
	Survey on Nursing Care Insurance Benefits (All-Japan Federation of National Health Insurance Organizations)	For estimate of nursing care insurance service	Late month after next	Average of the data in other months in the same quarter
	Report on Nursing Care Insurance Business (MHLW)	ditto	Late third month	ditto

1. Private final consumption expenditure (cont'd)

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Direct overseas purchase of resident households (direct domestic purchase of nonresident households)	Balance of Payments Statistics (MOF, BOJ)	For estimate of relevant items	Preliminary: middle of month after next; Revised: middle of fourth month	Estimate last month's value by multiplying last month's value of the same quarter of the preceding year by the ratio of year-to-year change of the preceding two months

2.Private housing investment

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Private housing investment	Survey on Building Construction Starts (MLIT)	For estimate of overall housing investment	Late next month	—

3.Private non-residential investment

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Private non-residential investment	Quarterly Financial Statements Statistics of Corporations by Industry (quarterly, annual) (MOF)	For estimate of demand-side private non-residential investment for second QE (non-financial corporation portion)	Early third month	—
	Business Outlook Survey (Cabinet Office, MOF)	For estimate of demand-side private non-residential investment for second QE (financial institution portion)	Prospective actual value: at end of the same quarter; Actual value: at end of the next quarter	Extend the preceding term's prospective data by using the gap between prospective value and actual value for financial & insurance industries, as derived from Business Outlook Survey
	Survey on Orders Received for Machinery. (Cabinet Office)	ditto	Middle of month after next	—
	Unincorporated Enterprise Survey (MIC)	For estimate of demand-side nonresidential investment for second QE (unincorporated enterprises portion)	Late month after next	—
	Labor Force Survey (MIC)	ditto	Late next month	—
	Establishments and Enterprises Census (MIC)	ditto	Every five years (intermediate years also surveyed)	—
	Survey on Service Industries (MIC)	ditto	Every five years	—
	Statistics on Building Construction Starts (MLIT)	ditto	Late next month	—

4. Private inventory increase

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Private inventory increase	Census of Manufacturers (METI)	For estimate of finished goods inventory	Preliminary: September in next year; Revised: end of March of year after next	—
	Indices of Producers Inventories (METI)	ditto	Preliminary: late next month; Revised: middle of month after next	(if commodity-specific data is not available for 1st QE) calculate how much the 3rd month data of the preceding year's same quarter have increased/decreased from the 2nd month (i.e., its preceding month); and then multiply the current quarter 2nd month's data by the increase/decrease rate.
	Brown Rice Producers' Inventory (MAFF)	For estimating finished goods inventory (rice & wheat)	Late month after next	(For 1st QE) the data of the preceding year's same quarter
	Agricultural Price Index (MAFF)	ditto	Late next month	—
	Census of Commerce (METI)	For benchmark of distributors' inventory	Every two or three years (2002 survey data used)	—
	Current Survey of Commerce (METI)	For extrapolating distributors' inventory	Preliminary: late next month; Revised: middle of month after next	(For 1st QE) Extrapolate commodity specific data by using the quarter-to-quarter trend of all goods.
	Financial Statements Statistics of Corporations by Industry (annual) (MOF)	For benchmark of work-in-progress inventory and raw material inventory	Next September	—
	Financial Statements Statistics of Corporations by Industry (quarterly) (MOF)	For extrapolating work-in-progress inventory and raw material inventory	Early third month	The preceding quarter's value is used for 1st QE.
	Current Survey of Production (METI)	For estimating raw material inventory (crude oil and natural gas)	Middle of month after next	—
	Trade Statistics (MOF)	For estimating raw material inventory (crude oil and natural gas)	Preliminary: late next month; Revised: late month after next	—
	Inventory Assessment Weight (Development Bank of Japan)	For inventory assessment adjustment	Next December	—

5.Government final consumption expenditure

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Government final consumption expenditure	Hearings from related agencies	For estimate of Compensation of Employees	Late month after next	Estimate the last month's value by multiplying last month's value of the same quarter of the preceding year by the ratio of year-to-year change of the preceding two months
	Recommendation of National Personnel Authority	ditto	Mid-August of the year	Average unit salary (base salary) is estimated by trend (year-end and diligence payment determined by NPA recommendation of preceding year)
	Research on Consumption of Local Governments (Cabinet Office)	For estimate of intermediate consumption and non-commodity sales	Not disclosed to public(data aggregation: Late month after next)	Estimated with past trend
	Survey on Medical Expense of National Health Insurance (All-Japan Federation of National Health Insurance Organizations)	For estimate of medical care service	Late month after next	Estimate the current quarter data by multiplying the preceding year's same quarter data by a (adjusted(*)) year-on-year increase/decrease rate of the 1st month (or the sum of the 1st and 2nd months, in case of 2nd QE). (*) Adjustment factor: the average gap in a year-on-year increase/decrease rate between the first month's data (or the first 2 month's data) and the whole quarter's data.
	Monthly Report on Fund (Social Insurance Medical Fee Payment Fund)	ditto	Late month after next	ditto
	Survey on Nursing Care Insurance Benefits (All-Japan Federation of National Health Insurance Organizations)	For estimate of nursing care insurance service	Late month after next	Average of the data in other months in the same quarter
	Report on Nursing Care Insurance Operations (MHLW)	ditto	Late third month	ditto

6.Public fixed capital formation

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Public fixed capital formation	Integrated Statistics on Construction Works (MLIT)	For estimate of relevant items	Late month after next	—
	Public Works prepayment Surety Statistics (Surety Companies Association)	Extrapolating public work contract amount in data-missing months	Middle next month	—

7.Public inventory

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Public inventory	Hearings from related agencies	For estimate of public inventor	Late next month	—

8.Exports and Imports

Estimated Component	Name of Statistics	Summary of Usage	Time of Announcement	Method of Extrapolation for Missing Month
Exports and Imports	Balance of Payments (MOF. BOJ)	For estimate of exports & imports	Preliminary: middle of month after next; Revised: middle of fourth month	Goods: Estimate last month's value by multiplying last month's export(import) data of Trade Statistics by the ratio of Exports(Imports) of Balance of Payments to Exports(Imports) of Trade Statistics in the preceding two months. Services: Estimate last month’s data by multiplying the data of the last month in the same quarter a year ago by the preceding two month’s year-on-year increase/decrease rate.
	Trade Statistics (MOF)	For estimating deflator for goods trade	Revised exports: late next month; Imports(details):late next month; Revised imports: late month after next	