

**Table B-1. Summary Confrontation of Methods Used in Constructing Historical National Accounts for 16 Advanced Capitalist Countries**

| Main Authors                 | Value Added Approach  | Expenditure Approach  | Income Approach                            |
|------------------------------|---|---|--|
| <b>AUSTRALIA</b>             |   |   |  |
| N.G. Butlin, 1986            | 1788-1827, VA, 1828-1860, VAVOP   |   |  |
| N.G. Butlin, 1962            | 1861-1939, 13 sectors, VAVOP  | 1861-1939, 4 categories of investment, VAVOP  |  |
| N.G. Butlin, 1977            |   | 1900-74, 9 categories, VAVOP  |  |
| <b>AUSTRIA</b>               |   |   |  |
| A. Kausel, 1979              | 1830-1913, 5 sectors, VAVOP   |   |  |
| A. Kausel, 1965              | 1913, 1920, 1937 and 1946-1950, 11 branches, VAVOP  | 1913, 1924, 1937 and 1948-1950, 6 categories, VAVOP                                 | 1913, 1924 and 1948-1950, 8 categories, VA |
| <b>BELGIUM</b>               |   |   |  |
| J. Gadisseur, 1973           | 1846-1913, 2 sectors (ag. and ind.), VO. I made a crude service proxy for 1846-1913, even cruder proxies for 1830-1846 using Gadisseur for industry and Goossens for agriculture                |   |  |
| C. Carbonnelle, 1959         | 1920-1938, 6 branches, VO. I made a crude service interpolation   |   |  |
| <b>CANADA</b>                |   |   |  |
| O.J. Firestone, 1957         | 1851-70, 8 sectors, VAVOP   |   |  |
| O.J. Firestone, 1958         | 1867-1953, 8 sectors, VAVOP. Detailed analysis for benchmark years at decade intervals. Rougher annual estimates  | 1867-1953, substantial detail by category, VAVOP                                    |  |
| M.C. Urquhart, 1986 and 1993 | 1870-1926, 18 sectors on an annual basis and benchmark estimates for 2 distributive sectors. Substantial branch details for agriculture and manufacturing, VA. Deflation only for GNP aggregate | 1870-1926 partial: investment for 7 sectors, government expenditure and exports, VA |  |
| Statistics Canada            | 1926 onwards, 15 sectors, VA  | 1926 onwards, 14 categories VAVOP   | 1926 onwards, 11 categories, VA            |

| Main Authors                              | Value Added Approach   | Expenditure Approach                                | Income Approach  |
|---|--|---|--|
| <b>DENMARK</b>                            |  |   |  |
| S.A. Hansen, 1974                         | 1818-1950, 23 branches, VAVOP  | 1844-1950, 3 categories, VAVOP                      |  |
| <b>FINLAND</b>                            |  |   |  |
| R. Hjerpe, 1989                           | 1860-1985, 13 branches, VAVOP  | 1860-1985 5 categories VAVOP                        | 1860-1985, 5 categories of wages and salaries.VA. Cost of living and wholesale price index |
| <b>FRANCE</b>                             |  |   |  |
| M. Levy-Leboyer & F. Bourguignon, 1985    | 1820-1913, 5 sectors, VAVOP.I used only the industry measure for 1820-70   | 1820-1913, 13 categories, VA                        | 1820-1913 wages, VA  |
| J.C. Toutain, 1987                        | 1815-1913, 1920-1938 and 1950. 14 branches, VAVOP. For 1820-70 I used his indicators for agriculture and services. For 1870-1960 I used his GDP estimates.   |   |  |
| <b>GERMANY</b>                            |  |   |  |
| R.H. Tilly, 1978                          | 2 branches (ag. 1831-1849 and ind. 1831-1846/7) for Prussia for 3 benchmark years, VO. I made a crude service sector proxy, adjusted to cover all Germany using demographic ratios, and linked to Hoffmann in 1850 |   |  |
| W.G. Hoffmann, 1965                       | 1850-1913, 1924-1938, 9 branches (with detail for 147 industries), VO. Weighting system not clear.   | 1850-1913, 1924-1938 1950, 5 categories VAVOP       | 1850-1913, 1925-1938, 9 categories, VA   |
| <b>ITALY</b>                              |  |   |  |
| R. Ercolani & O. Vitali (Fua Group), 1975 | 1861-1952, 11 branches, VAVOP  | 1861-1952, 18 categories, VAVOP                     | 1861-1971, 2 categories of wages and salaries, VA  |
| Maddison, 1991                            | Rewighted version of the above supplemented with production estimates of Fenoaltea   |   |  |
| <b>JAPAN</b>                              |  |   |  |
| K. Ohkawa and M. Shinohara, 1979          | 1885-1940, 5 sectors, VAVOP. I used this source for 1885-1940 and their expenditure estimate for 1940-50   | 1885-1940, 1930-44 and 1946-70, 6 categories, VAVOP | 1906-40, 1953-70, 4 categories, VA   |

| Main Authors   | Value Added Approach  | Expenditure Approach   | Income Approach   |
|--|---|--|---|
| <b>NETHERLANDS</b>   |   |  |   |
| J.L. van Zanden, 1987  | Four benchmarks (1820, 1850, 1880 and 1910). 8 sectors, VO      |  | Four benchmarks (1820, 1850, 1880 and 1910) wage and three types of property income, VA     |
| C. van Bochove & T.A. Huitker, CBS, 1987   | 1921-39, 21 sectors. VA (not yet published)                     | 1921-1939, 1946-1986. 7 categories, VAVOP. I used this for 1921-60, and deflated income for 1900-21  | 1900-1921. 1 category, deflated by cost of living index, 1921-39, 1946-86, 9 categories, VA |
| <b>NORWAY</b>  |   |  |   |
| Central Bureau of Statistics, 1970   | 1930-1939, 1946-1950. 11 branches, VAVOP                        | 1865-1939, 1936-1950. 7 categories, VAVOP. I filled the 1939-1946 gap from another CBS source and adjusted from the Norwegian to the OECD concept of GDP | 1930-1939, 1940-1950. 149 items, VA   |
| <b>SWEDEN</b>  |   |  |   |
| O. Krantz and C.A. Nilsson, 1975   | 1861-1970, 7 sector breakdown, VAVOP                            | 1861-1970, 7 category breakdown  |   |
| O. Krantz and Associates, 1986-91. 7 background vols. 2 (on agriculture and foreign trade) pending | 1800-1980, industry of origin, VAVOP                            |  |   |
| <b>SWITZERLAND</b>   |   |  |   |
| C. Clark, 1957   |   |  | 1890, 1895, 1899, 1913, 1924-1951. VAVOP. 1 category crudely deflated                       |
| <b>UK</b>  |   |  |   |
| P. Deane, 1968   |   | 1830-1914, 5 categories, VAVOP. I used her 1830-1855 figures   |   |
| C.H. Feinstein, 1972   | 1855-1913, 1920-1960, 4 sectors, VAVOP. Plus VO for 15 branches | 1870-1960 7 categories, VAVOP  | 1855-1960, 5 categories, VA   |

| Main Authors                     | Value Added Approach   | Expenditure Approach   | Income Approach |
|----------------------------------|--|--|-----------------|
| <b>USA</b>                       |  |  |                 |
| R.E. Gallman, 1966               |  | 1839, 1844, 1849, 1854, 1859 benchmarks and overlapping decade averages from 1859-43 to 1899-1908. Gallman replicates Kuznets technique and methods of presentation. Uses a large amount of information on commodity output and rougher estimates for services to build up volume estimates of final flows to consumers (4 way breakdown) and to capital formation (3-way breakdown). Full detail of estimates not published. I derived my 1840-69 estimates from Gallman. |                 |
| N.S. Balke and R.J. Gordon, 1989 |  | 1869-90. For this period Kuznets (1961) published only 5 year moving averages as he considered the annual information to be too weak. Balke and Gordon revamped the existing commodity flow estimates to incorporate extra information on construction, transport and communications. They provided annual estimates of nominal GDP, real GDP in 1982 prices and a GDP deflator. I used their estimates for 1869-90.   |                 |
| J.W. Kendrick, 1961              | Private Domestic Product: volume indices for 10 benchmark years from 1869 to 1953 with a 10 sector breakdown. His service estimate is a residual and his total is derived from the expenditure GDP. For most of the individual sectors he provides annual figures. | Decade averages of GDP for 1869-78 and 1879-88 and annual estimates for 1889-1953. Kendrick used Kuznets' (1961) commodity flow estimates with adjustments to put them on the basis used by the US Dept. of Commerce. VAVOP  |                 |
| Dept. of Commerce                |  | 1929-onwards annual estimates, 14 categories. They supply 3 weighting variants: 1987 weights, annual chain-weighting and quinquennially changing benchmarks. I used the latter.  | VA              |

VA means that the source cited shows current values. VO means that the source provides volume indices or constant price estimates. P means that the appropriate deflators are given or are implicitly available in the source cited. I have not included New Zealand in the Table as Rankin (1992) used proxy indicators.

**Table B-2. Confrontation of Toutain and Levy-Leboyer Estimates of Value and Volume of French GDP, 1820-1913**

|      | Value Added in Million Francs<br>at Current Prices |          |          |        | Volume Indices by Sector<br>(1913 = 100.0) |          |          |         |
|------|--|----------|----------|--------|--|----------|----------|---------|
|      | Agriculture  | Industry | Services | GDP    | Agriculture                                | Industry | Services | GDP     |
|      | Toutain  |          |          |        | Toutain                                    |          |          |         |
| 1820 | 3 637  | 3 252    | 2 076    | 8 965  | 46.9                                       | 9.7      | 29.6     | 22.0    |
| 1870 | 9 442  | 8 411    | 6 016    | 23 959 | 81.1                                       | 35.0     | 50.5     | 52.1    |
| 1913 | 13 024   | 19 212   | 17 335   | 49 571 | 100.0                                      | 100.0    | 100.0    | 100.0   |
|      | Levy-Leboyer                                       |          |          |        | Levy-Leboyer                               |          |          |         |
| 1820 | 4 117  | 3 391    | 1 503    | 9 011  | 41.4                                       | 18.0     | (17.5)   | (25.1)  |
| 1870 | 7 958  | 6 374    | 4 980    | 19 312 | 71.5                                       | 42.4     | (42.7)   | (51.4)  |
| 1913 | 11 907   | 16 143   | 10 792   | 38 842 | 100.0                                      | 100.0    | (100.0)  | (100.0) |

*Sources:* Toutain (1987) and Levy-Leboyer (1985). The figures in brackets are not explicit in Levy-Leboyer but are easily derived from the information he gives. I arrived at the Levy-Leboyer GDP volume index by using 1913 weights. The figures in this table are not adjusted to eliminate the effect of territorial changes.

**Table B-3. Confrontation of Toutain and Levy-Leboyer Sectoral and Aggregate Deflators (1913 = 100)**

|      | Agriculture | Industry | Services | GDP   | Agriculture | Industry     | Services | GDP   |
|------|-------------|----------|----------|-------|-------------|--------------|----------|-------|
|      |             | Toutain  |          |       |             | Levy-Leboyer |          |       |
| 1820 | 59.6        | 174.5    | 40.5     | 82.2  | 83.5        | 116.7        | 79.6     | 92.4  |
| 1870 | 89.4        | 125.1    | 68.7     | 92.7  | 93.5        | 93.1         | 108.1    | 96.6  |
| 1913 | 100.0       | 100.0    | 100.0    | 100.0 | 100.0       | 100.0        | 100.0    | 100.0 |

*Source:* As for Table B-2.

**Table B-4. Alternative Indices of French Industrial Output, 1820-1913 (1913 = 100)**

|           | Markovitch<br>(1965)                 | Levy-Leboyer<br>(1968) | Crouzet<br>(1970) | Levy-Leboyer<br>(1978 and 1985) | Toutain<br>(1987) |
|-----------|--------------------------------------|------------------------|-------------------|---------------------------------|-------------------|
| 1820      | 15.7                                 | 10.2                   | 20.7              | 18.0                            | 9.7               |
| 1870      | 47.8                                 | 32.8                   | 40.0              | 42.4                            | 35.0              |
| 1913      | 100.0                                | 100.0                  | 100.0             | 100.0                           | 100.0             |
|           | Annual Average Compound Growth Rates |                        |                   |                                 |                   |
| 1820-70   | 2.3                                  | 2.3                    | 1.3               | 1.7                             | 2.6               |
| 1870-1913 | 1.7                                  | 2.8                    | 2.2               | 2.0                             | 2.5               |
| 1820-1913 | 2.0                                  | 2.6                    | 1.7               | 1.9                             | 2.5               |

*Source:* Col. 1 from J.J. Markovitch "L'industrie française de 1789 à 1964 — Sources et méthodes", *Cahiers de l'ISEA*, AF4, July 1965, Table 1, pp. 216-7. Markovitch gives figures for decades or quinquennia, and I had to interpolate to get figures for the years shown here. Second, fourth and fifth columns from works already cited, third column from F. Crouzet, "Essai de construction d'un indice annuel de la production industrielle française au XIX siècle", *Annales ESC*, January-February 1970. All series, except Crouzet, include construction.

**Table B-5. Alternative Estimates of French GDP per Capita 1820-1913**

|                         | 1820  | 1870  | 1913  |
|-------------------------|-------|-------|-------|
| The compromise estimate | 1 218 | 1 858 | 3 452 |
| Toutain (1987)          | 983   | 1 858 | 3 452 |
| Levy-Leboyer (1985)     | 1 123 | 1 836 | 3 452 |

Table B-6. Area Breakdown of German GDP, Population and Per Capita GDP 1936, and 1990

|   | 1936                          |                     |                            |
|---|-------------------------------|---------------------|----------------------------|
|   | National Income<br>million RM | Population<br>(000) | Per Capita<br>Income in RM |
| Federal Republic Territory <sup>a</sup> | 41 757                        | 42 208              | 989                        |
| DDR Territory                           | 16 159                        | 15 614              | 1 035                      |
| East of Oder-Neisse                     | 6 968                         | 9 514               | 732                        |
| Total (1936 territory)                  | 64 884                        | 67 336              | 964                        |
| of which:                               |                               |                     |                            |
| Saar                                    | 629                           | 821                 | 766                        |
| West Berlin                             | 4 175                         | 2 685               | 1 555                      |
|   | 1990<br>(second half year)    |                     |                            |
|   | GDP<br>billion DM             | Population<br>(000) | Per Capita<br>GDP in DM    |
| Federal Republic <sup>a</sup>           | 1 216.9                       | 63 527              | 19 864                     |
| Former DDR                              | 97.7                          | 16 111              | 6 064                      |
| Total                                   | 1 359.6                       | 79 638              | 17 007                     |

a) including Saar and West Berlin.

Source: 1936 from *Handbuch* (1949); second half of 1990 from Statistisches Bundesamt, *Erste Ergebnisse der Sozialproduktberechnung 1992*, Fachserie 18, Reihe 1, Wiesbaden, January 1993, pp. 39 and 41.

Table B-7. Previous Estimates of the Performance of the East German Economy

|      | Population<br>(000s) | Index of GNP<br>at Constant<br>Prices<br>(1950 = 100) | Inferential<br>Level of GDP<br>per capita in<br>1990 Geary<br>Khamis \$ |                   | Population<br>(000s) | Index of<br>GDP at<br>Constant<br>Prices | Inferential<br>Level of GDP<br>per capita in<br>1990 Geary<br>Khamis \$ |
|------|----------------------|---|---|-------------------|----------------------|--|---|
| 1936 | 15 614               | 129.9   | 4 783   | 1970              | 17 058               | 231.9                                    | 7 816   |
|      |                      |   |   | 1971              | 17 061               | 237.1                                    | 7 990   |
| 1946 | 18 488               | n.a.  | n.a.  | 1972              | 17 043               | 245.1                                    | 8 268   |
| 1947 | 19 102               | n.a.  | n.a.  | 1973              | 16 980               | 252.8                                    | 8 559 <sup>b</sup>  |
| 1948 | 19 044               | n.a.  | n.a.  | 1974              | 16 925               | 264.9                                    | 8 998   |
| 1949 | 18 793               | n.a.  | n.a.  | 1975              | 16 850               | 274.7                                    | 9 373   |
| 1950 | 18 388               | 100.0   | 3 127   | 1976              | 16 786               | 280.2                                    | 9 597   |
| 1951 | 18 335               | n.a.  | n.a.  | 1977              | 16 765               | 288.8                                    | 9 904   |
| 1952 | 18 334               | n.a.  | n.a.  | 1978              | 16 756               | 293.7                                    | 10 077  |
| 1953 | 18 271               | n.a.  | n.a.  | 1979              | 16 745               | 301.9                                    | 10 365  |
| 1954 | 18 057               | n.a.  | n.a.  | 1980              | 16 737               | 308.3                                    | 10 590  |
| 1955 | 17 928               | 136.4   | 4 374   | 1981              | 16 736               | 314.6                                    | 10 806  |
| 1956 | 17 735               | n.a.  | n.a.  | 1982              | 16 732               | 313.5                                    | 10 772  |
| 1957 | 17 478               | n.a.  | n.a.  | 1983              | 16 700               | 319.5                                    | 10 999  |
| 1958 | 17 262               | n.a.  | n.a.  | 1984              | 16 671               | 328.6                                    | 11 332  |
| 1959 | 17 148               | n.a.  | n.a.  | 1985              | 16 644               | 338.8                                    | 11 703  |
| 1960 | 17 114               | 173.9   | 5 842   | 1986              | 16 625               | 343.7                                    | 11 886  |
| 1961 | 17 002               | 175.2   | 5 924   | 1987              | 16 642               | 349.5                                    | 12 074  |
| 1962 | 16 874               | 180.0   | 6 133   | 1988              | 16 667               | 353.3                                    | 12 187  |
| 1963 | 16 930               | 185.8   | 6 309   | 1989              | 16 399               | 357.4                                    | 12 530 <sup>b</sup>   |
| 1964 | 16 972               | 190.9   | 6 467   |                   |                      |  |   |
| 1965 | 17 020               | 198.6   | 6 708   | 1990 <sup>a</sup> | 16 111               |  | 5 704   |
| 1966 | 17 058               | 204.7   | 6 899   | 1991              | 15 910               |  | 6 042   |
| 1967 | 17 082               | 211.3   | 7 111   | 1992              | 15 730               |  | 6 589   |
| 1968 | 17 084               | 220.9   | 7 434   | 1993              | 15 648               |  | 7 003   |
| 1969 | 17 076               | 226.1   | 7 612   |                   |                      |  |   |

a) second half of 1990;

b) in 1973 and 1989. Czech levels of per capita GDP were \$7 036 and \$8 729 respectively. In my view, East German levels in this period were probably nearer to these Czech levels than to the levels previously thought to prevail in the DDR.

Source: GDP index derived as follows: 1936-50 movement from E.M. Snell and M. Harper, "Postwar Economic Growth in East Germany: A Comparison with West Germany", in *Economic Developments in Countries of Eastern Europe*, Joint Economic Committee, US Congress, Washington, D.C., 1970, p. 561; 1950-65 from T.P. Alton, "Economic Structure and Growth in Eastern Europe", in the same (1970) volume, p. 46; 1965-75 from Alton, *op. cit.* (1985), pp. 109-10; 1975-89 from T.P. Alton, ed., "Economic Growth in Eastern Europe 1975-1989", *Occasional Paper* 110, Research Project on National Income in East Central Europe, New York, 1990, p. 26. Population estimates derived for 1936-93 from the same Joint Economic Committee volumes, and from publications of the Federal Statistical Office, Wiesbaden. GDP per capita is benchmarked on the 1936 estimate in Table B-6 and its movement is derived from the first two columns of this table. The 1990-93 real GDP movement in the "neue Länder" (ex DDR) from Statistisches Bundesamt, *Volkswirtschaftliche Gesamtrechnungen*, Fachserie 18, Reihe 3, various issues. The official 1990 estimate in DM for East Germany was converted into dollars with the same PPP as was used for the Federal Republic.



Table B-8. Characteristics of the 15 Constituent Republics of the USSR in 1991

|              | Population<br>(000s) | GDP<br>(million 1990<br>international dollars) | GDP per capita in<br>1990 international<br>dollars |
|--------------|----------------------|--|--|
| Armenia      | 3 400                | 16 363   | 4 813  |
| Azerbaijan   | 7 250                | 30 026   | 4 142  |
| Belarus      | 10 300               | 65 619   | 6 371  |
| Estonia      | 1 600                | 13 832   | 8 645  |
| Georgia      | 5 500                | 29 520   | 5 367  |
| Kazakhstan   | 16 850               | 98 513   | 5 846  |
| Kyrgyzstan   | 4 500                | 13 158   | 2 924  |
| Latvia       | 2 700                | 21 423   | 7 934  |
| Lithuania    | 3 750                | 27 327   | 7 287  |
| Moldova      | 4 400                | 20 242   | 4 600  |
| Russia       | 148 800              | 990 360  | 6 656  |
| Tajikistan   | 5 400                | 13 158   | 2 437  |
| Turkmenistan | 3 750                | 11 471   | 3 059  |
| Ukraine      | 52 000               | 257 079  | 4 944  |
| Uzbekistan   | 21 000               | 78 777   | 3 751  |
| USSR         | 291 200              | 1 686 868                                      | 5 793  |

Source: Derived from B.M. Bolotin, "The Former Soviet Union as Reflected in National Accounts Statistics", in S. Hirsch, ed., *Memo 3: In Search of Answers in the Post Soviet Era*, Bureau of National Affairs, Washington, D.C., 1992. Col. 1 above is from Bolotin, pp. 182-3, col. 2 is adapted from Bolotin who presents his estimates in 1990 dollars, without giving the source for his PPPs. His total for the 15 republics is \$ 1,541,700 million. My estimate is 9.4 per cent higher and is derived as explained in Appendix C. However, I have used Bolotin's proportionate allocation of total GDP (pp. 184-5). Col. 3 is derived from cols. 1 and 2.

Table B-9. Alternative Estimates (in billion 1933 yuan) of Chinese GDP in the mid 1880s and in 1933

|                    | mid-1880s |                    | 1933   |  |
|--------------------|-----------|--------------------|--------|--|
| Chang (1962)       | 12 254    | Ou (1947)          | 20 044 |  |
| Feuerwerker (1969) | 14 710    | Ou (1948)          | 21 770 |  |
|                    |           | Liu (1946)         | 24 190 | (excluding Manchuria, Jehol, Sinkiang, Mongolia and Tibet) |
|                    |           | Liu (1946)         | 26 660 | (with Manchuria, Jehol, Sinkiang, Mongolia and Tibet)      |
|                    |           | Liu and Yeh (1965) | 29 880 | (including Manchuria and Outer Mongolia)                   |
|                    |           | Yeh (1979)         | 29 460 | (coverage not specified)                                   |

Source: Chang (1962), Feuerwerker (1969) and Ou (1947 and 1948) as above; Ta-chung Liu, *China's National Income 1931-36*, Brookings, Washington, D.C., 1946, p. 10; Ta-chung Liu and Kung-chia Yeh, *The Economy of the Chinese Mainland: National Income and Economic Development 1933-1959*, Princeton University Press, 1965, p. 66; Kung-chia Yeh, "China's National Income, 1931-36" in Chi-ming Hou and Tzong-shian Yu, eds., *Modern Chinese Economic History*, Academia Sinica, Taipei, 1979, p. 98. Feuerwerker (1977) in his *Economic Trends in the Republic of China*, Michigan Papers in Chinese Studies, No. 31, 1977.