Appendix A

Performance in Farming, Fishery, Forestry and Agricultural Sidelines, China 1933–95

The original statistical monitoring system of the Chinese State Statistical Bureau (SSB) was in most respects a copy of the Soviet material product approach, and its methods of data collection reflected the ubiquity of state control.

The SSB was created in 1952 and its aggregate estimates for agriculture are available on an annual basis from that year. The first major statistical publication (SSB, 1960) provided detail for 1949–58 on output of twenty major crops, some categories of livestock, and some farm inputs, but aggregate agricultural performance was indicated only by gross output values at current prices. Thereafter, there was a twenty year period in which published material on agricultural performance was scarce and often distorted for political reasons, particularly during the Great Leap Forward and Cultural Revolution. The SSB was actually abolished in 1968 and its staff dispersed. The provincial offices also seem to have been disbanded. The statistical system was reestablished in 1972, but most of the old staff had disappeared, many old records had been destroyed, and no new graduates with the requisite training had been produced in the years when universities had been closed. In 198l the World Bank reported that the central staff of SSB had only 200 people compared with 400 in 1966.

In the 1980s, after China had joined the UN, World Bank and IMF, it began to shift gradually to the standardised system of national accounts used by Western countries. Vestiges of the old concepts remain, and the statistical reporting system has not yet changed much. The new hybrid system can be seen most clearly in the official 1987 input/output table. Table A.1 shows the major entries for agriculture as a whole and for farming. In particular, it shows very clearly the relationship between the Western concept of gross value added and net material product, which was the main indicator of performance in the most sophisticated version of the former Chinese system. In fact the difference between the two magnitudes is rather small for agriculture.

A time series showing the three major official Chinese measures of aggregate agricultural performance: gross output, net material product (NMP), and gross value added (GVA) in "comparable" (quasi–constant) prices can be found in Table A.2. The gross product measure exaggerates performance because it makes no deduction for inputs used in production. According to the World Bank (1992) p.30, net material product was derived by deducting 13 separate input items from gross output. These were seeds, animal feed, breeding and veterinary costs, fertilisers, fuel, pesticides and other farm chemicals, electric power for production, cost of small implements,

depreciation, inputs to sideline products, equipment repairs and production support services, other physical inputs, but no deduction was made for inputs of "non–productive" services. Gross value added shows agriculture's contribution to gross domestic product and is comparable in concept to Western measures of performance. It is equal to net material product, minus "non–productive" services plus depreciation.

In the 1980s, the availability of statistical information improved a good deal with the publication of the *China Statistical Yearbook* covering all fields of economic activity. The *China Agriculture Yearbook* contained a statistical section which gave little more than the first mentioned source, but a special comprehensive retrospective volume (Ministry of Agriculture, 1989) covered the whole period 1949–86. It showed output estimates for about 50 crop and livestock items, a measure of aggregate gross agricultural output at "comparable" prices (pp.106–9) with a breakdown into five major branches (crops, livestock, fishery, forestry, and farm "sidelines" – the latter item referred to rural handicrafts, hunting and gathering activities). In the 1990s, this index of gross output was revised to show somewhat slower growth. Retrospective estimates of net material product of agriculture were provided for 1952–93. In 1997, retrospective official estimates of agricultural gross value added at comparable prices became available back to 1952. All these three indicators are available at current and "comparable" prices. However, no breakdown is published between farming, fishery, forestry and sidelines.

As I wanted to check the growth rates and levels of output shown in the official figures and to make an international comparison of Chinese and US farm performance, I constructed my own estimates of agricultural performance at constant prices. Table A.3 summarises my results for agriculture as a whole. Table A.4 shows my estimates of farm gross output and value added for six benchmark years from 1933 to 1994. I used FAO 1987 prices as weights, FAO quantities for 1975, 1987 and 1994, SSB quantities for 1952, 1957 and 1978 and quantities of Liu and Yeh (1965) for 1933. I had quantitative information for 136 crop and livestock items, and prices for 103 of these. For 24 items I felt it was reasonable to estimate shadow prices by assimilating non–priced items with prices for similar products. My aggregate for Chinese farm output therefore covers 125 items. I used the Chinese input output table to estimate 1987 inputs, and extrapolated these to other years using official indicators of the movement of major input items as explained in the notes to Table A.4. Tables A.5, A.6 and A.7 provide rough estimates for fishery, forestry and "sideline" output.

I used 1987 weights throughout because of the availability of a detailed input–output table for that year. Normally, the effect of taking late weights for a 61 year period would tend to understate the growth rate, but this is much less important in agriculture than in industry, because there are no new products and much less change in the product mix than in other sectors of the economy.

My estimates show slightly faster growth than the official figures for 1952–78. I found a growth rate of gross value added of 2.2 per cent a year, compared with the official 2.1 per cent. For 1978–95 my estimates show the same growth as the official 5.1 per cent. For 1952–95 as a whole my growth rate is 3.4 per cent a year, compared with the official 3.3 per cent. For farming I found a growth rate of 3.0 per cent for 1952–94, for fishery 5.7 per cent, forestry 7.1 per cent, and "sidelines" 5.6 per cent.

My estimates show a significantly higher level of value added than the official figures. For the benchmark year 1987 my agricultural gross value added was 38l billion yuan compared with the official 320 billion. The difference arises entirely from the farm sector where I have 326 billion yuan compared to the official 265 billion. For the other three sectors I used the official estimates.

For 1952 and 1957 my estimate of agricultural output is 14 per cent higher than the official figures, 18 per cent or over from 1978 onwards. It is not easy to explain this difference in results, because the statistical information in the Chinese official sources is rather limited. Published quantitative information is or has been available for about 50 items compared with 125 in FAO

sources. For the 50 SSB items there are no significant differences from FAO data, but it seems quite possible that the official estimates do not give very full coverage to items like fruits, vegetables or nuts, which are not subject to compulsory delivery. Official price information is rather scarce and seems to refer mainly to consumer rather than producer prices. Tables A.22a and A.22b compare a range of official estimates with those of FAO. One does not find striking differences, but it is not clear what prices were actually used in the official measures. Table A.22c shows there was still a significant degree of segmentation in Chinese farm markets in 1987. The biggest segment for cereals was peasant self–consumption, where prices must necessarily be imputed. The first "market" segment consists of items for which the government set a compulsory delivery. 1987 quotas were 18 per cent of the rice crop, 33 per cent for wheat, 40 per cent for maize and 50 per cent for soybeans. The second segment consisted of "above quota" deliveries for government purchase (where prices are higher). The highest prices prevail on the free market. Both the official and the FAO valuations of output seem to be somewhere between the quota and the above–quota prices, and the official valuations are probably lower.

It seems likely that my estimates of farm output are higher than the official figures for a mixture of reasons. Part of the explanation may be differences in valuation, part may be due to differences in coverage.

Albert Keidel (World Bank, 1994, pp.12, 15, 16) suggests that the official estimates understate 1987 farm output because of undervaluation and undercoverage. He maintains that in Chinese statistical practice farm self–consumption of grains is generally valued below market prices. He suggests an upward revaluation of grain output by 20 per cent to correct for this (which would add about 8 per cent to the value of farm output). He believes that the quantity of grain and vegetable output is not recorded fully and that the official estimates for these items should be augmented by 10 per cent and 30 per cent respectively to correct for this. This would probably add another 6 per cent to the value of farm output in 1987.

Measures of 1933 Farm Performance

Official estimates of farm performance do not provide any link with prewar years, but this is essential if one is to get a reasonable perspective on postwar performance.

My estimate of farm performance in 1933 was derived by linking aggregate output of a sample of 28 items in 1933 and 1975 (see Table A.21). I used all the 1933 information provided by Liu and Yeh (1965) which could be matched with the same items for 1975. The sample represented 73 per cent of 1975 gross output, and I assumed that coverage was the same in 1933. The main difference between their 1933 measure and mine are use of a different weighting base, my link with 1975 rather than 1957, and the fact that I matched a slightly smaller number of products. For value added I estimate 1933 to be 94 per cent of 1957 compared with an average of 96.2 for their two measures.

Table A.21 also shows 1931–7 output derived from Perkins (1969) for 22 items I was able to match. They show prewar farm output output about 10 per cent lower than I derived from the Liu and Yeh data for 1933. The main difference is that Liu and Yeh used prewar crop yield estimates which in some cases were higher than those which prevailed in 1957. Perkins did not accept that crop yields could have fallen. He assumed that 1957 yields prevailed in the 1930s in every province. He made some adjustments to the figures for area cultivated and used lower figures than Liu and Yeh for the 1930s stock of most animals. Table A.21 permits a detailed comparison of the Perkins and Liu–Yeh estimates for the 1930s for the items one can match, and the difference in the aggregate results can be seen in Table A.4. I prefer the figures based on Liu and Yeh as they are more fully documented. The Perkins assumption that 1957 yields prevailed in 1933 seems a bit arbitrary. It seems quite feasible

that 1957 yields were lower than in 1933 after 12 years of war and the disruption caused by agrarian reform and collectivisation.

Chinese Farm Performance in International Perspective

Another way of getting a perspective on Chinese performance is through comparisons with other countries. Table A.11 compares Chinese and US farming in 1987 using detailed FAO information on prices and quantities of individual commodity output, feed and seed, and taking non farm inputs from the respective input–output tables (Tables A.12 and A.13).

It is clear that China had the bigger farm economy with a value added 2.3 times that in the United States (at 1987 US prices). Value added per head of population was 51 per cent of the 1987 US level but Chinese labour productivity in 1987 was only 1.8 per cent of that in the United States. Table A.14 merges the benchmark levels with time series for the two countries. It can be seen that Chinese labour productivity has fallen substantially relative to that in US farming. In 1933, it was 7.1 per cent of the US level; in 1952, 5.1 per cent; in 1978, 2.2 per cent, and in 1994 only 1.6 per cent.

Table A.15 shows the results of an earlier 13 country comparison on similar lines for 1975, using detailed FAO information on quantities and prices of gross output and inputs of feed and seed, together with non–agricultural input information from various sources. The 1975 information on China has since been revised downwards by FAO and better information is now available on Chinese non–agricultural inputs, but nevertheless the results of this earlier study throw a good deal of light on comparative performance. In this earlier study China ranked second lowest in terms of labour productivity in this group of countries.

Table A.16 also throws interesting comparative light on Chinese performance. It now has the second highest input of chemical fertiliser per hectare of cropland. Its input ratio is exceeded only by that of Japan.