CHINA'S NATIONAL INCOME: A SURVEY OF ESTIMATES

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A number of official and Western estimates of China's national income for the period since 1949 are at present available. The official estimates are based on the Marxian production concept while the Western estimates are, in the main, based on the comprehensive production concept. The periods covered by the estimates vary; and even in cases where the periods covered are the same, the estimates vary in magnitude and, in most cases, in the implied rate of economic growth. Apart from differences arising from the different national income concepts and definitions employed in individual estimates, sources of discrepancies between series of estimates can be traced to the particular sets of primary data employed and also to the particular procedures followed in estimating the national income components. The present paper brings together the various estimates available to date and indicates for each, as far as possible, the basic production concept adopted, the particular national income aggregates estimated, the basic estimation approach employed, and the special procedures used for estimating some of the components of national income. Comparisons of the major series of estimates for the period 1952-1959 are made and the sources of discrepancies between the series are discussed. Finally, some problems are described which a researcher in the West has to contend with in working on China's national income accounting.

This paper attempts to take an inventory of the available estimates of China's national income.[1] It is divided into four sections: (1) national income accounting in China; (2) Western estimates of China's national income; (3) comparisons of the various estimates; and (4) some problems encountered in research on China's national accounting.

To facilitate the exposition that follows, a recapitulation of some of the general concepts of national income accounting and of the estimation approaches is in order.[2] National income is generally defined as the flow of goods and services, valued in money terms, which is available for consumption and adding to the existing stock of productive assets. It may also be defined as the accruing claims of the owners of productive resources (or factors of production) on consumer goods and services and the additions to wealth, valued in money terms. These alternative definitions apply to national income accounting in both the communist and the non-communist countries, even though the Marxian material production concept forms the basis of the former and the comprehensive production concept forms the basis of the latter. National income based on the Marxian concept is a measure of the production of physical goods and those services which serve material production; consumer services

[1]"China" refers to "Communist China" or "mainland China".

[2]See Studenski [1958], Parts I and II for a detailed account of the theory and methodology of national income accounting.

are usually excluded. The national income based on the comprehensive concept on the other hand, includes both material production and consumer services.[3] Needless to say, the interpretation of a particular national income estimate would be affected by the production concept adopted.

Three alternative approaches may be used for estimating national income: product, income, and expenditure. Whichever approach is employed, *mutatis mutandis*, the magnitude of the national income aggregate is, in theory, the same. In practice, it is not unusual for discrepancies to arise primarily because the statistical material used in the different approaches may not be comparable in scope or in quality. At the same time, the aggregate of national income may be expressed in "gross" or in "net" terms, depending on whether allowance is made for depreciation. It may be expressed in terms of "market prices" or of "factor cost", depending on whether indirect taxes (net of subsidies) are included or excluded. The aggregate may be termed "domestic" or "national", depending on whether the owners of the final product (or the productive resources) are classified by the geographical area in which they are residents regardless of their nationality or by nationality regardless of the geographical areas in which they are residents. Finally, an addition to the conventional terminology used in national income accounting in the West is the concept of "material product" based on material production. Material product may similarly be estimated on a gross (or net) as well as on a domestic (or national) basis, and it may also be valued at market prices or at factor cost.

I

BOUNDARY OF PRODUCTION

In China, as in the Soviet Union and Eastern Europe, the Marxian material production concept is adopted in national income accounting. The theoretical basis of such a concept has been dealt with elsewhere and requires no repetition here.[4] Suffice it to say that the various material production sectors listed in the Chinese national income accounts consist of industry, agriculture, construction, transport and communications, and commerce and catering trade. All services which are not directly related to material production are excluded, e.g. government administration, internal law and order and national defence, banking and insurance, social services, residential rents, personal services, etc. It is at once obvious that transport and communications may not altogether be material producing services since they cater for the needs of both the material and the non-material production sectors. It is interesting to note that not all the communist countries make this distinction in practice. Eastern Germany has always included both uses of transport and communications in the material product.[5] In April 1959, a working party of the Council for Mutual Economic Aid (CMEA) recommended the inclusion of passenger transport and the personal use of communication services in the material product, though the working party

[3]Ibid., Chapters 11–15.
[4]See Ishikawa [1965], Chapter 1.
[5]Stolper [1961], p. 180.

stressed that this was a practical necessity only.[6] China appears to have continued to follow the orthodox Soviet practice of including only the freight transport and that part of communications which serves the material production sectors.

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AGGREGATES

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In the Chinese national income accounts, the basic aggregates are the Gross Social Value Output and the Net Social Value Added. The former is the sum of the gross value outputs of the enterprises in the various material production sectors and generally is gross of duplications arising from inter-enterprise flows. In Western accounting terminology, these basic aggregates may be termed as Gross Turnover Material Product and Net Material Product.[7] The equivalent of Gross Value Added is not computed in China's national income accounting. However, there is no basic difference in the procedure of estimating the net value added between the Chinese and the Western system.[8]

Four national income aggregates can be distinguished: national income produced, national income distributed, national income redistributed, and national income for final disposal.[9] "National income" here is a generic term. The first three aggregates, in theory, are identical in magnitude while the last is an aggregate based on the equivalent of the "national" concept in Western national accounting.

The first aggregate is expressed as Net Domestic Material Product (NDMP). The second is an income aggregate; its structure shows the distribution of incomes which accrued to the productive workers themselves and to the community as a whole. The third aggregate is also an income aggregate and its structure shows the distribution of the incomes *after* transfers. Between the situation represented by the first and that represented by the second income aggregate, transfers take place between individuals, enterprises, collective organizations on the one hand, and the state which takes charge of the social redistribution fund, on the other; transfers also take place between the material and the non-material production sectors. The transfers in the first case are achieved through fiscal, credit, and price policies; whereas those in the second are the result of direct transactions. It is immediately apparent that not all of the primary incomes (i.e. national income distributed) are redistributed because some of these find their way to purchasing the final product.

The last national income aggregate is an expenditure aggregate whose structure shows the distribution of funds between consumption and accumulation. Although the accumulation fund is the equivalent of Net Capital Formation, the aggregate is not entirely net of depreciation because the consumption fund component includes a depreciation allowance for unproductive assets. It should

[6]United Nations [1959], p. 67.

[7]"Turnover" product was termed by Stolper. See Stolper [1961], p. 181.

[8]See Yüeh Wei [1956].

[9]*Ibid.* pp. 56–60. For an excellent summary of China's national income definitions and estimation methods, see Chen [1967], Chapter 2.

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be pointed out that national income for final disposal resembles Expenditure on National Product rather than National Expenditure because the latter should logically include expenditures on unproductive services, which by definition is not permissible.

As regards valuation, the outputs are, as a matter of practice, valued at market prices. However, the "market prices" in this case is theoretically different from that referred to in the Western national income accounts. Without going into theoretical details, the term is best replaced by "established prices".[10] While data on national income in some of the Eastern European countries are available in both current as well as in constant prices, those in China are generally in constant prices.[11]

OFFICIAL NATIONAL INCOME STATISTICS[12]

National income data for China are published irregularly. None has been released since 1960. The first reference to national income was made by Po I-Po in September 1956.[13] Another was made in the Second Five-Year Plan (1958–1962) proposals in which the national income target for 1962 was fixed at 50 percent above the 1957 level.[14] In 1957, Ho Wei, Ma Yin-ch'u, Niu Chung-huang and Yang Po all referred to China's national income in their writings.[15] These in the main were in the form of ratios relating to national income, e.g. accumulation (and/or consumption) fund to national income or budget revenue to national income. However, Yang revealed the figures for the 1952 and 1956 gross value outputs and net value added in the five material production sectors in "comparable prices".[16] Niu cited the same set of figures, though he referred to them as being valued in constant 1952 prices.[17] Both also gave the percentage distributions of national income by material production sectors and by types of ownership. Only in January 1958 did the State Statistical Bureau (SSB) formally release the national income aggregates which were expressed in terms of "comparable prices". The period covered was 1952–1956.[18]

[10]"Established prices" was a term used by Hoeffding and Nimitz in their study on the Soviet national income. See Hoeffding and Nimitz [1959].

[11]See Kaser [1961] for a survey of national income accounts in Eastern Europe and also Ishikawa [1965] for an account of the valuation in constant prices in China's national income accounting.

[12]The national income statistics may have been extracted from official documents, articles in periodicals or newspapers, monographs or recorded interviews, whose authors may not have any direct connections with the central government. These as well as those released by the State Statistical Bureau (SSB) are conveniently referred to as "official national income statistics." In parentheses, in the present paper, "official estimate" is used interchangeably with "SSB estimate" or "Chinese estimate". Owing to the fact that national income accounting is the responsibility of the SSB, the national income data obtained from any of the various sources just mentioned can justifiably be referred to as SSB data.

[13]Po was then the Chairman of the State Economic Commission. See Po I-po [1956].

[14]Proposals [1956].

[15]Ho Wei [1957], Ma Yin-ch'u [1957], Niu Chung-huang [1957], and Yang Po [1957a, 1957b, 1958].

[16]Yang Po [1957a].

[17]Niu Chung-huang [1957a], p. 23.

[18]SSB [1958].

The same set of data, valued in "constant 1952 prices", was published in English in April of the same year.[19] The percentage increases of national income over the years 1952–1957 with 1952 as the base were given by Hsu Ti-hsin and the percentage distributions of national income by types of ownership in the years 1952–1957 were published in, *inter alia*, the results of the First Five-Year Plan.[20] Absolute as well as relative increases of national income were published for 1958 and the official communique concerning the economic achievements in 1959 also revealed the percentage increase of national income in that year.[21] These figures were expressed in terms of constant 1957 prices. It was not until the first and the only statistical handbook to date, the *Ten Great Years* was published that the official percentage increases of national income in constant 1952 prices for the period 1949–1958 were revealed.[22]

Data on national income in current prices are scanty. Po in 1958 made a reference to the effect that the national income in current prices for the first plan quinquennium totalled 421,400 million yuan.[23] Annual figures in current prices appeared to have been implied in some of the ratios relating to national income. Apart from national income total, data on accumulation and/or consumption funds in current or in constant 1952 prices are available; these usually appear in the form of ratios relating to national income.[24]

II

The Western estimates of China's national income may be divided into the following groups: crude estimates; estimates which are essentially reconstructions of the official national income data; estimates which are derived from fragmentary information given in the official sources; estimates derived from a set of national accounts; and estimates by the product and expenditure approaches.

CRUDE ESTIMATES

Single-year estimates derived by crude methods were made by Szczepanik, Cheng, and Wu. *Szczepanik's* estimate of National Income (NI) for 1954 was merely a simple product of the assumed *per capita* income (US$40) and the total population.[25]

Cheng made three estimates for the year 1952.[26] The first estimate, the Net National Product (NNP) at Factor Cost, was an extrapolation from the NNP at Factor Cost estimated for 1936 by Ou Pou-san. The assumptions were that the NNP at Factor Cost increased at the same rate as the gross value output of

[19]Lu Kuang [1958], p. 8.
[20]Hsu Ti-hsin [1959], p. 249 and SSB [1959]. See also Hsüeh Mu-ch'iao [1964], p. 154.
[21]Li Fu-ch'un [1959] and SSB [1960a].
[22]SSB [1960b], p. 20.
[23]Po I-po [1958].
[24]See Chen [1967], notes to Table 2.7 for sources.
[25]Szczepanik [1955].
[26]Cheng [1956], Vol I, Chapter III.

both industry and agriculture during the period 1936–1952 and that the ratio between the gross value output of industry and that of agriculture remained unchanged throughout that period. The 1952 gross value outputs of industry and agriculture were obtained from Chinese communist sources. His second estimate, presumably an NI, was made with the use of the distributive-share method. The third estimate was an NNP by the product approach.

Wu's NNP at Factor Cost for 1953 was also an extrapolation from Ou's estimate, but in this case the national income in 1933 was used as the bench-mark.[27] The assumptions governing the extrapolation were similar to those used by Cheng. However, instead of relying solely on the official gross value output statistics for industry and agriculture, Wu devised a special production index to show the magnitude of the change between 1933 and 1953.

RECONSTRUCTIONS OF NATIONAL ACCOUNT

Li estimated the NDMP in constant 1952 prices with breakdowns into five material production sectors for the years 1952–1957.[28] At the time of writing, he presumably did not have any information at his disposal on the size of national income. His reconstruction was based largely on official statistics for the indi-vidual sectors and also on the writings of Ho, Ma, Niu and Yang.[29] This ex-plains the differences between his and the official estimates of the NDMP for 1952 and 1956.[30] Li also estimated the NNP for the period 1952–1957; these were actually based on his NDMP estimates. A conversion factor 1.1905 was applied to the NDMP to obtain NDP, given the assumption that the services excluded from the NDMP constituted 16 per cent of the NDP as shown in the India case. The NDP was then net of international payments to arrive at NNP.

Ishikawa also reconstructed the official national income accounts.[31] With the passage of time he was able to reap the benefit of more official statistical material being available. As far as the NDMP estimates were concerned, the official estimates of the overall aggregates for the years 1952–1957 were used as the controlling totals. Since official NDMP estimates (with breakdowns into material production sectors) are available for the years 1952 and 1956, his re-constructions were confined to the accounts for the years 1953–1955 and 1957. Ishikawa was very thorough in his reconstructions. He attempted to estimate the absolute values of the components of the various aggregates—mainly national income produced and national income for final disposal—where none was given in the official sources. As far as possible, he endeavoured to estimate the aggre-gates in current as well as in constant prices. In estimating the size of accumula-tion or consumption fund in national income for final disposal, he relied on the published accumulation or consumption ratios.

    [27]Wu [1956]. This estimate has presumably been superseded by a more recent estimate by him and his associates. See Wu [1963].
    [28]Li [1959], Chapter IV.
    [29]Ho Wei [1957], Ma Yin-ch'u [1957], Niu [1957b], and Yang [1957b].
    [30]Cf. Li [1959], p. 104, Table XXIV and Lu Kuang [1958], p. 8.
    [31]Ishikawa [1965].

At a time when official national income statistics were scanty, the United Nations Economic Commission for Asia and the Far East attempted to provide a series of China's national income for the period 1952–1956.[32] This was derived from extremely limited sources on national income in current prices and information available on the ratios of budget revenue to national income. In its annual survey for 1957, ECAFE published a series of NDMP in current market prices.[33] NDMP in constant 1952 prices were also estimated; these were based on the national income indices given in the *Ten Great Years*.[34] These material product aggregates were converted into NNP by a mark-up of 20 percent on the NDMP; the reason for this procedure was similar to that given by Li above. It is interesting to note that the derived NDMP aggregates in constant 1952 prices are different from the official figures, especially those for the period 1952–1957. This was probably due to an error in the base NDMP aggregate to which the series of indices was applied.

Luey derived the NDMP aggregates for the period 1957–1959, in terms of constant 1952 prices.[35] The findings were consistent with the official version given in the *Ten Great Years*. On the basis of limited information on national income in current prices and of the various ratios relating to what were suspected to be national income in current prices, the NDMP in current prices were derived for the period 1952–1959. Three series were derived, none of which could be conclusively said to be more reliable than the other two. Two sets of ratios were used: budget revenue relating to national income and revenue, net of surplus from previous year, to national income. The first set was applied to the actual revenue as well as to the actual revenue net of foreign loans; and the second was applied to the actual revenue net of foreign loans.

Barnett derived the series of national income in current prices for 1952–1956 from data on military and administration expenditures expressed as percentages of state expenditures and as percentages of national income.[36] The national income in current prices in 1957 was derived from Po's statement that the national income in current prices for the period 1953–1957 as a whole totalled 421,000 million yuan.

ESTIMATES DERIVED FROM A SET OF NATIONAL ACCOUNTS

Hollister constructed a set of national income accounts for the period 1950–1957.[37] His accounting framework was patterned after that of the U.S. Department of Commerce. The economic system was divided into the agricultural business, the non-agricultural business, the household, and the government sectors. Modifications were made of the U.S. system to the effect that instead

[32]United Nations [1957].

[33]Valuation in current *market* prices was stressed.

[34]United Nations [1962].

[35]Luey [1961], pp. 124–128.

[36]Barnett [1959].

[37]Hollister [1958].

of a consolidated business account for both the agricultural and the non-agricultural sectors, a sector account for each was devised, and that the rest of the world sector was omitted because of the paucity of data. Any transaction between the economy and the rest of the world was put under the non-agricultural business sector account. The division into agricultural and non-agricultural sectors made it possible to show the inter-relationships between them. Following the U.S. system, all state enterprises were incorporated into the business sector, which meant that government activity was reduced to that of providing the economic and social services not normally provided by the private sector.

Final sales approach was used for estimating the constituent items of the accounts. Hollister relied heavily on budget data and retail sales data, both of which constituted more than half of the GNP for 1952. Imputed value of farm consumption and the value of house rent and consumer services, amounting to 32 percent of the GNP, were estimated by indirect means, as were the private investments and inventory change. Rather than leave private investments to be derived as a residue, Hollister estimated them by using of data on changes in stock in the state trading enterprises, on changes in the capital of private trading enterprises, and on working capital of state enterprises.

The constituent items were entered in terms of current prices. These current price aggregates were converted into constant 1952 price aggregates by applying deflators to the various major constituent items. As far as consumption expenditures in the non-agricultural households were concerned, the current values were deflated with the use of a price index which were derived from data on average money wage and average real wage of industrial workers in 1950 and from the same types of data for the socialized sector during the period 1952–1957. The exact method of derivation was not given. The imputed farm home consumption and the farm house rent were deflated by a price index for farm sales of all agricultural produce. Government purchases were deflated by an index of world prices in U.S. dollars, which in turn was derived from the indices of exports and imports of those countries with similar commodity compositions of exports and imports as those of China's. Again the exact derivation method was not revealed. As regards gross domestic investment, the imputed farm investment expenditures were deflated by a price index for farm procurement; the farm investment purchase from the non-agricultural sector as well as the change in inventory were deflated by the official wholesale price index; and finally, construction was deflated by a unit cost index.

Hollister re-valued the GNP for 1952 and 1955 in terms of U.S. dollars. Direct comparisons of outputs of China and the United States were made to obtain the conversion factors from Chinese yuan to U.S. dollar and *vice versa.*

Eckstein's GNP at Market Prices in 1952 was also derived from a set of national accounts.[38] Again the basic framework of the U.S. national income accounting system was adopted. The economic system was divided into the household, the private business, and the public sectors. Owing to the relatively insignificant role of the private business sector in a "partially commercialized area such as that of mainland China", the business sector was merged with the

[38]Eckstein [1961].

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household sector into one sector account. Three sector accounts were constructed, namely, the household and private sector account, the public sector account, and the Gross National Product account.

A hybrid method was used for estimating the GNP at Market Prices. For the agricultural sector, the value added approach was used, but for the non-agricultural sector, the distributive-share method was used. In estimating the agricultural product, apart from the calculation of gross value output of individual farm produce, the material inputs expended on agricultural production were also estimated in detail. Where data were lacking, pre-war agricultural data were used. The wage-bill of the non-agricultural sector was based on his own research on employment and on the average annual wage in major enterprises. Estimates of transfer income as well as enterprise earnings were obtained from published data in scattered sources. Although both GNP and GNE were estimated, his contribution was the GNP estimate since the GNE was based partly on the GNP estimated.

Direct price and quantity comparisons were made of the agricultural produce in the United States and in China with the view to obtaining the purchasing power parities of the Chinese yuan in U.S. dollars and *vice versa*. Similar comparisons were made between India and China. The GNP in U.S. dollars was derived with the use of the purchasing power parity ratio obtained from the direct comparisons.

DIRECT ESTIMATION APPROACHES

Liu and Yeh used the product approach to estimate the GDP and the NDP with breakdowns into sectors of origin for 1933, and for 1952–1959.[39] GDE and NDE for 1933, and for 1952–1957 were also estimated, partly on the basis of the results obtained by the product approach and partly by the direct use of the expenditure approach. U.S. concepts and definitions in national income accounting were implicitly adopted. The economic system was divided into 14 sectors: agriculture, factories, handicrafts, mining, utilities, construction, modern transportation and communications, old-fashioned transportation trade, government administration, finance, personal services, residential rents, and work brigades. Depreciation was listed separately in the GDP.

The aggregates were expressed in terms of constant 1933, 1952, and also 1957 prices. The 1958 and 1959 product estimates were "conjectural" in nature because they were largely based on extrapolations from 1957.

Liu and Yeh reconstructed the official estimates of the national income produced and the national income for final disposal for the periods 1952–1959 and 1952–1957 respectively. In the reconstruction, Western definitions were adapted but the Marxian material production concept was retained. They also adjusted the official estimates to fit in with the Western accounting concepts and definitions.[40] No adjustments were made to the magnitudes of the primary data themselves.

[39]Liu [1963].
[40]The product estimates for 1952–1959 and the expenditure estimates for 1952–1957.

Wu and associates' estimates were based largely on Liu and Yeh's.[41] The aggregates were in terms of constant 1952 prices. In addition to revising some of Liu and Yeh's component estimates, they made product and expenditure estimates for the periods 1960–1962 and 1957–1962 respectively. Major revision was made to Liu and Yeh's net value added in agriculture. Liu and Yeh's data on coal mining were substituted by those estimated by Wu and his associate, Ling. The sectors which Wu and associates re-examined were agriculture, mining, manufacturing, utilities, and handicrafts.

With regard to their expenditure estimates, GNE, Wu and associates retained Liu and Yeh's estimates of domestic investment for 1952–1957 which were extended beyond 1957 by correlating domestic investment with machine availability, and assuming domestic investment in 1961 and 1962 to be one-third of that in 1960. Secondly, the government consumption component estimated by Liu and Yeh for the period 1952–1956 was also retained. The 1957 estimate was revised in the light of Wu and associates' own independent investigation. The estimates by Wu and associates for 1958, 1961 and 1962 were projections from the 1957 estimate, on the assumption that expenditure varied directly with population. Government consumption data for 1959–1960 were taken from Hollister's other study.[42] Thirdly, personal consumption expenditures for the period 1952–1957 were estimated on the bases of (a) a minimum maintenance level of consumption comparable to that in 1957 ("personal consumption I") and of (b) actual grain consumption with 1957 as the benchmark ("personal consumption II"). The expenditures for the period 1958–1962 were estimated on the assumption that the increase in personal consumption I or II was at the same rate as that in population. The alternative estimates for personal consumption gave rise to alternative GNE estimates in the final analysis.

Wu and associates also made direct price and quantity comparisons of the outputs in the United States and in China for purposes of inter-country comparisons of national products.

The "conjectual" product estimates for the period since 1960 may also be included here. Estimates of NDMP in constant 1952 prices for the period 1960–1962 were made by *Hsia*.[43] Estimating methods were not made known.

Luey also made estimates of NDMP in constant 1952 prices for the period 1960–1962. His 1960 and 1962 estimates were almost identical with those estimated by Hsia.[44] The estimates were arrived at by applying a number of relationships obtained from the official estimates for 1952–1957 to grain outputs for 1960–1962 and what fragmentary information available on gross value output of industry.

Liu provided a much more sophisticated set of conjectual product estimates for 1959–1965 derived from a simple structural model consisting of simple relationships built on the Liu-Yeh data for 1952–1957.[45] All told there were 16

[41]Wu [1963].
[42]Hollister [1960].
[43]Hsia [1966].
[44]See Luey [1966], Appendix B.
[45]See Liu [1968]. His work was actually finished a few years earlier. The results were reported at a conference held at Carmel, California in October 1965, and the findings were used in a paper prepared for the Joint Economic Committee of the U.S. Congress in February 1967. See Liu [1967].

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equations in the model. Estimates of NDP at constant 1952 prices for the period 1959–1965 were derived from the first eight equations. The remaining equations were used for deriving net domestic investment.

<center>III</center>

The brief survey above reveals to some extent the difficulties involved in the different attempts that have been made to estimate China's national income for the years after 1949. A comparison of the available estimates, official or otherwise, is now in order.[46] It may be recalled that some of the Western estimates are based on national accounting concepts used in the United States while others are based on concepts used in the Soviet Union and China. The methods of estimating national income are generally different and the statistical material used are not identical in all cases. For any one accounting period, different estimates appear to give different magnitudes of the level of income. Although many characteristic features of the available estimates can be distinguished, here we shall only be concerned with the differences in the magnitude of the various estimates for the year 1952 and for the period 1952–1959.[47]

<center>COMPARISON OF PRODUCT AGGREGATES FOR 1952</center>

As a first step a comparison of the national income estimates for 1952 is made because Eckstein's estimate has been confined to that year only. However, the single-year estimates for 1952 made by Cheng and other economists outside China are excluded from the comparison. To simplify the analysis, the official estimate will be made the standard in the comparison. Because the official estimate is a material product aggregate, this has to be transformed first into a conventional national income aggregate. Such an exercise has been performed by Liu and Yeh. Their "adjusted estimate" is actually the material product aggregate adjusted to conform to Western national income accounting framework.

The five estimates for 1952 are shown in Table I. It may be recalled that the product approach is used by the SSB and by Liu and Yeh, and to a certain extent, by Wu and associates. Eckstein's estimate is based on a hybrid of the product and the income approach, and the expenditure approach is used in Hollister's.

It can be observed that the adjusted official estimate is the median of the five product aggregates. The percentage deviations of the various estimates from the adjusted official estimate are as follows: +5.33 (Wu and associates), +4.99

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[46]Comparison of the product estimates for 1952–1957 made by SSB, Hollister, Li, Liu and Yeh, and Wu and associates can be found in Liu [1968]. Comparisons at the industry level of Eckstein's and Liu and Yeh's estimates for 1952 are also made in Liu [1968]; while detailed comparison of Eckstein's and Hollister's estimates for that same year is available in Luey [1966], Appendix A.

[47]Ideally two types of comparisons should be made: one in which the estimates compared are reduced to material product aggregates and the other in which they are transformed into the conventional national income aggregates. No attempt is made to consider the first type of comparison because for some of the estimates data are not available to make the necessary adjustments. Of course, estimates of the necessary data for the purpose of adjustments can be made, but such an exercise is beyond the scope of the present paper.

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TABLE 1

NATIONAL PRODUCT ESTIMATES, 1952

Hollister	GNP at Market Prices	67,860 million yuan
Eckstein	GNP at Market Prices	71,255 million yuan
Liu and Yeh	GPD	74,670 million yuan
Wu and associates	GDP	75,600 million yuan
Adjusted SSB	GDP	71,730 million yuan

Sources: Hollister [1958]; Eckstein [1961]; Liu [1963]; Wu [1963]; and, for the adjusted official estimate, Liu [1963], Vol. I, Table 68.

(Liu and Yeh), −0.66 (Eckstein), and −5.40 (Hollister). The discrepancy between the adjusted official and any one of the Western estimates is largely attributed to differences in the estimates for the value added in agriculture. However, for conceptual and definitional reasons, it is difficult to compare the estimated agricultural value added made by Eckstein and Hollister with those by the other estimators. Comparison of the adjusted official figure with those of Liu and Yeh, and Wu and associates for the agricultural sector, on the other hand, reveals a percentage deviation of +8.20 (Liu and Yeh) and +11.08 (Wu and associates). With regard to the last two estimates, one would expect Wu and associates' GNP estimate to come close to Liu and Yeh's GDP aggregate. The reason is that the former is a revised version of the latter. Although one is a domestic aggregate and the other a national aggregate, the difference is more apparent than real. Judging from the methodology used by Wu and associates, there is no actual difference between GNP and GDP.

Ignoring the adjusted official estimate for the moment, it can be observed that the discrepancy between the estimates by Liu and Yeh and by Wu and associates on the one hand, and the estimate by Eckstein on the other is approximately 5 per cent. It can be further observed that the difference between Eckstein's and Hollister's estimates is also about 5 per cent. If by some other criteria, the quality of Eckstein's estimate were superior to those by the other three estimators, then a margin of error of that magnitude, i.e. 5 per cent, could be considered reasonable in national income accounting. If Eckstein's estimate were indeed the best among the five, the adjusted official estimate would also be a "good" estimate since the difference between it and Eckstein's is small; the discrepancy might well be due to the basic difference between a domestic and a national aggregate. This would further imply that the original official material product aggregate is a reasonable estimate.

Unfortunately, it is difficult to evaluate Eckstein's estimate as a measure of China's economic performance in 1952. To wit, Eckstein asked that his study on China's national income be viewed as "an attempt to explore a new field of inquiry rather than to furnish definitive estimates."[48] As we shall see it is equally difficult to single out any one of the estimates so far considered as the most accurate and reliable.

[48]Eckstein [1961], p. iv.

COMPARISON OF PRODUCT ESTIMATES FOR THE PERIOD 1952–1959

For obvious reasons, only the adjusted official estimate and those of Hollister, Liu and Yeh and Wu and associates will be considered. The various series of product aggregates are shown in Table II. It is evident that the divergence between the adjusted official estimate and any of the Western estimates becomes wider for the period after 1957. Taking the period 1952–1957 as a whole, Liu and Yeh's GDP is lower than that of the adjusted official estimate

TABLE II

NATIONAL INCOME IN CONSTANT 1952 PRICES, 1952–1962
(1,000 million yuan)

Year	Adjusted SSB	Hollister	Liu and Yeh	Wu and others
1952	71.73	67.86	74.67	75.55
1953	76.94	77.06	78.99	79.02
1954	81.87	81.92	83.31	82.27
1955	87.69	85.41	86.57	86.07
1956	101.89	97.21	97.28	96.52
1957	110.15	102.42	100.82	100.00
1958	154.00	126.23	114.73	111.81
1959	188.47	142.57	132.43	123.73
1960	—	158.11	—	120.61
1961	—	—	—	82.01
1962	—	—	—	85.12

Notes: Adjusted official estimates and those of Liu and Yeh are GDP aggregates; those of Hollister and of Wu and associates are GNP aggregates.
The figures may differ from those given in the original sources. The differences are the result of eliminating minor discrepancies due to rounding of figures in the original sources, and also in the case of the figures under Wu and others, to re-working the basic sector and sub-sector tables but without altering the methods used by them.
Sources: See Table I.

TABLE III

PERCENTAGE DEVIATIONS OF WESTERN ESTIMATES FROM
ADJUSTED OFFICIAL PRODUCT ESTIMATES, 1952–1959
(Adjusted SSB estimate = 0)

Year	Liu and Yeh (GDP)	Wu and Others (GNP)	Hollister (GNP)
1952	+ 4.10	+ 5.33	− 5.40
1953	+ 2.66	+ 2.70	+ 0.16
1954	+ 1.76	+ 4.89	+ 0.06
1955	− 1.28	− 1.85	− 2.60
1956	− 4.52	− 5.27	− 4.59
1957	− 8.47	− 9.20	− 7.02
1958	−25.50	−27.40	−18.03
1959	−29.73	−34.35	−24.35

Source: Table II.

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by 1.90 per cent while Wu and associates' GNP is lower by 2.04 per cent (Table III). Hollister's GNP is 3.47 per cent below the official figure.

For the period 1952–1959 as a whole, the discrepancies are larger: − 12.08 per cent for Liu and Yeh's estimate, − 13.49 per cent for Wu and associates', and − 10.55 per cent for Hollister's.

The range of percentage deviations of Liu and Yeh's GDP estimate varies from + 4.10 (1952) to − 8.47 (1957) during the period 1952–1957 with a mean deviation of 3.8 per cent. In the case of the estimate by Wu and associates, the range varies from + 5.33 (1952) to − 9.20 (1957) with a mean deviation of 4.87 percent. As regards Hollister's, the range is between + 0.16 (1952) and − 7.02 (1957) and the mean deviation amounts to 3.12 percent.

It can be observed that both Liu and Yeh's and Wu and associates' estimates are higher than the adjusted official estimate for the period 1952–1954 and lower than it is for the period 1955–1957, and with the exception of 1952 the same applies to Hollister's estimates.

TABLE IV

NATIONAL EXPENDITURE IN CONSTANT PRICES, 1952–1962

(1,000 million yuan)

Year	Adjusted SSB	Hollister	Liu and Yeh	Wu and others
1952	73.46	67.86	76.40	75.70
1953	77.99	77.06	80.04	83.10
1954	82.25	81.92	83.68	85.80
1955	88.87	85.41	87.73	88.00
1956	101.34	97.21	96.68	94.00
1957	109.20	102.42	99.80	95.20
1958	—	126.23	—	103.60
1959	—	142.57	—	110.50
1960	—	158.11	—	118.40
1961	—	—	—	81.50
1962	—	—	—	82.70

Notes: Adjusted official estimate and those of Liu and Yeh are GDE aggregates; those of Hollister and of Wu and associates are GNE aggregates.

Sources: See Table I.

COMPARISON OF EXPENDITURE ESTIMATES FOR THE PERIOD 1952–1957

The expenditure estimates for the period 1952–1957 are shown in Table IV. For the period as a whole, all series are lower than that of the adjusted official estimate. Liu and Yeh's series is lower by 1.65 per cent, that of Wu and associates by 2.12 per cent, and finally, that of Hollister by 3.98 per cent. In the case of Liu and Yeh, the percentage deviations range from + 4.00 (1952) to − 8.61 (1957) with a mean deviation of 3.81. Those in Wu and associates' case range from + 6.55 (1953) to − 12.82 (1957) with a mean deviation of 5.83. Finally, those of Hollister vary between − 0.40 (1954) and − 7.62 (1952) with a mean deviation of 3.88.

COMPARISONS OF THE DERIVED RATES OF GROWTH

Since all the series except Hollister's have a higher value for the 1952 total product than the adjusted official estimate, the derived rates of growth—with the product aggregate for 1952 as the base—for the period 1952–1957 (or 1952–1959) will be correspondingly lower than the adjusted official figure. Table V shows the various derived overall and annual rates of national income growth for the different periods.

TABLE V

DERIVED RATES OF GROWTH OF NATIONAL PRODUCT IN CONSTANT 1952
PRICES

(percentage)

	Adjusted SSB (GDP)	Liu and Yeh (GDP)	Wu and others (GNP)	Hollister (GNP)
Overall increase				
1952–1957	53.4	35.0	32.4	50.9
1952–1959	162.7	77.4	63.8	110.0
1952–1960	—	—	59.6	133.0
1952–1962	—	—	12.7	—
1957–1959	71.0	31.4	23.7	39.2
1957–1962	—	—	− 14.7	—
Annual increase				
1952–1957	8.9	6.2	5.7	8.6
1952–1959	14.6	8.5	7.3	11.2
1952–1960	—	—	6.1	11.2
1952–1962	—	—	1.2	—
1957–1959	30.8	14.5	11.4	17.9
1957–1962	—	—	− 2.8	—

Source: Table I.

SOURCES OF DISCREPANCIES

The discrepancies between the adjusted official estimate of GDP and the other estimates of GDP or (GNP) are not unexpected. Liu and Yeh's estimates are not entirely independent of the official estimate for the period 1952–1957. They are based partly on revisions of some of the component sector estimates in the adjusted official series. Wu and associates' series is, in turn, based partly on some of Liu and Yeh's sector estimates. We have to omit Hollister's series here because his aggregates have not been broken down into sectors of industrial origin. Also, a similar analysis of the sources of discrepancies in the expenditure estimates will not be made here. The structure of the expenditure aggregate varies from one estimate to another, rendering direct comparisons of component estimates difficult.

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More specifically, Liu and Yeh revised the sector estimates for agriculture, factories, handicrafts, modern transportation and communications, old-fashioned transportation, trade (trading stores and restaurants), and finance. (For 1952, only the following net value added estimates were substituted: agriculture, handicrafts, and old-fashioned transportation.) Wu and associates in turn revised Liu and Yeh's net value added estimates for agriculture, factories, and handicrafts, and also substituted the adjusted official estimates of the net value added by utilities with their own.

A detailed sector-by-sector analysis of the various estimates shows that it is the discrepancies in net value added estimates for sectors such as agriculture, trade (trading stores and restaurants), modern manufacturing, and modern transportation and communications which chiefly account for the divergences between the adjusted official national income estimate and those of Liu and Yeh and of Wu and associates. For the period 1952–1957, the relative share of agriculture in the adjusted official NDP averages 41.7 percent. The estimated net value added for the agricultural sector is higher than the adjusted official estimate by 3.2 percent in the case of Liu and Yeh and by 3.0 percent in the case of Wu and associates. The relative share of agriculture in the total net product amounts to 43.6 percent in both cases. In the case of the estimates of net value added for trade (trading stores and restaurants), factories and modern transportation and communications, the Western estimates are lower than the corresponding adjusted official estimates. For the period 1952–1957 as a whole, Liu and Yeh's estimates for the three sectors are lower by 13.33, 5.70, and 13.76 percent, respectively. With the exception of the estimated net value added for the factories sector the above discrepancies also apply to the estimates made by Wu and associates, whose estimate of the net value added by factories is 6.39 percent lower than the adjusted official figure. Compared with the relative shares of the corresponding sectors in the adjusted official NDP, both Western estimates of the shares of trade (trading stores and restaurants) and of modern transportation and communications are lower by 1.51 and 0.48 percentage points, respectively. As regards the share of factories, Liu and Yeh's estimate is lower by 0.57 percentage points and Wu and associates' by 0.53 percentage points. The discrepancies in the net value added estimates can be explained further by the differences in methods of estimation as well as in the statistical material used. But these will not be considered here.[49]

AN OBSERVATION ON THE WESTERN ESTIMATES

The quality of the Chinese primary material is such that any national income estimates based on them will be suspect. As for the Western estimates, it is difficult to say which one of the series is better than the rest. Liu and Yeh's voluminous study on China's national income will certainly be a classic for some time to come. Their statistical appendices alone command admiration and respect; these constitute a masterpiece in that they contain meticulous details of a

[49]This, however, has been dealt with in Luey [1969].

vast quantity of statistical data extracted from multitudinous scattered sources. While the sources and estimating methods used at every stage of the estimation process will not be discussed in the present paper, it should be mentioned that Liu and Yeh's methods used for estimating the net value added by agriculture leave much to be desired. The study by Wu and associates is liable to the same criticism. Their estimates of the grain outputs, which ultimately determined the size of the net value added by agriculture, were based on the official grain output estimate for 1957, and derived with the aid of certain assumptions. Thus, their estimates for the period 1952–1959 may well be divorced from the actual situation. The importance of correctly estimating the size of the annual grain output cannot be over-emphasized, for the net value added by agriculture forms a very substantial share of the total net product. From a close reading of their work, it is clear that Liu and Yeh's estimate of grain output for 1952 is uncertain. The margin of error is not known, but if their figure were, say, 10 percent too high, the average annual rate of increase in GDP would rise by 10 percent (from the estimated 6.19 to 6.81 percent per annum) in the six-year period 1952–1957.[50]

IV

One of the major problems in research on China's national income accounting is that one has to contend with the poor quality of the Chinese statistics.[51] While it is possible to undertake consistency tests with the given official statistics, internal consistency does not necessarily mean reliability.

The lack of references to statistical sources and estimating methods in the source materials creates a further problem. Consider the ratios relating to national income given in the official sources. National income in absolute terms can be derived in principle by applying the given ratio between accumulation (or budget revenue) and national income to the size of the given accumulation fund (or budget revenue).

However, in attempting to derive the national income in current prices from a given ratio of revenue to national income, one may have to solve the problem of discovering the definition of the revenue component of the ratio first. Even if the national income component of the ratio is clearly defined, it is still necessary to know the coverage of the term "budget revenue". The Chinese term *kuo-chia yu-suan shou-ju* is generally translated as "financial revenue", although strictly speaking, it should be "national *budget* revenue".[52] Furthermore, "financial revenue" may well mean "actual revenue", depending on the context. Mah pointed out that "budget revenue", unmodified, could mean one of the following:[53]

    a. planned budget revenue, including the surplus from the previous year's accounts;

[50]See Chao [1965], Eckstein [1961], Li [1962], and Liu [1963].

[51]See, *inter alia*, Li [1962], Chao [1965].

[52]For "financial revenue", see Lu Kuang [1958], p. 9. For *kuo-chia yu-suan shou-ju* and "budget revenue", see Dictionary [1963].

[53]Mah [1959], p. 62.

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b. planned budget revenue, excluding the surplus from the previous year's account;

c. actual revenue, including the surplus from the previous year's account; and

d. actual revenue, excluding the surplus from the previous year's account.

To this list might be added:

e. planned budget revenue, including foreign loans;

f. planned budget revenue, excluding foreign loans;

g. actual revenue, including foreign loans;

h. actual revenue, excluding foreign loans;

j. planned budget revenue, including net income flows from abroad;

k. planned budget revenue, excluding net income flows from abroad;

m. actual revenue, including net income flows from abroad; and

n. actual revenue, excluding net income flows from abroad.

In addition to these, further interpretations of the term "budget revenue" can be listed: e.g. (a) combined with either (e) or (f), (b) with either (e) or (f), and so on; or (a) with either (j) or (k), (b) with either (j) or (k), and so on. It is no wonder, therefore, that no one outside China knows for certain what the official estimates of the national income in current prices actually are.

Consider also the derivation of the size of the accumulation fund from given information on the national income aggregate and on the accumulation ratio. Here we may take the case of deriving the size of the accumulation fund for 1952. According to Liu and Yeh, the accumulation ratio of 18.2 percent appeared to be the correct one because in their view, it was the only ratio which was the same in magnitude whether it was expressed in terms of current prices or in terms of constant 1952 prices.[54] This seems a reasonable choice except for the fact that the source material from which they extracted the data not only stated that the ratio was 18.2 percent when valued in current prices but also 16.1 percent when valued in constant 1952 prices. And both ratios were quoted on the same page.[55] It is plausible that the accumulation fund was expressed as a percentage of national income produced in one case and as a percentage of national income for final disposal in another. In this connection, it may be recalled that national income produced is a domestic aggregate while national income for final disposal is a national aggregate. If the former were larger in magnitude than the latter, then the accumulation fund expressed as a percentage of the domestic aggregate would be smaller than that as a percentage of the national aggregate. However, with the information available, we have not been able to say for certain that the 16.1 percent is actually a ratio relating to the NDMP or the 18.2 percent is a ratio relating to the NNMP.

It has often been said that an economy produces the kind of statistics it deserves. If an economy is backward, its statistics are more likely to be inferior in quality. Taken in this light, it would not be unreasonable to attribute the

[54]Liu [1963], Vol. I, Table 73.

[55]Niu Chung-huang [1957a], p. 51. Liu and Yeh made no reference to Niu's ratio of 18.2 percent.

poor quality of Chinese statistics to the relatively underdeveloped state of the economy. Nevertheless, whatever the reason, the real problem remains; namely, it is necessary to have some idea about the extent of the reliability of the data. In any attempt to appraise the reliability of the data from an underdeveloped economy that is non-communist, one at least has the opportunity to check the given data "in the field" by surveys or other techniques. However, researchers in the West studying China's national income accounting are denied such satisfaction.

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