Discussion Paper

Research Department, Central Bureau of Statistics, Norway

No. 87 April 1993

Living Conditions of Urban Chinese Households around 1990*

by

Olav Bjerkholt and Yu Zhu

Living Conditions of Urban Chinese Households around 1990*

by

Olav Bjerkholt and Yu Zhu

Abstract

This paper presents selected information from the Urban Household Survey (UHS) conducted by the State Statistical Bureau of China for the two provinces Sichuan and Liaoning for 1986-90. The UHS is a comprehensive survey of urban households from cities all over China, based on household records of income and outlays for the complete year in addition to socio-demographic background variables, quality of dwellings, inventory of durables, etc. The survey includes consumption and income data which allow comparison between the Chinese urban living standard and other countries, as well as assessment of the income inequality in the Chinese society. Through the survey data the aftereffects of the Cultural Revolution can also be traced.

Keywords: China, urban household data, living standard, Cultural revolution

* This paper is an outcome of an ongoing research cooperation project between the State Statistical Bureau of China and the Central Bureau of Statistics of Norway. The project was initiated in 1990 and has been supporten by a grant from the Norwegian Research Council for Science and Humanities.

Contents

1. Introduction

This article presents pertinent information about the living conditions of urban households in the People's Republic of China around 1990, based on data from the Urban Household Survey conducted by the statistical organization of China, i.e. by Provincial and Municipal Statistical Bureaus under leadership of the State Statistical Bureau in Beijing. The data source used comprises the Urban Household Survey for two provinces and the years 1986-90. The focus is on 1990, but the material from the four preceding years is also used to illuminate recent trends and developments.

The purpose is as much to present the richness of information and the amount of detail in the Urban Household Survey (UHS), with a view that this may encourage interest in further analysis of this unique source of information about the urban living conditions in China. The data source opens for a multitude of studies of specific aspects of the social and economic development of the urban Chinese society. The emphasis in this presentation is purely descriptive, no formal analysis have been attempted. A major concern has been to ensure as far as possible that the primary material has been understood and interpreted correctly.

The UHS is an important source of information. It is of great value to anyone interested in the current development of the Chinese society. The most important use that is being made of this source of information is, of course, in monitoring social and economic effects of the economic reform program taking place in China. The fast growth combined with far-reaching, but gradually implemented, economic reforms may change over some decades many of the aspects strongly identified with the post-1949 Chinese society. No one can forswear that upheavals will not take place when the all-powerful party-state changes the rules and yields the reins of economic power to a different set of actors, even in a gradual fashion. The value of good statistical surveys of this process can hardly be exaggerated. Further analysis of the UHS inside and outside China will surely have feedback on the sampling design, the choice of issues to be included in the survey, the quality control, the way of presenting the information from the surveys, etc.

Data from the UHS have been analysed outside China by several researchers. Hu Teh-Wei with various associates have conducted several analyses of Tianjin data from the UHS for years prior to the sample studied in this paper, see Hu & al. [5]-[8], and their results have been illuminating for our understanding of the observations studied here. Hussain & al. [10] have, as part of a research programme on the Chinese Economy at London School of Economics, analysed a subsample of the UHS for 1986 made available by the Chinese Academy of Social Science (CASS) from the original data of the State Statistical Bureau, but with little or no information about the sampling procedure. In principle, these data should overlap for the two provinces with the data under consideration here[1]. The CASS data have been used also by Roberta Dessi [3] in a somewhat

[1] The sampled data used at LSE covered 28 provinces after 3811 urban households (after "cleaning"). The coverage of individual provinces was much less than in our data for two provinces. The LSE study comprised, however, also data from the corresponding Rural Household Survey and allowed comparison of urban vs. rural household incomes, see [10].

speculative analysis of the factors affecting wealth holdings. Lewis and Andrews [11] analyses urban and rural consumption, but is unclear about the exact source of the urban data. In the World Bank publication [19] (translated from Chinese) staff members from CASS analyse Beijing household data for 1981 and 1982, perhaps this is a UHS subsample, no information about the sample procedure is given and no reference is made to the State Statistical Bureau. Distributional aspects of income and consumption of our sample data have been studied by Aaberge and associates [1]-[2].

The features selected for description of the living conditions of urban Chinese households can be grouped roughly as representing three different viewpoints to some extent cutting across the thematic division in chapters. One aspect is the level and distribution of living standard as described by the consumption and income level, the amount of living space and other dwelling conditions, the stock of durable goods owned by the household, etc. Most of the information about this aspect is found in chs. 6-8. The living standard of urban households in China can be compared with that of other countries at different stages of development. A second aspect which can be called the effect of politics on the social and economic development, are represented by two rather different influences overlapping in time: the aftermath of the havoc created by the Cultural Revolution, and the family planning policy vigorously pursued since the 1970s. The Cultural Revolution is very visible in the statistics 15 years after it officially ended (and will remain so for decades), in particular in the demographic and educational background variables of the households in chs. 4-5. The one-child policy which became the final form of the family planning efforts, especially in the urban areas, is an influence which will set its mark on the Chinese society for a long time. A third aspect of more temporary nature is the events, as recorded in the sample observations, of the particular years 1986-90 as set out in ch. 9. In the middle of this period occurred a relatively mild, but yet serious, burst of inflation, causing (or perhaps partly caused by?) a rush for durable goods, especially colour TV sets. The inflationary burst caused real incomes to fall for the vast amount of households earning wages set in nominal terms by the state.

* * *

The Urban Household Survey is a comprehensive household survey based on complete annual accounts of incomes and outlays of a large number of non-agricultural households with additional information about family structure, dwelling, ownership of durable goods etc., for each household. There is in China a quite sharp distinction between urban administrative units (metropolitan areas, cities and county towns) and rural administrative units (counties). The rural areas are covered by a corresponding survey, the Rural Household Survey. The sampling design of the Urban Household Survey is discussed in chapter 2, along with some information on the history of the UHS, the size of the samples, the statistical supervision of the sampled household etc.

The total number of *urban residents* in China, i.e. the total number population with domicile in urban administrative units, was 302 millions in 1990 or 26.4 per cent of the total population of 1143 million people in 1990 (SYC , 1991). There is also a commonly drawn distinction between *agricultural population,* which in 1990 counted 903 million people, and *non-agricultural*

population, which counted 220 million people in 1990 (SYC, 1991)[2]. This distinction cuts across the urban/rural administrative units. The UHS is delimited to comprise *non-agricultural urban* households (in chapters 4-10 just 'urban' is used for short).

While the UHS covers all provinces (except Tibet) and the municipalities of Beijing, Tianjin and Shanghai, altogether 29 of the 30 regions at province level, the sample observations analysed in this article are restricted to two provinces of China - Sichuan and Liaoning - each of which represents characteristic features of China today. Sichuan is the largest province by population with more than 100 million inhabitants and situated landlocked in the southwest central part of China on the Yangtze river. Liaoning is smaller, one of the first regions to become industrialized in China, and situated in the northeast on the Yellow Sea. Some background information on the two provinces is given in chapter 3.

The Chinese family structure is discussed in chapter 4. The one-child policy of China, which was introduced in 1980, has been quite strictly enforced in urban areas. Chinese urban families are as a consequence quite small. The family planning policy may have influenced the age of women at the first (and usually only) childbirth as well. The demographic composition of the urban population has been strongly influenced by political factors, such as the urbanization drive of the early post-1949 period, the forced migration to the countryside in the famine years of the early 1960s, and, particularly, the Cultural Revolution (1966-76) which sent tens of millions of young people to the country side. The disastrous hunger years of the early 1960s have also left severe marks in the population pyramid.

Chapter 5 deals with education and shows that China has achieved a very comprehensive urban education system, while the oldest generation is still marked by the illiteracy of the pre-1949 China. Traditionally the Chinese male population has received much better education and less illiteracy than the female population. For the youngest generation there is little difference by gender. Universitites and other higher education institutions in China were virtually closed down for a ten-year during the Cultural Revolution, and as a result many young people were deprived of higher education.

The urban households in China are generally small and often confined to narrow living quarters. As presented in chapter 6 the UHS reports in a fairly detailed way on these conditions. The quality of dwellings are described by size in m square meters and the access to various facilities. As to be expected, living quarters are generally cramped by western standard, and much more so in Liaoning than in Sichuan. Almost one quarter of the households in Sichuan have no sanitary facilities (almost one fifth in Liaoning). Almost 90 per cent of the households are owned by the work unit, state-owned or collective-owned.

The vast majority of Chinese urban households are dependent upon wage income from state-owned work units as shown in chapter 7. Relatively few (about 10 per cent) draw income only from collective-owned work units, and a negligible number, according to this survey,from self-employment. The survey includes fairly complete annual accounts of incomes and outlays, and

[2] The agricultural and non-agricultural population do not add up to total population as there is a small "others" category.

provides a good basis for the study of income distribution in urban China. The sources of income also those of a clearly supplementary character is surveyed in some detail, and the structure of the labour remuneration is presented. The female/male wage earnings ratio is presented and found to be a little above 80 per cent in Sichuan and close to 90 per cent in Liaoning. Wage earnings by occupation can also be deducted from the survey.

The UHS gives a very detailed description of the household consumption in terms of the goods purchased for household use. Chapter 8 examines the structure of consumption. The food composition is looked at in somewhat more detail, especially the role rice and other grains play in the urban Chinese diet, including variations with income. The stock of durables in the Chinese household is also presented. The Chinese urban consumer has in recent years had more choice of supply as pavement stalls of "free market" trade have given the state shops competition. Information inherent in the sample of the role of the free market versus state shops in the trade of six food categories is extracted.

Chapter 9 deals with the development of consumption in the years 1986-90, in particular the ownership and purchases of durables. In recent years, covered by our data, there has been a massive expansion in the ownership of certain durables. In the period a surge of inflation occurred, coinciding with a boom in durable goods demand and causing real incomes to fall. The household saving behaviour in these years is also presented.

Chapter 10 concludes.

2. The Urban Household Survey

It seems that relatively little has been published in English earlier about the sampling methods and organization of the Urban Household Survey, we therefore present our understanding of this important data source in a fair amount of detail in this chapter. The information about the Urban Household Survey below is based upon written sources available ([9]), upon unpublished notes in English from the State Statistical Bureau outlining various aspects of the data collection ([16]), and to some extent upon oral information[3].

The Urban Household Survey of the State Statistical Bureau was established in 1955 as a survey of 6000 state employee households in 27 cities throughout China. The continuation was disturbed by political unrest ("the anti-rightist campaign") in 1958 and finally abandoned in 1960. A new start was attempted in 1961 with a survey of 1000 households in 28 cities. This was expanded in 1964 to a huge survey of 139,000 households drawn from 59 cities and 24 county towns[4]. In the following years the survey comprised 4000 households of state employees from 40

[3] The information gathered from different persons and notes sometimes seems inconsistent, which may be due to communication problems as well as changes in the way the Survey has been conducted over the years, especially in the period since 1984.

[4] Cities and county towns are different administrative units. Cities are generally larger than county towns, which are the administrative centres of counties. Cities are directly under the province administration. The (continued...)

cities until it was suspended in the turmoil of the Cultural Revolution in 1966. Statistical work was to a large extent in disarray during the Cultural Revolution as a considerable part of the statistical staff was sent to the countryside and the regular statistical work came to a standstill. The consequences of this upheaval is still notable in the shortcomings of the Chinese statistical system, especially in the discontinuity of time series.

The Urban Household Survey was not reestablished until 1980. In that year a survey of 88,000 households of state employees was conducted and followed up in the ensuing years by surveys of a subsample of the 1980 survey. In August 1983 the State Statistical Bureau created on the basis of a State Council decision the National Organization of Urban Socio-Economic Survey. This entity functions as a separate department within the State Statistical Bureau with subordinate organizations at two lower levels. At the level of provinces (municipalities, autonomous regions) there are provincial urban sample teams as part of the Provincial Statistical Bureaus and at a lower level there are city and county urban sample teams. This reorganization has given the Urban Household Survey a very prominent place in the monitoring of the Chinese social and economic development.

From 1984 the sampling population was extended from covering only state employee households to all *non-agricultural households*. Urban administrative units may comprise agricultural enclaves. The agricultural population in the urban areas is not included in the Urban Household Survey. The urban non-agricultural population comprised in 1988 (see [13]) 140 million people[5].

The methodological basis for sampling households was considerably improved from 1984 onwards. The sample is taken from a large number of cities and county towns and covers all provinces (except Tibet). From each city or town selected is sampled a fixed minimum sample (100 or 50). The total sample has in recent years comprised varying numbers of households. The core sample consists of 15,000 households for each year. The number 15,000 is referred to ([9]) as the minimum number of households in a national urban survey to satisfy criteria of statistical confidence. The official credo is that a sample of this size implies that the sampling error of main characteristics is less than 1% at a confidence level of 95%. A central file of the records of these 15,000 households is kept by the State Statistical Bureau. The statistical bureaus in the provinces extend, however, the part of the Survey under their control to provide better representation at provincial level. The total number of households surveyed each year has consequently varied from less than 25,000 in the early years after 1984 and now seems to be about 44,000.

The sampling method has not been described in great detail in any document translated into English. The sampling procedure is described by Chinese statisticians as a multi-stage stratified systematic sampling and can be outlined as follows. As there is no register of all households

---

[4](...continued)
metropolitan-sized cities - Beijing, Tianjin, and Shanghai - are *municipalities* ranked on the same level as provinces. Other cities are classified by the size of the non-agricultural population in urban areas as *very large* (> 1 mill.), *large* (500,000-1 mill), *medium-size* (200,000-500,000) and *small* (< 200,000).

[5] There are, of course, in the rural administrative units many households who make their living from non-agricultural work, for instance from township industries. These households are also excluded from the UHS. The urban/rural distinction runs very deep in the Chinese statistical system.

available for statistical purposes in China the sampling is conducted as *two-stage sampling*. A one-time sample of about 150,000 households is established, i.e. ten times the size of the national annual sample, and this sample is the basis for annual sampling.

In the first stage of the one-time sample cities and county towns are selected from the around 3000 cities and county towns in China. All cities and county towns are divided into six large geographical areas. The national sample of 15,000 households is distributed between these large areas in proportion to the total non-agricultural population. Within each area cities and county towns are ordered according to the size of population. The minimum size of the sample from each city is set to 100 for cities and to 50 for county towns. These minimum numbers have been chosen for convenience with regard to the supervision of the sampled household (see below). For the national sample of 15,000 households a selection of 100 household corresponds approximately to a city with 1.46 million inhabitants and a selection of 50 households to a county town of 730,000 inhabitants. These numbers are then used as *sample intervals*. The cities and county towns are selected from the ordered list of cities and county towns by starting with the city in the comprising the central point in the first sample interval. A total sample size of 15,000 leads to a selection of 205 cities and county towns. The one-time sample of household is established by drawing about ten times the national sample from the selected cities and county towns.

Some cities and county towns seem to have been additionally included to provide better coverage; for instance are provincial capitals always included even if they were not selected and cities and county towns in remote areas inhabited by ethnic minorities are included "in recognition of the financial difficulties of those regions" at provincial or lower level in addition to those selected by this procedure[6].

The procedure for selecting households for the one-time survey has not been described in great detail in English. The households seem to have been selected in a three-stage procedure. In the selected cities and county towns *enumeration areas* have been defined by streets, and streets have been selected by systematic sampling from the list of enumeration areas. This is the first stage. In the second stage another cluster, *neighbourhood committees*, has been used as unit. Neighbourhood committees are selected in the second stage by systematic sampling from the selected streets. Finally, in the third stage households are sampled by residence registration as equal interval sampling in the order of geographic location, i.e. by door number. The three-stage procedure applies only for very large and large cities; in medium and small cities and in county towns only

[6] The actual total sample seems to have varied over the years since 1984 and generally been much larger than 15,000, although this number of households seems to have been kept in the central file at SSB. One note reports that the 1987 Survey comprised 32,855 households, an increase from 25,265 in the preceding year, and that the sampling interval used was 1 mill. persons. The same source reports that the number of city households increased between these two years from 17,046 to 25,265, while the number of county-town households decreased from 9,978 to 7,590. The number of cities and county towns covered in 1987 is 251 and 154, respectively. (Why the relative proportions of cities and county towns shifted so dramatically from one year to another is not revealed.) A more recent note reports that the Survey at the end of 1989 comprised 44,000 households covering 553 cities and county towns, 20 percent of the total number of cities and towns in China.

the latter two stages are applied[7].

The way of conducting the first and second stage of selecting clusters of households are of importance for the quality and representativity of the one-time survey. The reasons given for not applying simple random single-stage sampling of the households are that it would be too costly and difficult to establish a satisfying directory of family addresses for the whole city (or town). It would also be inconvenient with regard to the data collection and the supervision of the selected households. It is, of course, important that the streets and neighbourhoods selected have a good distribution over the whole urban settlement. Cost considerations seem to have been important.

Then there is the procedure of selecting the national sample of 15,000 households from the one-time survey. All the households of the one-time survey are visited by enumerators which register the size of the household and the employment status and income of each member. The one-time survey is classified on the basis of the registered information in five classes according to income per capita. The intervals which seems to have been the same since 1984, is in Huang & Cheng [9] given as 50 yuan and less, 50-70 yuan, 70-90 yuan, 90-110 yuan, and 110 yuan and more.

These income classes are then used as strata in a purely random sampling from the one-time survey. Apparently some checking procedures of the representativity of the sample are also undertaken, but not well described. It is stated that if "notable diversity" is found between the characteristics of the one-time sample and the randomly selected households, "...these households will be cast away, and the reselection will be organized until there's no notable diversity", Huang & Cheng [9].

Before 1988 the same sample was used each year. The unchanged sample saved costs, but difficulties naturally arose with the cooperation of households as the annual everyday accounting is no small task for the book-keeper in the family. Since 1988 the sample has rotated by changing one third every year. It is indicated that in special circumstances households of state employees and non-state employees were sampled separately[8].

The selected households are required to record incomes and outlays every day throughout the year in an account book under directions given by a Survey official or enumerator supervising the household. Each enumerator supervises 20 households and is required to visit each household twice every month. In addition to the account books the enumerator will collect further information by interview and by a questionnaire given to the household. There are certain checking procedures to ensure the quality of the data.

The enumerators are given considerable training and supervised by the statistical organization at the two regional levels. The enumerators are, of course, obliged to discretion with regard to revealing information about individual households to anyone or any agency. The detailed instruction says "definitely to avoid interfering in family quarrelling"(!). Fairly detailed guidelines

---

[7] Orally collected additional information indicates, however, that households in Liaoning until 1990 were selected via the workplace of income earners. This information has not been corroborated.

[8] This information does not seem to be consistent with what can be observed from the data. The data we have had access to comprise the Sichuan and Liaoning parts of the national file for 1986-90. According to the general description the same households should have included for 1986 and 1987, but this could not be verified.

are given by the State Statistical Bureau to the household survey divisions both in the provinces and in the cities and counties.

The annual urban household survey comprises, as mentioned above, 44,000 household at present. The excess of 29,000 households over the national sample of 15,000 households is a result of regional units extensions to provide better regional coverage. The 44,000 are distributed over 553 cities and counties. With each enumerator covering 20 households, there are altogether 2200 enumerators involved at the lowest level of data collection and supervision and a considerable larger number of employees involved at the three levels of statistical organization - an impressive organizational effort!

3. Two Chinese provinces - Sichuan and Liaoning

The use of data from the Urban Household Survey below is restricted to the parts of the national file of 15,000 households stemming from the provinces of Sichuan and Liaoning for the year 1990. The data made available to us by the State Statistical Bureau also comprised the extractions for the same two provinces for the four preceding years, and we make use of those data as well to shed light on the living conditions of Chinese households. As a background for the information about urban households in the two provinces a sketch is given of the main features of the two provinces and what they represent of the mammoth state of China.

Sichuan

The mountainous province of Sichuan is situated in the southwest of China. The population is concentrated along the valley of the Yangtze River (Chang Jiang) and in the Sichuan Basin in the central part of the province. With a highly developed water conservancy system and a humid subtropical monsoon climate, the Chengdu Plain - one of the nation's most thoroughly irrigated districts - is wellknown for its richness in agricultural products and often referred to as the "land of abundance". The famous ancient irrigation works of Dujiangyan, which was constructed already in the third century B.C., still serves the farming area on the Chengdu Plain today. Sichuan has a mild climate, the mean temperature in the provincial capital, Chengdu, is 5.7 degrees centigrade in January and 24.7 degrees centigrade in July.

Sichuan is by population the largest province in China and had a population of 108 million by 1990, i.e. 9.4 per cent of the total population. The urban population is, however, relatively small. There were 26 cities in Sichuan by 1988, of which two very large cities (Chengdu and Chongqing), no large cities, seven medium-sized and 17 small cities[9]. The number of non-agricultural residents in urban areas totalled in 1988 only 7.9 million or 7.4% of the province population, ([13], p.49). The urban total of Sichuan in the same year was 18.5 million or 17.5% of the province population. To further illustrate the relatively small number of people in Sichuan who

[9] For the size classification of cities, see footnote 4.

qualify for the UHS, it can be mentioned that Chongqing in 1988 was the largest city in China with 14.6 million people when the total population in the counties under municipal administration is included. The non-agricultural, urban population in Chongqinq was only 2.2 million in 1988, ranking 8th among Chinese cities.

Sichuan is isolated from the central part of China by precipitous mountains. On many occasions throughout the history of China feudal separatist regimes have been established in Sichuan because of its tenable defence position and highly self-sufficient economy. The first railway line connecting Sichuan with other regions in China was built in the 1950s. Compared to the coastal regions, Sichuan is disadvantageously situated with regard to international trade and integration in a wider economy.

Chengdu is the hub of road, railway and air transport in Southwest China. It is also the centre of the machinery, electronics and metallurgical industries in Sichuan. The hilly city of Chongqing is a major centre for transport, trade and industry in the upper reaches of the Yangtze River. As the first city in the southwest of China to have set up modern industries, Chongqing has today both light and heavy industry with metallurgy, machine-building, chemistry, textiles and food-processing as the backbone of a diversified industrial sector. Panzhihua (Ducou) is one of China's biggest iron and steel industry bases. Xichang is well known as China's most important centre of space industry.

Sichuan had very little industry before 1949, mostly producing basic consumer goods. Several of the 156 large projects of the First Five Year Plan were launched in Sichuan. The regional development policy at that time aimed at reducing income disparities between provinces by strengthening agriculture in the comparatively more backward areas and creating industrial centers where none existed before. The First Five Year Plan also gave priority to military needs. Sichuan was considered as the strategic rear base for the defence of China. (Chongqing was the provisional capital of the Nationalist Government during the Second World War). Armaments industry developed rapidly in the 1950s.

From the mid-1960s defence concerns induced the Chinese authorities to promote industrial bases in remote parts of the southwest of China including Sichuan. Investment in the so called "Third Front" facilities amounted to nearly 200 billion RMB yuan before it was suspended in the early seventies. The proportion of total investments absorbed by the "Third Front" policy varied from 38 per cent in the period 1963-1965 to 53 per cent between 1966-1970 and 41 per cent between 1971-1975. This explains why Sichuan and other interior provinces had a comparatively high per capita industrial output growth between 1957 and 1979. The income gap between the comparatively richer coastal provinces and the poorer interior provinces also narrowed significantly in this period. However, there is no doubt that the decision to channel such a large share of industrial investments into interior regions was incredibly costly by any measure.

The purpose of the reforms initiated in 1979 was to release the productive power and creativity of individual production units from the tight central administrative control and to open the nation's economy to more exposure to the international economy. Clearly, the coastal regions have benefitted most from the reforms and the adoption of an export-oriented development strategy. Sichuan was by and large a neglected region in this reform push in terms of investments,

except for a few areas (such as energy and mining of nonferrous metals) and, consequently, lagged behind the national average in per capita GDP growth in the 1980s.

Sichuan's GNP totalled 100 billion RMB yuan in 1989, and ranked in fourth place among all 30 provinces (municipalities, autonomous regions). The factor income from industry accounted for less than 40 per cent of the total for the province, which means that Sichuan is a comparatively less industrialized region. The per capita national income in 1990 is 896 yuan or 71.7 per cent of the national average. Per capita consumption was 527 RMB yuan for all residents and 1086 RMB yuan for non-agricultural residents in 1989 ([17]).

Although Sichuan may seem less developed than a number of other regions, the province has comparative advantage in quite a few fields. Sichuan is very rich in natural resources, especially hydro power and nonferrous metals, and subsequently has advantages in metallurgical industries. The enormous consumer market and plentiful supply of cheap labour would allow a further development of light industry. A big potential advantage in Sichuan is the high-tech defence enterprises ("Third Front" enterprises). These enterprises has advanced technology, the best equipment and hundreds of thousands of highly qualified technical and engineering staff. The armament industry compares favourably with many civilian industries. Modest progress has been made in recent years in turning this sector into a dual-purpose industry, serving both military and civilian needs.

The sample size of the survey data for Sichuan was 550 households and 1784 individuals in 1990. The survey covered 8 cities, of which two were very large, three medium-sized, and three small cities[10].

Liaoning

The province of Liaoning is situated in the northeast of China facing the Bohai Sea and the northern part of the Yellow Sea. In the southeast Liaoning borders on North Korea. Liaoning has a continental monsoon climate with an annual precipatation at about 750mm. The mean temperature of its capital, Shenyang, is -8.3 degrees centigrade in January and 23.5 degrees centigrade in July.

Liaoning had by the end of 1990 a population of 39.7 million or 3.4 per cent of China's population. The urban, non-agricultural population of Liaoning counted in 1988 12.9 million people or 37.8% of the province total ([13], p.49). The urban total was in the same year 19.3 million or 50.3% of the total population. Hence, the degree of urbanization is vastly different in the two provinces. The strict classifications - urban/rural and agricultural/non-agricultural - indicate a strict administrative control over internal migration. It also serves as a reminder that there are in many cities groups of temporary dwellers, i.e. without rights of residency as non-agricultural inhabitants, hired as construction workers and other jobs, and conspicuously absent from the survey.

---

[10] The selection of households by city was as follows (non-agricultural population in 1988 in parentheses): From the very large cities were selected 100 households from Chengdu (1.65 mill.) and 150 households from Chongqing (2.22 mill.), from the medium-sized cities were selected 50 households from Luzhou (253,000), from Zigong (384,000), and from Leshan (335,000). From small cities were selected 50 households from Nanchong (173,000), from Wanxian (149,000), and from Guangyuan (172,000).

Liaoning is undoubtedly China's most important base for heavy industry. Founded by the Russians and the Japanese under the semicolonial period in the first half of this century, Liaoning's heavy industry experienced another major booming period under the First Five-Year plan (1953-1957) strongly supported by Soviet aid. Shenyang, Anshan and Benxi were rapidly developed into important industrial centres. As a result of the industrial development Liaoning concentrated urban population. Four of the thirty very large cities (i.e. with more than 1 mill. non-agricultural residents) are located in Liaoning, with the capital Shenyang ranking the fourth, immediately after the 3 municipalities (Shanghai, Beijing and Tianjing). There are also four out of 28 large cities (i.e. between 0.5 and 1 mill.) located in the province.

Liaoning's GNP amounted to 92 billion RMB yuan in 1989 or 5.8 per cent of China's GNP, which gives Liaoning 5th place among the 30 regions in China. Merely 20 per cent of the national income comes from the agricultural sector, while 34 per cent of the employment takes place in farming, forestry, animal husbandry, fishery and water conservation. (The corresponding numbers of 39 per cent and 72 per cent in Sichuan express the difference between the two provinces.)

Liaoning stands out as a relatively highly industrialized and urbanized region in China. On the basis of the abundant natural resources of the region, the well-established basic industrial facilities, and last, but not least, the enormous potential yet to be exploited in the reform process towards a marked-oriented economy, an even higher growth rate - well above the national average - is to be expected for the 1990s.

Liaoning has an advantageous position with regard to coal, iron, petroleum and natural gas, as well as cultivated land, hydro power and water resources; an solid base for a continued development of heavy industry and this is what seems to be in the plans of Chinese authorities. Shenyang, the largest economic centre in Northeast China, is surrounded by a coal centre at Fushun, a steel centre at Anshan, the coal and iron city of Benxi, the coal and electricity city of Fuxin, and the rising petrochemical cities of Liaoyang and Tieling. Altogether these centres form a heavy industrial complex, served by a well-developed railway network. Shenyang is today a comprehensive industrial centre with a well developed machine tools industry among a large number of manufacturing branches. Dalian with the largest harbour in the Northeast of China is also an industrial base with many large and medium-sized key enterprises, producing everything from ocean-going ships, tankers and offshore drilling platforms to TV sets, tape recorders and washingmachines. The Anshan Iron and Steel Corporation,with 400,000 employees is the second largest industrial enterprise in China.

Liaoning's status as the nation's most important heavy industrial base has not been changed during the economic reforms in the 1980s. On the contrary, large scale investments have been made to ensure a stable growth in heavy industry. According to China's latest published Industrial Policy, raw materials, energy, transportation and telecommunication industries will enjoy top priorities to soften the pressure on the bottle-necks created by the constrained capacity of the processing industries. Liaoning's total investments in fixed assets in 1989 ranked 4th highest among the regions, while none had higher investment plans and plan fulfillment of projects with investment of 30 million RMB yuan or more.

Liaoning's fixed assets measures by original value are the highest in the nation. The manufacturing sector is highly capital intensive, the efficiency is, perhaps, less than should be expected. Overall labour productivity of industrial enterprises with independent accounting systems is below the national average. Gross output value in proportion to original value of fixed assets ratio and pre-tax profits as a share of sales revenue are also both lower than the average. This may be due partly to the fact that most enterprises have not implemented much technological innovations over the last 30 years, which means that technology still remains at the (Soviet) level of the 1950s. Another reason is the price and taxation systems still in force.

Forty years of a centrally planned economy have led to neglect of economic efficiency in pursuit of a high growth rate in output values. New establishments were for a long time almost the only way for expansion of production capacity. As a result most industrial enterprises in Liaoning suffer from the decay of "ageing": the technologies, as well as the facilities and the products are too old to meet the needs of a market with ever harder competition from more recent production facilities in other regions and from other countries. In the last few years impressive efforts have been made to upgrade the traditional industry and the old enterprises.

The sample size of the survey data for Liaoning is 597 households and 1983 individuals in 1990. The survey covered 6 cities, of which three were very large, two large, and one medium-sized[11].

4. Family structure[12]

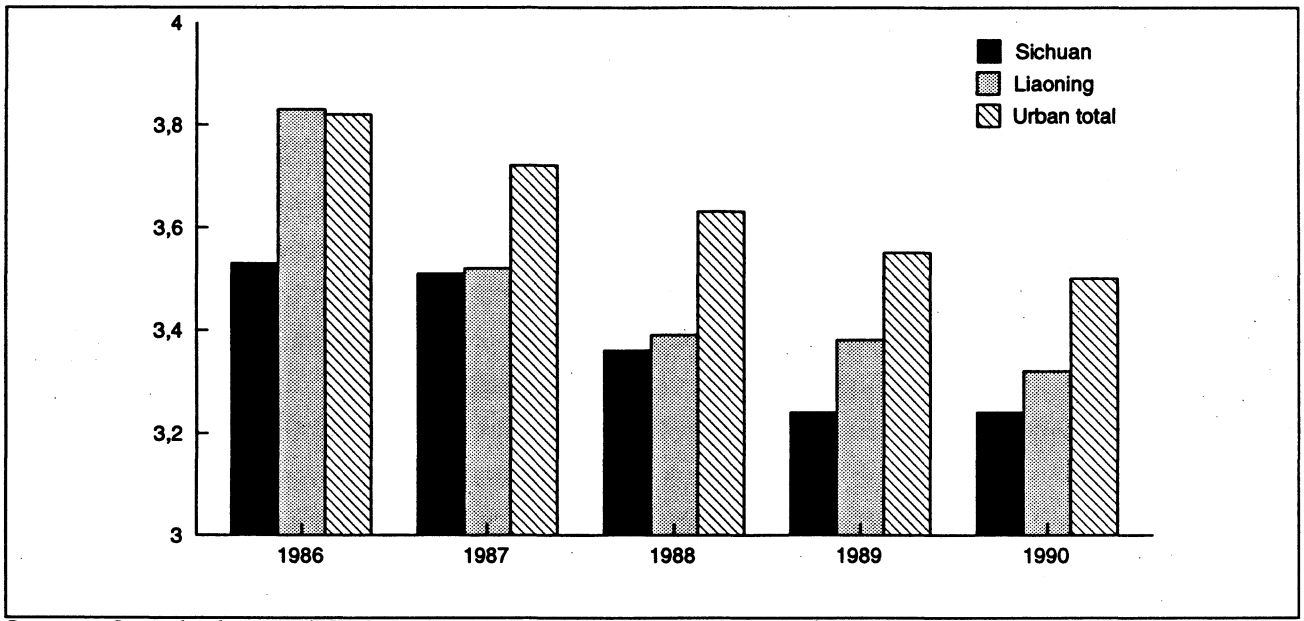
The traditional Chinese household included all generations and as a result was usually fairly large. Several factors have contributed in breaking up the traditional household to make way for the modern small Chinese urban household. The "one-child policy", which has been rather strictly enforced in urban areas from 1980, has naturally had a strong influence on the average number of children in the family. The social, economic and political development in post-1949 China, in particular, the economic reforms introduced after 1979 and the increased contact with western culture, has had considerable impact on the family life, time use, lifestyle and modes of thought among urban Chinese households. With regard to the family structure, however, nothing can rival the current family planning policy in overall impact on the demographic backdrop of the coming decades in China.

---

[11] The selection of households by city was as follows (non-agricultural population in 1988 in parentheses): From the very large cities were selected 150 households from Shenyang (3.52 mill.), as well as from Dalian (1.66 mill.), and 97 from Anshan (1.17 mill.). From the large cities were selected 100 households from Jinzhou (653,000), and 50 households from Dandong (504,000). From medium-sized cities were selected 50 households from Wafangdian (242,000).

[12] In chapter 4-9 below estimates from the sample data are generally given with standard deviations (in parentheses). Beyond this the statistical significance is usually not commented upon. Min/max observations are sometimes given. 'Mean' and 'average' are used interchangeably.

Figure 4.1: Average number of persons in urban households, 1986-1990



Source: Sample data and SYC 1990, 1991. According to related information in SYC 1991, p. 246 the larger the size of the city, the smaller the size of the household. For 1990 the Urban total curve in Figure 4.1 shows 3.50 as the average size of the household. The size varies from 3.30 in very large cities through large (3.45), medium (3.47) and small cities (3.64) to county towns (3.61).

In modern China young urban people have become more independent of their parents after getting married. The dominating system for allocating dwellings, namely that the work units is responsible for housing and distribute flats to employees, has also made it easier for young couples to establish their own household. On the other hand for single young people or unmarried couples it is not only difficult, but virtually impossible to establish a separate household. The declining birth rates which followed as a consequence of the family planning policy has contributed towards a smaller average size family. It is not uncommon though, that one or more parents live with the younger generation.

Figure 4.1 shows the average size of households as observed in our survey data for the two provinces and also the average size of the urban households in all of China. The province data and the urban total have somewhat different levels, but both show a quite marked tendency towards smaller households over the period covered by the survey.

The households included in the survey are of many different types. It is not surprising to find that as a result of the current birth control policy couples with one child have become a predominant urban household type, especially in Liaoning. The pure type of couples with one child (≤ 18 years) counts for 36.2% of all urban households in Sichuan and for 54.1% in Liaoning (see Table 4.1).

But also in other household types there may be single children. The meaning of the household types specified in Table 4.1 is explained in a note to the table. Both the single adult type and the types comprising three generations may include a single child (≤ 18 years) in the household, and as observed in 1990 just above 50% of all households in Sichuan and just above 60% of all households in Liaoning are one-child families in this sense.

Table 4.1: Frequency of different household types in 1990. Per cent

	Sichuan	Liaoning
Single adult (parent/grand parent)	8.9	4.0
Couple without children	14.0	7.4
Couple with one child (≤ 18 years)	36.2	54.1
Couple with two or more children (oldest child ≤ 18 years)	7.1	8.7
Couple with child(ren) and/or grandchild(ren)	22.5	19.6
Couple with parent(s) and child(ren)	9.1	4.7
Other	2.2	1.5

Percentages add to 100.0.
Note: Single adult may or may not include child/children. *Couple without children, Couple with one child,* and *Couple with two children,* should be self-explanatory as pure types. *Couple with child(ren) and/or grandchild(ren)* is either a two-generation family with eldest child > 18 years or a three-generation family with the main person in older generation. *Couple with parent(s) and child(ren)* is a three-generation family with the main person in the intermediate generation. The last type cover all other household compositions.

The frequency of household types is related to the demographic age structure of urban households. Figure 4.2 shows the age structure for the two provinces in the shape of the familiar population pyramid based on five-year cohorts as observed in the UHS data. The fact that the figure does not look much like a pyramid is, of course, striking. The below-35 years part of the figure shows a pattern that looks more like the result of a devastating war! Especially notable is the small size of the 20-24 and 25-29 cohorts, i.e. those born in the 1960s (for Sichuan also those born 1955-60), especially compared to the large preceding cohorts. The family planning policy has clearly had an effect, but other dramatic events have influenced the age structure of the urban population as well.

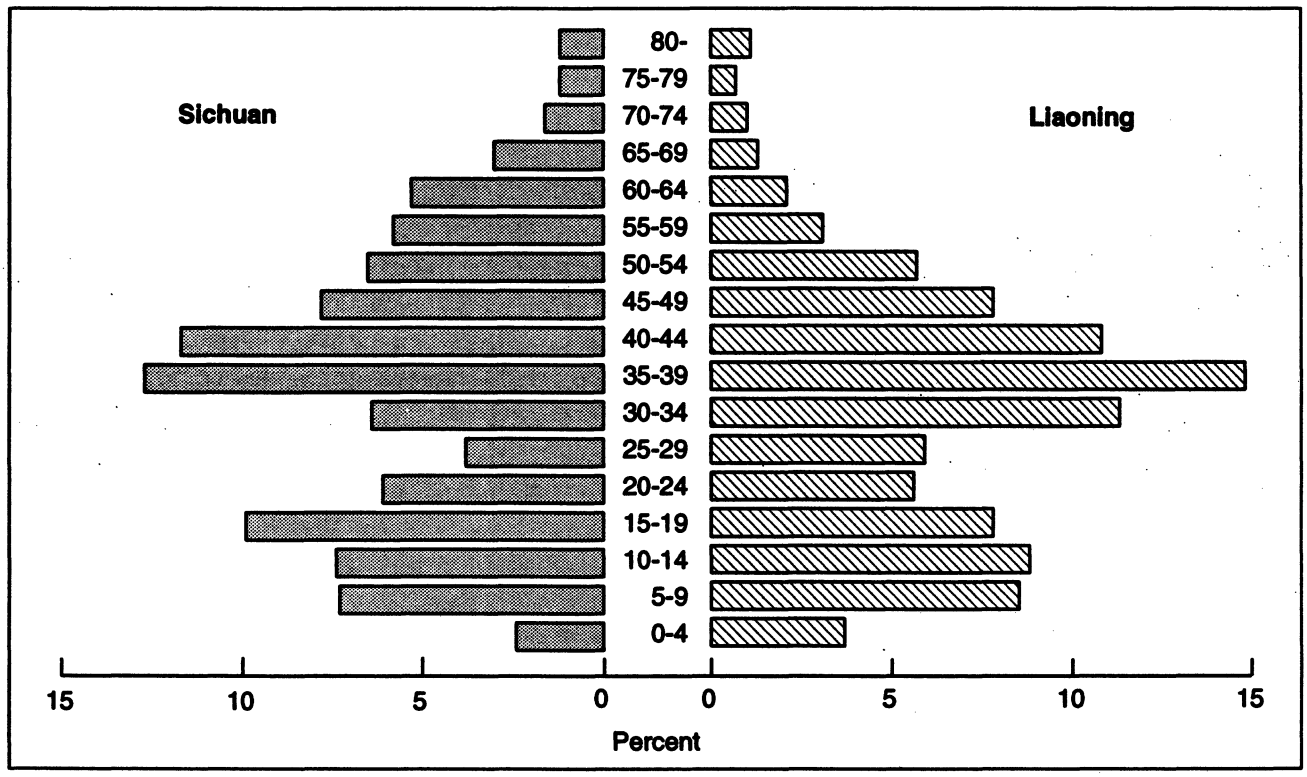
Among the impacts on the urban demographic structure is the accelerated urbanization drive which took place in the early years after 1949 as part of the rapid industrialization drive. In the early 1960s there were a succession of famine years which led to low birth rates, and also to a forced migration from the cities to the countryside in an attempt to dampen the effects of the famine. Finally, the Cultural Revolution which from 1966 and until the early 1970s sent tens of thousands of young people to the countryside. Although most were allowed to return to city life after some years exile, the normal pattern of family formation were severely interrupted[13].

It can also be noted that the one-child policy introduced from 1980 did not result in an immediate reduction in the number of childbirths, the 5-9 cohort is the same size as the 10-14 cohort, and much larger than the 0-4 cohort. To pursue these highly interesting demographic

[13] There is oral evidence that young people who married during this forced exile, usually lost the right to permanent residence in large cities forever.

aspects goes beyond our purpose here[14].

Figure 4.2: Age structure by 1990



In Table 4.2 more summary indicators of the overall household composition are given in the form of "dependency indices", and the UHS data observations are compared to corresponding indicators at the provincial and national level. The definitions of the dependency indices are given in a note to the table. By comparison of our Sichuan data with the corresponding urban totals for Sichuan it may seem as if the UHS data are biased in the direction of few children and elderly. As described above the UHS covers only from cities and county towns. From the information given in chapter 3 (footnote 10), it appeared that the Sichuan sample has been drawn from fairly large cities, hence, the urban total figures in Table 4.2 represent a somewhat larger universe, and other urban areas may have been less strictly controlled with regard to the one-child policy than the larger cities. This serves to explain to some extent also the tendency towards smaller families in larger cities stated in the annotation to Figure 4.1.

The survey data describes in detail the composition of the household with regard to the number and age of the household members, but exact information about the biological relationships are missing. Hence, the survey is far from ideal for studying the impact of the one-child policy on

[14] For monitoring the population development and the effect of the family planning policy other surveys are better suited than the UHS, especially the regular population sample surveys undertaken by the State Statistical Bureau and special fertility surveys undertaken by the State Family Planning Council.

behaviour. An observed couple with one child may thus be a two-child family with the elder child having left home, or a child living with relatives. With this in mind we shall, however, pose the hypothesis that the birth control policy has influenced the family decision on *when* to have the first (and usually only) child.

Table 4.2: Dependency indices, 1990

	Children index	Elderly index	Total index
Sichuan			
UHS	22.5	9.2	31.7
Urban total	33.6	12.3	45.9
Province total	34.9	8.6	43.5
Liaoning			
UHS	28.1	5.4	33.5
Urban toal	27.0	6.7	33.7
Province total	32.4	7.9	40.4
National			
Urban total	30.7	8.3	39.0
Total	41.6	8.7	50.3

Source: UHS data and the 1989 population sample survey as rendered in SYC 1990, p. 88-89.
Note: The *children dependency index* is defined as the ratio between the number of children (age 0-14) and the economically active population (age 15-64). The *elderly dependency index* is defined correspondingly for the group of elderly people (age ≥ 65). The *total dependency index* is the sum of the two dependency indexes.

As the one-child policy was introduced in 1980, it might be hypothesized that the strict enforcement of the one-child policy, although this followed earlier, but less strict family planning measures, that on average the birth would be postponed. For illustartion of the hypothesis the average age of mothers at first birth has been estimated for years before and after 1980. In Table 4.3 the years 1970, 1975, 1980 and 1985 as years of birth and from the UHS date the average age of the mothers who gave birth in those years has been estimated. To avoid the "false observations" of one-child families caused by, say, the only child being the one of more who still remains with the parents, or even a child living with grandparents, the selection can been delimited to families with the mother's age between certain limits. Table 4.3 shows the results when the age difference between mother and first child is between 18 and 35.

The age at first birth in Sichuan averaged over 1986-90 increases from 24.2 in 1970, through 25.2 in 1975 to 27.1 in 1980, and drops slightly to 26.8 in 1985. The corresponding averages for Liaoning are increasing throughout (see table 4.3). Hence, it seems that a tendency towards higher age of first birth in the 1980s than in the preceding decade can be discerned (without going

too deep into the details of statistical significance). The differences are small, however, and not great enough to be declared significant. The slight (and insignificant) anomaly for Sichuan in the post-1980 years hints, however, at a likely reason for the anomaly, and perhaps somewhat ruining for our reasoning, is the vast flow of "educated urban youth" (i.e. Junior high school and Senior high school graduates) amounting to tens of millions in the country as a whole, who were forced to work in the countryside and mountain areas during the Cultural Revolution and returned to their home towns in the 1970s. (This is not the last time we shall refer to the Cultural Revolution for explaining prominent features of urban China today!). Most of the exiled youth were still unmarried when returning after years spent in rural areas. The very late marriages for this group became a social problem before 1985. This demographic aftereffect of the Cultural Revolution thus makes it more difficult to draw definite conclusions with regard to the effect on the age of first birth of the one-child policy, at least from relatively crude demographic data such as in the UHS.

Table 4.3: Average age of women at first birth. Years

	Sichuan	Liaoning
Children (16-20) born 1970		
Age of mother	24.5 (0.32)	26.0 (0.38)
No. of obs.	127	116
Children (11-15) born 1975		
Age of mother	25.2 (0.31)	26.7 (0.60)
No. of obs.	109	71
Children (6-10) born 1980		
Age of mother	27.1 (0.21)	26.9 (0.18)
No. of obs.	113	140
Children (1-5) born 1985		
Age of mother	26.8 (0.63)	27.0 (0.82)
No. of obs.	61	59

Standard deviation of mean in parentheses.

5. Education

In the area of education there have been vast advances in China since 1949. The prevalence of illiteracy is still high, however; according to official estimates 22.3 per cent of the population aged 15 and over in all of China was illiterate or semi-illiterate in 1990 (SYC 1991, p.68). This national average covers a wide divergence the two genders: the illiteracy rate for males is 13% and for females as much as 32%. The prevalence of illiteracy is to a large extent a heritage from the

widespread analphabetism in China prior to 1949.

Table 5.1: Education by gender, Sichuan 1990. Per cent

	Sichuan			Liaoning		
	Male	Female	Total	Male	Female	Total
University/college	15.3	6.3	10.6	14.9	7.4	11.2
Polytechnic school	9.9	11.3	10.7	6.7	8.1	7.4
Senior high school	17.2	15.9	16.5	17.8	16.1	16.9
Junior high school	30.9	31.4	31.2	33.1	37.6	35.4
Primary school	21.0	23.3	22.2	19.7	19.7	19.7
Preschool age (<7)	4.2	3.6	3.9	6.6	5.7	6.2
Illiterates	1.5	8.3	5.0	1.1	5.3	3.2

Percentages add to 100.0. 'Polytechnic school' ('Technical secondary school', SYC 1991, p.66) means higher education of 2(4) years duration after Senior (Junior) high school, while 'University/college' covers higher education of duration ≥ 3 years. The no. of obs. for Sichuan are 857 (male) and 927 (female), and for Liaoning 1008 (male) and 975 (female).

The rural/urban divergence can be exemplified by the two provinces. The overall adult illiteracy rates for urban Sichuan and Liaoning in 1990 as estimated from the UHS data are 6.0% and 4.0%, respectively. The difference between these levels and the official estimates for the two provinces in the same year - 21.4% for Sichuan and 11.6% for Liaoning (SYC 1991, p.68) - indicates well enough the literacy gap between rural and urban areas.

The classification of educational achievement in the survey distinguishes five levels of schooling. The percentages of achievement for the two genders in both provinces are given in Table 5.1. 'Preschool age' and 'illiterates' are included for completeness. Note that pupils/students at any of the five levels are included at the educational level they are currently pursuing. The difference in achievement between males and females is quite distinct at the university/college level with a percentage for males more than double that for females in both provinces (with a slightly wider difference in Sichuan). At the other end of the scale the illiteracy rate for females is 5-6 times as high as for men (also with a wider difference in Sichuan). For intermediate education levels there is less difference between the genders.

The pure gender comparison in Table 5.1 for the status of educational achievement in urban China by 1990 can give a misleading impression with regard to gender discrimination in education today. A more adequate picture appears when gender is crossclassified with age as in Table 5.2A and 5.2B. Illiteracy and low educational achievement (i.e. primary school) is highly concentrated in the older generation. The illiteracy rate of the population under forty years of age is virtually zero (and for males illiteracy is negligible for all under 60 years of age). But for those

old enough to have been of primary school age prior to 1949 the illiteracy and semi-illiteracy rates are indeed higher, and extremely high for women: 46.2% in Sichuan and 60.3% in Liaoning! The incidence of illiteracy for those 60 years or more of age is 4-5 times as high for females as for males. The rate of illiteracy for this cohort may presumed to have been even higher before 1949 as adult illiterates were greatly encouraged to take literacy classes during the extensive anti-illiteracy campaigns in the late 1950s and early 1960s. (From general knowledge about the pre-1949 Chinese society female illiteracy must have been much more prevalent than male illiteracy, but maybe more men than women caught up after 1949 as well?)

Chinese education policy has emphasized the need to raise the level of the masses (and, of course, with no gender discrimination!). The efforts to make basic education universal for urban youths can be deemed as quite successful. The 9-year compulsory education imposed in the early 1980s has had a very strong effect on the age group 20-29. Practically none finishes schooling after primary school. The percentage of each cohort completing senior high school or higher level has been increasing over time as measured for the cohorts in the UHS data, but with some severe interruptions over time (see below), for the 20-29 cohort just about 72% complets this level or higher with negligible difference between males and females. The percentage of the ≥60 cohort having completed the same level is about 25%, but with almost twice as high percentage for males as for females.

Table 5.2A Educational achievement by gender and age group, Sichuan. Per cent

Education		Age group				
		20-29	30-39	40-49	50-59	≥60
University/College	Male	21.7	20.3	19.1	26.3	16.6
	Female	19.4	3.1	7.4	12.4	6.0
Polytechnic	Male	12.0	8.1	20.2	14.9	3.9
	Female	10.8	15.6	27.4	14.3	6.8
Senior high school	Male	39.8	16.9	11.0	14.9	10.8
	Female	40.9	17.2	8.0	10.5	5.1
Junior high school	Male	24.1	46.6	32.9	29.8	30.4
	Female	28.0	54.2	34.9	18.1	12.0
Primary school	Male	2.4	8.1	15.6	13.2	28.4
	Female	1.1	13.0	19.4	30.5	27.4
Illiterate	Male	-	-	1.6	0.5	9.8
	Female	-	0.5	2.9	14.3	46.2

Percentages add to 100.0.

The difference between the percentages of achievement for the two genders is still very marked at the highest level for all age groups in both provinces except for the age group 20-29. It is reassuring and a feature of real achievement that the higher level of education achieved for the younger generation has also removed the strong traditional gender bias in the Chinese society. There is also a fair amount who reaches higher levels of education. In the young generation of 20-29 years 21.7% of males and 19.4% of females have reached (or are currently attending) university/-college level in Sichuan, while the corresponding numbers for Liaoning are 15.2% and 12.1%.

The education achievement tables by gender and age (Tables 5.2A and 5.2B) reveal what seems a striking anomaly, namely that the achievement of the age group 30-39 for both of the two highest levels is lower than the preceding 40-49 cohort. Once again, the name of the anomaly is the Cultural Revolution! The immediate effect of the Cultural Revolution - or 'ten years of turmoil' in current terminology - was that the enrolment of new students was stopped at all universities and colleges from 1966. It was not until 1973 that the first "worker-peasant-soldier students" were recruited, by recommendations from the work-units instead of the traditional entrance examinations. In 1977 the admission system was finally reestablished. During the Cultural Revolution tens of millions of junior high and senior high school graduates were forced to work for years in the countryside and mountain areas as "educated urban youth". The result can be seen in the statistics as most of the cohort which was 30-39 in 1990 had junior high school as educational achievement. It was typically after completing junior high school that many young people were sent to the countryside. The number of university/college graduates among the 30-39 cohort in Sichuan is even lower than the ≥60, cohort and not much more than half of the 50-59 cohort.

Table 5.2B Educational achievement by gender and age group, Liaoning. Per cent

Education		Age group				
		20-29	30-39	40-49	50-59	60-
University/College	Male	15.2	23.7	24.0	29.0	1.7
	Female	12.1	10.2	12.4	7.4	-
Polytechnic	Male	7.1	6.9	16.1	8.6	1.7
	Female	13.8	9.1	12.4	4.9	-
Senior high school	Male	42.0	15.1	15.6	11.8	6.9
	Female	31.0	16.1	21.5	9.9	3.2
Junior high school	Male	35.7	52.7	38.0	30.1	20.7
	Female	37.9	64.2	39.5	22.2	3.2
Primary school	Male	-	1.6	6.3	18.3	53.4
	Female	0.9	0.4	8.5	39.5	33.3
Illiterate	Male	-	-	-	2.2	15.5
	Female	0.9	-	-	16.0	60.3

Percentages add to 100.0.

The "ten years of turmoil" seems to have taken a much heavier toll in terms of education among women, especially in Sichuan where only 3 per cent of the 30-39 cohort completed university/college education, as compared to 12.4 per cent among the 50-59 years old! Why this happened we can only speculate about. After the return from the countryside and the opening of the educational system again the polytechnics and universities were filled to capacity and many of the returned "exiles" would go to nightschool to catch up. Women somehow lost out in this process, perhaps by family decision, if there were means only for one to complete the education, and perhaps because there was catch-up to be done also with regard child birth.

There are some differences between the provinces to be observed. The Sichuan UHS data show a very much higher university/college education among the older generation, 16.6% for males and 6.0% for females of the ≥60 cohort, while the corresponding numbers in Liaoning are minuscule. The educational level of the oldest cohort in Sichuan is also surprisingly high by international comparison and may indicate a bias towards the higher educated in the UHS sample. At the other end of the scale the share of those with primary school as the highest achievement is much higher in Sichuan than in Liaoning. For the 30-39 cohort the shares are around 1% in Liaoning and more than 10% in Sichuan. A comparison of the educational achievement of women in the two provinces leaves unanswered questions. More women of the older generations reached university/college education in Sichuan than in Liaoning. The setback of the Cultural Revolution seems to have been much more severe for women in Sichuan than in Liaoning.

6. The quality of dwellings

Although the housing conditions of Chinese urban households have been significantly improved throughout the 1980s, they remain poor by international standards. Generally flats are small and lacking in facilities. There may seem to be a disparity between the quality of the dwelling itself and the improvement in living standard achieved by the aquisition of durable goods. One reason for this disparity may be that dwellings are distributed by the work unit for most urban households. The rent is low, but there may be little or nothing the individual household can do to acquire more living space or better basic facilities[15].

Table 6.1 displays some basic indicators of the density of living space as measured in the UHS data for the two provinces in 1990. The exact definitions of *living space, auxiliary space,* and *inconvenient household* as used in the survey is given in a note to the Table. Most striking in Table 6.1 is the difference between the two provinces. The living space, whether measured per person or per household, is about 50% higher on the average in Sichuan than in Liaoning. The difference in auxiliary space is lower, under 20% whether measured per person or per household. The number of inconvenient households is also much higher in Liaoning.

The dwelling component of the living standard is presented in average terms in Table

[15] A privatization of the dwelling market is one of the reforms considered in the current phase of economic reforms, see [20].

6.1. To illustrate the distribution of dwelling standard Table 6.2 gives estimates of parameters related to the distributions of total space per person and per household, respectively, as well as persons per room. The table show that the most dense-living fifth of the households in Liaoning has only 15.5 m^2 total space, while in Sichuan the corresponding number is just about 20 m^2. Furthermore, the bottom quintile in total space per person in Liaoning is with 4.9 m^2 barely above the "crowded" level (6.5 m^2 in Sichuan). The low extreme in the UHS data was for Sichuan a total space of 6 m^2 for a family of two and for Liaoning the same space for a family of three. But there is not much luxury at the top either, as the top quintile in total space per household has only 45 m^2 to move around on (65 m^2 in Sichuan).The figures show that current system of allocating dwellings is far from being totally "according to needs": households in the high quintile have three times as much space per person as in the low quintile. As measured by the density of persons per room the unevenness is no less notable.

Table 6.1: Basic indicators of housing conditions at the end of 1990

	Sichuan	Liaoning
Living space (m^2) per person	9.1	5.9
Living space (m^2) per household	29.8	19.5
Auxiliary space (m^2) per person	3.1	2.6
Auxiliary space (m^2) per household	10.1	8.6
Persons per room	1.4	2.1
Room per household	2.4	1.6
Inconvenient households (per cent)	3.5	15.2
No housing (per cent)	0.9	2.0

Note: Living space is the actual living space of the household members by the time of the survey, not including kitchen, sanitary facilities, corridors or space in temporarily put-up houses (sheds). The living space is given both in area (m^2) and in number of rooms. *Auxiliary space* is usable area in addition to "living space", including kitchen, balcony, corridor, toilet (bathroom), built-in wardrobe (cupboard), entrance hall (vestibule), passage way, etc. *Inconvenient household* means households whose family members all share one room, although living conditions may not be crowded (i.e. less than 4 m^2 living space per person) and the residential floor area may be large. A common example is that of a married couple who live with their parents or adult children. *No housing* means presumably that the household has no permanent dwelling. Per person figures are per person "usually living in the household", which for Sichuan is 1803, i.e. higher for some reason than the number of individuals in the UHS sample (1784).

The distribution of living space is also given in Figure 6.1 for the two provinces. The Liaoning distribution peaks sharply at only 4-6 m^2 per person, while the distribution for Sichuan peaks at 6-8 m^2 and stretches out much further. Around 15% of Liaoning households are classified as crowded (less than 4 m^2 living space per person), while less than 3% of Sichuan households fall into this category. Almost 53% of the households in Sichuan have 8 m^2 or more living space per

person, while the corresponding share in Liaoning is only 16%. The density with regard to living space is thus markedly higher in Liaoning.

A more detailed description of the amenities of the dwellings apart from the size is set out in Table 6.3. Well over 80% of the households in both provinces have their own piped water supply, with slightly better average in Sichuan. With regard to sanitary facilities, nearly half of Sichuan households have either no toilet or share with neighbours. In Liaoning this situation characterizes only about 35% of the households, but only 3% have both bathroom and toilet (9% in Sichuan).

Table 6.2: Distribution of total space per person and household, 1990

	Sichuan	Liaoning
Total space per person (m^2)	13.3 (0.35)	8.9 (0.15)
1st quintile	6.5 (0.06)	4.9 (0.04)
5th quintile	24.3 (0.50)	14.4 (0.13)
Total space per household (m^2)	40.2 (0.71)	28.7 (0.46)
1st quintile	20.3 (0.20)	15.5 (0.13)
5th quintile	64.9 (0.60)	45.4 (0.35)
Persons per room	1.51 (0.03)	2.30 (0.03)
1st quintile	0.82 (0.01)	1.35 (0.01)
5th quintile	2.53 (0.02)	3.27 (0.02)

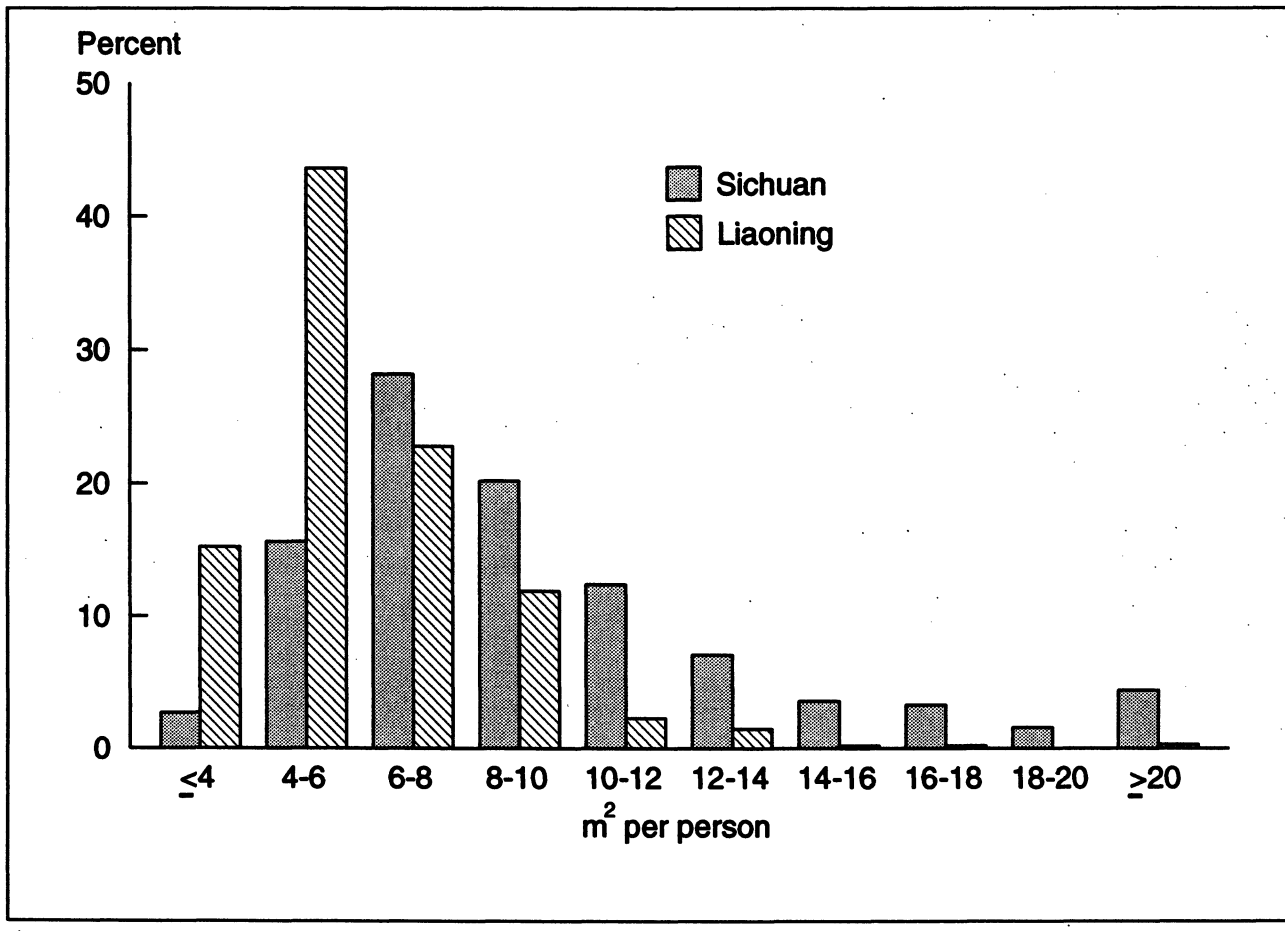
Standard deviation of mean in parentheses.
Note: Households reporting 'no housing' excluded (5 in Sichuan, 12 in Liaoning), for *Persons per room* also one household in Liaoning reporting 'no rooms'. Total space per person is the average over households and differ slightly from the global average, comp. Table 6.1.

The data on heating and cooling system reflects above all different climatic conditions (cfr. chapter 3). There may be cold winter days in Sichuan, but there are actually regulations restricting the installation of heating equipment. In the Liaoning climate heating equipment is a necessity, only 2% report no heating system. Air-conditioning is virtually non-existent (although electric fans are frequent, see Table 8.4).

Well above 80% of the households have their own kitchen in both provinces, while 7.5% of the Sichuan households have no access to kitchen (5% in Liaoning).

The situation with regard to ownership is also shown in Table 6.3. Close to 90% of the households in both provinces live in dwellings owned by the employing unit (state or collective). The rest is rented privately or owned by the households. The latter category which probably can be expected to increase as a result of economic reforms, comprises 8% in Sichuan and 6% in Liaoning.

Figure 6.1: The distribution of living space in Sichuan and Liaoning. Per cent



Finally, Table 6.3 gives information on the type of fuel used. In Sichuan the households are almost completely reliant upon piped coal gas (56%) and coal (38%) for cooking and water heating. In Liaoning the dependence upon piped coal gas is even higher (63%) and liquified petroleum gas has a share of 16%, while the less efficient and environmentally more detrimental use of coal comprises 18%. In Liaoning much of the energy use is, of course, related to heating in the winter season.

Table 6.3: The quality of dwellings. Per cent of households

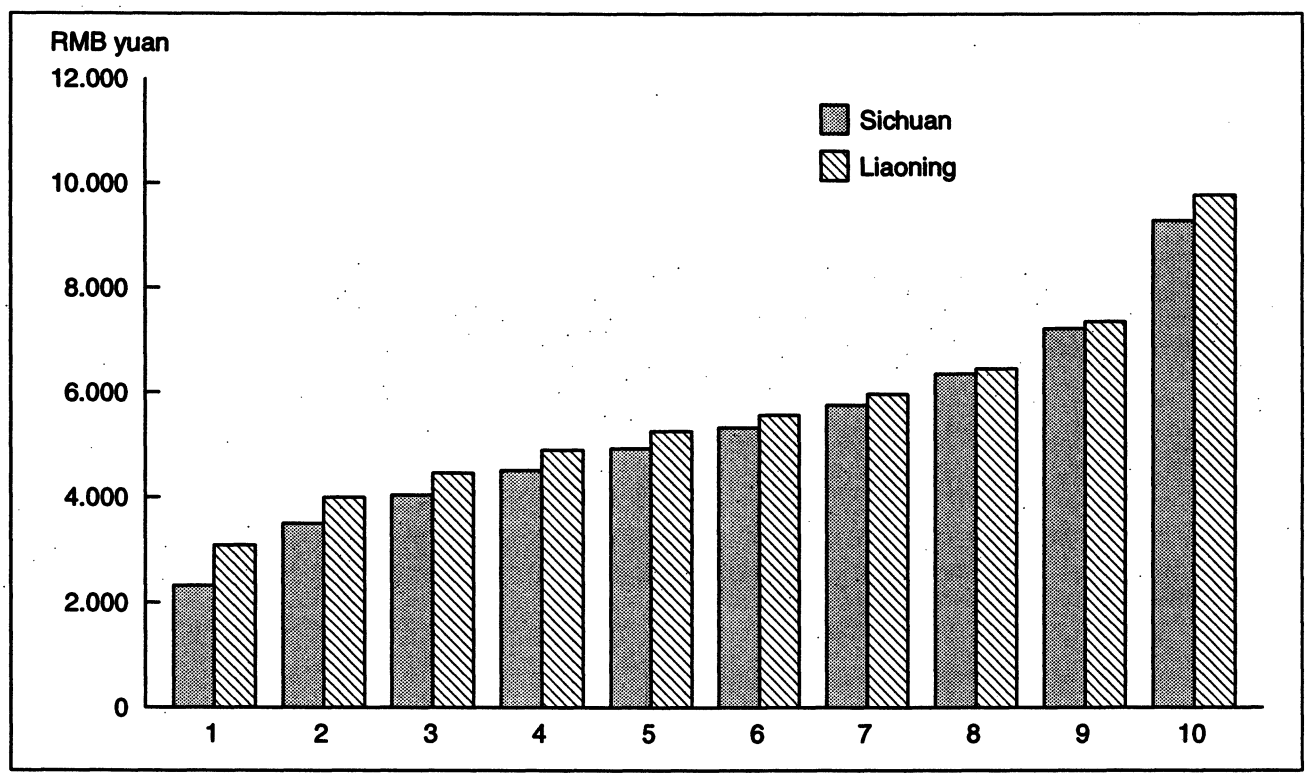
	Sichuan	Liaoning
I. Access to piped water supply		
1. No	1.3	2.3
2. Self-owned	87.3	83.1
3. Sharing with neighbours	11.5	14.6
II. Sanitary facilities		
1. No.	24.2	19.4
2. Both bathroom and toilet	8.7	3.2
3. Toilet only	43.3	61.0
4. Sharing with neighbours	23.8	16.4
III. Heating or cooling system		
1. No.	99.8	2.2
2. Air-conditioner	0.2	0.2
3. Central heating	-	65.0
4. Heated brick bed/heating stove (fire pan/brazier)	-	32.7
IV. Kitchen		
1. No.	7.5	4.9
2. Self-owned	86.4	83.1
3. Sharing	6.2	12.1
V. Ownership of housing		
1. No.	0.9	2.0
2. State or collective owned	89.3	89.1
3. Renting private housing	1.5	2.0
4. Private (self-owned)	8.3	6.4
5. Other	-	0.5
VI. Type of fuel		
1. No	0.9	2.0
2. Piped gas	56.4	63.5
3. Liquefied petroleum gas	2.0	16.2
4. Coal	37.8	18.3
5. Other	2.9	-

Percentages add to 100.0 under each Roman numeral.

7. Income structure and distribution

The average total household income in Sichuan in 1990 was *5329 RMB yuan* and in Liaoning *5687 RMB yuan*. By the official exchange rate of 1990, these amounts correspond to $ 1106 and $ 1180, respectively[16]. Such numbers are often used for international comparisons of income levels and living conditions. They may be misleading, however, as they often tend to understate the standard of living in low-income countries, unless calculated on a more sophisticated basis using an appropriate measure of the purchasing power value of the payroll. According to Gelb & al. [21] purchasing power estimates of Chinese income per capita range from three to eight times those of exchange-rate based measures. But also the availability of supplies, additional sources of household income etc. may be relevant and required information to assess the standard of living for an international comparison. We shall not attempt any such comparison here, but report the sources and composition of urban household income, including distributional aspects, according to the information in the survey.

Figure 7.1: Distribution of total household income by decile groups, 1990



[16] The exchange rate of RMB yuan against dollar has been sliding in recent years. In 1986-88 the rate was 3.72 yuan/$ (at year end), in 1989 4.72 yuan/$. Through 1990 the rate was pegged at 4.7 and 5.2. In the conversion the average import/export rate according to SYC 1990 has been used, 4.82 yuan/$. The free market exchange rate was approximately 30-50% higher in the period, perhaps somewhat lower at the end of 1990.

Figure 7.1 indicates the distribution of total household income in 1990 by the average income of each decile. A major reason for the spread in income between households is that the number of income earners may vary, but also income by income earner varies.

The income in Liaoning is higher than in Sichuan for each decile (Figure 7.1)[17]. The income distribution as measured by the Gini coefficient is slightly more unequal in Sichuan with Gini coefficient 0.20 than in Liaoning with Gini coefficient 0.17. The Gini coefficients are low compared to other countries. The Chinese urban income is by international comparison more equally distributed than most countries, although far from the 'equal income' impression sometimes spread both by friend and foe. For further analysis of the income distribution in terms of Gini coefficients and related measures for the UHS data under consideration, see Aaberge and associates [1]-[2][18].

In China the completely dominant source of private earnings in urban areas is wage earnings by employment either in *state-owned units* or in *collective-owned units*. The average urban annual wage income in China calculated from the UHS data for two provinces in 1990 as the average wage per payroll was *1783 RMB yuan* in Sichuan and *1930 RMB yuan* in Liaoning[19]. Earned income can also stem from 'self-employment', or a residual category of 'other employment'. The latter two categories are of little importance in the overall picture.

Labour market activities are stricly controlled, and there is little free movement in the labour market. In the post-1949 China individuals have been monitored in social activities in a way unparallelled e.g. in Eastern European countries. The institutions of control have been considerably weakened in the 1980s compared to the earlier decades ([18]), also for labour market activities.

In the traditional system labour power is allocated to work units according to plans drawn up at the highest level by the State Planning Commission. State agencies, institutes and enterprises are given annual quotas decided after consultations. Planning commissions at lower levels use similar procedures, and local labour bureaus assign new workers to work units on the basis of recommendations of screening committees. State-owned work units are generally given priority over collective-owned units in the allocation of labour power. For new entrants with higher education the same system has applied, but changes introduced in 1988 gave more opportunities for university graduates to express choice, see Lin & Bian [12]. Hence, the "work unit" plays a more important role in the life of the individual than just being a temporary choice of source of income.

The labour allocation process is certainly a feature of Chinese society that is going to change as the national planning apparatus is gradually dismantled in the economic reform process. Some provinces are ahead of others in the pace of economic reform; neither of the two provinces seem to be in the forefront in that regard. Increased freedom to choose is one side of the coin, the other is decreased job security. There are already measures in effect which make it easier for

---

[17] The relative income level has in fact shifted - at least in the sample - during the observation period, in 1986 the average Sichuan household income was higher than that of Liaoning, see Table 9.2.

[18] Aaberge & al.[1] shows that the Gini coefficient for the distribution of income among couples with one child is lower than for all households, only 0.15 for Sichuan and 0.12 for Liaoning. Aaberge & Li [2] shows that the Gini coefficient has increased in the period 1986-90.

[19] Approximately $ 370 and $ 403, respectively, see note 16.

managers to circumvent the "permanent employment" system by firing employees allowing the fired worker, say, 70% of the base wage, or short of firing, changing their jobs within the company and taking away bonus payments. Such measures naturally meet grassroot resistance, and the issue has been heatedly debated in Chinese media recently. According to All-China Women's Federation 70% of those laid off from industrial enterprises are women. The reasons given by managers, pushed from the top by a demand for higher efficiency, for sacking women (or refusing to hire women with a small child) is the poor education. Once again it is the effects of the 'ten years in turmoil' which haunt the future (and unfortunately by letting the same people pay again). The lowering of educational achievements of women during and as a result of the Cultural Revolution, as noted in chapter 5, leaves a large cohort of women severely handicapped in a labour market which may be about to change in appearance from underemployment to unemployment.

A more precise definition of the alternative categories of employment, given in the survey information, runs as follows: *State-owned units* comprise state-owned enterprises, government administration and subordinate units, and other state institutions. *Collective-owned units* comprise all other approved employing units whether enterprise, administrative office or other institutions. *Self-employment*, which is the basis for employment in the small private sector, requires registration and a permission to operate private business. Finally, *Other employment*, as the remaining category comprises individual earnings from at least six weeks income earning activity in the latest quarter, not derived from the other categories of employment. In this category one finds people who receive material for further processing at home, washing and mending clothes at home, housekeepers and various unregistered self-employment. So-called "free market" activities, which are found primarily in retail trade using family labour, is 'self-employment' if permission has been granted, but fall perhaps more often in the 'other employment' category?

Table 7.1: Households by employment. Per cent

	Sichuan	Liaoning
Households with member(s) employed by:		
State-owned units	60.5	48.7
Collective-owned units	8.9	11.4
Both state-owned and collective-owned units	19.1	34.6
Others	11.5	5.3

Percentages add to 100.0.

The UHS data does not give exact information for each individual about the type of employment. But there is information about the wage earnings from each of the two kind of employing units, and the number of payrolls of each category is also given. The importance of state-owned versus collective-owned units is indicated in Table 7.1 showing the percentage of households with income from one or both of these types of employment. The residual category of 'Others' in the table represents mostly retiree households, some of which may have supplementary labour income (see below).

Table 7.2: Household income sources. Average amounts by household, 1990. RMB yuan and per cent

	Sichuan			Liaoning		
	Mean		Pct.	Mean		Pct.
Total	5329	(84.8)		5687	(77.2)	
State-owned	2873	(89.2)	53.9	3045	(84.9)	53.5
Collective-owned	450	(38.1)	8.4	973	(52.8)	17.1
Other income from work units	377	(15.5)	7.1	394	(11.9)	6.9
Self-employment	22	(9.1)	0.4	11	(6.2)	0.2
Oher employment	9	(4.7)	0.2	4	(4.3)	0.1
Other labour activitites	54	(8.9)	1.0	38	(7.3)	0.7
Extra-pension income	42	(9.1)	0.8	51	(13.1)	0.9
Transfers	1179	(50.2)	22.1	857	(31.8)	15.1
Property income	57	(6.3)	1.1	43.9	(4.7)	0.8
Other income	266	(19.6)	5.0	270	(21.8)	4.7

Standard deviation in parentheses. Percentages add to 100.0. Total income as given in the UHS data for Liaoning differ slightly from the total of individual items.

Table 7.2 shows the average composition of income sources by household. In addition to income from employment, as discussed above, there are additional sources, especially transfers are of importance. More than 60% of the average household income in Sichuan and more than 70% in Liaoning stem from wage earnings in state-owned and collective-owned work units (Table 7.2). Wage earnings are presented with details of structure and distribution in Table 7.3, with male/female earning ratios in Table 7.4, and by occupation in Table 7.5.

Self-employment and other employment as defined above, jointly count for only a very small part of the average household income[20]. Very few households in the UHS sample comprise

[20] These income sources may, of course, be prone to underreporting, as more difficult to supervise by the authorities than wage earnings.

self-employed persons (9 in Sichuan, 4 in Liaoning), and all except one of these households also had wage income from employing units. For the income level of self-employed, see below[21]. No household in the UHS sample relies exclusively on 'other employment', clearly marking this category as a supplementary source of income.

Other income from work units in Table 7.2 comprises all cash income of employees in state-owned and collective owned units apart from wages, such as grants-in-kind, single-child subsidies, business travel subsidies, etc. Altogether, this amounts to about 10% of the wage income. Income from *Other labour activities* comprises income from second jobs, spare time activities etc. Some details about the variation of this income source among households is given below. *Extra-pension income* is income of jobs by retirees (not including retiree income). Among the non-wage income sources by far the most important is *Transfers*, which include retirement income for persons retired from state-owned and collective-owned units and price subsidies. *Property income* comprises interest, dividends etc. *Other real income* comprises any other additional sources of income, e.g. gifts and income from boarders as well as the modest amount of compensation given to the surveyed households. The latter four items are presented in somewhat more detail in Table 7.6-7.9.

There is no mention in the UHS documentation of income in kind. We are not referring to the almost universal subsidizing of dwellings, health services etc, but to ordinary marketed goods. Various observers have noted that income in kind received through work units, either free or highly subsidized, is not of negligible importance (noted also by Hussain & al. [10], p.4). A state-owned work unit may e.g. distribute eggs to employees at a below-market price, through ownership or special arrangement with a chicken farm.

State-owned units are more important as employing units than collective-owned (Table 7.1) and even more so as a source of income (Table 7.2). The average wage earnings per payroll is substantially higher on the average in state-owned units than in collective-owned. In Sichuan the average payroll of *1783 RMB yuan* quoted earlier is a weighted average of *1962 RMB yuan* in state-owned units and 1300 RMB yuan in collective-owned units. Hence, in Sichuan state-owned units payrolls are on the average 50% bigger than in collective-owned units. In Liaoning the difference is smaller, the average payroll of *1930 RMB yuan* covers an average payroll in state-owned units of *2101 RMB yuan* and in collective-owned units of *1568 RMB yuan*, a difference in wage earnings of about 44%. The difference in wage earnings per payroll between provinces is roughly the same for both types of units, and indicates a wage level in Liaoning around 10% higher than in Sichuan[22].

---

[21] Hussain & al. [10], p.3 maintain that cross checking reveal that the UHS 1986 data studied by them were significantly biased in favour of state-owned units and also in favour of the educated. This may seem a fitting description also of our data and may explain i.a. the low number of self-employed. According to SYC 1991, p.76 the private sector comprises at the end of 1990 6.71 mill. individual labourers or 4.6% of the urban labour force. Completely (or almost?) lacking in our sample are wage earners in foreign enterprises, joint ventures, and joint state-private enterprises which generally pay more, and often considerably more, than the employees constituting the sample. Also the suburban peasant entrepreneur may earn several times as much as the state worker and employee, [18], p.111.

[22] It has not been possible to check for possible differences in working hours.

Table 7.3: Decile distribution and structure of annual wage earnings per payroll in state-owned/collective owned units, 1990. RMB yuan

Province/ decile group	Total	Base wage	Floating income	Contract wage	Bonus	Subsi-dies	Other items
Sichuan							
Total	1783	1189	11	8	322	208	6
1st	584	490	2	-	50	37	4
2nd	989	743	18	9	129	75	16
3rd	1224	926	8	2	167	104	17
4th	1463	1012	18	6	250	145	33
5th	1672	1148	8	15	270	192	40
6th	1866	1235	22	19	328	215	48
7th	2068	1358	7	19	366	264	55
8th	2263	1466	11	3	445	279	59
9th	2534	1592	5	-	515	363	58
10th	3163	1924	7	10	704	409	110
Total in pct.	100.0	66.7	0.6	0.5	18.1	11.7	2.5
Liaoning							
Total	1930	1224	82	13	342	206	62
1st	754	597	12	-	45	91	8
2nd	1234	937	32	6	91	143	24
3rd	1472	1020	52	10	195	171	25
4th	1640	1156	69	4	209	165	37
5th	1806	1190	79	1	296	186	54
6th	1982	1264	82	2	360	208	66
7th	2187	1309	104	11	464	215	83
8th	2400	1464	112	10	476	246	92
9th	2644	1532	152	31	558	270	101
10th	3183	1776	124	59	726	369	129
Total in pct.	100.0	63.4	4.2	0.7	17.7	10.7	3.2

One reason for the marked difference in average labour remuneration by type of employing unit is that by far most white-collar jobs belong to state-owned units. This is in itself an insufficient explanation as many white-collar jobs do not pay very well compared to the better-paid blue-collar jobs. The underlying explanation in addition to the general priority of state-owned units over collective-owned units referred to earlier, is that the collective-owned units employ primarily blue-collar workers in smaller scale manufacturing and services with relatively small administrative and other overhead staff, while the state-owned sector in addition to (mostly large) enterprises also comprise administrative, management and research institutions[23]. Collective-owned units have very few employees with higher education. The difference in the wage level between the provinces is more marked for collective-owned units with a difference of more than 20%, than for state-owned units with a difference of 7%.

The structure of wages at each decile level of wage earnings per payroll for the two provinces is given in Table 7.3[24]. Almost two-thirds of the total remuneration consisted of *Base wage* in both provinces in 1990. Among the other elements in the structure of wage earnings are *Floating wage* and *Contract income* (both minor items), *Bonus* and *Subsidies*, which are substantial, and *Other items* (also of minor importance)[25]. The decile distributions show an important feature, namely, that bonuses are more important at high income levels. To just quote the base wage rates would hence be misleading with regard to wage inequality.

Table 7.4: Average annual wage earnings for female and male employees in state-/collective-owned units, 1990. Female/male wage earnings in per cent. RMB yuan

	Sichuan			Liaoning		
	Female	Male	Pct.	Female	Male	Pct.
Total	1604	1955	82.0	1818	2036	89.3
Base wage	1076	1299	82.9	1142	1303	87.7
Floating wage	15	7	224.2	77	87	88.4
Contract income	10	7	146.9	10	16	63.4
Bonus	288	356	80.9	336	348	96.5
Subsidies	175	241	72.5	191	221	86.4
Other items	41	47	86.8	63	61	101.8

[23] Lin & Bian [12], who, furthermore argue that state-owned units rank clearly above collective-owned units with regard to status attainment in the Chinese society.

[24] The wage earnings registered in the survey are - according to the survey infomation - the amounts actually received, exclusive of any amount deducted for sick leave or other absence, and inclusive of rents, charges for water and electricity, child care, medical treatment, and repayment of debts deducted by the employing unit.

[25] The structural composition of wages is not shown separately for the two employing units as there does not seem to be much systematic difference in the structure.

There are some notable differences between the provinces. *Floating wage* is negligible in Sichuan, but at a level of 4-5% of total wage for most wage earners in Liaoning. Subsidies increase as a percentage of total wage in Sichuan, but are roughly proportional in Liaoning.

The female/male structural composition of average wage earnings and the female/male wage earnings differential is shown in Table 7.4. The female level of wage earnings is 82% of the male level in Sichuan and almost 90% in Liaoning. These are high ratios by any standard, China has come a long way towards eliminating gender discrimination in work relations and equalizing male and female earnings, especially in view of the differences in educational achievements that still exist. Sichuan is lagging notably behind Liaoning, although it is not obvious why this should be the case.

The composition of the labour force and the average individual wage earnings by occupation - as measured in the UHS sample - is given in Table 7.5 (wage earners only). The relative pattern is roughly the same in the two provinces. Among the differences between the two provinces is that the proportion of Senior engineer/Engineer/Assistant engineer is twice as high in Sichuan as in Liaoning, while the ratio of Senior officers to Junior officers is so different in the two provinces. It was noted in chapter 3 that Sichuan is a much less industrialized province than Liaoning, but also that the manufacturing sector is more developed, advanced, and fast-growing than in Liaoning, and indicated here by the higher proportion of engineering skills.

Table 7.5: Composition of the labour force and wage earnings by occupation, 1990. Per cent and RMB yuan

	Sichuan			Liaoning		
	Labour force	Wage earnings		Labour force	Wage earnings	
Senior engineer	1.9	2801	(131.9)	0.5	2762	(220.8)
Engineer	9.9	2392	(59.9)	4.9	2481	(85.6)
Assistant engineer	9.8	1990	(52.8)	4.6	2114	(91.6)
Technician	5.4	1711	(70.3)	9.5	1892	(52.9)
Senior officer	2.4	2501	(166.8)	1.8	2549	(143.2)
Junior officer	5.5	2250	(83.4)	7.8	2374	(61.5)
Office clerk	16.0	1766	(49.5)	20.9	2003	(36.9)
Commerce worker	4.7	1318	(87.8)	4.6	1518	(79.9)
Service trade worker	3.9	1235	(93.6)	2.0	1661	(103.6)
Production & transportation	40.4	1610	(35.6)	43.5	1795	(29.7)

Standard deviation of mean in parentheses. Labour force composition percentages add to 100.0.

It was noted above that Liaoning on average has a higher level of wage earnings than Sichuan. It seems by inspection this is not a result of differences in the composition of the labour

force, as the large categories such as Production & transportation workers, Office worker, Engineer, and Assistant engineer all have higher levels of wage earnings in Liaoning (Table 7.5). A closer examination of factors determining relative labour remuneration, such as occupation, education age, type of employing unit and using also the information about the structure of wage earnings such as bonuses, would certainly have great interest, but is beyond our purpose here[26].

For the income level derived from self-employment there are few observations, as mentioned above. The average income from self-employment for these few households was in 1990 *1278 RMB yuan* in Sichuan and *1583 RMB yuan* in Liaoning[27]. Hence, the income level from self-employment is comparable to the wage level, somewhat higher than the base wage, but lower than total wage.

Income from other labour activities is a supplementary source of income for wage earners in off-hours, either by doing work at home for an employer or engaging in unregistered self-employment, such as retail trade on the street. The registration of such incomes through the survey may be less reliable than for wage earnings. Table 7.2 shows that on average this source is of little importance. 31% of Sichuan households and 19% of Liaoning households had such incomes in 1990 with mean value of *171 RMB yuan* and *198 RMB yuan*, respectively, i.e. approximately one tenth of the wage level[28].

Table 7.6: Transfers received by individuals, 1990. Average over non-zero observations. RMB yuan

	Sichuan		Liaoning	
Total	500.1	(17.7)	259.7	(8.14)
Income from dependents	6.5	(1.7)	6.1	(1.66)
Retirement income	254.9	(16.5)	92.4	(7.84)
Price subsidies	235.0	(2.8)	158.3	(1.01)
Other	3.7	(1.1)	3.1	0.51

Standard deviation of mean in parentheses. The no. of obs. is 1234 in Sichuan and 1960 in Liaoning. The high number of individuals in Liaoning indicates that almost everyone is entitled to prices subsidies in that province, but a much smaller number in Sichuan.

Transfers is the only non-wage source of income of general importance (Table 7.2). Table 7.6 shows the items under this heading and the average composition of transfers for individuals

[26] See e.g. the analysis of wages and bonus payments in Tianjin in Hu, Li & Shi [5].

[27] The min/max spread & (std.dev.) for Sichuan and Liaoning is RMB yuan 468/2200 & (241) and 789/3180 & (543), respectively.

[28] The min/max spread & (std.dev.) for Sichuan and Liaoning is RMB yuan 3/3550 & (25) and 4/2816 & (33), respectively.

(with non-zero transfers) in 1990. Most of the transfers are retirement income and non-wage-related price subsidies. The other items, such as income from dependents, are unimportant in the total average, but have relatively high variation between households. Price subsidies, on the other hand, follow strict rules and have little variation between households.

Retirement income is part of transfers, but can be estimated separately as the average per retiree for the two provinces. The estimates, as given in Table 7.7, show that the retirement income is on average of roughly the same size as the base wage, or two-thirds of the average wage. In China men generally retire when they are 60 (white-collar workers) or 55 (blue-collar workers) years old and woman when they are 55 or 50 (Lin & Bian [12]). The rules seem to be somewhat flexible. Retired persons may continue to work for other work units earning extra-pension income. The average extra-pension income for the not quite negligible part of the retirees who have non-zero extra-pension income - 18% in Sichuan, 23% in Liaoning. The level of extra-pension income, for those who have got it, is comparable to half the average level of wage earnings.

Table 7.7: Retirement income and extra-pension income by individual, 1990. Average over non-zero observations. RMB yuan

	Sichuan			Liaoning		
	Mean		Min/max	Mean		Min/max
Retirement income	1279	(38.8)	79/3451	1257	(34.9)	132/2768
Extra-pension income	775	(90.6)	496/2164	1164	(164.9)	841/3020

Standard deviation of mean in parentheses. The no. of retirees is 246 in Sichuan and 144 in Liaoning, the no. of retirees with extra-pension income is 30 in Sichuan and 26 in Liaoning.

Table 7.8: Property income by households, 1990. RMB yuan

	Sichuan		Liaoning	
Total	104.6	(10.8)	124.1	(11.4)
Interests	80.9	(6.6)	93.0	(9.6)
Dividends	8.6	(2.6)	30.5	(4.9)
Rents, royalties etc.	15.1	(7.6)	0.7	(0.4)

Standard deviation of mean in parentheses. The no. of obs. is 301 in Sichuan and 211 in Liaoning.

Property income is Table 7.2 on the average a very minor contributor to household income (Table 7.2). It consists mostly of interest, which many households receive on time deposits. Some households hold bonds, usually with a higher yield than time deposits. The overall amount of property income by household is on the order of two per cent of average total household income, when averaged over non-zero observations (roughly one half of the Sichuan households and one third of the Liaoning households).

The final source of household income listed in Table 7.2 - *Other income* - is almost by definition received by all households as this income source includes the reward given to surveyed households. The size and composition of this income is given in Table 7.9. The amount is on the order of five per cent of total household income. Sichuan households with more space, receive more from boarders. Gifts are not negligible, perhaps they are wedding presents. Gifts from abroad certainly occur, but who would report them?

Table 7.9: Other income by households, 1990. RMB yuan

	Sichuan		Liaoning	
Total	269.1	(19.7)	269.6	(21.8)
Gifts	79.4	(12.6)	173.7	(19.2)
Boarders	94.8	(10.9)	20.6	(5.2)
Subsidies to surveyed household	49.7	(1.0)	52.7	(0.7)
Sale of property	31.7	(8.8)	16.7	(8.6)
Other	13.7	(4.0)	9.2	(2.2)

Standard deviation of mean in parentheses. The no. of obs. is 544 in Sichuan and 597 in Liaoning.

8. Consumption expenditure

The survey includes information in great detail about consumption purchases, as well as stocks of durable consumer goods. In this chapter we survey the composition of consumer expenditure and look in somewhat more detail at the food composition. Table 8.1 shows the average composition over 14 categories of consumption expenditures, nine of which are food categories, for the surveyed households in Sichuan and Liaoning in 1990.

Table 8.1: Average consumption expenditure per household, 1990. RMB yuan and per cent

	Sichuan			Liaoning		
	Mean		Pct.	Mean		Pct.
Total	4653.5	(83.8)		5039.4	(81.4)	
Food subtotal	2210.1	(32.4)	47.5	2445.2	(33.1)	48.5
Grain	234.5	(4.0)	5.0	245.5	(5.6)	4.9
Fresh vegetables	292.6	(5.4)	6.3	348.9	(6.1)	6.9
Pork, beef and mutton	482.7	(8.5)	10.4	408.9	(7.8)	8.1
Poultry	134.6	(4.1)	2.9	60.6	(2.3)	1.2
Fresh eggs	108.0	(3.4)	2.3	216.6	(5.4)	4.3
Other meats, poultry & eggs	104.8	(3.2)	2.3	66.2	(3.0)	1.3
Fish	85.2	(2.7)	1.8	225.9	(5.9)	4.5
Fruit	182.3	(5.0)	3.9	323.1	(6.1)	6.4
Other food	585.3	(12.5)	12.6	549.7	(12.5)	10.9
Beverages and tobacco	270.0	(11.1)	5.8	320.5	(10.6)	6.4
Clothing	621.7	(20.5)	13.4	752.7	(19.1)	14.9
Durable goods	566.1	(37.7)	12.1	706.1	(48.5)	14.0
Services	500.2	(14.3)	10.7	457.1	(13.4)	9.1
Other expenditures	485.5	(14.3)	10.4	357.9	(13.4)	7.1

Standard deviation of the mean in parentheses. Percentages add to 100.0.

The most prominent feature of the consumption composition is that the expenditure on food accounts for almost 50% of total consumption expenditure in both provinces. The food share can (as already noted by Engel in 1857) be used as a somewhat inexact measure of the stage of development from a urban subsistence economy to an advanced stage of high-income urban lifestyle. International comparisons as in [4], include tobacco and beverages in the food expenditure. This broader concept amounts to 53-55% in our observations. According to [4] the corresponding share is higher in poor countries comprising in Asia e.g. Bangladesh (59%), Nepal (57%), Papua NG (64%) and in Africa e.g. Ghana (59%), Sudan (65%), and Madagaskar (58%). It is on the same level in countries such as Poland (53%), the Phillipines (54%) and Pakistan (54%), while most of the world's countries have a lower share, and most OECD countries have a food, tobacco and beverage share around 20%[29].

Clothing, as the second necessity good also has a high share of around 15%. Although the differences between these shares for the two provinces are small, they seem to go in the "wrong" direction as Liaoning, as the relatively more affluent province, has the highest shares for

[29] The international figures quoted are national observations, not urban population as the Chinese sample.

necessity goods. Food prices are, however, not the same, and generally higher in Liaoning with fish as a notable exception (Table 8.6A and 8.6B). Liaoning has, however, higher expenditure on Durable goods as well as for Beverages and tobacco. Sichuan scores higher for Services and Other expenditures.

In the food composition the most notable difference is that Sichuan has higher shares for all kinds of meat, while Liaoning has higher shares for fish as well as for eggs. The dependence of food consumption upon income level is indicated by means of quintiles in Table 8.2. The food share of total expenditure varies, but not overly much. In Sichuan it is nearly 56% for the lowest quintile and close to 43% for the highest, while in Liaoning the variation is from nearly 58% to 45%. The composition of the food expenditure also changes with income level. The high elasticity goods in Sichuan according to Table 8.2 are Fruit and Other food, and to a somewhat lesser extent Poultry, Other meats, poultry & eggs, and Fish. Low elasticity goods in Sichuan are Grain, Fresh vegetables, Pork, beef and mutton, and Fresh eggs as they all get reduced shares at higher income. In Liaoning the pattern is similar, but somewhat less marked. Aaberge & al. [1] study the inequality in the distribution of consumption expenditure in the same data by means of the Gini coefficient and related measures and find that the inequality in expenditure is (slightly) higher than for income. They show that food is more equitably distributed than other consumption items, while for durables it is the other way round. This is, of course, only a roundabout way of confirming commonplace facts about Engel curves.

Rice and other grains is the staple food of China and in earlier years played a more important role in the diet of Chinese households. It has been a major policy concern in China to secure an adequate amount of the basic staple food for each household. In 1986-90 rice was still a rationed and heavily subsidized good. The rationing has been abolished gradually, first in the Southern provinces and from October 1992 also in Beijing[30]. The average ration of rice was around 15 kg per month. Women and children had lower rations than men and heavy physical labour had rations higher than average. The UHS data for Sichuan give an average of 81 kg rice per capita in 1990, i.e. a little less than 7 kg per month per person. Table 8.3 shows the consumption of rice in Sichuan in physical units as well as in RMB value with some indicators of the variation in rice consumption in 1990[31]. The role of the "free market" is very limited with regard to the supply of the most important staple food, but the system of providing rice for the Chinese population has undergone a number of changes in recent years and may be ready for more, probably with safeguards in case of severe drought or other catastrophes.

[30] The abolishment of the rationing is combined with less subsidies and, hence, increased prices. All employees of state-owned and collective-owned work units get 12 RMB yuan per month in compensation. The black market value of grain coupon was about 0.3 RMB yuan per *jin* (= 500 grammes) in 1987, but decreased to only 0.03 RMB yuan per jin shortly before the whole system was abandoned, i.e. the price of grain from state-owned shops has been converging towards the market price throughout this period.

[31] Rice is the staple food in central and southern China, but not in the north and northeast.

Table 8.2: Food expenditure composition at different income levels, 1990. Per cent RMB yuan

	Sichuan			Liaoning		
	Mean	1st q.	5th q.	Mean	1st q.	5th q.
Grain	10.6	12.4	9.4	10.0	10.7	10.4
Fresh vegetables	13.2	15.8	12.6	14.3	16.1	14.1
Pork, beef and mutton	21.8	25.1	19.8	16.7	18.0	16.3
Poultry	6.1	5.2	6.3	2.5	2.4	2.5
Fresh eggs	4.9	4.9	4.6	8.9	9.7	8.2
Other meats, poultry & eggs	4.7	4.4	4.9	2.7	1.8	2.8
Fish	3.9	3.2	4.1	9.2	9.2	9.2
Fruit	8.2	6.1	9.5	13.2	12.2	12.6
Other food	26.5	22.9	28.6	22.5	19.9	23.9
Total food expenditure	2210	1477	2993	2445	1878	3154
Total expenditure	4654	2651	6994	5039	3256	7014
Food in % of total expenditure	47.5	55.7	42.8	48.5	57.7	45.0

Percentages add to 100.0. 1st q. = first quintile by total household income. 5th q. = fifth quintile by total household income.

The Urban Household Survey gives quite detailed information about the inventory of durable goods in the households. The average wage earning Chinese household has traditionally owned few, if any, durable goods[32]. The post-1949 economic policy aimed at securing adequate supplies for a minimum standard of living for all households and gave little room for the households to set aside means for acquiring durable goods. Only since the economic reform process started in 1979 have the households been given opportunities to express their desire for durable goods by having access to them via ordinary consumer market channels. Before 1979 most durable goods available in other countries were "unaffordable, unavailable, or even unknown" (Hu & al. [6]) for Chinese households. The production system gave prior to 1979 little priority to households' need for durable goods. Such goods were produced in small quantities (or not at all) and households would rush to get them when available. Installment plans and consumer loans for financing were not available either.

[32] The remarks on the emergence of durable demand in urban China in this and the next chapter draws heavily on Hu & al. [6].

Table 8.3: Annual grain and rice consumption by household in Sichuan, 1990. Quantities in kg, values in RMB yuan

		Mean		Min/max
Per household				
Grain	quantity	426.2	(7.2)	72/1126
	value	234.9	(4.0)	49/713
Rice	quantity	256.6	(5.1)	5/730
	value	82.3	(1.9)	1/447
1st q.	quantity	106.7	(3.4)	5/153
	value	34.0	(1.1)	1/61
5th q.	quantity	437.5	(7.2)	350/730
	value	142.1	(4.4)	97/447
Rice bought from free market				
	quantity	4.8	(0.9)	0/330
	value	4.4	(1.0)	0/399
Per person (quintiles by rice consumption)				
Rice	quantity	81.1	(1.6)	5/292
1st q.	quantity	38.2	(1.1)	5/52
5th q.	quantity	136.3	(3.2)	106/292

Standard deviation of mean in parentheses. 549 obs. 1st and 5th quintile by total household income, unless otherwise stated. The number of persons in a of household can be a fraction, e.g. a member who lives with the household in only 3 months of a year is registered as 1/4 person.

After 1979 much higher priority was given towards satisfying consumer needs by producing more of durables in short supply, allowing imports of durable to some extent and producing more kind of durables. Different durable goods have been "targeted" over time. At the end of the pre-1979 period the 'big four' sought after by households comprised bicycle, sewing machine (foot-powered), mechanical watch and transistor radio. The distinctive features of the Chinese household consumption development: the high degree of equality in incomes and the "starvation" with regard to durable goods, have caused the introduction of a wider range of consumer goods to follow a compressed pattern, different from the development of other countries, as well as taking place later in time. The fact that Chinese households through the general opening towards other countries which started in the 1970s, learnt more about living standards and lifestyles in other countries, may also have influenced the rush for durables in the 1980s, made possible by increased household incomes and production lines covering a range of durable goods.

The UHS data covering 1986-90 represents a particular phase in the development of accumulation of durables. The development over these years is discussed in the next chapter. Here

we look primarily at the situation in 1990. Table 8.4 shows the percentage of households owning (at least one) of ten *major durable goods* for the two provinces.

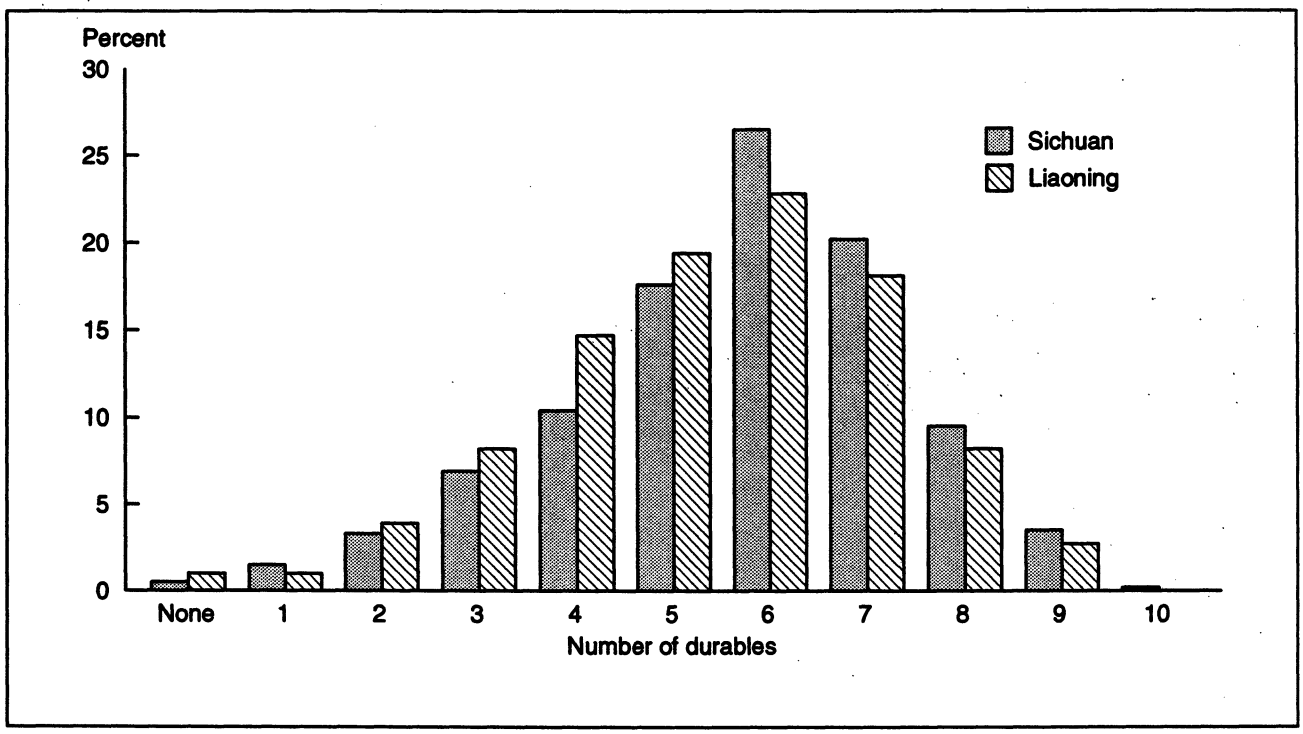
Table 8.4: Ownership of major durables (at least one), 1990. Per cent

	Sichuan	Liaoning
Bicycles	47.3	88.8
Sewing machines	62.0	56.3
Electric fans	96.9	41.2
Washing machines	82.0	81.1
Refrigerators	67.6	59.8
Colour TV	70.5	69.5
Black & white TV	43.3	46.7
Stereo recorders	32.5	33.5
Mono recorders	38.5	37.5
Cameras	26.7	28.1

The ownership percentages are rather similar in the two provinces. The most notable differences can easily explained by climatic (electric fans, perhaps also refrigerators) and topographic (bicycles) differences. Also the concentration of ownership is quite similar between the provinces as shown in figure 8.1. The similarity in the distribution of ownership of durable goods between the two provinces indicate that this observation represents common features in urban China in 1990.

The survey also includes information about the ownership of a number of other durable goods than the ten major goods presented above. A fairly complete presentation of the ownership in 1990 for the two provinces is listed in Table 8.5. The list which reflects the detailed specifications of the Survey, shows that there are a number of goods which have been highly sought after by Chinese household in earlier years, but have now reached maturity with corresponding less interest in monitoring the ownership percentage, e.g. mechanical wristwatches, leather shoes, wool coats etc. That wardrobes and other big pieces of furniture are more popular in Sichuan than in Liaoning, can be related to the observation made above of the relative abundance of floor space in Sichuan. The urban Liaoning people have fewer wardrobes, but more western style clothing! The list includes durables goods unattainable and/or unaffordable at the present time except for the very few, such as motorbikes and air-conditioners.

Figure 8.1: Households by number of major durables, 1990



Finally, we look in this chapter on the role of the socalled "free market" trade, which has competed in recent years with the state shops in the supply of a number of commodities. The free market trade typically takes place in open air stalls on pavements or squares. Among food items the free market trade has been most important in vegetables and meat. We have already noted that the free market plays little role for rice. Table 8.6A and 8.6B give a more complete picture by also showing the development over the years in the quantities bought of the food items in state shops and the free market, respectively, in Sichuan, and also the average prices paid. We should underline that the prices are not list prices, but unit prices, i.e. those actually calculated from the UHS observations as the purchase value per weight unit bought during a year[33].

The hypothesis underlying the interest in constructing these tables is that the free market has come to play a more important role in recent years. This is perhaps not so obvious from the observations after all. For *Grain* we notice again the predominant role of the state shops. There seems to be no movement in the direction of more free market sale in rice, which accounts for less than 10% of total rice purchases. The state price is stable and roughly the same in both provinces. The free market price is 2-4 times higher than the state price, which probably indicates that the free market specializes in special qualities rather than that rations are not big enough.

[33] The price variations and differences across years and provinces are quite prone to be misleading due to quality differences in the goods purchased, and possible observation errors either in the amount spent or the quantity purchased, in addition to the sampling errors. There may be considerable seasonal variations in some prices, which make the comparison of average prices over the year less relevant. Possible rebates for quantity or for other reasons would also translate into prices. There is also perhaps some doubt as to whether some state shops may have been privatized as part of the economic reform.

Table 8.5: Ownership of minor durables (at least one), 1990. Per cent

	Sichuan	Liaoning
Fur and other leather coats	30.4	28.6
Wool coats	88.2	90.1
Wool clothing	86.5	93.5
Western style clothing	59.3	72.2
Leather shoes	99.3	97.7
Wool blankets	78.7	65.3
Wardrobes	91.3	74.4
Sofa	78.5	65.2
Writing desk	87.5	61.5
Combination furniture	24.5	26.0
Sofa bed	13.3	19.9
Mechanical wristwatches	98.0	93.1
Electric wristwatches	32.5	53.1
Motorbike	0.5	0.5
Radio	32.2	34.8
Musical instruments	14.5	9.2
Air-cooling equipment	0.9	2.7
Air-conditioners	0.4	0.0
Electric cooking utensils	14.4	7.7

The purchasing pattern of *Fresh vegetables* differ significantly between provinces as the free market is completely dominating in Sichuan with state shops covering only 3-6% of total purchases. In Liaoning the situation is more even between the two sources of supply and the balance seems to be shifting in the direction of state shops. There are definitely lower prices on vegetables in Sichuan than in Liaoning, but not a very wide price gap, more on the order of ten per cent. As to be expected there are considerable unexplained differences in observed prices from year to year, and not a very clear pattern in the relationship between free market and state shop prices.

Table 8.6A: Quantities and unit prices of different food items bought from free-markets and state-shops in Sichuan, 1986-1990. kg and RMB yuan

		1986		1987		1988		1989		1990	
		F	S	F	S	F	S	F	S	F	S
Grain	Q	24.91	417.1	30.49	403.9	30.53	418.3	14.67	448.2	16.53	409.8
	P	1.016	0.423	1.052	0.413	1.293	0.449	2.014	0.481	1.637	0.545
	Obs	506	600	557	599	516	550	512	550	523	550
Fresh	Q	467.8	16.9	494.1	34.89	485.2	15.72	493.2	14.37	483.8	16.21
vege-	P	0.368	0.375	0.416	0.527	0.543	0.532	0.604	0.810	0.604	0.842
tables	Obs	599	273	597	322	548	276	549	333	550	359
Pork, beef	Q	81.24	24.54	63.30	39.79	63.02	39.54	59.37	40.85	63.49	41.53
& mutton	P	3.383	3.717	3.252	3.385	4.494	4.256	4.889	5.232	4.643	5.447
	Obs	597	514	596	561	545	536	545	532	544	534
Poultry	Q	24.08	5.854	26.74	3.814	22.81	4.134	23.09	4.298	21.25	5.858
	P	4.185	4.502	3.732	5.086	4.925	6.538	5.453	8.449	5.350	9.243
	Obs	594	287	567	242	535	217	538	291	526	321
Fresh eggs	Q	18.21	7.569	18.21	6.038	16.50	6.559	16.71	7.332	17.90	9.778
	P	3.027	2.869	3.282	2.981	4.340	3.949	5.228	4.952	5.070	4.698
	Obs	571	369	563	293	512	188	512	200	521	262
Fish	Q	16.53	5.500	12.66	4.971	11.13	3.304	11.31	4.353	12.50	5.037
	P	3.200	3.148	3.649	3.657	4.603	5.356	5.372	6.635	5.130	7.107
	Obs	585	514	578	349	512	217	508	290	528	362

F:Free market, S:State-owned shops, Q: Quantity, P: Unit price, Obs: No. of observations.

For *Pork, beef & mutton* there is - and contrary to our hypothesis - an increasing role for state shops in Sichuan, while in Liaoning it is the free market which is gaining considerable ground. There seem to be parity prices between the two sources, and prices are significantly higher in Liaoning. *Poultry* is another oddity. In Sichuan the state shops have only 15-25% of the trade and prices that are 10-50% higher than the free market, while in Liaoning the shares of the trade are reversed, and the state shop prices are between one third and half of the free market prices! The state shop prices of poultry in Liaoning are only about one third of the state shop prices in Sichuan. Can this be correct?

Table 8.6B: Quantities and unit prices of different food items bought from free-markets and state-shops in Liaoning 1986-1990. kg and RMB yuan

		1986		1987		1988		1989		1990	
		F	S	F	S	F	S	F	S	F	S
Grain	Q	45.84	489.1	29.40	401.3	34.47	386.3	40.72	344.3	30.94	408.1
	P	0.985	0.528	1.173	0.528	1.383	0.554	2.017	0.565	2.216	0.562
	Obs	311	600	438	600	399	600	387	600	370	596
Fresh	Q	360.5	300.2	322.6	284.0	266.7	392.7	273.1	362.7	280.0	349.6
vege-	P	0.375	0.399	0.682	0.952	0.774	0.544	0.982	0.699	0.911	0.631
tables	Obs	553	544	564	593	524	590	493	581	484	587
Pork, beef	Q	18.60	51.52	21.61	45.00	18.83	41.22	25.02	37.18	33.29	37.21
& mutton	P	3.256	3.208	3.967	3.580	5.339	4.380	6.289	5.735	6.454	6.065
	Obs	415	409	450	449	381	380	368	357	413	405
Poultry	Q	5.098	21.95	5.441	22.37	7.160	30.46	6.433	31.11	6.675	31.28
	P	4.175	1.556	5.141	1.970	5.638	2.240	6.791	2.711	7.589	2.417
	Obs	174	424	356	452	338	498	319	473	352	440
Fresh eggs	Q	21.22	21.95	22.89	22.37	23.30	30.46	27.59	31.11	27.69	31.28
	P	2.824	2.830	3.905	3.754	4.631	4.391	4.810	4.462	5.091	5.031
	Obs	453	424	515	452	450	498	423	473	425	440
Fish	Q	8.095	15.00	14.75	21.26*	12.07	20.92	16.36	22.27	19.78	24.19
	P	2.848	2.848	3.376	3.020	4.387	4.042	4.853	4.649	4.955	4.509
	Obs	307	500	486	579	399	572	396	562	405	538

* One unreasonable observation with a total consumption of 4311 kg fish in 1987, but only 58 yuan in expenditure has been deleted.
F:Free market, S:State-owned shops, Q:Quantity, P:Unit price, Obs: No. of observations.

The trade in *Fresh eggs* have fairly stable market shares in both provinces with the free market having about two thirds of the trade in Sichuan and about half in Liaoning. The prices seem to be about the same in both provinces and for both sources of supply. Finally, for *Fish* the state shops carry about 60% of total trade in Liaoning, with reversed market shares in Sichuan. Prices are significantly higher in the inland province (the fish trade in Sichuan is freshwater aquaculture).

9. Durable goods acquisition and saving 1986-90

The years 1986-90 have generally been marked by improvements in the consumer choice situation. Goods particularly sought after have become more available than earlier. Food rations were still applied, but were probably less restrictive than earlier. The most remarkable feature of this period from a consumer point of view was the sharp burst of inflation which took place in 1987-89.

Table 9.1: Consumer expenditures by household, 1986-1990. Per cent

	1986	1987	1988	1989	1990
Sichuan					
Food	49.4	45.8	45.1	48.5	47.5
Beverages and tobacco	5.5	5.9	5.0	5.8	5.8
Clothing	13.0	13.4	14.1	12.5	13.4
Durable goods	14.2	13.1	16.8	13.8	12.1
Services	9.3	10.3	9.1	9.7	10.7
Other expenditures	8.7	11.4	10.0	9.7	10.4
Liaoning					
Food	45.5	47.7	43.6	47.7	48.5
Beverages and tobacco	7.2	6.6	5.9	6.3	6.4
Clothing	18.2	16.0	15.5	14.2	14.9
Durable goods	12.5	15.3	21.5	17.6	14.0
Services	8.0	7.9	7.7	8.0	9.1
Other expenditures	8.6	6.6	5.8	6.3	7.1

Percentages add to 100.0 for each province.

Table 9.1 show the composition of consumer expenditures for the period 1986-90 for the two provinces. Although the composition changes structurally little over such a short period, the detailed time series are included here, because this period covers a rush to buy durables caused, at least partly, by the ominous inflationary development which took place in the middle of the period and was later brough under control. The durable expenditure share in Sichuan was just above 14% in 1986, increased to almost 17% in 1988 and subsequently fell to 12% at the end of the period. The corresponding numbers for Liaoning are even more spectacular, an increase from 12.5% in 1986 to 21.5% in 1988 and down to 14% in 1990. The definition of durable goods applied here include all the goods listed as major durable goods in Table 8.4 and the minor durable goods listed in Table 8.5, hence, a broader definition than used in most countries.

Table 9.2: Ownership of major durables in Sichuan and Liaoning, 1986-90. Per cent

	1986	1987	1988	1989	1990
Sichuan					
Bicycles	66.7	47.7	46.9	46.4	47.3
Sewing machines	71.0	62.8	52.7	57.1	62.0
Electric fans	93.2	92.5	94.2	96.2	96.9
Washing machines	69.0	66.8	77.5	80.4	82.0
Refrigerators	21.5	30.2	42.9	55.6	67.6
Color TV	27.2	34.2	49.1	63.6	70.5
Black & white TV	69.3	62.8	52.6	48.9	43.3
Stereo recorders	28.2	28.5	32.7	33.5	32.5
Mono recorders	28.7	28.9	31.3	36.9	38.5
Cameras	21.3	20.9	22.7	23.6	26.7
Liaoning					
Bicycles	95.7	91.0	88.3	87.7	88.8
Sewing machines	66.5	60.8	56.7	54.0	56.3
Electric fans	15.7	32.5	38.3	39.3	41.2
Washing machines	68.2	70.5	77.8	79.5	81.1
Refrigerators	5.5	14.5	33.3	46.7	59.8
Colour TV	29.7	29.7	51.2	58.0	69.5
Black & white TV	63.9	73.0	64.0	54.0	46.7
Stereo recorders	24.2	28.3	35.2	35.0	33.5
Mono recorders	26.8	31.2	31.8	34.0	37.5
Cameras	9.8	18.8	21.8	22.7	28.1

Table 9.2 gives the time series for ownership for each of the two provinces. From the table we can easily read out which are the established goods with flattened out ownership ratios, which are in ascendance, and which are in decline. In both provinces bicycles has apparently reached a stable level which, however, vary between the two provinces[34]. Sewing machines seem to have a decreasing trend in the ownership ratio, which might reflect a decrease in the self-sufficiency of the urban household. Electric fans are a necessity good in Sichuan, while the sharply increasing trend in Liaoning marks electric fans as an "in" good in that province. Washing machines are increasing from a level of around two thirds in both provinces to above 80%, a very marked increase for an important labour and time-saving good.

[34] The oddity in the ownership of bicycles in Sichuan in 1986 in comparison with the ensuing years, must be an effect of the sampling frame. In Chengdu "everyone" has a bicycle, while in Chongqing and other hilly cities there are few.

Table 9.3: Relative expenditures on major durables, 1986-1990. Per cent

	1986	1987	1988	1989	1990
Sichuan					
Bicycles	7.6	4.5	3.9	3.9	5.5
Sewing machines	0.7	0.7	0.5	0.2	0.6
Electronic fans	6.9	6.0	4.6	3.1	5.5
Washing machines	11.1	10.3	8.3	3.4	6.7
Refrigerators	22.0	42.4	35.0	36.4	32.6
Colour TV	35.1	23.2	38.6	47.9	41.7
Black & white TV	1.5	0.9	1.6	0.5	1.0
Recorders	12.1	10.5	6.0	3.9	3.3
Cameras	3.1	1.5	1.5	0.8	3.0
Liaoning					
Bicycles	12.9	8.7	4.5	4.0	6.9
Sewing machines	0.5	0.7	0.3	0.2	0.2
Electric fans	2.0	1.4	1.5	1.4	2.4
Washing machines	9.0	4.0	5.3	3.3	3.8
Refrigerators	19.7	29.0	33.5	48.9	37.9
Colour TV	41.8	44.7	47.3	37.6	43.6
Black & white TV	1.1	1.0	0.0	0.0	0.3
Recorders	11.9	9.0	5.8	3.4	2.2
Cameras	1.2	1.5	1.7	1.2	2.6

Percentages add to 100.0 for each province.

Refrigerators have the most remarkable increase, more than trebling in Sichuan and increasing tenfold(!) in Liaoning. The entries on colour TV and black & white TV set ownership show that the observed years cover the period of phasing in the colour TV set for Chinese households, while getting rid of the black & white TV set (or placing it in the bedroom). The introduction of colour TV has come late in China, but with great speed. Stereo and mono record players show almost identical picture, a durable good in moderate increase reaching together a coverage of about 70%. Cameras seem to have been much more rare in Sichuan than in Liaoning as late as the mid-1980s, but the two provinces end up at about the same level in 1990 (27-28%). A more detailed analysis would probably show the age and cohort effects in the phasing in and phasing out of durable goods, e.g. that young urban Chinese today have a vastly different ambitions with regard to durable goods than their parents.

The UHS also records the amounts used on purchases of the same durable goods in each of the years in the observation period. The results are presented in Table 9.3 for the two provinces. The expenditure on the ten durable goods is given as percentage of total expenditure on these

goods. The purchases are, of course. related to the inventories and corroborate the same picture[35]. Refrigerators and colour TVs are the ones for which money is spent in these years. Their share of total expenditure for the ten major durables vary between 57% and 84% for Sichuan and 61.5% and 86.5% in Liaoning.

Table 9.4: Nominal and real income and consumer expenditure by household for Sichuan and Liaoning, 1986-1990. Growth rates. 1986 RMB yuan and per cent p.a.

	1986	1987	1988	1989	1990
Sichuan					
Total household income	3382	3606	4186	4708	5329
Real income	3382	3314	3188	3083	3445
Growth rate	..	-2.0	-3.8	-3.3	11.7
Consumer expenditure	3099	3376	4171	4310	4654
Real consumer expenditure	3099	3103	3176	2813	2974
Growth rate	..	0.1	2.4	-11.4	5.7
Liaoning					
Total household income	3242	3888	4601	5057	5687
Real income	3242	3574	3504	3312	3676
Growth rate	..	10.2	-2.0	-5.5	11.0
Consumer expenditure	2837	3475	4484	4604	5040
Real consumer expenditure	2837	3194	3415	2973	3210
Growth rate	..	12.6	6.9	-12.9	8.0
Overall staff and workers' living cost index (1986=100.0)	100.0	108.8	131.3	152.7	154.7
Growth rate	7.0	8.8	20.7	16.3	1.3

The income and consumer development at household level in the period 1986-90 is set out in Table 9.4, which includes both nominal and real values. The average income of the Liaoning household bypassed that of the Sichuan household in the course of this period through a "leap" in 1987[36]. The real (deflated) values of income and consumption expenditure are arrived by deflating nominal values. SYC gives two price indexes: an overall retail price index and and an overall staff

[35] We have for practical reasons not corrected for relatively small panel element in the data, which will exert a slightly distorting effect on the year-by-year expenditure data.

[36] It is not altogether clear whether this may be an effect of a change in the sampling frame or not. Some odd changes from 1986 to 1987 have been noted elsewhere.

and workers' living cost index[37]. The price increase in the period 1985-1990 is registered as slightly higher for the latter index, which is the one adhered to here[38]. The inflation rate reached a menacingly 9% in 1987, then exploded by post-1949 Chinese standard in 1988 by a inflation rate of more than 20% and was still high in 1989 with 16%. In 1990 inflation had been brought under control again and was only at the level of 1%[39].

The real household income in Sichuan decreased throughout the period until a strong recovery in 1990, while the Liaoning average income increased sharply in 1987, decreased in the next two years as inflation ravaged and recovered in 1990. The real consumption expenditure followed the same pattern in both provinces, increased until 1988, retreated in 1989 and recovered somewhat in 1990. The 1990 level was in Sichuan lower than that of 1986. The movements in incomes and expenditure followed the same pattern in both provinces, and surely in urban areas in other provinces as well. (The main difference between the two provinces is the "leap" in income and expenditure in Liaoning in 1987, which might be a sampling effect.)

By 1990 real income was higher than in 1986 in both provinces, in Sichuan only by 1.9%, but in Liaoning by 13.4%. In view of the low income growth and the burden on the household economy of financing the surge in durable expenditure (refrigerator and colour TV!), it is not surprising that real consumer expenditure in Sichuan by 1990 was actually 4.0% lower than in 1986, while in Liaoning there was an increase in the same period of 13.1%.

Table 9.5: Durable goods and saving ratios, 1986-1990. Per cent

	1986	1987	1988	1989	1990
Sichuan					
Durables/total expenditure	14.2	13.1	16.8	13.8	12.1
Saving/income	8.4	6.4	0.4	8.5	12.7
Liaoning					
Durables/total expenditure	12.5	15.3	21.5	17.6	14.0
Saving/income	12.5	10.6	2.6	9.0	11.4

In Table 9.5 the expenditure on durable goods as a share of total expenditure (also given in Table 9.1) is juxtaposed with the saving ratios of the same years. The saving ratios show how saving dropped abruptly in 1988 when both total expenditure and expenditure on durable goods

[37] Hussain & al. [10], apply province-specific "proxy" price indices, constructed at LSE.

[38] The overall staff and workers' living cost index as published in the SYC has 1957=100.0. It has just been recalculated here to give 1986=100.0.

[39] It is common to hear doubts from Chinese observers as to whether the official indices measured inflation appropriately in 1987-89, comp. [18], p.18.

peaked[40]. The development of the saving ratios mirrors the durable ratio. The expenditure on durable goods reflects naturally both trend and cyclical movements. The rush to buy durable goods to secure the purchasing value of liquidity seems to have been an important phenomenon in the middle of the observation period overshadowing the underlying trend development.

To shed additional light on the durable "bubble" in 1988 Table 9.6 presents information on the proportion of households buying each kind of major durables in 1986-90 and the unit (average) prices paid for these goods. This serves again to corroborate the observations we have already made in relation to the inventory of and expenditures on major durables. Durable aquisition is by definition discrete and lumpy decisions.

Table 9.6: The proportion of households buying major durables and average prices paid. Sichuan and Liaoning, 1986-90. Per cent and RMB yuan

	1986		1987		1988		1989		1990	
	pct.	price	pct.	price	pct.	price	pct.	price	pct.	price
Sichuan										
Bicycles	15.0	175.8	8.0	200.1	10.2	203.8	6.5	270.1	7.1	252.0
Sewing machines	1.7	147.9	1.7	153	1.6	166.6	0.4	246.4	0.9	226.8
Electric fan	22.8	104.7	20.9	101.7	22.9	106.1	11.3	122.4	13.5	131.1
Washing machines	11.2	343.7	9.7	373.3	10.0	441.6	3.1	486.7	4.4	498.6
Refrigerators	8.0	955.7	12.0	1243.4	11.8	1570.1	9.3	1762.7	7.8	1349.2
Colour TV	8.5	1433	5.5	1485.2	9.5	2164.9	8.0	2685.1	5.6	2392.5
Black & white TV	1.3	382	1.2	263.3	1.8	468.7	0.4	612.5	0.7	450.0
Recorders	9.3	448.4	8.8	419.2	8.4	377.9	4.9	355.2	4.0	267.8
Cameras	5.2	208.2	3.0	180.8	2.7	300.1	1.5	233.3	2.4	403.3
Liaoning										
Bicycles	20.2	176.4	19.0	189.1	15.7	201.5	10.2	230.4	10.9	245.8
Sewing machines	0.8	158.2	1.7	163.4	1.2	198.9	0.5	240.0	0.3	264.5
Electric fans	3.2	177.7	4.0	146.1	4.8	220.4	3.8	217.5	4.0	235.5
Washing machines	7.2	344.2	4.3	382.7	8.0	457.6	3.5	539.9	2.5	587.3
Refrigerators	4.2	1301.9	7.5	1595.6	11.3	2058.0	12.7	2243.5	7.9	1865.5
Colour TV	7.8	1471.6	10.8	1700.1	14.0	2355.4	7.7	2849.3	6.0	2799.5
Black & White TV	1.2	264.6	1.0	405.8	0.3	85.0	0.17	130.0	0.2	650.0
Recorders	7.7	427.1	7.5	493.0	9.0	452.3	5.3	375.3	3.5	240.0
Cameras	2.7	118.6	3.2	188.9	4.0	295.8	2.5	272.1	3.4	301.7

[40] Saving ratios are throughout higher in Liaoning than in Sichuan. Aaberge & al. [1] find that household saving ratio vary relatively little by income decile groups and note that if the concept of household saving was extended to include net increases in the stock of consumer durables, saving ratios would vary more by income.

10. Conclusion

For Chinese households the 1980s have been years of economic reform with many changes affecting individuals and households. Generally it has been a period of improved living conditions. The high economic growth sustained by the Chinese economy through most of the 1980s has perhaps given more promises for the future than benefits to be reaped along the way. But there certainly have been material improvements, and one distinctive mark of this period has been the rapid aquisition of durables. This has come about by factors on the supply side, such as the growth of consumption goods industries in China (including conversion of military industries to produce consumer goods!), as well as on the demand side, such as satisfying the (suppressed) cumulated needs for more comfortable living made possible by increased incomes and, at least, some possibilities for loan financing. The increased knowledge about other countries brought about by mass media, personal experiences, and grapevine information has probably stimulated and enhanced common ideas about an attainable standard of living.

The data from the Urban Household Survey covers non-agricultural urban households which constitutes less than 20% of the Chinese population (but this mass of still would still make up the third most populous country in the world!). The UHS data studied were selected from only two of the thirty provinces, but can nevertheless be interpreted as representative of urban China.

The living conditions of urban households have been described by means of the UHS data in terms of living space, other dwelling conditions, income and consumption expenditure. The standard of living as measured by income is low in international comparison. Conversion by exchange rates shows that income per capita has been falling over the last 10-15 years, as the relative devaluation of the Chinese currency has been faster than the growth of the Chinese economy. Proper purchasing parity comparisons would probably give other results, however, and put China in the middle-income class of countries rather than among the low-income countries ([21]).

The effects of dramatic political events such as the Cultural Revolution has left deep marks in the demographic and educational background variables of the Chinese urban households. These effects were found to be very visible and important. The effect of the long period of closed institutions of higher education during the Cultural Revolution have had more important effects on woman than on men. The one-child policy has been in effect for more than ten years and will exert an influence on the Chinese society for decades and perhaps centuries. The immediate effects in terms of smaller families are easily observable.

The years covered by the UHS data shows that a system of fixed nominal incomes, but increasingly exposed to market fluctuations may cause uneven development as shown by the ups and downs of households' real income in this period. Whether the outburst of inflation in the late 1980s should be interpreted as an early warning of the dangers that the economic reform process might involve or, on the contrary, showing that the reform process *is* under firm political control, is a matter of viewpoint.

The economic situation in China can hardly be separated from the political situation, especially not when discussing the economic reform process which has been going on since the late

1970s and will unfold itself over the next decades. Chinese urban households might even be more concerned about the long-term political development than the short-term economic improvements. The real issue is whether the economic reform process launched by the Chinese authorities is a viable venture. Although the reform process seems tro have resulted in important gains until now, the whole concept of gradual and partial reforms goes against the grain with regard to the reform measures recommended or prescribed for other formerly centrally planned countries (generally of the "big bang" type with warnings against attempts at gradual reform, see Gelb & al. [21]). China may for a number of reasons be incomparable with the former Soviet Union and Eastern Europe. We shall not express any opinion on the viability of the Chinese reform process, just underline the need for monitoring the development, not only in terms of macroeconomic aggregates, but also including indicators of the living conditions of Chinese urban and rural households.

The use made above of UHS data may illustrate features fairly easy to monitor by (resource demanding!) surveys like UHS. There is a need, however, to adapt the survey to changing circumstances, e.g. to keep it representative by including new groups (comp. footnote 21), by adapting specifications to focus upon important household decisions as the households' decision set expands. More freedom for the households for decisions in the labour market, in financial markets, and in other areas should naturally be reflected in the monitoring survey.

References

[1] Aaberge, Rolf, Xiaojie Chen, Jing Li and Xuezeng Li: The structure of economic inequality among households living in urban Sichuan and Liaoning, 1990. Discussion Paper No. 70, Central Bureau of Statistics, Oslo, 1992

[2] Aaberge, Rolf and Xuezeng Li: The trend in income inequality in urban Sichuan and Liaoning, 1986-1990. Discussion Paper No. 75. Central Bureau of Statistics, Oslo, 1992

[3] Dessi, Roberta: Household saving and wealth in China: some evidence from survey data. DAE Working Paper, No. 9112, Department of Applied Economics, University of Cambridge, July 1991

[4] *The Economist Book of Vital Statistics*. The Economist Books Ltd, 1990

[5] Hu, Teh-Wei, Ming Li and Shuzhong Shi: Analysis of Wages and Bonus Payments Among Tianjin Urban Workers. *The China Quarterly*, March 1988

[6] Hu Teh-Wei, Ming Li and Shangjin Wei: Household durable goods ownership in Tianjin, China. Unpublished, August 1988

[7] Hu, Teh-Wei, Jushan Bai and Shuzhong Shi: Household Expenditure Patterns in Tianjin, 1982 and 1984. *The China Quarterly*, June 1987

[8] Hu, Teh-Wei, Jushan Bai and Jiarong Fu: The Linear Expenditure System: An application to households in a large Chinese city. Unpublished.

[9] Huang Langhui and Cheng Xuebin: Sample design of the urban household income and expenditure survey in China. Paper presented at International Statistical Institute, 48th Session, Cairo, 9-17 September, 1991

[10] Hussain, Athar, Peter Lanjouw and Nicholas Stern: Income Inequalities in China: Evidence from Household Survey Data. Working Paper CP/18, Suntory-Toyota Centre for economics and Related Disciplines, London School of Economics, November 1991

[11] Lewis, Philip and Neil Andrews: Household demand in China. *Applied Economics*, 21, 793-807, 1989

[12] Lin, Nan and Yanjie Bian: Getting Ahead in Urban China. *American Journal of Sociology*, 1991

[13] *China - Forty Years of Urban Development*. State Statistical Bureau, 1990

[14] *Statistical Yearbook of China (SYC) 1990.* State Statistical Bureau, 1991

[15] *Statistical Yearbook of China (SYC) 1991.* State Statistical Bureau, 1992

[16] "A Brief Introduction on the Urban Households Survey of China", "Organization and Implementation of China's Urban Household Survey". State Statistical Bureau. Unpublished notes

[17] *Statistical Yearbook of Sichuan 1991.* Sichuan Provincial Statistical Bureau, Chengdu, 1992

[18] Walder, Andrew G.: Urban Industrial Workers: Some Observations on the 1980s. In Rosenbaum, Arthur Lewis (ed.): *State and Society in China,* Westview Press, Colorado, 1992

[19] Li, Xuezeng, Shengming Yang and Juhuang He: *The Structure of China's Domestic Consumption.* World Bank Staff Working Papers, No. 755, The World Bank, Washington D.C., 1985

[20] *China - Implementation Options for Urban Housing Reform.* A World Bank Country Study, The World Bank, Washington D.C., 1992

[21] Gelb, Alan, Gary Jefferson and Inderjit Singh: Can Communist Economies Transform Incrementally? The Experience of China. Paper presented at Eight Annual Macroeconomics Conference of National Bureau of Economic Research, March 1993.

ISSUED IN THE SERIES DISCUSSION PAPER

No. 1 *I. Aslaksen and O. Bjerkholt (1985)*: Certainty Equivalence Procedures in the Macroeconomic Planning of an Oil Economy.

No. 3 *E. Biørn (1985)*: On the Prediction of Population Totals from Sample surveys Based on Rotating Panels.

No. 4 *P. Frenger (1985)*: A Short Run Dynamic Equilibrium Model of the Norwegian Production Sectors.

No. 5 *I. Aslaksen and O. Bjerkholt (1985)*: Certainty Equivalence Procedures in Decision-Making under Uncertainty: An Empirical Application.

No. 6 *E. Biørn (1985)*: Depreciation Profiles and the User Cost of Capital.

No. 7 *P. Frenger (1985)*: A Directional Shadow Elasticity of Substitution.

No. 8 *S. Longva, L. Lorentsen and Ø. Olsen (1985)*: The Multi-Sectoral Model MSG-4, Formal Structure and Empirical Characteristics.

No. 9 *J. Fagerberg and G. Sollie (1985)*: The Method of Constant Market Shares Revisited.

No. 10 *E. Biørn (1985)*: Specification of Consumer Demand Models with Stochastic Elements in the Utility Function and the first Order Conditions.

No. 11 *E. Biørn, E. Holmøy and Ø. Olsen (1985)*: Gross and Net Capital, Productivity and the form of the Survival Function. Some Norwegian Evidence.

No. 12 *J.K. Dagsvik (1985)*: Markov Chains Generated by Maximizing Components of Multidimensional Extremal Processes.

No. 13 *E. Biørn, M. Jensen and M. Reymert (1985)*: KVARTS - A Quarterly Model of the Norwegian Economy.

No. 14 *R. Aaberge (1986)*: On the Problem of Measuring Inequality.

No. 15 *A.-M. Jensen and T. Schweder (1986)*: The Engine of Fertility - Influenced by Interbirth Employment.

No. 16 *E. Biørn (1986)*: Energy Price Changes, and Induced Scrapping and Revaluation of Capital - A Putty-Clay Model.

No. 17 *E. Biørn and P. Frenger (1986)*: Expectations, Substitution, and Scrapping in a Putty-Clay Model.

No. 18 *R. Bergan, Å. Cappelen, S. Longva and N.M. Stølen (1986)*: MODAG A - A Medium Term Annual Macroeconomic Model of the Norwegian Economy.

No. 19 *E. Biørn and H. Olsen (1986)*: A Generalized Single Equation Error Correction Model and its Application to Quarterly Data.

No. 20 *K.H. Alfsen, D.A. Hanson and S. Glomsrød (1986)*: Direct and Indirect Effects of reducing SO_2 Emissions: Experimental Calculations of the MSG-4E Model.

No. 21 *J.K. Dagsvik (1987)*: Econometric Analysis of Labor Supply in a Life Cycle Context with Uncertainty.

No. 22 *K.A. Brekke, E. Gjelsvik and B.H. Vatne (1987)*: A Dynamic Supply Side Game Applied to the European Gas Market.

No. 23 *S. Bartlett, J.K. Dagsvik, Ø. Olsen and S. Strøm (1987)*: Fuel Choice and the Demand for Natural Gas in Western European Households.

No. 24 *J.K. Dagsvik and R. Aaberge (1987)*: Stochastic Properties and Functional Forms of Life Cycle Models for Transitions into and out of Employment.

No. 25 *T.J. Klette (1987)*: Taxing or Subsidising an Exporting Industry.

No. 26 *K.J. Berger, O. Bjerkholt and Ø. Olsen (1987)*: What are the Options for non-OPEC Countries.

No. 27 *A. Aaheim (1987)*: Depletion of Large Gas Fields with Thin Oil Layers and Uncertain Stocks.

No. 28 *J.K. Dagsvik (1987)*: A Modification of Heckman's Two Stage Estimation Procedure that is Applicable when the Budget Set is Convex.

No. 29 *K. Berger, Å. Cappelen and I. Svendsen (1988)*: Investment Booms in an Oil Economy -The Norwegian Case.

No. 30 *A. Rygh Swensen (1988)*: Estimating Change in a Proportion by Combining Measurements from a True and a Fallible Classifier.

No. 31 *J.K. Dagsvik (1988)*: The Continuous Generalized Extreme Value Model with Special Reference to Static Models of Labor Supply.

No. 32 *K. Berger, M. Hoel, S. Holden and Ø. Olsen (1988)*: The Oil Market as an Oligopoly.

No. 33 *I.A.K. Anderson, J.K. Dagsvik, S. Strøm and T. Wennemo (1988)*: Non-Convex Budget Set, Hours Restrictions and Labor Supply in Sweden.

No. 34 *E. Holmøy and Ø. Olsen (1988)*: A Note on Myopic Decision Rules in the Neoclassical Theory of Producer Behaviour, 1988.

No. 35 *E. Biørn and H. Olsen (1988)*: Production - Demand Adjustment in Norwegian Manufacturing: A Quarterly Error Correction Model, 1988.

No. 36 *J.K. Dagsvik and S. Strøm (1988)*: A Labor Supply Model for Married Couples with Non-Convex Budget Sets and Latent Rationing, 1988.

No. 37 *T. Skoglund and A. Stokka (1988)*: Problems of Linking Single-Region and Multiregional Economic Models, 1988.

No. 38 *T.J. Klette (1988)*: The Norwegian Aluminium Industry, Electricity prices and Welfare, 1988.

No. 39 *I. Aslaksen, O. Bjerkholt and K.A. Brekke (1988)*: Optimal Sequencing of Hydroelectric and Thermal Power Generation under Energy Price Uncertainty and Demand Fluctuations, 1988.

No. 40 *O. Bjerkholt and K.A. Brekke (1988)*: Optimal Starting and Stopping Rules for Resource Depletion when Price is Exogenous and Stochastic, 1988.

No. 41 *J. Aasness, E. Biørn and T. Skjerpen (1988)*: Engel Functions, Panel Data and Latent Variables, 1988.

No. 42 *R. Aaberge, Ø. Kravdal and T. Wennemo (1989)*: Unobserved Heterogeneity in Models of Marriage Dissolution, 1989.

No. 43 *K.A. Mork, H.T. Mysen and Ø. Olsen (1989)*: Business Cycles and Oil Price Fluctuations: Some evidence for six OECD countries. 1989.

No. 44 *B. Bye, T. Bye and L. Lorentsen (1989)*: SIMEN. Studies of Industry, Environment and Energy towards 2000, 1989.

No. 45 *O. Bjerkholt, E. Gjelsvik and Ø. Olsen (1989)*: Gas Trade and Demand in Northwest Europe: Regulation, Bargaining and Competition.

No. 46 *L.S. Stambøl and K.Ø. Sørensen (1989)*: Migration Analysis and Regional Population Projections, 1989.

No. 47 *V. Christiansen (1990)*: A Note on the Short Run Versus Long Run Welfare Gain from a Tax Reform, 1990.

No. 48 *S. Glomsrød, H. Vennemo and T. Johnsen (1990)*: Stabilization of emissions of CO_2: A computable general equilibrium assessment, 1990.

No. 49 *J. Aasness (1990)*: Properties of demand functions for linear consumption aggregates, 1990.

No. 50 *J.G. de Leon (1990)*: Empirical EDA Models to Fit and Project Time Series of Age-Specific Mortality Rates, 1990.

No. 51 *J.G. de Leon (1990)*: Recent Developments in Parity Progression Intensities in Norway. An Analysis Based on Population Register Data.

No. 52 *R. Aaberge and T. Wennemo (1990)*: Non-Stationary Inflow and Duration of Unemployment.

No. 53 *R. Aaberge, J.K. Dagsvik and S. Strøm (1990)*: Labor Supply, Income Distribution and Excess Burden of Personal Income Taxation in Sweden.

No. 54 *R. Aaberge, J.K. Dagsvik and S. Strøm (1990)*: Labor Supply, Income Distribution and Excess Burden of Personal Income Taxation in Norway.

No. 55 *H. Vennemo (1990)*: Optimal Taxation in Applied General Equilibrium Models Adopting the Armington Assumption.

No. 56 *N.M. Stølen (1990)*: Is there a NAIRU in Norway?

No. 57 *Å. Cappelen (1991)*: Macroeconomic Modelling: The Norwegian Experience.

No. 58 *J. Dagsvik and R. Aaberge (1991)*: Household Production, Consumption and Time Allocation in Peru.

No. 59 *R. Aaberge and J. Dagsvik (1991)*: Inequality in Distribution of Hours of Work and Consumption in Peru.

No. 60 *T.J. Klette (1991)*: On the Importance of R&D and Ownership for Productivity Growth. Evidence from Norwegian Micro-Data 1976-85.

No. 61 *K.H. Alfsen (1991)*: Use of macroeconomic models in analysis of environmental problems in Norway and consequences for environmental statistics.

No. 62 *H. Vennemo (1991)*: An Applied General Equilibrium Assessment of the Marginal Cost of Public Funds in Norway.

No. 63 *H. Vennemo (1991)*: The marginal cost of public funds: A comment on the literature.

No. 64 *A. Brendemoen and H. Vennemo (1991)*: Aclimate convention and the Norwegian economy: A CGE assessment.

No. 65 *K. A. Brekke (1991)*: Net National Product as a Welfare Indicator.

No. 66 *E. Bowitz and E. Storm (1991)*: Will restrictive demand policy improve public sector balance?

No. 67 *Å. Cappelen (1991)*: MODAG. A Medium Term Macroeconomic Model of the Norwegian Economy.

No. 68 *B. Bye (1992)*: Modelling Consumers' Energy Demand.

No. 69 *K. H. Alfsen, A. Brendemoen and S. Glomsrød (1992)*: Benefits of Climate Policies: Some Tentative Calculations.

No. 70 *R. Aaberge, Xiaojie Chen, Jing Li and Xuezeng Li (1992)*: The structure of economic inequality among households living in urban Sichuan and Liaoning, 1990.

No. 71 *K.H. Alfsen, K.A. Brekke, F. Brunvoll, H. Lurås, K. Nyborg and H.W. Sæbø (1992)*: Environmental Indicators.

No. 72 *B. Bye and E. Holmøy (1992)*: Dynamic equilibrium adjustments to a terms of trade disturbance

No. 73 *O. Aukrust (1992)*: The Scandinavian contribution to national accounting

No. 74 *J. Aasness, E, Eide and T. Skjerpen (1992)*: A criminometric study using panel data and latent variables

No. 75 *R. Aaberge and Xuezeng Li (1992)*: The trend in income inequality in urban Sichuan and Liaoning, 1986-1990

No. 76 *J.K. Dagsvik and Steinar Strøm (1992)*: Labor supply with non-convex budget sets, hours restriction and non-pecuniary job-attributes

No. 77 *J.K. Dagsvik (1992)*: Intertemporal discrete choice, random tastes and functional form

No. 78 *H. Vennemo (1993)*: Tax reforms when utility is composed of additive functions.

No. 79 *J. K. Dagsvik (1993):* Discrete and continuous choice, max-stable processes and independence from irrelevant attributes.

No. 80 *J. K. Dagsvik (1993):* How large is the class of generalized extreme value random utility models?

No. 81 *H. Birkelund, E. Gjelsvik, M. Aaserud (1993):* Carbon/energy taxes and the energy market in Western Europe

No. 82 *E. Bowitz (1993):* Unemployment and the growth in the number of recipients of disability benefits in Norway

No. 83 *L. Andreassen (1993):* Theoretical and Econometric Modeling of Disequilibrium

No. 84 *K.A. Brekke (1993):* Do Cost-Benefit Analyses favour Environmentalists?

No. 85 *L. Andreassen (1993):* Demographic Forecasting with a Dynamic Stochastic Microsimulation Model

No. 86 *G.B. Asheim and Kjell Arne Brekke (1993):* Sustainability when Resource Management has Stochastic Consequences

No. 87 *O. Bjerkholt and Yu Zhu (1993):* Living Conditions of Urban Chinese Households around 1990

P.B. 8131 Dep, 0033 Oslo 1, Norway
Tel: (47) 22 86 48 32,
Fax: (47) 22 11 12 38, Telex: 11 202 SSB N