Chinese population data

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Population data is the most important, and luckily, also the richest among the economic data sources of pre-industrial China.[1] Through his collection of China's land acreages, populations and taxation figures in the two millennia from AD 2 to 1911, Liang argues persuasively that the Chinese historical economic data were made available by the official administration. He also argues that from the Han to the Tang dynasty the government was mostly concerned with household registration. In contrast, land registration was supplementary and unimportant Yet the quality of Chinese population data is highly skeptical. In the Ming dynasty, for instance, the only reliable population returns were those made in the Hongwu reign. From 1393 onwards, population records are available for at least 137 years of the 251 years of the Ming period but these recards raise many questions. For instance, of all reports, only the populations reported in 1403 and 1506 are slightly larger than those in 1391. Based on established knowledge of Ming history, these recorded population data covered only part of the entire Ming population and became increasingly irrelevant to real changes.

Nor can modern researchers find a way to amend some of the errors in the Ming population data. In her study of the Ming population in Fujian, E. Rawski clearly denies any possibility of "construct(ing) a method which could explain and predict

[1] Liang 1980, preface.

differential success in under-reporting".[2] Enumeration of households and individuals were required when Zhu Yuanzhang built up the lijia system. The assignment of head-based labour service in particular needed such information. However, enumerating all residents could not be a routine task for the local administrationnot because it not only incurred huge costs but also faced confrontation from members of rural communities, who made every effort to avoid the tax burden. In reality the completion of taxation and services at the local level thus followed traditional practice to accept, with certain minor technical adjustments, the formerly reported population figures as the legitimate taxation basis. It had nothing to do with demographic growth that must have take place in the three centuries. Except for the earliest records, the extant Ming population figures are meaningful only in this fiscal practice. While E. Rawski's research confirms Ho' argument on Ming populations, the remaining question is whether the Chinese population data of the preceding periods were reliable or not.

1.

Perkins makes serious efforts to reconstruct Chinese historical population prior to 1400. In the face of the unreliability of the Chinese population data in the sixteenth and seventeenth centuries, He compares changes and distribution of the Chinese

[2] E. Rawski, 181.

population during the Song, Yuan and early Ming eras to validate the household data prior to 1400.[3] A few of the important question he raises on the data quality include[4]:

1. How difficult was it to count the number of people in China?
2. Were the institutions set up to register the population suitable for the task?
3. Are the published data consistent with known historical events and plausible demographic trends?

Following these three lines of inquiry into the past, Perkins has made good sense of the Chinese historical population records. Prior to the establishment of the Ming dynasty in 1368, the Chinese government made serious efforts to register population. The published data are fairly consistent with known historical events such as the Mongol conquest, which caused a great decline in Chinese aggregate households. Furthermore, observed from the household perspective rather than from that of the total recorded "individuals", the trends in demographic changes demonstrated in the extant data are plausible. Because the extant data were made independently by three dynastic powers, the demonstrated consistency in these data strongly suggests the reliability of such population data in projecting the main trend in Chinese demographic changes in the three centuries from 1080 to 1393.[5]

This cross-dynastic study provides a solid foundation for my study of the Chinese economy at the macro-level. Nonetheless, Perkins' interpretation can be improved substantially as researches in recent decades have provided much more

[3] Perkins 1969, 195.
[4] Perkins 1969, 192-3.
[5] Perkins 1969, 196-201.

detailed studies on Chinese population data. I shall focus my investigation only on the Song population data, which Perkins had identified as a main issue in future research. In Chapter 2 of this book, I have argued from the institutional perspective the Song population returns were most trustworthy because population reporting was independent from tax collection. The increase in reported households was not immediately or directly related to increases in taxes. Household growth was rather expected to be one of the most important tasks a local official should achieve during his tenure.[6] It is also clear that the Song court did not ask the local administration to report total number of family members as there were no tax benefits for the Song administration to do so. These two observations, though uncertain will explain the seemingly controversial nature in Song population data as demonstrated in Table A-1.

The major trend in Northern Song population changes in the eleventh century is clearly indicated by rising in aggregate households from 6.86 million in 1003 to 20.88 million in 1110. Except for the 1011 figure, which was obviously an error, all other figures show a gradual and smooth pace in population growth. A substantial decline occurred in 1021 as the registered households reduced by 1 million. This unusual change might be related to the weakening of the Song administration during financial crisis that was caused by the war against the Tangut during the Renzong reign. Hyperinflation was evident in the preserved Song indirect taxation data as well.

Table A-1. Song aggregate households, 1003-1223

[6] Cheng 2003, 11-2.

Year	Aggregate households	Total numbers	Numbers per household
1003	6,864,160	14,278,040	2.08
1006	7,417,570	16,280,254	2.19
1008	7,908,555	17,803,401	2.25
1009	8,402,537	-	-
1011	133,112	541,419	4.07
1014	9,055,729	21,996,965	2.43
1015	8,422,403	18,881,930	2.24
1019	8,545,276	19,471,566	2.28
1020	9,716,712	22,717,272	2.34
1021	8,677,677	19,930,230	2.30
1023	9,898,121	25,455,859	2.57
1029	10,162,689	26,054,238	2.56
1031	9,380,807	18,936,066	2.02
1034	10,296,565	26,205,441	2.55
1037	10,663,027	22,482,516	2.11
1038	10,104,290	-	-
1039	10,179,989	20,595,307	2.02
1042	10,307,640	22,926,101	2.22
1045	10,682,947	21,654,163	2.03
1048	10,723,695	21,836,004	2.04
1050	10,747,954	22,057,662	2.05
1053	10,792,705	22,292,861	2.07
1058	10,825,580	22,442,791	2.07
1061	11,091,112	22,683,112	2.05
1063	12,462,317	26421651	2.12
1064	12,489,481	28823252	2.31
1065	12,904,783	29077273	2.25
1066	12,917,221	29092185	2.25
1067	14,181,485	-	-
1069	14,414,043	23068230	1.6
1072	15,091,560	21867852	1.45
1075	15,684,529	23807165	1.52
1077	14,245,270	30807211	2.16
1078	16,402,631	24326123	1.48
1080	16,730,504	23830781	1.42
1083	17,211,713	24969300	1.45
1086	17,957,092	40072606	2.23
1088	18,289,375	32163012	1.76
1091	18,655,093	41492311	2.22
1094	19,120,921	42566243	2.23
1097	19,435,570	43411606	2.23

1099	19,715,555	44364949	2.25
1100	19,960,812	44914991	2.25
1102	20,264,307	45324154	2.24
1103	20,524,065	45981845	2.24
1108	20,648,238	46173891	2.24
1109	20,882,438	46734784	2.24
1110	**20,882,258**	**46734784**	**2.24**
1159	11,091,885	16842401	1.52
1160	11,575,733	19229008	1.66
1161	11,364,377	24202301	2.13
1162	11,139,854	23112327	2.07
1163	11,311,386	22496686	1.99
1164	11,243,977	22998854	2.05
1165	11,705,662	25179177	2.15
1166	12,335,450	25378648	2.06
1167	11,800,366	26086146	2.21
1168	11,683,511	25395502	2.17
1169	11,633,233	24772833	2.13
1170	11,847,385	25971870	2.19
1171	11,852,580	25428255	2.15
1172	11,730,699	25955359	2.21
1173	11,849,328	26720724	2.26
1174	12,094,874	27375586	2.26
1175	12,501,400	27634010	2.21
1176	12,132,202	27619019	2.28
1177	12,176,807	27025758	2.22
1178	12,976,123	28558940	2.20
1179	12,111,180	29502290	2.44
1180	12,130,901	27020689	2.23
1181	11,567,413	26132494	2.26
1182	11,432,813	26209544	2.29
1183	11,156,184	22833590	2.05
1184	12,398,309	24530188	1.98
1185	12,390,465	24393821	1.97
1186	12,369,881	24341447	1.96
1187	12,376,552	24311789	1.71
1188	11,876,373	24306252	2.14
1189	12,907,438	27564106	2.31
1190	12,355,800	28500258	2.26
1193	12,302,873	27845085	2.24
1218	12,669,684	28377441	2.24
1222	12,669,310	28325070	2.24
1223	12,670,801	28320085	2.24

Sources: Fang 2010, 234-7; Chen Zhichao, 1995, 25-27

A sharp decline in aggregate households can be seen in 1159, a population reported shortly after the end of the war with the Jurchen. In the preceding two decades, the Song administration lost half of its territory and a great number of populations. The Southern Song population records were less reliable than that of the Northern Song.[7] The major trend observed from Table A-1 is a slow growth in aggregate households from 1159 to 1200, with a peak record of 12.9 million in 1189. It is difficult to explain the many irregular yearly changes, though the Song government's lost of an efficient population reporting mechanism in the twelfth century should be a major reason.

The consistency of Northern Song population records can be further tested at the prefecture level. The extant records provide a full report of all 234 prefectural-level households in three benchmark years, the 980s, 1080 and 1102. In no other periods of Chinese dynasties can one find such detailed resources. Wu Songdi has already compiled all these records and presented them in his work on Song population. He admits that for 63 prefectures, about one-fourth of the total, their reported figures were suspicious because irregular changes in the number of adult male or households.[8] But one can discern clearly a shared trend of rapid growth in total households at the circuit level in a century. When this rising trend is contextualized

[7] For a discussion on the distribution and quality of population figures in the Southern Song, see Wu Songdi 2000, 138-54.
[8] Wu Songdi 2000, 119-121.

against the development in urbanization and water transportation as revealed by the taxation data, the expansion in the Chinese market economy in the eleventh century is unmistakably evident.

Wu Songdi estimates 5.4 individuals for average family size in the Song era. He reaches this estimate from two different sources. First, population returns in North China conducted by the Jurchen Jin dynasty in 1187 suggested that average family size was 6.0-6.2. Second, Wu Songdi collects population records preserved in famine relief reports of 28 prefectures in the Southern Song. Food rationing during the famine relief period required full accounting of all members of a family. Thus, most of the average family size reported in the twelfth- and thirteenth centuries was between 5.2-5.4. Wu, therefore, adopts 5.4 for average family size in the eleventh century.[9]

Based on the solid evidence on Northern Song population data, I agree with Wu Songdi that by the early thirteenth century, Song population should have exceeded 100 million. For 1078, one of the chosen benchmark years in the comparison of the national incomes between Song and Ming, the estimated population is 89.7 million. The registered households in 1077 numbered 16,603,954. This is close to the number of aggregate households in 1080, which numbered 16,730,504 (see Table A-1). The 1080 total figure is most often citied because we have the full report of the population at the prefectural level. Nonetheless, the real population towards the end of the eleventh century should have fallen to the range of 90-100 million.

2.

[9] Wu Songdi 2001, 155-62.

Establishing consistency of the thirteenth and fourteenth-century figures also affect the economic study of the interim period. Fortunately Perkins has accomplished this task when he compared the Yuan population returns with the 1393 census and offered a historical context to explain the radical changes at the regional level. In proving the reliability of the early Ming data, his work inevitably demonstrates the huge loss in Chinese population caused by the Mongol conquest, especially in North China, the Up- and the Middle-Yangtze regions (see Table A-2).[10] In areas other than these war-inflecting regions, population continued to grow. This continuity is clearly proven by the population growth in Zhejiang.

Table A-2. Chinese population data by province (1080-1393)

Province	Song 1080	Song-Jin 1173	Yuan 1270/90	Ming 1393
Hebei (N)	984,195	2,277,131	593,852	334,792
Shaanxi-Gansu (N)	962,318	-	92,651	294,526
Shanxi (N)	450,869	-	241,969	595,444
Shandong (N)	1,370,800	-	363,611	753,894
Henan (N)	823,066	-	162,962	315,617
Subtotal	4,591,248	6,987,000	1,455,045	2,294,273
Hubei (C)	589,302	267,000	527,518	775,851
Hunan (C)	811,057	1,005,134	1,819,145	537,614
Jiangxi (C)	1,365,533	1,862,614	676,115	1,553,923
Subtotal	2,765,892	3,134,748	1,602,281	2,867,388
Anhui (E)	2,152,814	1,161,339	162,962	537,614
Jiangsu (E)	*	*	1,602,281	1,375,320
Zhejiang (E)	1,830,096	2,295,863	2,384,274	2,138,225
Subtotal	3,982,910	3,457,202	4,149,517	4,051,159
Fujian (SE)	992,087	1,424,296	1,364,467	815,227
Guangdong (SE)	565,534	526,913	681,477	675,599

[10] Perkins 1969, 196-201.

Guangxi (SE)	242,110	505,883	386,239	211,263
Subtotal	1,799,731	2,457,092	2,432,183	1,702,089
Sichuan	1,403,484	2,721,911	99,538	215,719
Total	14,543,265	18,757,953	13,644,388	10,593,314

Source: Perkins 1969, 195. In his calculation of subtotal populations, Perkins combined Hubei, Hunan, Jiangxi, Anhui, Jiangsu, Zhejiang, Jiangxi and Fujian together to show a sharp decline in population in these regions. I divide them into Central China, East China and Southeast China for comparison.

* Most areas of Anhui and Jiangsu in Song eras belong to Huainanlu, thus the provincial figure is not available. The reported 2,152,814 households in 1080 and 1,161,339 households in 1173 refer to the population of both provinces.

The trend in population changes in the Lower Yangtze is extremely important to my comparison of market development and living standards in Song and Ming eras. Population data on the Lower Yangtze produced in different dynastic periods prior to 1400 also prove the consistency of the Song and Yuan data. Although the population records preserved in extant gazetteers are far from sufficient, the data on the chosen 9 prefects in the Lower Yangtze as shown in Table present a roughly similar pattern of population changes. The Mongol conquest brought little damages to the local economy and population growth is evident in Suzhou, Nanjing and Shaoxing. This population growth can thus further support the argument on Jiangnan's agricultural development in the thirteenth and fourteenth century.

Table A-3. Population Density in the Lower Yangtze

(individual/km^2)

980 1080 1102 1199 1279 1290 1390s 1770

Suzhou 756	21	104	91	103	196	277	292
Hangzhou 367	47	135	138	174	261	241	144
Huzhou 348	31	117	131	165	--	192	162
Nanjing 507	41	119	85	--	83	160	116
Zhenjiang 383	39	81	94	94	159	146	128
Shaoxing 447	28	77	140	--	137	150	134
Huizhou 188	4	36	36	41	42	53	44
Yangzhou 330	23	42	44	28	34	--	95

Source: Table 7-4.

The extant Song population data is a rich mine to be explored in the future. As this book compares market development in the eleventh century with the early Ming command economy, it is necessary to identify the approximated Chinese population around 1077 and 1400. The research on early Ming population has provided trustworthy estimations of Chinese population around 1400. As Perkins have tested the consistency in Chinese aggregate household records three centuries prior to 1393, this appendix aims to prove the reliability of the Northern Song population data with regard to the comparison with the early Ming. To show that the Song household data is consistent throughout the century, I examined the eleventh-century aggregation

household data and address the general information on distribution of the aggregate population in three benchmark years.

It is fairly safe to suggest that by the early thirteenth century, the Song population should have exceeded 100 million while the real population towards the end of the eleventh century should have fallen within the range of 90-100 million. Therefore, the estimated population of 89.7 million in 1077 can be taken as a reasonable approximation.