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Bulletin of  
SUNG YUAN  
Studies

## THE SUNG ECONOMY: HOW BIG?

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How big was the Sung economy? How much of the production of that economy was appropriated or controlled by the state for its own purposes?

Difficult as these questions are, we must attempt to answer them, even as we recognize that inadequate evidence will always render such attempts highly tentative. The questions need to be answered not only because they are important in their own right but also for two or more specific reasons. First, unless we have some notion of the overall size of the Sung economy, we lack a basic point of reference against which to measure results obtained from the growing number of studies of Sung local and regional economies. Second, even tentative answers open up the possibility of global comparisons of the Sung economy with the economies of Ming and Ch'ing and thus a clearer picture of the changes that did and did not occur in China's economy during the late imperial period from Sung to Ch'ing.

A recent and very ingenious attempt to estimate total Sung national income around 1080 and the percent of that income collected in tax revenues has been made by Albert Feuerwerker in his important article, "The State and the Economy in Later Imperial China."<sup>1</sup> The reconstruction involves several steps.

Beginning with total population figures and the assumption (relying on estimates by Dwight Perkins) that per capita consumption/output of the unhusked grain was approximately 550 chin yearly, Feuerwerker estimates a total yearly grain output of approximately 381,000,000 tan in the late eleventh century.<sup>2</sup> He then draws on price figures collected by Ch'üan Han-sheng to estimate a "normal" grain price of 0.6 taels (liang) per tan. Multiplying that price with the total grain output gives a value of 229,000,000 taels for the yearly grain output.

Then, assuming (1) an 80/20% division between agricultural and nonagricultural employment, (2) that 70% of the total national income originated in the agricultural sector (allowing for the greater value added per capita in nonagricultural compared with agricultural labor), and (3) that 80% of cultivated acreage was planted in grain, he estimates that about 60% ( $0.7 \times 0.8 = 0.56$ ) of total national income came from grain input. Dividing the total value of grain output by 60% then gives a estimated total national income of 381,000,000 taels.

Using estimated government revenues of 50,000,000 taels leads Feuerwerker to

<sup>1</sup>In *Theory and Society* 13 (1984), pp. 279-326. (Hereafter, Feuerwerker 1984.)

<sup>2</sup>Although Feuerwerker has quite reasonably selected for his grain consumption/output figure the mid-point of Perkins' 500-600 chin estimate, it should be noted that Perkins allows for the possibilities (1) that "production in the Ming and Ch'ing times fell below 500 catties per capita for long periods"; (2) that grain "consumption levels in China rose slowly (and unevenly) perhaps by as much as 20 to 30 per cent" from the beginning of the Ming to the twentieth century; and (3) that perhaps, though it is unlikely, consumption may have declined during the same period. Dwight H. Perkins, *Agricultural Development in China 1368-1968* (Chicago: Aldine Publishing Company, 1969) p. 15. The tenuousness of this estimate is further increased when it is pushed back to serve also for the Sung period, thus using it as a constant over ten rather than six centuries.

conclude that the late eleventh century Sung government was able to collect approximately 13% of total national income in taxes.

Table 1 summarizes these results:

TABLE 1  
FEUERWERKER ESTIMATES FOR THE NORTHERN SUNG (c.1080)

|                                       |                             |
|---------------------------------------|-----------------------------|
| Population                            | 90,000,000                  |
| Output of unhusked grain per capita   | 550 <u>chin</u>             |
| Total grain output                    | 381,000,000 <u>tan</u>      |
| "Normal" grain price per <u>tan</u>   | 0.6 <u>liang</u>            |
| Total value of grain output           | 229,000,000 <u>liang</u>    |
| National income                       | 381,000,000 <u>liang</u>    |
| Government revenue                    | 50,000,000 (?) <u>liang</u> |
| Revenue as percent of national income | 13%                         |

Feuerwerker's calculations are not without their problems as he himself points out with an engaging scepticism not typical of practitioners of cliometrics. He admits to being "very unsure of the S[ung] figures especially" and that he "guessed wildly to convert tax units in kind into cash." Some readers may be inclined to wonder how far sophisticated calculations of this sort can make up for those "wild guesses" that are forced on us by the poor quality data normally at our disposal (when there is any data at all!). Nevertheless, as we shall see in a moment, the Sung data, properly analyzed, can be made to yield up more in the way of plausible and useful information than it has until now. Interestingly, Feuerwerker's conclusion that the Sung government may have collected revenues totaling some 13% of national income has received what appears to be at least one independent corroboration in the work of Robert Hartwell. In a massive study of Sung government revenues and expenditures in the 1070's, Hartwell concludes that the Sung state collected between nine and seventeen percent of GNP in taxes, refining that somewhat later in the same article to "less than twelve percent of GNP."<sup>3</sup>

Even rough order estimates of this kind are very useful if done carefully and with a keen sense of the plausible. They allow us to compare the effectiveness of Sung revenue collection and its possible effects on the overall economy with the efforts of other government for which we have better data. For example, Feuerwerker's similar calculations for the Ming (c. 1550) and the Ch'ing (c. 1750, c. 1880's, c. 1908) come up with estimates of government revenue as a percent of national income centering on the six to eight percent range. (Feuerwerker 1984, p.300) Outside of China, we find that most European states even well into the nineteenth century diverted only some four to six percent of national income into public expenditures. (Feuerwerker 1984, p.299) For modern underdeveloped

<sup>3</sup>Robert M. Hartwell, "Government Finance and the Regional Economies of China, 750-1250" (Typescript 1984) pp. 3, 21. (Hereafter, Hartwell 1984.)

countries, the figure tends to be in the ten to fifteen percent range. (Hartwell 1984, p.3) If the Sung government was indeed able to collect in taxes ten percent or more of total national income or GNP, this is surely testimony to a remarkable effectiveness for a premodern government.

But, before we become too comfortable with the seeming mutual corroboration of the conclusions of Feuerwerker and Hartwell, it is important to stress that both methodologies involve a considerable amount of estimating and those estimates are sometimes highly questionable.

We have already seen Feuerwerker's estimate of total national income around 1080 is about 381,000,000 taels (liang) or, using the one-to-one official exchange rate, 381,000,000 strings of cash. Hartwell arrives at his estimate of GNP by first using "the wages of a quasi-military worker, i.e. a common wage laborer" as an index to the income produced by each of 30,807,211 adult males (ting) on the population registers in 1077. Unfortunately, he neglects to tell us what wage figure he is using, and on the basis of what evidence. Moreover, he further complicates matters by converting all his data to an imaginary accounting unit, the silver-kilo.<sup>4</sup> However, working backwards, we can calculate that he is using a yearly wage per adult male of 1.3428 silver-kilos, which just happens to work out to a nice round 35 strings per year at the official exchange rate! When we multiply the 30,807,211 ting by 1.3428, we obtain a total of 41,367,923 silver-kilos of GNP per year. (Hartwell 1984, p.3)

Hartwell then tries an alternate calculation. He begins with Chang Chung-li's estimate of China's GNP in the 1880's which would work out to about 1.2859 silver-kilos yearly per household. On his belief that "Sung per household income was certainly no less than that during the late Ch'ing," he multiplies this figure by the 17,051,093 registered Sung households in 1080, obtaining a total of 21,926,194 silver-kilos. Hartwell agrees with Feuerwerker that Chang's estimate is probably too low (although he would raise it by even more than the twenty percent suggested by Feuerwerker) and also notes that a certain number of Sung households failed to make it onto the population registers.

On the basis of all these calculations, Hartwell decides to use for 1077 GNP a compromise figure between the 21 million silver-kilos based on Chnag's estimates and the 41 million silver-kilos of his own estimate, settling on a figure of 31,500,000 silver-kilos. When we convert that figure to strings of cash at the official 1:1 rate for ounces of silver-kilos to strings of cash, instead of

<sup>4</sup>This complication is totally unnecessary since, for purposes of his study, Hartwell uses the official exchange rate of one string cash = one liang of silver. (Hartwell 1984, p. 84.) The silver-kilos make the use and checking of Hartwell's work very clumsy for all the rest of us in the field who find strings and ounces (liang) the most reasonable accounting units to work with and are therefore faced constantly with the necessity of converting Hartwell's silver-kilos to something more familiar. In addition, the use of this artificial unit of account tends repeatedly to suggest a precision and accuracy in the figures presented that is in fact spurious and belied every step of the way by imprecision of data with which we have to work.

Feuerwerker's 381,000,000 strings of national income or GNP yearly, we came come up with a figure well over twice as large: 907,515,000 strings!

It was clearly time to take another look at the calculations by which Feuerwerker arrived at the figures presented in Table 1. At the outset, we can note two corrections that need to be made: (1) to convert chin to tan, Feuerwerker used a consistent factor of 130. Actually, in the Sung and Ming, 120 chin made up a tan; in the Ch'ing, a tan was only 100 chin.<sup>5</sup> (2) Feuerwerker's estimate of government revenues of 50,000,000 ounces of silver (or strings of cash) around 1080 is far too low. We are undoubtedly much closer to the real situation if we increase that figure to 100,000,000 ounce/strings.<sup>6</sup>

Recalculating Feuerwerker's results using these adjustments gives us the follows:

TABLE 2  
CORRECTED ESTIMATES FOR NORTHERN SUNG (C.1080), MING AND CH'ING

|                                       |                          |
|---------------------------------------|--------------------------|
| SUNG:                                 |                          |
| Population                            | 90,000,000               |
| Output of unhusked grain per capita   | 550 <u>chin</u>          |
| Total grain output                    | 412,500,000 <u>tan</u>   |
| "Normal" grain price per <u>tan</u>   | 0.6 <u>liang</u>         |
| Total value of grain output           | 247,500,000 <u>liang</u> |
| National income                       | 412,500,000 <u>liang</u> |
| Government revenue                    | 100,000,000 <u>liang</u> |
| Revenue as percent of national income | 24%                      |
| MING (c. 1550)                        |                          |
| Revenue as percent of national income | 5.5-7%                   |
| CH'ING (c. 1750)                      |                          |
| Revenue as percent of national income | 3.3-6%                   |
| CH'ING (c. 1908)                      |                          |
| Revenue as percent of national income | 3.7-7.5%                 |

<sup>5</sup>Ogawa Tamaki 小川環樹 et al., Shin jigen 新字源 (Tokyo: Kadokawa shoten, 1968), p. 1224.

<sup>6</sup>Hartwell 1984, p.21. 12% of Hartwell's GNP estimate would equal 108,901,800 ounce/strings; 11% would be 99,826,650 ounce/strings. Actually yearly cash income alone from 1068 to 1078 of more than sixty million strings. Edmund H. Worthy, John W. Haeger (ed.), Crisis and Prosperity in Sung China (Tucson: University of Arizona Press, 1975), p.112, Table 5.2) (Hereafter, Worthy 1975.)

Unfortunately, the results of these recalculations severely strain credibility, suggesting as they do that the Sung government was able to appropriate through taxation almost one fourth of total national income. That the procedure itself is not necessarily flawed is suggested by the quite reasonable results it produces for Ming and Ch'ing.

It may be, then, that some of the estimates for the Sung are simply too low, leading to significant understatement of total national income in the Sung. (our figure for total tax revenue is, by comparison, relatively hard.) This can happen more easily than one might expect since, in this kind of calculation, the cumulative effect of even a few quite small variation can be very large indeed. Strictly by way of example: let us use a population figure of 100,000,000 (instead of 90,000,000); a "normal" grain price per tan of 0.7 (instead of 0.6) and 50% of national income coming from grain output (rounding Feuerwerker's 0.56 down to 0.5 instead of up to 0.6). With these revised estimates, total national income becomes 640,000,000 liang. If that were the case, government revenue of 100,000,000 liang would be 15.6% of total national income, bringing us at least close to what we would seem to be the realm of possibility.<sup>7</sup>

I hasten to emphasize as strongly as I can that the above exercise is strictly by way of example to illustrate that, sometimes, "little things mean a lot." I most certainly do not recommend massaging our figures in this way to make the result fit pre-ordained conclusions. What all of the above shows, I believe, is the approach of Feuerwerker and Hartwell may be useful for arriving at estimates of total national income in the face of a paucity of data that might seem at first to preclude any such efforts. If that is true, then such estimates do enable us to say important things about the proportion of that national income that passed through the hands of the government. Also, it should be stressed that Feuerwerker, not a specialist on the Sung economy, was able to recognize (and willing to tell us in no uncertain terms) that his reconstruction for the Sung was much more tentative than those for Ming and Ch'ing. As our knowledge of the Sung economy gains in precision, there is every reason to expect that we will be able to do increasingly sophisticated analyses of this kind with ever greater confidence in the results to which they lead.

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<sup>7</sup>This percentage, or something very close to it, is all the more reason because it seems quite clear that the 1070's, as a result of Wang An-shih's new policies, represent a high point in the northern Sung government's revenue collecting abilities. (See Hartwell 1984, p.6, Table 2, and Worthy 1975, p.112, Table 5.2.) This period saw a vigor of government activity (and flourishing economic growth?) that was unprecedented and could not sustained. Hence, it may be that, for this very brief and quite exceptional period, government revenues did command a proportion of total national income that would appear to be unachievable by a premodern government. If that was indeed the case, it helps us to understand even better the breadth of opposition provoked by Wang's reforms.