

The Kuznets Curve on Income Distribution Does Not Hold in China: A Critical Assessment¹

Qichun He and Heng-fu Zou

Abstract

We find robust evidence that within each consecutive dynasty of ancient China, inequality demonstrates a “U” shape (or rather a “spoon” shape, to be more precise). As inequality hit an upper limit, war occurred, leading to a new dynasty replacing the old one. The cycle would then repeat itself. A simple explanation for this has been offered, and policy implications have also been presented.

Key Words: Kuznets Curve; Income inequality; U shape; Ancient China

JEL Classification Numbers: N95; O11; O43

1. INTRODUCTION

The Kuznets curve is one of the most cited terms in economics. To put it simply, the Kuznets curve indicates that economic inequality is inverted “U” related to income per capita for the modern era. In this paper we demonstrate that the Kuznets curve does not hold in ancient China (loosely speaking, ancient China refers to the time before 1949, the founding year of the People’s Republic of China). We find that in Chinese history, a very long period that consisted of many consecutive dynasties, inequality actually exhibits a “U” shape (or to be more precise, a “spoon” shape) over time within each dynasty. High inequality would lead to war, and a new dynasty would subsequently replace the previous one. This cycle repeated itself more than ten times during two thousand years of Chinese history.

We argue that two important features may help to explain why the “U” shape in inequality would happen repeatedly in ancient China. First, from 221 B.C. (the founding year of the Qin dynasty) until 1949, a period of over two thousand years, China remained an agrarian economy. Therefore, the ancient Chinese economy can be deemed a Malthusian era. In such a period, the standard of living shows no upward or downward trend. This stagnation in the standard of living is because people mainly rely on farmland for the production of the survival good, food. According to the Malthusian preventive check (Malthus, 1798), more farmland would bring higher fertility, which would choke off growth. Since there were no consecutive major technological

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improvements in agriculture within each dynasty, the standing of living remained stagnant and was fully determined by per capita farmland.

Second, the Qin dynasty marked the beginning of the institution of a dictatorial government, with the emperor as the dictator. Without democracy, there was no division of power to impose checks and balances on the government. Therefore, the redistribution of land and efforts to combat corruption (either by government officials or by landlords through the confiscation of farmland) would depend on the personal preferences and abilities of the emperor. The first emperor of each dynasty gained power in war by toppling the previous dynasty. Therefore, the founding emperor was always the ablest in terms of gaining power and ruling and often used high income inequality as an excuse to overthrow the previous dynasty. He would then redistribute the farmland to the poor, leading income inequality to drop, and fertility, and thereby population, would increase. In China, the first son of the emperor usually claimed the crown after his father passed away. However, the first son might not have been the most capable for serving his role. Sooner or later, corruption of his bureaucracy would emerge. With the weakening of the government capacity, taxes would also increase (lots of tax revenues might be captured by the corrupt officials at all levels of the government who might also be landlords). As a result, the poor would lose their land and be unable to make a living, let alone reproduce. As more farmland was concentrated at the hands of corrupt government officials and landlords, income inequality would rise, and fertility and thereby population would decrease. When income inequality hit an upper limit, or a new, powerful leader emerged, war would again happen, and often a new dynasty would be erected. Even if a son with strong leadership abilities inherited the throne, he could only postpone but not avoid the inevitable, as the old Chinese saying illustrates: "History will always repeat itself."

This "U"-shaped income inequality explains the historical cycles in China's more than two thousand years of agrarian society. Nonetheless, the theme of our paper is more general. The historical cycle in ancient China may be partly due to the Chinese cultural mentality: "People do not hate poverty but hate inequality." This mentality may also exist in other countries, as Rousseau (1762) elaborated in his seminal work "*The Social Contract*". In the industrial era, if a country cannot combat corruption and avoid a concentration of wealth (that is, the income inequality is "U" shaped rather than an inverted-U shape), then the legitimacy of the government will be questioned. Sooner or later, people will rise up and overthrow the government. When there is no democracy, war may be inevitable. Therefore, the lesson from Chinese history is that, if a government wants to have peace and prosperity, it had better distribute income more equally.

Last but not least, there must be numerous shortcomings in our analysis, but we hope our study will stimulate people's interest in learning more about the impact of income distribution, the value of which Kuznets (1955, p. 27) forcefully argued:

Without better knowledge of the trends in secular income structure and of the factors that determine them, our understanding of the whole process of economic growth is limited; and any insight we may derive from observing changes in countrywide aggregates over time will be defective if these

changes are not translated into movements of shares of the various income groups.

2. DATA

2.1. Data sample

When studying ancient China, the scarcity of data is the first and foremost constraint. Fortunately, there are historical books documenting economic, cultural and demographic facts. The demographic data may be the most consistent information that one can find in historical books. Through Baidu.com (i.e., the Chinese counterpart to Google), we find that many history lovers have uploaded demographic data from the encyclopedia of Chinese ancient historical texts, the most famous series being the twenty-four volumes (24 shǐ in Chinese), each of which is around 500 pages. This series of historical books alone would occupy a whole bookshelf one meter wide and two meters high. We are indebted to the anonymous history enthusiasts who have provided demographic spreadsheet for over five thousand years of China's ancient past, from the Xia dynasty in 2146 B.C. to today. Although Chinese civilization surely existed before 2146 B.C., there is no written documentation prior to this.

In this paper we focus on the period from 221 B.C. to 1644, the last year of the Ming dynasty. The reason is mentioned above. 221 B.C. was the first year of the Qin dynasty with a dictatorial government (Chinese historians treated it as the beginning of the feudal system), prior to this, China was a slave society. We also do not consider the Qing dynasty (1616–1911), the end of the feudal system. This is because the Qing dynasty can no longer be treated as a closed economy. Many researchers have studied trade between the Qing dynasty and western civilizations and found agricultural and industrial technologies flowing into China via international trade and industrial production beginning to expand. Therefore, the Malthusian preventive check may not be applied to this period.

From 221 B.C. to 1644, there were over 17 major dynasties. Table 1 presents their names and duration. There were around 50 dynasties in total during this period, with the shortest lasting only three years (East Jin and Late Han, *Dong Jin* and *Hou Han* in Chinese). The Tang dynasty was one of the most powerful, and lasted 289 years (618–907). The Yuan dynasty, which conquered part of Europe, lasted only 162 years (1206–1368).

Table 1.
Chinese Dynasties in the Feudal System

Name of Dynasties	Major Sub-dynasties	Duration	Data Available
Qin		221–207 B.C.	
Han	West Han	206 B.C. –8	

	East Han	25–220	YES
San Guo		220–280	
Jin		265–420	
Nan Bei Chao	Nan Chao	420–589	
	Bei Chao	386–581	
Sui		581–618	
Tang		618–907	YES
Wu Dai Shi Guo		907–960	
Song		960–1279	YES
Yuan		1206–1368	
Ming		1368–1644	YES
Qing		1616–1911	YES

Note: We have included only the major dynasties.

We have located the data on the major dynasties that we focus on and disregarded the short dynasties. The reason for this is twofold. First is the unavailability of data. Second, to study income distribution over a long horizon, we need the time span to be at least one hundred years. Otherwise, the analysis would not be meaningful, as income distribution (and its proxy, fertility and population, elaborated on later) does not change very quickly in any society.

As illustrated in Table 1, even for the major dynasties, we only have available data for four of them, namely, East Han (25–220), Tang (618–907), Song (960–1279), and Ming (1368–1644). For each, we only have data on some years, as detailed in Table 2. We will use this data for our analysis.

Table 2.
Demographic Data for Each Dynasty

Dynasty	Year	Number of Households (in 10, 000s)	Total Population (in 10,000s)	Number of Persons per Household
East Han (25–220)	57	427.9634	2,100.78	4.91
	75	586.0573	3,412.50	5.82
	88	745.6784	4,335.64	5.81
	105	923.7112	5,325.60	5.77
	125	964.7838	4,869.08	5.05
	140		4,915.00	
	144	994.6915	4,973.06	5
	145	993.768	4,952.42	4.98
	146	934.8227	4,756.68	5.09
	156	1,067.80	5,647.69	5.29

Tang (618–907)	705	615.6141	3,714.00	6.03
	726	706.9565	4,141.97	5.86
	732	786.1236	4,543.13	5.78
	740	841.2871	4,814.36	5.72
	742	852.5763	4,890.98	5.74
	754	906.9154	5,288.05	5.83
	755	891.4709	5,291.93	5.94
	760	293.3174	1,699.38	5.79
	764	293.3125	1,690.00	5.76
	820	237.54	1,576.00	6.63
Song (960–1279)	1006	741.757	1,628.03	2.19
	1034	1,029.00		
	1053	1,079.27	2,229.29	2.07
	1066	1,291.72	2,909.22	2.25
	1083	1,722.17	2,496.93	1.45
	1122	2,088.23	4,673.48	2.24
	1162	1,113.99	3,311.23	2.97
	1187	678.9449	4,470.51	6.58
	1207	768.4438	4,581.61	5.96
	1223		7,681.00	
	1264	569.6989	1,302.65	2.29
Ming (1368–1644)	1381	1,065.44	5,987.33	5.62
	1393		6,054.00	
	1403	1,141.58	6,659.83	5.83
	1502	1,040.98	5,090.87	4.89
	1504	1,050.89	6,010.58	5.72
	1578	1,063.15	6,069.29	5.71
	1620	983.5426	5,165.55	5.25

Source: www.baidu.com.

2.2. Proxies for income inequality and their patterns

Since this was an agricultural society, the standard of living would show no upward or downward trend within each dynasty. Therefore, we are primarily interested in plotting the income inequality against time. We do not have the data needed to calculate the income inequality in ancient China. As illustrated in Table 2, we do have data on the number of households, total population and the number of persons per household. Based on this demographic information, we are able to build a proxy variable for income inequality.

In a Malthusian era, farmland is the most important source of income. Therefore, we can use the distribution of farmland as a proxy for income distribution. However,

data on the distribution of farmland is unavailable. Nonetheless, as mentioned in the introduction, in a Malthusian era, people's fertility choices and thus the total population are determined by agricultural resources that are essential for the production of goods necessary for survival – namely, food, as argued by Malthus (1798, ch.1, p.13).

In an agricultural society that is governed by the Malthusian trap, population is determined by the quantity of farmland. China has a long history, and the amount of farmland has remained relatively constant at least within each dynasty. Thus, the size of the population remains constant within a dynasty (Table 2 illustrates that the largest population remained around 60 million from the East Han dynasty during 25-220 to the Ming dynasty during 1368-1644). However, when farmland (the primary source of income in a Malthusian era) is unequally distributed, the size of a population will shrink. This is because when more agricultural land is captured by a landlord (be it a governmental official or the landowner), the poor will have less farmland. The number of children poor families can raise will inevitably decrease, leading the total population to shrink. Because landlords would already be rich enough to have as many children as they want, more wealth would not change their fertility behavior significantly.

Given this, we can use total population to infer the distribution of farmland in ancient China. As stated, the more unequal the distribution of farmland, the lower per capita farmland of the poor, who comprised the majority of the population, leading to a lower fertility rate. Therefore, we use the reciprocal of the population as a proxy for income inequality in ancient China. A more equal distribution of farmland would ultimately lead to more people. Therefore, a higher reciprocal of population is positively associated with a larger degree of income inequality.

We have plotted the data (the reciprocal of the population) against time for each dynasty. The results are presented in Figures 1 to 4. The solid lines are cubic smoothing of the data. One can observe that the proxy for income distribution generally demonstrates a “U” shape (or a “spoon” shape, to be more precise) over time within each dynasty.

FIG. 1. The Time Pattern of the Proxy for Inequality in East Han Dynasty

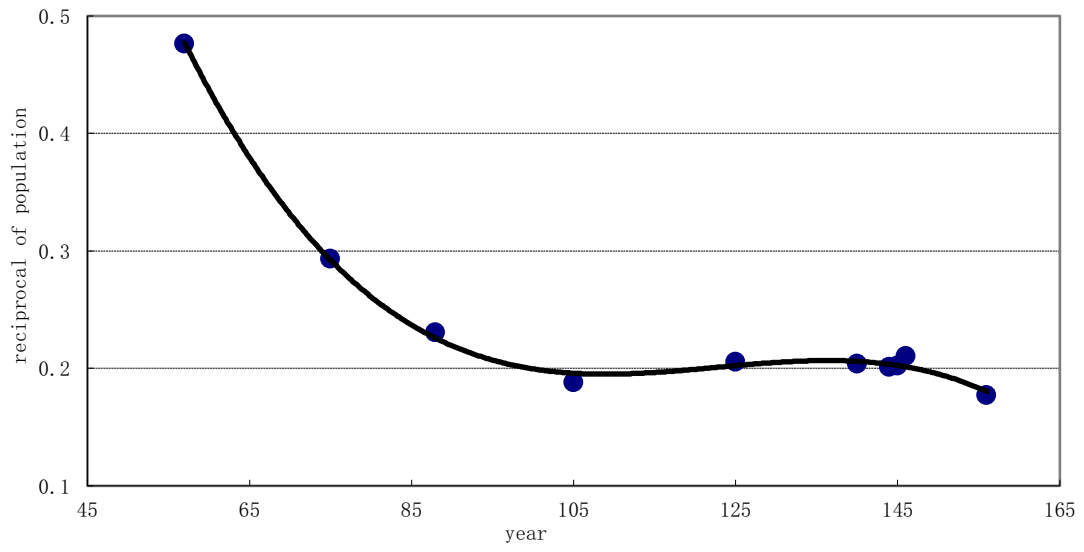


FIG. 2. The Time Pattern of the Proxy for Inequality in Tang Dynasty

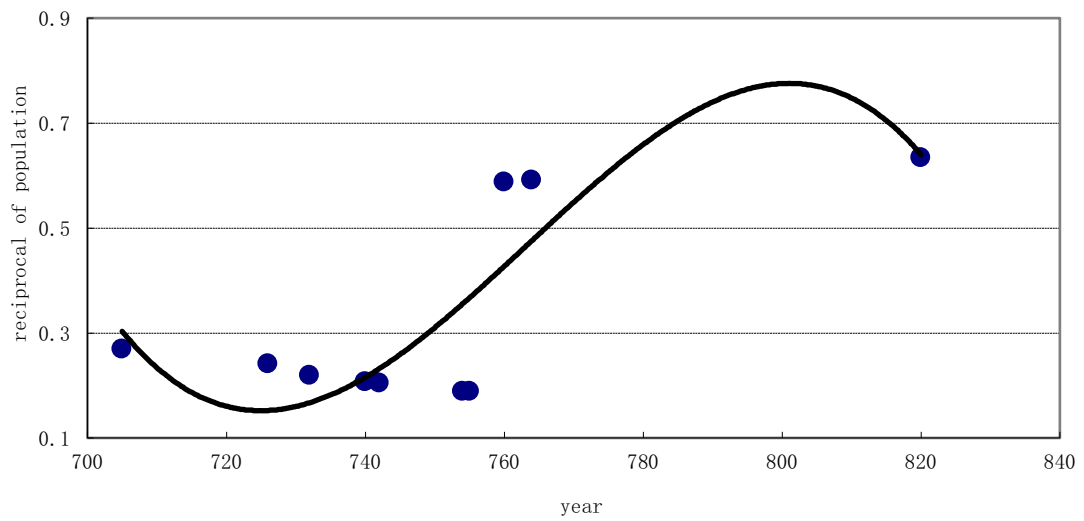


FIG. 3. The Time Pattern of the Proxy for Inequality in Song Dynasty

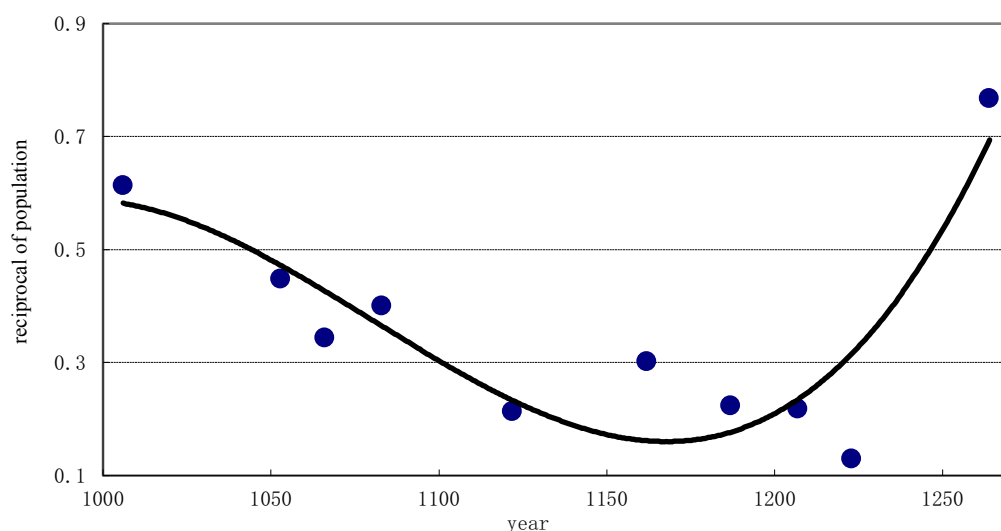
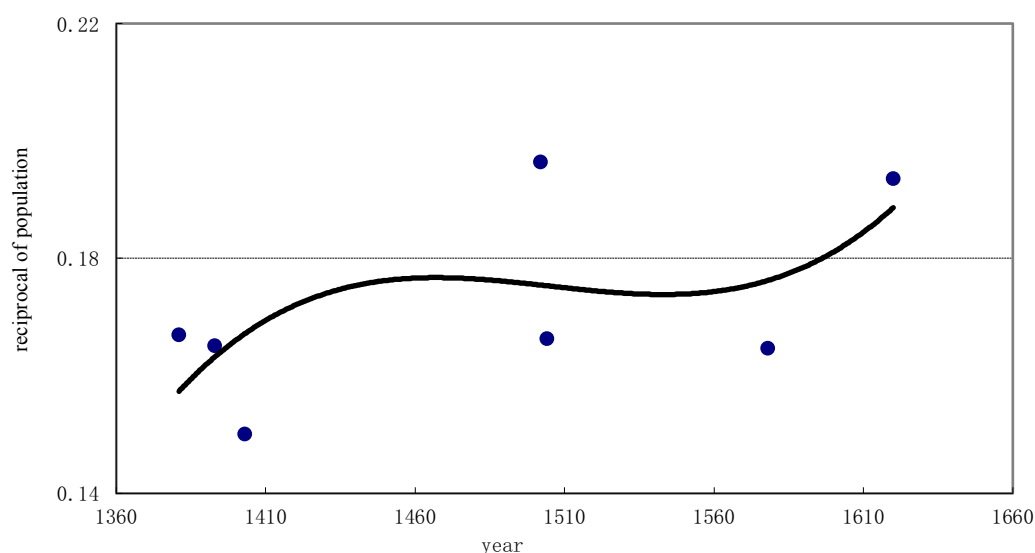


FIG. 4. The Time Pattern of the Proxy for Inequality in Ming Dynasty



2.3. Robustness check

We have checked our results with another proxy for income distribution. Following the above argument, a more equitable distribution of farmland in ancient China would have been good for the poor. The number of persons per household would have increased. Therefore, the reciprocal of the series would also be positively related with income inequality.

The results with the second proxy for income inequality demonstrate patterns similar to those obtained above. That is, income inequality decreases at the beginning of a dynasty. As time goes by, income inequality increases and remains. We do not report the results here, but the readers can verify the results themselves.

3. Implications for Modern China

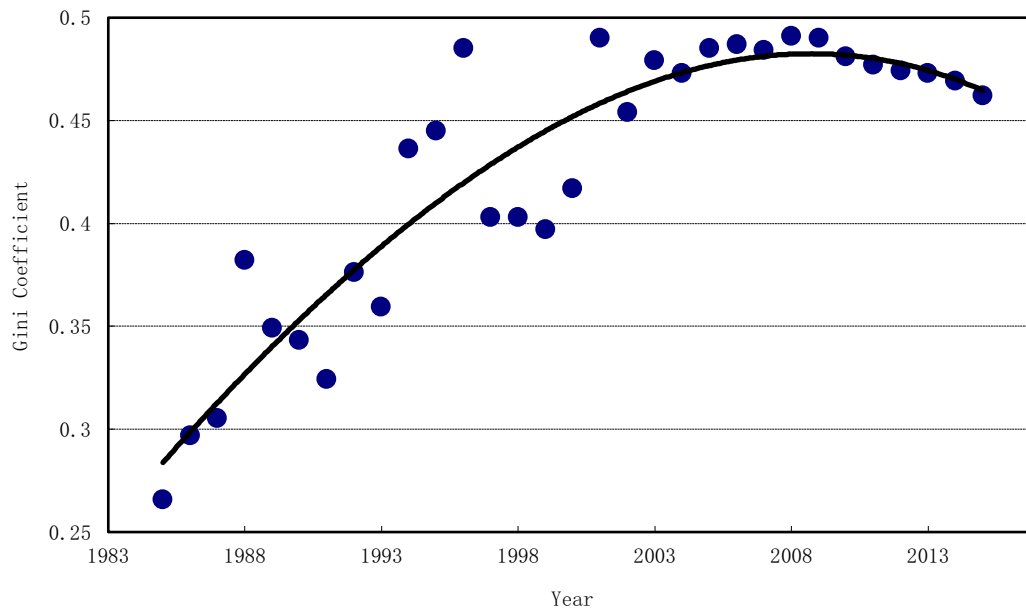
As discussed above, one reason why we study history is to learn useful lessons. The growing income inequality that currently exists in China has received much attention. Many researchers have produced estimates of the Gini coefficient for post-reform China (see e.g., Ding and He, 2016; Li and Luo, 2011, and references therein). Generally, these researchers have found an increasing trend in income inequality measured by the Gini coefficient for post-reform China. For instance, Ding and He (2016) used the unique micro-level annual urban household survey (UHS) data from 1986 to 2009 and found that the variance of log household disposable income in China increased from 0.14 in 1986 to 0.43 in 2009. Moreover, they noted the following:

Consumption inequality, whether total consumption or nondurable consumption, closely tracks disposable income inequality over time. This pattern contrasts sharply to what we found in the United States and other advanced economies. In those countries, consumption inequality has been increasing much more slowly than income inequality. Also, the level of consumption inequality is usually significantly lower than that of income inequality. (Ding and He, 2016)

Li and Luo (2011) discussed the potential biases, such as the income definition, reweighting, sampling bias, and regional differences in purchasing power parity, in inequality estimation in China. They corrected the sampling bias by estimating the up-tail shape of income distribution by use of Pareto distribution and income information of the wealthiest segment of society using the Forbes list, Hurun list, and amount of compensation for CEOs. They found that eliminating the sampling bias in the up-tail of income distribution increases the inequality measure of the urban residents, that between urban and rural residents, and that of the whole nation.

We rely on the China Statistical Yearbook for the data on Gini Coefficients during 1985–2015, illustrated in Figure 5. One can observe an increasing trend in income inequality during the reform-era (i.e., the era after the reform and opening up in 1978).

FIG.5. The Time Pattern of the Income Inequality in Post-reform China: 1985-2015



The Gini coefficient may not be able to capture all types of inequality in today's China. Other aspects of inequality are widespread and alarming. For instance, residents in large cities enjoy superior services and public goods in almost all aspects of life including education, hospital, transportation, and safety. In contrast, residents in smaller cities and villages do not have services and public goods of the same quality. Additionally, the Gini coefficient cannot reflect regional differences in inequality. The eastern and coastal provinces of China are much richer than the western and interior provinces, and the income gap between the rich provinces and poorer ones is not diminishing over time (see e.g., the discussion in the introduction of He and Sun, 2016). As President Xi summarized in the 19th National Congress of the Chinese Communist Party (CCP), the main challenge facing China today is the incompatibility between people's increasing demand for a beautiful life and unbalanced and inadequate development.

As China is currently in its industrialization stage, it may not be appropriate for us to apply the findings in the agricultural era to China today. Nevertheless, modern China does have similarities with ancient China in the sense that economic decentralization coupled with political centralization is the common feature. Therefore, it depends on whether contemporary China's political centralization is able to tackle the issue of income inequality. After the founding of the People's Republic of China (i.e., China) in 1949, political centralization did take a different form: family-governed political centralization was replaced by party-ruled political centralization (where the "party" refers to the CCP). This does represent progress, as the power concentration shifted away from the royal family to a ruling party. However, it is still different from the separation of power in representative democratic societies.

China's one party rule has enabled China to build strong governmental capacity, which may facilitate the investment in public infrastructure that is conducive to economic growth. Government capacity is an essential part of the state capacity highlighted recently by economists (see e.g., Acemoglu, Garcia-Jimeno and Robinson,

2015; Acemoglu, Moscona and Robinson, 2016; Besley and Persson, 2009, 2010, and references therein). Additionally, democracy has its own pitfalls (see the criticism written by Samuel Brittan, 1975). To summarize, the Chinese one-party governing system has its own advantages and disadvantages. Concerning our study, will the sole ruling CCP be able to tackle the issue of inequality? Only time can tell. We leave this important topic to future studies.

4. CONCLUSIONS

We find that within each dynasty of ancient China, inequality demonstrates a “U” shape. Each time inequality reached a high point, a war occurred, and a new dynasty would then emerge. A simple explanation for this cycle has been offered in the introduction. The lesson from Chinese history is that, if a government wants to have peace and prosperity, it should ensure that income is distributed equally.

However, as history always repeated itself in ancient China, it prompts a more profound question: can an autocratic government distribute income more equitably? Chinese history tells us the answer is no. Inequality had a “U” shape within each dynasty. This means that sooner or later people will inevitably rise up against its leaders. To avoid another repeat of history, we may have to resort to Rousseau and Montesquieu (1748), who demonstrated that checks and balances on governments via the separation of power are essential for the welfare of the people. Autocrats cannot ensure forever peace and prosperity, but democracy can, although democracy alone may not be sufficient. Things are easier said than done. It may take the collective wisdom of both leader and the general populous to find a path to democracy and prosperity. Concerning the Kuznets curve, one may need to take the political economy into account when evaluating the validity of the Kuznets curve. That is, the underlying political system may partly determine whether the Kuznets curve will hold up in modern China. We leave this important issue to future studies.

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