Growth and Happiness in China, 1990-2015

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…[C]an't get no satisfaction!

Rolling Stones, 1965

In the past quarter century China's real GDP per capita has multiplied over five times, an unprecedented feat.[1] By 2012 virtually every urban household had, on average, a color TV, air conditioner, washing machine, and refrigerator. Almost nine in ten had a personal computer, and one in five, an automobile. Rural households lagged somewhat behind urban, but these same symptoms of affluence, which were virtually nonexistent in the countryside in 1990, had become quite common by 2012.[2] In the face of such new-found plenitude, one would suppose that the population's feelings of well-being would have enjoyed a similar multiplication. Yet, as will be seen, well-being today is probably less than in 1990.

This article, which builds on a prior study[3], describes the evolution of China's well-being in the quarter century since 1990, and suggests the likely reasons for the disparate trajectories of subjective well-being (SWB) and GDP per capita (hereafter, simply GDP). The terms subjective well-being, life satisfaction, and happiness are used here interchangeably, and refer to people's overall evaluation of their lives. The article also describes important differences in subjective well-being among various groups in the population, and notes some possible reasons for these differences.

As in any historical study of a developing country, quantitative data are in short supply – though typically expanding and improving with time. The task of empirical study is to assemble and evaluate the quantitative evidence available, and assess its fit with the broader historical context, as is attempted here.

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Although the available measures of China's SWB in the period under study tend to be biased toward the urban sector, the same is true of economic growth.[4] Hence the present data should provide a reasonable perspective on the course of well-being in an area experiencing an unparalleled improvement in the per capita output and consumption of goods and services.

Long term movement

Since 1990 China's SWB has been U-shaped over time, falling to a 2000-2005 trough and then recovering (Fig. 1).[5] This pattern is found in four different series that reach back into the 1990s – WVS, Gallup1 and 2, and Horizon. The fifth series in Figure 1, based on the China General Social Survey (CGSS) only starts in the 2000s, and trends upward, like the other series in the same time span. The series that include 1990s data come from three different survey organizations, two American and one Chinese. In every one pre- and post-trough values are higher than those in 2000-2005, even though the series differ in their origin, measure of SWB, and sample size (see Technical Box 1). The consistency of the results from these different series strengthens the finding on the overall movement. Lack of annual data prevents more precise dating of the trough in SWB. Additional support for the U-shape is provided by the 95% confidence interval bars presented for the WVS data. There is no overlap between the confidence interval at the 2000-2005 trough and the corresponding intervals for the initial value of the series in1990 and the terminal value in 2012.

The 1990 WVS value of 7.29 for SWB seems high for what was then a poor country, but several considerations point to its plausibility.[6] China's urban labor market at that time has been described as a "mini-welfare state", its workers, as having an "iron rice bowl."[7] Concerns about one's current and future job and family security were virtually non-existent. Those employed by public enterprises (which accounted for the bulk of urban employment) were essentially guaranteed life-time jobs, and had benefits that included subsidized food, housing, health care, child care, and pensions, as well as assurance of jobs for their grown children. Russia's labor and wage policies served as the model for communist China, and

China's value of 7.29 is almost identical to the 7.26 found in the available data for pre-transition Russia.[8] In 1990 life satisfaction differences by socio-economic status in China were very small, as was true also of former Soviet Union countries prior to transition.[9] In the 1990 survey data for China, mean values exceeding 7.0 are found across the distributions by education, occupation, and income; hence the high overall average cannot be attributed to a disproportionate representation in the 1990 survey of those with high life satisfaction.

It is doubtful that the recovery in SWB by the end of the period reaches a value exceeding that in 1990. In the WVS series, the one covering the longest time span, the terminal value of 6.85 in 2012 is significantly less than the 1990 value of 7.29. The upper bound of the 95% confidence interval in 2012 is 6.93, well below the lower bound of 7.16 in 1990. Another indication that China has not recovered to its 1990 value is the slippage in its worldwide ranking by SWB. If the 2012 high-to-low array of 100 countries with recent WVS data is taken as a reference,[10] then China falls from 28th to 50th between 1990 and 2012. The middling position of China in the 2012 WVS ranking is fairly consistent with that in the current Gallup World Poll ladder-of- life array for 157 countries -- in 2013-15 China was 83rd.[11]

The SWB pattern for China calls into question the relevance of point-of-time (cross section) relationships as a basis for predicting actual change over time. A positive international cross section relationship between SWB and GDP is typically found in the happiness literature, and has often been the basis for claiming that economic growth increases subjective well-being.[12] Based on the regression results of such cross section studies, China's striking five-fold multiplication of GDP in a quarter century would be expected to increase SWB by anywhere from six-tenths to a full point or more on a 1-10 life satisfaction scale.[13] It is noteworthy that four different surveys reaching back into the 1990s fail to give evidence of an increase approaching this magnitude.

The positive cross section relation of SWB to GDP implies that the growth rates of GDP and SWB will be positively related. But China's growth rate of GDP goes through three cycles between 1990

and 2012 while SWB goes through only one. Moreover, the growth rate of GDP is highest around 2005 (figure 2, left panel) when SWB is just about at its lowest. Also noteworthy is the disparate course of the rate of inflation, which has typically been found to have an inverse relation to SWB.[14] In China in 2000-2005, when SWB was at its lowest, the rate of inflation was also low --lower than in any other years between 1994 and 2015 (Figure 2, right panel, and Table A2). Neither GDP nor inflation have time series patterns that might explain the course of SWB.

Although China's subjective well-being does not have the expected relation to GDP or inflation, its overall trajectory is the same as the SWB pattern in European countries transitioning from socialism to capitalism from the late 1980s onward. For those countries whose SWB data extend back into the socialist period, SWB invariably follows a U- or V-shaped pattern.[15] Unlike China, however, where GDP grows at an unprecedented rate, in the European countries GDP collapses and recovers in a pattern much like that of SWB, a difference between China and Europe to be discussed subsequently.

Determinants of the SWB trajectory

Two factors appear to have been of critical importance in forming the U-shaped course of subjective well-being in China – unemployment and the social safety net. In the 1990s severe unemployment emerged and the social safety net broke down. The "iron rice bowl" was smashed, giving rise to urgent new concerns about jobs, income security, family, and health. Although incomes rose for most of those who had jobs, the positive effect on well-being of income growth was offset by a concurrent rise in material aspirations.[16]

In its survey of findings on subjective well-being, the high profile Stiglitz-Sen-Fitoussi Commission states: "One aspect where all research on subjective well-being does agree concerns the high human costs associated with unemployment."[17] The reason why unemployment has a major adverse effect on well-being is straightforward – jobs are of critical importance for sustaining people's livelihood,

family, and health, and it is concerns with these personal circumstances that are foremost in shaping people's happiness.[18]

The quantitative evidence on unemployment is consistent with the view that unemployment has been an important determinant of China's SWB trajectory. The unemployment rate rose sharply from near-zero shortly before 1990 to double-digit levels in 2000-2005, and then declined moderately. Although the unemployment estimates are somewhat rudimentary,[19] this pattern appears consistently in unemployment data from several different sources (Fig. 3). Subjective well-being largely mirrors inversely the path of the unemployment rate. As the rate rises, SWB declines; as the rate falls, SWB increases. The 2000-2005 trough in SWB occurs when the unemployment rate reaches its peak.

The term "massive" is used repeatedly by China specialists in describing the precipitous upsurge in unemployment that began in the 1990s.[20] In little more than a decade (1992-93 to 2004) 50 out of 78 million lost their jobs in state-owned enterprises (SOEs), and another 20 million were laid off in urban collectives.[21] Knight and Song aptly describe this period as one of "draconian … labor shedding."[22]

The impact of unemployment on SWB was not confined to those who lost their jobs. As has been demonstrated in the SWB literature[23] increased unemployment also reduces the well-being of those who remain employed, because they fear for their own jobs as layoffs increase. An indication of the widespread anxiety associated with a high level of unemployment in China is the answer to a nationally representative survey question that asked, "Now thinking about our economic situation, how would you describe the current economic situation in China: is it very good, somewhat good, somewhat bad or very bad?" In 2002 when unemployment was at two-digit levels, almost half of respondents (48 per cent) answered somewhat or very bad; by 2014, when the unemployment rate had markedly improved, only six per cent fell in these two categories.[24] The survey responses also demonstrate how employment is what matters for SWB, not growth of GDP. The growth rate of GDP was considerably higher in 2002 than in

2014 (Figure 2, left panel, and Table A2), but respondents assessed the state of the economy as much worse in 2002.

Along with the upsurge in unemployment, the social safety net, whose benefits were employer-provided, broke down, aggravating the decline in SWB. As workers lost jobs, their benefits disappeared, though for a modest fraction temporary support was provided through an urban layoff program. Those who found jobs in private firms no longer enjoyed the benefits that they previously had in the public sector. Even for those who retained public jobs, new government policies abolished guaranteed employment and life-time benefits.

The unemployment rate is itself an indicator of safety net coverage because benefits were employment-dependent. Survey data on pension and health care coverage provide additional quantitative evidence of the course of safety net benefits (Figure 4). Note that the pattern in these safety net indicators tends to be U-shaped, and the trough in coverage occurs in 2000-2005 when unemployment peaks and SWB reaches its lowest point.

The emergence of extensive unemployment and dissolution of the social safety net were due to the initiation by the government of a comprehensive policy of restructuring SOEs, many of which were inefficient and unprofitable. Although the new policy was successful in stimulating economic growth, it marked an abrupt end to the era of "reform without losers." As Naughton points out, urban SOE workers "bore the brunt of reform-related costs."[25] According to a World Bank report, "by all measures, SOE restructuring had a profound effect on … the welfare of millions of urban workers."[26] The quantitative unemployment, safety net, and SWB patterns here are consistent with these statements.

Faced with massive and rising urban unemployment, government policy shifted gears. Beginning in 2004 the rate at which SOEs were down-sized diminished sharply. Between 1995 and 2003, reduced employment in SOEs far exceeded increased employment elsewhere in the urban sector; thereafter, the situation was reversed, and the unemployment rate improved (Figure 3).[27] The safety net, as indexed by

healthcare and pension coverage, also started to get better (Figure 4). The result was a turnaround and gradual recovery of SWB.

In 2000-2005 the growth rate of GDP was approaching its highest level at the same time that unemployment was rising. How could output be growing, and so rapidly, when employment was falling? The answer is that China's restructuring policy involved greatly expanded support for a relatively small proportion of large, capital-intensive, and high productivity SOEs at the expense of numerous small, labor- intensive, and low productivity SOEs, a policy officially labeled "Grasping the big and letting go of the small." As described by Huang:[28]

> "Grasping the big" meant restructuring, consolidating, and strengthening China's largest SOEs…. "Letting go of the small" meant that the government supported privatization of individually small but numerically numerous SOEs. These are labor-intensive firms and singling them out for privatization, with no established social protection in place, led to massive unemployment, social instability, and wrenching human costs…. Instead of managing tens of thousands of small firms scattered around the country, the Chinese state could now focus on only a few thousand firms [which benefitted from] a massive reallocation of financial, human, and managerial resources away from the small SOEs to a handful of the largest SOEs.

This redistribution of resources from low productivity small SOEs to high productivity large SOEs resulted in a strong upsurge in output at the same time that small SOEs shed labor, creating a large pool of unemployed. As Huang points out, "…GDP growth in the 1990s increasingly was disconnected from the welfare of Chinese citizens."[29] The survey responses reported above on the state of the economy in 2002 and 2014 provide concrete evidence of the continuation of this disconnect. The economy was viewed by the public as much worse in 2002, even though the GDP growth rate was considerably higher than in 2014.

The difference between China's GDP trajectory during transition and that of the European countries appears to be due to the difference in restructuring policies. In both cases restructuring led to massive unemployment. But while the European transition countries abandoned the entire public sector to privatization and experienced a major GDP collapse, China invested heavily in the most productive SOE's and was rewarded with significant output growth.

Other social and economic factors

Is China's SWB trajectory a reflection also of societal conditions such as social capital, income inequality, or environmental pollution? What about the "predictors" of cross section SWB differences among countries identified in previous World Happiness Reports –material, social, and institutional supports for a good life -- do they explain the time series course of SWB in China?[30] To answer these questions this section examines the quantitative evidence to see whether changes over time in these variables conform as expected to the movement in SWB since 1990, as do the data on unemployment and the social safety net.

The measures of social capital examined here –trust in others and civic cooperation --are those used in a recent article that seeks to explain the change in China's life satisfaction from 1990 to 2007, one of the rare articles addressing change over time.[31] The specific questions and responses are given in Technical Box 2. The two indicators of social capital are treated separately in what follows.

Trust has an overall trajectory fairly similar to SWB, falling at the beginning of the period and rising at the end (Figure 5). It is plausible that in the 1990s, as restructuring led to the emergence and growth of unemployment and job competition, a decline in interpersonal trust occurred. Correspondingly, the upswing in employment during the 2000s' recovery may have helped restore trust. The decline and recovery of interpersonal trust may, in turn, have reinforced the U-shaped trajectory of SWB. The biggest difference between trust and SWB centers on the value in the 2000-2005 period. Trust is slightly higher,

but not much different from that in adjacent years, while SWB is lower. As noted previously, the lower value of SWB in the 2000-2005 period is credible because it is found in four different surveys conducted independently of each other.

Another measure of social capital is civic cooperation, a term reflecting disapproval of cheating or bribery in circumstances such as paying taxes or claiming government benefits (see Technical Box 2). The composite measure presented here is the average of four components, each of which has a pattern fairly similar to that in the summary measure (Technical Box 2 and Table A5). In each interval from 1990 to 2007 the summary measure of civic cooperation moves in the same direction as trust, though the movements in civic cooperation through 2001 are slight. After 2001, however, trust and civic cooperation begin to diverge noticeably and, from 2007 on, in seemingly contradictory directions -- a rise in trust being accompanied by a decline in civic cooperation, i.e., increased acceptance of cheating and bribery. Unlike trust, the overall pattern of change in civic cooperation consequently differs considerably from that in SWB, and casts doubt on any causal connection between the two.

The results in the general literature on the relation between income inequality and happiness are mixed—some studies report no relationship, while others find that an increase in inequality reduces happiness.[32] In China income inequality, as measured by the gini coefficient, has trended upward since the early 1980s, increasing when SWB is both falling and rising (Figure 6, panel A).[33] It is hard to see how the course of income inequality could explain the U-shaped movement of SWB. Indeed, as will be seen subsequently, since the beginning of the millennium, the life satisfaction difference between the lowest and highest income groups has diminished despite an increase in income inequality.

One might expect that the widely-publicized environmental pollution problem in China would have had an adverse impact on happiness. A recent study based on cross sectional data, however, finds no relation between pollution and overall life satisfaction, the measure of interest here, although there is a shorter-term effect on day-to-day moods.[34] The time series finding in the present analysis turns out to be

much like the nil cross section finding. If the trend in coal consumption is taken as a measure of the course of environmental pollution, one finds that coal consumption trends upward throughout most of the period, rising after 2005 at close to its highest rate, when life satisfaction is going up, not down (Figure 6, panel B).

Housing prices are also sometimes mentioned as a determinant of life satisfaction. The housing price data only start in 2000, about the time that a housing market becomes widely established in China. Housing prices trend steadily upward from 2000 on (Figure 6, panel C), a development that might be expected to reduce life satisfaction. But, in fact, life satisfaction rises, not falls.

There are six "predictors" of the point-of-time national evaluations of SWB presented in the World Happiness Reports – GDP per capita (in log form), healthy life expectancy, freedom to control one's life, corruption, social support, and giving to charity. Of these it is possible to obtain time series measures for China that span the period covered here for the first four. (In the 2016 World Happiness Report the time series course of healthy life expectancy is based on that in life expectancy at birth, and the latter is consequently used in the present analysis.)[35] None of these "predictors" has a time series pattern suggestive of a causal relation to SWB. GDP and life expectancy, which are themselves highly correlated, both trend upward throughout the period (Figure 7). Freedom to choose the course of one's life changes very little over time, and its movements do not conform to those in SWB. Corruption, approximated here by the acceptability of bribery, increases somewhat after 2001, but remains at a very low level. The two measures with the greatest changes—GDP and life expectancy— reach their highest values at the end of the period, but SWB does not.

The 2016 World Happiness Report presents a cross section regression equation based on data for 156 countries in the period 2006-2015 in which the six predictors are found to fit national ladder-of-life (LoL) evaluations with an R-squared of 0.74.[36] Another way of evaluating the predictors here is to see how well this cross section equation predicts China's actual LoL values from 2006 to 2015. If China's

values for the independent variables are entered in the equation, the answer is, not very well: the predicted values are uniformly higher, often by a substantial amount (Figure 8). Moreover, if one leaves aside the year 2006 (for which values for China are available for only three of the six independent variables) the predicted values exhibit a nil trend, while the actual trend is upward. In addition, bivariate time series correlations show that the variation in the predicted values from 2006 to 2015 is due, not to any of the six independent variables, but to the year dummies, which are an amalgam of the year dummies for the 156 countries in the regression analysis.[37] The predicted vs. actual LoL results support the previous conclusion that the cross section predictors fail to explain time series change.

As noted, the "predictors" relate to point-of-time differences among countries, not time series trends. Indeed, in the 2016 World Happiness Report, in an evaluation of the reasons for a decline in life satisfaction in four Eurozone countries hard hit by the Great Recession, the unemployment rate is added to the analysis and found to have an effect equal to that of all six predictors combined.[38] This result underscores the point that the variables found to be important for predicting cross section differences among countries may differ from those chiefly responsible for time series change.

Table 1 presents the bivariate correlation and corresponding p-value between life satisfaction and each of the variables discussed in this and the preceding section. (The housing price variable is not included because the series spans only half the period). Although five observations are very few for computing correlations, the pattern of results is, in general, consistent with the observations based on the graphs. The unemployment rate and safety net indicators come quite close to the 0.10 level of significance. Trust and income inequality have the next highest correlation coefficients, but the p-values are above 0.30. The remaining variables have even worse p-values, and, in some cases, the sign of the correlation coefficient is contrary to what might be expected. As a whole, the correlations uphold the conclusion that unemployment and the safety net have been the important forces shaping the course of China's life satisfaction.

Why are unemployment and the social safety net so important? The answer is that these factors bear most directly on the concerns foremost in shaping personal happiness—making a living, family life, and the health of oneself and one's family. It is these concerns that are typically cited by people worldwide when asked an open-ended question as to what is important for their happiness.[39] In contrast, broad societal matters such as inequality, pollution, political and civil liberties, international relations, and the like, which most individuals have little ability to influence, are rarely mentioned. Abrupt changes in these conditions may affect happiness, but for the most part, such circumstances are taken as given. The things that matter most are those that take up most people's time day after day, and which they think they have some ability to control.

Differences by socio-economic status and age

Although China's well-being declined, on average, and then recovered somewhat, there were significant differences among various groups in the population. Perhaps most striking was the severe impact of restructuring on those of lower socio-economic status (SES). In 1990 the difference in life satisfaction between the third of the population with the lowest incomes and that with the highest was quite small (Figure 9). Subsequently life satisfaction of the lowest third plunged markedly, while that of the highest actually improved slightly. The result was the emergence of a marked disparity in life satisfaction between the more and less affluent. Toward the end of the period life satisfaction of the lowest stratum recovered somewhat, and by 2012 the disparity in life satisfaction, though still sizeable, had shrunk considerably.[40] The standard deviation of life satisfaction, a measure reflecting all sources of life satisfaction differences, not just SES, follows the SES pattern of rising and decreasing inequality in life satisfaction (Figure 9, bottom).

The course of the life satisfaction difference by socio-economic status demonstrates the critical importance of full employment and safety net policies for the well-being of the most disadvantaged

segment of the population. As these policies were abandoned in the 1990s, the lowest socio-economic group was the one that suffered severely. Data by level of education are indicative of the differential employment and safety net effects. The unemployment rate of those with a primary education or less soared to almost 20 per cent in 2000-2005, while that of the college-educated group remained at less than 5 per cent (Figure 10). Similarly, pension and healthcare coverage of the less-educated declined much more than that of the more-educated (Figure 11). Consistent with these differences, satisfaction with finances and self-rated health increased for the highest income stratum and decreased for the lowest (Figures 12 and 13).[41] Eventually, as economic policy reversed and brought unemployment down, and substantial efforts were initiated to repair the social safety net,[42] these disparities diminished. Life satisfaction of the lowest third of the population recovered as employment and the safety net improved, though in 2012 it was still less than in 1990 (Figure 9).

Those aged 30 and over experienced large declines in life satisfaction over the quarter century studied here; men and women were about equally affected. In 1990 those aged 30 and over were already on a life course set under "iron rice bowl" conditions. The collapse of the traditional environment severely disrupted their lives, and substantially reduced their well-being. As economic restructuring took hold, the cohort of 1946-60, which spanned ages 30-44 in 1990, suffered the biggest decline in life satisfaction (Figure 14). From an initial situation in which virtually everyone had jobs, men and women alike, in 2002 less than 70 per cent were employed. Most of the remainder of the cohort, 21 per cent, had been forced into early retirement, and six per cent were unemployed.[43]

The next oldest cohort, that of 1936-45 also had a considerable initial drop in life satisfaction. However, the overall decline was cushioned, as most of this cohort reached retirement age (55 for women, 60 for men) by 2012 and qualified for pensions, though these were sometimes reduced or in arrears.[44]

In contrast, the younger cohort of 1961-70, which in 1990 was in its twenties, experienced only a mild decline in life satisfaction between 1990 and 2002, and ended up with life satisfaction about the

same as initially. The members of this and the successor cohorts were less wedded to traditional ways and better able to adapt to the new "free market" conditions, most notably by acquiring a college education. In 2002, 35 per cent of the cohort of 1961-70, which was then then in its thirties, had completed a college education; for the following cohort, that of 1971-80, the corresponding figure was 40 per cent. In contrast, among the older cohorts, those born before the 1960s, the percentage with a college education was 11 to 15 per cent.[45] As seen above, those belonging to the higher SES group – which includes those with a college education -- largely escaped the adverse impact on life satisfaction of economic restructuring; clearly young adults were among the beneficiaries.

As has been seen, China's overall U-shaped life satisfaction trajectory is much like that of Europe's transition countries. This similarity is also true of the differentials in life satisfaction that emerged. For both China and the European countries, small SES differences at the start of the transition were replaced by large disparities. [46] The lowest SES group experienced a severe decline in life satisfaction, while the upper tier typically enjoyed a mild improvement. Those under age 30 fared better than their older counterparts. [47] In both areas adaptation to the new environment was greatly facilitated by a college education.[48]

Differences by residence and migration status

Rural life satisfaction appears to have largely paralleled urban. Two different SWB series display similar trends in rural and urban areas, with the urban sector being somewhat higher throughout (Figure 15). The series start in the new millennium, because prior to that, no reasonably comparable rural-urban breakdown of SWB is available.

The 1990s saw the onset of a substantial movement from rural to urban areas, as government restrictions on migration were increasingly relaxed. According to census data, between 1990 and 2010 the proportion of people in cities that had a rural *hukou* (identifying the holder as a resident of a rural place) rose from 17 to 36 per cent.

Rural *hukou* holders in urban areas were initially treated as second-class citizens, but are gradually being assimilated.[49] The few life satisfaction surveys in the early 2000s that classified the urban population by *hukou* status uniformly found urban *hukou* holders with higher SWB than rural migrants.[50] While the upward trend in life satisfaction since then has been fairly similar for the two groups (Figure 14, bottom panel), the evidence is mixed on whether or not the gap has closed. In several surveys the gap persists, but in others it has disappeared.[51] A comparison between rural migrants and those remaining in rural areas is less ambiguous – initially the migrant group was higher, but in recent years there is no difference.[52]

Summary and implications

China's soaring GDP growth over the past quarter century is viewed by many analysts as the hallmark of a successful transition from socialism to capitalism. But if the welfare of the "common man" is taken as a criterion of success, then the picture is much less favorable and more like that of European transition countries. From 1990 to 2000-2005 life satisfaction in China, on average, declined. Since then it has turned upward, but is at present probably less than a quarter century ago. China's ranking in the international array of countries by SWB appears to have declined considerably since 1990. There is no evidence of an increase in life satisfaction of the sizeable magnitude that would be expected based on the international point-of-time relationship of happiness to GDP.

The lower income and older segments of the population have suffered most, and their life satisfaction remains below that in 1990. The upper income and youngest population groups have, in contrast, enjoyed fairly constant or a modest improvement in life satisfaction. The quite small life satisfaction differential by socio-economic-status that prevailed in 1990 has been replaced by a considerably larger one, though there has been some lessening since the SWB trough of 2000-2005.

The evidence on subjective well-being comes from four surveys conducted independently by three different survey organizations, and shows quite consistent results. Further support derives from the similarity between the course of SWB during China's transition and that in the European transition countries. The U-shaped pattern of SWB is a transition phenomenon common to both Europe and China.

To understand the course of well-being in China, one must recognize that few societies have undergone such wrenching change in such a short period of time. Isabelle Attane' and Baochang Gu convey succinctly the essence of this transformation:

> [T]he dismantling of collective structures under the reform and opening-up policy … overturned the social organization that had prevailed in previous decades, producing an impact that extended far beyond the economy alone. Previously, each individual had depended on the state, through his or her work unit, for all aspects of daily life. Everyone enjoyed guaranteed access to employment, housing, health, education of children, and for urban dwellers, retirement and social insurance. Gradually transferred to the private sector, these areas are now governed by the market, which makes access to them less systematic, and therefore increasingly unequal.[53]

The data here on life satisfaction provide a summary indication of the overall impact of this social transformation on people's lives. The circumstances through which SWB was most directly affected were labor market conditions and the social safety net. Briefly put, the dynamics of change are as follows. In the first part of the transition, as economic restructuring is undertaken, jobs and safety net benefits shrink markedly for the disadvantaged members of the population, and well-being suffers severely, especially for those who are older or in the lowest economic stratum. In contrast, life satisfaction of those who are in the highest economic stratum tends to improve slightly, while that of young adults, who are typically more-educated and better able to cope with the new economic environment, remains fairly constant. The difference in life satisfaction by socio-economic status, which initially was quite small, widens substantially. Eventually, as economic recovery takes hold, the job market improves. In addition,

the government, in response to symptoms of economic distress, starts to mend the social safety net. The result is that life satisfaction, on average, turns upward, and the disparity in life satisfaction between the more and less affluent shrinks. Life satisfaction of the disadvantaged, however, remains below its 1990 level.

The evidence supporting this interpretation is of two types. The first is quantitative time series on unemployment and the social safety net. These series move as one might expect in relation to SWB, in terms of both average levels and differences by SES. The second type of evidence is qualitative—descriptions by China specialists of the state of the economy and society, especially the job market and social protection. These qualitative accounts are consistent with the time series pattern in the quantitative data and contribute to its understanding.

Plausible causal variables other than GDP that fail the time series test of conformity to the SWB pattern are civic cooperation (one of the proxies for social capital), income inequality, environmental pollution, housing prices, life expectancy, freedom to control one's life, and corruption (as indexed by acceptance of bribery). Trust in others, another social capital proxy, is a borderline case, moving somewhat similarly to SWB, but less so than unemployment and the social safety net. The six predictors of point-of-time differences in SWB in the World Happiness Reports do not explain the time series change in China's SWB. As pointed out in the 2016 Report, the choice of these predictors is constrained by the limited availability of comparable data for a large number of countries worldwide,[54] and the variables that are, in fact, chosen "may be taking credit properly due to other better variables."[55]

The variables that appear to be of primary importance in explaining SWB are those that bear most directly on the personal concerns foremost in shaping happiness— jobs and job security, family life, and health. As has been seen, GDP is not as good an indicator of employment conditions as the unemployment rate. Healthy life expectancy, as actually measured, is dominated by changes in infant and child mortality; in contrast, the safety net measure of healthcare coverage bears directly on the health of

the adult population, that to whom the SWB data relate. Social support as indexed by "having someone to count on in times of trouble" is a less certain buttress than government unemployment insurance and income support programs. The preeminence of employment and the safety net in explaining SWB is because it is these circumstances that bear most immediately on people's happiness. Unfortunately, comparable data on these conditions for countries worldwide are not readily available or cross section study.

In policy circles subjective well-being is receiving increasing attention as an alternative or complement to GDP as a measure of well-being.[56] There could hardly be a better test case than China for comparing the two measures. As indexed by GDP, well-being in China has multiplied over five-fold; based on SWB, well-being is, on average, less than a quarter of a century ago. These disparate results reflect the different scope of the two measures. GDP relates to the economic side of life, and to just one dimension—the output of goods and services. SWB, in contrast, is a comprehensive measure of individual well-being, taking account of the variety of economic and noneconomic concerns and aspirations that principally determine people's well-being. There is no hint in GDP of the enormous structural changes that impacted people's lives in China. In contrast, SWB captures the increased anxiety and new concerns that emerged as a result of growing dependence on the labor market. If the objective of policy is to improve people's well-being, then SWB is a more meaningful measure than GDP, as China's experience attests.[57]

Technical Box 1. Surveys and Measures of Subjective Well-Being

World Values Survey (Sample Size: ~1,000–2,000). Life satisfaction: All things considered, how satisfied are you with your life as a whole these days? Please use this card to help with your answer. 1 (dissatisfied) 2 3 4 5 6 7 8 9 10 (satisfied)

Gallup1 (Sample Size: ~3,500). Life satisfaction: Overall, how satisfied or dissatisfied are you with the way things are going in your life today? Would you say you are 4, very satisfied; 3, somewhat satisfied; 2, somewhat dissatisfied; or 1, very dissatisfied?

Gallup2 1999, 2004 (Sample Size: ~4,000). Ladder of life: Please imagine a ladder with steps numbered from 0 at the bottom to 10 at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally stand at this time?

Gallup2: Gallup World Poll 2006-2015 (Sample Size: ~4,000, except 2012 ~9,000) Ladder of life: Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you, and the bottom of the ladder represents the worst possible life for you. On which step of the ladder would you say you personally stand at this time, assuming that the higher the step the better you feel about your life, and the lower the step the worse you feel about it? Which step comes closest to the way you feel?

Horizon 1997–1999, 2001 (Sample Size: ~5,000). (In Chinese) In general, are you satisfied with your current life: very satisfied, fairly satisfied, fairly dissatisfied, or very dissatisfied? (single answer). Coded 5, 4, 2, or 1.

Horizon 2000, 2002–2010 (Sample Size: ~2,500–5,500). (In Chinese) In general, are you satisfied with your current life: very satisfied, fairly satisfied, average, fairly dissatisfied, or very dissatisfied? (single answer). Coded 5, 4, 3, 2, or 1.

Chinese General Social Survey (CGSS) 2003, 2005, 2006, 2008, 2010-2013 (Sample Size: ~5,500-12,000). (In Chinese) On the whole, do you feel happy with your life: very unhappy, unhappy, so-so, happy, or very happy? (single answer). Coded 1, 2, 3, 4, or 5.

Technical Box 2. Measures of Social Capital and Freedom of Choice

World Values Survey 1990, 1995, 2001 (Sample Size: ~1,000–1,500). Trust: General speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? 1, most people can be trusted; 2, can't be too careful. Recoded 1 or 0.

World Values Survey 2007, 2012 (Sample Size: ~2000). Trust: General speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people? 1, most people can be trusted; 2, need to be very careful. Recoded 1 or 0.

World Values Survey (Sample Size: ~1,000–2000). Civic cooperation: Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between, using this card.

A) Claiming government benefits which you are not entitled to
Never 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 Always
B) Avoiding a fare on public transport
Never 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 Always
C) Cheating on tax if you have the chance
Never 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 Always
D) Someone accepting a bribe in the course of their duties
Never 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 Always
Recoded 10, 9, 8, 7, 6, 5, 4, 3, 2, or 1 for each item.

World Values Survey (Sample Size: ~1,000–2000). Freedom of choice: Some people feel they have completely free choice and control over their lives, and other people feel that what they do has no real effect on what happens to them. Please use the scale to indicate how much freedom of choice and control you feel you have over the way your life turns out. None at all 1 2 3 4 5 6 7 8 9 10 A great deal

[1] Penn World Table (2016).
[2] National Bureau of Statistics of China (2013).
[3] See Easterlin et al (2012). There has been a welcome increase in studies of China's subjective well-being. The journal, *Social Indicators Research*, recently devoted an entire issue to the subject [vol., no.] (see also Abbott et al (2016), Steele & Lynch (2013)). The article in *Social Indicators Research* by Cheng et al (2016) provides a valuable survey of recent research. Almost all of this work, however, comprises cross section studies. With the important exception of Bartolini and Sarracino (2015), there are virtually none that focus on the principal concern here, the nature and determinants of the change over time in SWB. For a discussion of time series studies prior to 2012 see Easterlin et al (2012). Good overviews of the Chinese economy are in Brandt and Rawski (2008) and Fan et al (2014a).
[4] Knight and Song (2005), Xu (2011). Speaking of the period of policy reforms initiated in 1993, Cai et al (2008), p. 181, observe that "a large amount of resources have been extracted from the agricultural and rural sector to support urban industrialization."
[5] Here and in subsequent figures, vertical broken lines delimit the period when SWB troughs. Also, in order to highlight the longer-term movement, a three-year moving average is plotted for series with annual data.
[6] Data and sources for the graphs and numbers cited in the text are presented in the Online Appendix.
[7] Knight and Song (2005), p. 19.
[8] Easterlin (2014).
[9] Easterlin (2012).
[10] Helliwell at al (2012), p. 39.
[11] Helliwell et al (2016), p.21.
[12] Arrow and Dasgupta (2009), Deaton (2008), Diener et al (2010), Frey and Stutzer (2002), Guriev and Zhuravskaya (2009), Inglehart (2002), Stevenson and Wolfers (2008), Veenhoven (1991).
[13] Easterlin et al (2012).
[14] Di Tella et al (2001).
[15] Easterlin (2009).
[16] Fan, Kanbur, Wei, and Zhang (2014b), p. 10: "Happiness draws from relative comparisons. As income increases, people's aspirations aim for a new target." See also Akay et al (2012), Carlsson & Qui (2010), Chen (2014), Knight & Gunatilaka (2011).
[17] Stiglitz, Sen and Fitoussi (2008), p.149. See also Layard et al (2012).
[18] Cf. Cantril (1965), Easterlin (2013), Radcliff (2013).
[19] Feng, Hu, and Moffitt (2015); Gustafson and Ding (2011); Knight and Xue (2006).
[20] Cf. Cai, Park, and Zhao (2008), p.182; Naughton (2008), pp.121-122; Huang (2014), p. 294.
[21] Naughton (2008), p. 121.
[22] Knight and Song (2005), p. 22.
[23] DiTella, MacCulloch, and Oswald (2001).
[24] Pew Research Center (2014).
[25] Naughton (2008), p. 121.
[26] World Bank (2007). See Giles, Park, and Cai (2006) for a comprehensive study of the impact of economic restructuring on urban workers.
[27] OECD 2010, Gustafsson and Ding (2011).
[28] Huang (2014), p. 294. Cf. also Huang (2008), pp. 169 ff.
[29] Huang (2008), p. 273.
[30] Helliwell et al (2012) pp. 13 ff.; (2013) pp. 11 ff.; (2016), p. 17.
[31] See Bartolini and Sarracino (2015). The authors include a third measure of social capital, social participation, which is measured as the percentage of the population reporting (a) membership in or (b) unpaid voluntary work for various associations. Unfortunately, this measure is not comparable over time. The number of associations named in the WVS surveys varies between 8 and 15, and the question on voluntary work is asked in only two surveys. As a result, the total number of options presented to a

respondent varies from lows of 8 to 15 (in 1995, 2007, and 2012) to highs of 29 and 30 in 1990 and 2001. Not surprisingly the highest values for participation occur in the latter two years, those with the largest number of respondent options.

[32] Layard et al (2012), pp. 70-71.

[33] Xie and Zhou (2014); we are grateful to Professors Xie and Zhou for providing the data needed to reproduce the China series in Figure 1 of their paper. See also Cai et al (2010), Gustafsson et al (2008), Knight and Song (2000).

[34] Zhang et al (2015).

[35] Helliwell at al (2016), p. 17.

[36] Ibid., p.16.

[37] The bivariate correlation coefficients (p-values in parentheses) with predicted LoL are as follows (n=10): year dummy .70 (.02), social support .45 (.19), ln gdp .35 (.33), life expectancy .29 (.45), donation .19 (.61), free choice -.21 (.61).

[38] Helliwell et al (2013), pp. 15, Table 2.2.

[39] Cantril (1965), p. 162, Table VIII: 6.

[40] In this and subsequent figures depicting differences by SES based on WVS data, the 2001 WVS observations are omitted, because the highest and lowest education groups were not covered in the 2001 survey. Due to this omission, SES differences in 2001 are much smaller than in the two adjacent surveys, 1995 and 2007. The mean value of SWB in 2001, however, does not seem to be affected by the omission of the highest and lowest education groups. If the highest and lowest education groups are dropped from the 1995 and 2007 surveys, one finds that the overall means in both surveys are virtually identical to those when the two education groups are included.

[41] Graham et al (2015) report an increase in mental illness from 2002 to 2012.

[42] For a comprehensive overview of China's new social protection system see Cai and Du (2015); see also Fang (2014), Ravallion (2014).

[43] See CHIP surveys of 1988 and 2002.

[44] Giles, Park, and Cai (2006).

[45] Cohort data on percentage completing college education are from CHIP surveys 1988, 2002, and 2013.

[46] Easterlin (2012).

[47] Easterlin (2009).

[48] Demographic changes in China differed somewhat from Europe, primarily because China's 1990 situation was governed by public policy and traditional strictures regarding marriage, divorce, and childbearing. See Davis 2015 and Attane' & Gu (2014).

[49] Henderson (2014).

[50] See CGSS (2003), CHIP (2002), and Horizon (2003).

[51] Surveys showing the persistence of the gap are the CGSS (2010-2013), CFPS (2012), and CHIP (2013); those showing no gap are CFPS (2010) and (2014), and CHFS (2011).

[52] See CGSS (2005-2013) and CFPS (2010-2014). Papers by Knight and his collaborators based on a 2002 national household survey, though finding differences other than those reported in this section, provide valuable insights into reference groups affecting happiness. For a good summary, see Knight and Gunatilaka (2011).

[53] Attane' & Gu (2014), p, 3.

[54] China illustrates the problem. Of the six predictors, there are no data for corruption, and there are data for freedom of choice for only 6 of the ten years spanned by the Gallup World Poll.

[55] Helliwell et al (2016), p.19.

[56] See OECD (2013) and Layard and O'Donnell (2015).

[57] An objection to SWB sometimes voiced is that the SWB scale is bounded, while GDP is not. In response, one might note, first, that there is substantial agreement that international differences in self-reported SWB, such as those reported in the series of World Happiness Reports, are meaningful. The Nordic countries are invariably leaders in SWB with values in the neighborhood of 8 on scales with an

upper limit of 10, while the lowest values are down around 3. This suggests that there is plenty of opportunity to improve the happiness of people worldwide even in the Nordic countries. Moreover, if well-being is the goal of public policy, then reaching a value of 10 with everyone "completely satisfied" would seem to be a sign of remarkable policy success. By contrast, if GDP is the measure of well-being, there is no clear mark of achievement other than an ever-higher growth rate, which, as evidenced by China's experience, says little about what is really happening to people's lives.

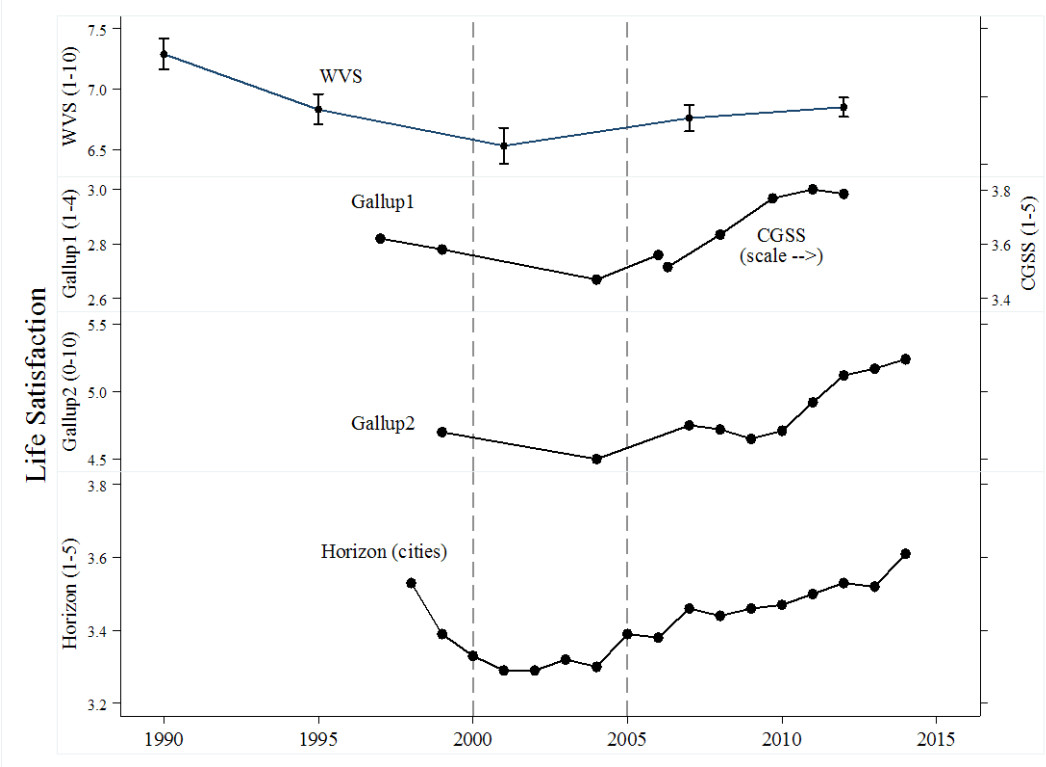
Table 1. Time Series Correlation with WVS Life Satisfaction of Indicated Variable, 1990-2012

	Correlation Coefficient	p-value
Unemployment rate	-0.76	0.13
Pension coverage	0.74	0.15
Healthcare coverage	0.89	0.11
Trust	0.52	0.37
Civic cooperation	0.17	0.79
Gini coefficient	-0.57	0.31
Coal Consumption	-0.21	0.73
Log GDP per capita	-0.46	0.44
Life expectancy at birth	-0.50	0.40
Freedom of choice	-0.27	0.67
Bribery acceptable	-0.10	0.87

n = 5, except healthcare coverage, n = 4.

Note: The basic data are given in the Online Appendix Table A1, col.1; Table A3, col. 3; Table A4 rows 1, 6; Table A5, rows 1, 2; and Table A6a, cols. 1-4.

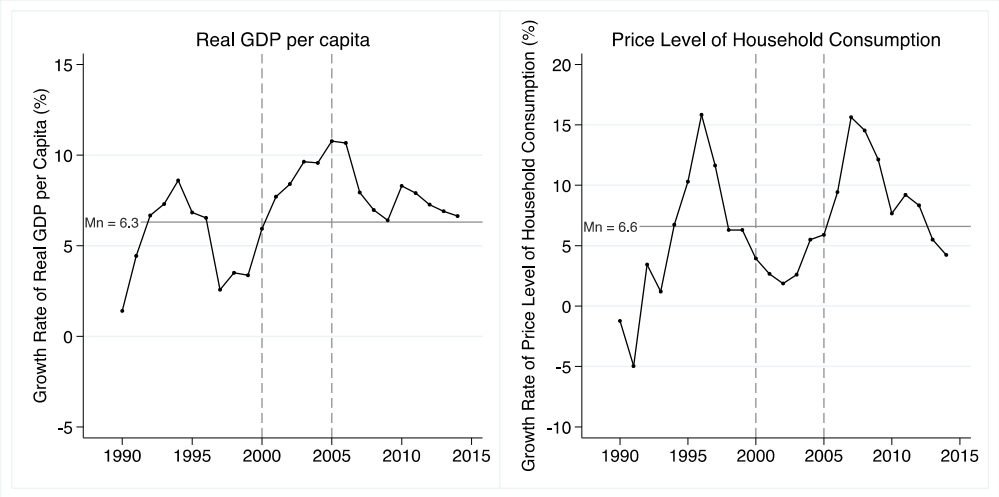
Fig. 1. Mean Subjective Well-Being, Five Series, 1990-2015



Source: Online Appendix, Table A1.

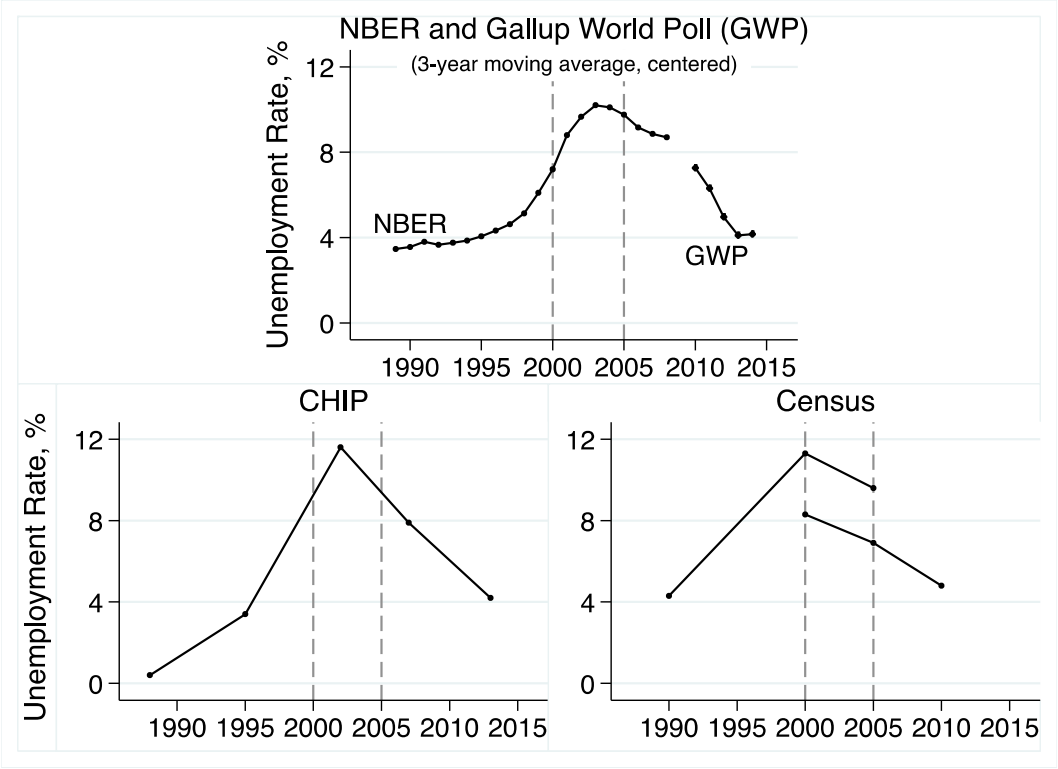
Notes: Horizon series is 3-year moving average, centered, of annual data for 1997-2015; Gallup 2, after 2004, is three-year moving average, centered, of annual data for 2006-2015; CGSS is three item moving average for dates given in Technical Box 1. Series with response options of 1-4 or 1-5 are plotted to twice the scale of series with response options of 1-10 and 0-10. For survey questions and response options, see Technical Box 1.

Fig. 2. Growth Rate of Real GDP per Capita and Price Level, 1988-2015
(3-year moving average, centered)



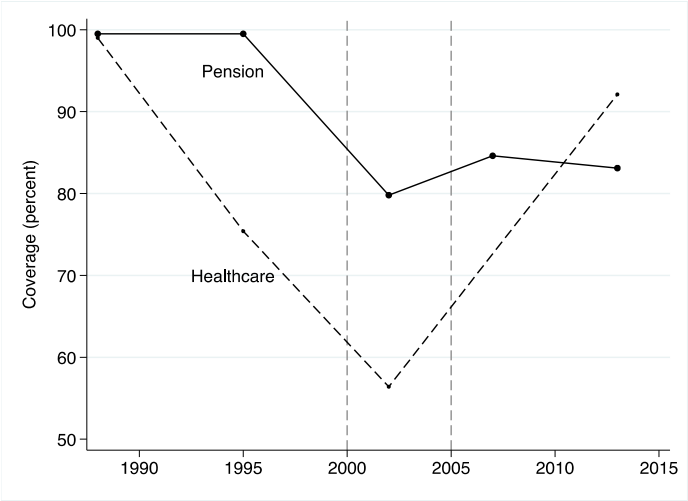
Source: Online Appendix, Table A2, cols. 3 and 6.

Fig. 3. Urban Unemployment Rate, Four Series, 1988-2015
(per cent of labor force)



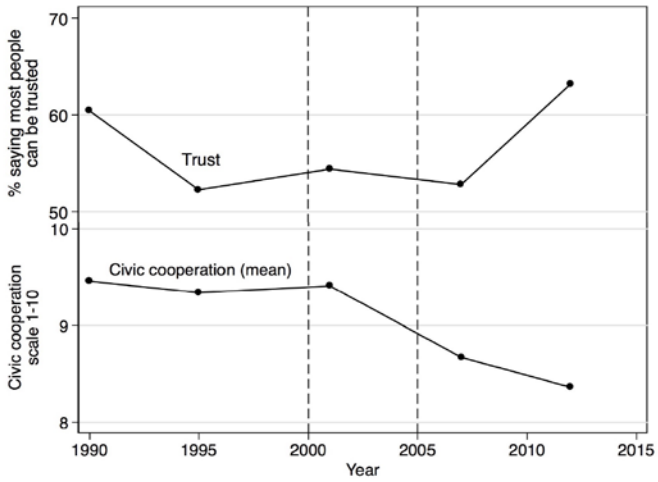
Source: Online Appendix, Table A3.

Fig. 4. Safety Net Indicators: Pension and Healthcare Coverage, 1988-2013
(urban households)



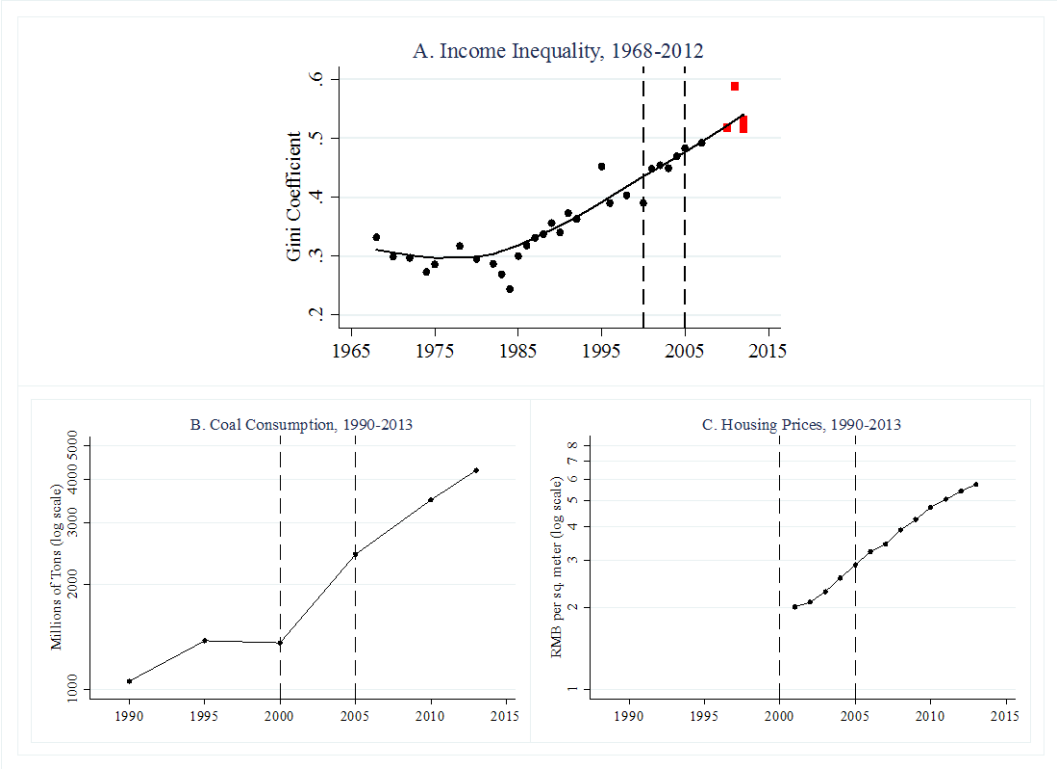
Source: Online Appendix, Table A4.

Fig. 5. Measures of Social Capital, 1990-2012



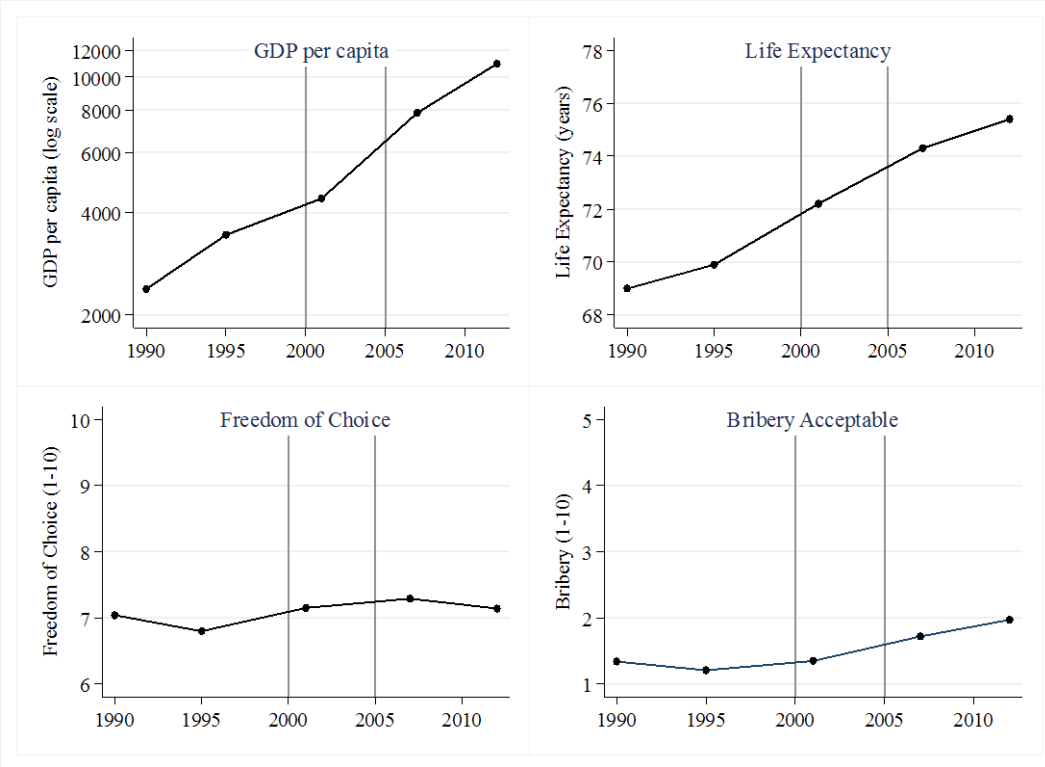
Source: Online Appendix, Table A5.

Fig. 6. Indicators of Trends in Income Inequality, Environmental Pollution, and Housing Prices



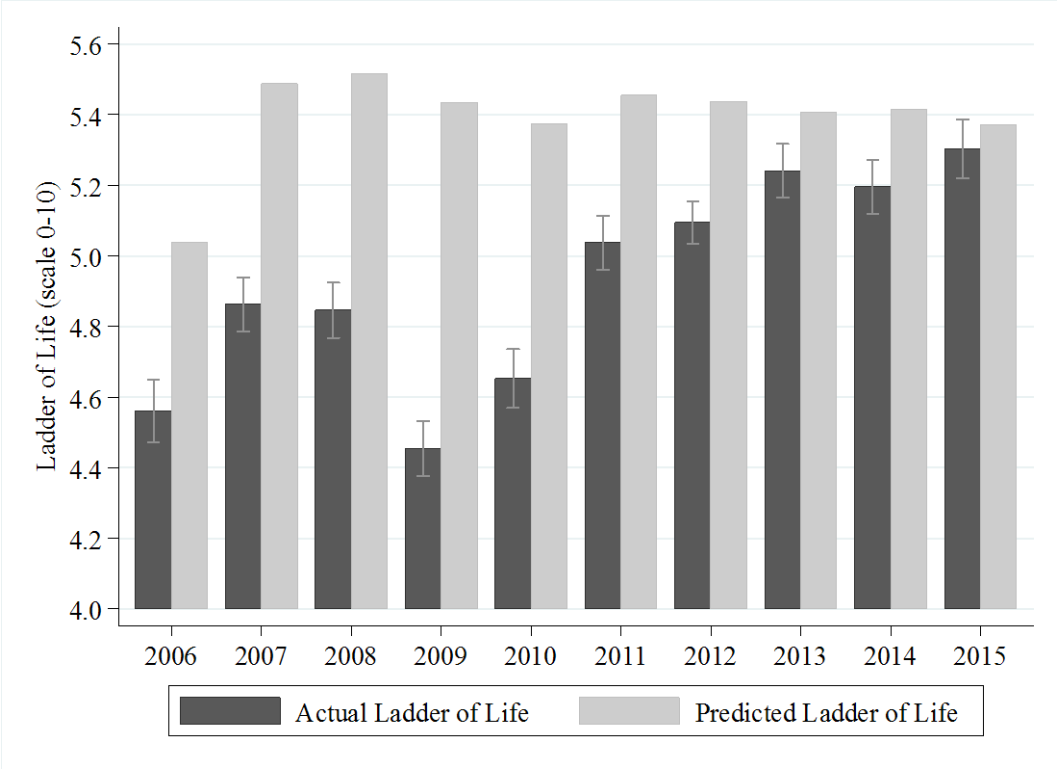
Sources: Panel A, reproduced from Xie and Zhou (2014); Panels B and C, Online Appendix, Table A6.

Figure 7. Cross Section Predictors of SWB (World Happiness Reports), 1990-2012



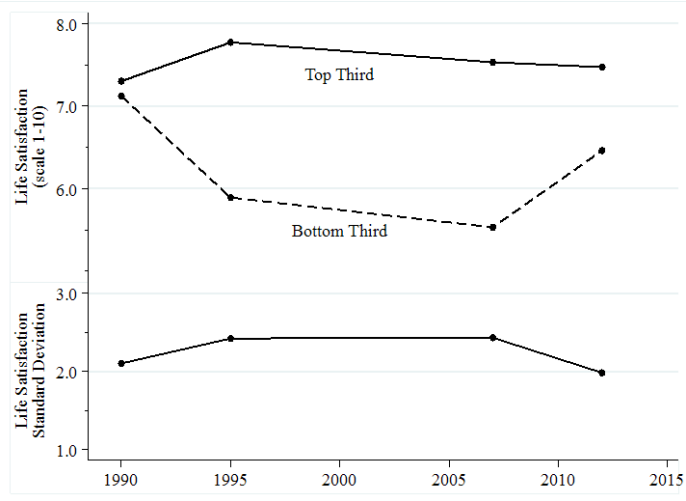
Source: Online Appendix, Table A7.

Fig. 8. Actual and Predicted Mean Ladder of Life, 2006-2015



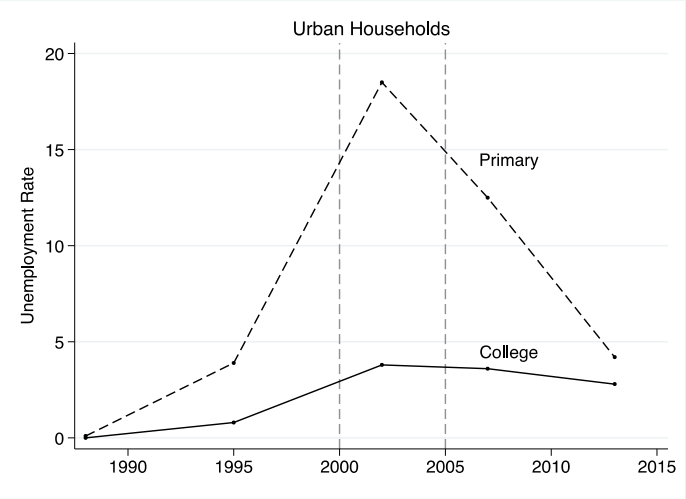
Source: Online Appendix, Table A8.

Fig. 9. Mean Life Satisfaction, Top and Bottom Income Terciles,
and Standard Deviation of Life Satisfaction, 1990 – 2012



Source: Online Appendix, Table A9.

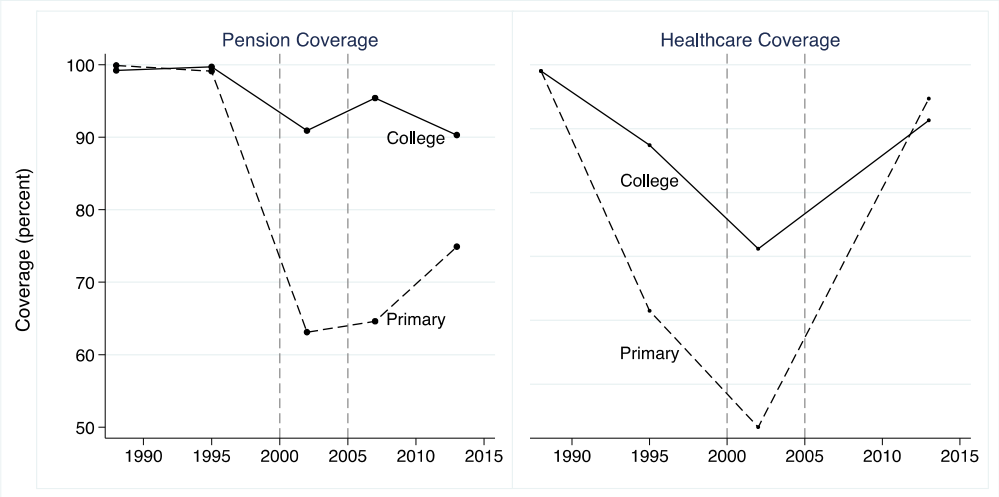
Fig. 10. Unemployment Rate by Level of Education,[a] 1988-2013
(percent of labor force)



Source: Online Appendix, Table A10.

a. Persons with college education or more and primary school education or less.

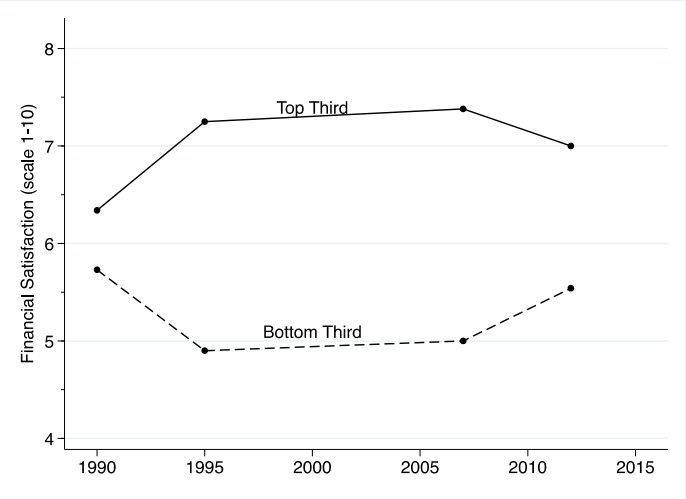
Fig.11. Safety Net Indicators by Level of Education,[a] 1988-2013
(urban households)



Source: Online Appendix, Table A4.

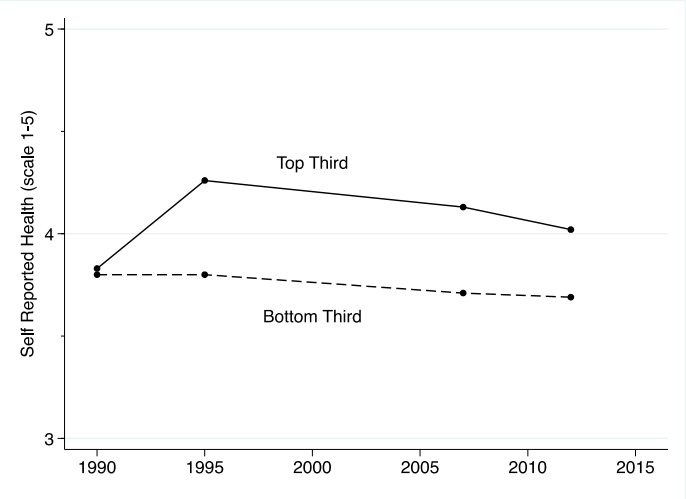
a. Persons with college education or more and primary school education or less.

Fig. 12. Mean Financial Satisfaction, Top and Bottom Income Terciles, 1990 – 2012



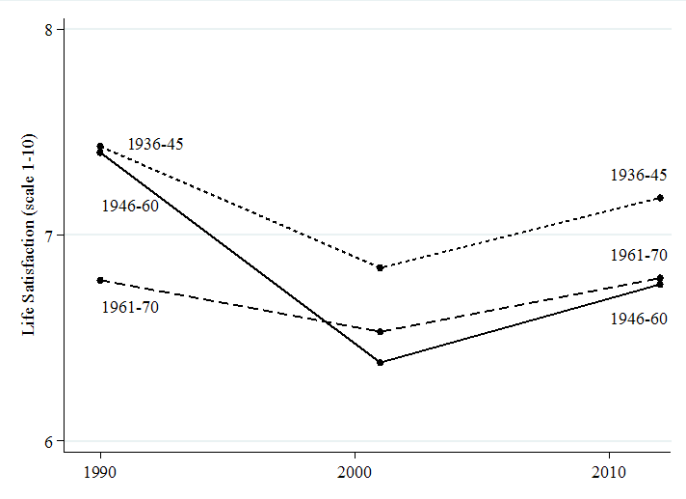
Source: Online Appendix, Table A11.

Fig. 13. Mean Self-Reported Health, Top and Bottom Income Terciles, 1990 – 2012



Source: Online Appendix, Table A12.

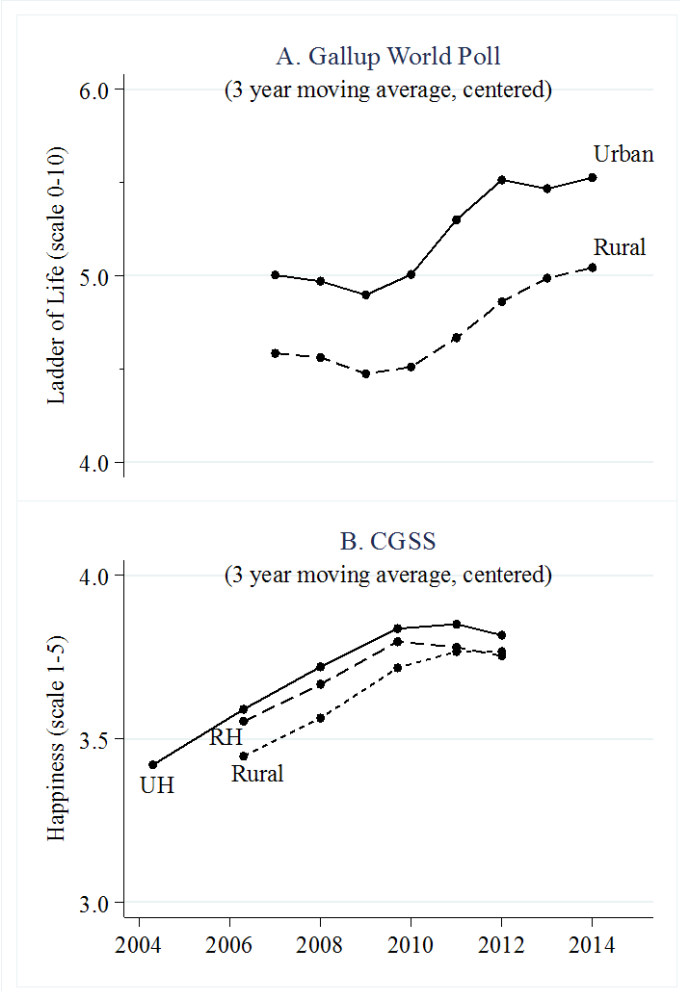
Fig. 14: Mean Life Satisfaction by Cohort, 1990-2012



Note: In 1990 the cohort of 1961-70 was 20 to 29 years old; the cohort of 1946-60, 30 to 44; and the cohort of 1936-45, 45 to 54.

Source: Online Appendix, Table A13..

Fig. 15. Mean Life Satisfaction by Residence and *Hukou* Status, 2003-2015



Source: Online Appendix, Table A14.
Legend: UH = Urban hukou holders in urban areas
RH = Rural hukou holders in urban areas

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ONLINE APPENDIX

(Easterlin, Wang & Wang, Growth and Happiness in China, 1990-2015)

Table A1. Mean Subjective Well-Being, Five Series, Total Population, China, 1990-2015[a]

	(1) WVS (1-10)	(2) Gallup (1-4)	(3) CGSS (1-5)	(4) CGSS (MA[b]) (1-5)	(5) Gallup (0-10)	(6) Gallup (MA[b]) (0-10)	(7) Horizon (Cities) (1-5)	(8) Horizon (MA[b]) (1-5)
1990	7.29							
1995	6.83							
1997		2.82					3.69[d]	
1998							3.48[d]	3.54
1999		2.78			4.7[c]		3.44[d]	3.40
2000							3.27	3.33
2001	6.53						3.28[d]	3.29
2002							3.33	3.29
2003							3.26	3.32
2004		2.67			4.5[c]		3.38	3.31
2005			3.41				3.28	3.39
2006		2.76	3.46	3.52	4.56		3.52	3.38
2007	6.76				4.86	4.76	3.35	3.46
2008			3.68	3.64	4.85	4.72	3.51	3.44
2009					4.45	4.65	3.47	3.46
2010			3.77	3.77	4.65	4.71	3.41	3.47
2011			3.86	3.80	5.04	4.93	3.53	3.50
2012	6.85		3.78	3.79	5.09	5.12	3.57	3.53
2013			3.72		5.24	5.18	3.49	3.52
2014					5.20	5.25	3.51	3.61
2015					5.30			

Sources: WVS (World Values Survey: www.worldvaluessurvey.org); Gallup1 and Gallup2: (www.gallup.com); Horizon Research Consultancy Group, series for "cities" (www.agmr.com/members/horizon.html)

a. For specific questions and response options, see text, Technical Box 1. The scale for each survey is shown above in parentheses.

b. Three-year moving average, centered.

c. 1-10 scale

d. 1-4 scale, mean computed from 5,4,2,1 coding.

Table A2. Real GDP per Capita and Price Level of Household Consumption, 1988-2015

	(1)	(2)	(3)	(4)	(5)	(6)
	Real GDP per Capita (2011 US dollars)			Price Level (US 2005 = 100)		
		Rate of Change (%)			Rate of Change (%)	
Year		Annual	MA[c]		Annual	MA[c]
1988	2408			13.3		
1989	2361	-1.94		15.6	17.45	
1990	2386	1.08	1.37	12.8	-18.05	-1.28
1991	2505	4.98	4.43	12.4	-3.24	-5.00
1992	2687	7.24	6.66	13.2	6.29	3.40
1993	2896	7.78	7.31	14.1	7.16	1.19
1994	3095	6.90	8.59	12.7	-9.87	6.74
1995	3439	11.09	6.82	15.6	22.95	10.32
1996	3523	2.45	6.52	18.4	17.89	15.86
1997	3735	6.00	2.56	19.7	6.74	11.63
1998	3706	-0.76	3.50	21.7	10.27	6.29
1999	3901	5.26	3.35	22.1	1.86	6.27
2000	4118	5.56	5.90	23.5	6.67	3.92
2001	4401	6.87	7.66	24.3	3.23	2.67
2002	4866	10.56	8.39	23.8	-1.90	1.87
2003	5243	7.75	9.62	24.9	4.27	2.60
2004	5796	10.56	9.58	26.2	5.41	5.51
2005	6400	10.43	10.77	28.0	6.84	5.93
2006	7126	11.33	10.68	29.6	5.54	9.47
2007	7858	10.29	7.95	34.3	16.02	15.66
2008	8034	2.23	6.97	43.0	25.43	14.54
2009	8709	8.41	6.41	44.0	2.18	12.15
2010	9456	8.58	8.30	47.8	8.85	7.68
2011	10205	7.92	7.92	53.6	12.02	9.22
2012	10945	7.25	7.27	57.2	6.81	8.35
2013	11673	6.66	6.92	60.8	6.22	5.49
2014	12473	6.85	6.63	62.9	3.45	4.23
2015	13271[a]	6.40		64.8[b]	3.03	

Sources: Real GDP per capita 1988-2014 (Penn World Table 9.0, http://www.rug.nl/research/ggdc/data/pwt/), Real GDP per capita 2015 (NBS of China, http://www.stats.gov.cn/), Price level 1988-2014 (Penn World Table 9.0, http://www.rug.nl/research/ggdc/data/pwt/), Price level 2015 (NBS of China, http://www.stats.gov.cn/).
a. Extrapolated by the NBS series, assuming the 2015 growth rate is the same (6.4%) in both series.
b. Extrapolated by the NBS series, assuming the ratio of the NBS CPI (1978=100) to the PWT price level in 2015 is 9.5, following the decreasing trend of the ratio since 2011.
c. Three-year moving average, centered.

Table A3. Urban Unemployment Rate, Four Series, 1988-2015
(percent of labor force)

Year	(1) NBER	(2) GWP	(3) NBER (MA[a])	(4) GWP (MA[a])	(5) CHIP	(6) Census
1988	3.5				0.4	
1989	3.0		3.5			
1990	3.9		3.6			4.3
1991	3.8		3.8			
1992	3.7		3.7			
1993	3.5		3.8			
1994	4.1		3.9			
1995	4.0		4.1		3.4	
1996	4.1		4.3			
1997	4.9		4.6			
1998	4.9		5.1			
1999	5.6		6.1			
2000	7.8		7.2			11.3/8.3[b]
2001	8.2		8.8			
2002	10.4		9.7		11.6	
2003	10.4		10.2			
2004	9.9		10.1			
2005	10.0		9.8			9.6/6.9[b]
2006	9.4		9.2			
2007	8.1		8.9		7.9	
2008	9.1		8.7			
2009	8.9	8.2				
2010		8.7		7.3		4.8[b]
2011		4.9		6.3		
2012		5.3		5.0		
2013		4.7		4.1	4.2	
2014		2.3		4.2		
2015		5.5				

Sources: NBER (urban hukou population): Feng, Hu, and Moffitt 2015; GWP (www.gallup.com); CHIP (urban households, http://www.ciidbnu.org/chip/index.asp); Census (random samples of the Census data from the NBS of China, and statistics on http://www.stats.gov.cn/)

a. Three-year moving average, centered.
b. Urban (city + town) population; other census values are for urban hukou population.

Table A4. Safety Net Indicators by Level of Education, 1988-2013
(urban households)

A. Pension coverage
(percent of males ages 60+ and females ages 55+)

		1988	1995	2002	2007	2013
1	All	99.5	99.5	79.8	84.6	83.1
2	College or more	99.2	99.7	90.9	95.4	90.3
3	Middle school or high school	99.8	99.7	88.7	90.6	86.8
4	Primary school or less	99.9	99.1	63.1	64.6	74.9
5	Row 2 - Row 4	-0.7	0.6	27.8	30.8	15.4

B. Healthcare coverage
(percent of population ages 15+)

		1988	1995	2002	2007	2013
6	All	(99)[a]	75.4	56.4		92.1
7	College or more	(99)	87.4	71.2		91.3
8	Middle school or High School	(99)	74.6	52.8		91.9
9	Primary school or less	(99)	61.5	43.3		94.7
10	Row 7 - Row 9	(0)	25.9	27.9		-3.4

Source: CHIP (urban households, http://www.ciidbnu.org/chip/index.asp). Healthcare was not asked in 1988 and 2007.

a. Values for 1988 assume coverage was nearly universal, based on responses on self-rated health (SRH) by income and education in the 1990 WVS which are very close together. Cf. Inglehart et al 1998, V83.

Table A5. Measures of Social Capital, 1990-2012

	1990	1995	2001	2007	2012
Most people can be trusted (% agree)	60.4	52.3	54.4	52.8	63.2
Civic cooperation (10=always; 1=never)					
Wrong to falsely claim benefits	9.30	8.63	8.86	7.48	7.33
Wrong to avoid fare	9.42	9.39	9.66	8.96	8.38
Wrong to cheat on tax	9.46	9.47	9.42	9.00	8.79
Bribing not acceptable	9.66	9.79	9.65	9.28	9.03
Mean	9.46	9.34	9.41	8.67	8.36

Source: WVS. Specific questions and response options are given in Technical Box 2.

Table A6. Indicators of trends in environmental pollution and housing prices, 1990-2014

	Coal Consumption (million tons)	Housing Prices RMB/sq. meter	Housing Prices (MA[a]) RMB/sq. meter
1990	1055		
1991			
1992			
1993			
1994			
1995	1377		
1996			
1997			
1998			
1999			
2000	1357	1948	
2001		2017	2019
2002		2092	2102
2003		2197	2299
2004		2608	2581
2005	2434	2937	2888
2006		3119	3234
2007		3645	3447
2008		3576	3893
2009		4459	4253
2010	3490	4725	4726
2011		4993	5049
2012		5430	5424
2013	4244	5850	5738
2014		5933	

Sources: Coal Consumption, Department of Energy Statistics, National Bureau of Statistics (2015). *China Energy Statistical Yearbook 2014*. China Statistics Press; Housing Prices, NBS of China.

a. Three-year moving average, centered.

Table A7: Cross Section Predictors of SWB (World Happiness Reports), 1990-2012

	(1) GDP p.c. US$ 2011	(2) Life Expectancy yrs.	(3) Freedom of Choice (1-10)[a]	(4) Bribery acceptable (1-10)[b]
1990	2386	69.0	7.04	1.34
1995	3439	69.9	6.80	1.21
2001	4401	72.2	7.15	1.35
2007	7858	74.3	7.29	1.72
2012	10945	75.4	7.14	1.97

a. 1 = none; 10 = a great deal.
b. 1 = never; 10 = always.

Source: Col. (1) Table A2, col.1
Col. (2) World Bank, World Development Indicators
Cols. (3), (4) World Values Survey

Table A8. Actual and Predicted Mean Ladder of Life, 2006-2015

Year	Actual ladder	Predicted ladder	1.96 s.e.
2006	4.56	5.04	0.09
2007	4.86	5.49	0.08
2008	4.85	5.52	0.08
2009	4.45	5.44	0.08
2010	4.65	5.38	0.08
2011	5.04	5.46	0.08
2012	5.09	5.44	0.06
2013	5.24	5.41	0.08
2014	5.20	5.42	0.08
2015	5.30	5.37	0.08

Sources: Cols. 2 and 4, Gallup World Poll. Col. 3, based on equation in Helliwell et al (2016), p. 16, Table 2.1, col. 1.

Table A9. Mean Life Satisfaction, Top and Bottom Income Terciles, and Standard Deviation of Life Satisfaction, 1990-2012 (scale 1-10)

	(1) 1990	(2) 1995	(3) 2007	(4) 2012
All	7.29	6.83	6.77	6.86
Top Tercile	7.30	7.77	7.53	7.47
Bottom Tercile	7.12	5.89	5.53	6.46
Top minus bottom	0.18	1.88	2.00	1.01
Life Satisfaction St. Dev.	2.10	2.42	2.43	1.98

Source: World Values Survey.

Table A10. Unemployment Rate, by Level of Education, 1988-2013
(per cent of labor force)

	)				
	1988	1995	2002	2007	2013
All	0.4	3.4	11.6	7.9	4
College or more	0.0	0.8	3.8	3.6	2.8
Middle school or high school	0.5	3.7	13.8	8.8	5.2
Primary school or less	0.1	3.9	18.5	12.5	4.2
Primary minus college	0.1	3.1	14.7	8.9	1.5

Source: See Table A3, CHIP.

Table A11. Mean Financial Satisfaction, Top and Bottom Income Terciles, 1990-2012 (scale 1-10)

	(1) 1990	(2) 1995	(3) 2007	(4) 2012
All	6.10	6.11	6.06	6.18
Top third	6.34	7.25	7.38	7.00
Bottom third	5.73	4.90	5.00	5.54
Top minus bottom	0.61	2.35	2.38	1.46

Source: World Values Survey.

Table A12. Mean Self-Reported Health, Top and Bottom Income Terciles, 1990-2012 (scale 1-5)

	(1) 1990	(2) 1995	(3) 2007	(4) 2012
All	3.82	4.01	3.93	3.86
Top third	3.83	4.26	4.13	4.02
Bottom third	3.80	3.80	3.71	3.69
Top minus bottom	0.03	0.46	0.42	0.33

Source: World Values Survey.

Table A13. Mean Life Satisfaction by Cohort, 1990-2012
(scale 1-10)

Cohort	(1) 1990	(2) 2001	(3) 2012
1936-45	7.43	6.84	7.18
1946-60	7.40	6.38	6.76
1961-65	6.78	6.53	6.79

Source: World Values Survey.

Table A14. Mean Subjective Well-Being by Residence and Hukou Status, 2003-2015[a]

	(1)		(2)		(3)		(4)		(5)	
	Gallup (0-10)				CGSS (1-5)					
	Urban		Rural		UH		RH		Rural	
	Y	MA	Y	MA	Y	MA	Y	MA	Y	MA
2003					3.29		3.19			
2004										
2005					3.45	3.42	3.44	3.35	3.36	
2006	4.80		4.41		3.52	3.59	3.43	3.55	3.40	3.45
2007	5.12	5.00	4.70	4.58						
2008	5.09	4.97	4.64	4.56	3.80	3.72	3.79	3.67	3.58	3.56
2009	4.70	4.90	4.34	4.47						
2010	4.90	5.01	4.44	4.51	3.84	3.84	3.78	3.80	3.71	3.72
2011	5.42	5.30	4.75	4.67	3.87	3.85	3.82	3.78	3.86	3.77
2012	5.58	5.51	4.81	4.86	3.84	3.82	3.74	3.75	3.73	3.77
2013	5.54	5.47	5.02	4.99	3.74		3.70		3.71	
2014	5.28	5.53	5.13	5.04						
2015	5.76		4.98							

Legend: UH = Urban hukou holders in urban areas
RH = Rural hukou holders in urban areas
Y= yearly
MA = Three item moving average, centered

Sources: Gallup, See Table A1. CGSS (http://www.chinagss.org/index.php?r=index/index&hl=en).

a. For specific questions and response options, see Technical Box 1