3

THE DATA

The input-output time series for 1952-77 are pieced together from Chinese official sources. Except for 1952-58, official data exist only in widely scattered fragments. These have been collected and pieced together by several U.S. government agencies: the Central Intelligence Agency (CIA), the Department of Agriculture (USDA), and the Department of Commerce (DOC). These series are fully documented as to sources and methods of estimation. A number of China scholars have also published data series with full documentation. Where available and appropriate these data series were adopted (sometimes after modification) in this study with full acknowledgment and complete reference.

The Food and Agriculture Organization of the United Nations (FAO) publishes annual estimates not supplied by Peking on both the output and input. China scholars agree that the FAO estimates leave much to be desired mainly because of lack of documentation of sources, methods of estimation, and assumptions made. We share these views and have in general not used FAO estimates.

All of the time series, except those for grain and population, are incomplete or nonexistent. The basic work in gap filling for the 1952-75 period was done by Thomas R. Gottschang. The basic methodology guiding data generation and analysis is related to the aggregate production function and factor productivity decomposition based on the residual method. These techniques were developed for the People's Republic by the writer in connection with earlier studies of Chinese agriculture.[19] The techniques employed in filling information gaps ranged from simple arbitrary, but hopefully plausible, assumptions to interpolations and extrapolations, regressions on available related series, and the Moorsteen-Kaplan procedure (see Appendix 1, Table 14) familiar to students of the Soviet Union. These details and complete source documentation appear in the notes to the tables.

The complete grain and population series are the more controversial, because of their importance in any empirical study of China.

The grain series is taken from USDA figures. It excludes soybeans and includes potatoes in grain-equivalent weight based on a ratio of four to one. The USDA estimates are based on official data fragments since 1958 and the compilations of the State Statistical Bureau for 1952-57.[20] Questions recently have arisen about whether changes have been made on the potato-grain conversion ratio and the treatment of soybeans in grain output reports. Evidence seems to indicate that changes have taken place, but their timing is unknown. Field and Kilpatrick recently recalculated a consistent "official grain series" based on plausible guesses about the dates of the changes.[21] The last word is far from being in, however. In a special statistical release on the 30th anniversary of the People's Republic, Peking revealed that its recent grain output figures included soybeans and the grain equivalent of potatoes at the old four-to-one ratio.[22]

The long-term output trend will be little affected by the changes. The corrections suggested by Field and Kilpatrick are to an extent compensating, lowering the official figures for the earlier years when their new five-to-one potato-grain conversion ratio is applied and raising the same figures for the early years when soybeans are included. Thus the average compound rate of grain output growth calculated from the USDA series is 2.3 percent per year; the rate from the Field-Kilpatrick (CIA) series comes to 2.2 percent. The exponential growth curve remains relatively stable even though the USDA estimates for 1976 and 1977 are probably understated by perhaps 5 million metric tons. It is not considered worthwhile to recalculate the grain series and several others related to it. However, to reduce the effect of an understated benchmark year figure on projections for 2000, the trend value for 1977 has been used instead of the "reported" grain output. (For the handling of the newly released official data, see Table 2.)

The size of China's population, its growth rate, and the growth deceleration likely in the future remain major points of contention. Of the several population estimates available, those of John S. Aird

Table 2—Comparison of Tang estimates and official 1979 releases

Source	Population[a] (millions)	Cultivated Land (million hectares)	Tractors — All (million 15 horse power units)	Tractors — Large and Medium	Tractors — Hand	Power Drainage and Irrigation Equipment (million horse power)	Pigs (millions)	Sheep	Large Animals	Grains[b] (million metric tons)	Cotton	Oil-bearing Crops	Aquatic Products	Insecticides	Chemical Fertilizers	Energy Consumption[c]	Gross Value of Agricultural Output (billion yuan)
Tang 1977 estimates	973	107	1.3	...	...	47	274	161	110	280	2.2	3.7[e]	1.7[e]	1.4[e]	8.5	...[e]	79
State Statistical Bureau																	
1977	946	100	1.557	0.467	0.577	60	292	161	94	283	2.1	4.0	4.7	0.5	7.2	36	134
1978	958	100	1.927	1.090	1.370	66	301	170	94	305	2.2	4.6	4.7	0.5	8.7	40	146

Sources: People's Republic of China, State Statistical Bureau, "Communique of China's 1978 National Economic Plan," *Beijing Review*, July 6, 1979, pp. 37-41; and Ye Jianying, "Speech in Celebration of the 30th Anniversary of the Founding of the PRC," *Beijing Review*, October 5, 1979, pp. 7-16.

Notes: The discrepancies between the Tang estimates of inputs and official statistics are usually modest and offset one another. The stock figures are for the end of the year. Additional notes on this table appear in Appendix 2.

[a] These figures exclude Taiwan.

[b] Grains include potatoes at one-fourth their weight and soybeans.

[c] The Tang estimate includes domestic production plus imports. The official figures include only domestic production.

[d] The Tang estimate is in 1952 yuan; the official estimates are in current yuan.

[e] These are 1952 figures; the 1977 estimates are not available. The coverage of oil crops may not be strictly comparable over time.

have been selected (see notes to Appendix 1, Table 11). Aird and some other Western demographers may have underestimated the efficacy of the Chinese population control measures. On the other hand, the post-Mao relaxation policy is likely to mean some increase in fertility rates. Labor reward in the collective sector of agriculture continues to encourage more labor units per family. In short, because the Chinese have not had a census since 1953, Aird's medium projections continue to be accepted. Official Peking may be equally in the dark concerning the country's demographic dimensions.

FOOTNOTES

[19] Anthony M. Tang, "Policy and Performance in Agriculture," pp. 459-509; and "Input-Output Relations in the Agriculture of Communist China," in W. A. Douglas Jackson, *Agrarian Policies and Problems in Communist and Non-Communist Countries* (Seattle: University of Washington Press, 1971), pp. 280-302.

[20] Students of China agree that Peking does not keep two sets of books: one for the leaders and planners themselves and another (with inflated figures) for external consumption. Official releases represent the government's own best estimates. There is a second type of government release, mainly for the Chinese public, whose purpose is to promote numerous campaigns of "emulation and exultation." Unfortunately, the releases are not labeled for distinction, and it takes sensitivity on the part of the investigator to make the separation.

[21] Robert Michael Field and James A. Kilpatrick, "Chinese Grain Production: An Interpretation of the Data," *China Quarterly* 74 (June 1978): 369-84.

[22] *Beijing Review*, October 5, 1979, p. 13 shows grain output of 304.5 million metric tons in 1978 and 163.9 million metric tons in 1952. The 1952 figure includes soybeans and values potatoes at $\frac{1}{4}$ their natural weight, as is shown in People's Republic of China, State Statistical Bureau, *Ten Great Years* (Peking: Foreign Languages Press, 1960; reprinted as Occasional Paper No. 5, Program in East Asian Studies, Western Washington State College, Bellingham, Wash., 1974).