The evolution of wealth-income ratios in India 1860-2012[*]

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September 28, 2018

Abstract

This article is about the metamorphoses of aggregate Indian wealth over fifteen politically transformative decades. Based on a comprehensive new database, I find that wealth-income ratios have fluctuated tremendously in the twentieth century. In emerging India of the twenty first century, wealth is quickly attaining the same disproportionate size (relative to national income) that was seen during economic downturns in interwar colonial India. The long run U shaped trajectories of wealth-income ratios are reasonably explained by a mid century asset price slowdown and the return of high land shares in national wealth. Implications for balanced growth models are not too sanguine because rising wealth-income ratios have become visible in most large economies, irrespective of their stage of capitalist development.

JEL Classification: E10, D30, D31

Keywords: India, Economic growth, Wealth-Income ratio, National wealth, Ricardian dilemma

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[†]**Link to the latest version of this article, online appendix and supplementary materials.**

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1 Introduction

Aggregate wealth has been central to theories of capitalist development. Karl Marx proposed that "the wealth of societies would appear as an immense accumulation of commodities" and distinguished the *non-passive* productive capital accumulation process which would drive economic growth. To David Ricardo, wealth appeared distinctly as rights to "indestructible" land and capital which could be used to improve it. But to both these political economists of the nineteenth century, there were fundamental conflicts between wealth accumulation and the production of output. Either due to labor-replacing technical change or due to the power of landlords to expropriate surpluses from growth, wealth could acquire tremendous relative importance in the long run.

Recently, Piketty and Zucman (2014) produced cross country historical series which have revived these arguments (at least in spirit). As it turns out, high wealth-income ratios seem to be a feature of nearly all the advanced capitalist nations. The importance of wealth was only temporarily suppressed by war shocks and rapid economic growth during the twentieth century. In the nineteenth century, when Ricardo and Marx were writing, these nations were already societies where wealth was worth several years of national income. The crucial question from a general perspective is how wealth evolves over the path of capitalist development, without the supporting histories of mercantilism or colonial markets. And for these questions one may learn many new insights from observing the histories of today's larger emerging economies.

This article addresses the history of wealth-income ratios in India over fifteen decades (1860-2012). Around 1900-01, India was a poor, agriculture based economy under colonial rule. By 2000-01 (real) national income had multiplied 1800% with increased importance of industry and services. At this point, India's population and economic growth ranked amongst the highest in the world. Quite obviously the metamorphosis of wealth underlying such large changes had to be significant; or at least one would assume some capital dynamism associated with recent decades. Surprisingly, this has not been a main concern of the macroeconomists and economic historians who have studied India. Instead much emphasis is placed upon constraints[1] that may have inhibited flows of output and investment. This leaves a limited picture where prosperity and de-

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[1]See for example Bagchi (2000) on colonial era private investment. For the pro-business climate that unleashed Indian economic growth from its modest "Hindu rates" phase (1950-80) see Rodrik and Subramanian (2005).

velopment was (and will continue to be) determined solely by the potential for economic growth. And yet India has always been an economy where wealth has played a key role - kingdoms, conquests, plunders and decentralized capitalist enterprise after all are rarely motivated with the view to purely expand national income.

The contributions of this research fill some gaps in our general understanding of global wealth-income ratios. I construct a comprehensive new database for India drawing upon various historical studies, statistical abstracts, surveys and official accounts consistent with international guidelines put in place by the UN System of National Accounts (SNA). This database has series on national wealth and its components, estimates of public wealth as well as private and public savings computed as per UN SNA conventions. These data are not perfect by any stretch of imagination but they are the first systematic attempt to document and link the evolution of such important macro-history variables for India. Hidden wealth, informal transactions and underestimations of various economic activities are ongoing challenges to accurately measure aggregate wealth. Perhaps in the future with sophisticated financial intelligence as well as better official records of assets and land, these data can be improved. There are indications from recent "asset register" disclosures that efforts are being made by official authorities to estimate corporate and public wealth. So realistically, these data should be viewed as baseline or lower bound estimates on what we know about contemporary Indian wealth.

Using this database, I produce and explain new stylized facts with wealth at the center of Indian macroeconomic history. Wealth-income ratios fluctuated tremendously, particularly in the low growth environment of the pre 1950 period. With only around 0.5-1% output growth, there was enough momentum for accumulated wealth to loom large over national income. The situation was temporarily accentuated during economic slowdowns associated with the interwar period, where wealth became almost worth seven years of national income. Connecting the interwar years to the twenty first century, wealth-income ratios appear U shaped. Since 1960, aggregate wealth has consistently grown faster than income despite remarkable episodes of macroeconomic achievements and a decline of public capital. Part of the explanation maybe traced to high saving rates, exceeding structural shifts in rates of economic growth. But in fast growing economies old wealth declines rapidly, so that more and more new savings are needed to replace capital. Wealth decompositions reveal that U shape ratios in fact reflect a resurgence of cumulated capital
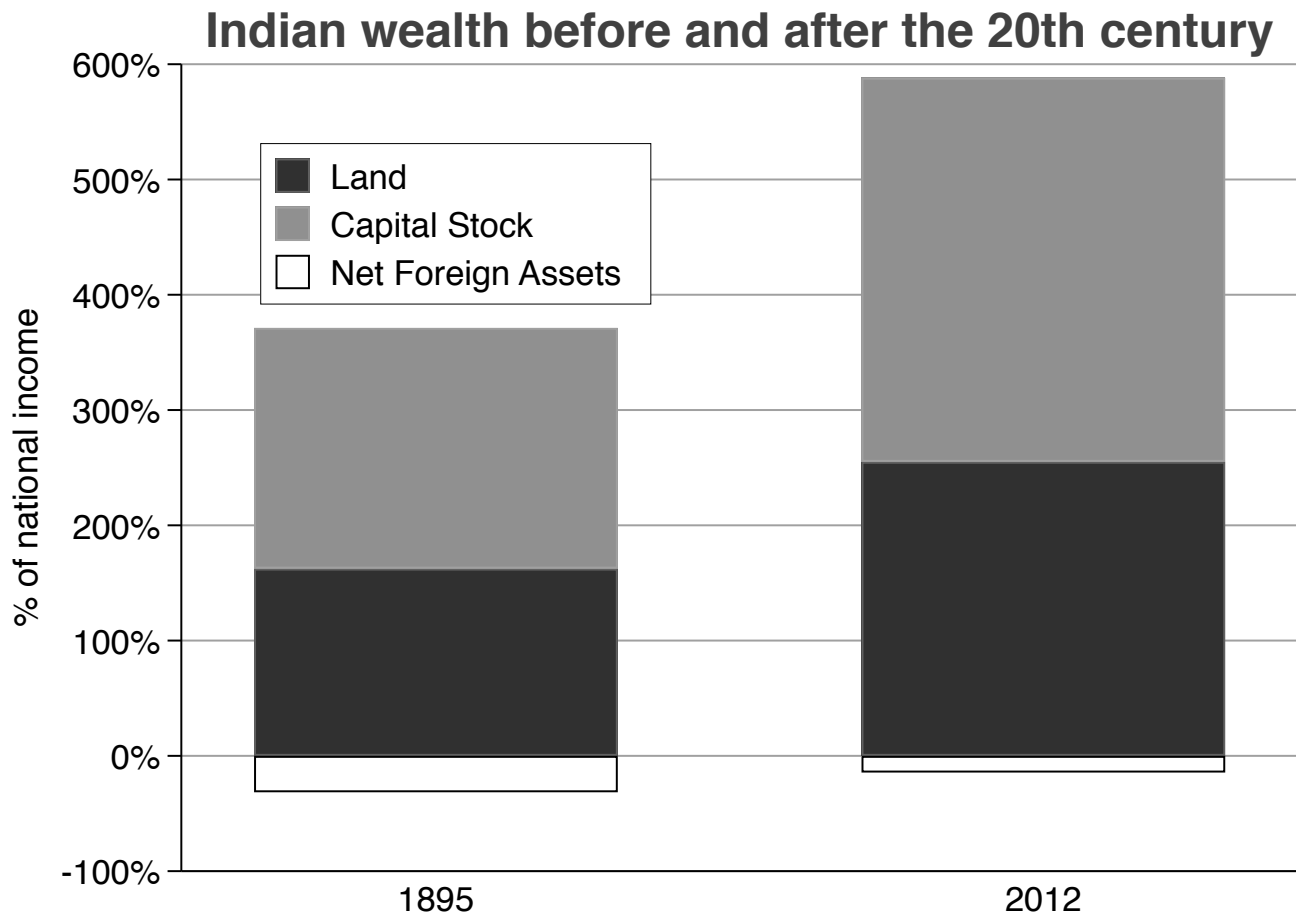
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Indian wealth before and after the 20th century

Benchmark series. National wealth = land + capital + net foreign assets.

Source: Author's computations in Supplementary Database Table 3B

Figure 1: Structure of national wealth in India 1895 vs 2012

gains, rather than pure saving-growth profiles. Asset prices were suppressed by consumer price inflation and capital losses in the transition period around Indian independence. Since 1980, they have acquired much more importance than the price of domestic output. Asymmetries are clearly visible via the share of wealth embodied in land or equity prices.

Taken alone, or even in combination with results from other countries, these findings have important implications. The way economists theorize about wealth accumulation relies on balanced growth models. With technology, tastes, demographics and wartime destructions, one can basically account for histories of wealth accumulation in comparable advanced economies. Yet, recent wealth-income ratios seemingly show the same upward trend in all sorts of large economies; with

widely varying rates of economic growth. Along with India, China (Piketty et al., 2017), Russia (Novokmet et al., 2018), South Korea (Lee and Yoon, 2017) are all in a situation where national wealth is cumulating faster than income. With these permutations, the only binding thread remains the connectivity provided by market dynamism and capital friendly attitudes. Appetites for secure returns appear to transcend the demand and supply for purely productive capital. So surely, theory has to move beyond the constraints of fixed factor proportions which anchor balanced growth[2] models. Perhaps the powerful processes at the core of Ricardo and Marx may not yet be extinct.

Finally, the evolution of wealth-income ratios puts India's many political transitions in context. Modern Indian economic history is usually visualized as three distinct political periods; British colonial rule (1857-1947), semi-socialist (1950-80) and neoliberal (1991 onwards). British India is one of the most studied topics in social science history, with contentious debates[3] peppering the literature. There is also vigorous argument regarding the direction of statist policies and neoliberalism since the achievement of independence. But the magnitude of Indian wealth has rarely figured in each of these debates. Political practices suggest that wealth was clearly identified at all times, with policy focusing on appropriating or generating more of it. After all, regimes can always be categorized based on their protection of the very notion of private property. The East India company taxed wealth (land revenue), continuing older practices, far before the British administration developed property rights[4] or income taxation. Even in contemporary India, despite industrial growth, hallmark symbols of property remain real estate prices in Delhi, Bombay and Bangalore which rival other metropolitan cities in rich countries.

The remainder of this article is divided as follows: the next section discusses data and concepts, introducing the accounting framework of wealth-income ratios. The article then immediately dives into results, presenting the main series, decompositions and changing structures of national

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[2]For an excellent exposition of these constraints within standard growth theory architecture, especially due to land, see Homburg (2014)

[3]These debates are too rich to be summarized in this article. Tomlinson (2013) is perhaps one of the most balanced recent works which brings together all the various arguments and summarizes key statistics. The conflict between different schools on colonial origins of underdevelopment is surveyed in Robb (1981). The nationalist debate was reignited, most clearly in Mukherjee (2008) and Roy (2016) with the former being a neo-nationalist perspective i.e putting colonialism at the center of inherited economic problems.

[4]See Swamy (2011)

wealth. The last section concludes. This article is also supplemented with an extensive online appendix and a supplementary database in spreadsheet format.

2 Data and conceptual notes

2.1 Sources

I use standard concepts outlined in the UN SNA framework to compile a comprehensive digital dataset of Indian wealth and national incomes in the long run. My construction framework closely follows attempts to similarly aggregate long run national balance sheets on a cross country basis by Goldsmith (1985) and Piketty and Zucman (2014). The main challenge is that no unifying source exists to combine and collate India's national wealth. There is to date no official tradition of compiling national balance sheets, outside of a few dispersed sectoral accounts of assets and liabilities. For flows in the post 1950 period, I use official national accounts for all net-of-depreciation flows i.e national income, capital formation, capital transfers, foreign investment at current prices. For historical flows of output, income and saving I collected data from Sivasubramonian (2000) and Maddison (1992). Nominal variables are adjusted when appropriate using the national income deflator at 2012 prices.

For wealth estimates, I combine official capital stock figures from the Central Statistical Organization (CSO) and land values from nationally representative[5] surveys. For pre-1960 estimates of national wealth, I draw upon the homogenous balance sheets attempted from multiple sources in Goldsmith (1983). Following SNA guidelines, consumer durables are excluded from net-of-depreciation fixed assets. Foreign balances are taken from the extended and updated dataset associated with Lane and Milesi-Ferretti (2007). Public sector balance sheets - i.e the net wealth of administrative government, full and partially controlled public enterprises - are impossible to complete due to limited disclosures. However I provide elements of the public balance sheet such as capital outlays (cash flow basis), capital stock at current prices and public debt[6] (internal and

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[5]The National Sample Survey Organization (NSSO) puts out a decennial All India Debt and Investment Survey (AIDIS) which estimate household balance sheets

[6]Since government accounts are disclosed for audit purposes, they simply cumulate past flows rather than following an accrual system. This works for financial loans but does not give a proper picture of capital assets. I use the

external).

Complete series (1950 onwards) of public sector savings are provided, computed using capital finance sections of the official national accounts. These information were collected from the government's disclosures to the Comptroller & Auditor General of India (CAG) as well as annual statements of assets and liabilities which are part of union budgets of the Central Government of India. Demographic data are taken from the World Bank Open Database and stock market series (market capitalization, price indices) were downloaded from the Federal Reserve of St Louis (FRED) database. More detailed information on sources, concepts and data history are made available in the online appendix (section A and B) of this article. The entire dataset can be reconstructed using raw sources digitized in the supplementary database.

2.2 Main concepts

2.2.1 National wealth

According to the UN SNA "national wealth W is the sum, for the economy as a whole, of non-financial assets and net claims on the rest of the world." It can be defined alternatively as the sum of public (W_g) and private wealth (W_p) where each owns wealth equaling the sum of financial and net-of-liabilities non financial wealth. Social accounting institutions can be further broken by claims into households, non-profit institutions serving households (NPISH), corporations, government and the rest of the world. At the aggregate level, financial wealth nets out to zero since the liabilities of one sector equals the assets of another.

In simpler terms, national wealth is the aggregation of three kinds of assets. Non-produced (eg land), produced non-financial assets (eg machinery, buildings, dwellings etc) and net foreign assets. Economists have long used produced capital stock as the barometer of growth and development, typically being interested in capital-output ratios. Wealth however is a broader concept bringing together the production side of the economy with real constraints such as limited land or mineral reserves. Intangibles are also included in the UN SNA accounting framework. In conjunction with the net of liabilities foreign asset position (NFA), national wealth can be written as:

IMF's accrual based estimate of public debt for core government (Abbas et al., 2011) as the benchmark debt series

$$W_t = \underbrace{V_t}_{Land} + \overbrace{K_t}^{Capital} + NFA_t \equiv W_p + W_g \tag{1}$$

All aggregates are measured in current prices. Other non-financial assets such as precious metals (gold & silver) are also part of national wealth, but I exclude them from benchmark calculations due to lack of consistent data. These assets play a much smaller role in the production side of the economy but do impact aggregate demand depending on saving preferences[7] of households. Using assumptions on data from scattered sources, alternative wealth series have also been computed; readers are referred to the supplementary database and online appendix for details. Although they increase the size of aggregate national wealth, on the whole their movements are not large enough to change the long run trends.

2.2.2   Market value vs book value national wealth

Although SNA definitions of national wealth correspond to perpetual inventory type methods (PIM), recently many authors, following Piketty and Zucman (2014), have begun to rely on market value national wealth where corporate net worth is measured using the equity holdings of households. Book value national wealth equals market value national wealth plus the residual net worth of the corporate sector with both definitions converging when Tobin's Q equals 1. In my assessment with corporate balance sheet constraints it is a rather huge challenge to compute market value national wealth with precision. I only use book value national wealth in all my series. Over the long run there is sufficient reason to assume that market and book values would be relatively similar in trend if not size. Although in the appendix I discuss the pros and cons of applying either method to India, I discuss the main elements briefly.

In the 1950s, according to industrial reports, Mukherjee and Sastry (1959) found market value national wealth to be quite well approximated by book value measurement. It is likely that Tobin's

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[7]Indian households have historically had a tremendous affinity to holding gold and silver in their portfolio. This preference has withstood the changing economic structures of over a century. Badarinza et al. (2016) estimate a significant fraction of household wealth stored in gold around 2011-12. Imports of gold were strongly regulated in the post independence era but for past political elites, especially royals, gold was the main store of value. Administrators were acutely aware of this and foreign conquerors were seduced by the stock of gold stored in India. Atkinson (1902) used production capacity and rough estimates of plunder and loot to estimates the stock of gold in the late nineteenth century. Gold & silver were worth almost one year of national income in this period.

Q was lower during the peak years of the Hindu rate of growth because of financial repression. In more recent years, evidence from samples of corporations suggests Tobin's Q is close to 1; roughly 1.1-1.2 in the 1990s (Khanna and Palepu, 2005) and around 0.94 for large Indian corporations in the 2000s (Allen et al., 2006). Its important to note, following the latter reference, that market capitalization and Tobin's Q in India is a very imperfect source of information regarding corporate net worth. Historically, the equities of a large fraction of Indian companies do not experience much (if any) trading. Inventories which appear on book value accounts on the other hand move faster, giving a more updated sense of prices.

2.2.3 Income and savings

The definition of national income (Y) is standard, i,e net-of-depreciation domestic product plus net factor income (NFIA) from abroad. The flow of savings (S) are defined as net-of-depreciation capital formation plus net foreign investment and capital transfers from abroad. Coverage of saving flows, especially after 1950 is very complete and allows a full institutional decomposition of savings. Each institution's saving is the sum of capital expenditure and net lending. I use capital finance accounts to compute public sector (administrative government, public enterprises) savings. Private savings are derived as the residual of national *less* public saving flows.

2.2.4 Data coverage

Data coverage is as follows: National wealth and its components are available for the entire 1860-2012 period on a roughly decennial basis. Capital stock series are annual starting 1981. National income data is annual for 1900-2012 along with further estimates for 1860, 1875 and 1895 using Goldsmith's adjustments for depreciation. The aggregate saving rate is available for 1900-2012 and its private and public decompositions start in 1951. Since pre-1900 national incomes and inflation estimates are too fragile, I do not use them in any decompositions. Government assets are given for select years in the post-independence era 1950-2012 but public debt estimates are annual for the same reference period.

2.3 Wealth-income ratios

The evolution of wealth itself is determined by accounting for new capital accumulation and revaluation of existing assets:

$$W_{t+n} = W_t + S_t + \delta_{t+n}W_t \qquad (2)$$

Basically, changes in the level of wealth over time are either volume (savings) driven or due to a price effect (capital gains, $\delta_{t+n}W_t$). From a macro-history perspective, the key long term evolution is $\beta_t = W_t/Y_t$; the wealth-income ratio. β denotes the years of annual national incomes necessary to reproduce the stock of wealth. Obviously capital, wealth and production change enormously over time so that (more than constant price series) wealth-income ratio scales these metamorphoses in a meaningful way.

If in the long run there are no relative price deviations ($\delta = 0$) - for example if wealth is purely reproducible capital - then the steady state is defined by convergence of wealth and income growth rates $\beta_t \to \beta = s/g$. The slower the rate of economic growth, the longer it takes for national income to reconstitute the stock of wealth. Fundamentally, this is the one good Harrod-Domar-Solow steady state result but it applies to a more general class of models with balanced growth. Historically asset prices have in fact played an important role, so one-good models are not always justified. Sustained price deviations can result from to asymmetric economic shocks, real estate pressures or structural capitalization of monopoly rents. It is better to empirically distinguish the contribution of each to why and how wealth evolves historically.

2.4 Multiplicative versus additive wealth equations

Using the framework in Eqq 2 and macro-accounting, wealth accumulation can be decomposed into its constituent driving forces. In multiplicative models, where wealth evolves according to $W_{t+1} = (1 + q)(W_t + sY_t)$, forces of wealth accumulation can be split according to:

$$1 + q = \frac{(1 + g_w)}{(1 + g_{ws})} \qquad (3)$$

Where $1 + q$ is the (real) capital gains factor, $1 + g_w = (W_{t+1})(W_t)$ is the wealth growth factor and $1 + g_{ws}$ is the volume driven wealth growth factor with $g_{ws} = s/\beta_t$. With savings rate information, the capital gains factor can be derived as a residual.

The additive equation can be derived directly by cumulating savings and dividing Eqq 2 by Y_{t+1} to get:

$$\beta_{t+n} = \underbrace{\frac{W_t}{Y_{t+n}}}_{\text{Initial wealth}} + \underbrace{\frac{S_{t,t+n}}{Y_{t+n}}}_{\text{Cumulated savings}} + \underbrace{\frac{\delta_{t+n}W_t}{Y_{t+n}}}_{\text{Cumulated capital gains}} \quad (4)$$

With either method, I use the capital gains portion ($1+q$ or $\frac{\delta_{t+n}W_t}{Y_{t+n}}$) to capture all other determinants barring saving rates or cumulated saving. They are the remnant explanations when growth of wealth cannot be explained purely by savings as per the data. Note that in the long run, savings are much more essential to the multiplicative equation because asset prices need to be "multiplied" with some non-zero element. Even with structural capital gains, as $n \to \infty$, if saving rates are rising over time then they will acquire much more importance as an explanation of $1 + g_w$. The additive decomposition is better in the medium run, particularly because the initial wealth factor[8] can be important over smaller time frames. I provide both decompositions since they convey important information in different ways.

3   Results: Indian wealth in the long run

I turn now to this article's main findings and central result shown in Figure 2. Benchmark Indian wealth-income ratios can be read either as secularly increasing from 1860 to 2012 or as the combination of two waves. The first wave drove up β from around 250-300% in the late nineteenth century to nearly 700% at the beginning of World War II (1939). This was followed by a dramatic decline; matching the strikingly sharp rise observed between 1913 and 1939. National wealth pushed down to just under four years of national income by 1960. The second wave is essentially a unidirectional rise starting 1960 and ongoing into the twenty first century. In 2012, wealth was worth almost six years of national income. This leaves much to be addressed in the rest of this section, particularly because these large swings coincide with the structural and political events of the mid twentieth century and the rise of post 1990s "shining" India.

Why were wealth-income ratios so low around the mid nineteenth century? After all, at this point India was a low growth agrarian society with a patrimonial landowning class. Precise estimates are lacking but the best attempts from economic historians put economic growth at less than 1%

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[8]Because $\beta_{\text{initial}} = \frac{W_t}{Y_{t+n}} = \beta_t/(1+g)^n$, the weight of this factor declines over the long run. See Section C of the online appendix for discussion of the details, merits and mechanisms of both equations
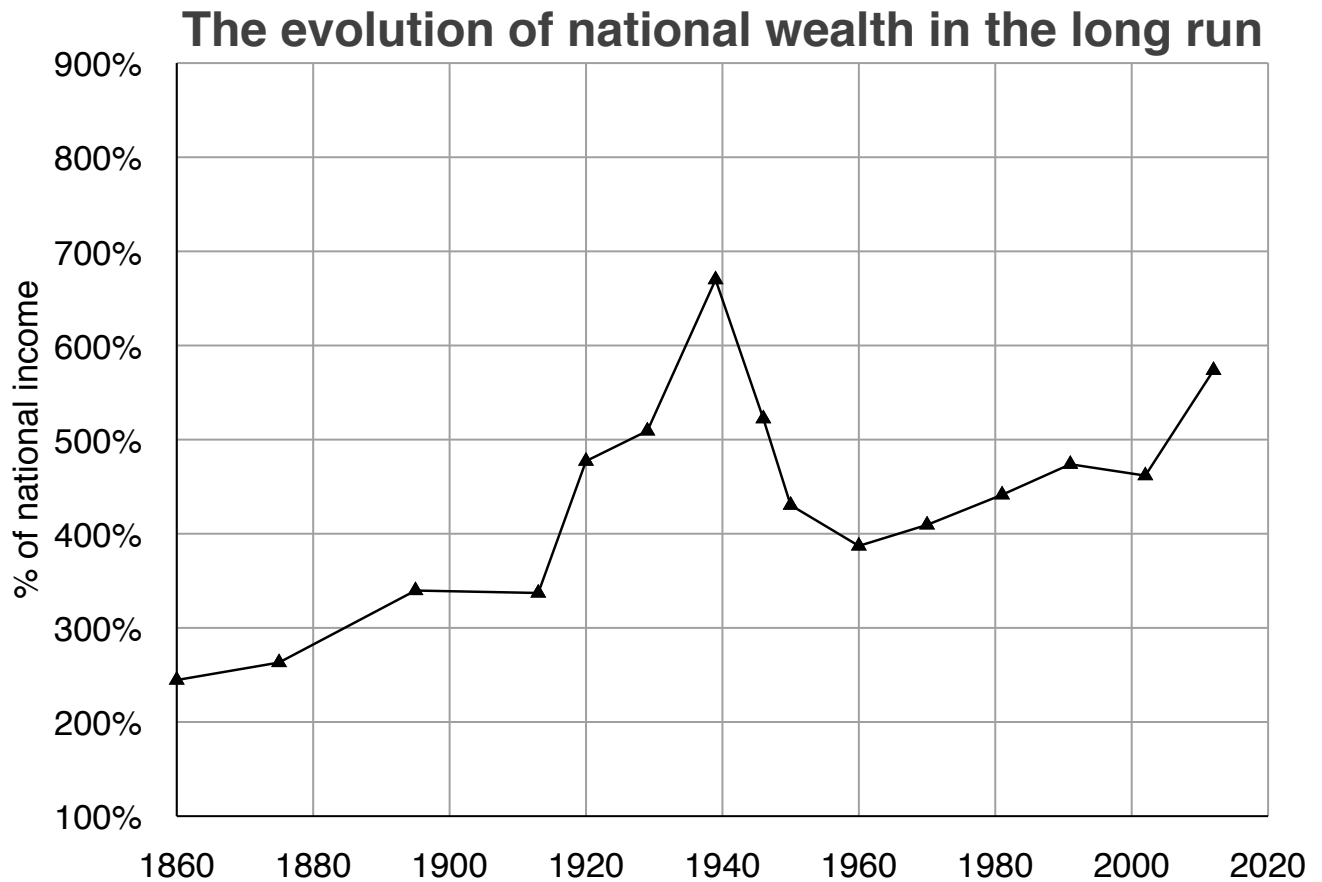
The evolution of national wealth in the long run

Benchmark series. National wealth = land + capital + net foreign assets.

Source: Author's computations in Supplementary Database Table 3B

Figure 2: Wealth-income ratios in India 1860-2012

and closer to around 0.5% (Broadberry et al., 2015) until 1870. With such negligible growth, as per the long run steady state s/g formula, wealth should have been worth several years of national income. Consider the approximately similar situation in pre-industrial Europe. With low growth , β was closer to 600-700% and dominated by agricultural land values (Piketty and Zucman, 2014). The main difference however was that Europe had higher saving rates. Past investments in land had generated sufficient surplus to be accumulated as capital in the transition to industrial capitalism. Colonial India had markedly different incentive and institutional structures. The hierarchical land revenue systems installed during Company rule were based on surplus extraction rather than generation through re-investment to improve agrarian productivity. De-industrialization in the

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first half of the nineteenth century and primitive transport[9] were hardly the recipes to generate investment dynamism.

Between 1870-1914, the Indian economy transformed substantially. The British administration began public investment into irrigation (specially canal systems), increased acreage and improved transport. A careful incentivization approach recalibrated the fiscal burdens of landed elites towards ownership rights (Roy, 2016). Land became more productive but there was no overwhelming demographic boom. Multi-decade railway expansion generated significant social savings (Donaldson, 2018) and agriculture became export oriented. The diffusion of commercial incentives raised the rate of investment. Economic growth, for this period, was around 1-2% and with limited population growth this implied per-capita incomes were growing at 0.5-1% annually (Roy, 2006). For an admittedly limited period, this meant the Indian economy was growing at rates not necessarily much behind Europe. The growing importance of land raised both land prices as well as rents (Roy, 2002). These developments implied a tendency for increasing wealth-income ratios because s/g for the 1870-1914 period was higher than it had been in the past.

3.1 The 20th century wealth revolution

Aggregate twentieth century trends in Indian wealth can be characterized by two simultaneous developments. On the one hand, there were large fluctuations in wealth-income ratios especially during the turbulent 1900-47 period. This pattern, which can best be summed as a *rise-fall-rise*, generated a pronounced U shaped evolution between 1939 and 2012. At the same time there were secular upward shifts in the profiles of saving and growth rates (Table 1). Economic growth accelerated over the transition from colonial rule to planned development and subsequent market driven dynamism. But the rise in saving rates was much higher, moving from single to double digits when comparing 1913-46 and 1950-81. In some sense, the heavy lifting in terms of higher savings was stronger in the planned era than the late twentieth century Indian macroeconomic ascendancy. The net result was a growing correspondence between the predicted one good steady state (s/g) and observed wealth-income ratios. Obviously the real lesson is that capital accumulation was important. But it does not unify the linear s/g profile with empirical non-linearities of

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[9]See Clingingsmith and Williamson (2008) for de-industrialization. Tomlinson (2013) puts the lack of social savings down to much of the primitive pre-1850 transport structures.
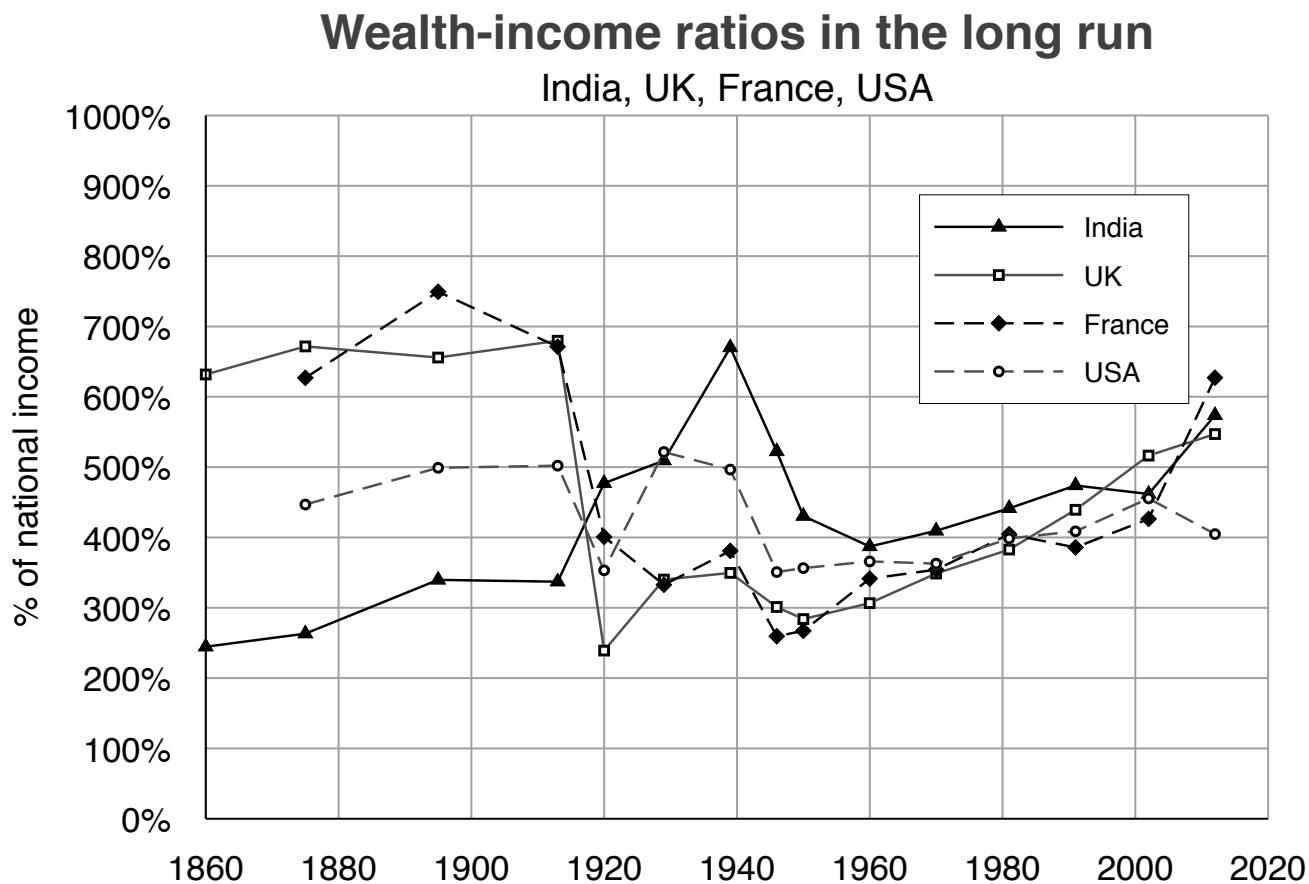
wealth-income ratios.

Sub-period	Real growth of national wealth (g$_W$)	Real growth of national income (g)	Savings out of national income (s)	Steady state formula (β = s/g)
1913-1946	2.60%	1.18%	2.59%	220.05%
1950-1981	3.91%	3.83%	10.56%	275.54%
1981-2012	6.91%	6.04%	22.69%	375.59%

Table 1: Growth and saving rates in India 1913-2012. Supplementary database (Table 6A). Benchmark national wealth series

Another key transformation occurred at the global level over the twentieth century. Figure 3 compares the evolution of national wealth in India to other large economies on a historical scale. In the second half of the nineteenth century there was a large gap between wealth-income ratios in Europe, USA and India. The size of wealth relative to national income was a third of European levels and half the American levels. Differences between Europe and USA were understandable considering the latter was growing faster (s/g was lower) and the former had colonial resources. The Indian wealth-income ratio at this point was what should have been expected after a long investment stagnation. But the first half of the twentieth century produced fluctuations and reshaping of growth trajectories everywhere. In the aftermath of World War II (and Indian independence), wealth-income ratios collapsed together and their recoveries over the next several decades occurred at more or less the same pace, creating a soft convergence. By this point, Indian wealth was worth slightly more (in terms of national income) than levels in France, UK and USA. To be sure, the long run U shaped evolution of β in rich countries was quite different from India. Europe and USA had sustained high wealth-income ratios for long periods which were interrupted by progressive tax innovations combined with asset price shocks between 1914-60. India's U shape connects what was an interwar period bubble[10] to a sustained increase in wealth-income ratios

[10]This bubble also appeared in Europe and USA following the Great Depression. There are many reasons for this bubble in Western countries, most of which are beyond the scope of this article. Briefly, the depression created

since the 1960s.

Wealth-income ratios in the long run

India, UK, France, USA

Source: Author's computations and World Inequality Database (wid.world). See Supplementary Database Table 5A

Figure 3: Wealth-income ratios in France, India, UK and USA

3.1.1 The rise of capital accumulation

How did rising Indian economic growth square up with aggregate wealth in the twentieth century? The multiplicative decomposition (Table 2) sheds some light on the changing sources of wealth accumulation. In the long run with rising saving rates, accumulation increased significantly. Indian wealth in the late twentieth century (and early twenty first century) was predominantly driven

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a stronger output collapse because wealth-income ratios rose in the 1930s in most large economies. This can be understood as accumulated inventories, public capital driven recoveries etc.

by new accumulation (higher s/β). Between 1950 and 2012, volume (saving) effects explain[11] approximately 63-75% of (real) wealth growth rates. Pre-1950 trends on the other hand reflected wealth accumulation through asset price appreciations. The real rate of capital gains accounts for around 70% changes in wealth through 1913-46. Obviously data imperfections raise many challenges. But using the best series on hand, the simple message is that capital accumulation was too low to account for the striking patterns that are observed in interwar India. Secondly, as I will soon discuss, macroeconomic and distributional factors played an important role in structuring the accumulation of wealth in different ways.

Sub-period	New accumulation, $g_{sw} = s/\beta$	Real rate of capital gains, $q = \frac{(1+g_w)}{(1+g_{sw})} - 1$	(1) % growth of wealth due to saving	(2) % growth of wealth due to capital gains
1913-1946	0.77%	1.82%	30.12%	69.88%
1950-1981	2.45%	1.42%	63.58%	36.42%
1981-2012	5.14%	1.68%	75.66%	24.34%

Table 2: Sources of wealth accumulation 1913-2012. Multiplicative decompositions using benchmark wealth series. Supplementary database (Table 6A)

In the immediate decades after independence, state planning focused most heavily on capital formation. It was hypothesized that the rate of savings needed to be raised to finance the capital goods sector and use this as an anchor to push up rates of economic growth. To a great extent this was a response to international market exposure and low demand for capital goods that had been identified as constraints to domestic capital buildup in late colonial India (Bagchi, 2000). While the basis of initial planning was the erstwhile Mahalanobis[12] model, globally "in vogue" economic ideas were unanimously focused on overcoming supply side constraints to industrialization. With limited

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[11]All decomposition results also hold under different computations of wealth, i.e by adding alternative gold & silver series.
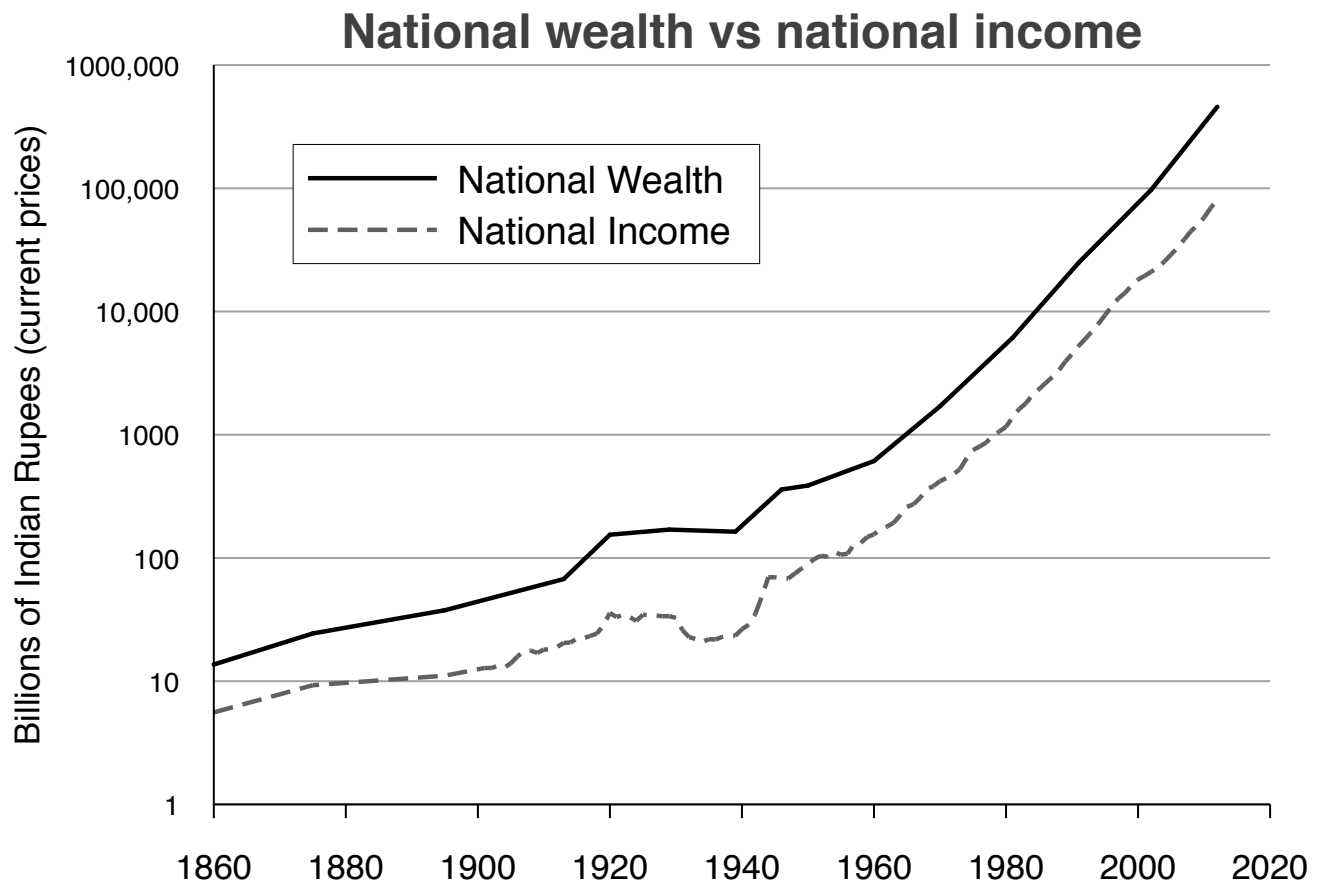
[12]More correctly this was the Feldman-Mahalanobis two sector model based on Marxist principles. The technical program was modeled in Mahalanobis (1953).

capacity to generate saving in a poor economy, the public sector took on much of the burdens of investment. The result by the end of the 1970s was that despite planned accumulation India's "Hindu rate" of growth could not push beyond 3.5% although the net saving rate did eventually increase to five times its colonial average. Note that despite its inherent bias towards rising saving rates, the multiplicative equation still requires some amount of capital gains (q = 1.4%) to account for the residual rise in wealth-income ratios. Problems of acreage stagnation and high population growth (Chakravarty, 1984) continued to buoy asset prices (particularly land) through the latter half of the 1950-80 period. But the bulk of wealth changes in this period are explained by higher capital investment.

Due to the failure to raise growth rates, India's political class began to abandon its mistrust of private capital in the 1980s (Kohli, 2006). The growing consensus amongst economic experts was that the state could simply not fill the gap between desirable and actual growth rates without participation from private players. Industrial dynamism followed deregulatory reforms and Indian economic growth stepped up to historic highs into the twenty first century. With rising incomes the rates of savings doubled to finance much of the capital accumulation characterizing the 1980-2012 period. The new equilibrium was high growth-high savings with a capacity to build and sustain higher capital-output ratios. Its important to remember that policy orientation switched from pro-poor to pro-business in independent India but it was always pro-capital. The only difference was the accumulation once driven by public planning, now became an opportunity for private capital.

3.2   The changing structure of wealth

From a comparative view, the rise of savings explains why India moved from low to high wealth-income ratios between 1913 and 2012. But does the shift in the savings-growth profile alone explain the U shaped evolution in the long run? The simple response is no. There are two remaining concerns to be addressed. First, why did wealth-income ratios grow so rapidly until the eve of World War II and why did they decline so much by 1960-61. Secondly, how did the importance of initial wealth change? Especially considering the remarkable differences in economic growth before and after Indian independence.

National wealth vs national income

Billions of Indian Rupees (current prices)

Legend: National Wealth; National Income

Source: Author's computations in Supplementary Database Table 3B

Figure 4: National wealth and income at scale.

3.2.1 The interwar bubble

Much of the spike in wealth-income ratios during the interwar years is down to a denominator effect. Figure 4 shows the separate evolutions of national wealth and national income. While long run trajectories trajectories are relatively similar, growth stalled in the 1920s and nominal output completely collapsed after the great depression. The outcome was a decade long asset price inflation (relative to consumption goods). Part of the subsequent decline in wealth-income ratios was simply the resumption of national income growth in the 1940s. Conditions that led to the onset of stagnation in the 1920s had their origins in the second decade of the twentieth century. Much of the 1870-1914 growth had been derived from increased per-capita agricultural sector growth. The structure of agrarian investments predominantly raised land area but did not improve yields by a significant margin (Blyn, 1966). At the same time, improvements in agriculture

were a stabilizing strategy of the British administration in India; large landowning classes did derive some surplus. Tastes for gold and silver were large, acting as a sink for much of the savings of rural elites (Roy, 1995). By 1900-05 once land expansion reached its limits (Tomlinson, 2013), the slowdown of agricultural output began to exert a drag on per-capita income growth. Economic historians trace the interwar slowdown to this crisis in agriculture (Roy, 2006). The whole situation was compounded by 1920-21 due to demographic shocks; after a long dormancy, declining death rates (Guha, 1991) pushed up population growth in India and created a severe land scarcity situation. This combination of land scarcity under sustained population growth from 1900-46 plagued almost the entire first half of the twentieth century.

Composition of National wealth
Incl. Gold & Silver
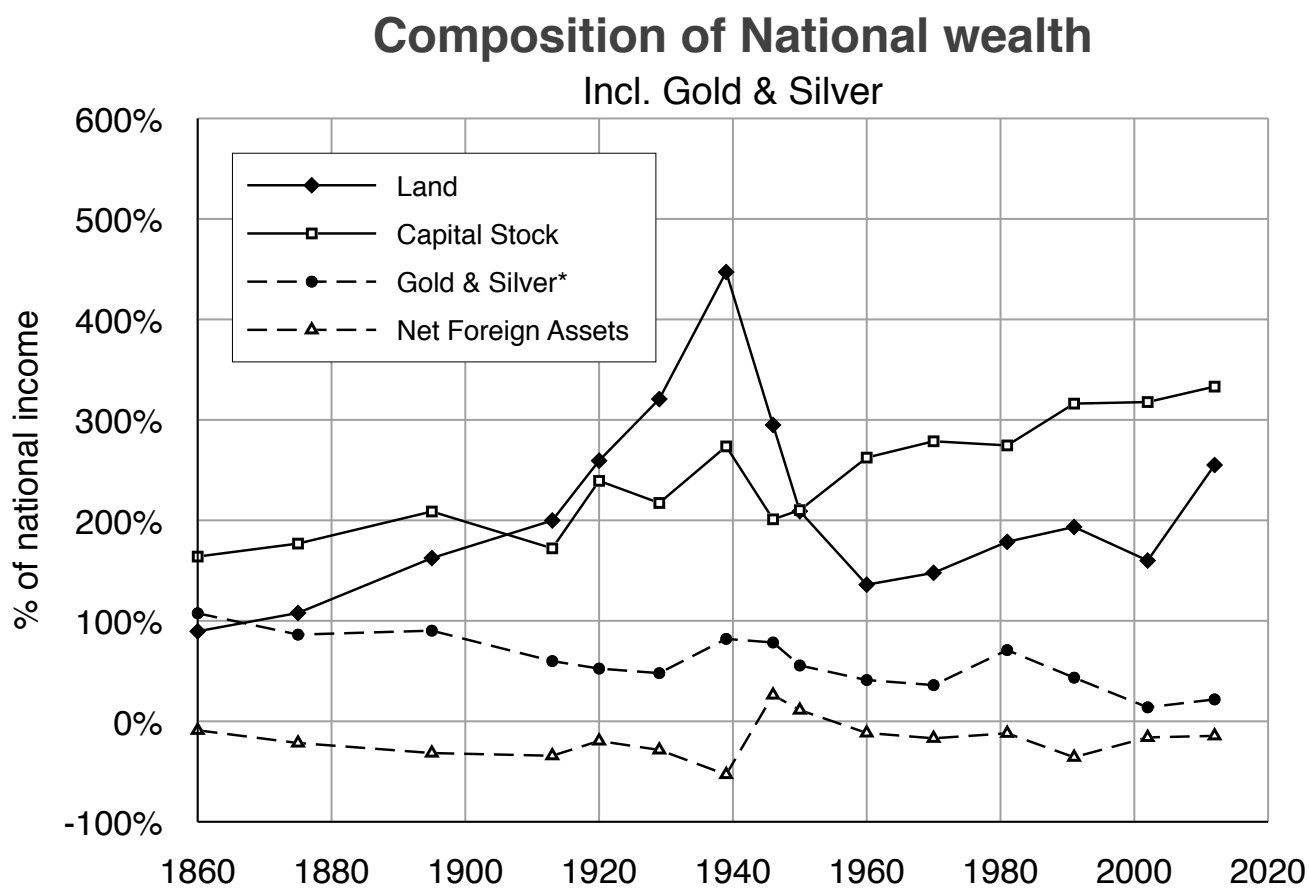
*Gold & silver Scenario 1.

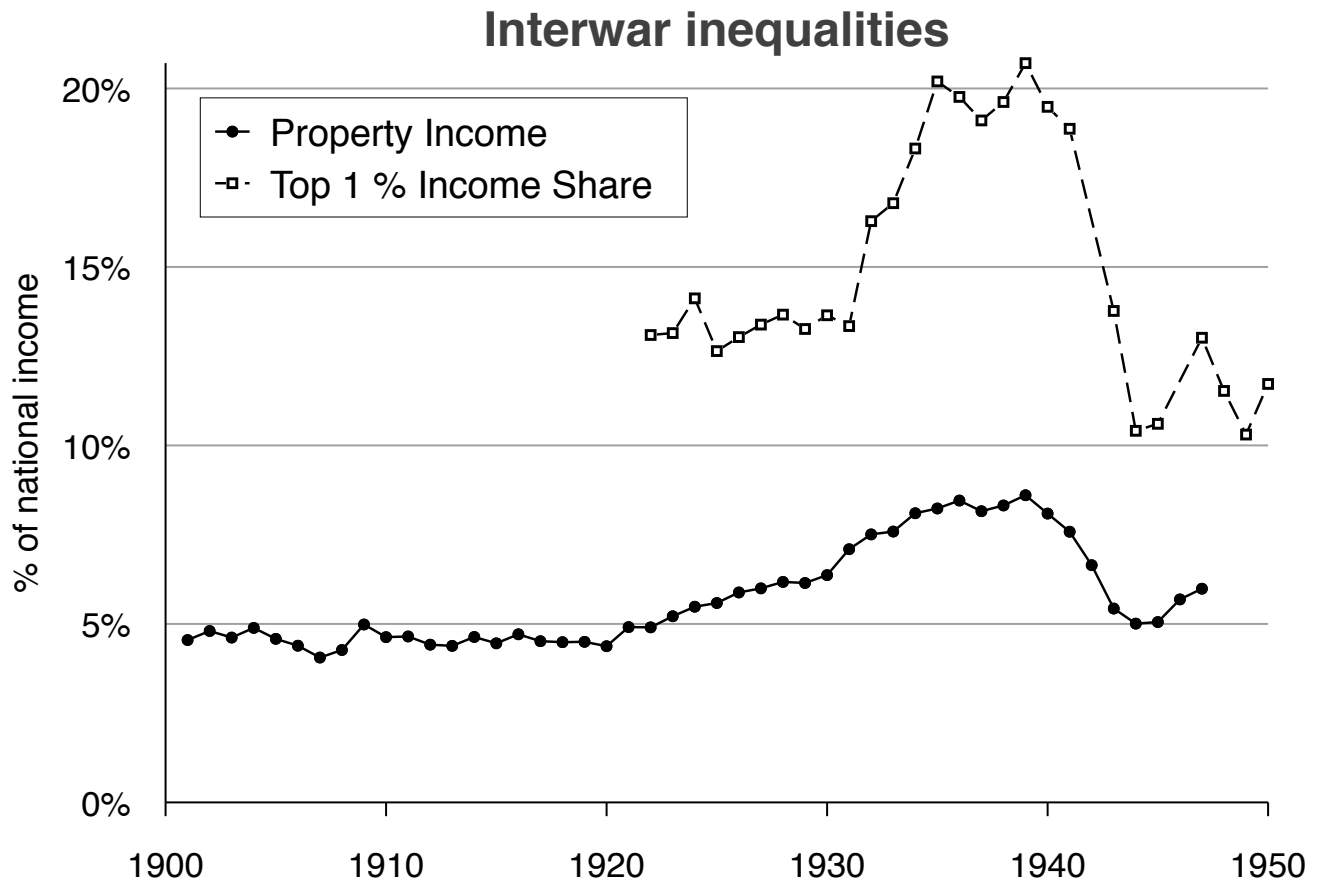Source: Author's computations in Supplementary Database Table 3B

Figure 5: Composition of national wealth 1860-2012

Early agricultural gains in the commercialization expansion of 1870-1914 and the scarcity situation that followed explain the unambiguously growing importance of land in national wealth (Figure 5). In his famous theory, Ricardo (1821) had argued that capitalist development could create exactly these dilemmas due to the unique position occupied by landowners. This class had acquired property rights to a non-reproducible asset which would become scarcer due to population growth. In such a situation, the value of land would increase[13] owing to higher capitalization of rents from the surplus. Accordingly, land prices would rise disproportionately relative to other capital. Note that although wealth-income ratios rose due to the output collapse, land pushed past the value of capital during the interwar years. Conditions on the whole had become much more favorable for landowners. Land revenue, which had been the major tax instrument under colonial rule became a fraction of rates prevailing in the 1800s (Maddison, 1971). Within the agricultural sector, real wage rates completely stagnated after the great depression. But non-wage (especially property) incomes and certainly income concentration increased as a whole (Figure 6). Higher shares of property in aggregate national income after 1929 were basically redistribution towards the propertied gentry. Cash crop farmers were particularly affected because the great depression squeezed global demand for their output. This produced part of the export surpluses in gold and silver[14] motivated by distress sales to keep up with unrealistic rent burdens (Tomlinson, 2013).

The price turbulence created by agrarian distress and growth slowdowns can be better understood on the basis of ground realities. Hirashima (2008) conducted detailed micro-studies of land

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[13]The source of asset price divergence is related to the distinctive properties of reproducible vs non-reproducible assets. This argument can be summarized as follows: assume land volume is fixed ($V = p\bar{V}$) where p is the price of land relative to the consumption good. Thus higher values are due to real capital gains. Income derived from land (rents) is $R = rV$ and the arbitrage condition requires that the return (r) to any form of wealth be equal. By substitution, $p\bar{V} = \frac{R}{r}$ with capitalization factor $1/r$. In this scenario with decreasing returns, if the capital-labor ratio is to be maintained under population growth then r must fall. The capitalization factor rises and since the volume of land is fixed, p must rise to maintain portfolio balance. Note that prices could rise even in anticipation of eventual rents, before land constraints become binding. For more detailed models, see the land-theorem in Homburg (2014) and the land constrained model in Foley and Michl (1999). Bubbles from rising capitalization factors were the principal force driving land values in colonial Punjab.

[14]Note that the other reason for exports of gold were also outflows to support "home charges." These were payments made to Britain for administrative services from revenue collected in India. Land revenue contracts had been set in the late 1800s so that the real revenue obtained from land had dwindled, plus the depression lowered capacities to recover past revenues.

Interwar inequalities

Source: Author's computations and World Inequality Database (wid.world). See Supplementary Database Table 2B

Figure 6: Income inequality and property income shares in interwar India

markets in the erstwhile Punjab[15] region. Punjab had the largest price booms (Mukerji, 1969) between 1900-46, appropriated a third of total irrigation funding and half the total irrigated area by 1919-20. As the chief beneficiary of past investments, this region had the most potential to exhibit Ricardian dynamics during growth slowdowns. Hirashima found that the land prices grew very rapidly starting in 1910-15 and outpaced the growth of rents thereby creating a "land bubble" in the interwar years. Since most small rural households had taken financial loans to make land purchases, the depression reduce their ability to pay back moneylenders. Land transactions, which peaked in the 1930s, were mostly sales of smaller holdings to wealthy landowners who had excess liquidity to buy land without external financing.

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[15]Now split into Indian Punjab and Pakistan Punjab

What lessons can be drawn from the Indian experience of the interwar years? The most important conclusion is that in agrarian type economies if (1) growth rates are low (2) there are sufficient past investments to support land holdings and (3) economic growth is primarily demographic, then older wealth will dominate national income. This differentiates the size of wealth-income ratios in India during the mid eighteenth century (250-300%) from the levels between 1920-39 (500-700%). Temporarily, the dominance of wealth over national income gave India the *synthetic* appearance of eighteenth century Europe on the cusp of industrialization.

3.2.2   The return of asset prices

To understand the decline of old wealth under economic growth, I present estimates from additive wealth equations (which count initial wealth) in Table 3. These cover 1913-2012 on an approximately decennial basis. Using these results, it is easy to understand the U shaped trajectory followed by wealth-income ratios in the long run. The causes behind the declining ratios over 1940-60 were twofold. First saving rates had not yet risen sufficiently. Thus they could not compensate for the declining share of initial wealth under the economic growth recovery. The contribution of initial wealth W_t to wealth-income ratios β_{t+n} after n years is $W_t/Y_{t+n} = \beta_t/(1 + g)^n$. Even a small rise in growth rates can have a significant impact. In ten years, a growth rate of 1% reduces W_t/Y_{t+n} by around 10%. A growth rate of 3.5% on the other hand consumes 30% of initial wealth. The second effect stems from capital losses incurred in the lead up to independence and the Indo-Pak partition. Capital gains cumulated over ten years used to worth almost 100-150% of national income. They turned negative between 1939-46 and remained suppressed under 60% until the 1980s.

These decompositions also shed light on the return of high wealth-income ratios after 1981. The division of land between India, Pakistan and Bangladesh had reduced the total amount of land. The position of capital (relative to land) became much more favorable due to wartime industrial demand. Prices of land and other assets, such as equities, were then expropriated by rising consumer price inflation (Figure 7) in the aftermath of independence. This had to do with the nationalizations of intensive industries, land-reforms aimed at breaking large landholdings[16]

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[16]India's two step land reforms of the 1950s and 1970s were meant to be redistributive as opposed to expansionary (Besley and Burgess, 2000). Land reform committees operated acknowledging expansionary constraints and were cognizant of the increased concentration of land in the twilight of British rule. Perhaps unsurprisingly, Maoist peasant

and progressive taxation implemented in the 1950s under India's socialist minded Prime Minister Jawaharlal Nehru. But under growing saving rates and the retreat of state intervention from domestic investment, the situation became more favorable for private industry. Asset prices responded positively, accelerating away from consumer prices after India's 1990s reforms. Additive estimates show that cumulated capital gains again were worth 100-150% of national income after the 1980s. Growth in the size of cumulated savings compensated for declining initial wealth under economic growth. Thus, asset price fluctuations were necessary conditions behind the fall and rise of wealth in the twentieth century. They mirror the long run U shaped path of Indian wealth-income ratios.

Period	$\beta_t = W_t/Y_t$	$\beta_{t+n} = W_{t+n}/Y_{t+n}$	Initial Wealth Effect W_t/Y_{t+n}	Cumulated Savings Effect $S_{t,t+n}/Y_{t+n}$	Cumulated Capital Gains effect $\delta_{t+n}W_t/Y_{t+n}$	(1) % W_{t+n} due to initial wealth	(2) % W_{t+n} due to cumulated savings	(3) % W_{t+n} due to asset prices
1913-1920	337%	477%	323.08%	26.25%	82.36%	67.71%	5.50%	26.79%
1920-1929	477%	509%	381.81%	23.50%	98.53%	74.96%	4.61%	20.42%
1929-1939	509%	670%	507.92%	40.91%	148.58%	75.81%	6.11%	18.08%
1939-1946	670%	522%	543.10%	16.75%	-36.91%	104.00%	3.21%	-7.20%
1950-1960	430%	387%	282.56%	51.75%	58.91%	72.99%	13.37%	13.64%
1960-1970	387%	409%	267.89%	75.00%	62.45%	65.43%	18.32%	16.25%
1970-1981	409%	441%	283.35%	114.32%	44.56%	64.19%	25.90%	9.91%
1981-1991	441%	474%	264.86%	100.47%	107.95%	55.90%	21.20%	22.90%
1991-2002	474%	462%	264.75%	141.07%	56.52%	57.33%	30.55%	12.12%
2002-2012	462%	574%	224.01%	194.47%	150.83%	39.05%	33.90%	27.05%

Table 3: Sources of wealth accumulation 1913-2012. Additive decompositions using benchmark wealth series. Supplementary database (Table 6A)

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movements of the late 1960s were located in erstwhile colonially designated landlord areas (Banerjee and Iyer, 2005).

The equity-output price gap
Share price index vs national income deflator
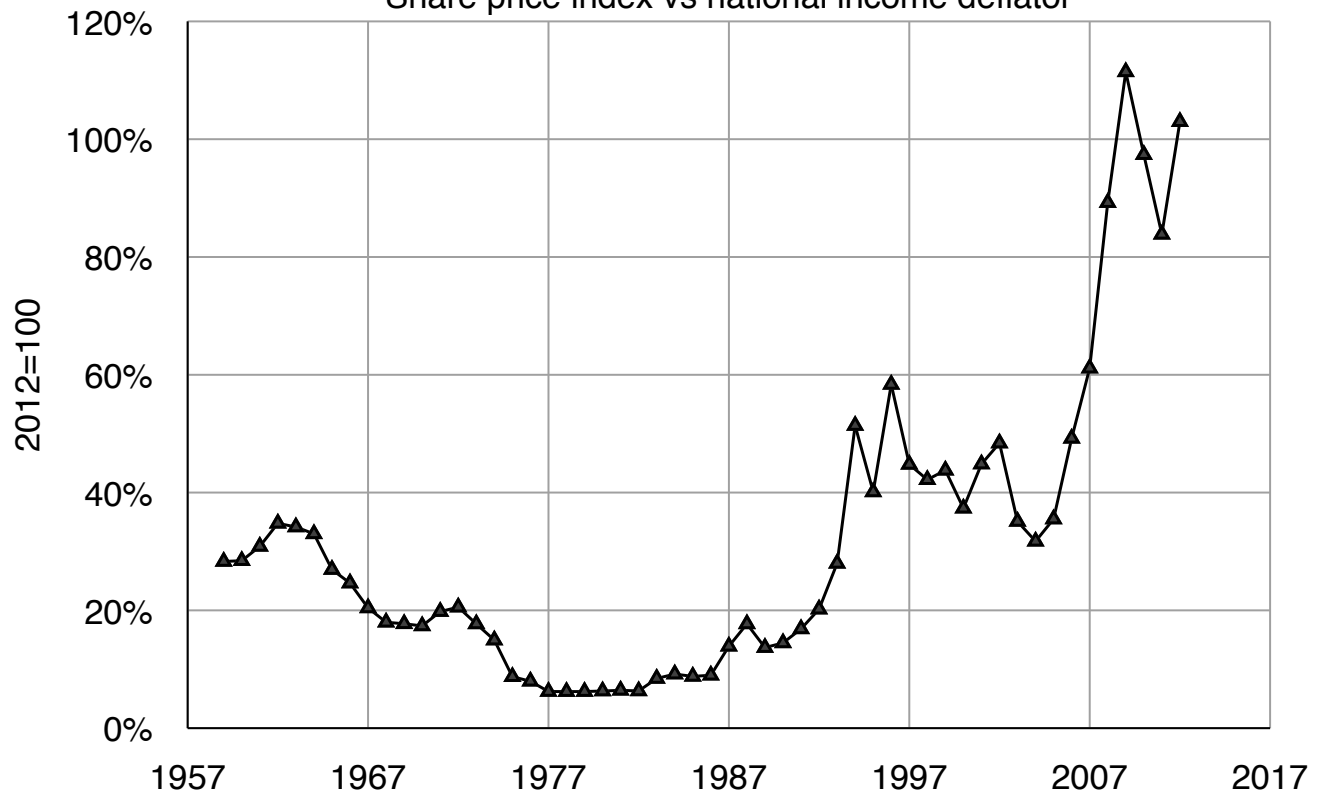
Source: Author's computations in Supplementary Database Table 2B

Figure 7: Ratio of stock market prices and national income deflator (2012=100)

Finally, rising asset prices deserve to be contextualized with the return of high land values in the twenty first century. In the 1920-39, land prices had risen but also acquired relative importance under the external shocks to national income from the great depression. Contemporary trends seem to be more structural and long term in nature. A majority of the Indian population is still land dependent but the driver of recent land prices is urban, rather than agricultural land. Estimates from the NSSO AIDIS surveys reveal that following the 1970s "Green Revolutions" land values in rural India were almost twice[17] their urban equivalents on a per household basis. By 2012, the urban-rural land price ratio[18] was approximately 150%. Wealth inequality in India since 1991 itself

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[17]This did not imply higher real estates prices in rural India because the value of structures and buildings are excluded

[18]See Sheet *Raw 7_8* in the Supplementary Database.

seems to be driven by the growing urban-rural divide (Anand and Thampi, 2016). At the same time, preferences for land continue to dominate household portfolios across the board Badarinza et al. (2016). I do not attempt to explain the urban land phenomena, but these can result from rising non-agricultural incomes, inelastic preferences for land and rural-to-urban migration. Compared to other large economies (Figure 8), India is the country with the largest demographic pressure and lowest land-population ratios. In these other countries, the growth of private real estate has been crucial to rising wealth-income ratios. With this in mind, the value of land should in theory (as in experience) be highest in the country with most pressing land dependencies. As long as projections of demographic dividends continue to be realized, Indian population growth may well keep land prices high and feed their appreciation.

Population density and land in large economies
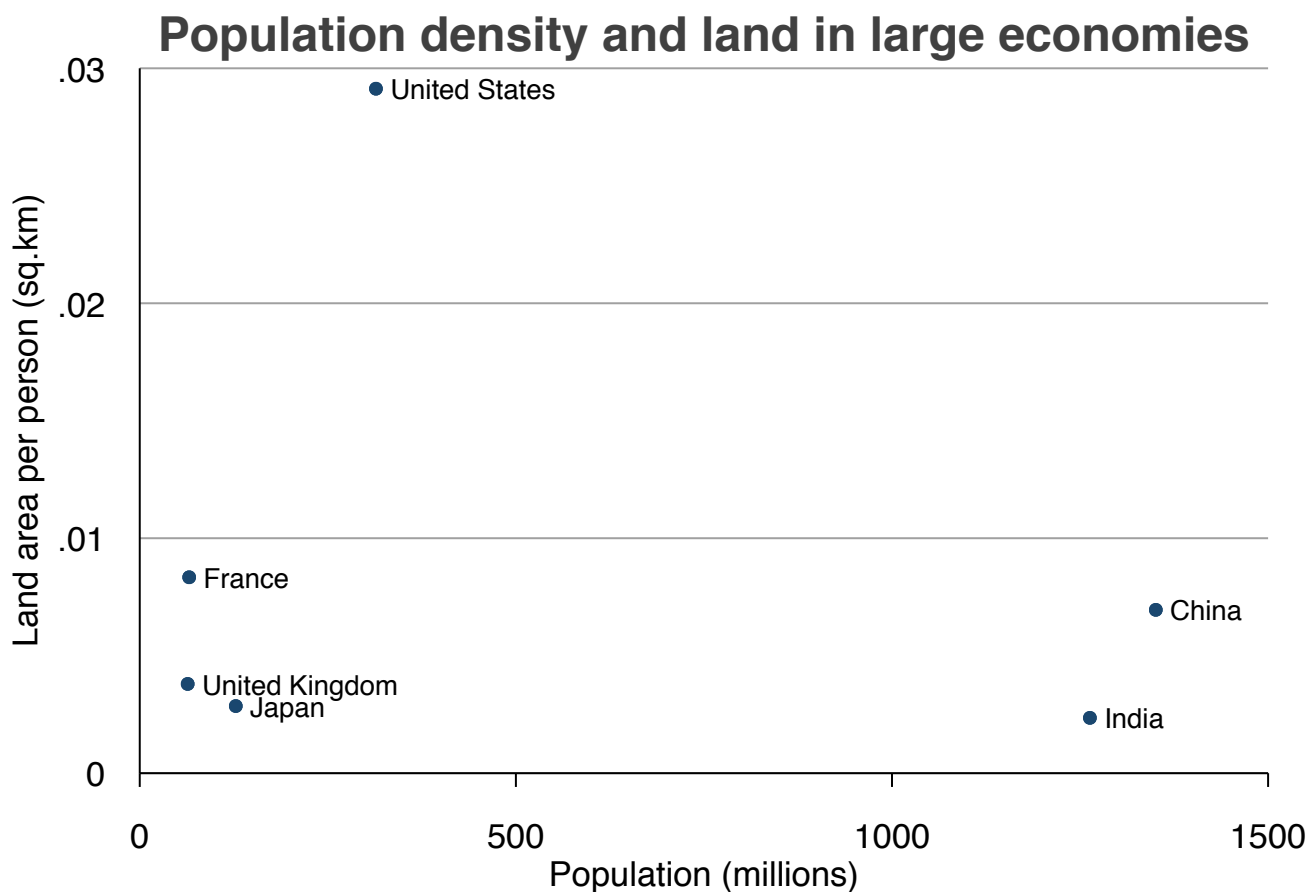
Source: World Bank Open Database

Figure 8: Land-population ratios in large economies (2012)

3.3 Political economy of public wealth in independent India

The British empire's economic operations in India were split into fiscal-military rule and unfettered integration into global commerce. The government operated primarily as an administrator, rather than providing basic industrial capital through state enterprises. Besides the socially dominant landlord class, an indigenous capitalist class had sprung up and strengthened its position under the great depression and wartime turbulence (Mukherjee, 1976). Much of the ownership of wealth in colonial India should therefore be seen as private rather than public. After six decades, Indian wealth still appears to be mostly private. But this does not necessarily reflect a continuation from colonial to twenty first century India.

First, the combination of depressed asset prices and state expropriations (through 1950s and early 1970s nationalizations) imply that private wealth in sum had to have lost some share of national wealth. On the fiscal policy front, the combination of estate duties (1957-85) and wealth taxation (1957-92) were enacted to put boundaries on extreme private appropriation of wealth. The second main factor is the emergence of the Indian public sector which monopolized critical industries. Ironically it was India's leading industrial capitalists and the political class that jointly[19] developed outlines for state led industrialization. Planned development needed basic and priority industries, which themselves involved high risk investments. India's population was too poor to provide finance for rapid industrial growth.

The state took on much of this burden in the first few decades of independence (Figure 9). Between 50-70% of capital expenditure came from the public sector until the 1980s, while the rate of private saving grew slowly but surely. Early financing drew heavily on foreign borrowing, reversing[20] India's temporary foreign asset position of the 1940s. Borrowing was large in size and essential in the face of less than 10% private saving rates until the 1960s. But the strategy

[19]India's leading industrialists gave an economic outline in the 1945 "Bombay Plan." While Nehru (the first Indian Prime Minister) had mixed feelings towards the importance of private industry, it is generally agreed that India's first two five year plans were de-facto adoptions of the Bombay Plan. Economic historians have identified this development in two ways. (1) It was the best way for industrialists to protect themselves from global competition and (2) Building domestic industrial strength was a reaction to the foreign laissez faire type operations that retarded Indian development under British rule

[20]British borrowing to finance the war had stopped India's long status as a debtor.

did produce results. Public monopolies were generating some surplus because capital formation exceeded the public sector's net borrowing (i.e positive saving rates) until almost the 1970s (Figure 10).

Public capital formation in Independent India
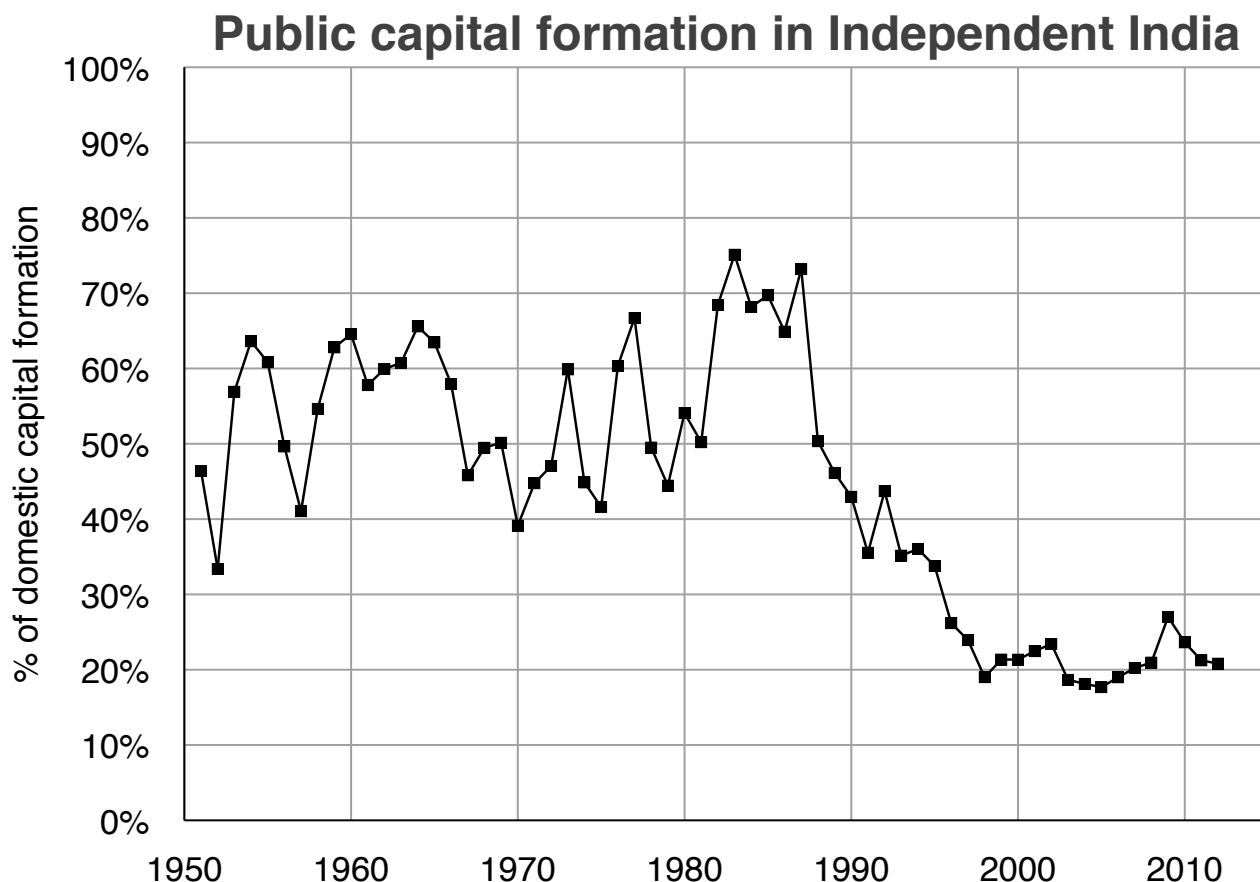
Source: Author's computations in Supplementary Database 2A

Figure 9: Public vs private capital capital formation 1951-2012

The demise of public wealth since the 1980s can be inferred indirectly on the basis of incomplete balance sheet information, capital ownership and long run saving rates. Financial holdings of the public sector are unavailable, besides cash flow information which shows[21] a downward trend.

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[21]Only since 2012-13 have asset registers of the public sector become available. In annual budgets, the central government releases its cash-flow estimates of accumulated outlays and loans (at actual values). The worth of loans in terms of national income is non-trivial, at around 10-20% through most of the 1951-2012 period but it also represents liabilities of state governments and public enterprises. Estimates are available in Supplementary Database Table 4B

Evolution of saving rates
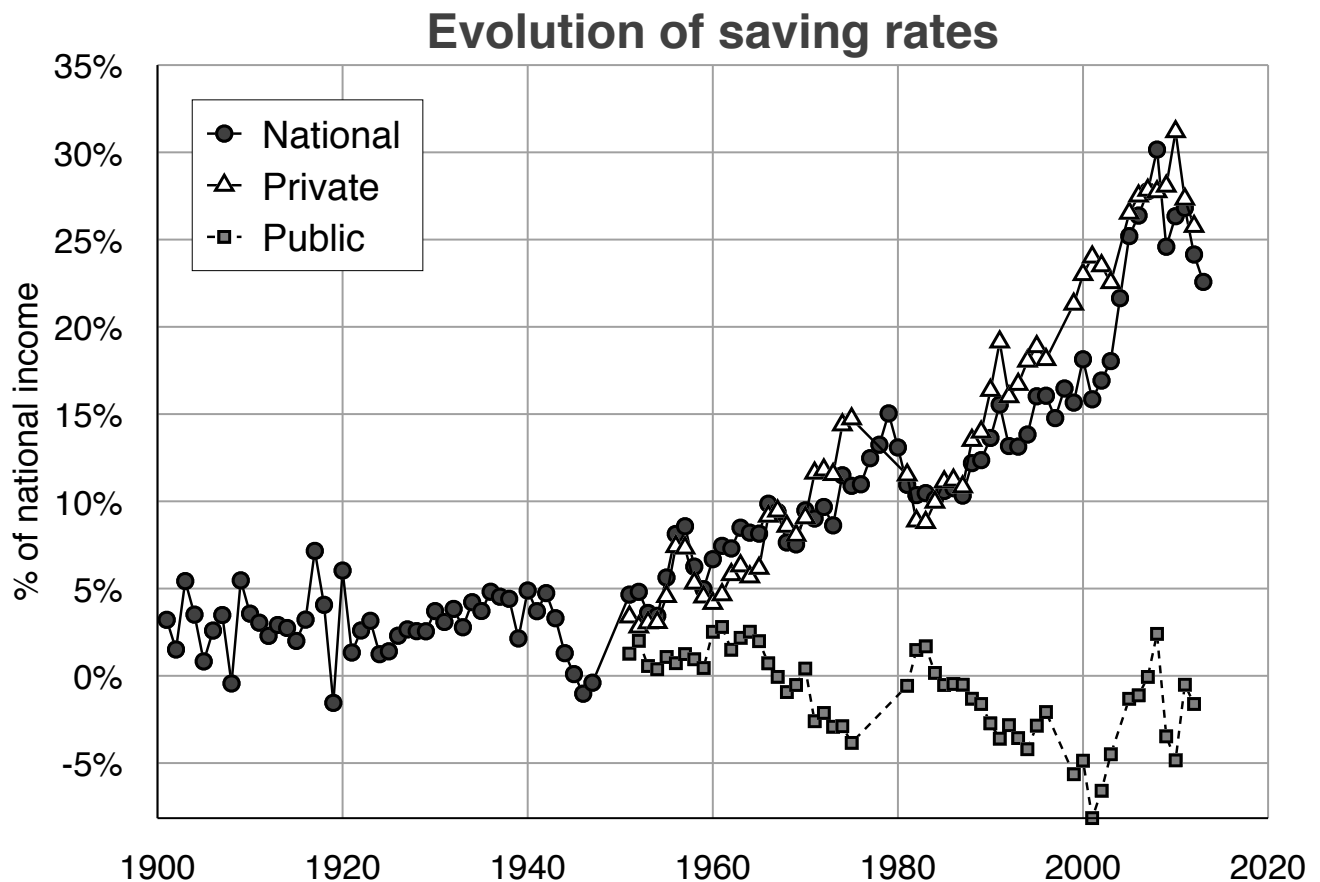
Source: Author's computations in Supplementary Database 2A

Figure 10: The evolution of saving rates 1900-2012

The general mechanism seems to be an initial crowding in of private capital into the industrial and financial setup followed by a retreat of the public sector from capital ownership, leaving the state with primarily a deficit financing role. Private or public wealth is the sum of non-financial assets and net-of-liabilities financial assets of the respective sector. Assuming (for a moment) the same size of financial wealth for each, higher wealth shares will accrue towards the larger non-financial capital owner.

It is unambiguously true that private capital (corporations and households) has appropriated a growing share of domestic capital stock since the early 1990s (Figure 11). Since on aggregate, capital is rising faster than national income, this could have been purely distributive dynamics had public capital also been rising. Growing private shares could have reflected faster capital

accumulation in the private sector as opposed to the public sector. But instead, one observes secularly falling ratios of public capital to national income (Figure 12); hence the "retreat of the state." This marks evolving ideology of technocrats during the mid 1990s which reversed earlier nationalizations through the sale of public assets and reduced restrictions on private entry and finance into public monopolies. At the same time, public debt has increased by a rather large magnitude. In the 1950-81 period it used to around 20-40% of national income. Since 1991 it is closer to 60-70%, driven by internal borrowing with the growth of domestic financial sources. Now relaxing the equal financial wealth assumption, it would require public financial assets on the order of 40-60% national income to create 100% asset-liability balance for the public sector. And these assets would need to have grown at astonishingly high rates to outpace private wealth. The latter possibility seems unrealistic considering decades of negative public saving rates.

As argued already, the size of wealth-income ratios in independent India is well explained by the higher steady state ratio s/g. If saving rates are being used to accumulate wealth and if private saving exceeds the national saving rate for most years then aggregate private wealth should be growing faster than public wealth. The exact positive or negative public wealth would obviously depend upon the starting base or even asymmetric valuations. Cheap privatizations, such as when a public asset is sold but become immediately more valuable in private hands, can exacerbate the public-private wealth gap without a signal from the savings gap. The persistence of large capital gains after 1980 would certainly fit this theory. But sufficient evidence exists on the whole to support the following: high wealth-income ratios in twenty first century India should be seen effectively as the rise of private wealth-national income ratios in conditions because (1) Public capital has reduced (2) Public debt has increased (3) Domestic claims on public debt have risen (3) Public saving rates have turned negative. This development agrees well with trends in richer economies (with a larger welfare state) whose public capital is also on the decline (Chancel et al., 2018) over the same timespan.

4 Conclusion

My conclusions are brief. This article has shown that Indian wealth gained importance in the twentieth century, particularly in the last decades of colonial rule. India's independence temporarily slowed the accumulation of wealth with core explanations being capital losses, better nominal

Private capital since 1980
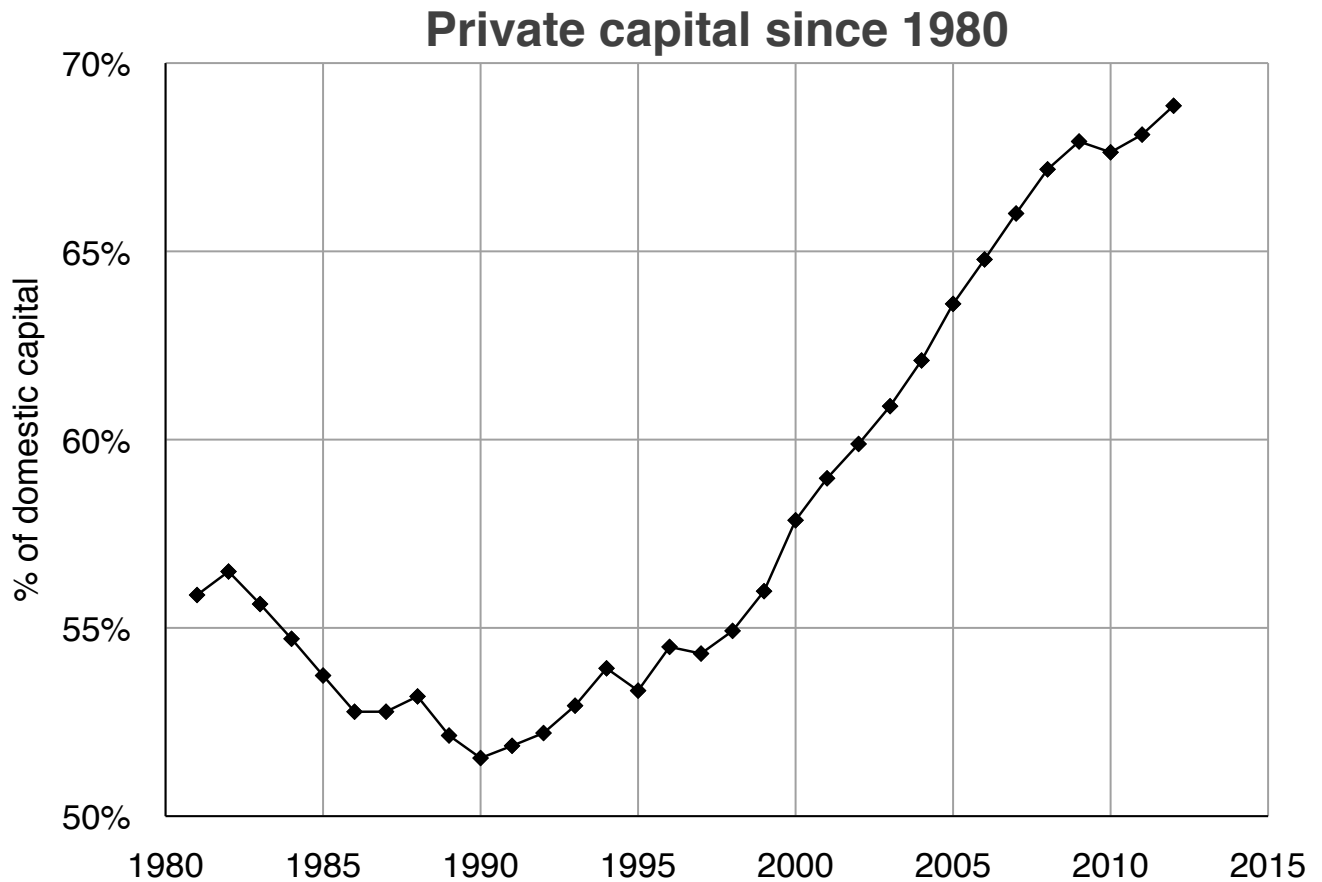
Source: Author's computations in Supplementary Database 3C

Figure 11: Public vs private capital share (non-financial) 1981-2012

output growth and a lag in generating sufficient savings to substitute for past wealth. Since the early 1980s, wealth-income ratios are gradually returning to their historic peak. There are many parallels between the interwar years and recent regimes of wealth accumulation; they reflect private wealth, asset prices are key and are driven by land as a growing proportion of national wealth. Remarkably, the Indian experience shows that wealth can become disproportionately large for any rate of national income growth. The only difference is that India's saving rates can today sustain a much larger capital-output ratio.

High wealth-income ratios do not necessarily imply growing wealth concentration. But in an economy with large social inequalities, a situation of large capital gains and privately held wealth, which by definition accrue to wealth owners, it is difficult to justify shared equitable results from

Select elements of public balance sheet

* net non-financial assets
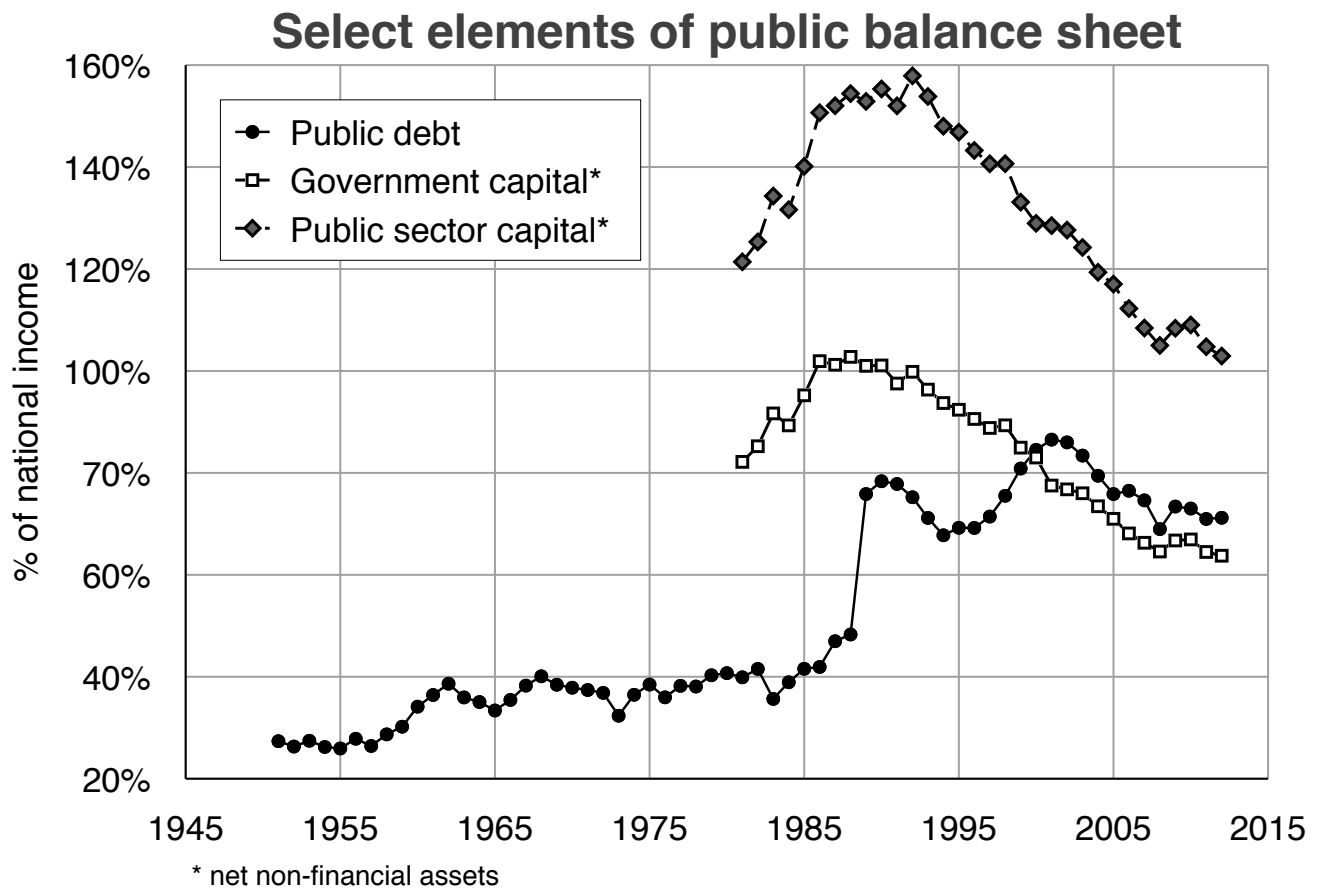
Public debt corresponds to general government. Public capital includes general government and public enterprises. Source: Author's computations in Supplementary Database 4B

Figure 12: Public capital (non-financial) and public debt 1951-2012.

wealth creation. Valuable land or even financially sophisticated private assets such as public debt would be claimed mostly by the rich. Trends in wealth-income ratios certainly coincide with periods of income concentration. Recent wealth inequality studies also point towards upward redistribution of land and financial assets since 1991. Regarding the functional income distribution, it is very difficult to measure precise shares of capital when in India a non-trivial amount of national income still gets absorbed by the unorganized sector. The composition of income may vary significantly in unincorporated activities due to different social relations of production or power hierarchies. This article should be seen as a preliminary step towards answering these very important questions. It is crucial to first identify the trends, size and composition of wealth, especially given the very limited statistical evidence that was already available. Future research can then be routed towards

understanding many remaining areas of research such as ecological assets, financialization, in-heritance and sectoral wealth balances.

Appendices

A data appendix is available in the online repository for this article;

https://www.dropbox.com/sh/q2tlpx5dt6kj0ll/AAC5qHj3XdEcO9px11VTIeJwa

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