Ideological Shifts and Wealth Dynamics: Unraveling the Century-Long Accumulation of Chinese National Wealth (1911-2020)*

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January 11, 2025

Abstract

In this paper, we construct the first-ever long-run series of Chinese national wealth from 1911 until 2020, by combining novel historical sources with existing national accounts. Our findings reveal that the net national wealth-to-income ratio in China remained largely stagnant within the range of 300-400% for the better half of the 20^{th} century, followed by a rapid and sustained increase only from the mid-1980s onward. Overall, national wealth-to-income ratio has increased from around 300% in the 1930s to nearly 900% in 2020. However, this long-term growth in total national wealth conceals profound heterogeneities in wealth composition, which is mainly dictated by ideological shifts throughout the contemporary history of China. Firstly, the public share of Chinese national wealth exhibits a drastic inverted U-shaped pattern throughout the 20^{th} century. Contrary to prevalent beliefs, the upswing in the public share of national wealth commenced as early as the late 1920s during the Republican government's nationalization endeavors. Our analysis reveals a less pronounced divide in private and public wealth shares between the Republican and Communist eras, with 40% of corporate assets already nationalized by the founding of the People's Republic of China. Post-reform initiatives in the late 20^{th} century returned China to a mixed property regime, with around 70% of national wealth in private ownership by 2020. Moreover, political ideologies also profoundly influence the dynamics of wealth accumulation through its magnified emphasis on national savings, price distortions via misallocation of inputs across sectors, etc. Consequently, the primary composition of private Chinese national wealth has transitioned from predominantly consisting of farmland to a combination of residential housing and personal savings, while public national wealth is predominantly concentrated in corporate assets.

*__Very preliminary draft, please do not cite or circulate without the authors' authorization.__ Jiangting Wang provided extraordinary research assistance. We'd like to thank very helpful comments from Luis Bauluz, Lucas Chancel, Denis Cogneau, Kyoji Fukao, Amory Gethin, Mariko Hatase, Pierre-Cyrille Hautcœur, Thanasak Jenmana, Ruixue Jia, Branko Milanovic, Eric Monnet, Chiaki Moriguchi, Rowaida Moshrif, Thomas Piketty, Osamu Saito, Daniel Sanchez Ordonez and other participants at the Atelier Simiand at the Paris School of Economics, the World Inequality Lab internal seminar, the CASS internal seminar, and the economic history seminar at Hitotsubashi University. We thank Rishabh Kumar for sharing with us wealth data on India. Extraordinary research collaboration with the China Historical Balance Sheet (CHBS) team is also greatly appreciated. All remaining errors are ours.

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1 Introduction & Contributions to Literature

"I believe that in urban areas, there is indeed a phenomenon of the rich getting richer. However, in rural areas, it is more common to observe a situation where the poor and the rich become poorer at the same time."

Shijin Dong, Chinese Agronomist (1948)

How has China accumulated its national wealth from a backward agrarian economy to a modernized country with a very strong state presence over the past 100 years? What are the long-run dynamics between wealth accumulation and economic growth in China throughout the turbulent 20^{th} century?

All of these are important questions that have up until now not yet been properly answered in the economics discipline. In this paper, we attempt to construct the first ever long-run Chinese national wealth balance sheet stretching from the founding of the Republic of China in 1911 up until 2020, tracing out the history of national wealth accumulation with the rise and fall of various political regimes in between. To the best of our knowledge, our Chinese national wealth series will be the longest and most comprehensive one in the existing literature.

Overall, our main findings are the following. First of all, we find that Chinese national wealth has remained more or less stagnant for the better half of the 20^{th} century. It fluctuated within a very limited range between 300 and 450% from the 1930s until the early 1980s. Afterwards, with the advent of the reform and open-up period, Chinese national wealth has started to increase in a very dramatic and sustained manner. By 2020, the wealth-to-income ratio has reached an exceptionally high level of around 900%.

However, such an increase in total national wealth over the very long run conceals significant heterogeneities in wealth composition, which in turn is very much dictated by political ideology shifts across time. Firstly, we document a very dramatic inverted-U shape of the public share of national wealth throughout the 20^{th} century. Specifically, public share of national wealth went from being negative in the early 1930s, to its peak at around 90% of national wealth in the 1960s and 70s, then gradually decreased in the

reform and open-up period (post-1980s) to a stabilized 30% under a mixed-property regime in the 2010s.

Overall, we find that political ideologies very much dictate the dynamics of wealth accumulation over time. Two stylized facts emerge for Republican China (1911-1949). First of all, the nationalist government was very much indebted to the foreign sector at the time, with significant government bonds and treaty debt compensations claimed by foreign powers. Secondly, nationalization efforts for corporations in particular, had started as early as the late 1920s under the Nanjing nationalist government. By the founding of the People's Republic of China, around 40% of total corporate wealth had been concentrated in the hands of the public sector. Consequently, the discontinuity in terms of public and private shares of national wealth between the Republican and the Communist regimes, especially in the strategic corporate sector, was less profound than previously imagined.

That being said, the collectivist emphasis of Maoist China was still vividly manifested, first of all, in the violent and swift collectivization campaign which turned total national wealth to be almost 90% public-owned within a short duration of five years, and secondly in the predominantly savings-induced wealth accumulation of the heavy-industry corporate sector (at the expense of the agricultural sector) from the 1950s onwards. At the same time, we also witness extremely large and inefficient price distortions acting in the form of negative capital gains for corporate assets accumulation, which might explain the stagnant national wealth-to-income ratios for the entire Maoist period.

Such an over-emphasis on national savings-driven wealth accumulation was not phased out completely even in the post-reform period. Although significant housing reforms towards more privatization and market-based regulation have allowed for an increasing role of price liberalization in asset accumulation, their consequences have also left a looming housing bubble in the making and engendered an over-reliance on the real-estate sector for the national economy in the most recent years.

Last but not least, we also provide some preliminary evidence on how ideological underpinnings have driven the disparate spatial distribution of national wealth over

time, via the instances of treaty port openings in Republican China, Japanese colonization of Manchuria and Third Front Construction in Maoist China, etc. We also attempt to map out the first estimate of top 10% wealth shares in Republican China, where despite surging wealth inequalities mostly manifested in the form of real-estate asset concentration in urban areas, overall wealth inequalities were much less drastic than previously purported to be, comparatively also much lower than top wealth shares in highly mature capitalist economies in the West at the same time. This is mostly due to the fact that first of all, rural land inequalities were comparatively low to begin with in prewar China, and the Republican period was marked by significant out-migration of rich landlords from rural regions to larger metropolis. Such a significant loss of wealth at the top of the distribution further contributed to the general impoverishment of rural China at the time.

Our paper contributes to the existing literature along several dimensions.

First of all, in terms of national wealth estimation, there is currently a large literature on estimating long-run country-level wealth-to-income ratios, starting with the seminal paper by Piketty and Zucman (2014), which estimates long-run wealth-to-income ratios in a selected number of high-income countries. Since then, there has been an explosion of country-specific studies, usually with better-quality national accounts data.[1] As for estimating China's long-term wealth-to-income ratio, there is a recent influential paper from Piketty et al. (2019) which meticulously documents the rise of Chinese national wealth, but focuses only on the post-reform period (1978-2015). In this paper, building on and also improving their series based on better-quality data, we go a few steps further and describe the evolution of Chinese national wealth accumulation over the entire 20^{th} century. In other words, we will cover three key periods of modern Chinese history, the Republican China period (1911-1949), China under Mao (1949-1978), and post-reform China (1978-2020).

In addition to extending the Chinese national wealth series over a longer time horizon, another important contribution of this paper to the whole literature on national

[1]Such studies include, but are not limited to, the following: Germany (Albers et al., 2022), the United States (Dray et al., 2022), Sweden (Waldenström, 2017), Spain (Blanco et al., 2021), Italy (Gabbuti & Morelli, 2023), India (Kumar, 2022), post-reform China (Piketty et al., 2019), Greece (Charalampidis, 2018), South Korea (Lee & Yoon, 2017), Switzerland (Baselgia & Martinez, 2022), the United Kingdom (Madsen, 2019), the Netherlands (Toussaint et al., 2022) and post-USSR Russia (Novokmet et al., 2018).

wealth accumulation is to provide an alternative perspective on wealth accumulation other than that on Western and industrialized advanced economies, which currently dominates this strand of literature. The past studies spearheaded by Piketty and Zucman (2014) universally document, to varying degrees, a narrative of the come-back of capital in rich advanced economies, which indicates essentially a U-shaped pattern of national wealth-to-income ratios across rich countries over the entire 20^{th} century. However, in emerging countries which used to be characterized with a very strong agricultural sector and semi-colonial or colonial status, as well as limited private wealth accumulation with constrained development of capitalism at the turn of the 20^{th} century, national wealth accumulation oftentimes does not exhibit a U-shaped pattern expected for modern Western countries. It has also been disputed that it is exactly the lack of "effective capital accumulation" in late-Qing China which could have played an important role in the great divergence between China and the West. In this paper, we provide a novel angle on the unique Chinese experience in accumulating national wealth, in particular we attempt to understand what factors specifically hamper or drive national wealth accumulation and development in China over the long run. It contributes to the literature by providing new evidence on national wealth accumulation for backward economies throughout the better part of the 20^{th} century.[2]

Furthermore, there has already been a very large literature on estimating long-run historical Chinese national accounts, although most of the past scholarship has been rather focusing on estimating long-term Chinese national income (B. Wu, 1946; T.-c. Liu & Yeh, 1965; Perkins, 1969; Rawski, 1989; Angus, 1998; H. X. Wu, 2000; Broadberry et al., 2018, 2021; Ma & De Jong, 2019). Given that our series focuses on the evolution wealth-to-income ratio in essence, our methodology on estimating long-run Chinese net national income would also contribute to this debate on the flow estimation of historical Chinese national accounts.

On top of the historical national accounts, we also contribute to the vast literature on estimating existing capital stock in the Chinese economy, as well as the capital versus labor shares of national income (Chow, 1993; Chow & Li, 2002; Chow et al., 2006;

[2]The only other study in the national wealth literature which focuses on emerging economies is Kumar (2022), which depicts the Indian national wealth accumulation experience from 1860 to 2018. We provide a comparison between the Chinese and Indian wealth accumulation stories in the following parts of the paper.

Holz, 2006; J. Zhang, 2008; Bai & Qian, 2010). Compared to the existing literature, which almost exclusively focuses on national capital estimation using the Perpetual Inventory Method (PIM), our paper extends further in two important directions. First of all, our series of national wealth is much more complete with regards to the entire national economy, by strictly following the guidelines of the System of National Accounts and incorporating the aggregates of household, government, corporate and foreign wealth, in contrast to the literature which focuses mostly on the aggregates of fixed capital formation. Secondly, compared the PIM convention in this strand of literature, especially for the corporate sector, we adopt an alternative stock estimation method which relies less on flow capital investment data, and fewer assumptions on depreciation rates and baseline capital stock.

Furthermore, our paper contributes to a strand of literature attempting to comprehend the nationalization and modernization trajectory of the Chinese state (Naughton, 1988; Rawski, 1989; Kirby, 1990). Our paper demonstrates a more complete trajectory of (de)nationalization & (de)collectivization throughout the turbulent history of China in the 20^{th} century, and we providing new pieces of evidence on the close linkage between early-stage modernization and nationalization in backward economies (Suesse, 2023). In particular, we delineate the landscape of the rise and fall of State-Owned Enterprises (SOE) throughout the past 100 years in China, and explore the linkage between the public share of corporate assets and economic development over the long run. This contributes to the literature on understanding the role played by national corporations in the West (Short & Conrad, 1983; Toninelli, 2000; Piketty, 2014), by adding in a new perspective on the importance of state-led industrialization in backward economies.

Last but not least, our paper also touches upon the literature on estimating economic inequalities in pre-industrial societies via the lens of social tables (Milanovic et al., 2011; Alfani, 2021; Milanovic, 2024). There has been a number of studies on inequalities in Republican and Maoist China using class labels (Treiman & Walder, 2019; Alesina et al., 2020). Our paper contributes to this strand of literature by tentatively mapping out the first-ever top 10% wealth share in China throughout the 20^{th} century, by combining class label designations and statistics resulting from land reforms

gazetteers, socialist transformations, as well as contemporary household surveys.

In the remainder of the paper, section 2 provides the estimation methodology for national wealth accumulation in China, section 3 summarizes our main data sources as well as their limitations, section 4 presents the main results and section 5 concludes.

2 Estimation Methodology

In practice, we estimate national wealth by strictly following the guidelines of the UN System of National Accounts (SNA 2008), which means that we estimate wealth aggregates for the four main institutional sectors, namely the household,[3] general government, corporate and foreign sectors separately, and then allocate the corporate sector into the remaining three sectors by their relative shares of corporate ownership, through the market values of corporate equities and corporate bonds held respectively by each sector. Within each institutional sector, we also estimate asset holdings by major types of non-financial assets, financial assets, and liabilities, and calculate the aggregate net wealth accordingly.[4]

In our benchmark methodology, we attempt to uncover the market value of different asset (liability) classes as faithfully as possible, which is in nature the so-called census-like method, where the market value of a given asset class is calculated as the product of the prevailing asset-class unit market price and the macro aggregate number of units in the particular asset market.

However, given that not all market-clearing asset prices exist in archival records, and for the better half of the 20^{th} century, China was not governed under a mature market economy, we rely on a wide range of alternative estimation techniques, for instance the book value of corporate wealth, where the total value of corporations is estimated by the book value of corporate assets net of non-equity corporate liabilities from existing

[3]Here we merge the household sector and "non-profit institutions serving households" (NPISH) sector together, as the division between the two isn't always very clear.

[4]Major types of non-financial assets include residential housing, farmlands and other domestic capital. The last category typically includes non-residential housing, farming machinery, livestock, unincorporated business assets, etc. Consumer durable goods are excluded in our series. Financial assets include but not limited to the following: equities, currency and deposits, bonds, etc. Natural resource assets (such as forestry land, mineral resources, etc) are also excluded in our aggregate wealth series, but reserved lands are included.

or reconstructed corporate balance sheets, or compensation methods (backing out of existing capital levels via assumed capital-to-output ratios) for certain asset classes such as agricultural lands when the land market was absent or non-existent.[5]

Following the definition from the UN System of National Accounts (SNA 2008), national wealth could be defined as the following: *"For the economy as a whole, the balance sheet shows the sum of non-financial assets and net claims on the rest of the world. This sum is often referred to as national wealth"*. As such national wealth W_{nt} could be written as the following:

$$W_{nt} = NFA_t + K_t \tag{1}$$

where net market-value national wealth W_{nt} is estimated as the sum of Net Foreign Asset Position (NFA_t) and Total Net Domestic Capital (K_t). Net foreign wealth is estimated as gross foreign assets net of gross foreign liabilities. Net domestic capital could be further subdivided into **non-produced assets** such as agricultural land, and **produced assets** such as housing, corporations and other types of domestic capital (machinery, farming tools, etc).

Additionally, by public and private asset ownership, national wealth could also be defined as the following:

$$W_{nt} = W_{gt} + W_t \tag{2}$$

where net national wealth is the sum of net private national wealth (W_t) and net public national wealth (W_{gt}), which separately indicates the aggregate of financial assets (net of liabilities) and non-financial wealth for the government and the private (the household sector and non-profit-institutions serving households).[6]

Public national wealth includes all kinds of asset classes directly or indirectly owned

[5] All the details on how constructed our historical balance sheet series by different asset classes or institutional sectors could be found in the Appendix.

[6] Notice here that the term of net foreign wealth disappears, because the financial assets net out to be zero across all institutional sectors (household, general government, corporation, NPISH and foreign), as financial asset of one institutional sector is the financial liability of another.

by the public sector (namely state administration, state-owned enterprises, and other public agencies). Given the turbulent and oftentimes violent history of nationalization and de-nationalization throughout the 20^{th} century in China, the long-run evolution of public and private shares of national wealth is in itself a very interesting research inquiry to be understood more thoroughly.

As previously mentioned, an alternative way of measuring corporate wealth when corporate assets are not valued at their market value, would be to estimate the total value of corporate assets, net of non-equity corporate liabilities from corporate balance sheets, which is often labeled as the book value of corporate wealth. Rather conveniently, in periods of time when both methods of estimating corporate wealth are empirically feasible, we could define residual corporate wealth as the difference between book-value corporate wealth and market-value corporate wealth. Tobin's Q, which is defined as the ratio between the book value and the market value of corporations, would then be equal to one when the residual corporate wealth is equal to zero.[7] Both market-value and book-value corporate wealth estimations have their merits and pitfalls. Depending on contexts and data availability, we may be able to only use one particular corporate asset estimation methodology over another.[8]

For the better part of this paper, we would be presenting results with the concept of "wealth-to-income ratio", in order to understand better the interplay between national wealth accumulation and national income growth over the very long run. It is defined as $\beta_{nt} = \frac{W_{nt}}{Y_t}$ and essentially indicates the number of years of annual national income Y_t needed to reproduce the national wealth stock W_{nt} (Piketty, 2014). As such, we also construct the long-run national income series for the same period of interest. Compared to wealth stock, flow data on national income is more readily available. Nonetheless, various adjustments still have to be made in order to adhere to the net national income definition as stipulated by the System of National Accounts.[9] In addi-

[7] It would be larger than one when book-value corporate wealth is larger than market-value corporate wealth, and vice versa.

[8] For instance, especially for the Maoist period in China (1952-1978), there was no market valuation of corporations in China (no market capitalization, and no effective existence of stock market, etc). What we estimate is essentially the book value of corporate wealth during this period time. Accordingly, we also make the convenient assumption here that market-value corporate wealth is equal to book-value corporate wealth during this period, i.e. Tobin's $Q = 1$.

[9] Please see appendix 6.1 where we have a more detailed discussion on how we constructed the long-run net national income series under varying assumptions for different periods of interest.

tion, given the fact that wealth tends to be more concentrated than income, a rise in the wealth-to-income ratio oftentimes is also indicative of further wealth concentration at the top.[10]

Given the very long timespan we cover, the estimation of Chinese national wealth in this paper is divided into three main sub-periods, namely the Republican China period (1911-1949), the Maoist China period (1949-1978), and the post-reform period (1978-2020). Such a timing demarcation delineates the three major periods of differentiated political regime upheavals in China for the entire 20^{th} century. Given that data availability and the contours of data production largely hinge upon the nature of ruling regimes in China, this division is also empirically justified.

3 Data Sources

In this section, we summarize the main data sources for the major asset categories estimated in this paper under different political regimes in 20^{th}-century China.[11] As previously mentioned, our data sources differ greatly depending on the main sub-periods of interest.

Republic of China (1911-1949) For the Republican period, due to data limitations, we take the year 1933 as the focal point, where we estimate each asset category in detail, and then extend both backward (until 1911) and forward (until the early 1940s) under varying assumptions.[12]

[10] Except in circumstances where the increase in national wealth is mostly due to the rise in public wealth such as the public pension fund, etc.

[11] The major asset categories included here are agricultural land, housing (real-estate), corporations, directly government-owned assets, foreign assets and other domestic household assets. Furthermore, in this section, we only provide a brief summary of the data sources. For more details on the construction of the national wealth series and the minute assumptions made in between, we refer the reader to the appendix of the paper.

[12] There are many reasons as to why this year was chosen as the focal point of aggregate national wealth estimation. To list a few, it is the year for which exists the first national industrial census conducted by T.-c. Liu (1937). This is also the year characterized by relatively political stability of the Nanjing nationalist government with vibrant economic activities across the entire country. Additionally, in the current draft of the paper, we only produce the aggregate wealth figures for the year of 1933 alone. For agricultural land and residential housing, we have a few additional points for the Republican era, as separately reported in the land and housing wealth-to-income ratio series. The more complete aggregate wealth-to-income series from 1911 onwards will be completed in the coming future in more complete versions of this paper.

For agricultural land wealth, we adopt the census-like method, where we estimate total land value as the product between the total areas of cultivated land and the national-level unit land price. We obtain provincial-level land area and price data by synthesizing a wide range of primary data sources, such as Republican government land surveys, land statistical abstracts commissioned by the Statistics Bureau of the National Government at the time, as well as previous studies on agricultural land areas in China (B. Wu, 1946; Buck et al., 1964; T.-c. Liu & Yeh, 1965). On the other hand, for residential housing, we collect first-hand total property revenues for the major cities at the time from various archival sources and back out the property values based on average effective property tax rates. For smaller cities, we collect household rental expenditures (or income) data from representative surveys conducted at the time and assume a certain relationship between rental income and total property value (Buck, 1930).

One of the major reasons why the year 1933 is chosen as the focal point for the Republican period is the availability of the industrial census conducted by T.-c. Liu (1937), which contains rather rigorous information on the total outputs by industrial subsectors and forms the basis of corporate asset estimation for that year. As such, for each industrial sub-sector, for instance the textile sector, if we can find micro-level corporate balance sheets of representative factories, which allows us to back out the asset-output ratio of these firms, we would take the average asset-output ratio of these factories as the industrial sub-sector mean, and use the output data from T.-c. Liu (1937) to back out the total net corporate assets of that particular sub-sector. We also replenish this 1933 industrial survey data with other statistics from the Manchurian Railway Archives, in order to have more precise estimates of industrial assets for the Northeast region of China under Japanese occupation.

Foreign wealth in 1933 is obtained by substantially modifying a few existing studies (Remer, 1933; C. Wu, 1955; C.-m. Hou, 1965) where the authors have already produced various estimates of total foreign investments in China in the early 1930s. We rectify these statistics along two major dimensions, first of all the extent of foreign debts shouldered by the national government at the time with supplementary data from Archival Historical Data of Foreign Debts in the Republic of China. Secondly,

we add back foreign housing data which we estimate based on property tax records in concessions areas in major cities in China at the time, such as the French Concession and International Settlement areas in Shanghai.

Maoist China (1949-1978) For People's Republic of China prior to 1978, to begin with, for agricultural land assets, given the lack of effective land market after the land reforms and rural collectivization campaigns, currently we take the simplified approach of a compensation method, where total land values are assumed to be a fixed ratio of crop outputs.[13] We take annual crop outputs data from the National Yearbooks of Agriculture and assume varying ratios with the corresponding changes in legal stipulations on land compensation over time.

For the other asset categories (housing, corporation, government asset, etc), our main data sources are a few national statistical compendiums, which usually compile various types of national asset or investment statistics for different sub-sectors during the Maoist period (1949-1978).[14] Given the collectivist nature of China at the time, these statistical yearbooks and compendiums oftentimes predominantly focus on the asset estimation of central state-owned entities, such as the stock of fixed assets for state-owned industrial or commercial enterprises, asset balance sheet of central bank, etc. We make necessary adjustments to incorporate the non-central (local) dimensions of national assets at the time, such as total asset values for urban and rural collective enterprises, etc.

Post-reform China (1979-2020) The post reform-and-open-up series is anchored upon the one estimated by Piketty et al. (2019). Their series effectively ends around 2013-2015, and we extend it forward for all institutional sectors, as well as the public-private asset divisions up until the fiscal year of 2020, with new or modified national accounts data collected for the latest years.[15] In addition, we also re-estimate, for instance, the

[13]This assumption is reasonable when the land was expropriated for governmental or other uses.

[14]These statistical compendiums include but are not limited to the following: Chinese Socialist Transformation Compendium (1953-1957), Selected Compendium of Chinese Economic Archives (1952-1960), Chinese Industry Economic Statistics Compendium (1949-1984), Chinese Industry Statistical Yearbooks (1985-1994), Financial Institution Renminbi Credit Balance Sheet (1952-2013), Forty Years of Endeavor (1949-1989), etc

[15]For instance, the official GDP statistics have been modified on multiple occasions, which oftentimes modifies the historical series as well. Second of all, the latest population census in 2020 also corrects key flow variables in China which significantly alters the old series, such as aggregate population, ur-

corporate balance sheet for the period 1978-1992 based on newly available corporate liabilities data from the financial institution balance sheet (1952-2013) published by the People's Bank of China.

All in all, it's important to acknowledge that our national wealth series is still far from being perfect and faces different data limitation issues for different periods of interest. For instance, our treatment of the Republican period puts disproportionate weight for the early 1930s, and we still need to adjust better the way we estimate both housing and land values for the other decades of interest during this period of time. Second of all, our correction to the official statistics published in various yearbooks during the PRC period is also insufficient for the moment, especially with an emerging literature calling for caution while directly utilizing official Chinese economics statistics (W. Chen et al., 2019; Martinez, 2022; Ferguson & Kim, 2023). As such, additional efforts are needed to better gauge the reliability of official statistics during this period of time. That being said, our series is still one of the first to undertake the most exhaustive and gigantic data collection efforts over the most extended period of time for estimating Chinese national wealth accumulation. Despite the significant extent of assumptions made for different asset classes under study, we believe the series presented in this paper still capture the major order of magnitudes of national wealth variations in China over time. We hope our current series would also spark further academic interests and discussions for perfecting historical Chinese national wealth estimation in the coming future.

4 Preliminary Results

4.1 Long-run National Wealth Series (1911-2020)

First of all, we present the long-run series of aggregate net-national-wealth to net-national-income ratios for China from 1933 to 2020.[16]

banization rate, per capita housing space, etc. That being said, the major orders of magnitude reported in Piketty et al. (2019) are not altered with the revised national wealth series during this period of time.

[16]Without further explanations, for the remainder of this paper, while we invoke the concept of "wealth-to-income" ratio, we will be talking about net-national-wealth to net-national-income ratios. Furthermore, to ensure consistency in terms of geographical coverage, the whole wealth series from 1911 till 2020 only covers the geographical area of mainland China, in the sense that it doesn't include Taiwan, Macao SAR and Hong Kong SAR.

To begin with, Table 1 summarizes the aggregate wealth estimation results for the year of 1933 alone. We could see here that at the height of the Republican China period, the bulk of national wealth was concentrated in the household sector, with household wealth to national income ratio standing at around 320%. Within the household sector, given the fact that China was still a predominantly agrarian economy, the overwhelming majority of private wealth was manifested in the form of agricultural land, which represented more than 200% of national income at the time. This was followed by private housing wealth which represented around 50% of national income in 1933.

In addition, what comes as quite striking is the fact that the Republican government was relatively poor and held very little wealth compared to either the household or the foreign sector. Two stylized facts emerge. First of all, in terms of asset levels, the Republican government held very little non-financial or financial assets. Its holding of agricultural land and housing asset did not surpass more than 2 to 3% of national income at the time. Secondly, the Republican government was also heavily indebted in the 1930s, with its liabilities rising up to nearly 20% of national income. Most of these liabilities were in actuality foreign liabilities, for instance debt and bonds claims held by foreign entities in China at the time. This also in a way contributes to the fact that the net foreign asset position as reported in Table 1 was negative in China in 1933. The composition of foreign wealth in China seems to be mostly driven by corporate equity assets, government bonds and debt claims, and residential housing assets. On net, foreign entities owned an equivalent of total net assets of 40% of net national income in China in 1933. This also fits the general narrative that China was a semi-colonized society back in the days. If we further examine the net foreign asset position at a cross-country level in Figure 58, we notice that the level of negative net foreign asset position in China in the 1930s was very similar to that in India during the same period of time, which came close to -50% of Indian national income at the end of the 1930s. This further lends credence to our estimates as rather faithfully characterizing the nature of semi-colonial societies.

On the whole, China in 1933 was best characterized as a deeply agrarian economy with extremely limited state financial capacity and was also a net debtor towards the rest of the world.

Table 1: Net National Wealth in 1933 by Institutional Sectors

Categories	**Household Sector**	**Government Sector**	**Foreign Sector**
Non-financial Asset	274%	7%	-4%
Agricultural Land	207%	2%	0.00%
Housing	41%	3%	-4%
Others	27%	2%	0.00%
Financial Asset	36%	6%	-26%
Equities	19%	4%	-14%
Currency & Deposits	16%	2%	0.00%
Bonds	2%	0.00%	-12%
Liabilities	1%	18%	2%
Net Wealth	310%	-6%	-23%

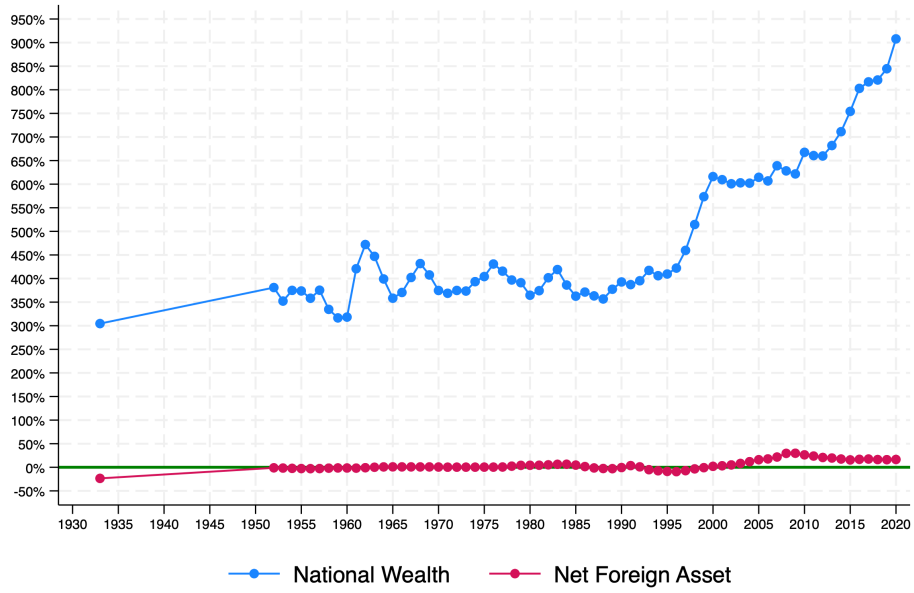
Notes: Figures indicate the ratio of net wealth w.r.t. net national income in 1933.

Moving onto the longer time horizon, in Figure 1 we look at the wealth-to-income ratio for the entire Chinese national economy from 1933 to 2020.

Overall, if we first focus on the national wealth series, we could see that wealth-to-income ratio in China had been fluctuating between 300% and 400% for the better half of the 20^{th} century (1930-1990), with some idiosyncratic ups and downs in between. However, on the whole, there was no effective sustained increase and accumulation in national wealth-to-income ratio over this period of time. This in itself is a very interesting finding. Indeed, it doesn't indicate that national wealth was not growing over this period of time, but rather that its pace was more or less on par with the growth of national income, and wealth didn't accumulate and increase further in a more sustained manner than income.

More sustained growth in national wealth-to-income ratio occurred from the mid-1980s onwards, and by the second decade of the 21^{st} century, Chinese national wealth to income ratio has increased to a record high of around 900%. At the same time, net foreign asset position has also turned from negative to being consistently positive from the early 2000s onwards. For the first time in its history, China has become a net creditor towards the rest of the world, in spite of the relatively limited size of net foreign asset position given the much larger scale of the Chinese economy nowadays.

Figure 1: Net National Wealth to Net National Income Ratio (1933-2020)



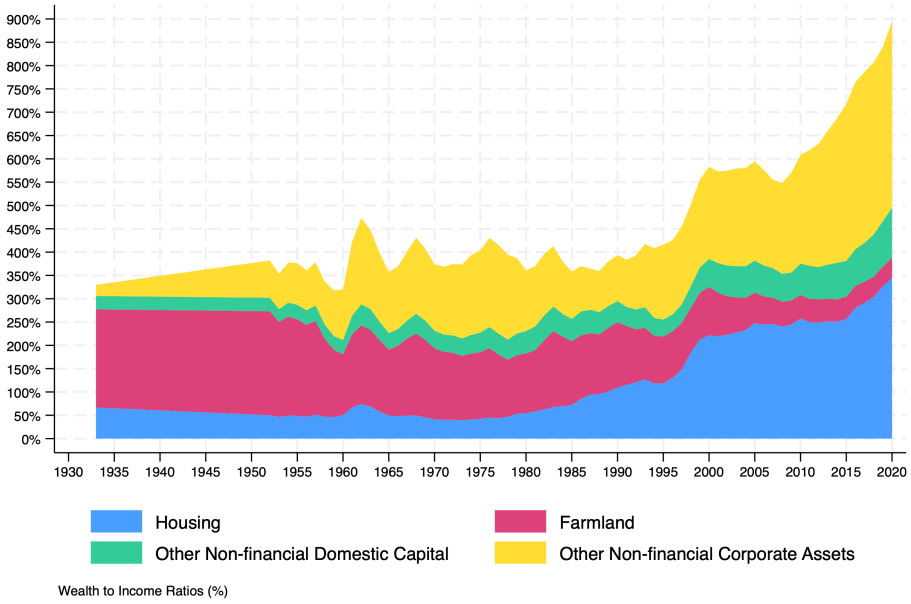
4.2 Asset Composition, Nationalization and Privatization

A very natural question to be pondered over next is how Chinese national wealth was composed of over the past 100 years, and what the major forces are that drive (de)nationalization processes over the course of a century.

First of all, we decompose domestic capital in China into different asset types, in order to better comprehend the heterogeneous asset composition variations over time. In Figure 2, we decompose domestic capital (K_t in equation 1) into housing, agricultural land, non-financial corporate assets and other non-financial domestic capital over the period of 1933-2020. We could observe that in the early decades, domestic capital was dominated by the presence of agricultural land. In the Maoist period (1949-1978), there was a rather sudden uptick of non-financial corporate assets, which was indicative of the capital-intensive industrialization efforts during this period of time. At the same time, the share of agricultural land continued to decrease, although it occupied more or less the same share as corporate assets (in total national wealth) over these decades, indicating the decreasing yet still central role of agricultural-land-based wealth in Maoist China.

The share of agricultural land in Chinese national wealth began to decrease more consistently from the 1990s onwards, while at the same time housing wealth appeared

Figure 2: Long-Run Domestic Capital Composition (1933-2020)

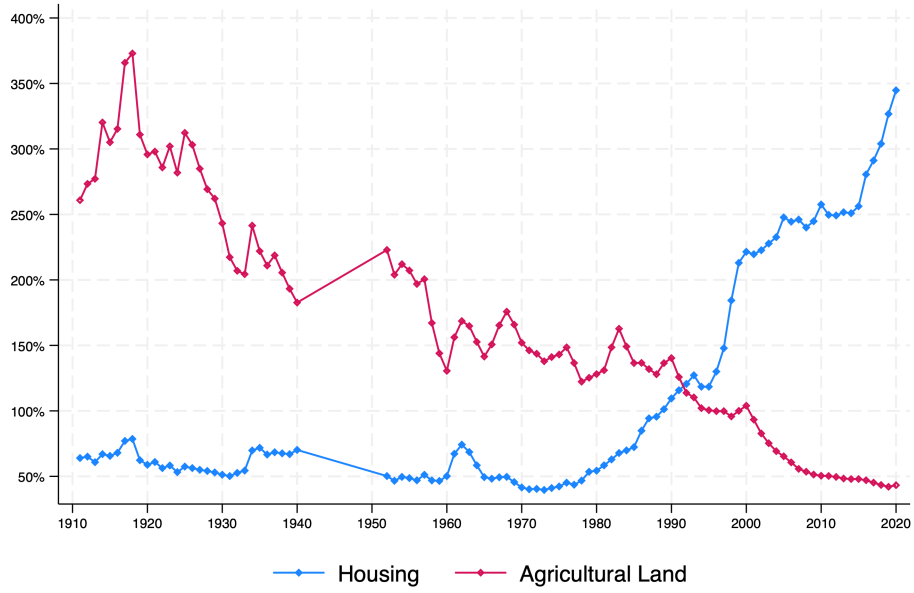


to start replacing agricultural land as one of the most important asset categories, in tandem with the housing privatization reforms throughout the late 1980s and 1990s. Over the next several decades, it has completely replaced agricultural land and together with corporate wealth, it has become one of the two most important domestic asset categories in post-reform contemporary China.

This "land asset versus real-estate asset" scissors-gap phenomenon is more vividly represented in Figure 3, where we plot the agricultural land wealth to national income ratio against the housing wealth to national income ratio from 1911 to 2020. It's easy to observe that agricultural land was consistently the most important asset category in Republican China across the years, although its ratio to national income had been gradually declining over time. During the same period of time, housing-wealth-to-national-income ratio stood at around only 50 to 70%. Furthermore, it's important to note that the housing wealth ratio stagnated within this interval for the better half of the 20^{th} century from 1911 until the early 1980s. Housing value started to overtake that of agricultural land in the 1990s, which is indicative of the extensive housing privatization reforms taking place during those years. Overall, over the course of the past 110 years, agricultural land wealth to national income ratio has decreased from 300% to less than 50%. On the other hand, housing wealth to national income has increased from 50% to almost 350% in 2020. This almost symmetrically diverging trend between

agricultural land wealth and housing wealth also tracks very closely the evolution of increasing urbanization in China over the years, as reported in Figure 30, where nationwide urbanization rate increased from around 10% in Republican China to more than 60% in 2020.

Figure 3: Agricultural Land Wealth and Housing Wealth to National Income Ratio (1911-2020)



Notes: Agricultural land wealth here doesn't include forestry, fishery and animal husbandry land values. It includes both values of crops attached to the farmland and the underlying land value.

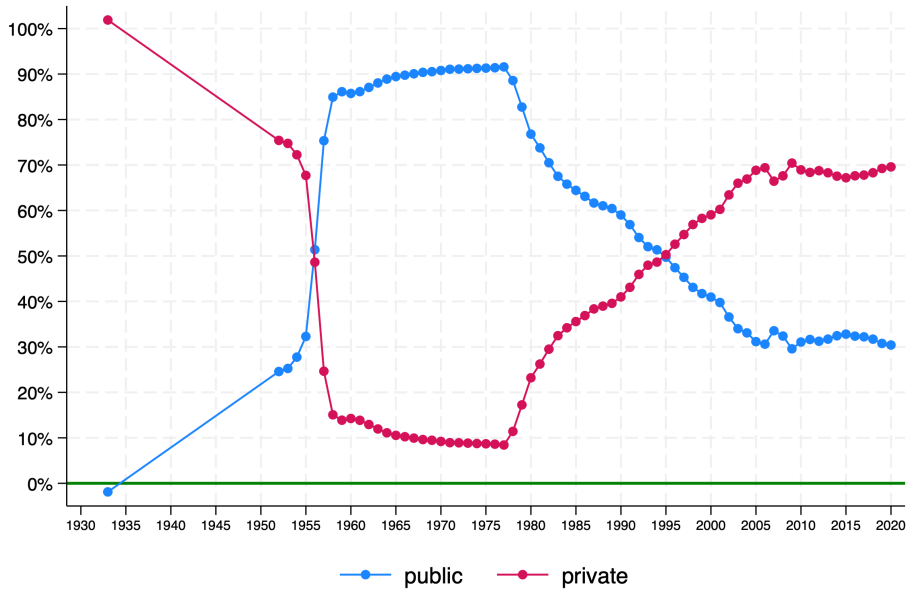
After having witnessed that China has transitioned from a land-wealth-based economy to a housing-wealth-based economy, we would like to further analyze the entities behind the holding of national wealth in China, namely how much national wealth are the private and public sectors respectively possessing, and in what?

Delineating the history of national wealth privatization over the entire 20^{th} century in China requires very detailed decomposition for all types of capital under study. Appendix 6.6 provides a very detailed discussion on how we arrive at the private versus public share figures for housing, land, corporate assets, etc, as well as the assumptions and methodologies employed for each asset class of interest.

Figure 4 depicts the long-run evolution of public and private shares of national wealth in China from 1933 till 2020. First of all, it's interesting to note that the public share of national wealth was negative in 1933. This is not a surprise as the same was found

for other Western countries, the government of which relied heavily on public debts to finance the two world wars at the time as well. Although as previously mentioned, in China the nature of government debt was rather different (dominated by foreign debt as opposed to domestic debt).[17] Although private wealth occupied more than 100% of national wealth in 1933, it was very much swiftly compressed following the socialist transformations initiated by the Communist Party of China in the early 1950s. The entire procedure was very drastic, and somewhat violent, as we could see that within less than five years, the private share of national wealth decreased abruptly from nearly 80% to around 10%. This was oftentimes referred to as one of the most drastic episodes of collectivization in human history (Xiao, 2014).

Figure 4: Long-run Public and Private National Wealth Shares (1933-2020)

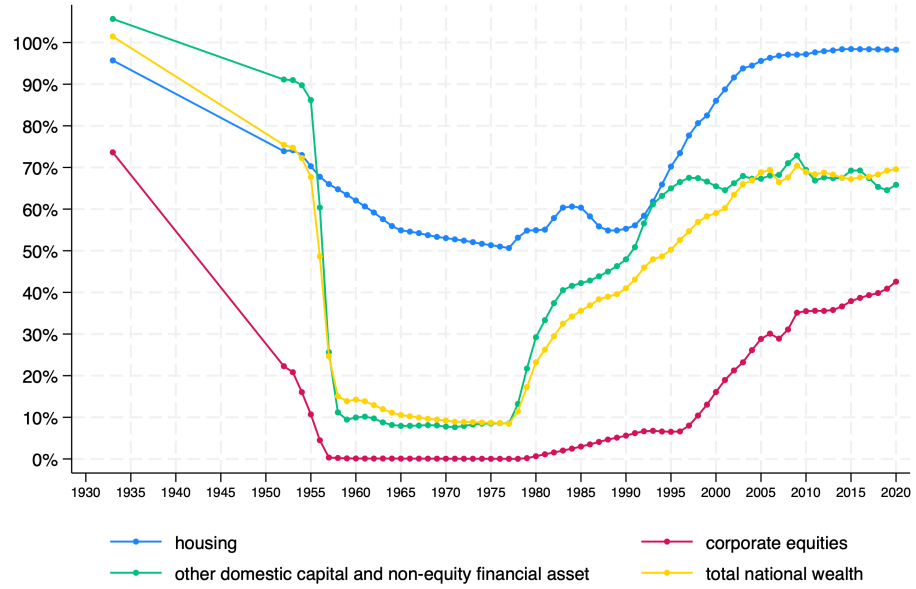


Afterwards, the private and public divides of national wealth remained relatively stable over the 1960s and 1970s, with the peak when 90% of national wealth was in the hands of the public sector. More extensive and sustained privatization took place from the late 1970s onwards. From Figure 4, it's shown that there were different waves of rather "organized" privatization initiatives in China during the reform and open-up period. Shock therapies were not extensively applied as in the case of Eastern Euro-

[17] Our online appendix provides a more in-depth discussion on the different types of debts shouldered by the nationalist government at the time.

pean privatization experiences (Lipton & Sachs, 1992; Sachs, 1992). Consequently, the private share of national wealth has since then gradually increased in order and stabilized at around 70% of total national wealth in the 2010s. This seven-to-three private and public divide in national wealth ownership best characterizes the nature of being a mixed-property economy which China is today.

Figure 5: Private Shares of National Wealth by Asset Types (1933-2020)



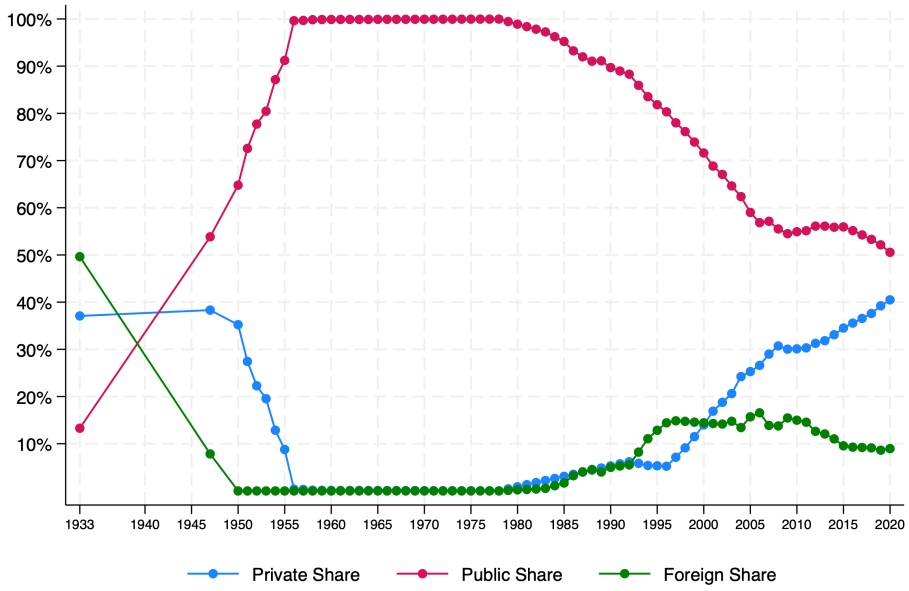
Admittedly, the pace of privatization (nationalization conversely) differs substantially depending on the asset class under study. Figure 5 depicts the heterogeneous privatization variations over time in terms of different asset categories.

Among all asset classes, corporations were consistently the least privatized across time. Private share of corporate equities reached its apex in the 1930s, when of all domestic and foreign corporate equities either held by the Chinese government or the household sector, more than 70% of those are in the hands of private households.[18] Since then, Chinese corporations had been very drastically nationalized in the socialist transformation period, and it was also one of the last asset types to embark on privatization in the post-reform period, where up until 2020 only 40% of total corporate equities were in the hands of the Chinese households (while the total private share

[18]The peak of Chinese domestic capitalism (driven by private Chinese nationals) occurred around the early 1920s, please see the newly-created enterprise registered capital share in appendix Figure 44.

of national wealth is now around 70%).

Figure 6: Nature of Ownership of Net Corporate Wealth in China (1933-2020)



Notes: Data for the year 1947 are taken from Xu and Wu (2003). Data for all the other years are based on our own calculations.

If we further zoom in onto corporations alone, we could see that in terms of equity holdings, the public share had started increasing with the founding of the Nanjing nationalist government in 1927 (Figure 44), with the nationalization efforts initiated by the Kuomingtang to materialize one of the three principles of the people as advocated by Sun Yat-sen. Within the first ten years of the Nanjing nationalist government, the cumulative public share of registered capital of all newly created enterprises rose from 15% to 23%. The more extensive wave of nationalization took place more drastically in the aftermath of the Second World War, where from Figure 6 we could see that the public share of corporate assets increased from around 10% in 1933 to more than 50% in 1947, which was accompanied by a corresponding decrease in the foreign share of corporate wealth at the same time. It could be argued that a non-negligible component of the rise of public corporate wealth during this period of time was due to the confiscation of foreign corporate assets, especially Japanese corporate assets in the aftermath of the Second World War.

The extensive foreign presence in prewar China is further confirmed that in the year of 1933, of all domestic corporate equities in China, around 50% of them were held

by foreign entities (Figure 6). The foreign presence was hence even more widespread than domestic private enterprises at the time. This is more vividly illustrated in Figure 40 and Figure 41, where we restrict our attention to modern industry enterprises alone, and present the foreign, private and public shares of gross corporate assets by different modern industry sub-sectors. It's worth noting here that foreign corporate wealth was very much concentrated in heavy-industry as well as strategically critical sectors such as shipbuilding and repairs, mining, military and public utility firms. In Manchuria which at the time was under Japanese colonization, almost the entirety of the aforementioned four sub-sectors were foreign (i.e. Japanese) owned.

We measure more systematically in which corporate sub-sectors were nationalization campaigns occurring to begin with in Republican China in Table 14.[19] It is clear that nationalization took place more vehemently in sectors such as transportation (railways in particular), mining and service.[20] On the other hand, public asset was non-existent for sectors such as handicrafts industry and commerce.

We also construct long-term public, private and foreign shares of corporate assets by corporate sub-sectors over the longer time horizon (1890-2020). If we focus on private shares alone in Figure 46, it is evident that compared to other corporate sub-sectors, finance and transportation were the least privatized industries consistently throughout Chinese history in the 20^{th} century. The private share of transportation corporation assets never surpassed 20% from 1890 up until 2020. While on the other hand, commercial enterprises (wholesale and retailing) have consistently been the most privately vibrant corporate sub-sectors over the course of the 20^{th} century, with on average 60 to 70% of commercial corporate wealth held in the hands of the household sector across time except for Maoist China. More interestingly, the foreign control of Chinese corporations started with transportation and modern-industry firms at the turn of the 20^{th} century, and gradually concentrated in the financial and commerce sectors around the 1930s (Figure 48).

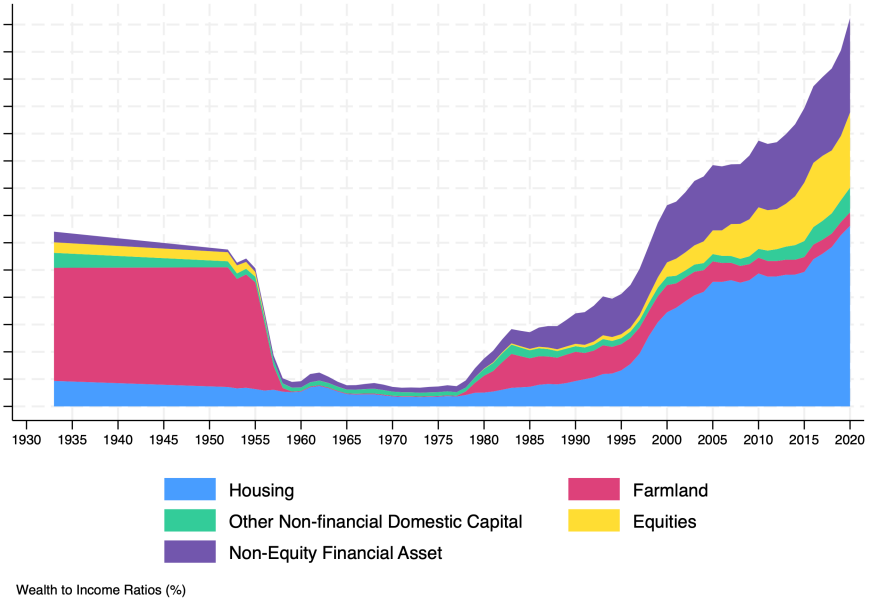
After having traced out the contours of (de)nationalization of the corporate sector,

[19]It should be noted here that in this table we are looking at gross asset ownership structure only, not net corporate equity holdings. This is also the reason why the results here differ from the equity holding structure reported in Figure 6. In short, not accounting for corporate liabilities, the private share of corporate assets and the foreign share of corporate assets were flipped in 1933.

[20]The majority of public assets in the service sector was concentrated in education and health.

in direct contrast, privatization took place in a more extensive manner for housing wealth. Even at the height of collectivization in the 1960s and 1970s, around 50% of housing was still privately owned. This is owing to the fact a lot of homestead values (in rural China in particular) and a certain fraction of urban housing were never officially collectivized.[21] Up until 2020, rather strikingly, almost all housing wealth is now privately owned in China.

Figure 7: Long-Run Gross Private Wealth Composition (1933-2020)



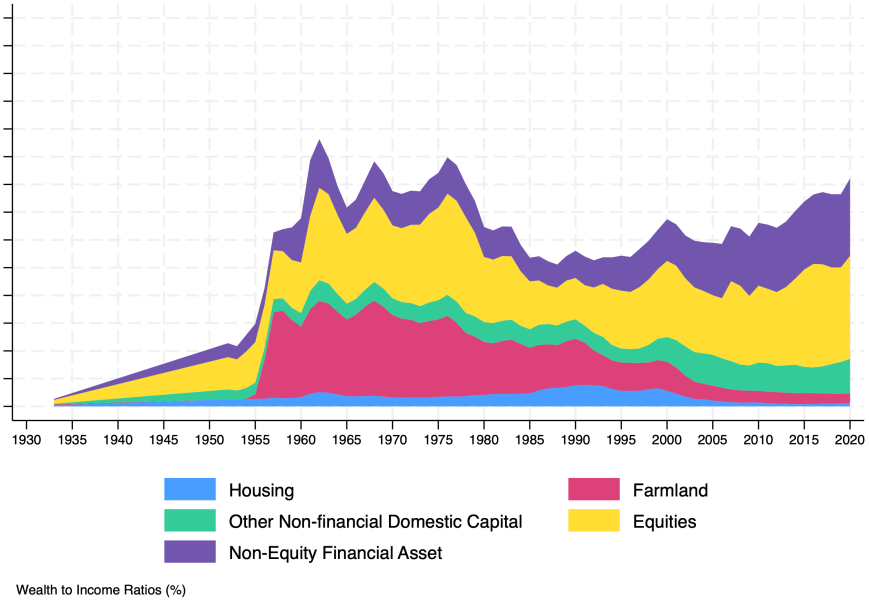
Notes: This Figure indicates the total amounts of private wealth (the sum of household and non-profit institutions serving households) by asset types, without accounting for private liabilities.

The privatization evolution of different asset classes speaks directly to the asset composition evolution of both private wealth and public wealth in China. In Figure 7, we delineate the historical evolution of gross private national wealth in China by asset categories. It's worth highlighting that in Republican China, the predominant private wealth category was agricultural land, with rather limited private wealth held in housing, financial assets or corporate equities. Private wealth in China came to a nadir with the advent of the Maoist period, with the total gross private wealth-to-national-income ratio falling below 50%. Later on, during the reform and open-up period, we could observe a very striking replacement of agricultural land by residential housing as the predominant asset category in private Chinese national wealth (nearly 50% of

[21] See appendix 6.6.2 for a more detailed discussion on this.

total gross private national wealth in 2020). We also witness a large albeit less drastic surge in non-equity financial assets among Chinese households (around 25% of total gross private national wealth), which is largely dominated by the rise of the Chinese savings glut (Wei & Zhang, 2011). As such, the replacement of agricultural land by residential housing as one of the major components of Chinese national wealth as depicted in Figure 2 speaks directly to the asset composition reshuffling in private national wealth over the course of the 20^{th} century.

Figure 8: Long-Run Gross Public Wealth Composition (1933-2020)



Notes: This Figure indicates the total amounts of public wealth by asset types, without accounting for public liabilities.

The other piece of the puzzle lies in the evolution of public national wealth composition. In Figure 8, we could observe that in the 1930s, the gross aggregate of Chinese public national wealth was rather negligible. It started to increase markedly in the 1950s with extensive land and corporation collectivization. Collectivized land value formed as a solid basis of public national wealth during this period of time. However, the more impressive phenomenon at the time was the very large increase in corporate public wealth, which was oftentimes purported to be siphoning off an excessive amount of capital at the expense of the agricultural sector. Although public corporate-equity form of wealth took a dip in the 1980s, it has since consolidated itself as the single most important public asset component in China: by 2020, it has occupied nearly

50% of gross public national wealth, with other financial non-equity assets coming second at around 30% of gross public wealth, which is almost the exact opposite of private Chinese wealth. The aforementioned depiction of public and private wealth composition evolution could be most adequately summarized into the following sentence: the Chinese government owns the enterprises, while the Chinese public own the houses.

4.3 Decomposition of Wealth Accumulation into Savings Effect and Price Effect

How much of the national wealth accumulation is due to the national savings (hence re-investment into capital accumulation) behavior of the economy at large, and how much of that is a result of capital gains or losses, i.e. (de)valuation effect over time?

We intend to quantitatively answer this question by following the decomposition methodology proposed by Piketty and Zucman (2014), where we decompose the accumulation of national wealth into the volume effect (savings effects) and price effect (capital gains or losses), via both the multiplicative and additive decomposition approaches.

The two decomposition approaches differ by modelling how the relative price effect (capital gains or losses) enters the wealth accumulation equation, either multiplicatively or additively. The multiplicative accumulation equation writes as the following:

$$W_{nt+1} = (W_{nt} + S_t)(1 + q_t) \tag{3}$$

where the total stock of national wealth in the economy W_{nt+1} in period $t+1$ is a result of the initial wealth stock from the previous period t: W_{nt}, in addition to the total amounts of net national savings realized in year t: S_t, multiplied by the real rate of capital gains $1 + q_t$. On the other hand, equation 4 states the additive decomposition model, where we have KG_t as the additive term that captures the total amounts of capital gains or losses in a given economy.

Besides the difference in mathematical construction, the two decomposition approaches also differ slightly in their decomposed items: the multiplicative approach essentially

decomposes the growth rate of wealth into the growth component that is induced by savings rates and the other growth component due to capital gains or losses; on the other hand, the additive approach decomposes wealth accumulation into a part of the accumulation that is due to the initial wealth accumulation (some base-year starting-point accumulation effect), the cumulative new savings (volume) effect and the remaining (residual term) as the capital-gain-or-loss effect (price effect).[22]

In terms of similarities between the two, however, in practice, while measuring the relative roles of volume effect versus price effect, we would first calculate the fraction of wealth growth or accumulation that is induced by net national savings, the price effect is then rather treated as a residual term, which means that it could reflect potential measurement errors other than real capital valuation effects.

$$W_{nt+1} = W_{nt} + S_{nt} + KG_t \tag{4}$$

The multiplicative decomposition of national wealth accumulation in China by decades (1952-2020) is reported in Table 2.[23] First of all, it's important to note here that the average annualized wealth growth rate was much lower in the initial decades after the founding of People's Republic China (namely the Maoist China period) than the decades ensued during the reform and open-up period, where the growth rate g_{wt} stood at only 3 to 4% between 1950 and 1980, and it skyrocketed to an annualized rate of around 10% in the following decades up until now.

Rather strikingly, the capital-gain effect throughout the first few decades (1952-1980) was negative, which means that there were net capital losses in national wealth accumulation from the 1950s until the end of the 1970s. The extent of capital loss was tremendous, as it offset more than half of the positive savings-induced national wealth accumulation effect, especially in the 1950s and 1970s. This partially reflects the fact that national wealth accumulation in China in the Maoist period was realized with very large inefficiencies (in terms of real rate of capital gains or losses in particular).

[22] In appendix 6.7 we discuss in further detail the theoretical underpinnings of the two decomposition approaches, such as the one-good versus two-good Harrow-Domar-Solow capital accumulation model, as well as their respective empirical estimation components.

[23] For the moment we haven't obtained net national savings figures for the Republican China period yet, which will be further replenished in the future.

In China of the post-reform era (after the 1980s), there was a gradual reduction in the disparity between volume and price effects. This shift was particularly notable with the implementation of privatization and the intensification of market reforms. Over the first two decades of the 21^{st} century, the relative importance of the price effect has surpassed that of the volume effect, marking a notable reversing trend during this period.

On top of the relative sizes of the volume versus price effects, what is more striking is that if we correlate the real growth rate of national wealth with the wealth growth rate induced by either savings effect or capital gains, we observe another interesting pattern. In Figure 51 where we correlate the price-induced wealth growth rate with the overall wealth growth rate for two main sub-periods (1952-1980 and 1981-2020), we witness a very strong positive correlation between the price effect and real wealth growth rate in both periods of time, with very large R-squared values in both time periods as well (70% to 90%). However, the nature behind both positive correlations is quite different. During Maoist China, the positive correlation is mostly driven by the fact that in years where capital losses were higher, the corresponding wealth growth rate was also lower, as the overwhelming majority of the price effects were negative, while in the post-reform period (1980-2020), it is mostly a story of positive price effect contributing to positive real wealth growth rates over time.

On the other hand, even more strikingly, in Figure 52, the correlation between savings-induced wealth growth rate and overall wealth growth rate is negative (1952-1980), or even non-existent (1980-2020), where the R-squared between the two variables is essentially zero. This is further confirmed by the fact that there's very little inter-temporal correlation between the variation in net national savings rates and that in wealth growth rates (Figure 53). This seems to illustrate that although on the aggregate, savings effect (capital formation) significantly overshadows price effect in its contribution to total national wealth accumulation in China, however, the **dynamic** of wealth accumulation over time appears to be completely explained by capital gains and losses in China irrespective of the time period under study, via either price distortions in Maoist China or positive asset appreciation in periods of market transition.

As a robustness check on the validity of the multiplicative decomposition method, we

compare the two decomposition results in Table 15 (the percentage shares of the relative effects calculated in each decomposition method are colored in blue). Overall, we could notice that both multiplicative and additive decomposition approaches deliver very similar results in terms of the general order of magnitude and sign of the effects: in the sense that the negative capital gain effect is equally detected across both decomposition methods for the period 1952-1980. Savings effects are also both positive and largely dominate the negative capital loss effects in absolute values. For the recent time period (1980-2020), given the fact that the additive approach would tend to over-emphasize and give more weight to the most recent years (where the price effect is more likely to overshadow the savings effects with the contemporary economic structure driven by housing price booms in China), the additive decomposition results demonstrate that the price effect is indeed larger than the savings effect compared to the multiplicative decomposition approach, but not by an alarmingly large margin which would threaten the comparability between the two methodologies.

Which asset class in particular is driving the savings effect versus the largely inefficient & negative, then drastically surging and positive price effect?

In order to answer this question, we adopt the additive approach, and we divide national wealth into a few asset classes, which we believe to be the most susceptible to large swings of savings and price effects over time.[24] Specifically, these asset classes include residential housing, land, foreign wealth, and other domestic capital (which was treated as a residual term, hence it's inclusive of all types of other non-housing and non-land non-financial assets in the domestic economy).

The advantage of the additive decomposition approach in this scenario is that it allows us to further decompose the overall savings effect and the price effect into the relative effects shouldered by each particular asset class. For instance, the additive approach here would permit us to analyze that over a given period of time, of all the savings-induced effect on aggregate national wealth accumulation, how much of that was induced by housing wealth accumulation (and the rest by foreign wealth, land or other domestic capital respectively).

[24]The same asset class decomposition was done for Spain in Blanco et al. (2021).

Table 3 reports the percentage shares for different asset classes, respectively for savings effect and price effect. We also divide the period of interests into 1952-1980, 1980-2020 and the whole period from 1952 to 2020. We expect the composition of the savings versus price effect to differ rather substantially given the different national wealth accumulation channels during these two sub-periods.

Table 2: Accumulation of National Wealth in China: Multiplicative Decomposition by Decades

Decades	Wealth Growth Rate	Volume Effect	Price Effect
	g_{wt}	g_{wst}	$\frac{1+g_{wt}}{1+g_{wst}} - 1$
1952-1960	2.8%	6.8%	-3.7%
		218.4%	**-118.4%**
1960-1970	4.8%	5.6%	-0.7%
		114.9%	**-14.9%**
1970-1980	3.9%	8.1%	-3.9%
		191.6%	**-91.6%**
1980-1990	10.3%	6.8%	3.3%
		67.1%	**32.9%**
1990-2000	9.2%	6.2%	2.9%
		68.2%	**31.8%**
2000-2010	11.9%	5.4%	6.2%
		46.7%	**53.3%**
2010-2020	10.5%	4.9%	5.3%
		47.8%	**52.2%**

Notes: This table presents the deacadal wealth accumulation decomposition via the multiplicative approach. It decomposes wealth accumulation into price effects (annualized real rate of capital gains) and volume effects (annualized savings-induced growth rate of wealth) for each period under study.

First of all, in terms of savings effect, consistently across time it could be seen that other domestic capital occupies the overwhelming majority share of total savings effects. For the period 1952-1980, other domestic capital accounted for a whopping 93% of total cumulative savings effect in China. The share slightly decreased in the post-reform era, as part of the savings effect is now shouldered by housing and foreign wealth increases.

Even more strikingly, if we move on to the decomposition of the capital gains effect, the share for other capital domestic capital was positive for the period 1952-1980, standing at around 134%. It has to be noted that as previously mentioned, given that the overall capital gain effect for this period is negative, a positive share of more than 100% means that the other domestic capital category was significantly losing its asset

values in real terms absent savings-induced wealth accumulation. By closer examination, we could see that this is also the only category that has enjoyed negative valuation effect during this period of time, given that the shares for housing, land and foreign wealth were slightly negative, which in turn indicates that they have enjoyed slight asset appreciation during this period of time.

Table 3: Accumulation of National Wealth in China by Types of Capital, 1952-2020: Additive Approach

Panel A: Savings (% of total cumulative savings)				
Sub-periods	Housing	Other Domestic Capital	Land	Foreign Wealth
1952-1980	7%	**93%**	0%	0%
1980-2020	17%	**78%**	0%	5%
1952-2020	17%	**79%**	0%	4%
Panel B: Capital Gains (% of total capital gains)				
Sub-periods	Housing	Other Domestic Capital	Land	Foreign Wealth
1952-1980	-4%	**134%**	-27%	-2%
1980-2020	**56%**	31%	13%	-1%
1952-2020	**57%**	29%	14%	0%

Notes: This table illustrates the accumulation of national wealth in China during 1952-2020 using an additive decomposition approach. National wealth is decomposed into residential housing, other types of domestic capital, land and foreign wealth. Land includes both farmland and reserved land. The table shows that, e.g., other domestic capital accounts for 93% of total cumulative net savings over 1952-1980.

During the latter period (1980-2020), however, the situation was reversed. Especially with extensive housing privatization and reforms in the 1990s, where a market-based housing economy was gradually put in place, residential housing started to occupy the largest share of positive capital gains effect during this period of time. Around 60% of the total capital gains in national wealth over the last four decades in China have been due to housing assets appreciation, while the capital gain share for other domestic capital has decreased from 134% (1952=1980) to around 30% (1980-2020).

The aforementioned analysis suggests that during the Maoist period in China, the bulk of national wealth accumulation took place in other forms of non-housing & non-land domestic capital. And such wealth accumulation also happened in a very inefficient way, with extremely high capital- & savings-intensive wealth accumulation, and very large & negative price distortions at the same time. By further examining the asset composition of such "other domestic capital" in Figure 49, we find that around 80% of them are corporate non-financial assets, mostly comprised of machinery, factory buildings, and other corporate non-financial productive assets. In terms of wealth-to-

income ratios (Figure 50), it is apparent that there was on net *positive* accumulation of corporate non-financial assets throughout the 1950s to 1970s, yet it was accompanied with very unstable fluctuations in between. This could be reflective of the offsetting forces between savings and price effects for this particular asset class during this period of time. Afterwards, corporate wealth suffered a substantial downward blow from the late 1970s onward (and throughout the 1980s). This is also reflected in the net corporate wealth to national income ratio evolution depicted in Figure 38. If we further decompose the relative accumulation effects of other domestic capital by decades, we will notice that the 1970-1980 and 1980-1990 decades also suffered the largest negative capital loss effects, which almost completely counteracted the positive savings effects during the same periods of time.[25]

One important arena for future research is to understand better the negative economic and development repercussions associated with such form of distorted capital accumulation in Maoist China. The sectoral misallocation of inputs of production appears to be emphasized by the past literature (Cheremukhin et al., in press), on how the over-emphasis on the heavy industry sector came at the expense of raising productivity in the agricultural sector, hence in turn hindering the rate of structural change in China in those decades. In our preliminary analyses above, we demonstrate in a very straightforward way the tremendous costs associated with such pure savings-induced and price-distorted form of capital accumulation. More formal theoretical modelling analysis is needed to situate our empirical descriptives into the dynamic interactions between wealth accumulation and economic development in China over the long run.

4.4 Cross-Country Comparisons

The Chinese experience of national wealth accumulation becomes more distinct in direct comparison to national wealth accumulation in other countries.[26] Overall, we compare a few important asset categories such as land, housing, the evolution of public wealth, and the price and savings effect decomposition in a comparative perspec-

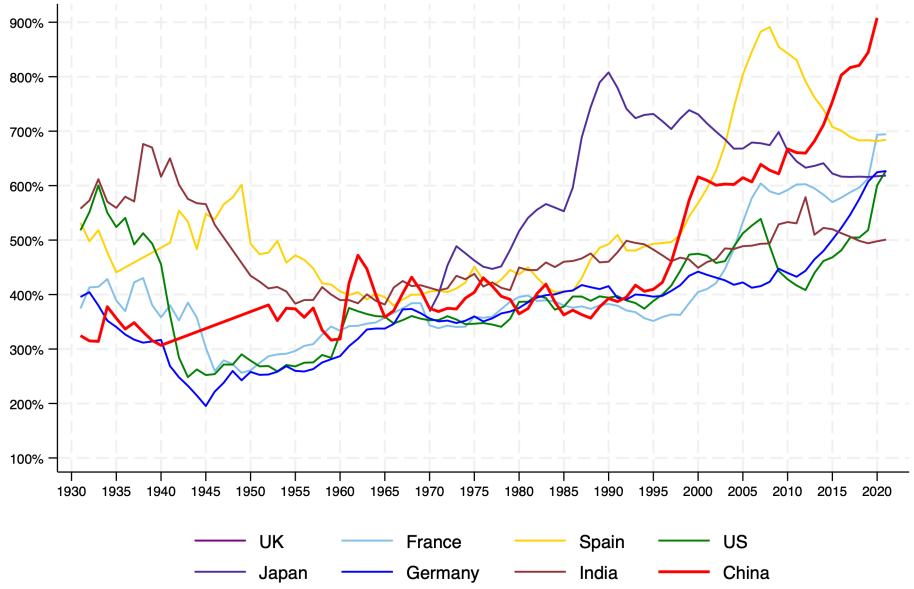
[25]Not reported in the paper, but could be found in the online appendix document "ChinaNationalWealth.xlsx", sheet "A44".

[26]Here we select a few Western countries for which we have comprehensive long series of national wealth, as well as a few developing countries whose data are currently available in the World Inequality Database.

tive.

First and foremost, we could directly compare the aggregate national wealth to national income ratios between China and the rest of the world in Figure 9. In terms of aggregate national wealth, China does not seem to be an exceptional case internationally speaking. For the better half of the 20^{th} century, China appears to blend well into the international wealth accumulation experience, where the national wealth-to-income ratios have stayed relatively stable in the decades following the end of Second World War, and started to increase further with the onset of globalization and economic take-off from the 1990s onwards, in similar momentum as in other major economies across the globe. However, this aggregate wealth-to-income ratio masks significant heterogeneities in the wealth accumulation experience of different asset classes.

Figure 9: National Wealth to National Income Ratios: Cross-country Comparisons



Notes: Data for other countries come from World Inequality Database.

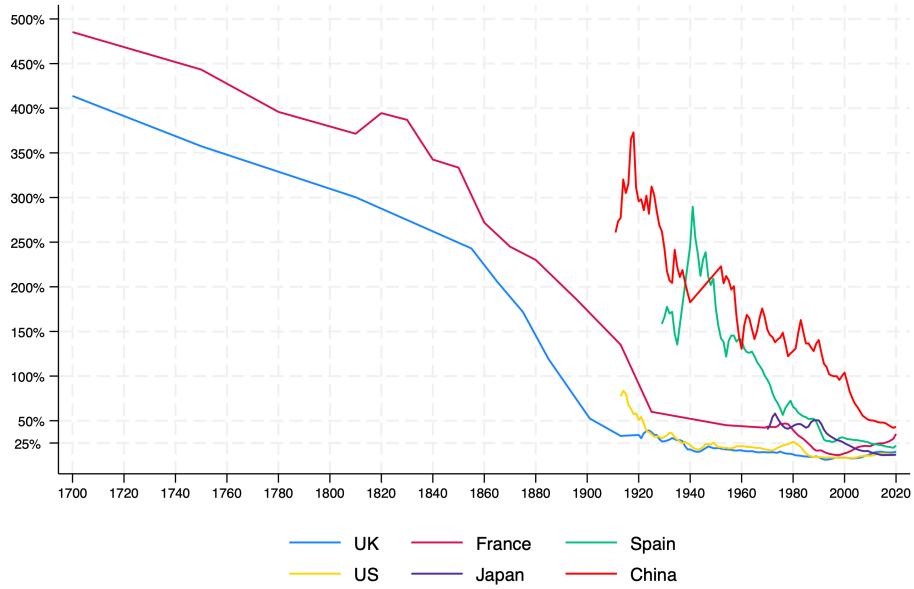
First of all, in terms of farmland wealth, what we could observe in Figure 10 is that in most of the developed countries, such as the United States, France or the United Kingdom, the transition from an agrarian economy to a modern industrialized economy had already occurred around the turn of the 20^{th} century, with their respective agrarian wealth to national income ratios already falling below 50% around the 1920s. For

France, the decline in the ratio of agricultural land wealth to national income arrived a bit later, given the relatively more important role of agriculture in the French economy compared to its counterparts. However in China, at the time of the founding of the Republic of China in 1911, agricultural land wealth-to-national-income stood as high as 250%, and reaching even 400% in the ensuing decade with a vibrant land market in place. Although it gradually decreased in the following years, land value still dominated national wealth composition, with ratio to national income standing within the range of 250 to 300% throughout the 1920s and 1930s. One exception in this comparison, however, is Spain, which had a very similar ratio of agricultural land to national income as that in China in the 1930s and 1940s. This points to the well-established fact that Spain itself is rather a late modernizer among Western countries.

Accordingly, another interesting question would be to understand how long it took the Western industrialized countries to realize such a developmental transition (from an agrarian economy to a newly industrialized economy) in the long run, in comparison to China. Using data from Piketty and Zucman (2014), we plot in the same figure the very long-term evolution of the ratio of agricultural land wealth to national income in both France and the United Kingdom from 1700 to 1954. In total, it took both countries more than 200 years to reduce the ratio of agricultural land wealth to national income from 400% to less than 50%, while for China this drastic transition took place in slightly less than a century. Such *drastic modernization* in China is in itself an important dimension for future research, i.e. the violent wave of urbanization in China against the tumult of the 20^{th} century.

Secondly, when we look at the evolution of housing wealth in Figure 11, compared to Western countries, Chinese housing wealth was very low in both the Republican period and the early decades after the founding of the PRC, when purportedly housing values were also significantly compressed to be at their construction costs, instead of being valued at their market prices. Such compressed housing wealth was gradually released with the housing market reforms from the late 1980s onward. However, what is striking is that even after such extensive housing market reforms, the housing wealth-to-income ratio didn't reach an extremely high level compared to the pinnacle level reached by other Western countries. For instance, Japan reached a housing

Figure 10: Long-term Agricultural Land Wealth to National Income Ratio: Cross-Country Comparisons



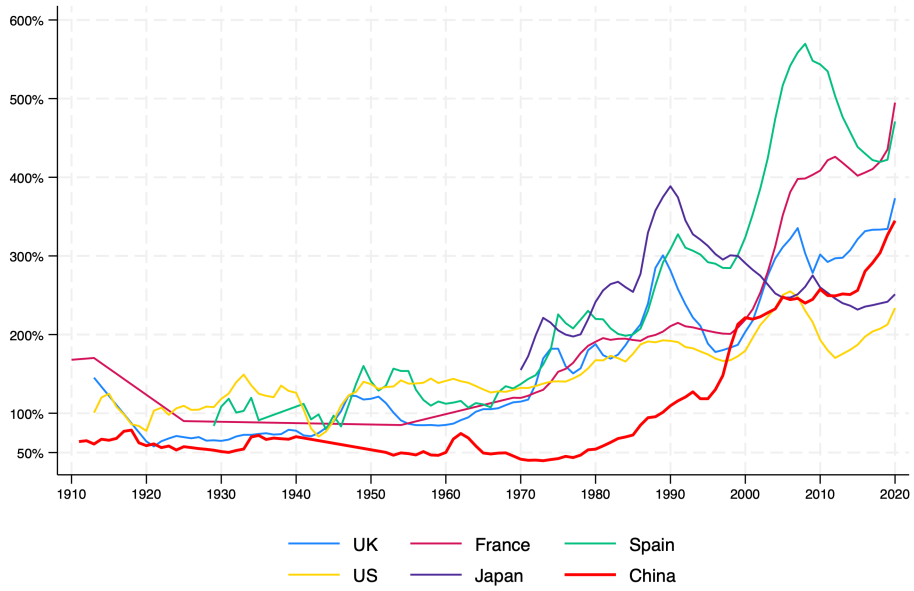
Notes: Data for other countries come from World Inequality Database.

wealth to national income ratio of around 400% at the height of its housing bubble around the early 1990s. The United Kingdom and France also reached very similar levels of housing wealth on the eve of the Great Recession. Rather astoundingly, the housing wealth to income ratio in Spain reached nearly 600% around the end of the 2000s. Nevertheless, in China the housing wealth to income ratio only reached at around 350% in 2020.[27]

Furthermore, the biggest Chinese exception in its historical wealth accumulation internationally speaking is the very large presence of the public sector, as reported in Figure 12, where after the founding of the People's Republic of China, the Chinese public wealth to national income ratio has consistently stayed within the range of 200 to 400%. In the most recent years, it has slightly increased from 200 to 300%, yet it is still on par with the very long-run average in the past 70 years. Rather interestingly, this ratio comes very close to the estimates we obtained for the U.S.R.R. on the eve of its dissolution in the late 1980s. Overall, the Chinese public wealth accumulation ex-

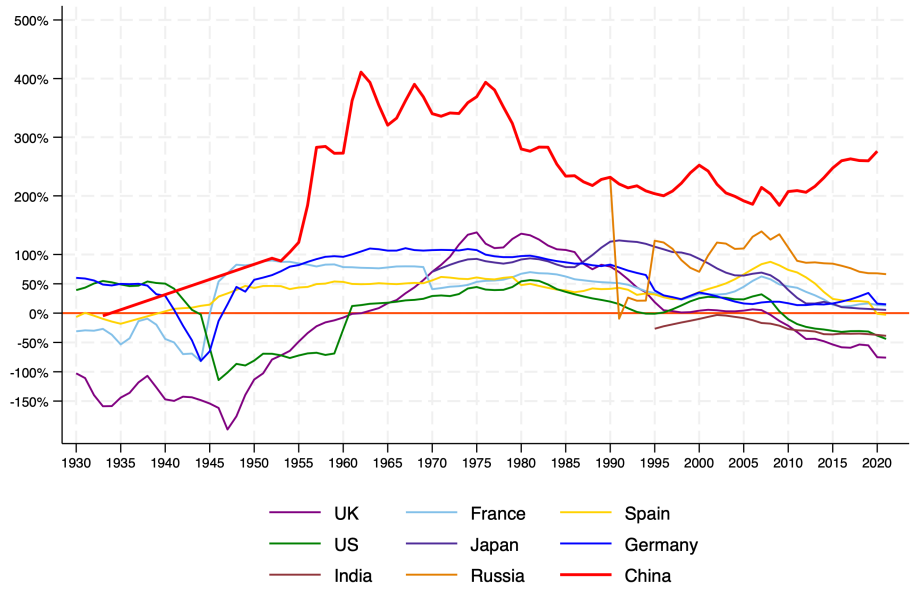
[27] Although this shouldn't be taken as a piece of evidence that the housing bubble is not a major issue in the Chinese economy, but rather in the limited space of international comparison, the Chinese housing boom phenomenon is not exceptionally distinctive.

Figure 11: Long-term Housing Wealth to National Income Ratio: Cross-Country Comparisons



Notes: Data for other countries come from World Inequality Database.

Figure 12: Long-term Public National Wealth to National Income Ratio: Cross-Country Comparisons



Notes: Data for other countries come from World Inequality Database.

perience is in direct contrast to the oftentimes close-to-zero or negative public wealth to national income ratios we constantly witness for almost all other major economies around the world. With a stabilized 30% public share of national wealth in the most recent decade (Figure 57), China is one of the largest and only few mixed-property economies in the world.

Table 4: Cross-country Comparison: Accumulation of National Wealth in China, India, Spain, the US, the UK, Germany, France, and Sweden (1950-2016) - Multiplicative Decomposition

	1950-2016	1950-2016	1950-2016	1950-1980	1950-1980	1950-1980	1980-2016	1980-2016	1980-2016
Countries	Wealth Growth	Volume Effect	Price Effect	Wealth Growth	Volume Effect	Price Effect	Wealth Growth	Volume Effect	Price Effect
	g_{wt}	g_{wst}	$\frac{1+g_{wt}}{1+g_{wst}}-1$	g_{wt}	g_{wst}	$\frac{1+g_{wt}}{1+g_{wst}}-1$	g_{wt}	g_{wst}	$\frac{1+g_{wt}}{1+g_{wst}}-1$
Spain	**4.1%**	1.9%	2.2%	**5.0%**	2.5%	2.4%	**3.4%**	1.5%	2.9%
		46.3%	53.7%		51.0%	49.0%		34.1%	65.9%
the U.S.	**3.1%**	2.2%	0.9%	**3.9%**	3.4%	0.5%	**2.3%**	1.1%	1.2%
		71.0%	29.0%		87.2%	12.8%		47.8%	52.2%
the U.K.	**3.3%**	1.7%	1.5%	**3.6%**	2.5%	1.1%	**3.0%**	1.0%	1.9%
		53.1%	46.9%		69.4%	30.6%		34.5%	65.5%
Germany	**3.9%**	3.6%	0.3%	**6.3%**	6.0%	0.2%	**2.1%**	1.6%	0.4%
		92.3%	7.7%		96.8%	3.2%		80.0%	20.0%
France	**4.2%**	3.1%	1.1%	**6.0%**	4.5%	1.4%	**2.7%**	1.9%	0.8%
		73.8%	26.2%		76.3%	23.7%		70.4%	29.6%
Sweden	**3.5%**	4.1%	-0.5%	**3.9%**	5.4%	-1.5%	**3.2%**	2.9%	0.3%
		113.9%	-13.9%		138.5%	-38.5%		90.6%	9.4%
India	**5.4%**	5.2%	0.2%	**3.9%**	2.4%	1.5%	**6.9%**	5.1%	1.8%
		95.8%	4.2%		62.3%	37.7%		74.4%	25.6%
China	**7.7%**	6.2%	1.4%	**3.9%**	6.8%	-2.7%	**10.5%**	5.8%	4.4%
		81.6%	**18.4%**		**165.9%**	**-65.9%**		**56.9%**	**43.1%**

Notes: This table illustrates the accumulation of national wealth in China, India, Spain, the US, the UK, Germany, France and Sweden during 1950-2016. Computations were made using national accounts and other sources. The results for Spain, the US, the UK, Germany, France and Sweden originate from Blanco et al. (2021). Results for India come from Kumar (2022). Results for the US cover the period until 2015. Results for Spain cover the period until 2017. Results for India cover the period until 2012. Results for China start from 1952 onwards and end in 2020. Restricting the Chinese series to the 1952-2016 period gives virtually the same results.

Ultimately, if we put the wealth accumulation decomposition exercise via the lens of cross-country comparison for the time period of 1950-2016, we observe that first of all, the average wealth growth rate in China is significantly higher than that in other countries during this period of time. On average, the annualized wealth growth rate in China is around 7.7%, surpassing the average of 3 to 4% observed for other industrialized developed countries in Table 4. And this seems to be particularly driven by the rather violent and drastic wealth accumulation in the post-reform period (1980-2016), where the annualized wealth growth rate is more than 10%. The negative price effect for the period 1950-1980 is not universally shared at the cross-country level, except for Sweden which also experienced a negative price effect (on national wealth accumulation) during the same period of time.

On the whole, the only country that shares similar wealth growth experience with China appears to be India, whose average annualized wealth growth rate for the same period of time stands at around 5.4%, significantly higher than the other Western economies. In addition, Indian wealth accumulation seems to be overwhelmingly driven by savings-induced wealth growth as well, with very negligible price effects over the entire period.

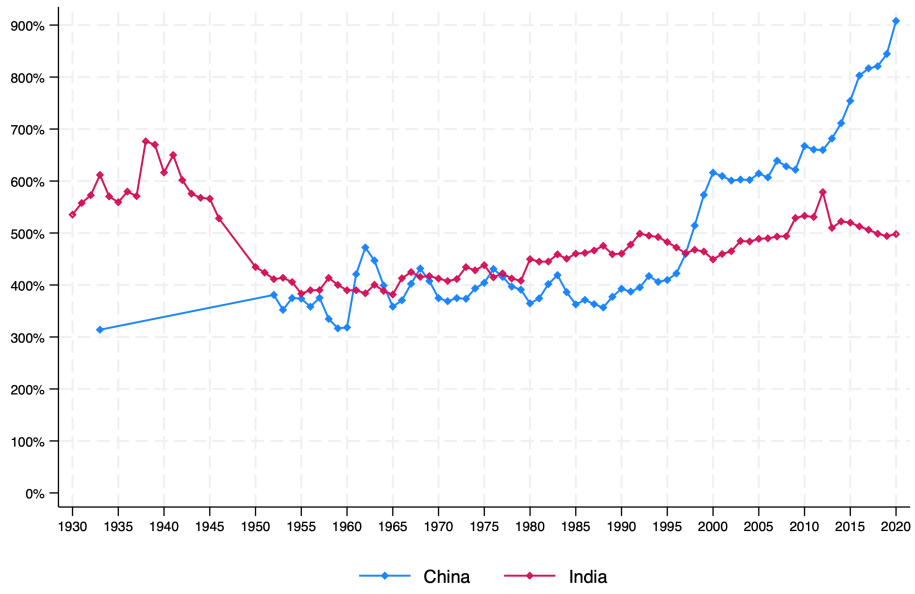
4.5 China-India Comparison: Similarities and Differences in National Wealth Accumulation

In order to understand better the similarities and differences in the wealth accumulation experiences of the two largest emerging economies in the world, in this subsection we compare in detail the evolution of national wealth to income ratios for these two countries, as well as the two most important asset categories in national wealth composition: agricultural land and real-estate assets.

First of all, we plot the aggregate national wealth to national income ratios of the two countries from 1933 to 2020 in Figure 13. In the early 1930s, although for the moment we do not have the annual wealth series for China yet, it's safe to assume to that the Chinese wealth-to-income ratios were significantly lower than in India at the time, with Indian wealth-to-income ratio (600%) totalling almost twice the value in China (300%). This difference in itself is very striking and needs to be understood better

in the future. Afterwards, World War Two acted as a tremendous shock on wealth accumulation in India, and then the two wealth series tracked very closely with one another until the late 1990s, where the divergence occurred again and Chinese wealth-to-income ratio overtook that of India in the most recent decades. What is driving this historical convergence and re-divergence in wealth-to-income ratio between these two countries?

Figure 13: China-India Comparison: Net National Wealth to National Income Ratio (1933-2020)

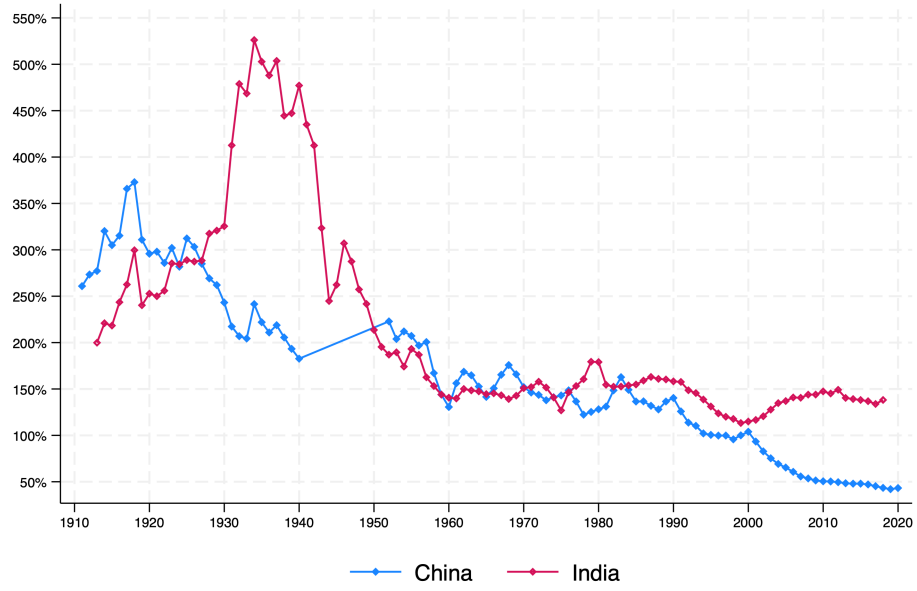


Notes: India data are taken from World Inequality Database.

We plot the agricultural land and housing wealth to national income series and observe some rather striking trends. First of all, compared to the secular decline in agricultural land value to national income in China over the past century, India land value has witnessed much more fluctuation (Figure 14). First of all, there was a huge spike in Indian land wealth to national income ratio in the 1930s, which was mostly due to the collapse of national income at the time (Kumar, 2022). Then the two series stayed very close to each other for the ensuing five decades, and began to diverge again from the 2000s onwards. Rather strikingly, the Indian land-wealth-to-income ratio started increasing slightly in the past two decades, while that in China continued its consistent decline. In the most recent years, Indian land values still occupy around 150% of national income, more than three times as large as that in China. Overall, the agricultural land wealth series appears to be able to explain the great difference between

Indian and Chinese wealth-to-income ratios in the 1930s, as well as the overlapping decades from the 1950s until the 1980s (as agricultural land still counted as the principle component of national wealth for both countries during this period of time). Yet the divergence in the two land wealth series from the 2000s onwards cannot really explain the oppositely diverging trends in national wealth observed in Figure 13.

Figure 14: China-India Comparison: Agricultural Land Wealth to National Income Ratio (1933-2020)

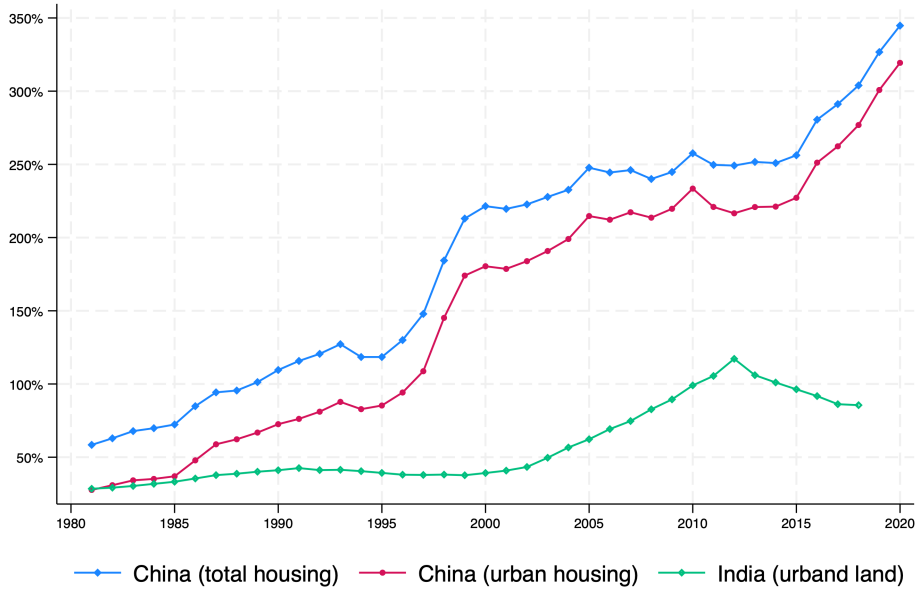


Notes: Indian data come from Kumar (2022), whose data points are further interpolated to have a continuous time series. Prior to 1980, Indian land values contain all lands (both agricultural and dwelling lands); After 1981, Indian land data contain rural land values only.

As such, in order to better explain the substantial divergence in national wealth in the most recent decades, we switch our attention to the accumulation of housing wealth. Given that in India data we can only distinguish between urban land (which is more or less a good proxy for real-estate wealth) and rural land values, we plot both total housing and urban housing to national income ratios for China, in conjunction with Indian urban land to national income ratios in Figure 15 for the post-1980 period. First of all, it could be noted that Chinese housing wealth is almost exclusively driven by the appreciation in urban housing values over the past forty years. On the other hand in India, urban land to national income ratio stayed stagnant for the first two decades, and then started to increase continuously from the 2000s onwards, to an apex of more than 100% of national income in the early 2010s, which is indicative of rapid urbanization in India during this period of time. However, the series started slightly declining

from 2012 onwards.[28] On the whole, Chinese housing wealth to national income ratio has risen to almost three times of that in India by the end of the 2010s, which plausibly explains a large fraction of the recent divergence in aggregate national wealth to national income ratios between the two countries.

Figure 15: China-India Comparison: Housing Wealth to National Income Ratio (1933-2020)



Notes: Indian data come from Kumar (2022), whose data points are further interpolated to have a continuous time series. Total housing series for China includes both urban housing and rural housing wealth.

Overall, it appears that historically speaking, Chinese and Indian national wealth to income ratios converged with each other in the aftermath of World War Two, and had since been on par with one another until the most recent 30 years, where the two series began to significantly diverge from each other again. A large fraction of this divergence could be explained by the surging Chinese housing wealth to income ratios in the most recent years, while in India urban land values increased much more mildly compared to China.

4.6 Preliminary Evidence on Historical Wealth Distribution in China

In this paper, we also attempt to delineate the distribution of national wealth in China in the 20^{th} century via two perspectives: the spatial distribution of national wealth,

[28] These data points for India should be interpreted with caution, as official GDP statistics for India for the most recent years are reputed to be gravely inflated (Subramanian, 2019).

and the top wealth shares in China over time.[29]

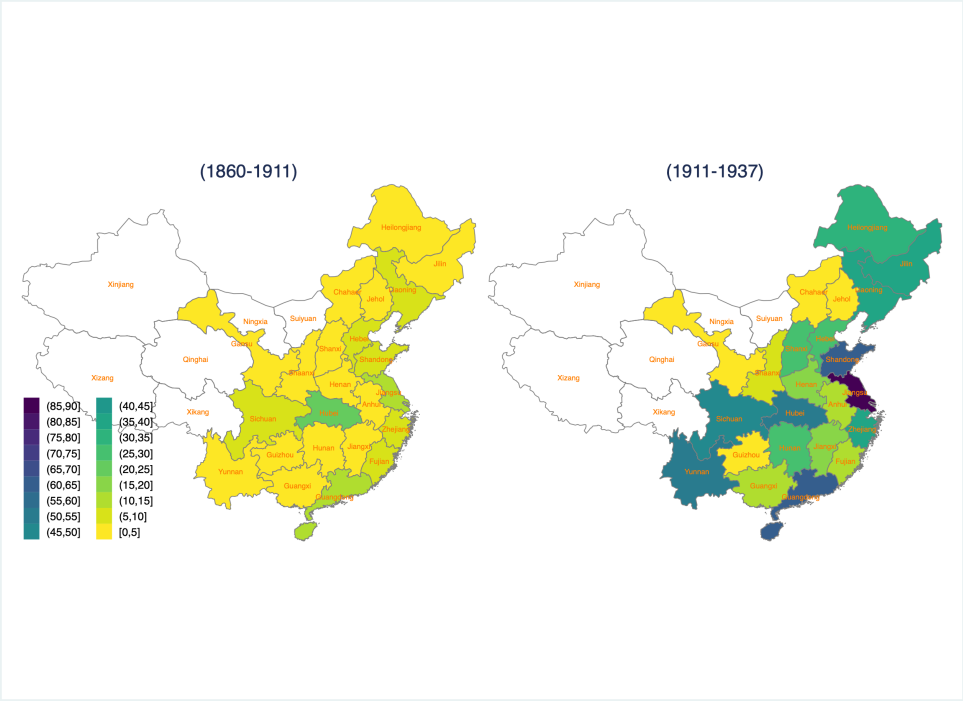
In terms of the spatial distribution of wealth, the most interesting dimension is the distribution of corporate assets over time. First of all, we demonstrate the provincial-level distribution of total corporate registered capital during the Republican years with newly-established firm data from Du (1991, 2019). Given that our corporate asset data start with the first officially registered modern factory with non-missing registered capital in China (1860),[30] the entire series stretches from 1860 to 1937. Hence, we divide the time frame into the late Qing Dynasty era (1860-1911) and the prewar Republican era (1911-1937). It could be seen in Figure 16 that most of the corporate capital accumulation occurred in the Republican period, with higher concentration of corporate registered capital in both coastal provinces and hinterland provinces along the route of the Yangtze River (the same could be said for new firm creation as documented in Figure 59). It has also been empirically proven that there's a strong correlation between the opening of treaty ports in China and more fixed corporate capital accumulation during this period of time (Bo et al., 2023), which might have paved the way for path dependence of economic advantages enjoyed by treaty ports over the long run (Jia, 2014).

In Maoist China, the geographical distribution of corporate assets became more politically motivated. For instance, in Figure 17 where we plot the provincial-level distribution of modern industry enterprises' fixed assets between 1958 and 1984, we could easily observe that right after the founding of the PRC, the Northeast region occupied the lion's share of industrial assets at the time. However, in the 1960s and 1970s, its share gradually declined and was compensated by the corresponding increase in industrial fixed assets in the Southwest provinces (such as Sichuan, Yunnan, etc), with the initiative of the Third Front Construction to strategically relocate industrial assets from coastal regions to the west hinterlands (Naughton, 1988; Meyskens, 2020; Fan

[29]Overall, this section is still very preliminary. We plan to replenish this section further in the next version of this paper, for instance by constructing the full time series of housing, agricultural land and corporate asset distribution at the provincial level from 1911 to 2020. In addition, in terms of the population-wise distributional wealth series, for the time being, we only construct the top 10% wealth share for the year of 1933 only, which will also be replenished further in the future to produce a complete top 10% wealth series over the entire 20^{th} century.

[30]It refers to the factory called Qing Mei Foreign Trading Company, which was founded as a joint company by Chinese merchants with other American businessmen at the time, engaging in trade operations through various ports in Shanghai, Yantai, and Tianjin.

Figure 16: Corporations: Distribution of Total Registered Capital (1860-1937)

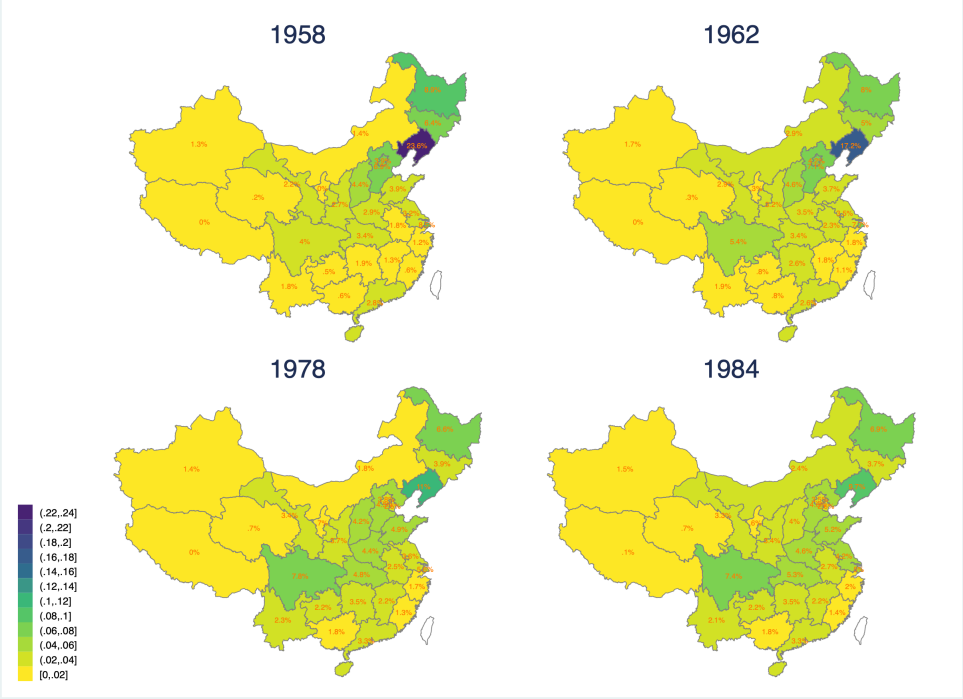


& Zou, 2021). For instance, by 1984, the share of industrial fixed assets in Liaoning province (9.7%), which occupied almost a quarter of total national industrial fixed assets in 1958, was nearly on par with the share of fixed assets in the province of Sichuan (7.4%).

In addition to the dynamics of spatial distribution of corporate wealth, we also attempt to map out the distribution of total national wealth at the aggregate population level, for instance by constructing the conventional top 10% wealth share measure (Piketty et al., 2006; Saez & Zucman, 2016; Alvaredo et al., 2018).

Due to the absence of wealth tax in China at the time, our estimation of top wealth share is largely based on existing social tables and past research on land and housing inequalities in China. Our methodology can be summarized as the following. First of all, given the large differences in both income & wealth levels, as well as the dynamics of economic inequalities within both urban and rural regions of China, we estimate the top 10% wealth shares in both regions separately. To achieve this, we first need to estimate the relative shares of urban versus rural assets for each asset class: for instance, in terms of land, what the urban share (out of total national land assets) is supposed to be. In the following parts of this sub-section, we discuss in detail how

Figure 17: Distribution of Gross Fixed Assets of SOE Industry Enterprises (1958-1984)



Notes: This Figure indicates total gross fixed assets of industrial firms at the provincial level for four different years in time during the early decades of the People's Republic of China.

we arrive at the top 10% wealth shares for agricultural land and residential housing in both rural and urban China at the time, given that these two asset categories together make up nearly 80% of total private wealth in the early 1930s.

In order to identify the top 10% wealthiest individuals in China at the time, we take the social class distribution estimates from two sources. To begin with, in rural China, based on data from land reform county gazetteers ($N = 1257$), Pang et al. (2021) estimate that nationwide on the eve of the land reform (late 1940s), in terms of social class distribution, rural population could be divided into landlords, rich peasants, middle peasants and poor peasants, with each social class group representing respectively 4.95%, 3.68%, 34.7% and 48.56% of total rural population. As such, the wealthiest social classes in rural China, also the main target from whom wealth was expropriated and redistributed during the land reform, accounted for around 8.6% of total rural population. In urban China, based on the social class distribution studies conducted by Du (2004, 2005) on Shanghai in the 1930s, we could observe in Table 16 that the upper class, upper-middle class and middle class together accounted for nearly 30% of total population in Shanghai (comparable to the wealthiest individuals in rural China).

We hypothesize that the social class distribution in Shanghai was representative of the urban landscape in China at the time, and based on the urbanization rate (around 10 to 12%) estimated for the early 1930s, we conjecture that the 30% wealthiest individuals in urban regions, together with the landlords and the rich peasants in rural regions, made up around the top 10% wealthiest individuals in terms of asset holdings in Republican China.

Moving onto the asset shares of the top 10%, with regards to agricultural land, there are two important past studies by Guan (2012) and Pang et al. (2021), which use separate sources to arrive at land inequality estimates not too far away from each other in Republican China. We take the average of these two estimates to back out the mean land inequality in rural China during the Republican period, where we estimate that the top 10% land share was at around 50%.[31]

On the other hand, land and housing inequalities in urban China were comparatively speaking much more extreme. Given the lack of comprehensive data on housing wealth distribution in prewar China, we rely on statistics compiled in the immediate aftermath of the founding of the PRC, which served the purpose of surveying wealth-holding of the capitalist property-owning class prior to the socialist transformation campaigns (1953-1957). Owing to wartime-related capital destruction, etc, the housing wealth concentration in the early 1950s should be best viewed as a lower bound of the housing wealth inequalities prevailing in the 1930s in China. First of all, in order to arrive at a more precise estimate of top housing wealth inequalities, we need to estimate the share of property-less individuals in urban China. Some indirect evidence obtained from urban population records in the early 1950s on the share of households with rental housing puts this figure to be around 60%.[32] Second of all,

[31] Firstly, it's important to note that the land inequality measures here abstract away from land values (land price), i.e. we assume the prices of lands owned by the different rural social classes are the same, which also fits the general historical narrative at the time. Hence, all variations in land inequalities come from the changes in sizes of land-holding. Furthermore, Guan (2012) estimate the average land Gini in China between the 1920s and early 1940s to be 0.60; while Pang et al. (2021) estimate the land Gini to be around 0.47, where the 8% landlords and rich peasants own 42.8% of total lands in terms of land areas. This is also consistent with the results obtained by the National Bureau of Statistics in 1952, based on land reform data where landlords and rich peasants, constituting 6.9% of households, owned approximately 51.9% of the total land area, which could be slightly inflated for various reasons.

[32] Source: History of Chinese Population (Volume Six)", Fudan University Press, 2001. This is an average percentage figure ranging from cities with population sizes over a million (Shanghai, Beijing and Nanjing) to smaller cities such as Cangzhou (Hebei Province), Xiangfan (Hubei Province), etc.

based on archival sources on Socialist Transformations (1953-1957),[33] we find that the richest individuals, namely the identified capitalist property owners and urban landlords (top 1%) owned nearly 40% of total residential housing areas in Shanghai at the time.[34] On the other hand, in smaller cities, although housing inequalities were much more moderate, based on the data we could collect,[35] we believe the housing wealth share of the top 1% in urban China at the time stood at around 30% on average. After factoring into the property-less class (60% of urban population), we estimate the property value shares of the richest 30% individuals to be around 90% (assuming the remaining 10% property-owning class occupied the average share, i.e. 10% of total housing wealth).

On the whole, adding in our estimation of top wealth shares for the other asset classes doesn't change the order of magnitude of top wealth shares in both urban and rural China manifested by asset concentration in land and housing assets already, where in Table 5 we could see that the overall top wealth share for the landlords and rich peasants in rural China stands at 46.11%, while the share for the 30% wealthiest middle and upper social classes in urban China stands at around 92%. This gives us a weighted average of nationwide top 10% wealth share at around 66%.[36]

In general, it's acknowledged that due to the outflow of the wealthy class (landlords) from rural areas into larger urban metropolis, the wealth disparity between urban and rural areas was widening at the time, while the wealth gap within rural areas was nar-

[33] Namely Compendiums of Socialist Transformations (1953-1957)

[34] In terms of real housing inequalities, the estimated share (for the capitalist property owners, approximately top 1%) was as high as 53.9%, after factoring in the more valuable housing assets owned by the rich, which we estimate based on the construction costs of different types of residential housing with data extracted from <Chronicles of Shanghai> (上海通志), Volume 5, Shanghai People's Publishing House, 2005.

[35] We construct similar housing inequality measures for capitalist property owners in cities of Beijing, Jinan, Xiamen and Xiangfan (in Hubei Province), mostly based on the Chronicles of Real-Estate Development for these cities compiled for the early 1950s. The housing area shares for the capitalist class (usually less or around 1% of the total urban population) ranged from 10% to 20%. Although being much lower than housing concentration levels in Shanghai, after factoring in the differential housing values owned by the capitalist class, top 1% real housing wealth shares were still quite high (25 to 30%) over all representative cities in China at the time.

[36] Another important dimension on overall wealth inequalities is the share of aggregate assets allocated to either urban or rural regions of China. Inferred from rural social surveys during the Republican era, it is known that urban landlords accounted for over 20% of the total landlord population (Guan, 2012). Furthermore, the land area owned by landlords in cities was approximately 2 to 3 times that of landlords in villages. Additionally, considering that some wealthy urban classes such as bureaucrats and capitalist entrepreneurs often owned significant amounts of land, in Table 5 we now allocate 40% of the land assets to urban areas, which should be regarded as an **upper bound** of urban land share.

rowing. The further loss of the affluent class exacerbated the overall poverty in rural society. In the future, the mechanisms (colonization, uneven industrialization, etc) behind such relatively low rural wealth inequalities versus unprecedented concentration of wealth in urban China at the time need to examined in further detail.

Table 5: Wealth Inequalities - Top 10% Wealth Share (1933)

Asset Type	Region	National Aggregate Assets Total	Top 10% Share (%)	Top 10% Assets Total
Land	Rural	31560	50.00%	15780
	Urban	21040	90.00%	18936
Buildings - Dwellings	Rural	7235	30.00%	2170
	Urban	3112	90.00%	2800
Other Buildings	Rural	991	100.00%	991
	Urban	3529	100.00%	3529
Farming Machinery	Rural	2344	45.00%	1055
	Urban	0	0.00%	0
Livestock	Rural	4345	30.00%	1303
	Urban	0	0.00%	0
Inventory	Rural	89	100.00%	89
	Urban	0	0.00%	0
Currency	Rural	586	60.00%	352
	Urban	391	60.00%	234
Other Financial Asset	Rural	0	0.00%	0
	Urban	8871	95.00%	8428
Total	Rural	47149	46.11%	21740
	Urban	36943	91.84%	33928
	Nationwide	84092	**66.20%**	55668
Per Capita Wealth	Rural	112		646
	Urban	603		1838
	Nationwide	173		1135

Notes: "Assets Total" in million 1933 yuans. Per capita wealth in 1933 yuans. For the "Top 10%" columns, for rural regions we refer to the group of "landlords and rich peasants" (which accounted for 8.6% of total rural population), for urban regions we refer to the wealthiest 30% individuals, i.e. the three top social classes documented in Du (2004, 2005). They together make up the top 10% wealthiest group in China at the time.

Overall, we believe personal wealth inequalities in China around the 1930s, in terms of top 10% wealth shares, stand within the interval of 55 to 65%. Compared to other Western countries for which we have reliable data on wealth inequalities in the early 1930s, China appears to be moderately unequal across the entire wealth inequality spectrum. With data collected from the World Inequality Database, in 1933, top 10% wealth shares in France reached 78%, with the figure standing at around 86% for the

United Kingdom, 85% for the United States and 70% for the Netherlands.[37] This result is in itself quite reasonable, as private wealth accumulation in China at the time was not as extreme as wealth concentration in more advanced Western countries with more mature development of capitalism and relatively little progressive wealth taxation at the same time (Piketty, 2014). Furthermore, if we compare the wealth inequality levels in Republican China versus those in the most recent years where China was under market transition (Figure 61), we could see that the 1930s' top wealth shares were similar to the levels of increasing wealth inequalities in the mid-2000s in China, yet still far from the pinnacle of wealth concentration in the 2010s, with the top 10% wealth shares standing at nearly 70%. Overall, wealth inequalities in Republican China could be best qualified as moderately elevated.

5 Conclusion

In this paper, we document the accumulation of Chinese national wealth over the past 110 years from the founding of the Republic of China in 1911 up until 2020, by undertaking unprecedentedly gigantic data collection efforts, combining sources from both national and local archives, gazetteers, prefecture and provincial chronicles, existing national accounts, statistical compendiums, yearbooks and contemporary surveys.

We find that the aggregate net national wealth to net national income ratio has increased by threefold (from 300% to 900%) over the course of an entire century. The most important asset component has also shifted from agricultural land to residential housing and corporate assets. Beneath the surface of such drastic modernization, the nature of ownership of national wealth has also undergone tremendous swings in between, from negative public wealth in the 1930s, to 90% total public wealth in national assets in the 1960s, and 30% total public wealth in the most recent years, where ideological shifts across different political regimes appear to principally dictate the rise and fall of public versus private wealth division over time.

[37] It's important to note that given some of the wealth inequality figures here are based on (estate or inheritance) tax records, the unit of which could be either at the tax filer level or equal-split adult if the tax records were filed jointly by couples. Most of the time tax-unit based inequalities are lower than individualized-adult inequalities (without accounting for within-unit inequalities), as such, wealth inequalities for these other countries should be viewed as lower bounds while being compared to those in China estimated in this paper.

Ideologically motivated policy-making has also left a lasting imprint on the dynamics of national wealth accumulation, where it acts as both constraints and facilitators on wealth accumulation, by over- or under-emphasizing wealth accumulation in favored sectors of the national economy. This necessarily generates great distortions in wealth accumulation, oftentimes acting in forms of substantial factor mis-allocation and significantly inefficient capital losses, with overheated savings-induced wealth growth in one sector at the expense of another.

In the next step of this paper, we plan to understand better how ideologically-driven national wealth accumulation strategies would impact the macro growth trajectories of a given country embedded in a more theoretical neoclassical growth framework, and how the continuities and discontinuities across different political regimes of varying ideologies facilitate or hinder the interaction between capital accumulation and economic development over the long run, with the introduction of the elements of diverging or re-converging urban-rural inequalities in China over the entire past century.

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6 Appendices

6.1 Construction of Net National Income and Other Flows Data

Net National Income (NNI), Y_{nt} in this paper, is defined as the following:

$$Net\_National\_Income = Gross\_Domestic\_Product - Consumption\_Fixed\_Capital + Net\_Foreign\_Income$$

The Chinese National Bureau of Statistics report the series of Gross National Income (GNI) from 1952 to 2020, based upon which we further add back in the total amounts of imputed rent and minus consumption of fixed capital, following the definition from Alvaredo et al. (2020). In the Chinese context, given that imputed rent is not reported by the National Bureau of Statistics, we further assume that the annual macro aggregate of imputed rent in China is 2% of total housing value in a given year. In addition, the national income series for the Republican period comes from Asian Historical Statistics, Volume China.

In addition, net national savings S_{nt} is defined as the sum of net domestic investment (net-of-depreciation domestic capital formation) in a given economy, and net foreign investment and capital transfers from abroad (which is essentially the sum of current account and capital account balances).

$$Net\_National\_Savings = Net\_Domestic\_Investment + Net\_Foreign\_Investment$$

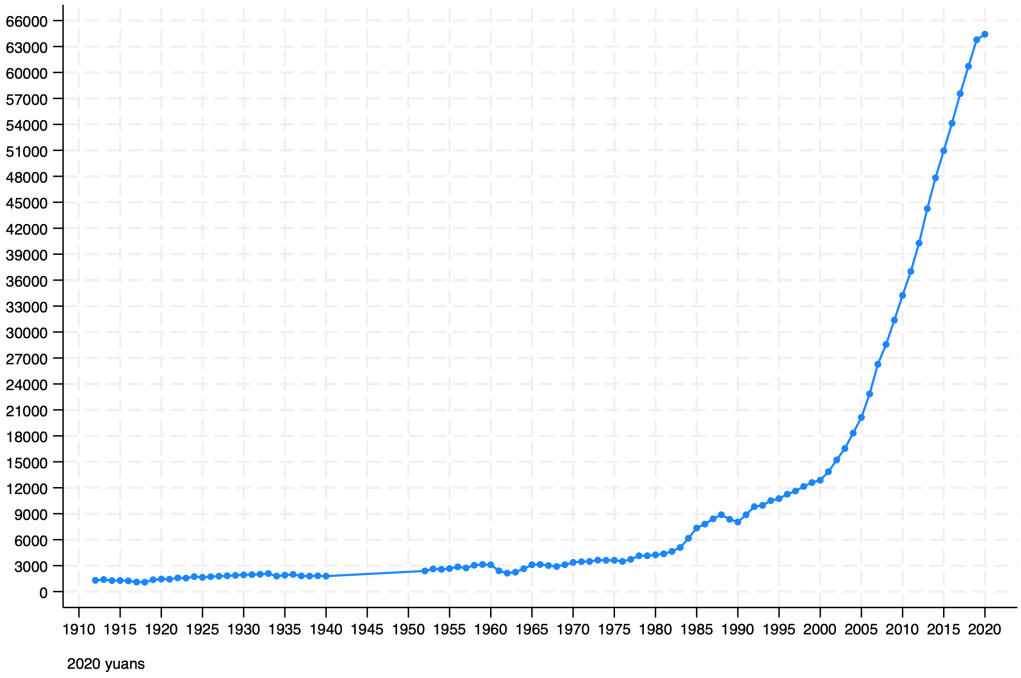
6.2 Evolution of Administrative Units in China (1911-2020)

All the maps produced in this paper strictly follow the administrative unit division evolution described below:

1. In the early 1930s, the Republic of China implemented a two-tier provincial

Figure 18: Net National Income Per Capita (Level and Log), 1912-2020

(a) Per Capita Net National Income (1912-2020), 2020 yuans



(b) Per Capita Log Net National Income (1912-2020)

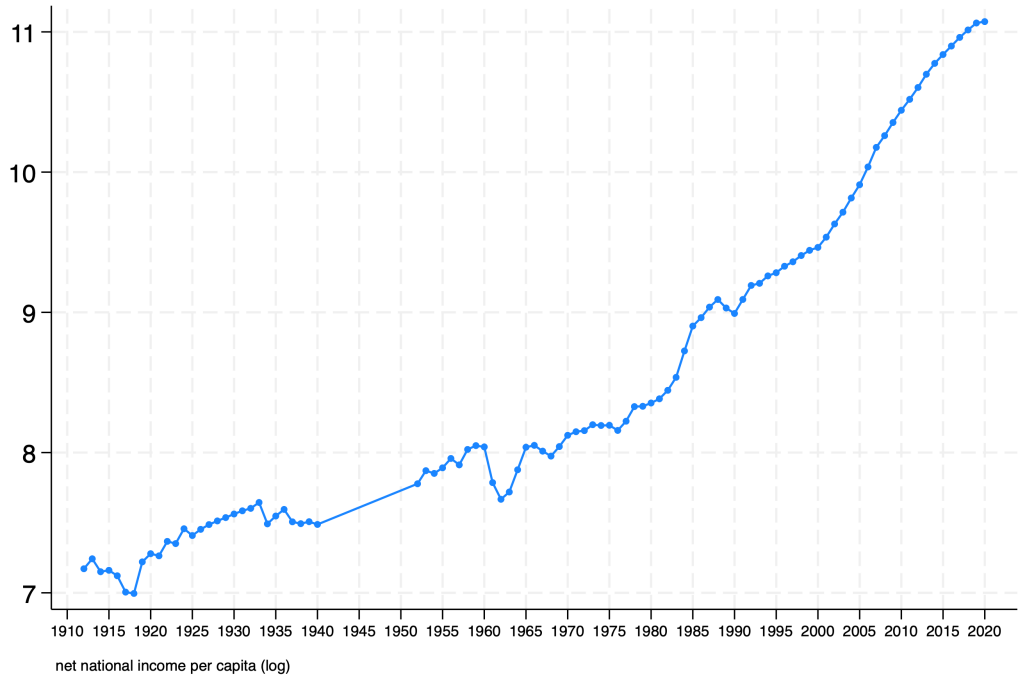
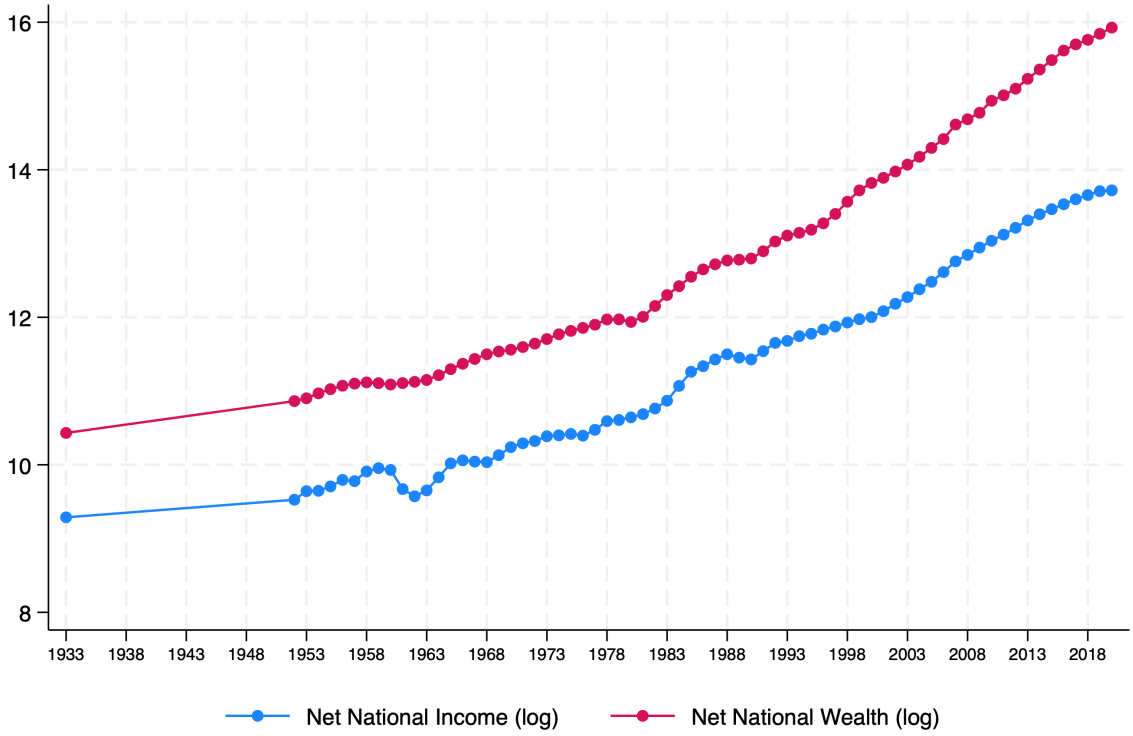


Figure 19: Net National Wealth and Net National Income (1933-2020)



Notes: This Figure depicts the aggregate net national wealth and aggregate net national income numbers (1933-2020) in logarithmic forms.

and county administrative system, with a total of 38 primary administrative regions. Among them, there were 28 provinces, including Jiangsu, Zhejiang, Anhui, Jiangxi, Hubei, Hunan, Sichuan, Xikang, Fujian, Guangdong, Guangxi, Yunnan, Guizhou, Hebei, Shandong, Henan, Shanxi, Shaanxi, Gansu, Ningxia, Qinghai, Suiyuan, Chaha'er, Jehor, Liaoning, Jilin, Heilongjiang, and Xinjiang; 6 directly governed municipalities, including Nanjing, Shanghai, Beiping (Beijing), Qingdao, Tianjin, and Hankou; 2 administrative regions, Weihaiwei Administrative Region and Eastern Province Special Administrative Region; and 2 local regions, Tibet Local Region and Mongolia Local Region.[38]

Figure 20: Administrative Map of the Republic of China in 1933

Notes: Outer Mongolia is consistently excluded from our analysis.

2. In 1958, administratively the People's Republic of China was composed of 2 municipalities (Beijing and Shanghai), 22 provinces (Hebei, Shanxi, Liaoning, Jilin, Heilongjiang, Shaanxi, Gansu, Qinghai, Shandong, Jiangsu, Zhejiang, Anhui,

[38]Throughout the paper we exclude (outer) Mongolia from our analyses to ensure consistency with the series during the People's Republic of China period.

Fujian, Henan, Hubei, Hunan, Jiangxi, Guangdong, Sichuan, Guizhou, Yunnan), four autonomous regions (Inner Mongolia, Xinjiang, Ningxia and Guangxi), and one autonomous region in preparation (Tibet).

3. The popularization of people's communes began in 1958, and township administrative units were gradually abolished.

4. On January 2, 1967, the city of Tianjin in Hebei Province was re-ascended to the status of a municipality directly under the administration of the central government, enjoying the same status of Shanghai and Beijing.

5. In 1982, the constitution declared the abolition of people's communes and the reintroduction of townships.

6. On April 13, 1988, the administrative region of Hainan was abolished, and Hainan Province was established.

7. On March 14, 1997, Chongqing Municipality in Sichuan Province was reclassified as a centrally administered municipality.

6.3 Agricultural Land

As previously mentioned, for Republican China, we take the focal year of 1933 and estimate agricultural land value using the census-like method, where land value is estimated as the product between the total area of cultivated land and the unit land price.

First of all, total area of arable land was estimated at the provincial level, where we take the estimates from T.-c. Liu and Yeh (1965) as the benchmark, and revise them with supplementary data, such as the Statistical Abstract of the Republic of China (commissioned by the Nationalist Party's Statistical Bureau in 1945), the Statistical Yearbook of Fifty Years of People's Republic of China (PRC), the Compendium of Fifty Years of Statistical Data of of PRC, and Asian Historical Statistics: Volume of China (Hitotsubashi University), etc. A few notable corrections include situations when T.-c. Liu and Yeh (1965) gave higher estimates of total arable land areas than the ones reported by Statistical Yearbooks of PRC for the year of 1949.

In 1933, the data of cultivated land area and per capita cultivated land area in each province of the country are shown in Table 6: there were 1.53 billion mu[39] of cultivated land in the country, and the per capita cultivated land area was 3.5 mu.

Table 6: Rural Population and Cultivated Land Area at the Provinical Level in China, 1933

Province	Rural Pop (million)	Arable Land Area（million mu）	Land p.c. (mu/person)
Anhui	23.28	71.5	3.1
Chahaer	2.02	18.8	9.3
Zhejiang	20.72	45.9	2.2
Fujian	11.83	23.3	2.0
Henan	33.46	129.3	3.9
Hebei	28.36	120.2	4.2
Hunan	28.68	69.3	2.4
Hubei	24.98	77.4	3.1
Gansu	6.57	39.7	6.0
Jiangxi	15.75	43.0	2.7
Jiangsu	34.01	92.0	2.7
Guangxi	13.63	37.3	2.7
Guangdong	32.00	50.0	1.6
Guizhou	8.72	24.6	2.8
Ningxia	1.09	7.1	6.5
Shanxi	11.72	69.0	5.9
Shandong	38.19	120.0	3.1
Shaanxi	9.50	54.0	5.7
Xikang	0.88	4.6	5.2
Suiyuan	2.20	20.6	9.4
Sichuan	51.48	121.4	2.4
Qinghai	1.13	5.0	4.4
Yunnan	11.80	36.0	3.1
Xinjiang	4.24	16.0	3.8
Manchuria	23.28	235.2	10.1
Tibet	1.41	2.0	1.4
Special District	1.05	0.4	0.4
Total	441.98	1533.6	3.5

Notes: Manchuria includes the provinces of Heilongjiang, Jilin, Jehol and Liaoning. Special district includes the six special municipalities at the time: Nanjing, Shanghai, Beiping (Beijing), Qingdao, Tianjin and Wuhan.

Afterwards, we further divide total arable lands into three main types of agricultural lands in rural China, namely paddy land, dry land and orchard land. Given the fact that generally different types of lands have large differences in land prices, and if the value of cultivated land is calculated directly from the average land price, it will generate large errors. Therefore, we first determine the proportion of paddy land, dry land and orchard land in the total cultivated area in each province, calculate the area, land price and value of the three types of cultivated land separately, and finally sum

[39]Mu (Chinese: 亩; pinyin: mǔ or , mǔ) is a unit of area measurement used in China, where it is officially standardised. It corresponds to 1/15 of a hectare, or about 666.67 m2.

up to get the value of cultivated land in the whole country.

Compared to orchards, there is more abundant and systematic data on the areas of paddy lands and dry lands, including national and provincial-level statistics. The National Land Commission compiled the "Outline of National Land Survey Reports," providing detailed information on land use in 16 provinces. The Statistical Bureau of the National Government compiled the "Statistical Abstract of the Republic of China", which included data on the areas of paddy fields and dry fields in 25 provinces in 1930. These two sets of statistics from the Republic of China era constitute our primary data sources. Additionally, the Planning Bureau of the Ministry of Agriculture systematically compiled the "Handbook of Agricultural Economic Data", which included the area of paddy fields and dry fields in 28 provinces, municipalities, and autonomous regions from 1949 to 1957. We believe that although there may be changes in land use in the two to three decades from the 1930s to the early years of the People's Republic of China, there should not be systematic differences. Therefore, we can use the data from the early years of the People's Republic of China as a reference and supplement. We prioritized the results of the survey in the 1930s, calculated the proportional relationship between paddy fields and dry lands based on these two sets of historical data, and then took the mean value to represent the utilization of paddy fields and dry lands in each province. Ultimately, the shares of orchard land are calculated based on the statistics compiled in Buck et al. (1964), B. Wu (1946) and T.-c. Liu and Yeh (1965). In summary, the utilization of arable land in each province is shown below in table 7.

To estimate the prices of various types of farmland, we use the three sets of provincial land price data provided by the "Statistical Abstract of the Republic of China" and the "Outline of National Land Survey Reports" by the Land Commission as benchmarks. Additionally, we utilize the "Actual Situation of Land Taxation by the Nationalist Government", the "China Economic Yearbook (1934-1936)" and some social surveys from the Republic of China era as references for the land prices of paddy fields and dry fields in each province.

To summarize, we calculate and sum up the value of paddy fields, dry lands and orchard lands in each province separately to get the value of total assets of cultivated land in the country. Specifically, in 1933, the total area of cultivated land in

Table 7: The shares of paddy fields, dry fields, and orchards in the total arable land area for each province

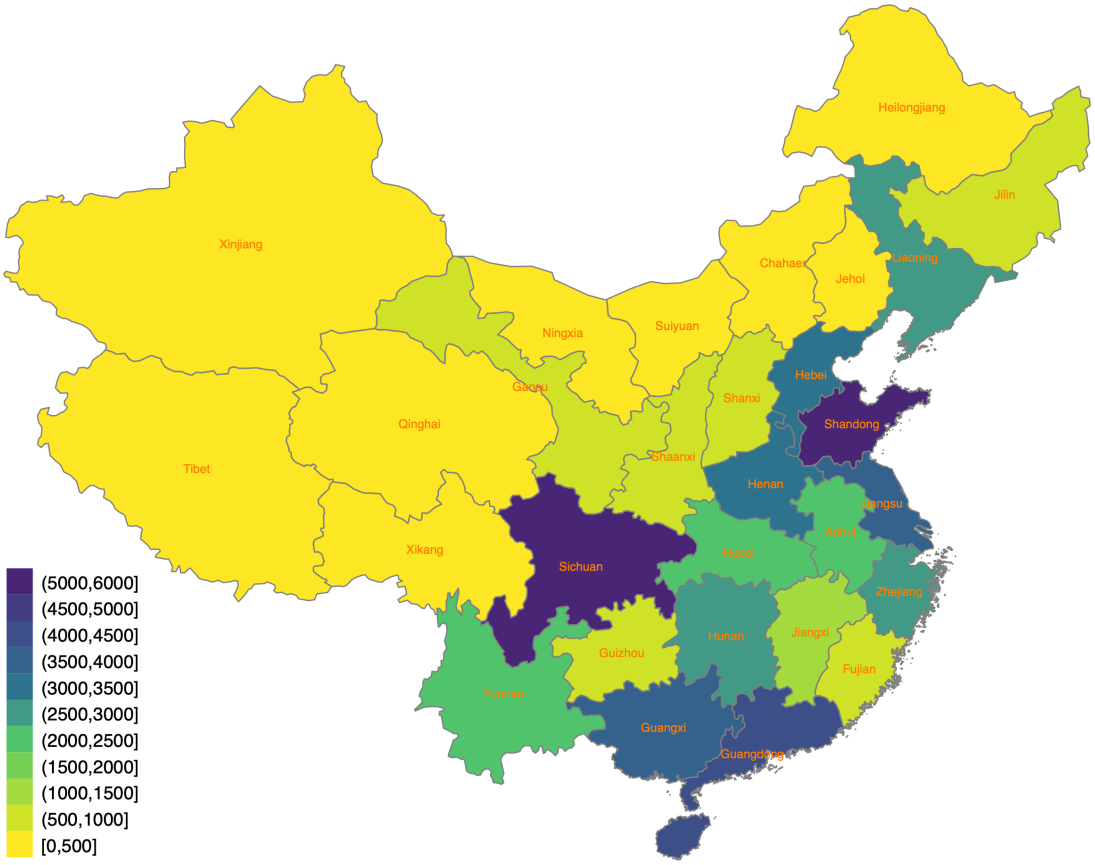
Province	Paddy land share (%)	Dry land share (%)	Orchard land share (%)
Anhui	33.2	64.3	2.5
Chahaer	5.7	91.8	2.5
Zhejiang	76	21.5	2.5
Fujian	78.8	18.7	2.5
Henan	5.2	92.3	2.5
Hebei	0.6	96.9	2.5
Hunan	75.2	22.3	2.5
Hubei	46.7	50.8	2.5
Gansu	0.2	97.3	2.5
Jiangxi	70.1	27.4	2.5
Jiangsu	43.3	54.2	2.5
Guangxi	68.8	28.7	2.5
Guangdong	70.2	27.3	2.5
Guizhou	40.3	57.2	2.5
Ningxia	0.2	97.3	2.5
Shanxi	0.1	97.4	2.5
Shandong	1.1	96.4	2.5
Shaanxi	6.9	90.6	2.5
Xikang	0.2	97.3	2.5
Suiyuan	0.2	61.2	2.5
Sichuan	42.8	54.7	2.5
Qinghai	0	97.5	2.5
Yunnan	43.3	54.2	2.5
Xinjiang	4.2	95	0.8
Liaoning	1.2	98	0.8
Jilin	2.1	97.1	0.8
Heilongjiang	0.8	98.4	0.8
Jehol	1.4	97.8	0.8
Tibet	0	99.2	0.8
Special District	25.5	71.8	2.2
Total	25.5	71.8	2.2

Notes: Special district includes the six special municipalities at the time: Nanjing, Shanghai, Beiping (Beijing), Qingdao, Tianjin and Wuhan.

30 provinces was about 1.533 billion mu, and the total assets of cultivated land was about 52.98 billion yuans.

The provincial-level aggregate agricultural land value is reported in Figure 21, where we could see that the provinces of Sichuan and Shandong enjoyed the highest agricultural land values in 1933, totalling more than 5 billion yuans. Hence each province occupied more than 10% of total land values in China at the time.

Figure 21: Provincial-level Aggregate Agricultural Land Value (1933, million yuans)



Notes: The unit is 1933 million yuans. Agricultural land value includes both values of crops attached to the farmland and the underlying land value.

In addition, by combining various historical sources, we also calculate the total output value of major crops nationwide in 1933 to be around 12.96 billion yuan, with grain crops accounting for 83.8% of the total production and 68.3% of the total value. Based on the previously estimated arable land area, the average per mu output value of arable land nationwide was 8.45 yuans, This is rather consistent with the figures reported by Z. Chen (1936), where in 1934, based on a survey conducted by him across 22 provinces and 1520 locations nationwide, it was revealed that the average output value (production value) per mu of paddy fields was 12.3 yuan, while that of dry land was 7.2 yuan.

Overall, based on these aggregate value figures, we could calculate that the land value to output value ratio in 1933 was around 4.1. This is a very important figure, as we will be using it to denote the benchmark relationship between total land value and output value for Republican China, and further use this as a reference capital-to-output ratio for farmlands to apply the derived "compensation method" in order to estimate land values in the era of the People's Republic of China.

For the other years in the Republican period, we continue using the census-like method, and extend the series of both total cultivated land areas and national land prices by combining various historical sources.

Specifically, first of all, for cultivated land areas, for the early period (1911-1936), Y. Zhang (1991) estimated total cultivated land in China for the years 1914, 1933, and 1949. By cross-checking with other sources, it's generally acknowledged that cultivated land areas displayed a mild increase in the early decades of the Republic of China (Perkins, 1969; C. Wu, 1989). Accordingly, we take the growth rates from Y. Zhang (1991) to match with our newly estimated total agricultural land area data in 1933. From 1937 onwards, due to war destruction, there was certain fluctuation in the total areas of cultivated land, and direct statistics were unavailable. The Agricultural Produce Index compiled and reported in the Asian Historical Statistics (AHS), which documents the total volume of agricultural output in China during the war years, was used instead as a proxy variable for changes in cultivated land area.

For land price indices in the Republic of China, for the period 1911-1936, they are di-

rectly taken from Wang (1997). This index was developed based on statistics compiled by National Bureau of Statistics of Republic of China during that period of time. From 1937 to 1949, the Grain Price Index (1913=100) from Lu and Peng (2005) was used instead. This Grain Price Index closely aligns with the trend of Wang (1997) for the concurrently non-missing years (1911-1932). As such, combined with national income data during the Republican period, we produce a continued series of agricultural land value to national income ratio from 1911 to 1940 as reported in Figure 22, where we observe relatively large increase in agricultural land wealth to national income ratio in the early Republican years, and then a sustained decrease over the next two decades due to both downturns in land price and lowering agricultural outputs in the late 1930s.[40]

Given the fact that there isn't really an effective land market in the People's Republic of China, instead we use the compensation method to estimate total land values in the post-1949 period. Specifically, we invoke the land compensation ratios (such that how many times of crop output from a particular parcel of land are to be compensated to the peasants once the land requisition takes place) stipulated in representative government regulation documents in the event of land requisition at different points in time. Land requisition by the government for different kinds of uses had been occurring since the founding of the PRC. For instance, in 1953, the "Land Requisition Regulations for National Construction" issued by the State Council stipulates the following:

"The compensation for requisitioned land shall be jointly assessed by the local People's Committee in conjunction with the land-using unit and the landowner. **For general land, the standard is based on the total value of the fixed output over the most recent two to four years.** For special types of land such as tea hills, tung oil hills, fish ponds, lotus ponds, mulberry orchards, bamboo groves, orchards, reed ponds, and other specific lands, flexible arrangements can be made based on the specific circumstances."[41]

Based on this compensation method, as well as the relevant capital-output-ratios we calculated for the Republic of China, we take the compensation ratio to be four for

[40] The additional war years in the 1940s were omitted for the moment due to a lack of reliable national income data from 1941 till 1949.

[41] For the full text please see: 1953 Land Compensation Regulation.

Maoist China. Farmland output figures were taken from the Chinese Statistical Yearbooks of Agriculture (1952-2020).

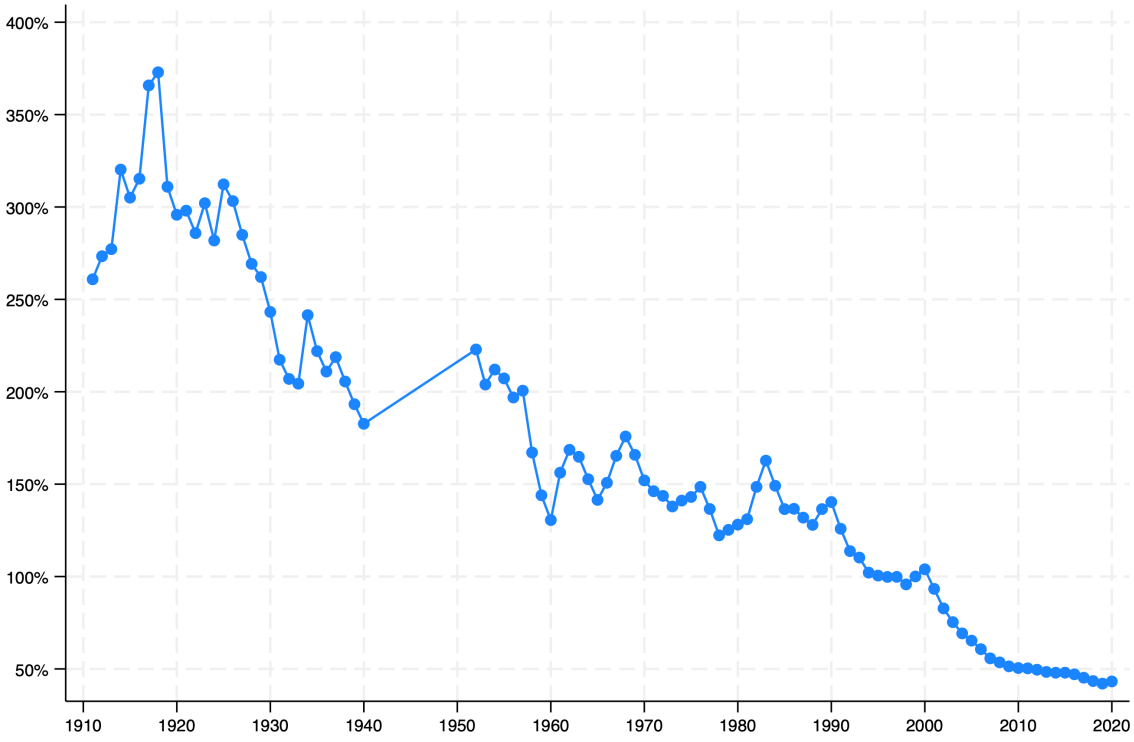
In addition, in 1998, the new land requisition regulation law stipulates the following:

- The compensation for land is six to ten times the average annual output value of the cultivated land in the three years before the requisition.
- The resettlement assistance fee is four to six times the average annual output value of the cultivated land in the three years before the requisition.
- The compensation standards for attachments and young crops on the requisitioned land are determined by the provinces, autonomous regions, and directly administered municipalities.

As such, in this paper the current assumption is that the compensation ratio of farmland value to output from 1952 to 1980 is 4 times, from 1981 to 1998 is 5 times, and from 1999 onwards is 6 times.[42] Accordingly, the entire series of agricultural land wealth to national income ratio from 1911 till 2020 is reported in Figure 22, where we could see the ratio has dramatically decreased from around 250%-350% in the Republican era to less than 50% in the most recent years.

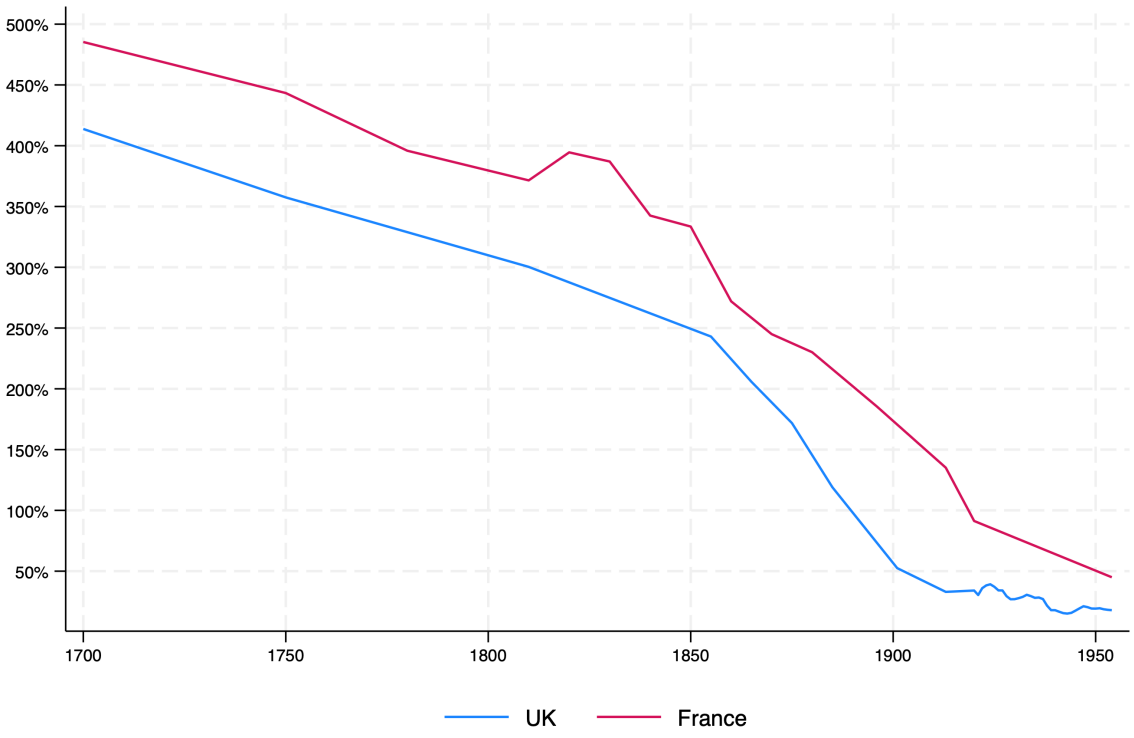
[42] We also test the robustness of our compensation ratio assumptions by different sub-periods via, for instance, increasing the compensation ratios for the most recent decades post-1999, and we observe the same vast declining agricultural land value as documented in Figure 22.

Figure 22: Agricultural Land Wealth to National Income Ratio (1911-2020)



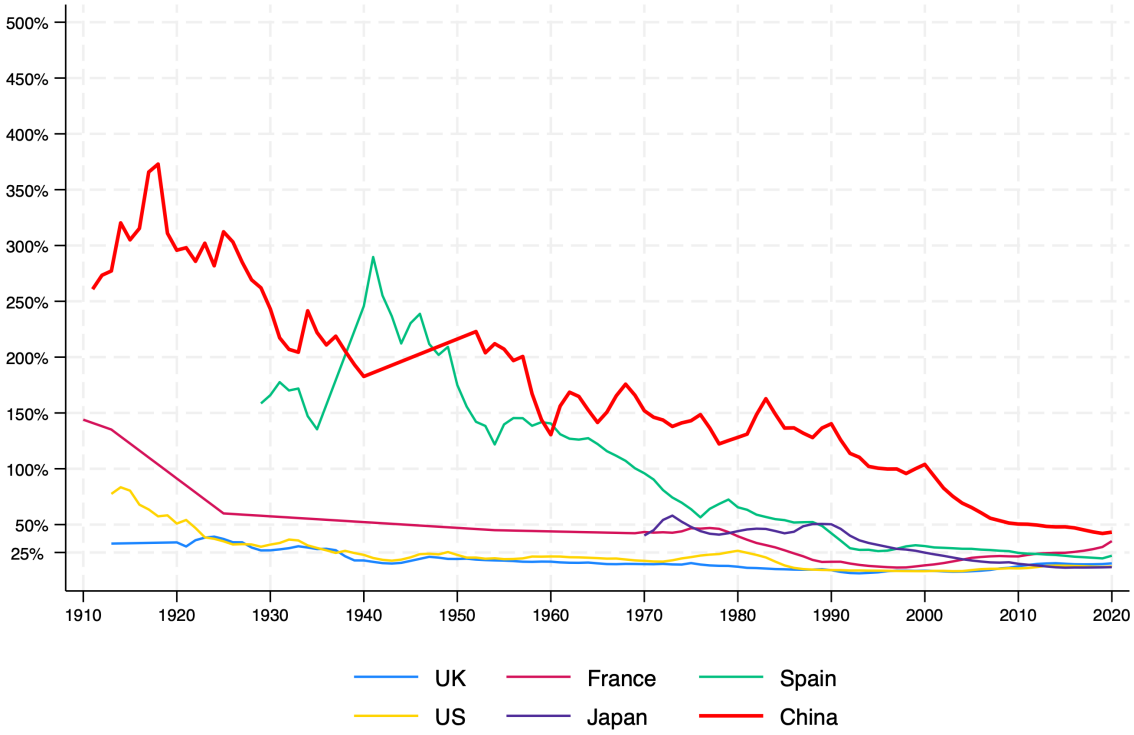
Notes: Agricultural land wealth here doesn't include forestry, fishery and animal husbandry land values. It includes both values of crops attached to the farmland and the underlying land value.

Figure 23: Historical Agricultural Land Wealth to Net National Income Ratio in France and the UK (1700-1950)



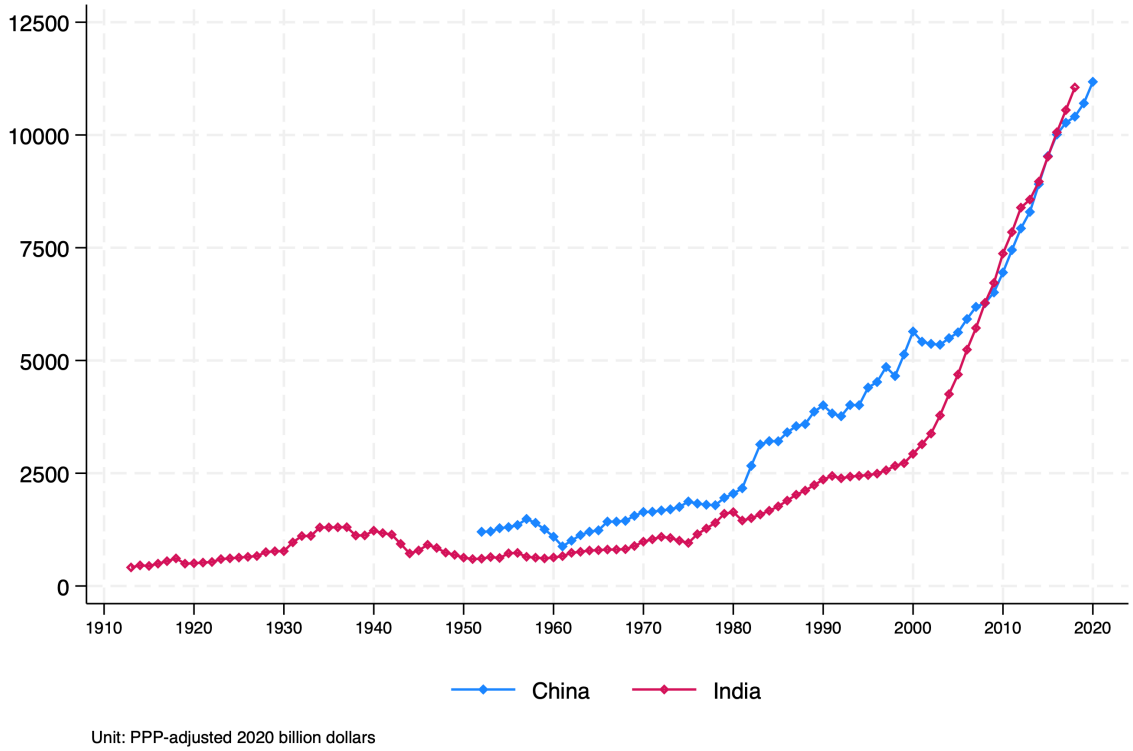
Notes: Historical agricultural land wealth data for these two countries are taken from Piketty and Zucman (2014).

Figure 24: Agricultural Land Wealth to Net National Income Ratio (1910-2020)



Notes: Data for other countries come from World Inequality Database.

Figure 25: China-India Comparison: Agricultural Land Values (billion dollars)



Notes: The unit is in PPP-adjusted 2020 billion dollars.

6.4 Housing

6.4.1 Housing Value Estimation (1911-1949)

For the moment in this paper for the Republican era, the same as for other asset categories, we provide detailed estimation methodology for housing for the year of 1933 alone to begin with, and then we detail our methodology on how we extend the series of housing value both backward and forward for the entire Republican period.

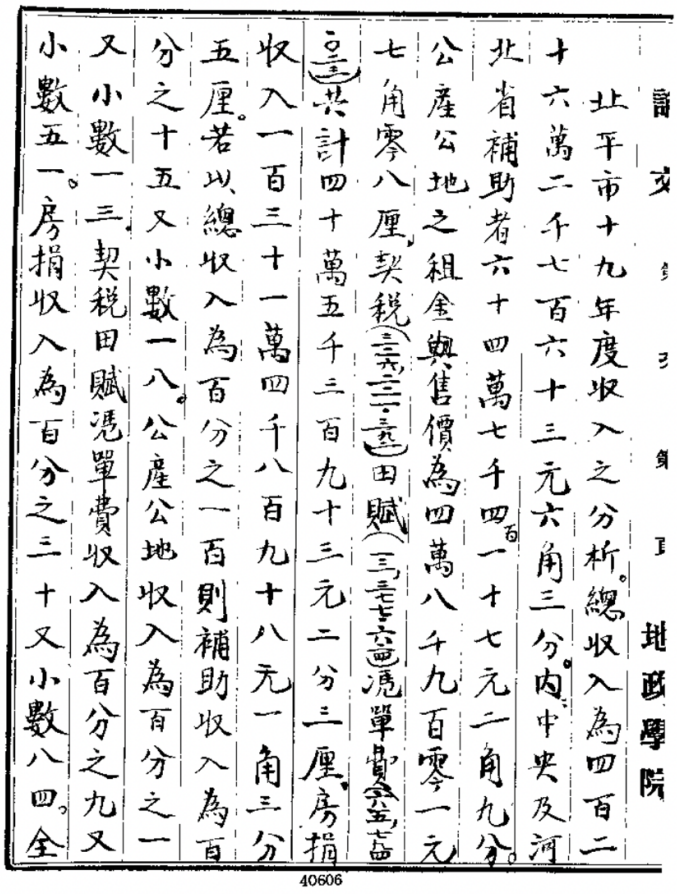
Additionally, while examining property tax archival sources for the Republic of China era, we find that around 1933, the boundary between housing prices and land prices was not clear, and in some big cities such as Shanghai, taxes on the building structures and the land underlying the building were separately levied. Therefore, while discussing property tax and estimating the value of property thereby attached, we generally consider the value of the housing as the sum of the value of building structures as well as the value of the land underlying them (i.e. we merge the two different property tax records together when they were levied separately).

Housing Value in Major Cities We separately estimate real-estate value in major cities and non-major cities (i.e. the rest of the country), given the availability and institution of extensive property tax in major cities at the time. For real-estate values in these major cities, we calculate the property (land) value via dividing total property tax revenues in the major city by the average tax rate, where in year t in a given city i:

$$Revenue_{it} = HousingValue_{it} \times TaxRate_{it}$$

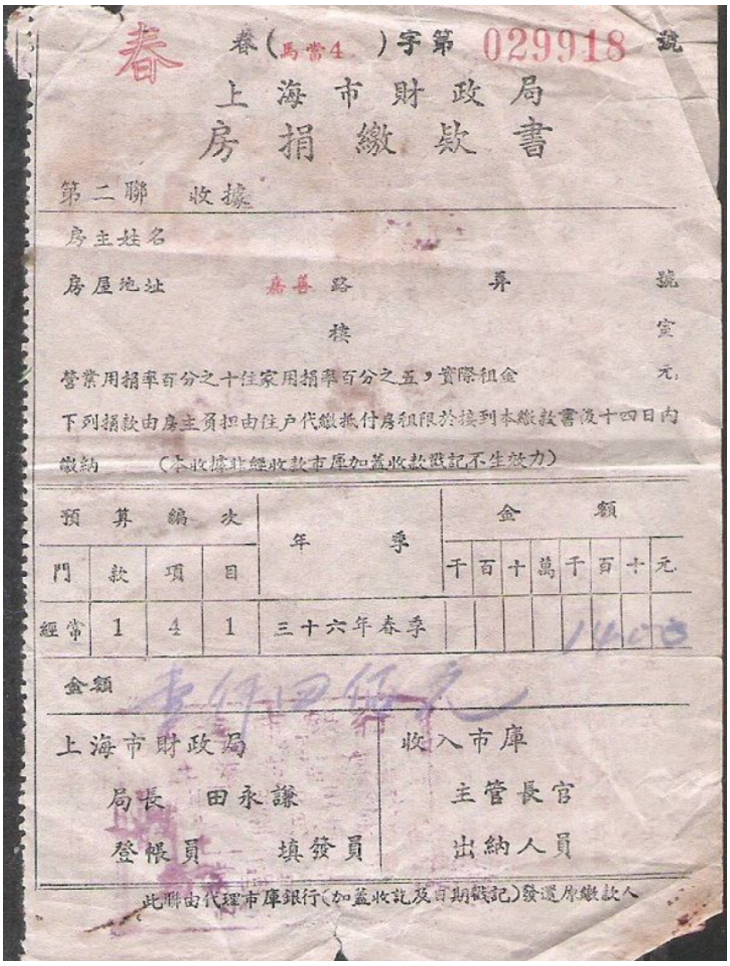
Based on the comparative economic, political and strategic importance, as well as national representative-ness, sixteen cities including Shanghai, Beijing, Chengdu, Tianjin, Hangzhou, Qingdao, Changsha, Chongqing, Fuzhou, Xiamen, Nanjing, Kunming, Guangzhou, Hankou, Weihaiwei, and Xijing (Xi'an) are selected as nationally representative major cities （中心城市）at the time. Examples of property tax payments for the two major cities at the time (Beiping and Shanghai) could be found in Figure 26 and Figure 27.

Figure 26: Example of Property Tax Fiscal Revenues in Beiping (1930)



Notes: This Figure reads that in the City of Beiping (Beijing), in the Year 19 of Republic of China (1930), total fiscal revenues amounted to 4.263 million yuans, meanwhile property tax revenues totalled around 1.315 million yuans (nearly 31% of total fiscal revenues of that year).

Figure 27: Example of Property Tax Payment in Shanghai (1947)


春（馬當4）字第 029918 號

上海市財政局

房捐繳款書

第二聯 收據

房主姓名

房屋地址 嘉善 路 弄 號

室

核

營業用捐率百分之十住家用捐率百分之五實際租金 元

下列捐款由房主負担由住户代繳抵付房租限於接到本繳款書後十四日內繳納 （各收據非經收款市庫加蓋收款戳記不生效力）

預算編次				年季	金額							
門	款	項	目		千	百	十	萬	千	百	十	元
經常	1	4	1	三十六年春季								

金額

上海市財政局

局長 田永謙

登帳員 填發員

收入市庫

主管長官

出納人員

此聯由代理市庫銀行（加蓋收訖及日期戳記）發還原繳款人

Notes: This Figure indicates a property tax payment certificate for a housing located on Jiashan Road in Shanghai, 1947. The total amounts of property tax paid amounted to 1,400 yuans.

Table 8 reports the total property values in the sixteen main cities. It's striking to observe the predominant position of Shanghai, which accounts for more than 60% of total housing values at the time (among major cities), followed by Nanjing, the capital at the time, and then Beiping (Beijing).

Table 8: National Wealth (1933) - Housing Wealth in Major Cities

City	Housing Value (mil)	Share	Pop Size (10,000)	P.C. Value (yuans)
Shanghai	2534.73	**62.49%**	333.09	760.97
Nanjing	411.25	10.14%	72.61	566.36
Beiping	245.35	6.05%	151.97	161.45
Guangzhou	205.44	5.06%	104.26	197.04
Tianjin	189.25	4.67%	88.99	212.65
Hankou	94.35	2.33%	76.60	123.18
Qingdao	66.19	1.63%	44.93	147.32
Fuzhou	56.03	1.38%	41.49	135.06
Hangzhou	55.47	1.37%	52.40	105.86
Xiamen	46.29	1.14%	21.41	216.24
Chengdu	44.74	1.10%	30.29	147.71
Kunming	44.50	1.10%	20.72	214.76
Chongqing	36.87	0.91%	28.13	131.09
Changsha	13.39	0.33%	43.67	30.66
Xi'an	6.68	0.16%	17.08	39.11
Weihaiwei	5.76	0.14%	19.37	29.74
Total	4056.29		2170.12	1886.17

Housing Value in Non-major Cities: Urban and Rural Areas In the historical records of non-major cities' property values in the 1930s, there is limited direct information on housing prices or construction costs. Therefore, it is necessary to estimate housing values through indirect methods. Here, we derive housing expenditure based on abundant data on wages, income, and household consumption from relatively micro-level surveys or statistics during the Republic of China era. Firstly, we assume that the annual average expenditure on housing is equal to the annual average housing rental expenditure, and we take ten times the annual rental expenditure as the housing value:

$$Rent_{it} = HousingValue_{it} \times 0.1$$

In table 9b and table 9a, we could see examples of household-level rental expenditures reported in certain social survey series during the Republican period, in both urban and rural areas in the provinces of Zhejiang and Jiangsu. In the specific esti-

mation process, the first step is to determine the annual average housing expenditure of urban and rural households. For surveys and statistics that do not explicitly specify household expenditure, we assume that household income offsets expenditures and estimate household income based on wages. Regarding the proportion of housing expenditure to total household expenditure, we give priority to the data provided by primary historical materials. If that information is unavailable, we use 5% as the proportion of housing expenditure to total household expenditure (Buck, 1930).

Afterwards, using statistics on average urban and rural household sizes, we can calculate the per capita housing value. If the primary historical records in various regions have precisely surveyed the average number of people per household, we calculate based on their records. "Chinese Population History - Republic of China Volume" compiled and calculated the household size of rural populations from 1929 to 1933 in various regions, finding that the average household size in rural areas is 5.3 people. Taking into account the differences in urban and rural household sizes, actual family sizes, and household sizes, we round down to estimate based on a standard urban household of 4 people and a standard rural household of 5 people. Finally, we multiply the per capita housing value by the population of each province to obtain the housing value for urban and rural areas.

Figure 28 reports the provincial-level housing value totals (excluding housing values in the 16 major cities), we find that provinces such as Sichuan, Guangdong, Jiangsu and Hebei enjoy the highest total housing values in China in 1933, with housing values in Sichuan alone totaling around 1.7 billion yuans at the time.

Ultimately, if we sum the total housing values in both major cities and the rest of the country, total housing value in 1933 stands at around 15.6 billion yuans, which makes the total housing value to national income ratio in 1933 stands at 61.6%. At the same time, it should be noted that the housing value estimated here includes all housing value in the given economy, as such it includes housing directly owned by households (residential housing), foreign-owned housing located in concession areas in cities such as Shanghai and Tianjin, housing owned directly by the government, well as commercial buildings owned by corporations. We have also separated all these categories based on for instance the residential to commercial housing shares in representative

Table 9: Housing Value Estimation in Non-major Cities: Instances of Zhejiang and Jiangsu Provinces

(a) Housing Value Estimation in Non-major Cities of Jiangsu Province

Year	Location	Rural/Urban	HH Size	Rent	Est. Value	P.C. Value
1930	Suzhou	Urban	3.2	26.00928	260.0928	81.28
1930	Wuxi	Urban	3.7	26.1576	261.576	70.70
1930	Wujin	Urban	3.4	21.66768	216.6768	63.73
1930	Zhenjiang	Urban	3	35.13024	351.3024	117.10
1930	Jiangdu	Urban	2.1	3.93984	39.3984	18.76
1930	Nantong	Urban	3.3	18.51816	185.1816	56.12
1930	Yixing	Urban	2.7	11.15952	111.5952	41.33

(b) Housing Value Estimation in Non-major Cities - City of Wuxing in Zhejiang Province

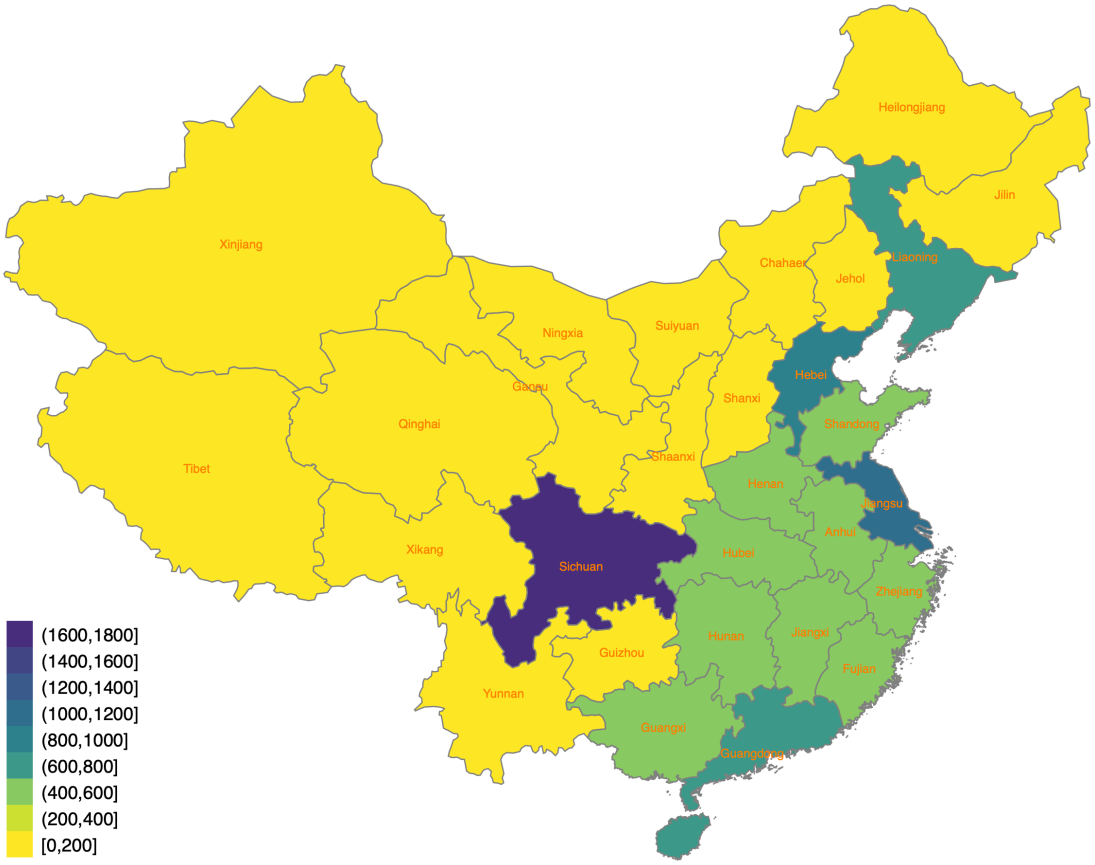
Year	Location	Rural/Urban	HH Size	Rent	Est. Value	P.C. Value
1930	Wuxing	Urban	3.1	26.56164	265.6164	85.68
1939	Linghu	Rural	5.23	9.11	91.1	17.42
1939	Shuanglin	Rural	4.9	4.47	44.7	9.12
1939	Yuanjiahui	Rural	4.49	2.77	27.7	6.17
1939	Nanxun	Rural	5.35	7.21	72.1	13.48

Notes: Source: **Social Survey Series of the Republican China** - Rural & Urban Economy Volumes; Comparison of the Percentage Distribution of Domestic Workers' Household Living Expenses.

cities at the time, etc, as well as foreign housing (which will be detailed more in the foreign sector).

Estimation of Other Years in Republican China (1911-1942) For the other years during the Republican period, housing wealth is estimated as the following. First of all, we adhere to the same estimation methodology where we divide total housing assets into three main categories, namely aggregate housing wealth for the 16 major cities, the non-major city urban areas and the rural areas separately. In order to estimate housing value for each of these aforementioned categories, first of all, we need to map out the evolution of urbanization trends in China. The general consensus in academia right now is that the most reliable urbanization rate measure on China comes from the first population census in post-independence China in 1953. For the Republican period, there has already been a number studies attempting to quantify the extent of urbanization in China, yet due to varying definitions of what counts as an urban area, our conclusion is that the existing studies mostly over-state the true extent of urbanization at the time. That being said, what is more trustworthy is the probably the trend of urbanization documented in the existing literature, which is that China experienced

Figure 28: Provincial-level Aggregate Private Housing Value (1933, million yuans)



Notes: The unit here is 1933 million yuans. The 16 major cities listed before are excluded.

a phase of increasing urbanization from the 1910s onwards, and then during the war years due to wartime destruction urbanization slightly decreased, and then slowly recovered back its prewar level in the early 1950s. As such, based on the benchmark value obtained from the 1952 population census conducted in 1953, as well as some minor adjustments on provincial-level urbanization rates, we arrive at an urbanization rate for the year of 1933 of around 12.16%, which was slightly lower than the 1952 urbanization rate at around 12.8%. For the other years in Republican China, we take the yearly growth rate of urbanization (1911-1949) from H. X. Wu (2016), and linearly extrapolate our 1933 measure both backward and forward. Figure 32 gives a comparison of our modified series versus the original series from H. X. Wu (2016). With this series of urbanization rate and total Chinese population data from the Asian Historical Statisitics (AHS) for the Republican period, we are able to calculate total urban and population data for the entire period.

In addition, for the 16 main cities, given the extremely important place of Shanghai just as described, we will be using Shanghai as a proxy to extend the whole series of major-city housing value for the entire Republican period. As such, we also take total Shanghai population data from the **Republican Shanghai Population Records** (1911-1949), and for the other major cities' population, we assume two different linear trends by two sub-periods, namely prewar China (1911-1937), and wartime China (1937-1949). For prewar China, we assume population in other major cities grew with the same trend as in Shanghai. For wartime China, we assume their population grew with the same trend of urbanization nationwide.

In terms of specific estimation, to begin with for Shanghai, we have annual total property tax revenues for both dwellings and land underlying dwellings. Based on these records, we back out the weighted total of real-estate value for Shanghai from 1911 to 1942. Then, with annual total population in Shanghai we could produce the series of per capita housing value, after which for the moment we take a simplified approach by using the Shanghai-based per capita housing price index (1933 = 100) as the per capita housing price index for all the other 15 major cities in China, and back out the nominal per capital housing value for these cities for the entire Republican period with

the nominal value obtained for 1933.[43]

For the non-major city urban areas, we rely on the housing price index series reported in **Statistical Analysis of China's Land Issues**, produced by the National Government Statistics Bureau, and we use the land price index for the small and medium cities as a proxy for real-estate price index in these less developed urban areas of Republican China, to back out the total property values in those cities.

For rural areas in China, we assume the per capita housing rental expenditure didn't change throughout the Republican period (1.64 yuans in 1933 constant prices), and we re-adjust the per capita housing rental expenditure into nominal prices by using the grain price index from lupeng2005 as a proxy for rural consumer price index at the time. Ultimately, we also adjust the property values for non-major-city and rural categories up by 6% to account for non-dwelling building values (such as commercial building, etc).

6.4.2 Housing Value Estimation (1949-1978)

Housing value during the PRC period is estimated based on the following equation:

$$\begin{aligned} Total\_HousingValue_t = NewlyBuilt\_HousingValue_t + \\ CapitalGain_t - \delta_t Total\_HousingValue_{t-1} \end{aligned} \tag{5}$$

Additionally, throughout this period of time, we estimate housing values for urban and rural areas separately.

For Maoist China, given the absence of housing market, capital gains of housing are assumed to be zero. Newly built housing value statistics are total annual fixed investment in housing taken from China Statistical Yearbooks. Specifically, annual national-level rural housing investment for the years of 1952-1957 are available and taken from

[43]The more accurate approach would be to collect all the property tax revenues for each single city included in the major-city sample. Owing to time constraints, the lack of comprehensive archival data on an annual basis, etc, currently we assume the housing price evolution in Shanghai across years is representative of that in all other major cities. In the future we attempt to separately collect more complete property tax revenue for a few other large cities among the major-city sample, such as Nanjing, Hankou, Beiping (Beijing) and Canton to begin with.

Cheng (2020). Afterwards, we rely on two sets of flow data: From the Chinese Statistical Yearbook of 1983, we take the flow series called "非生产性建设投资中住宅投资" (Investment in Non-Productive Residential Construction), which is available from the year 1950 onwards annually. Another series of flow data is called "全社会住宅建设投资" (Total Investments in Residential Construction) taken from the Chinese Fixed Asset Investment Statistics, which is available annually for the years from 1981 until 2000. For the overlapping years where both series are concurrently non-missing, we assume the average ratios between the two in the early 1980s as the constant ratio between total residential construction investment and non-productive residential construction investment for the period 1950-1978. Given the rural investment figures in the 1950s, we could also calculate the share of rural investment out of total investments, and back out the urban investment shares. Housing depreciation δ_t during this period of time is assumed to be 2% in urban areas and 3% in rural areas. Additionally, given that we need housing value for a base year in this methodology, initial housing asset value in 1949 was obtained via extrapolating from 1933 onward.

6.4.3 Housing Value Estimation (1979-2020)

Following equation 5, for the period 1978-2020, first of all, **Newly built housing value** is estimated as the following: $(Population_t \cdot PerCapita\_LivingSpace_t - Population_{t-1} \cdot PerCapita\_LivingSpace_{t-1}) \cdot Price_t/m^2$, which is essentially a product of the total living space change (due to both per capita living space change and population growth) and housing price per square meter.

Furthermore, **capital gains** are estimated as the part of the housing value change due to price fluctuations: $Population_{t-1} \cdot PerCapita\_LivingSpace_{t-1} \cdot (Price_t/m^2 - Price_{t-1}/m^2)$. Ultimately, housing depreciation δ_t during this period of time is also assumed to be 2% in urban areas and 3% in rural areas.

All the aforementioned statistics are taken separately for the urban and rural areas from Chinese Statistical Yearbooks.

In addition, in urban areas, we have three sets of housing prices, namely the average residential housing sales price, average commercial housing sales price and construction cost of housing per square meter. One important remark to be made here is that

before 1986, in urban areas housing assets in China were valued at their construction costs. First of all, this is due to data limitation as residential housing price becomes available only from 1991 onwards, and commercial housing price becomes available from 1987 onwards. As such, for the pre-1986 period, we evaluate urban housing at its construction cost value. Furthermore, this method is also empirically justified, as 1986 marked the beginning of a series of housing reforms which gradually took place in the following decade, with the most important housing reform then taking place in 1998 (which is also the starting year of nationwide residential housing price in China).

In 1986, the State Council issued the **Implementation Plan for the Phased Implementation of Housing System Reform in Urban Areas Nationwide**. The team designed a plan to "increase rent, provide subsidies, and promote employees' home purchases," and selected the four cities of Tangshan, Yantai, Bengbu, and Changzhou as pilot cities. The whole procedure of housing reform was very gradual (1986-1998), but 1986 was generally regarded as the starting point of housing marketization. The next two milestones of housing reforms in China took place in the years of 1994 and 1998.

In 1994, the State Council issued the **Decision on Deepening the Reform of the Urban Housing System**, proposing a shift in the system of housing construction and investment from a national and unit-based model to a system where the state, units, and individuals bear shared responsibilities together. During the period from 1994 to 1997, although the commercialization and market-oriented reforms of housing were comprehensively promoted, the welfare housing allocation system was still temporarily retained in the process of transition. Objectively, both the new and old housing systems operated simultaneously during this period. It was not until 1998 when the State Council issued the **Notice on Further Deepening the Reform of the Urban Housing System and Accelerating Housing Construction**. This notice clearly outlined the direction of marketization, monetization, and commercialization reforms for urban housing. It marked the initiation of a thorough reform of the housing system, halting the practice of "physical distribution of housing" and implementing the monetization of housing allocation. This move signaled the establishment of a housing supply system primarily based on market provision.

As such, in our estimation, for the years between 1978 and 1986, residential housing

price per square meter in the urban area was taken at the construction cost value. Starting from 1987 onwards, given the partial housing reform in place as well as the availability of national commercial housing sales price, we compute the residential housing price per square meter as a weighted average of urban housing construction cost per square meter and commercial housing sales price per square meter, with the respective weights the share of total public housing versus private housing in the Chinese economy in that given year.[44], and then for the period 1991-1997, we replace the commercial housing sales price with the newly available residential housing sales price. Ultimately, from the year 1998 onwards, we take the private housing weight to be 100%, in other words the national average residential housing sales price is taken as given, without re-weighing based on the private versus public housing shares in the economy.[45]

This is also why in Figure 29, we observe a very precipitous jump in national housing wealth to national income ratio in the late 1990s, reaching around 220% by the turn of the century.

6.5 Corporations

For both the Republican era and the Maoist era, given the lack of listed company data (absence or under-development of the stock market, hence meager data on market capitalization of firms in general), we estimate net corporate wealth with the **book-value approach**, namely in the most ideal scenario when all primary data are available, we would estimate net corporate wealth as the sum of total corporate non-financial assets and financial assets, net of the non-equity corporate liabilities reported in corporate balance sheets. The implicit assumption here is that Tobin's Q is equated to be one from 1911 untill 1978.

[44] We take the private shares of urban housing in China from Piketty et al. (2019) for the period 1978-2020.

[45] Although in 1998 around 34% of urban housing was still publicly owned, given the discontinuation of welfare housing allocation schemes, if the existing public housing is to be sold or transferred, it will be subject to the market price of residential housing in the private sector. As such, we no longer take the re-weighing method for the years from 1998 onwards.

Figure 29: Housing Wealth to National Income Ratio (1911-2020)

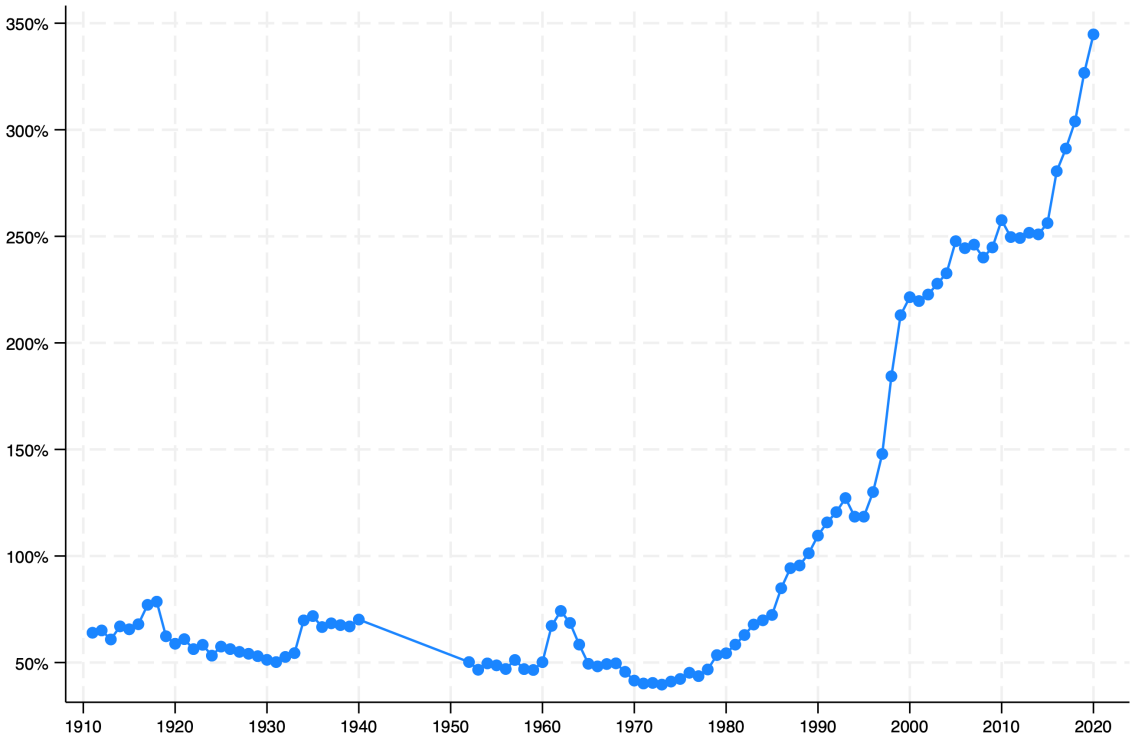


Figure 30: Agricultural Land & Housing Wealth to National Income Ratio, and Urbanization Rate (1911-2020)

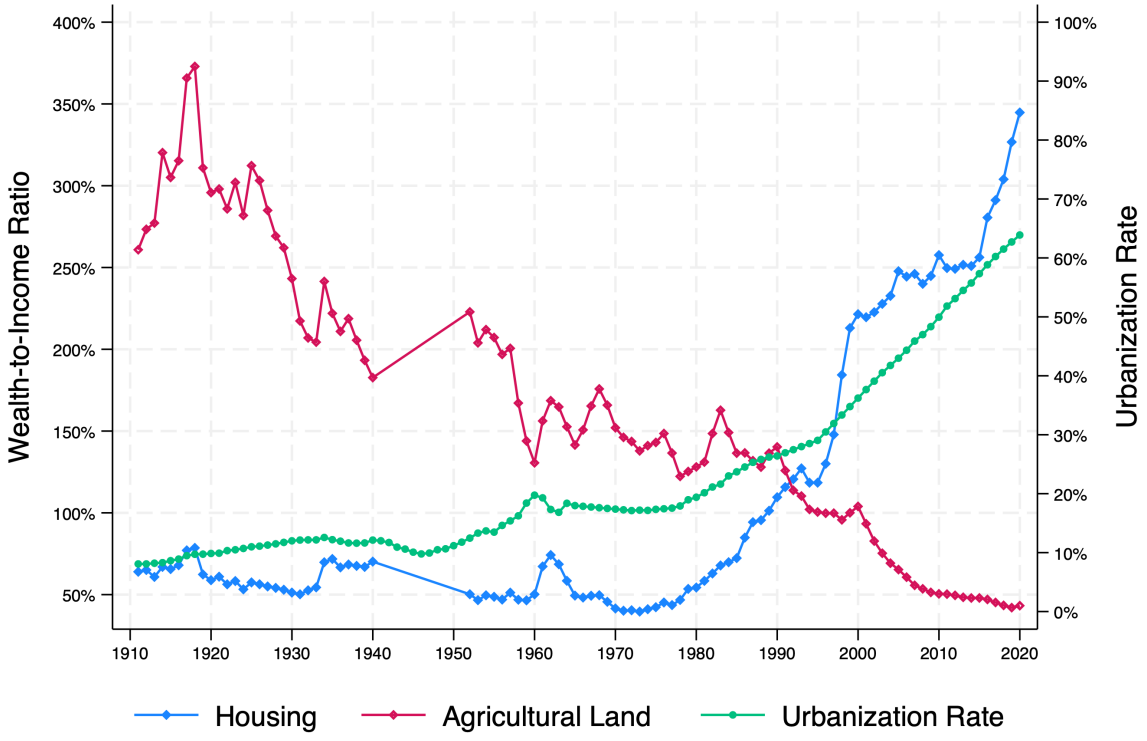
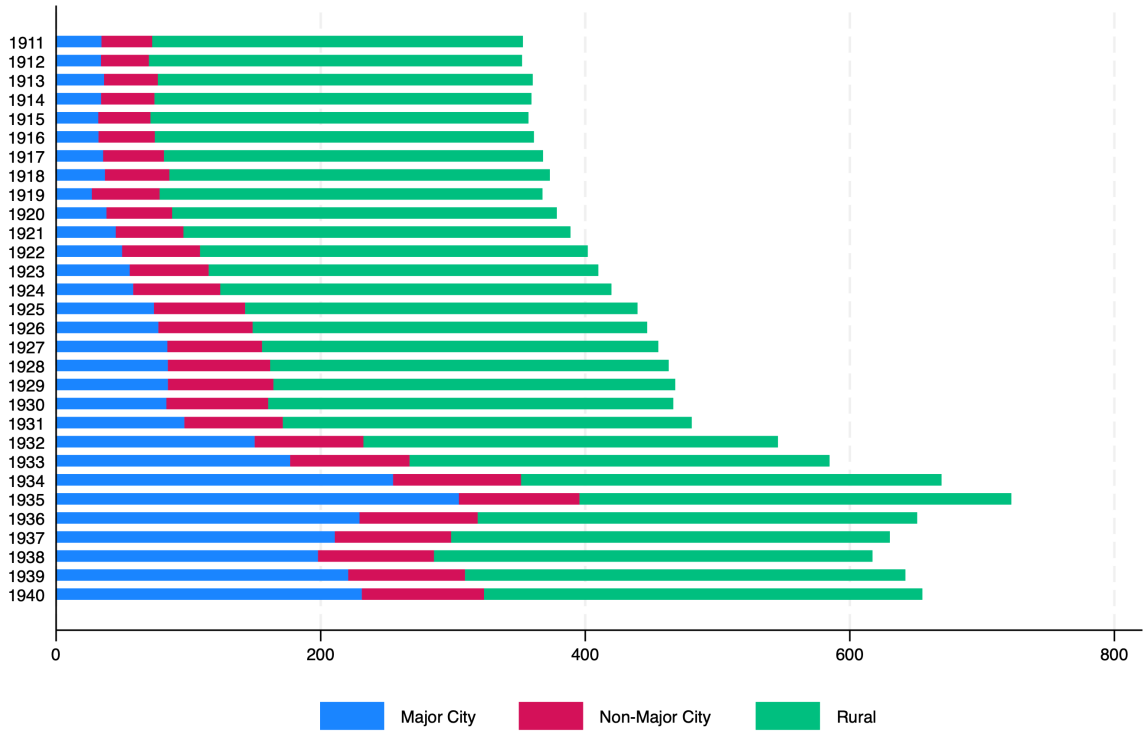


Figure 31: Housing Wealth in Republic of China by Categories of Interest (1911-1940)



Notes: The series is in 2020 billion yuans.

Figure 32: Urbanization Rate Comparisons (1911-1952)

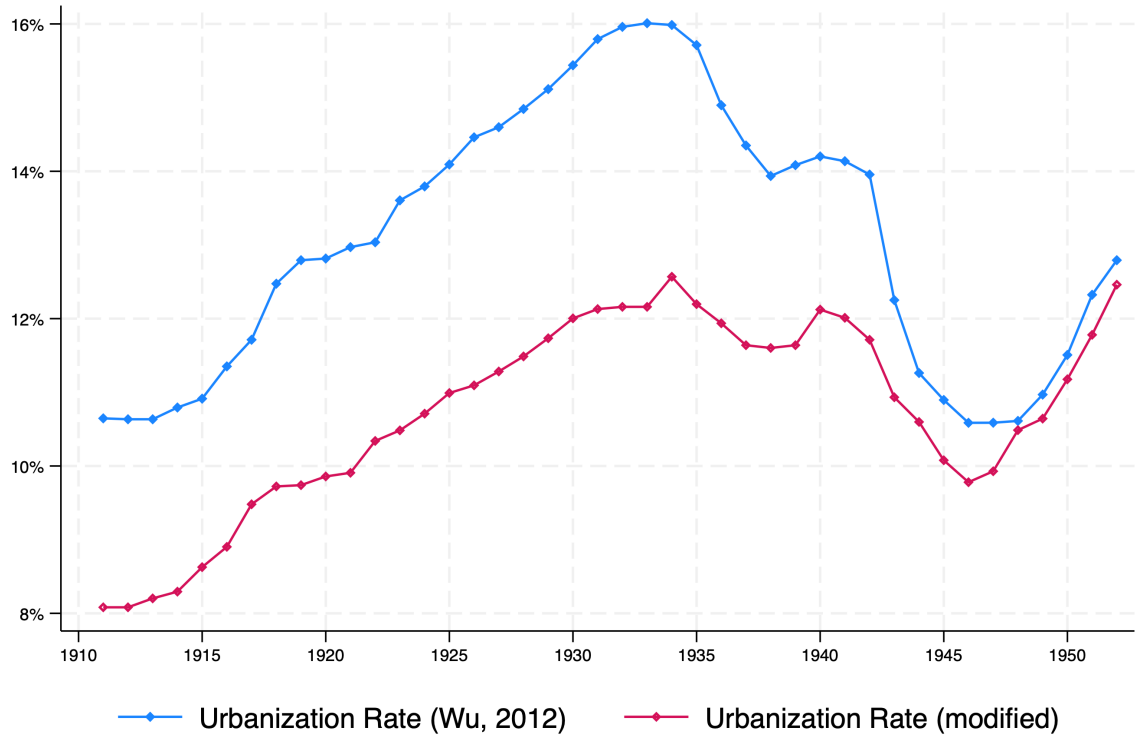


Figure 33: Rural and Urban Housing Wealth to National Income Ratio (1911-2020)

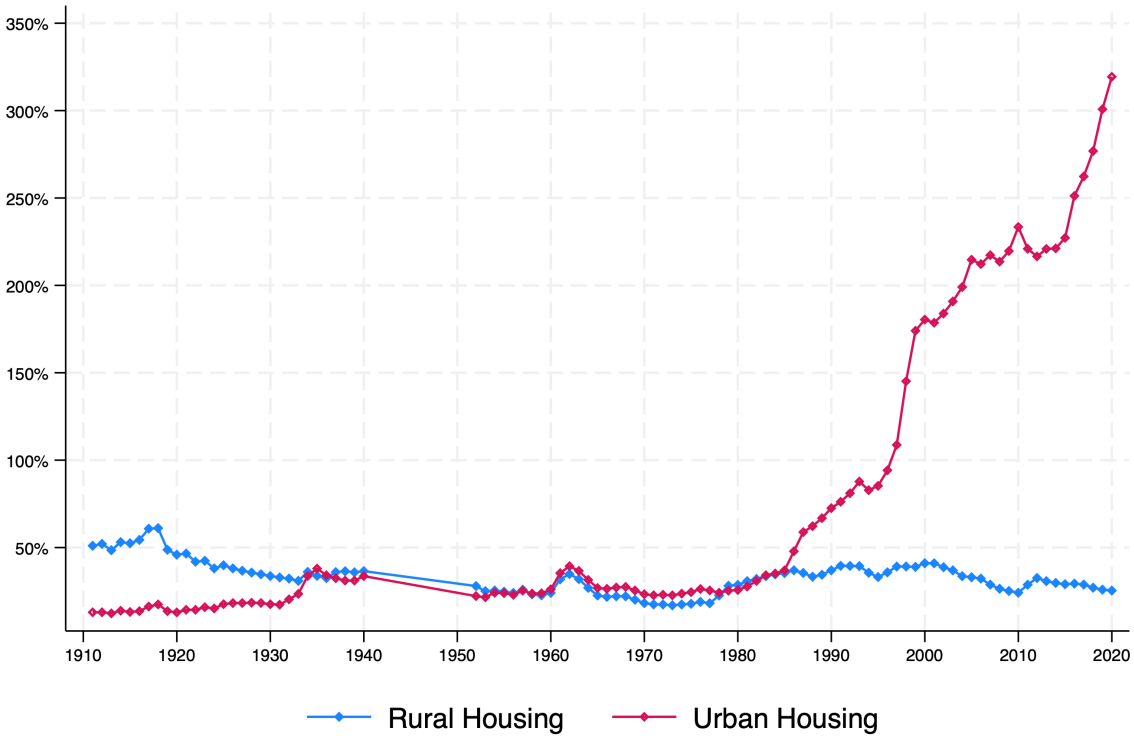
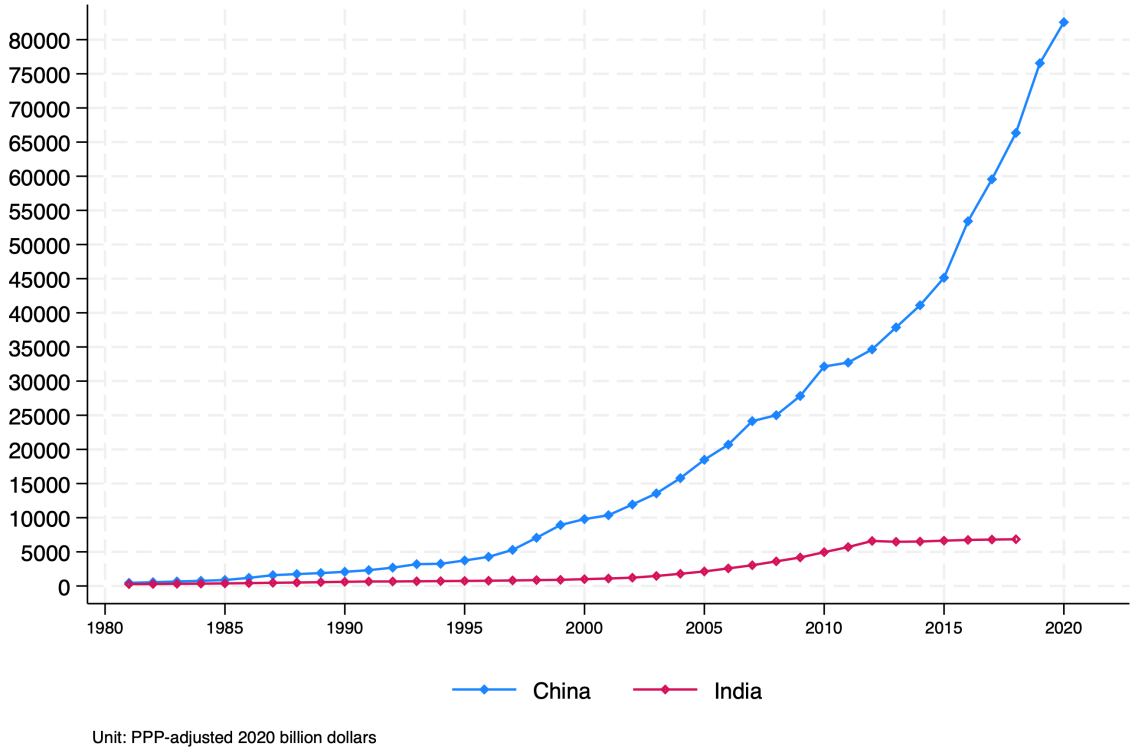


Figure 34: China-India Comparison: Housing Wealth & Urban Land Values (billion dollars)



Notes: Indian data come from Kumar (2022). The unit is in PPP-adjusted 2020 billion dollars.

6.5.1 Corporations (1911-1949)

For the republican period, we start with very detailed corporation wealth estimation for the year of 1933, and then we extend both backward and forward with varying embedded assumptions. Firstly, total corporations could be divided into non-financial corporations and financial corporations. Given the intricacies of estimation involved for each sub-sector, here we report the estimation details for modern-industry non-financial enterprises and financial corporations only. For estimation on, for instance, service enterprises mining enterprises please refer to the online appendix.

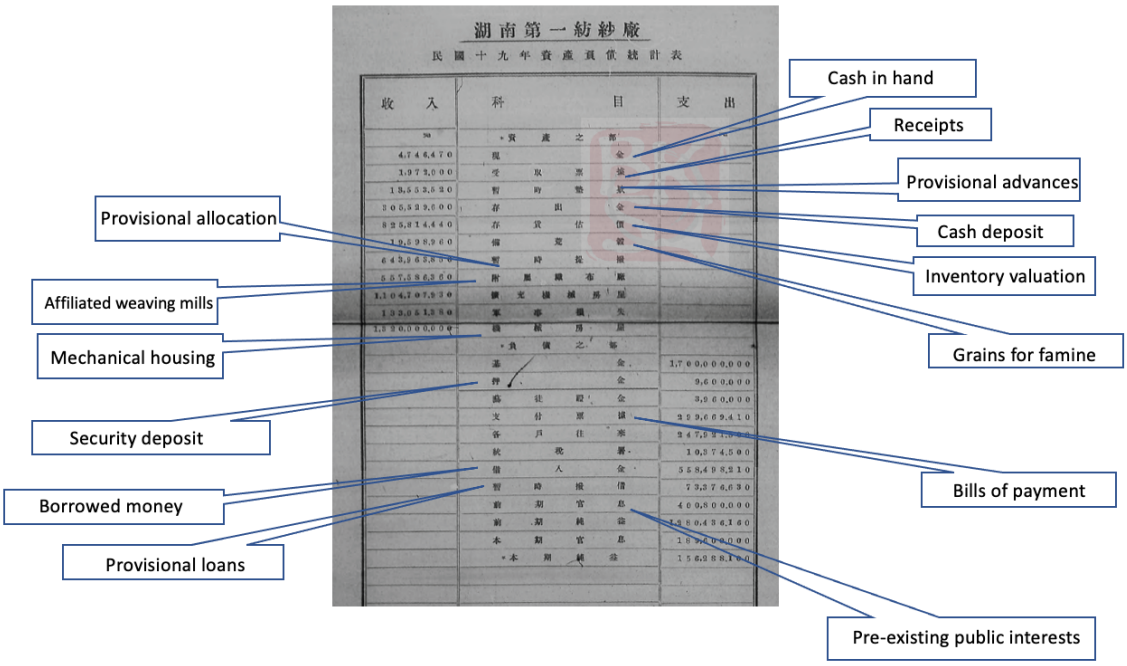
Non-financial Corporations For non-financial corporations, estimation is further done separately for modern-industry enterprises, mining enterprises, transportation % telecommunications enterprises, commercial enterprises and service enterprises.

Modern Industry Enterprises For modern industry (现代工业) firms, we estimate the corporate asset values at the industrial sub-sector level (18 sectors in total). In sub-sectors where asset data is detailed or sector-representative modern industrial enterprise asset data is well-established, the ratio of industry assets to output is directly calculated based on the micro balance sheet of of representative enterprises, such as the one reported in Figure 35. This ratio is then used as the basis to estimate the overall sub-sector's total assets. In situations where asset data is not abundant or there is significant internal variation within industrial enterprises, the estimation process relies on the capital consumption ratio from B. Wu (1946) and the asset depreciation rate statistics from T.-c. Liu and Yeh (1965), in order to back-out the capital-to-output ratios for these sub-sectors: $GrossAssets_{it} = IndustrialOutput_{it} \times \hat{CapitalOutputRatio}_{it}$. This estimation technique is not limited to modern-industry firms only, we also apply similar methodologies for mining companies, handicrafts industry companies, etc (see online appendix for further details).

A summary of gross corporate assets by modern industry sub-sectors could be found in table 10, where we could observe that first of all, the industrial assets in mainland China are approximately 3.6 times that of the Northeast region (Manchuria). Secondly, the two industrial sub-sectors that enjoy the largest asset shares at the time were public utility companies (35.5%) and textile companies (26%), with the latter being the single

largest sub-sector for private enterprises (C. Liu, 2020).

Figure 35: Example of a Company Balance Sheet Table in Republican China



Notes: This factory was named the Hunan No.1 Spinning Mill Factory in the textile industry, Year 19, Republic of China.

Financial Corporations According to the standards set by the China Financial Yearbook (1939), China's financial institutions before the Sino-Japanese War can be classfied into six main categories: banking, trust, insurance, money-related business, and other financial businesses (including savings associations, postal savings and remittance bureaus, silver companies, etc). In this paper, based on different financial functions, they are simplistically divided into two categories: banking financial institutions and non-banking financial institutions. The former includes all financial institutions primarily engaged in lending, deposits, and exchange operations, such as modern banks, traditional money shops, savings associations, postal savings and remittance bureaus, and pawnshops. The latter encompasses all other financial institutions (trust companies, insurance companies, etc). Among them, the banking industry is the core

Table 10: Gross Aggregate Assets of Modern Industries (1933)

Modern Industry	China Proper	Manchuria	Total	Share
Public Utility	823.78	372.69	1196.48	**35.47%**
Wood and Wood Products	5.21	5.42	10.63	0.32%
Metal and Metal Products	65.51	30.49	96.00	2.85%
Machinery Manufacturing	36.46	7.54	43.99	1.30%
Small Electrical Manufacturing	9.37	0.04	9.42	0.28%
Transport Equipment Manufacturing	7.38	8.18	15.56	0.46%
Shipbuilding and Repair	139.94	25.11	165.05	4.89%
Stone, Clay and Glass Products	37.63	9.80	47.44	1.41%
Total Non-edible Oil	30.52	19.26	49.79	1.48%
Coking	2.51	7.01	9.52	0.28%
Charcoal	0.55	0.07	0.63	0.02%
Chemical Products	29.77	2.38	32.16	0.95%
Other Chemical Products	14.15	4.76	18.91	0.56%
Textile	805.43	70.00	875.43	**25.95%**
Apparel Manufacturing	46.78	1.46	48.24	1.43%
Leather and Rubber	73.76	1.32	75.07	2.23%
Tobacco and Liquor	157.10	21.14	178.23	5.28%
Paper and Printing	109.79	6.60	116.39	3.45%
Food Industry	159.55	58.34	217.89	6.46%
Miscellaneous	11.07	1.42	12.49	0.37%
Military	73.60	80.00	153.60	4.55%
Total	2639.88	733.04	**3372.92**	100.00%

Notes: The unit is in 1933 million yuans. Gross asset figures here include both fixed assets (factory housing, machinery) and non-fixed assets (inventory, working capital, etc).

of the entire financial system and the primary focus of our estimation of financial institution balance sheet for the Republican era. Here we also detail the estimation method for banking institutions only (in particular Chinese-funded banks and foreign-funded banks). More information related to data sources on non-banking financial institutions could be found in the online appendix.

In the 1930s, China's banking financial institutions could be classified into three categories based on ownership structure and operational methods: First, there were Chinese-funded banks (Huazi Banks，华资银行), typically owned by Chinese citizens and employing modern operational approaches; Second, foreign-funded banks (外资银行), owned by foreign residents and also adopting modern operational methods. This category encompassed all foreign banks operating in China (excluding the Hong Kong region) and included the pseudo-Manchurian Central Bank. The third category consisted of traditional Chinese banks, primarily comprising old-style money shops and pawnshops.

Chinese-funded Banks First of all, Huazi banks' balance sheets are taken from National Banking Yearbooks for the years stretching from 1921 to 1936. The balance sheet from the banking yearbooks document quite exhaustively the assets and liabilities decomposition of Chinese-funded banks. For instance, in terms of assets, we have categories such as cash on hand, loans, securities, reserves for issuing coupons, real-estate assets, etc, namely we have the exhaustive list of both financial assets and non-financial assets for these Huazi banks.

Overall, Huazi banks experienced a golden period of development in the 1920s and early 1930s. On one hand, their registered capital and total assets continued to expand. According to estimates made in this paper, by 1933, the total assets of Huazi banks reached 3.69 billion yuan, accounting for 53.4% of the entire financial industry. In contrast, all foreign-funded banks (including the Manchukuo Central Bank) only accounted for 23.8% of the total. The former was more than twice the latter. On the other hand, the industry concentration also increased steadily. According to the statistics from the "National Banking Yearbook of the 26th Year of the Republic of China" (1937): "the nine largest Huazi banks, including Bank of China, China Construction

Bank, 'Southern Three Banks,' and 'Northern Four Banks,' absorbed 58% of the national deposits and issued 62% of the loans in 1935."[46]

Foreign-funded Banks Foreign banks entered China after the Opium War and have since been a very important financial force in modern Chinese economy. From the late 1920s, the development of foreign banks in China slowed down. Between 1927 and 1936, only the United States, Japan, and the United Kingdom established a small number of banks, while many banks from various countries either closed down or withdrew from China.[47]

There are already a lot of previous scholarly attempts to map out the total aggregates of foreign bank assets in Republican China. However, based on our own judgments, there's either significant under- or over-estimation of foreign bank presence. In this paper, we manually collected and organized the operational status and balance sheets of 31 foreign-funded banks in China nationwide, and we re-estimate the shares of these foreign banks' total businesses which in actuality operated in China by country of origin. After extensive verification, we believe that the assumptions made in the "Economic Statistical Abstract" (1935) are the most reasonable. It suggests that Japan had approximately 10%, the United States had about 2%, and the United Kingdom had about 33.3% of banking business assets in China.

The final estimate indicates that the total capital of foreign banks in China in 1933 was approximately 2.199 billion yuan (this Figure is largely consistent with C. Wu (1955)'s estimate). Among these, the United Kingdom had 951 million yuan, Japan had 537 million yuan, France had 185 million yuan, the United States had 118 million yuan, and the Netherlands had 111 million yuan, ranking in the top five. The United Kingdom and Japan together accounted for 67% of the total.

[46]"North Four Banks" refers to the financial consortium in the northern region, comprising the four banks of Yanyie, Jincheng, Daliu, and Zhongnan. On the other hand, "South Three Banks" denotes the financial consortium in the southern region, which includes the three banks of Zhejiang Xingye, Zhejiang Shiye, and Shanghai Commercial Savings.

[47]This is not to say that foreign banks ceased to be an important component of the financial landscape in China at the time, but rather relatively weakened also with the rise of Chinese-funded banks.

6.5.2 Corporations (1949-1978; 1979-1992)

Non-Financial Corporations We estimate the total assets and liabilities of non-financial corporations during this period of time as the following.

Given that during the pre-reform era of PRC, in particular after 1957, the overwhelming majority of corporate assets in China were publicly-owned, we take the corporation sector categories along which the assets of State-Owned Enterprises (SOE) were reported in Chinese Statistical Yearbooks as the benchmark for corporate asset estimation. Specifically, state-owned corporations were divided into six main sub-sectors, namely industry corporations (modern industry and handicrafts industry), commercial corporations, transport, storage and post corporations, construction corporations, agriculture corporations and urban utility corporations. Below we will present the general estimation methodology employed for estimating total corporate assets for each corporate sub-sector, as well as the detailed strategy we adopted for modern-industry firms in particular. Estimation specificities for other corporate sub-sectors could be found in the online appendix.

In contrast to the Perpetual Inventory Method (PIM) which has been the norm in the literature, we adopt the stock estimation methodology for the corporate sector during this period of time. Specifically, we estimate the total **Gross Assets of Non-financial Corporations** with the following equation by each of the corporate sub-sectors:

$$\begin{aligned} \boldsymbol{NonFinancialCorp\_Assets_t} = NetFixedAssets_t + TotalWorkingCapital_t \\ + NonFinancialCorp\_Deposits_t \end{aligned} \tag{6}$$

The main data sources used here include but not limited to the following: Chinese Statistical Yearbooks (1980-1989), Selected Compendium of Chinese Economic Archives (1952-1960), Chinese Industry Economic Statistics Compendium (1949-1984) and Chinese Industry Statistical Yearbooks (1985-1994), from which we extract tables that contain asset stock figures for both net fixed assets and total working capital for the aforementioned six types of state-owned enterprises. Below are the definitions for some key variables used for estimation of non-financial corporate asset values.

The term **Net Value of Fixed Assets**, serving as a component of the total assets of non-financial corporations in equation 6 refers to the value of fixed assets after deducting accumulated depreciation from the **Gross Value of Fixed Assets**, which denotes the original value of all fixed assets owned by industrial enterprises.[48] It is calculated based on the actual payments made during the purchase and construction of various fixed assets. The sources of fixed assets include the pre-existing fixed assets acquired after liberation, fixed assets completed and delivered for use through basic construction, and fixed assets increased through renewal and renovation measures.

In addition, the term **Total Working Capital**[49] could be further divided into fixed-amount working capital and non-fixed-amount working capital:

$$\boldsymbol{TotalWorkingCapital_t} = FixedAmount\_WorkingCapital_t + NonFixedAmount\_WorkingCapital_t$$

Both fixed-amount and non-fixed-amount working capitals could be defined as the following:

1. **Fixed-Amount Working Capital**

   It includes three parts: **reserve funds**, **production funds**, and **finished product funds**. Since industrial enterprises implement quota management for these three types of funds, it is referred to as fixed-amount working capital.

   Reserve Funds (储备资金): It refers to the working capital in a state of production preparation.

   Production Funds （生产资金）: It refers to the working capital involved in the actual production process.

   Finished Product Funds （成品资金）: It is the working capital invested in

[48] For some years and some corporate sub-sectors, the net-value fixed assets series are not available, as such we use the gross-value fixed assets series instead, and interpolate depreciation rates from other adjacent years to back out the net-value fixed assets series. For more details please refer to the online appendix.

[49] The term working capital is also labelled as "circulating fund" by Chow (1993).

products that await sales within the company.

2. **Non-Fixed-Amount Working Capital**

   Non-fixed-amount working capital refers to the portion of the enterprise's liquid assets that is uncertain in terms of its fixed or predetermined amount. Examples include cash, other monetary funds, accounts receivable, trade receivables, other receivables, short-term investments, etc., in industrial enterprises.

Ultimately, **Bank Deposits of Non-financial Corporations** were taken from the Financial Institution Credit and Balance Sheet (1952-1990) produced by the People's Bank of China. However, it should be noted here that we cannot decompose the deposits by different corporate industries, in the sense that we do not have detailed information on the specific deposit values for commercial enterprises and industrial enterprises separately. As such, for the industry-specific corporation asset estimation, we omit the deposit term across all scenarios.

In addition, given the special corporate structure during Maoist China, it's important to mention that working capital (both fixed and non-fixed) was completely supplied by the Ministry of Finance and the Central Bank (People's Bank of China) during the collective years. As such, by composition, it could also be written as the following:

$$\boldsymbol{TotalWorkingCapital_t} = Loans\_FinInstitutions_t + Allocation\_MinistryofFinance_t$$

Throughout the period of 1957-1978, the share of working capital supplied by the Ministry of Finance versus the share supplied by People's Bank of China experienced very large fluctuations. We trace out the entire history of these policy changes with historical documents specifying the working capital regulations for every single year, and with data on industry-specific loans supplied by the People's Bank of China from the Financial Institutions' Balance Sheet, we calculate the remainder as the amounts of working capital allocated by the Ministry of Finance to SOEs on an annual basis.

This decomposition exercise is necessary because we believe that only a fraction of

the working capital would be considered actual liabilities of the firms at the time, basically the component that was effectively loans to them with interest rates attached by the Central Bank, while the amounts allocated by the Ministry of Finance are simply earmarked fiscal allocations for firms which were never paid back.

As such liabilities of non-financial corporations could be written as follows:

$$\boldsymbol{NonFinancialCorp\_Liabilities_t} = Loans\_FinInstitutions_t$$

Furthermore, the net worth of non-financial corporations is expressed as the following:

$$\boldsymbol{NonFinancialCorp\_NetWorth_t} = NetFixedAssets_t + NonFinancialCorp\_Deposits_t + TotalWorkingCapital_t - Loans\_FinInstitutions_t$$

Modern Industry Enterprises For all the corporation categories, modern industry enterprises are the ones with the most complete and ample data sources. This is not a coincidence as during the early years of P.R.C., the government adopted a very heavy-industry-tilted development policy. In our estimated series, we also find out that modern-industry enterprises' total assets consistently occupied around 60 to 70% of total corporate wealth during preform China.

In particular, we estimate industrial-enterprise corporate assets separately for state-owned industrial enterprises and industrial collectives (in both urban and rural areas). To begin with, for state-owned industrial enterprises, the most sufficient data points we have over time are figures related to the independent accounting state-owned enterprises taken from the Chinese Industry Economic Statistics Compendium (1949-1984) and the subsequent Chinese Industry Statistical Yearbooks (1985-1994).[50]

[50]Independent accounting industrial enterprises should meet the following conditions simultaneously: 1. Legally established with their own name, organizational structure, and premises, capable of assuming civil liabilities; 2. Independently own and use assets, assume liabilities, and have the right to enter into contracts with other entities; 3. Independently account for profits and losses and can prepare balance sheets.

Overall, after having cross-checked with many different sources, we are able to confirm that the share of non-independent accounting industrial enterprises never surpassed more than 5% of total industrial enterprise assets. As such, we make the adjustments to include these non-independent accounting industrial firms in our final step of asset estimation.

In terms of working capital, given that most of the time we only observe the fixed-amount working capital values (for every year from 1952 till 1990), we try to estimate the non-fixed-amount component, first of all, by utilizing data from the Selected Compendium of Chinese Economic Archives (1952-1960), which contains information on total working capital for independent accounting industry enterprises from 1952 till 1960. And then, we take the ratio between fixed-amount and non-fixed-amount working capital to interpolate for the years after 1960.

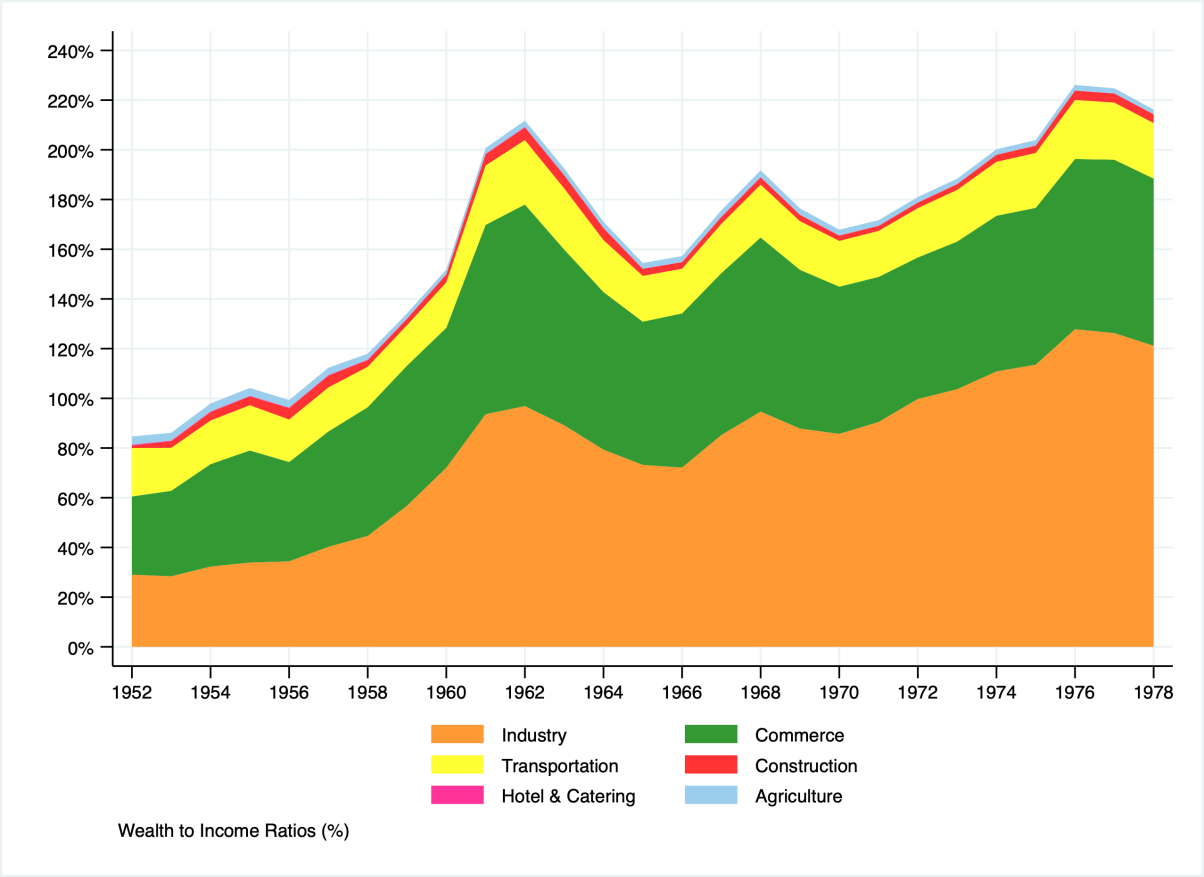
Total gross corporate assets by sub-sectors are reported in Figure 36. During Maoist China, total gross corporate assets were mostly composed of industrial enterprises and commercial firms, with the remainder occupied by transportation companies and others.

Financial Corporations During this period of time, the overwhelming majority of financial institutions were nationalized in China. At the same time, the role of economic leverage was also negated, and macroeconomic management of finance and the economy relied entirely on directive planning.

State-owned and collective economies were not allowed to raise funds through stocks and bonds. The flow of funds was entirely controlled through a centrally planned channel. With the completion of socialist transformation, private economy had virtually disappeared by 1958, and individual economic activities were limited to a very small scope, only enough to sustain one's own livelihood. Therefore, the securities system and securities market lost their foundation for existence.

In particular, there were only two kinds of financial institutions existent in China at the time, namely the People's Bank of China (which acted as the de-facto central bank), as well as the rural credit cooperatives. We recover the balance sheets of these two

Figure 36: Gross Corproate Asset Composition by Sub-sectors (1952-1978)



Notes: Gross corporate assets refer to the sum of total working capital and net-value fixed assets. Corporate liabilities (loans) and corporate bank deposits are not taken into account.

financial institutions by synthesizing data from three main sources to construct the complete financial corporation balance sheet from 1952 to 1978.

The first data source is called "奋进的四十年" (Forty Years of Endeavors), which is a national statistical compendium on aggregate economic statistics covering the People's Republic of China from 1949 till 1989. Specifically, we extract information from the National Bank and Rural Credit Cooperatives' Asset Statement Tables in this compendium, which contain detailed records on the sources and usage of national financial institutions' assets.

Given that there were only two kinds of financial institutions in China during this period of time (the People's Bank of China, which officially acted as the Central Bank of the country at the time, and rural credit cooperatives that were scattered across the rural areas), we think these tables more or less capture the entirety of major and visible institution-based financial activities in pre-reform China (1949-1978).

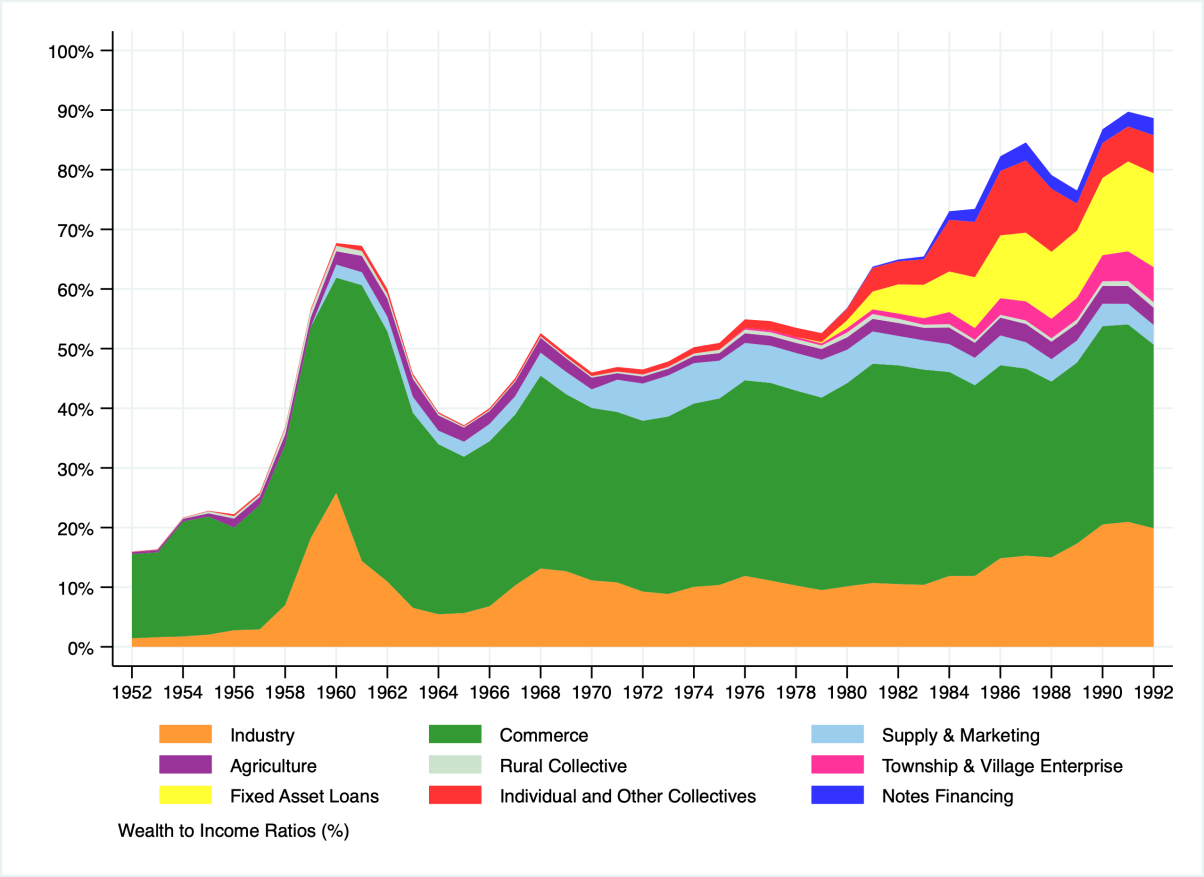
We also complement these data sources with financial institutions' balance sheet information found in Financial Yearbooks and other Chinese Statistical Yearbooks, specifically for years from 1989 onwards.

The aforementioned primary data source is complemented by two additional data sources, with one of them called Financial Institution Renminbi Credit Balance Sheet (1952-2013), published by the People's Bank of China, and the other Monetary and Financial Statistics in the People's Republic of China compiled by the Asian Historical Statistics (AHS) team at Hitotsubashi University.[51]

Based on all these sources harmonizing all financial institutions' balance sheets between 1952 and 1992, one interesting statistic we could produce is the total amounts of bank loans administered to different kinds of enterprises over time. In Figure 37, it's very striking to observe that a very large share of bank loans in pre-reform China were administered to commercial firms (商业企业), with industry-firm loan of much smaller scale. Addition, supply and marketing （供销） firms are essentially a type of commerce companies, as such the total share becomes even larger if we sum up these

[51] Their primary sources are also balance sheets from the People's Bank of China, but with more detailed decomposition of the source and usage of the funds.

Figure 37: Corporate Bank Loan Classifications (1952-1992)



Notes: This Figure assembles corporate loans at banking financial institutions of all levels.

two categories.

6.5.3 Corporations (1993-2020)

The series of corporate wealth from 1993 onwards is mostly an extension of the previous series constructed by Piketty et al. (2019) on the period 1993-2015, to further include the post-2015 years. More details on this could be found in the online appendix. Specifically, we rely on the various waves of Chinese national economic censuses (1996, 2001, 2004, 2008, 2013, 2018), and annual statistical yearbooks for each corporate sub-sector (industry, wholesale & retailing, real-estate, etc) for asset estimation.

The net corporate wealth to national income ratio from 1933 to 2020 can be observed in Figure 38, where the very large decrease in net corporate wealth to national income ratio from the late 1970s onwards could be rationalized with the sky-rocketing increase in corporate asset-to-liability ratios during the same period of time as reported in Figure 39.[52]

6.6 History of Nationalization and Privatization in Contemporary China (1911-2020)

In this sub-section, we talk about the history of nationalization and privatization throughout the history of contemporary China.

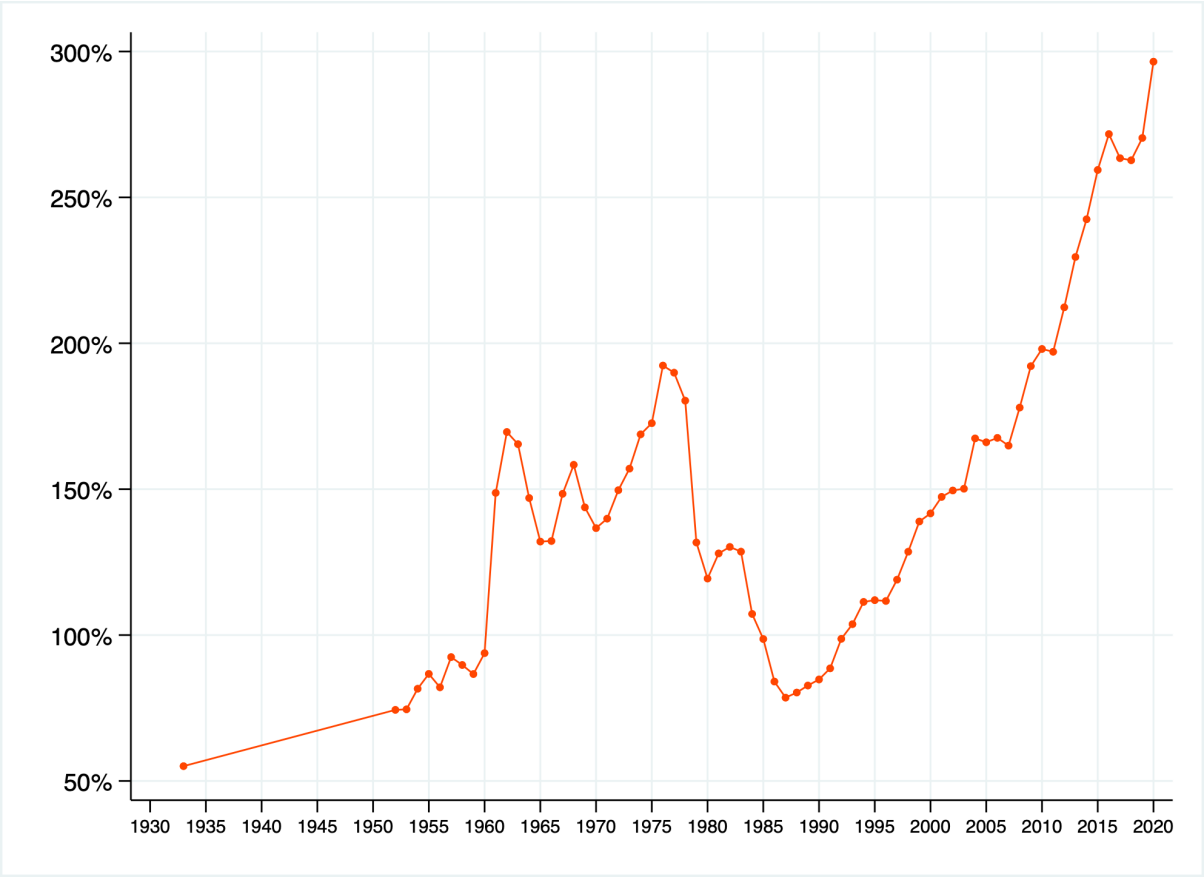
6.6.1 Land

During the Republic of China, land was predominantly privately owned, there was very few government-owned land (standing at around 1% of total farmland maximally speaking) as was depicted in a national survey conducted by the government between 1929 and 1933 in table 11.[53]

[52] It's important to note here that Piketty et al. (2019) didn't take into account this increasing corporate debt structure in the 1980s, as such we also modified their series, and this is also why our corporate wealth series for the 1980s differs significantly from theirs in the end.

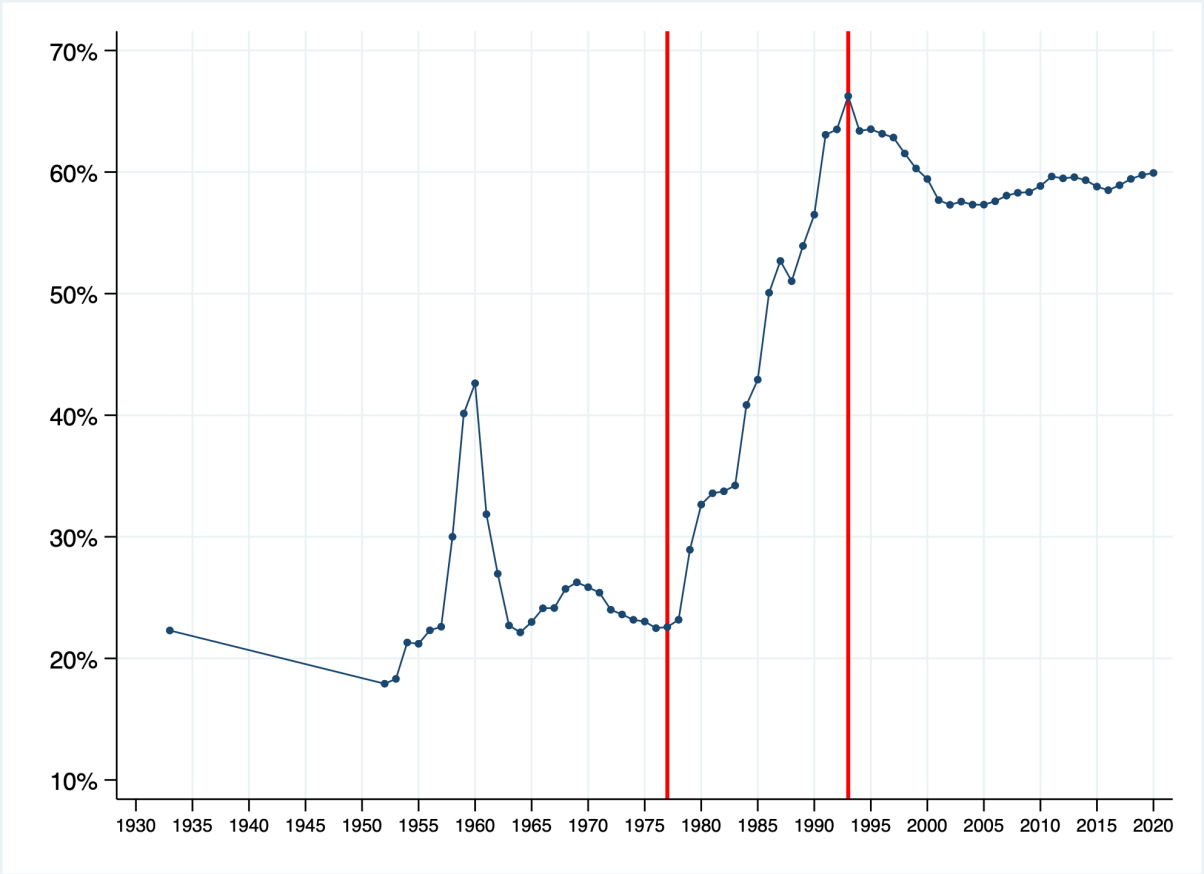
[53] Indeed there was a simplification for the moment: family-owned lands and clan-owned lands (or other local community-owned lands) are all allocated to the household sector for the moment. This represents around 15% to 20% of total farmlands in Republican China (1930s).

Figure 38: Net Corporate Wealth to National Income Ratio (1933-2020)



Notes: It refers to net book-value corporate wealth: the sum of corporate financial assets and non-financial assets, minus non-equity corporate liabilities.

Figure 39: Liability to Asset Ratio of All Corporations (1933-2020)



Notes: It refers to ratio between non-equity corporate liabilities and gross corporate assets (non-financial and financial).

Table 11: Land Ownership Distribution Survey in the Republic of China in 20 Provinces and 111 Counties (1929-1933)

Crop Cultivation Zone	No. Counties	Total	Private	Public	Academic	Temple	Clan	Military	Gentry
Wheat Zone	53	100.0%	93.5%	0.9%	0.7%	2.2%	2.1%	0.1%	0.5%
Spring Wheat Zone	4	100.0%	82.4%	0.0%	0.3%	0.9%	0.0%	11.0%	0.0%
Winter Wheat and Millet Zone	19	100.0%	90.7%	0.9%	1.1%	5.3%	0.0%	2.0%	0.0%
Winter Wheat and Sorghum Zone	30	100.0%	96.8%	1.0%	0.4%	0.3%	0.0%	1.0%	0.2%
Rice Zone	58	100.0%	3.2%	1.1%	0.8%	1.5%	0.8%	2.4%	0.0%
Yangtze River Rice and Wheat Zone	17	100.0%	93.1%	1.2%	1.2%	0.7%	0.0%	3.8%	0.0%
Rice and Tea Zone	18	100.0%	96.0%	1.8%	0.5%	0.5%	0.0%	1.2%	0.0%
Sichuan Rice Zone	17	100.0%	88.5%	0.5%	0.8%	3.7%	2.7%	3.2%	0.2%
Rice Double Harvest Zone	4	100.0%	99.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Southwest Rice Zone	2	100.0%	97.0%	0.8%	0.8%	14.0%	0.0%	0.0%	0.0%

Notes: Data Source: Statistics Bureau of the National Government General Accounting Office. Year 30 of the Republic of China, Page 59. Gentry land here refers to gentry-sponsored clan-based land. Public land refers to the lands directly owned by the government (either local or central).

In the early years of PRC, after the land reform (1947-1952), the overwhelming majority of lands were privately owned. Rural collectivization started around 1953, with the onset of the socialist transformation of all major sectors of the economy. Peasants were first organized into **Mutual Aid Teams**: resources were pooled together for farming purposes, but ownership remained 100% private. Afterwards, beginner-level **Agricultural Production Cooperatives (APC)** were introduced. The ownership structure can be best described as half-private and half-public, where all farming tools and machinery were collectivized, lands were also semi-collectivised, but in a collective shareholder fashion (where each farming household took benefits from the lands based on their relative contributing shares). Later on, the rather abrupt and forced transition towards higher-level APCs occurred from 1956 onward, and eventually with the establishment of **People's Communes** in 1958, almost all lands were collectivized by the end of 1958 (100% public). Accordingly, we take the shares of rural households administered into the agricultural production cooperatives as a proxy of the share of farmlands collectivized during this period of time.[54] Accordingly, 99.1% of farmland became public by the end of 1958.

Table 12: Rural Collectivization in China (1949-1958)

Year	Mutual Aid Teams	Beginner APC	Higher-level APC	People's Commune
1950	10.7%			
1951	19.2%			
1952	39.9%	0.1%		
1953	39.3%	0.2%		
1954	58.3%	1.9%		
1955	50.7%	14.2%		
1956	0.9%	28.7%	63.2%	
1957		3%	93%	
1958				99.1%

Notes: APC refers to Agricultural Production Cooperatives. The percentages indicate the share of rural households which were incorporated into a particular kind of cooperative unit. Data come from Chinese Socialist Transformation Compendium (1953-1957).

For the post-1978 period, currently we take the simplified approach by invoking the government-household farmland share split from Piketty et al. (2019), namely "the share of farmland owned by the household sector is set equal to 30% in 1978 and increases over time to reach 60% in 2015", indicating gradually increasing de-factor

[54]For beginner APCs, we divide farmland to be 50% private and 50% public. While for higher-level APCs, farmland is 100% public.

usage rights rendered to the household sector on lands by the government.

6.6.2 Housing

During the Republican era, we specifically estimate housing assets directly owned by the government (not indirectly owned via the ownership in enterprises). For more details please refer to the online appendix.

In terms of collectivization for housing, in rural areas, during the period of agricultural collectivization (1953-1957), farmland, livestock, and agricultural tools became gradually collectively owned in rural areas, but homesteads and residential properties remained the property of the farmer. In 1958, as China entered the period of people's communes, the ownership of homesteads (the land underlying the house) was transferred to collective ownership, and farmers retained only the right to use them.

However, the houses built on these homesteads would "forever belong to the commune members", hence remained private during this period of time. In 1982, the new 1982 Constitution stipulated: "Homesteads, self-cultivated land, and self-cultivated hills also belong to collective ownership." This reinforced the collective ownership of homesteads, establishing a system where the right to use the homesteads belonged to the farmers.

For the moment, we make the simplified assumption that 70% of housing in rural areas belongs to the household sector starting from 1950s onwards. And it was changed into 80% in the year of 1982, and then increase by 10 percentage points in every ten years. Currently 100% of housing in rural areas are privately owned, following the same decomposition methodology as in Piketty et al. (2019).

On the other hand, in urban areas, there was a more gradual process of de-privatization and our series is also more data-based. Around the beginning of the 1950s, it is estimated that the household sector owned around 70% of total urban housing in China (X. Hou et al., 1999). After socialist transformations,the state assumed the responsibility of supplying and overseeing urban housing, resulting in predominantly state or state-run work unit ownership of urban housing. This share decreased to a nadir of around 20% around the end of the 1970s. After reform and open-up, housing privati-

zation occurred at varying paces across different provinces.[55]

6.6.3 Corporations

Figure 40: Industry-Sector Gross Corporate Asset Shares (Manchuria, 1933)

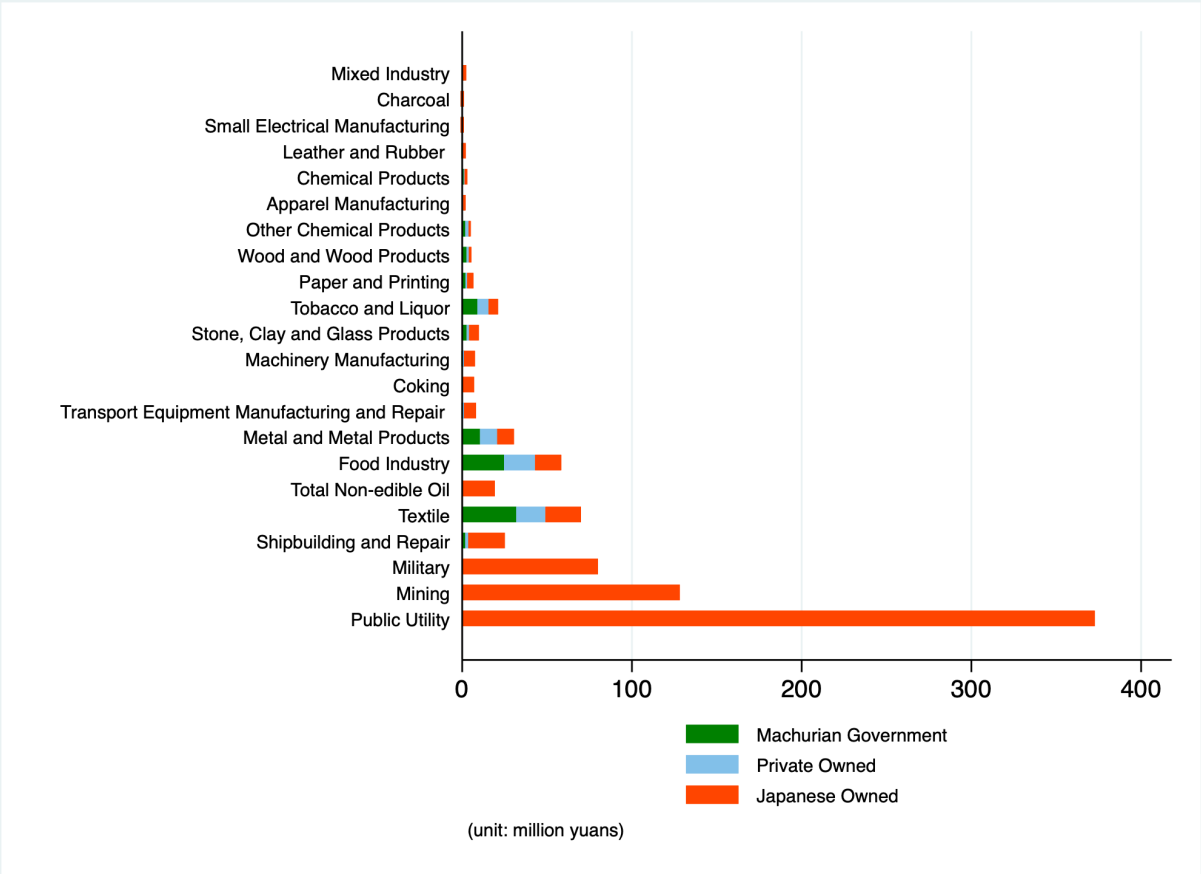


Table 13: Ownership Structure of Major Types of Financial Corporations (1933)

Categories	Paid-in Capital	Provident Fund	Percent
Chinese-owned Banks	260.846332	76.644445	29.98%
Manchukuo Central Bank	15	0.29	1.36%
Foreign-owned Banks	329.85	76.965	36.14%
Money Shops	94.725	0	8.42%
Pawnshops	60	6	5.86%
Savings Banks	13.71	3.42298268	1.52%
Trusts	10.697098	0.82456677	1.02%
Chinese Insurance	25.14721	2.446059	2.45%
Foreign Insurance	135.794934	13.2087186	13.24%
Total	945.770574	179.8017721	100%

Notes: Notes: The unit here is million yuans (1933).

Corporations in Republican China

[55]For further details on housing privatization, please refer to Piketty et al. (2019).

Figure 41: Industry-Sector Gross Corporate Asset Shares (China Proper, 1933)

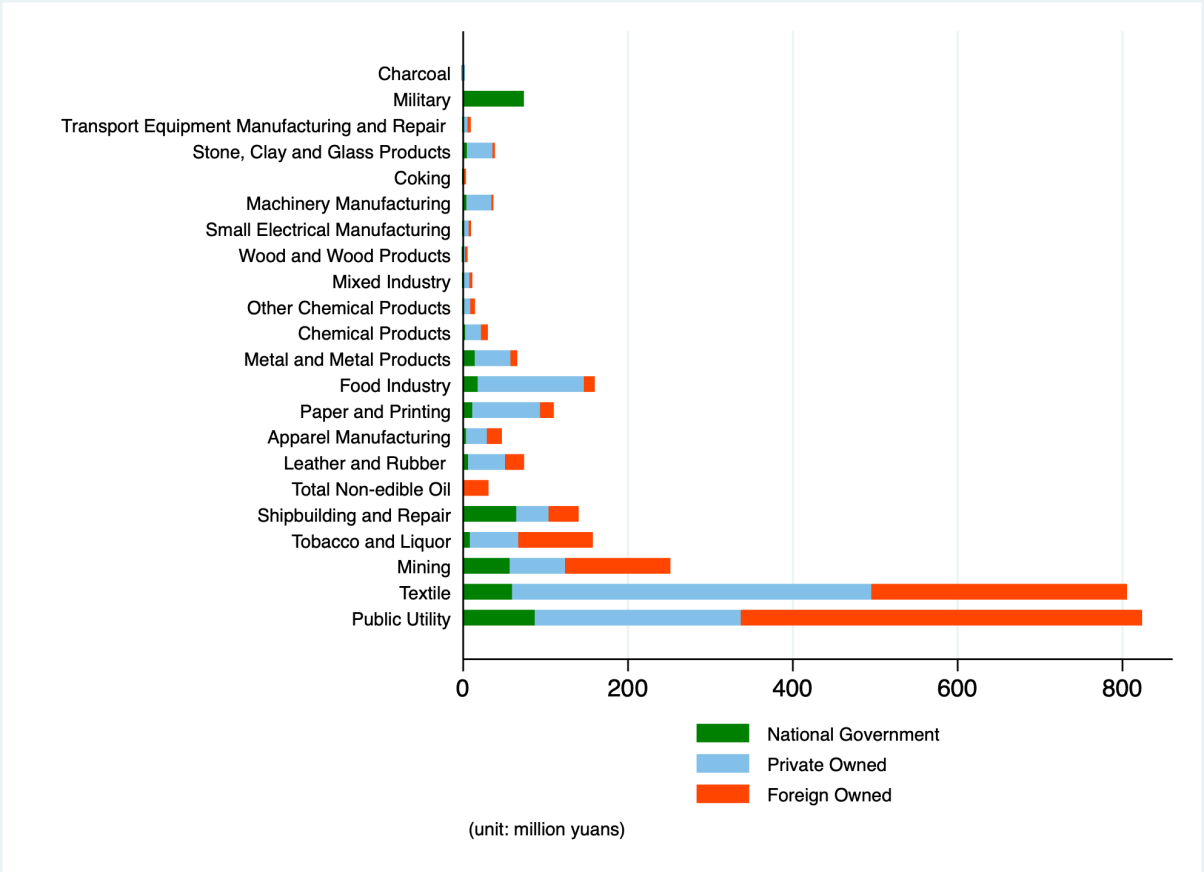


Figure 42: Industry Share in China by Ownership (1933)

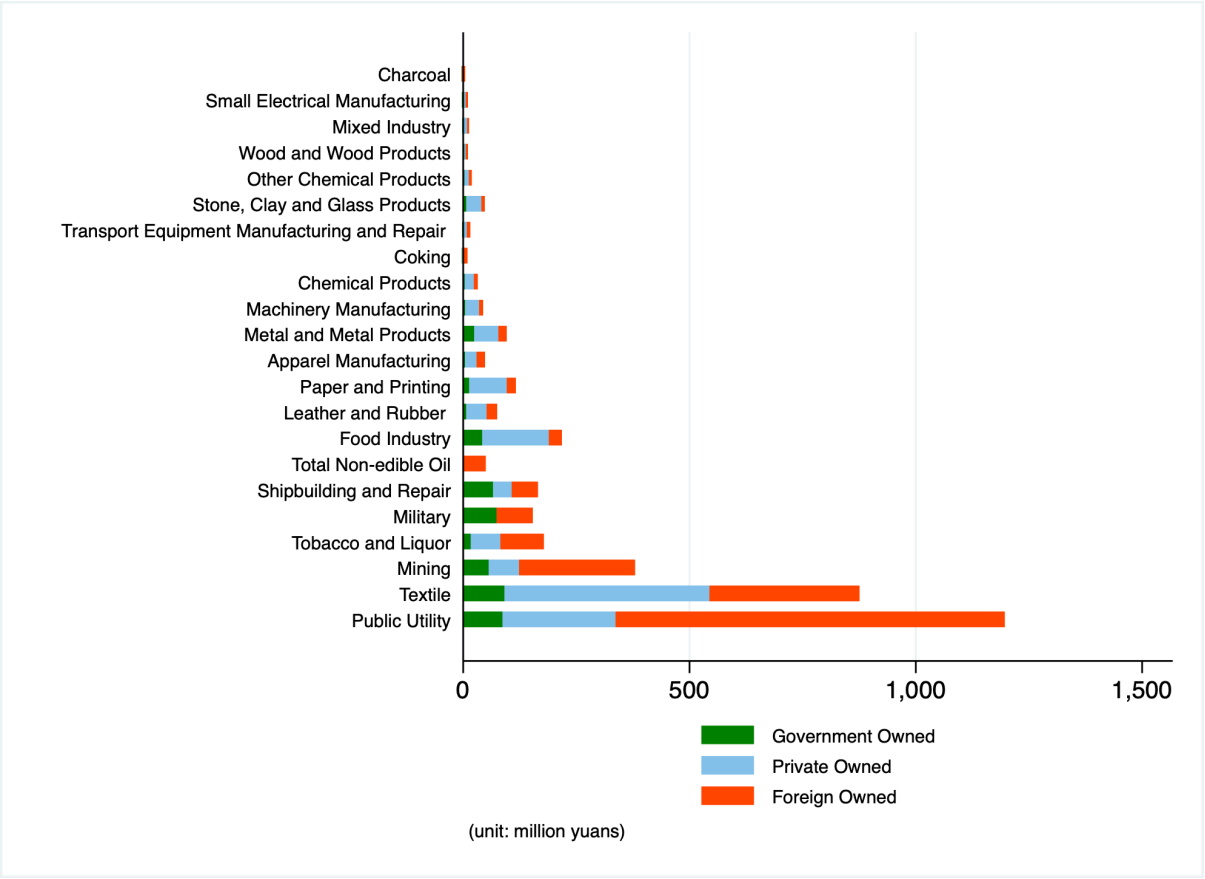
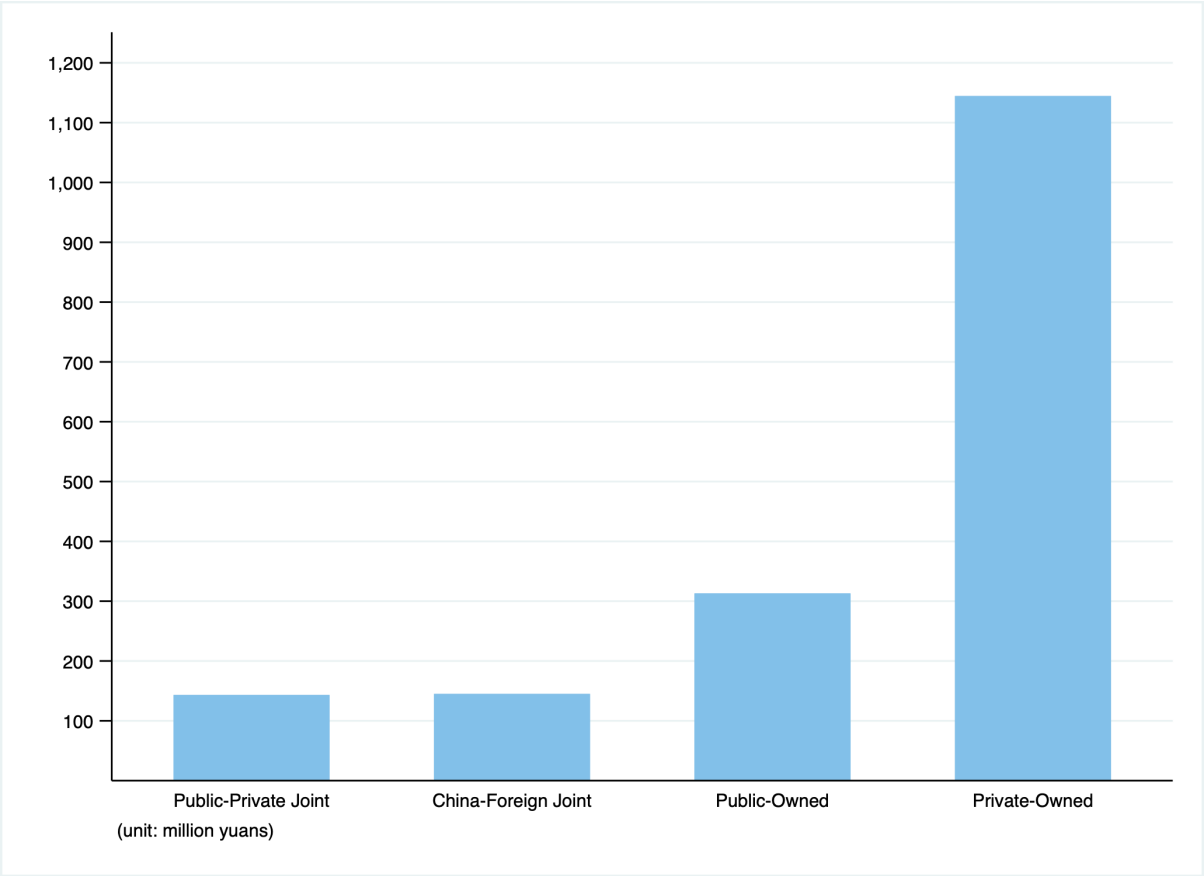
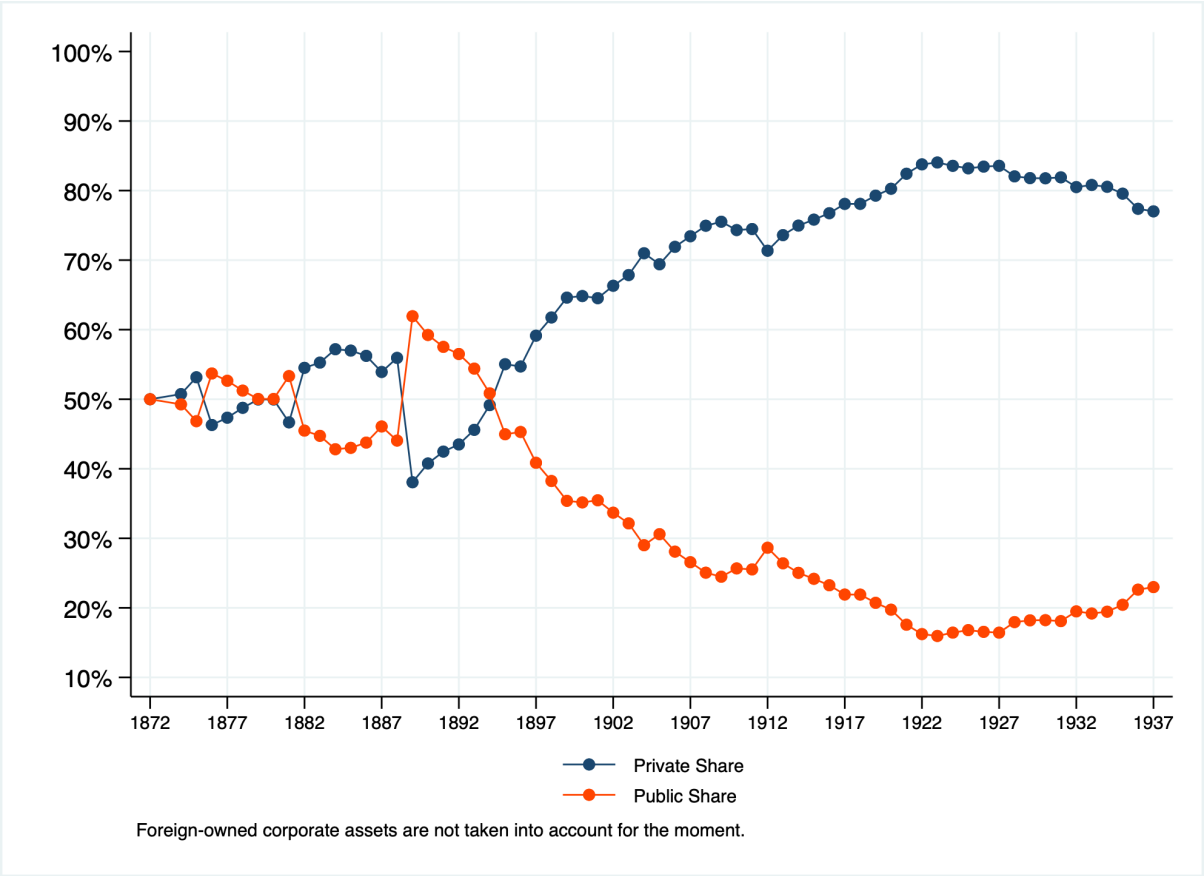


Figure 43: Total Registered Capital by Ownership Structure (1860-1937)



Notes: Data come from Du (1991, 2019). It refers to cumulative totals of registered capital of all newly created domestic modern enterprises between 1860 and 1937. Unit: all figures are deflated to 1933 million yuans.

Figure 44: Nature of Ownership of Corporate Registered Capital (1872-1937)



Notes: Data come from Du (1991, 2019). It refers to the public or private share of cumulative totals of registered capital of all newly created domestic modern enterprises between 1860 and 1937. For public-private joint enterprises, we adopt the 50-50 rule. Unit: all figures are deflated to 1933 million yuans before calculating the share variables.

Table 14: Ownership Structure of All Corporations (1933)

Corporate Sector	Asset Total	Public (%)	Private (%)	Foreign (%)
Modern Industry	33.73	10.67%	38.02%	51.31%
Handicrafts Industry	21.53	0.00%	100.00%	0.00%
Mining	3.80	22.46%	26.70%	50.84%
Transportation	19.31	59.31%	15.40%	25.29%
Commerce	64.99	0.00%	48.75%	51.25%
Service	10.67	38.43%	56.89%	4.69%
Non-Fin Corporations	154.02	14.27%	48.12%	37.61%
Financial Corporations	11.26	5.30%	38.20%	56.50%
All Corporations	**165.28**	**13.66%**	**47.45%**	**38.9%**

Notes: The unit is in 100 million yuans (1933). The table refers to gross corporate assets (not net of liabilities).

Socialist Transformation of Corporations (1953-1957) There were many innovative ways to transform capitalist industry and commerce enterprises into collective entities in China during the socialist transformation era, namely peaceful purchase (some compensation method for the capital owners), turning firms into joint public-private management entities and finally the concept of "Dividing the Fat Among Four Horses" （四马分肥), which is in nature a profit distribution scheme for private capitalist enterprises. It stipulates that the annual profits of private enterprises and mixed public-private enterprises should be distributed in the following four aspects: approximately 30% for national taxes, approximately 10% to 30% for enterprise reserve funds, approximately 5% to 15% for employee welfare bonuses, and approximately 25% for dividends to shareholders, directors, etc.[56]

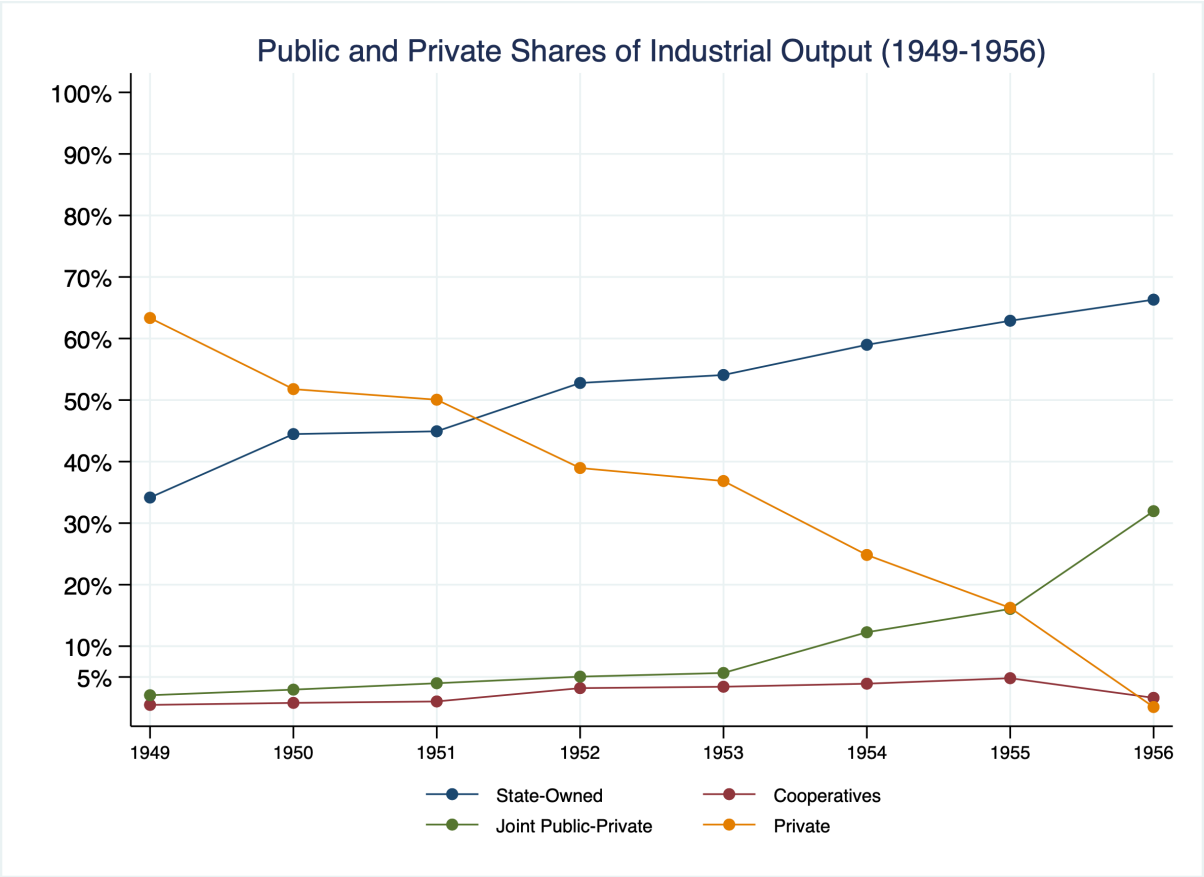
From Figure 45, we could see the socialist transformation of industrial enterprises occurred rather swiftly after the founding of PRC. In 1949, only around 35% of total industrial outputs were from State-Owned Enterprises,[57] while more than 60% of outputs resulted from private industrial enterprises. The private share was gradually decreased to nearly zero by the end of 1956, with a corresponding increase in both

[56]In 1956, after the nationalization of the entire private industry through mixed public-private ownership, the state decided that the original private entrepreneurs would no longer participate in the profit-splitting scheme of their original enterprises. Instead, they would be paid an annual interest by the state based on their shareholding, uniformly set at a five per mille annual interest rate. Originally set to be paid for 7 years, it was later extended by 3 years and ceased in September 1966 with the start of the Cultural Revolution, although the interest payments obtained cannot be reinvested or inherited.

[57]The asset shares of SOEs, however, were larger than the output share, as SOEs were already disproportionately concentrated in heavy industries at the time. We also use these differential capital-output ratio assumptions of different types of firms to back out the public-private corporate asset share evolution during this period of time. For more details on this please refer to the online appendix.

state-owned share and public-private-joint share. At the height of socialist transformation (1955-1956), the majority of private-owned industrial enterprises were transitioned into public-private management entities, in a manner to expedite the socialist transformation momentum as well.

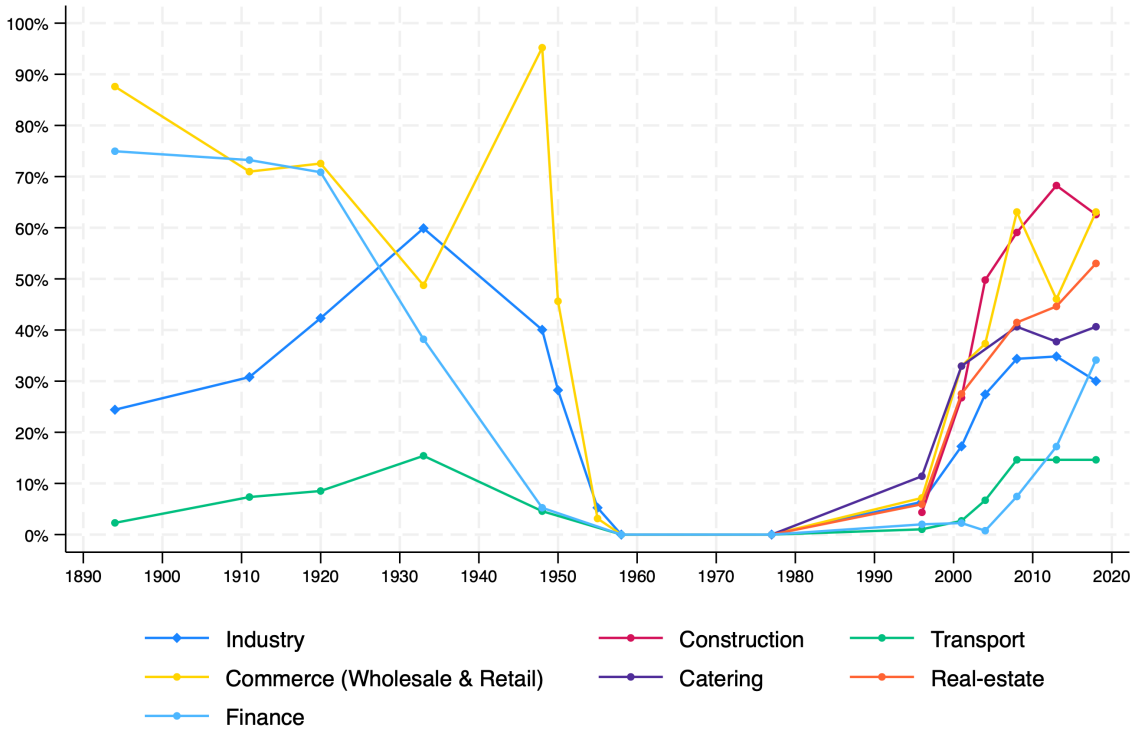
Figure 45: Public and Private Shares of Industrial Output (1949-1956)



Notes: Statistics of the series are calculated based on data taken from Compendiums of Socialist Transformation (1953-1957).

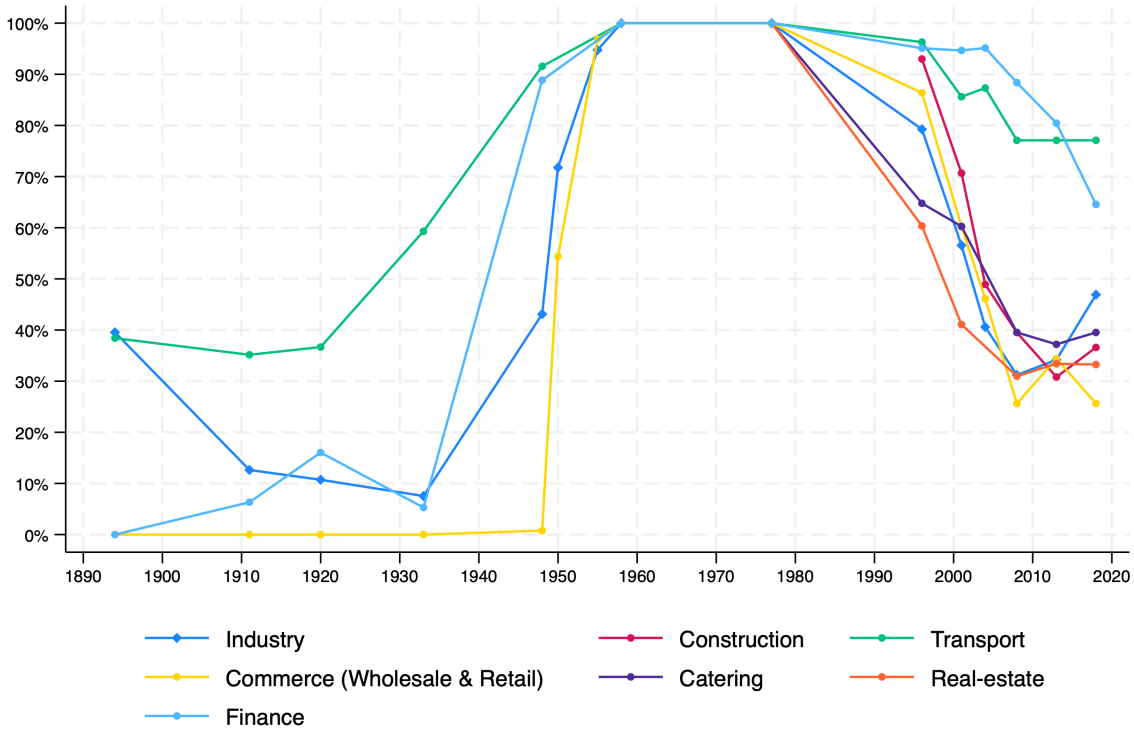
For the exact process of privatization of **State-Owned Enterprises** in the post-reform era (1978-2020), please refer to Piketty et al. (2019).

Figure 46: Private Shares of Corporations by Industries (1894-2018)



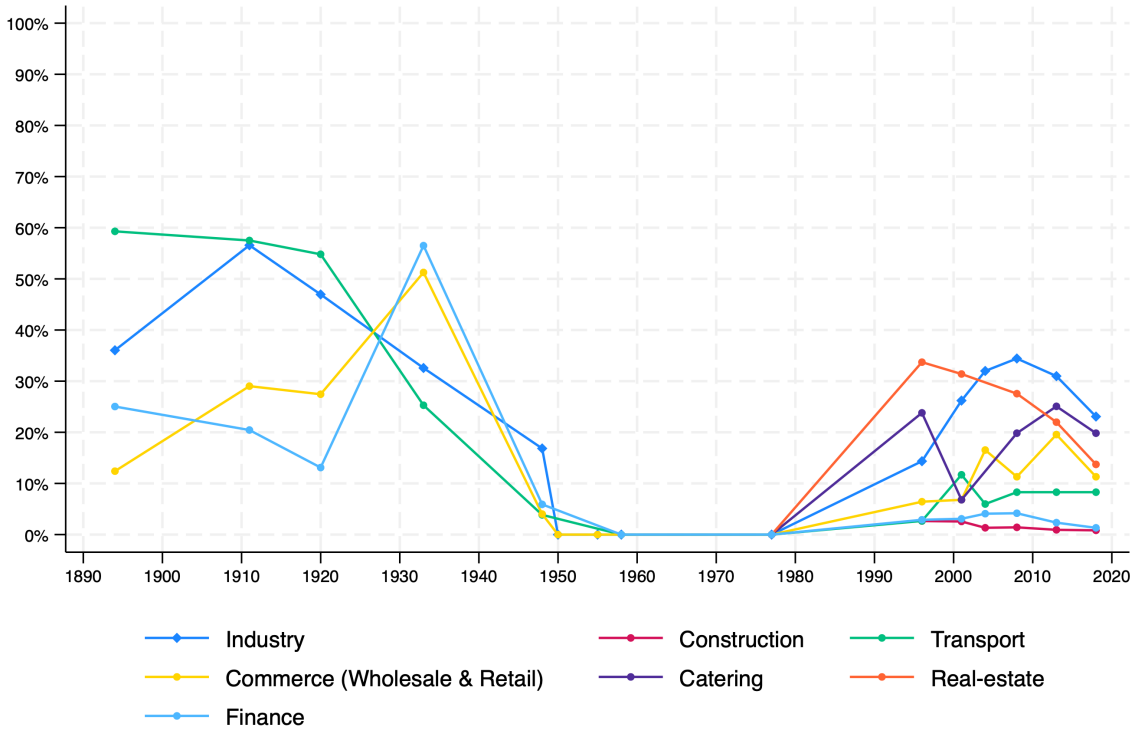
Notes: Data on industry-sector shares for the early years other than 1933 are taken from Xu and Wu (2003). Data for the year 1933 are based on our own calculations. Data points for the 1950s are based on primary data sources from the Compendium of Socialist Transformations (1953-1957), data from the 1990s onwards are calculated based on the capital ownership shares from various rounds of National Economic Censuses.

Figure 47: Public Shares of Corporations by Industries (1894-2018)



Notes: Data on industry-sector shares for the early years other than 1933 are taken from Xu and Wu (2003). Data for the year 1933 are based on our own calculations. Data points for the 1950s are based on primary data sources from the Compendium of Socialist Transformations (1953-1957), data from the 1990s onwards are calculated based on the capital ownership shares from various rounds of National Economic Censuses.

Figure 48: Foreign Shares of Corporations by Industries (1894-2018)



Notes: Data on industry-sector shares for the early years other than 1933 are taken from Xu and Wu (2003). Data for the year 1933 are based on our own calculations. Data points for the 1950s are based on primary data sources from the Compendium of Socialist Transformations (1953-1957), data from the 1990s onwards are calculated based on the capital ownership shares from various rounds of National Economic Censuses.

6.7 Decomposition of Capital Accumulation into Volume Effect and Price Effect

6.7.1 Theoretical Foundation: One-good versus Two-goods Harrow-Domar-Solow Model

Wealth accumulation between period t and period $t+1$ could always be decomposed into a relative price effect and a volume (savings) effect, where the accumulation equation could be written as the following:

$$W_{nt+1} = W_{nt} + S_{nt} + KG_t$$ [58]

Following Piketty and Zucman (2014), if we assume that we are in a one-good wealth accumulation model and there's no relative price effect (where $KG_t = 0$), we re-arrange both sides in terms of wealth-to-income ratios (β_{nt}) and we will arrive at the following equation:

$$\beta_{nt+1} = \frac{\beta_{nt} + s_t}{1 + g_t} \tag{7}$$

where $\beta_{nt} = \frac{W_{nt}}{Y_t}$, $g_t = \frac{Y_{t+1}}{Y_t} - 1$, and $s_t = \frac{S_t}{Y_t}$, which indicates the savings rate in a given economy.

Equation 7 could also be written as the following:

$$\beta_{nt+1} = \frac{1 + g_{wst}}{1 + g_t}\beta_{nt} \tag{8}$$

where g_{wst} is equal to $\frac{S_t}{W_{nt}} = \frac{s_t}{\beta_{nt}}$, which indicates the savings-induced wealth growth rate.

It could be easily seen here that in the long-run steady state with a fixed savings rate $s_t = s$ and $g_t = g$, we will have:

[58] It could be noted here that this essentially corresponds to the additive wealth accumulation equation specified in equation 4.

$$\beta_n = \frac{s}{g} \tag{9}$$

where the steady-sate wealth-to-income ratio β_n is the ratio between the steady-state savings rate and the growth rate of the economy.[59]

Furthermore, in the long-run steady state, the savings-induced wealth growth rate g_{wst} is equal to the growth rate of the national income g.

6.7.2 Multiplicative Decomposition versus Additive Decomposition

In the one-good wealth accumulation model above, the relative price effect is abstracted away (assumed to be equal to zero). In practice, the relative price effect is existent and sometimes can even dominate the savings effect. Under such circumstances, it's important to assess the relative roles played by the price effect and the savings effect in explaining the long-run dynamic of wealth accumulation. In terms of modelling the relative impacts of the two, the relative price effect could either enter the wealth accumulation equation multiplicatively or additively.

In a multiplicative manner, we have the identity from equation 3:

$$W_{nt+1} = (W_{nt} + S_t)(1 + q_t)$$

where q_t indicates the relative price effect (real rate of capital gains). If we divide both sides by W_{nt}, we obtain:

$$\frac{W_{nt+1}}{W_{nt}} = (1 + \frac{S_t}{W_{nt}})(1 + q_t) \tag{10}$$

Replacing $\frac{W_{nt+1}}{W_{nt}}$ by $1 + g_{wt}$, and $\frac{S_t}{W_{nt}}$ by g_{wst}, we have:

$$1 + g_{wt} = (1 + g_{wst})(1 + q_t) \tag{11}$$

[59] For instance, if the saving rate is $s = 10\%$, and if the economy grows at rate $g = 2\%$, then in the long run the wealth-income ratio has to be equal to 500%.

where g_{wt} denotes the real growth rate of national wealth from period t to period $t+1$, g_{wst} denotes the savings-induced wealth growth rate, and q_t indicates the real rate of capital gains or losses between the two periods. We further label it the volume effect (or quantity effect) as the share of national wealth growth attributed to savings behaviors, and the residual term as the price effect (attributed to capital gains or losses):

$$Volume\_Effect = \frac{g_{wst}}{g_{wst} + q_t}$$
$$Price\_Effect = \frac{q_t}{g_{wst} + q_t}$$

We could also express equation 11 in terms of wealth-to-income ratio (β_{nt}) fluctuations. Specifically, we divide equation 10 by $\frac{Y_{t+1}}{Y_t} = 1 + g_t$ (where g_t indicates the growth rate of national income) and after re-arranging terms we have the following identity equation:

$$\frac{\beta_{nt+1}}{\beta_{nt}} = \frac{(1 + g_{wst})(1 + q_t)}{1 + g_t} \tag{12}$$

where the growth rate of β_n (wealth-to-income ratio) from period t to period $t+1$ could be expressed as a function of being proportional to the savings-induced wealth growth rate (g_{wt}), the real rate of capital valuation (q_t) and inversely proportional to the growth rate of national income (g_t).

It could be easily observed that equation 12 is simply an extension of equation 8, where the relative price effect $1 + q_t$ enters the equation multiplicatively and is positively proportional to the wealth-to-income ratio β_{nt} term.

The additive decomposition operates in a very similar manner, first of all, we take the specification in equation 4, we divided both sides by Y_{t+1}, and we have the following:

$$\frac{W_{nt+1}}{Y_{t+1}} = \underbrace{\frac{W_t}{Y_{t+1}}}_{\text{Initial wealth}} + \underbrace{\frac{S_t}{Y_{t+1}}}_{\text{Cumulated Savings}} + \underbrace{\frac{KG_t}{Y_{t+1}}}_{\text{Cumulated Capital Gains}} \tag{13}$$

And we replace $\beta_{initial} = \frac{W_{nt}}{Y_{t+1}}$, $\beta_{savings} = \frac{S_t}{Y_{t+1}}$ and $\beta_{price} = \frac{KG_t}{Y_{t+1}}$, we have:

$$\beta_{nt+1} = \beta_{initial} + \beta_{savings} + \beta_{price} \tag{14}$$

where $\beta_{initial}$ indicates the initial wealth effect, $\beta_{savings}$ indicates the cumulative new savings effect (corresponding to the volume effect in the multiplicative decomposition scenario) and β_{price} indicates the price effect.

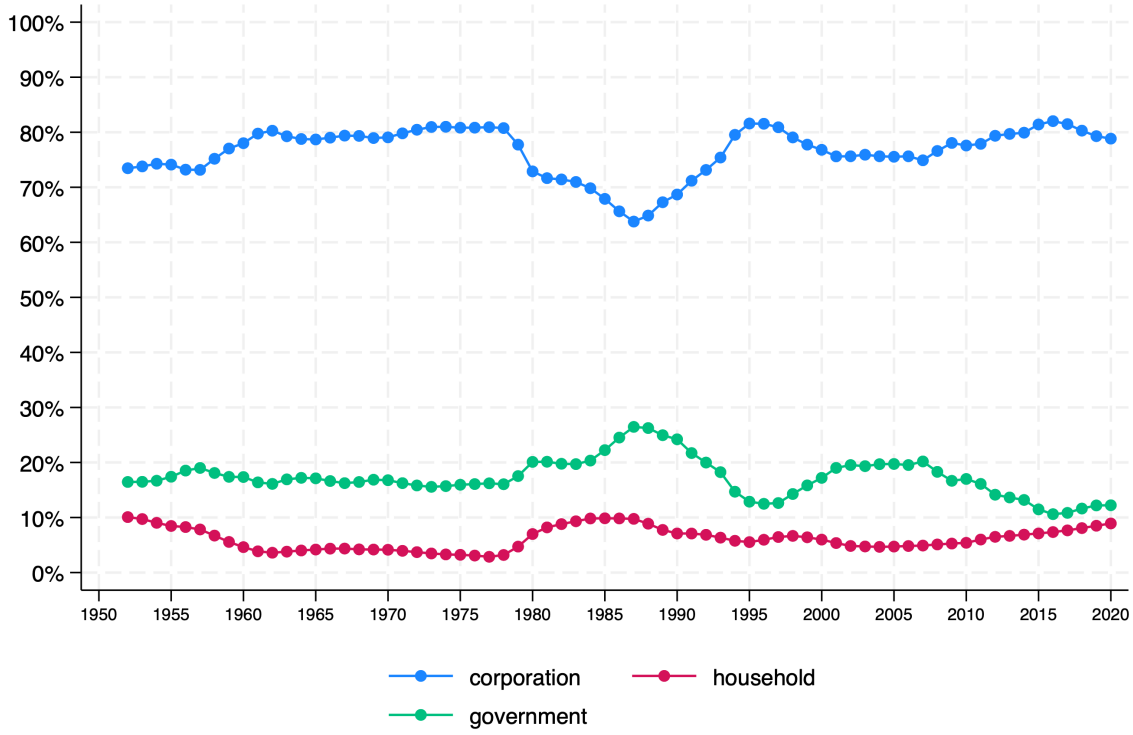
In terms of the strengths and weaknesses of either approaches, conceptually it's self-evident that the multiplicative approach does not allow for a modelling of zero savings rates (the savings rate has to enter multiplicatively in a strictly positive or negative manner). Second of all, the role of initial wealth may be more important to account for in the context of large capital destruction due to wars or other exogenous shocks. And given the set-up, the initial wealth effect also tends to converge to zero when we are evaluating wealth accumulation over a very long time horizon. However, at the same time, this could also be one of the shortcomings of the additive decomposition, which is that it tends to put more weight, i..e over-emphasize the most recent years while performing wealth accumulation decomposition over a very extended period of time. As such, the multiplicative decomposition approach is preferred for long-run wealth accumulation decomposition, while we do report the results using both decomposition approaches together as well.

Table 15: Sources of Market-Value National Wealth Accumulation in China, 1952-2020: Additive Decomposition versus Multiplicative Decomposition

			Additive	Additive	Additive	Multiplicative	Multiplicative
Period	Net Wealth (t)	Net Wealth (t+n)	Initial Wealth Effect	Cumul. Saving	Capital Gains	Volume Effect	Price Effect
	β_t	β_{t+n}					
1952-1980	380.9%	366.8%	124.7%	443.0%	-200.9%	6.8%	-2.7%
			34.0%	**120.8%**	**-54.8%**	**165.5%**	**-65.5%**
1980-2020	366.8%	907.1%	17.7%	412.0%	477.4%	5.8%	4.4%
			1.9%	**45.4%**	**52.6%**	**56.8%**	**43.2%**
1952-2020	380.9%	907.1%	5.7%	432.4%	468.9%	6.2%	1.4%
			0.6%	47.7%	51.7%	81.3%	18.7%

Notes: This table presents the comparison of the sources of market-value national wealth accumulation, between the additive decomposition approach and the multiplicative decomposition approach. The additive decomposition approach decomposes national wealth accumulation into three components, namely the initial wealth effect, the cumulative new savings effect and the capital-gain-or-loss effect.The multiplicative decomposition approach decomposes national wealth accumulation into two components, namely the savings-induced wealth growth effect, and the capital-gain-or-loss effect.

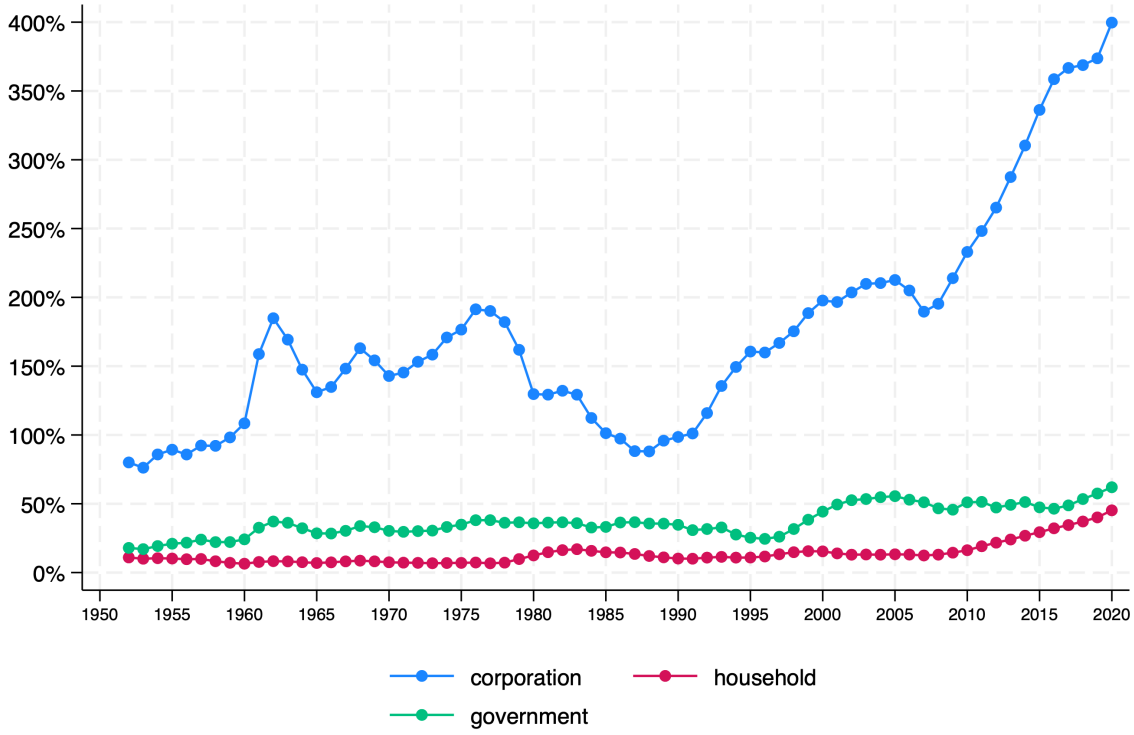
Figure 49: Composition of Other Domestic Capital (1952-2020)



Notes: Other domestic capital here corresponds to the concept of "other domestic capital" presented in table 3. Essentially it refers to the non-housing and non-land components of non-financial assets in national wealth. It could be further divided into corporate non-financial other domestic capital, household non-financial other domestic capital and directly government-held non-financial other domestic capital.

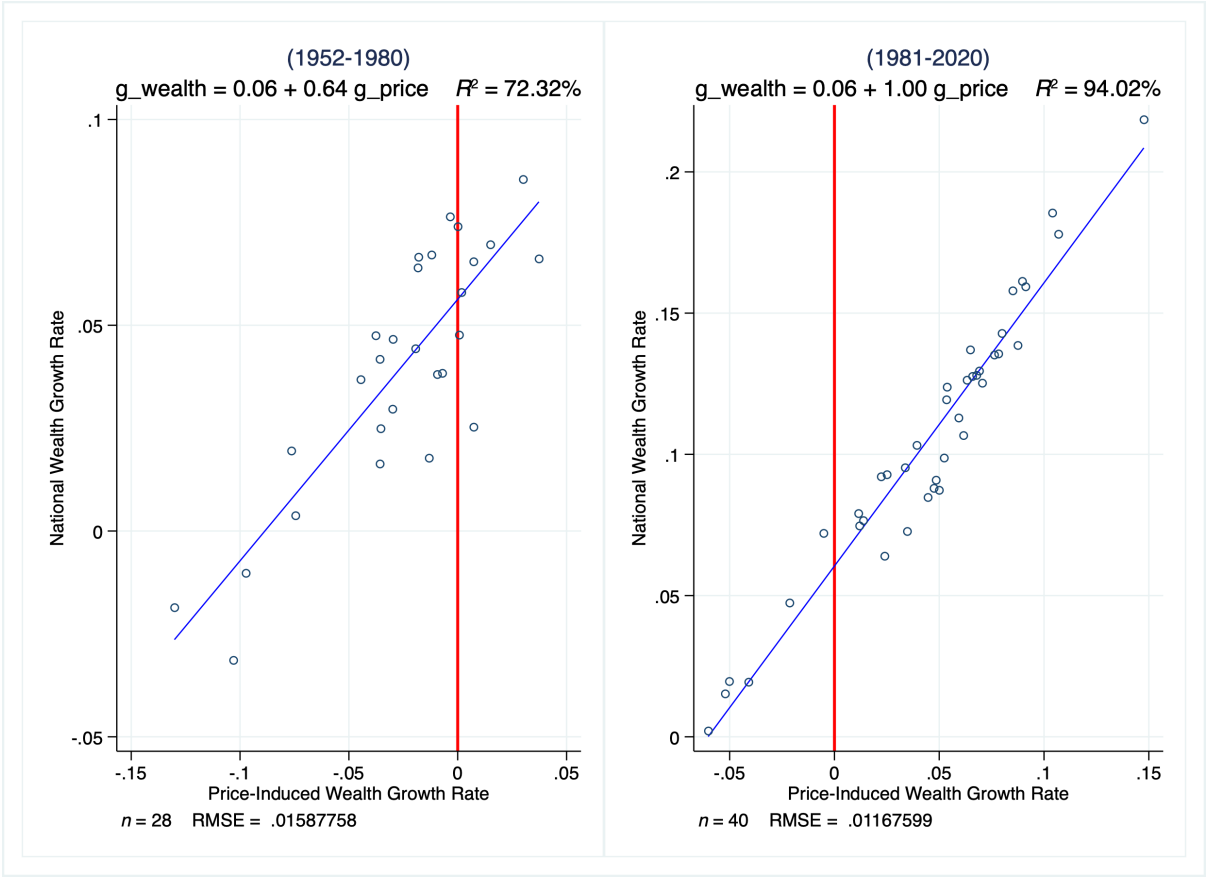
6.8 Additional Statistics on Wealth Aggregates, Cross-Country Comparison and Wealth Distribution

Figure 50: Wealth-to-Income Ratios of Other Domestic Capital (1952-2020)



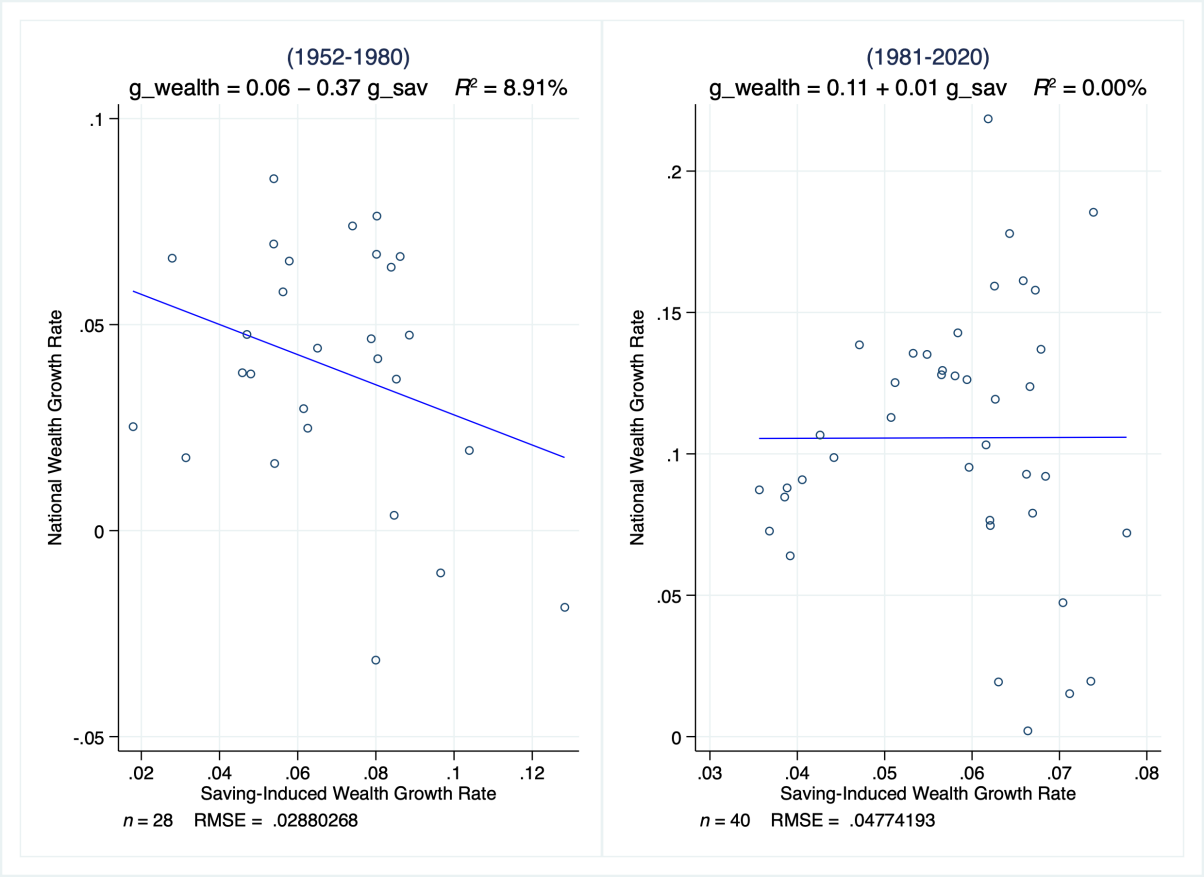
Notes: Other domestic capital here corresponds to the concept of "other domestic capital" presented in table 3. Essentially it refers to the non-housing and non-land components of non-financial assets in national wealth. It could be further divided into corporate non-financial other domestic capital, household non-financial other domestic capital and directly government-held non-financial other domestic capital.

Figure 51: Correlation between Wealth Growth (g_{wt}) and Price-Induced Wealth Growth ($\frac{1+g_{wt}}{1+g_{wst}} - 1$): 1952-2020)



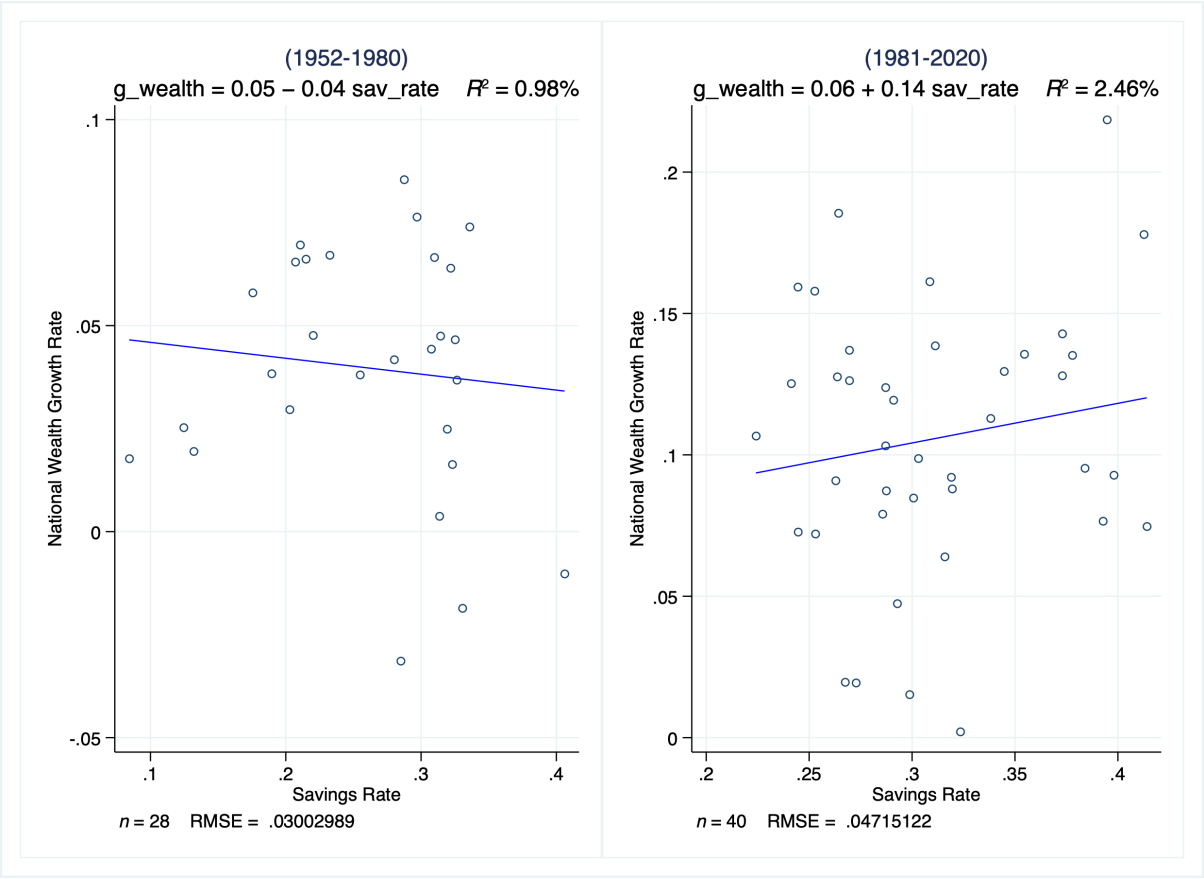
Notes: "g_wealth" refers to wealth growth rate (g_{wt}); "g_price" refers to price-induced wealth growth rate ($\frac{1+g_{wt}}{1+g_{wst}} - 1$).

Figure 52: Correlation between Wealth Growth (g_{wt}) and Savings-Induced Wealth Growth (g_{wst}): 1952-2020



Notes: "g_wealth" refers to wealth growth rate (g_{wt}); "g_sav" refers to savings-induced wealth growth rate (g_{wst}).

Figure 53: Correlation between Wealth Growth (g_{wt}) and Savings Rates ($\frac{S_t}{Y_t}$): 1952-2020



Notes: "g_wealth" refers to wealth growth rate (g_{wt}); "sav_rate" refers to net national savings rate ($s_t = \frac{S_t}{Y_t}$).

Figure 54: Net Foreign Asset (NFA) to National Income Ratios (1933-2020)

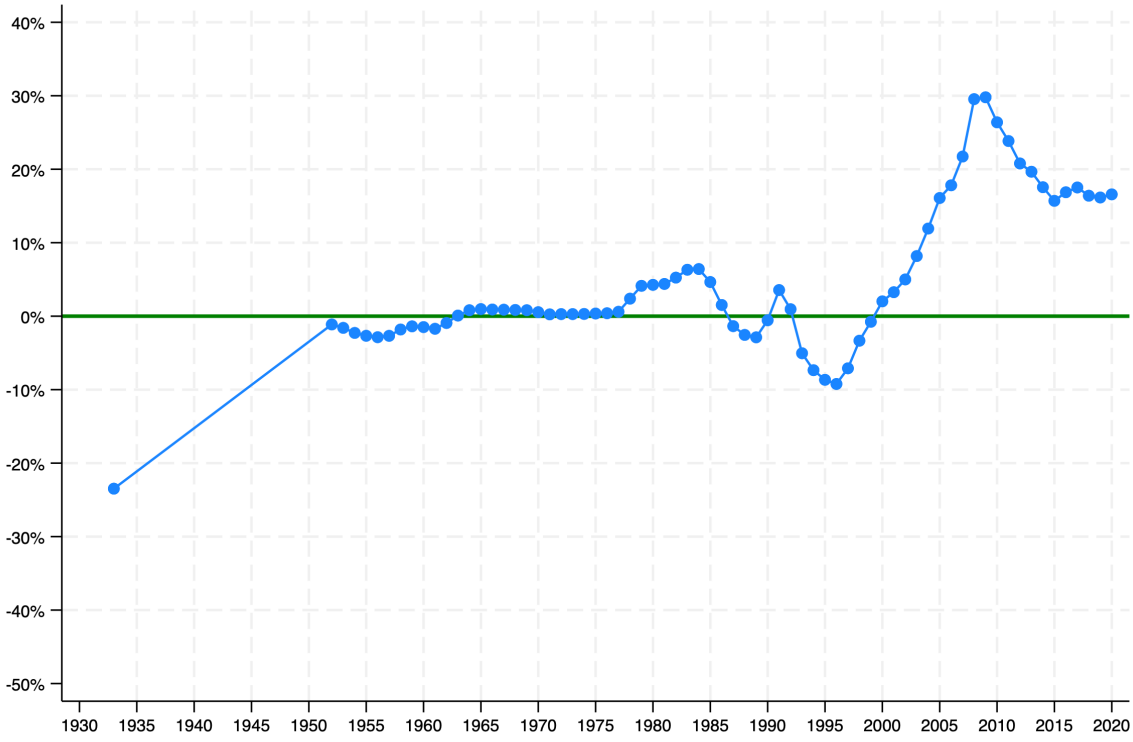
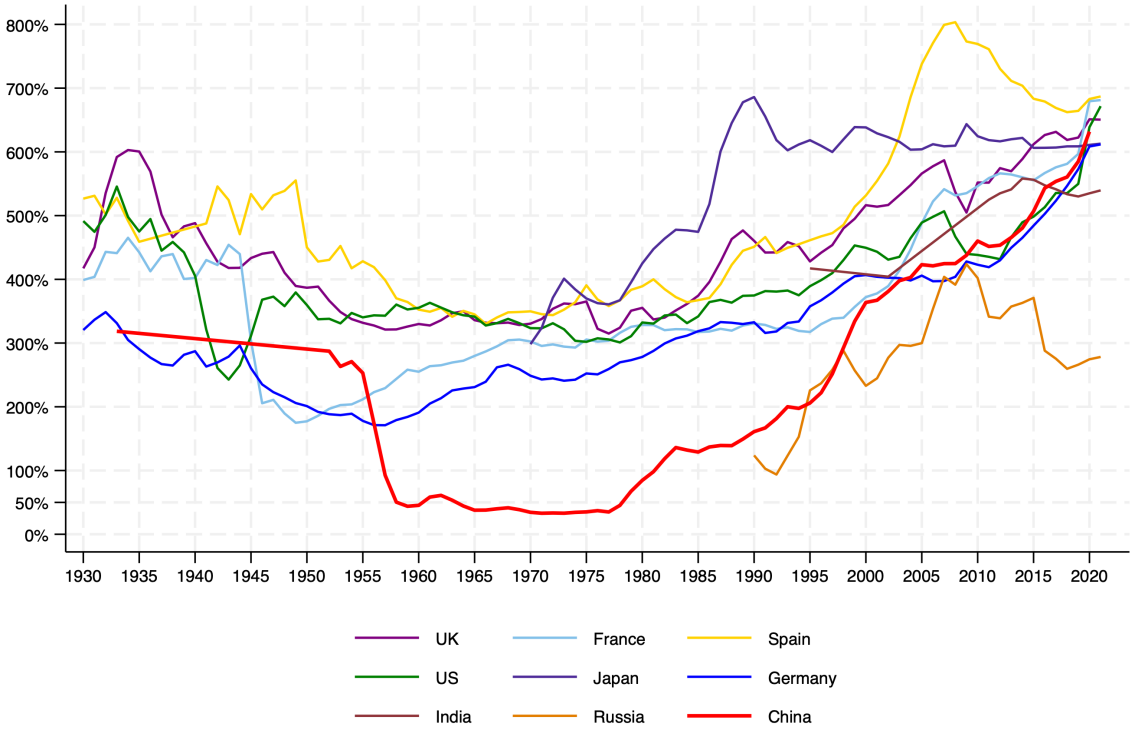
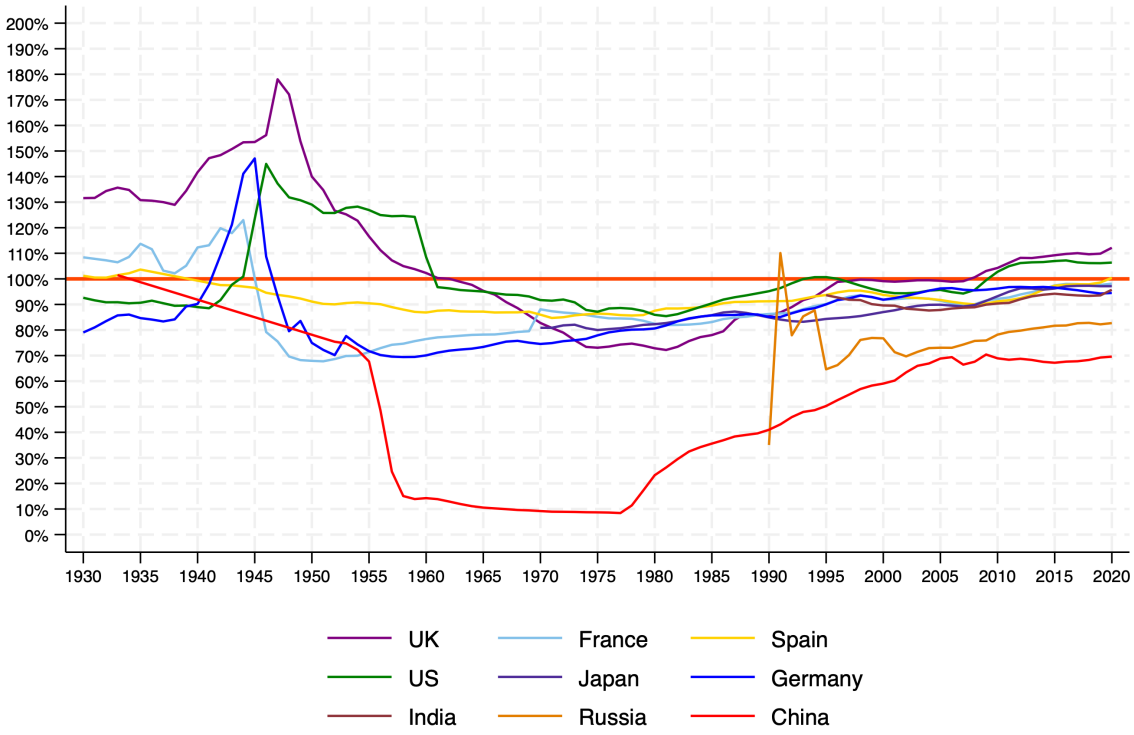


Figure 55: Long-term Private National Wealth to National Income Ratio: Cross-Country Comparisons



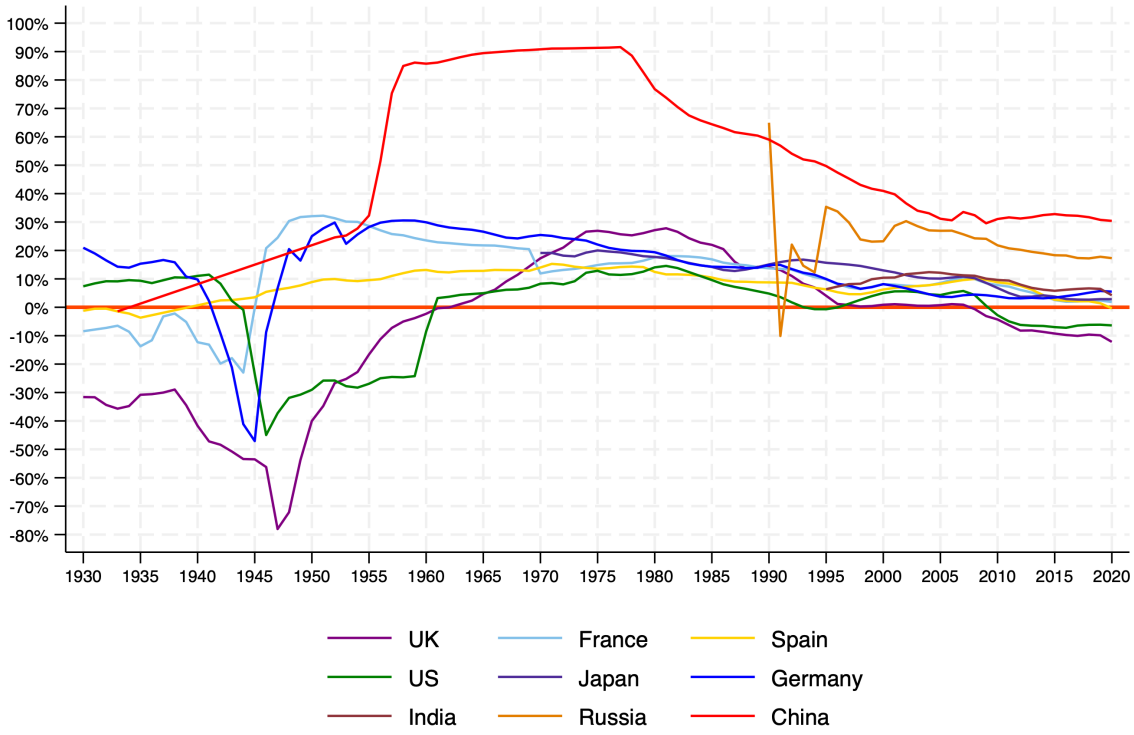
Notes: Data for other countries come from World Inequality Database.

Figure 56: Long-term Private Share of National Wealth : Cross-Country Comparisons



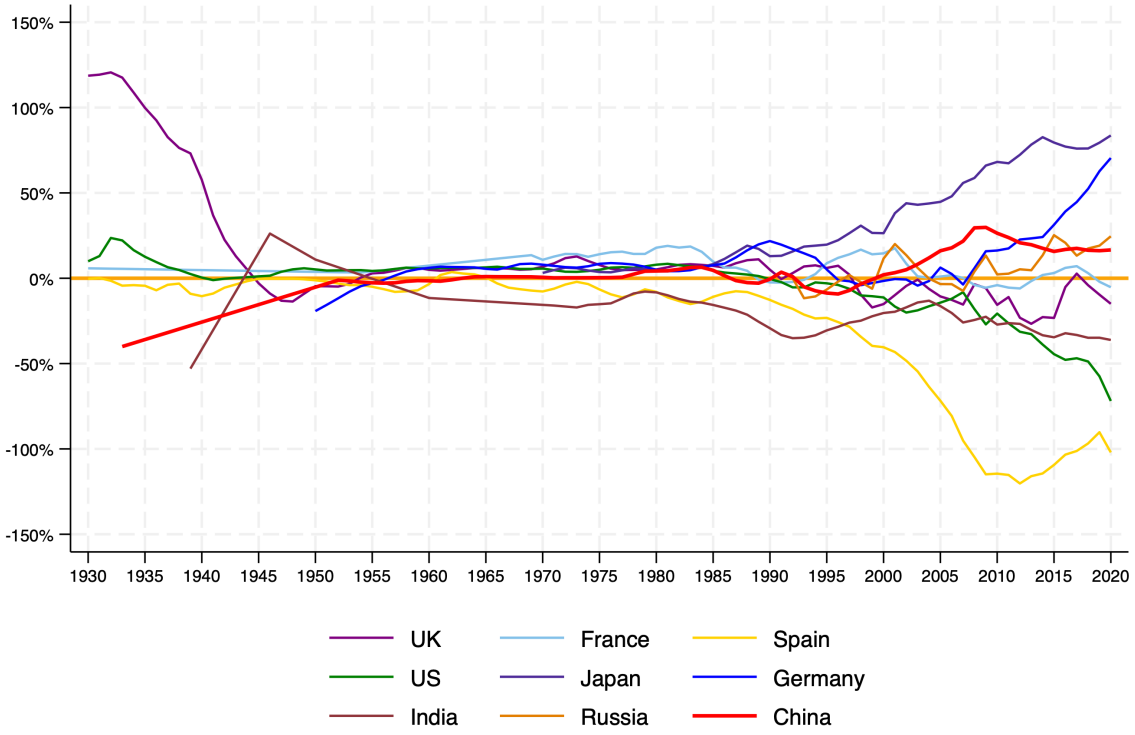
Notes: Data for other countries come from World Inequality Database.

Figure 57: Long-term Public Share of National Wealth : Cross-Country Comparisons



Notes: Data for other countries come from World Inequality Database.

Figure 58: Long-term Net Foreign Asset Position to National Income Ratio: Cross-Country Comparisons



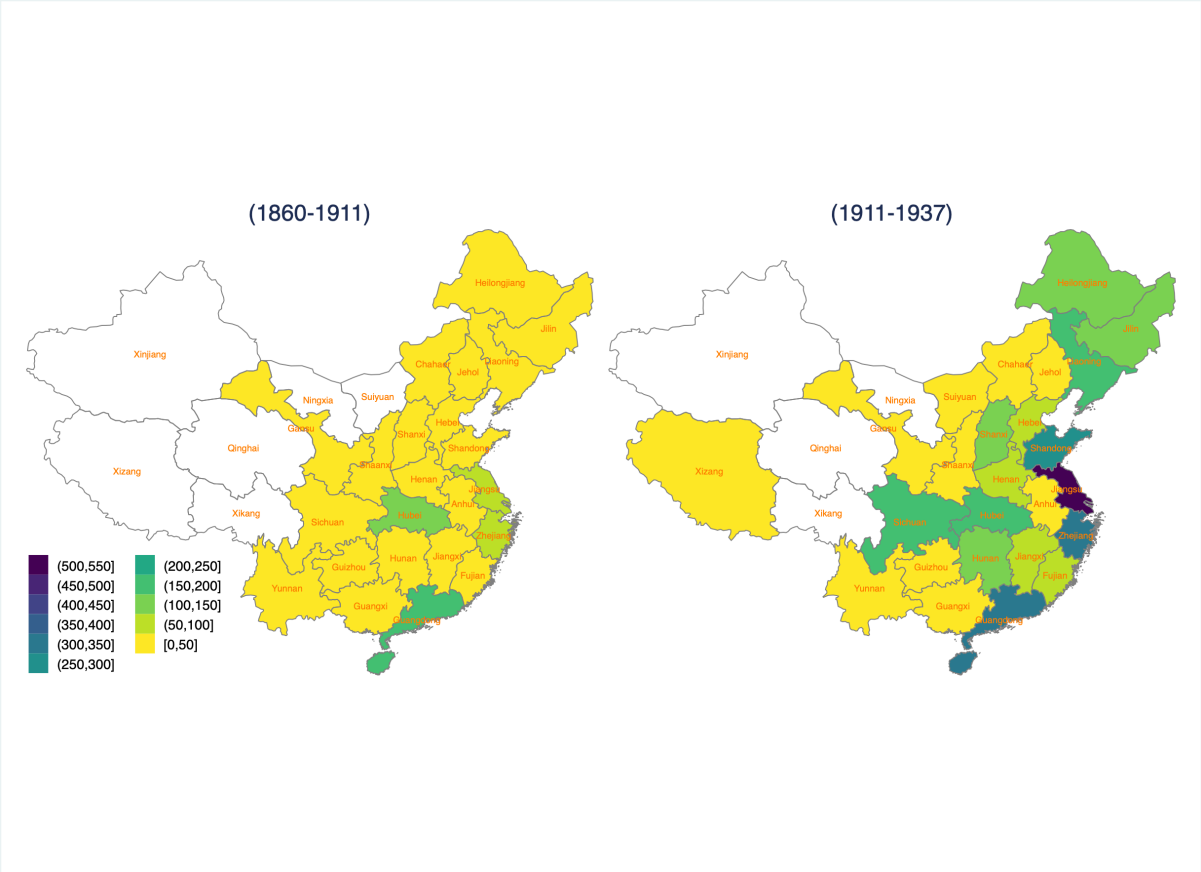
Notes: Data for other countries come from World Inequality Database.

6.9 Price Indices

6.9.1 Price Indices in Republican China

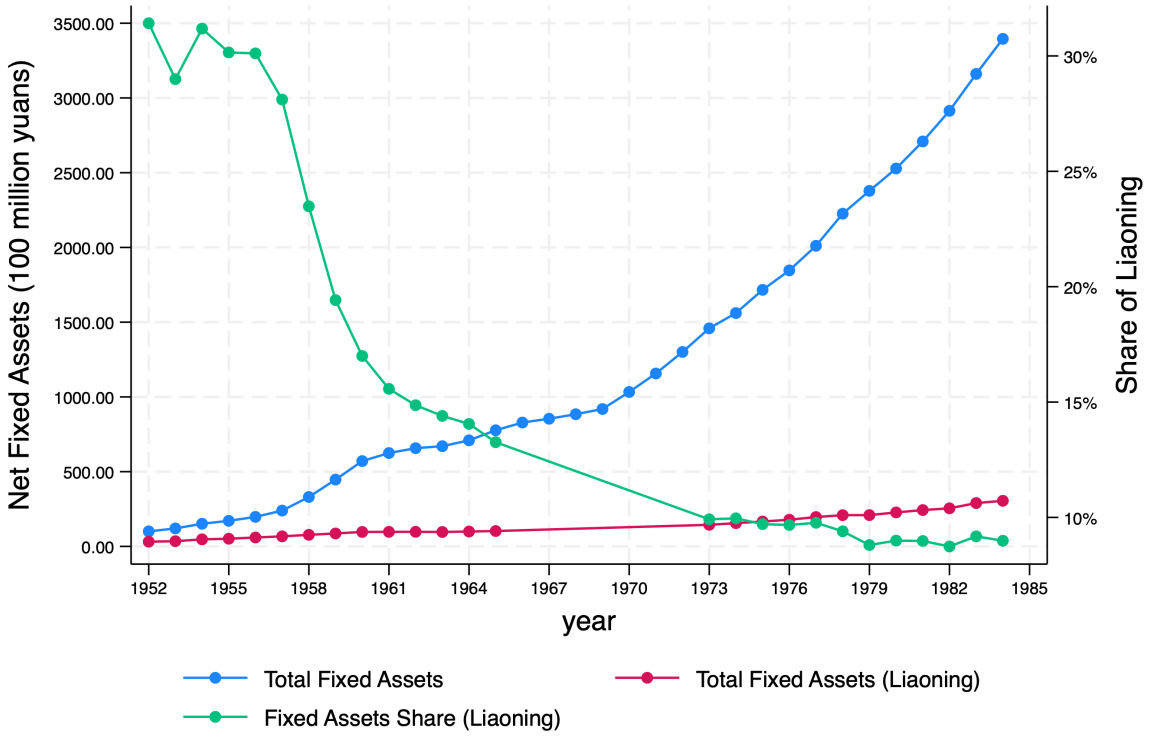
After the Republic of China was established, various regions in China successively began general price investigations and the compilation of price indices. Continuously maintained were the Guangzhou Wholesale Price Index compiled by the Agricultural and Industrial Department of the Guangdong Provincial Government from 1912 onward, the Tianjin Wholesale Price Index compiled by the School of Economics at Nankai University from 1913 onward, and the Shanghai Wholesale Price Index compiled by the National Taxation Committee of the Ministry of Finance from 1919 onward. The price indices of these three urban areas were subsequently continued by different departments until 1949. In the later period of the Republic of China, price data for Chongqing were also relatively complete. The Central Bank compiled the Wholesale Price Index of 22 essential commodities in Chongqing from 1937 to 1948.

Figure 59: Corporations: Distribution of Total New Firms (1860-1937)



Notes: This Figure counts the cumulative total number of newly-created domestic firms in China for two sub-periods, 1860-1911 and 1911-1937. Data come from Du (1991, 2019).

Figure 60: Geographical Distribution of Industrial SOEs - The Fall of the Northeast: The Case of Liaoning



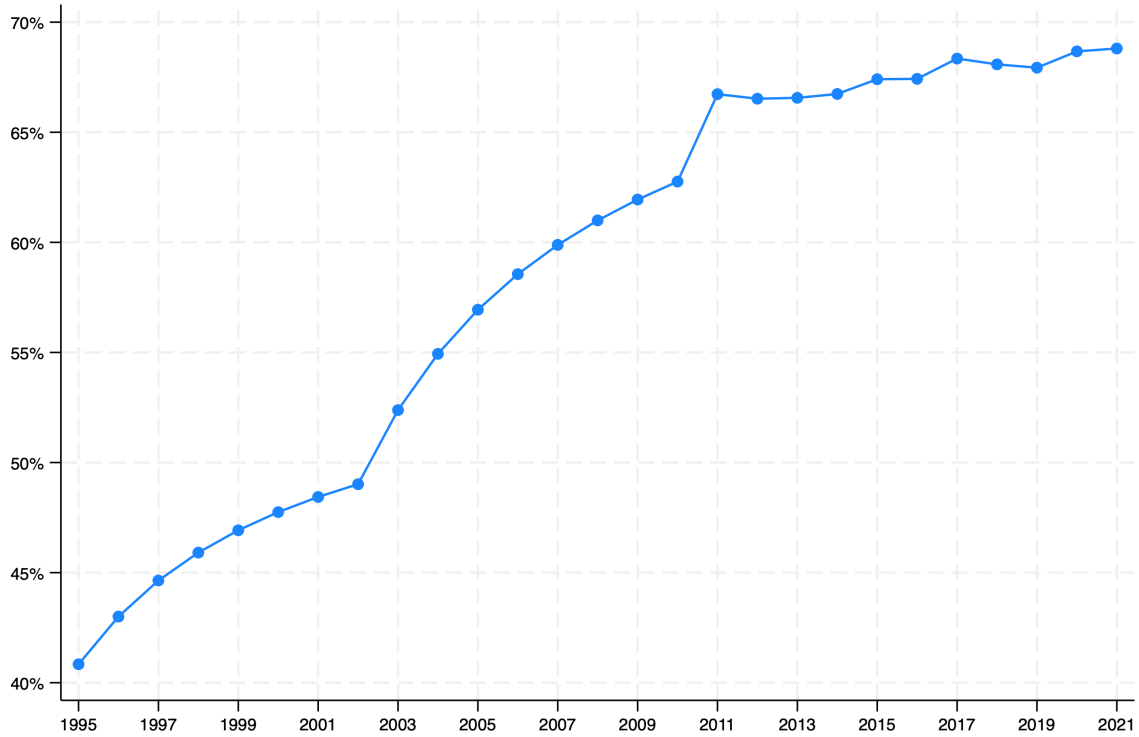
Notes: This figures counts the total net fixed assets for modern-industry enterprises in China, as well as zooming in on the province of Liaoning as well as its industry asset share in the national economy.

Table 16: Ranking of Social Classes and Their Population Distribution in Shanghai in the early 1930s

Social Class Rank	Class Compo.	Class Compo.	Pop. Shanghai	
	Rural	Urban	Population	(%)
Upper	Privileged Bureaucrats	Privileged Bureaucrats, Upper-level Business Owners	0.9	0.48
Upper-Middle	Officials, Large Landlords	General Business Owners, General Government Employees, Middle and Senior-level Professionals	23.3	12.34
Middle	Small Landlord, Wealthy Farmers	Office Clerks, Low-level Employees	33.3	17.64
Lower-Middle	Self-cultivating Farmers	Workers	70.0	37.08
Lower	Poor Hired Farmers	Urban Poor	61.3	32.47

Notes: Data come from Du (2004, 2005). Population figures for Shanghai are in 10,000 people. Among them, the upper class is determined mainly by the levels of wealth, social status, and influence, identifying the most typical class of wealthy individuals. The upper-middle class mainly distinguishes between the wealthiest and generally affluent groups based on income levels in the industrial and governmental sectors. The middle class sets the lower bar for low-income employees at an annual salary of 400 yuan. The lower-middle class level is divided according to the average annual income of workers, set at 200 yuan. Clearly, the main criterion for distinguishing between the middle and lower-middle classes is the level of wage income. Since the family property of lower-class urban residents is primarily movable property, income levels can directly reflect their wealth levels. Therefore, this social class hierarchy can also be used to differentiate urban social classes based on different wealth levels. In addition, (rural) small landlords are also classified as urban residents, and their wealth levels are generally higher than those of the working class.

Figure 61: Top 10% Wealth Shares in China (1995-2021)



Notes: This series is based on the wealth estimates reported in Piketty et al. (2019), with micro survey data of China Household Income Project (1995, 2002), and China Family Panel Studies (2010, 2012). We then further top correct it annually with Forbes Rich Lists and Hurun Rich Lists.

Additionally, there is the Wertheim Index from 1913 to 1937, which was based on Shanghai, Tianjin, and Wujin as sampling locations, selecting 34 basic commodity prices for wholesale price compilation (Q. Chen, 2003). Buck et al. (1964) investigated and organized data on peasant income, price indices, and wage indices from 1906 to 1933. Although the data collection points were limited, they covered a large geographical range, making them widely cited. Based on existing research, this article selects the adjusted Shanghai Wholesale Price Index as the main index.[60]

6.9.2 Price Indices in People's Republic of China

Young (2003) systematically adjusts Chinese growth downward by recalculating the GDP deflator based on official statistics. In our study, we adopt his methodology and reproduce the same corrections. All the real values presented in our paper, encompassing both wealth and income, are derived using this revised GDP deflator, for the period between 1952 and 2020.

[60]For more information on the Shanghai Wholesale Price Index, please refer to our online appendix: document "ChinaNationalWealth.xlsx", sheet AP2.