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Abstract

The evolution and metamorphoses of wealth underpins historical questions of growth and distribution. This article develops new, homogenized series of the wealth-income ratio in India over fifteen transformational decades: from colonial rule after the demise of the Mughals to the contemporary rise of Indian capitalists on a global scale. Over the long run, there were two major waves of wealth accumulation. The first ended around World War II and was characterized by a Ricardian vision - landlords appropriated surplus value under low productivity conditions, benefiting from a large divergence of asset prices relative to consumer price inflation. Between 1939 and 2012, the Indian wealth-income ratio mimics the U shaped trend observed in other large economies. The second wave (between 1960 and 2012) is partly explained by capital accumulation but price effects consistently dominate large changes in wealth dynamics. Implications for distribution are noteworthy. Upswings of the wealth-income ratio are nearly always accompanied by rising concentration of economic power. Finally, over the last three decades the structure of national wealth favors private wealth over public capital. These findings underline an important stylized fact: despite large structural differences between rich and emerging countries, wealth-income ratios are rising everywhere in the twenty first century.

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1 Introduction

This article addresses a crucial long run question in the macroeconomic history of India: what were the trajectories of wealth-income ratios and what explains them? Intensive recent efforts by economists have produced new stylized facts on the global evolution of national wealth. In rich countries, specifically the early industrializers (US, UK, Western Europe), smaller slightly late industrializers (such as Sweden and Japan) and transitional economies (Russia and China) there has been a tremendous upsurge[1] in wealth accumulation relative to economic growth since the last few decades of the twentieth century. Wealth-income ratios are rising everywhere. To be sure, in the long run of capitalist history wealth was always high relative to national income save for the interruption caused by the two world wars and consolidation of the welfare state in the early twentieth century. Yet, the similarity of this key ratio in remarkably different economies raises new questions about how capitalism diffuses itself across geographical spaces and over time. Were we to only restrict our attention to mature economies undergoing demographic stagnation then the explanation was simple - when economic growth is low then savings from the past gain excessive importance. This result was derived from the one good model of capital accumulation and differences could be explained based on savings and growth rates alone. For example, Europe tends to have larger wealth-income ratios than the US because of higher saving rates and lower growth rates. But wealth-income ratios have also risen in Russia and China since the demise of communism. China's fast growth poses new doubts on the legitimacy of simple capital accumulation alone. Indeed the rise of wealth also carries with it a rise of private wealth over public capital. Better knowledge can only be gained by expanding the analysis to more and more countries and extending back in time as far as possible. By studying the case of India we can learn new lessons on how wealth evolves and why.

My contribution here is to ask new, important questions by putting wealth at the center of Indian economic history since the late nineteenth century. In order to do so, I build an extensive new wealth and income database for India which covers both its colonial past and different regimes since independence. Unlike the practice in many other economies there is no official tradition of compiling national balance sheets, besides some dispersed sectoral accounts of assets and liabilities. It is therefore no surprise that analysts of India's economic performance almost strictly rely on flows of output, income and investment. To overcome this lack of homogenized wealth series I draw on various historical studies, statistical abstracts, surveys and official accounts in a systematic way which is consistent with international guidelines put in place by the UN SNA. The quite obvious disclaimer applies: in a developing economy with enormous issues of data reliability these newly compiled series are only one of possibly many more future estimates. Their validity is only as strong as the reader's belief in official sources. Perhaps in the future as better records of assets and land are collected at the official level, these data may be improved. Additionally, the large informal sector and

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[1]These historical trends are collected in the World Wealth and Income Database online at wid.world. Cross country balance sheets are presented in Piketty and Zucman (2014a). For Sweden see Waldenström (2017) and for China see Piketty et al. (2017)

underestimations of various economic activities are an ongoing challenge today and they were so in the past. Every few decades, a new set of historical computations are presented which do not necessarily agree with estimates made previously in the literature. This is the very pattern of historical studies on India. Indeed given the enormous disagreement between different experts on Indian history (Marxists, Nationalist schools, Institutionalists etc) there is an incentive to be circumspect of different takes on the same question. But social scientists should embrace these differences as the probable unfolding of some scientific progress. This article too should be understood as a small part of this tradition. In turn, the analysis in this article allows new insights on the forces behind capital accumulation, the influence of global events, the rise and retreat of the state, class dynamics and potential directions in the future for the world's largest democracy. On an international basis, this adds to knowledge on the evolution of the wealth-income ratio. India presents unique circumstances under which capital floundered and flourished. It was a large colonial economy enmeshed into international markets, transitioned to an independent state with strong state restrictions and finally has emerged as a key cog in the globalization process with much more open markets. Through much of India history over the last fifteen decades, the wealthiest and poorest persons on the planet somehow populate its national boundaries.

[Figure 1 about here.]

With these issues in the background, this article presents two major findings. Firstly, the wealth-income ratio (β_N) has gone through two large "waves" between 1860 and 2012. National wealth was less than 300% of national income when the last Mughal emperor (Bahadur Shah Zafar) died and the British crown consolidated power in the mid nineteenth century. It rose slowly at first and then rapidly during the inter-war period to reach a historical high of almost 600% by 1939. Subsequently a large set of domestic and global shocks led to the demise of the first wave. By the end of the reign of independent India's first prime minister (Nehru) in the 1960s β_N was closer to 400%. It has been on an upward path ever since, with a particular acceleration in the first decade of the twenty first century. By 2012, the wealth-income ratio was just short of 600%, again approaching its last historical high of the colonial era. Seen between 1939 and 2012, the shape of the long run wealth-income ratio is U shaped, exactly as observed in rich countries like the US, UK and France for the same period. In the post war era, the evolution of β_N is increasingly looking like the same phenomena on a global scale.

Secondly (and related to the first finding) the decomposition of wealth accumulation reveals fundamental differences in what drove the wealth-income ratio previously versus today. At a very low national saving rate (s) of only 2-3%, the first wave was essentially driven by a relative increase in the price of assets as against consumer price inflation. With a real rate of capital gains $1 + q$ and growth factor $1 + g$, if $q > g$ persists for too long then wealth may rise relative to national income with little role of savings. Thus a large redistribution occurs in favor of classes already possession of such valuable assets. Land is indispensable to this picture, exactly for the reasons enumerated by David Ricardo - its scarcity under even some economic growth eventually enriches the rentier

class. The first wave of β_N largely reflected the rising value of land relative to national income. This inequality $(q > g)$ presents a starkly different picture to what was going on in rich countries when these economies were predominantly agrarian. While undoubtedly the US and Europe had powerful landlords, much of their land was valuable due to past investments in agriculture. Therefore Piketty and Zucman (2014a) state that the past and present of wealth-income ratios are explained by the steady state formula s/g. On the contrary in nineteenth century Sweden, Waldenström (2017) also finds the dominance of price effects (and capital imports) presenting at least some similar evidence to wealth dynamics in India. In newly emancipated India with state regulation and the enactment of social equity policies (especially land ceilings, estate taxation etc), q substantially declined but did not disappear. The second wave was driven by combination of s and q, i.e capital accumulation and capital gains with a stronger role for the former. Capital has increased over the six decades since independence and now constitutes a large portion of national wealth. Land values are rising again too, crossing 200% by 2012, and the rise is mostly an urban phenomena. Seen intuitively this puts the political economy of real estate in context. In a country with large poverty, real estate prices in top metropolitan cities like Bangalore, Delhi and Mumbai rival Manhattan and London. The ultimate takeaway is that not just in the medium run, but even over long periods the role of asset prices is important since it transforms economic resources much more rapidly. This explains why in India today, despite very high economic growth (above 7%) wealth-income ratios are high.

The discussion of these findings focuses on two stylized facts and one mostly speculative implication. Public capital built through large public savings in the 1960s is surely giving way to more domestic private wealth. Here data only covers the period 1981-2012. Nonetheless, this presents a point of convergence with global trends for the same time scale - public capital is declining in large economies. Second, between 1913 and 2012, where data are available for comparison, β_N and top income shares in India move together. Thus rising wealth-income ratios are accompanied usually by a concentration of economic power. Finally I argue that while India's demographic dividends represented a "natural" tax against the rise of inheritance, this may change in the future because aggregate rates of mortality risk are finally converging to international standards. The largest gains in this natural tax are almost over but by no means comparable to Europe. Without chronically declining mortality and with rising private wealth, the economic flow of inheritance can become important in the future.

This rest of this article is organized as follows: the next section (Section 2) summarizes briefly some important economic trends in the Indian transition between the mid nineteenth century and early twenty first century. Next, Section 3 lists various useful concepts and main data sources involved in the production of the companion database. The second part of this section (Section 3.2) goes through results and findings including main trends, decompositions etc. This is followed by a brief discussion of these results in the context of distribution in Section 4. Section 4.3 concludes. A detailed appendix is available for the interested reader. This carries more thorough reviews of related literatures, definitions, concepts, alternative decompositions and scenarios to test for robustness of benchmark results.

2   Historical background and related literature

Modern India is one of the most studied topics in economic and social history. Accordingly there is much intellectual conflict on the relationship between the semi-stagnant Indian economy of the nineteenth century and its relationship with colonialism which lasted till 1947. On this matter, this article has nothing new to contribute. There are however important takeaways: on national income, population growth, prices and class compositions this rich literature has much to inform us. On such topics, multiple volumes of the Cambridge Economic History of India offer very valuable studies. After a century of direct and indirect control, the British Crown inherited a largely poor agrarian economy in 1862. Administering a large and loosely connected region generated substantial statistical reports eventually forming the basis of countless economic studies. Claims about Indian living standards frequently underwent revisionism as more scholars produced new estimates from past data. Recent estimations by Broadberry et al. (2015) put per real capita output in India at roughly 15% of Britain around 1871 and emanating primarily from agriculture. Despite its role in domestic production, agricultural output in the nineteenth century suffered from low productivity and technological obsolescence. A landlord class, installed by the British to optimize revenue collection, sat on the top of an underdeveloped[2] system of production. Surplus from production was distributed up the ranks of the agrarian hierarchy. Economic growth during the late nineteenth century was more or less non-existent. Even optimistic estimates by Heston (1983) put the growth of per capita national income at around 0.6%.

Nationalists, perhaps the most critical of British rule, argued this lack of economic change as being driven by the drain of wealth[3] from India to Britain - colonial policy was meant to be exploitative. Others, such as Roy (2016) have instead argued that colonial policy was formed on the basis of global market integration. Regardless, there is some evidence that even with aggregate underdevelopment some capital accumulation took place in the nineteenth century. The first Indian capitalists (such as the Tatas) established themselves within colonial confines of the late 1800s. Indian railways were installed by the British, allowing transportation of produce at the domestic and global level. Although agricultural investment was low, the highest productivity lands were cropped by the end of the nineteenth century. Nascent industrial[4] expansion, particularly in cotton and jute output also followed. Colonial India was administered to be (and was) an economy based on private enterprise[5], no doubt partially due to legacy of the East India Company. This required some incentive to investors. Railways for example featured private guarantees[6] of dividends. The caveat is that even the modest installation of capital was low when seen on a per capita basis. Living standards and technological

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[2]Many have argued that the effects of colonial land tenures significantly affected independent India. See for example Banerjee and Iyer (2005)

[3]This argument is best known due to Naoroji (1901)

[4]The growth of large scale industry is well analyzed in Morris (1983)

[5]The contribution of government to value added was less than 10% between 1870 and 1947. Statistics from Tomlinson (2013)

[6]See Bogart and Chaudhary (2013)

progress were on average low.

National income estimates starting 1900 are more reliable with benchmark estimates usually assigned to Sivasubramonian (2000). Relative to the nineteenth century, some economic progress was made especially in terms of aggregate income growth. National income growth was not spectacular but fluctuated between 0.9-1.1% through the first half of the twentieth century. Much of this growth looks less sanguine on a per capita basis. After demographic stagnation for the six decades prior to 1921, there was finally a notable mortality decline which structurally drove up population growth rates. Population growth continued into India's transition from a British colony to an independent sovereign nation in 1947. This unprecedented regime change carried huge economic reforms. The independence movement had been built on strong social movements and this was to seep into the economic policy that followed. The state engaged in development planning, drawing on different economic systems (Soviet and Capitalist) but tried to self-steer the rate of growth through accumulation. Nationalizations of private sector corporations were rampant through the first two decades of independence or private capital had to operate under regulated licensing. Many British era firms had been transferred[7] to Indian owners but either could not sustain profitability or were absorbed by the state during this period. Some social progress did follow. Aristocratic land was expropriated (directly and via taxation), land reforms enacted over multiple stages, agricultural self-sufficiency was achieved and many public companies were setup for provision of consumer goods. Despite the progressive goals of the activist state however, economic growth did not rise as it did in East Asia during the same period. This so-called repressed economic regime was eventually replaced with market liberalization - the source of contemporary economic dynamism as proposed by Rodrik and Subramanian (2004). In the first set of reforms, which started in the 1980s domestic capitalists were given more eased regulations. A second set of reforms followed in the early 1990s relaxing both banking and international finance regulations.

The economic progress made since the early 1990s put the focus on flow concepts such as saving rates and per capita income growth. This was not always the case, particularly because prior to 1980 substantial direct taxes were supposed to come from wealth in different forms. In independent India there was a need to monitor capital stock and statisticians were commissioned to compute national wealth. This resulted in estimates of Indian wealth by Mukherjee and Sastry (1959) followed by Mukherjee (1964). Official national accounts have used these studies as benchmark years from which to develop capital stock estimates. During the British era of land revenue taxation, balance sheets for select years (1875, 1895) were estimated by Atkinson (1902) which gave the first insight into the tangible wealth of India. Various studies also tried to estimate Indian wealth in the early twentieth century using different taxes and resulting abstracts. These have been tabulated in Goldsmith (1983). Although Goldsmith provides painstakingly compiled national wealth estimates for select time periods, his intellectual focus in these projects was not to assess capital accumulation. Rather,

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[7]For a history of concentrated corporate ownership, see Khanna and Palepu (2005). For a regional case study of corporates immediately after independence see Roy (2017)

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his very well known cross-country[8] balance sheets were part of the Gerschenkron-Goldsmith debates[9] on financialization of the 1960s and 1970s. Still these debates led to related data which are valuable and to a great extent my effort here is to update these series into the twenty first century.

3 Data and results

3.1 Data

Concepts: This article is supported by a comprehensive database of national wealth and income estimates covering the period 1860-2012. I use standard concepts as outlined in the UN System of National Accounts (SNA) and the framework closely follows Waldenström (2017) - itself related closely to the definitions in Piketty and Zucman (2014a). National wealth (W_{Nt}) is defined as the sum of non-financial assets and net claims on the rest of the world. Ownership of national wealth lies with the four main institutional sectors as per convention, i.e: households, non-profit institutions serving households (NPISH), corporations and government. Each institution's wealth is its *net-of-liabilities* sum of financial assets but at the aggregate national level one sector's liabilities are the assets of another sector. The domestic capital stock aggregates these different net financial claims and represents the reproducible part of domestic wealth. Land is a non-produced asset, distinct from capital stock used in production and valued at nominal levels. Detailed descriptions of the underlying definitions of wealth, with emphasis on each component, are given in Appendix A. Therefore national wealth is the sum of land, capital and net claims on the rest of the world. In summary[10] we can write national wealth as:

$$W_{Nt} = \underbrace{L_t}_{\text{Land}} + \underbrace{K_t}_{\text{Capital stock}} + \underbrace{NFA_t}_{\text{Net foreign assets}} \tag{1}$$

The definition of national income (Y_t) is standard, i.e *net-of-depreciation* domestic product plus net factor income from abroad (NFIA). National savings flows are also computed net of depreciation. Briefly, net national savings (S_t) are the sum of net domestic capital formation (including errors & omissions) and net foreign investment. The rate of national saving (s_t) is $\frac{S_t}{Y_t}$. The associated database for this article presents both nominal series and real series for income and savings, computed using the national income deflator at 2012 prices.

National wealth combined with flows of national income is fundamental to this analysis and expressed by the term $\beta_{Nt} = \frac{W_{Nt}}{Y_t}$ i.e the national wealth-national income ratio. The value of β denotes the years of national income necessary to generate the level of national wealth, so for example if $\beta_{Nt} = 400\%$ then national wealth is worth four years of national income. Primarily, economists are

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[8]Goldsmith (1985)

[9]Both economists were concerned primarily with the relationship between financialization and economic development.

[10]Note that capital stock is the sum of fixed assets and inventories for each institution. In the appendix, wealth is decomposed in the conventional way in equation (3)

interested in the evolution of W_{Nt} & β_{Nt} with special focus on the steady state $\beta_{Nt} \to \beta_N$ at which wealth is accumulated at the rate of growth of national income. Wealth changes from one period via the following simple law of motion: $W_{t+n} = W_t + S_t + PK_t$ where PK_t represents capital gains. The point is wealth can change from one period to the next based on accumulation and/or revaluation of existing assets. For example if there are no savings made during a given period but β rises then relative capital gains (over and above consumer price inflation) maybe responsible. The law of motion for β following Piketty and Zucman (2014a) can be written as: $\beta_{t+n} = \frac{\beta_t}{1+g_{t,t+n}}(1 + \frac{s_t}{\beta_t})(1 + q)$ where $1 + q$ is the relative capital gain/loss and $g_{t,t+n}$ is the rate of economic growth. For given data on β_N and s, we can derive q as a residual from the law of motion of wealth accumulation. These contributions to wealth accumulation are of particular interest in the context of long run political economy and form the focus of subsequent sections.

To be sure, the long run steady state is only a context for reference. The assumption that developing countries have matured in their accumulation process enough to reach a steady state is perhaps ambitious. One can however use it to study potential gravitation to (or from) the one good model of capital accumulation. In the one good case, productive capital can be consumed or saved for further accumulation. Under standard assumptions, the neoclassical steady state puts the long run wealth-income ratio as $\beta = s/g$ when price effects wash out i.e $q = 0$. For an elasticity of substitution between capital and labor less than one, saving finances capital accumulation to match the growth of labor supply. At any given saving rate (s), the wealth-income ratio increases if economic growth (g) is low. But as is the case, wealth is also made up of assets such as land whose supply is limited and which cannot be "saved." Owners of such assets can instead derive rents which get capitalized into higher prices. In his theory of political economy, Ricardo (1821) was particularly concerned that economic growth would eventually exhaust all land available for production. Subsequently the economy would reach a stationary state (rather than steady state) where capital accumulation would cease, with rents absorbing[11] all of the capitalist's surplus. The Ricardian stationary state never materialized - neither has capital accumulation ceased nor has economic growth stopped. Yet the complete falsifiability of the Ricardian dilemma remains to be seen. The rising value of real estate, especially scarce land in metropolitan cities has co-existed with economic growth. It stands to reason that capital gains will (and do) play a key role in the wealth-income ratio.

Sources: For the sake of brevity, only main sources are listed here but Appendix A.1 carries detailed source references, robustness/comparative checks and discussions on various historical measurement controversies as regards India's national income and wealth. The fundamental problem with Indian wealth data is that neither the Central Statistical Organization (CSO) nor the Reserve Bank of India (RBI) compile official balance sheets. Thus national wealth is estimated using historical studies, in particular drawing strongly on Goldsmith (1983) who homogenized estimates of land values, capital stock, net foreign claims as well as gold & silver stocks from assorted sources. For more

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[11]For a rigorous treatment comparing neoclassical growth to the Ricardian model see Foley and Michl (1999). Even when land is not fully utilized, prices of land will rise under expectation of future rents

recent periods (1980 onwards), official national accounts make available aggregate and institutional series on net domestic capital stock on an annual basis. Capital is measured at book values at current prices. Related studies prefer to allocate corporations capital as the equity holdings of households (when available). In the case that Tobin's q equals 1, then book and market values converge or equities fully represent the book value of corporations. While important, data on listed and unlisted Indian companies is lacking and restricts my series to book values only. When available, in business surveys for recent years Tobin's q for listed Indian companies tends to be close to (or slightly higher) than 1 - for example in Khanna and Palepu (2005). Capital stock estimates are combined with National Sample Survey (NSS) estimates of land held by households and net foreign assets drawn from the updated and extended dataset[12] of Lane and Milesi-Ferretti (2007). NSS land values at the national level (privately owned only) are however only available on an infrequent basis based on the decennial All India Debt and Investment Survey (AIDIS). I discuss and outline various changes in Goldsmith's series as well as the AIDIS series in the asset-specific sections of the appendix. Due to past policy restrictions on private gold imports, there are limited estimates of households' holding of gold and silver. Therefore I drop private bullion stocks from my benchmark wealth series but provide[13] various possible scenarios in the appendix and re-include them in any decomposition of wealth into its various components. Importantly, there is no change in the main trends when bullion is included in any of the listed scenarios.

Official national accounts are used for series on national income and savings starting 1951 as provided by the Ministry of Statistics and Program Implementation (MOSPI). National income series are extended back using Sivasubramonian (2000) and savings using Maddison (1992). Estimates of income and saving prior to 1900 are either incomplete (in the case of savings) and perhaps too fragile to be used for any decompositions of wealth accumulation equations but do provide a picture of the wealth-income ratio in the second half of the eighteenth century. Thus decompositions of wealth into volume (savings) or price effects (capital gains/losses) begin starting with the first available estimates of national wealth in the twentieth century (1913).

3.2   Main trends

3.2.1   The rise, fall and rise of India's national wealth

[Figure 2 about here.]

The evolution of the wealth-income ratio in Figure 2 tells us a great deal in terms of similarities and

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[12]Available online at http://www.philiplane.org/EWN.html

[13]In particular, gold has been an important asset for Indians and plays a prime role not only today but even in the very long run of history. Various conquerors of the subcontinent were motivated by India's gold based riches - this is outlined and roughly estimated by Atkinson (1902). Goldsmith made estimates on a decennial basis using statistical abstracts and other assumptions. I extrapolate the last few available series in Goldsmith (1983) and Goldsmith (1985) to the present using NSS estimates by Badarinza et al. (2016) and World Gold Council estimates in Bhattacharya (2002). See the section on Gold & Silver in Appendix A.1

differences across several large economies. Despite structural, geographical and temporal distinctions, four major large economies (India, France, UK and US) are characterized by the well known "U" shaped trend in β_N between 1939 and 2012. In Europe this trend is more pronounced when taken over the longer timespan 1860 to 2012 with balance sheet recoveries in the inter-war period - the "U" mainly having been related to war and tax related shocks in the first half of the twentieth century as documented in Piketty and Zucman (2014a). β_N in India however underwent a non-linear trend or rather two large "waves." Starting from low initial levels in the mid-nineteenth century, β_N rose rapidly during the inter-war era only to start trending down strongly starting with World War II. National wealth again started rising in the 1960s and sharply increased in the early 21st century. Strikingly, the value of national wealth relative to income is making a comeback everywhere - in the old industrialized economies but also in Japan, China and India.

First wave (1860-1939): As an underdeveloped British colony, during the second half of the nineteenth century India had accumulated very little wealth. Relative to Britain and France (the two main colonizers), India's national income was very low and per capita output was a fraction of European standards. The wealth-income ratio accordingly was less than half of British and French levels. However, national wealth rose slowly from around 250% of national income to just around 320-350% between 1860-1913. In Britain and France over the same period, β_N persisted well over 650% or worth around six to seven years of national income. By no means should these relative initial differences be surprising - colonial economies did not experience the scale of capital accumulation experienced by Western Europe due to industrialization. Given its already low levels of national income[14] during this phase, India's low β_N characterized a wealth-poor economy with a minuscule surplus available for further capital and wealth accumulation. The situation was drastically altered over the period 1913-1939 i.e from the eve of World War I all the way to the start of World War II. Europe experienced large one-time negative shocks to its national wealth due to capital destruction and economic turbulence during and after World War I. Although there was slight recovery between the two world wars, β_N in Britain and France was halved from its levels in the nineteenth century. At the same time, India experienced an equally dramatic but reverse trend as β_N rose sharply to reach around 600% by 1939 - its highest ever historical[15] level. As we will see in subsequent sections, rather than large accumulation this is mostly attributable to a divergence in the prices of consumer goods versus capital goods and land. The rise in β_N in India happened at rates similar to that in the US during this period, though for quite different reasons[16] obviously.

Second wave (1939-2012): World War II had a detrimental effect on capital stock and asset prices everywhere marking the beginning of a severe downturn in wealth-income ratios. Here India

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[14]Levels of national income were low and income growth more or less only compensated for the growth of population so that the real economy more or less stagnated well into the first two decades of the twentieth century. See Tomlinson (2013)

[15]Including Goldsmith's estimates for Gold and Silver, β_N is almost 700%

[16]The inter-war period was part of America's "most progressive decade" in terms of capital accumulation according to Field (2003)

was no different. Although somewhat geographically (though not colonially) isolated from war, there were other important factors that contributed to this decline. Most importantly, the period before and after Indian independence in 1947 created a turbulent atmosphere for capital accumulation and land ownership. Significant territory with fertile land was lost to the newly created country of Pakistan and planned development was initiated along with social pressures for land reforms looming large. By 1960, β_N had come down to around 400% but with nation building came at least some form of capital accumulation. The second wave was characterized by a slower but perhaps more resilient increase in the wealth-income ratio which withstood significant economic changes and taxation regimes. The increasing trend accelerated in the first decade of the twenty first century with β_N crossing 500% by 2012. Compared to other major Asian economies (China and Japan), the rise in wealth-income ratios in India is more sober and more akin to Europe. However reasons for the differential growth rates of β_N differ substantially. China accumulated wealth much faster[17] than India although both shared economic and demographic dynamism while β_N in Europe and Japan was being driven up by demographic[18] and economic stagnation. Put in simple terms, today there seems to be much ambiguity around the view that wealth dominates income when economic growth is low.

3.2.2 Determinants of wealth and capital accumulation

How has wealth accumulation changed over the last fifteen decades and are the factors driving β_N in the first wave similar to the second? The simple answer to the latter is no, they are not. More concretely, trends in India's national wealth cannot be fully explained by the standard capital accumulation model and it is obvious that substantial changes in relative price of assets were key over the medium and long run. Expanding on the relationship between economic growth and wealth-income ratios, Table 1 breaks down the growth rates of wealth (g_w) vis-a-vis national income growth (g) and the saving rate (s). Two qualifiers deserve mention. First, these comparisons only consider the periods after 1900 when more reliable data on flows of wealth, income and saving are available. Second, it is impossible to make sweeping explanations of trends in β_N given the profound structural and political changes in the Indian economy over the last hundred years. The sub-periods (roughly three decades long) are split into the colonial era, the state driven mixed economy phase and the more recent neoliberal period.

[Table 1 about here.]

It is immediately obvious that in India the relationship between wealth and income is not straightforward. In the colonial era economic growth lagged behind the growth of national wealth. The one good steady state $\beta = s/g$ in the standard model of capital accumulation predicts a much lower wealth-income ratio, roughly 200% because while growth was low, so was the rate of saving. Although the nationalist "drain of wealth" argument in Naoroji (1901) has been played down, this breakdown at least lends it some credibility. How could India achieve a higher capital-output ratio

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[17]For the trends and structure of β_N in China see Piketty et al. (2017)

[18]See Piketty and Zucman (2014a) for cross country explanations vis-a-vis Europe, Japan and the US

- crucial for expanded production - at such low saving rates? In the mixed economy phase, India's much criticized "Hindu growth rate" while low by international standards actually matched and mildly exceeded the rate of growth of wealth. With independence also came a much higher saving rate (almost 10%), implying some surplus was being generated from the production process. Actual trends in β_N during this period are closer though still in excess of the steady state $s/g = 266\%$. Finally, in the three decades prior to 2012, the rates of growth of wealth and income attained their highest levels easily exceeding 6%. Not only was neoliberal India generating economic growth but also very good conditions for wealth creation. The rate of savings was double its level in the previous period and nearly ten times the colonial saving rate. As a result, the predicted steady state wealth-income ratio was high - almost 400%. Still, the gap between the actual wealth-income ratio and that predicted by the steady state formula is significant, reflecting in the fact that wealth during this period grew almost 1% faster than national income. The underlying point is that wealth accumulation can dominate national income in high and low economic growth regimes.

Differences in the structure of accumulation distinguish independent and colonial India. For example, under the colonial regime if most wealth was held in the form of non-produced assets (like land) then a rise in the wealth-income ratio would indicate a rise in the price of the limited asset relative to consumer price inflation. Table 2 decomposes the trends in β_N into its savings driven accumulation (g_w^s) and real relative price effects (q) as originally discussed in Section 3. Multiplicative decompositions use the benchmark series for β_N completely excluding gold & silver. Appendix B presents alternative estimates using additive decomposition methods[19] and including different estimates[20] for precious metals. Differences (if any) are quite minor and only serve to confirm benchmark findings.

[Table 2 about here.]

Until independence, the trends in the wealth-income ratio were essentially an asset price phenomena. The tremendous rise in β_N until 1939 was strongly driven by capital gains which explained 74% of wealth accumulation between 1913 and 1946. This included periods of large positive and negative rates of wealth growth but the gap between β_N and s/g meant large revaluations in the prices of existing assets. On average, $q > g$ or the rate of capital gains exceeded the growth factor $1 + g$. This gap was closed in the first three decades after independence where savings explain 60% of the dynamics of β_N. The declining influence of q on β_N was gradual but significant in the medium run, especially between 1950 and 1960 when it explained 60% of wealth accumulation. With the economic growth following post-1980s market reforms came a sharp rise in national savings so that wealth accumulation closely followed capital accumulation - g_w^s explains 75% of g_w between 1980-2012. The second wave is thus consistent with robust structural changes in the national savings profile. Note that on a decennial basis, capital gains play a very important role in wealth accumulation. In eight out of eleven sub-periods they explain over half of the changes in β_N. But in the very long run with income growth as the savings rate rises, the explanatory weight of savings (the volume effect) will

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[19]See Table 4 in Appendix B for the additive decomposition

[20]Period wise tables 5, 6, 7 in Appendix B.2

always be relatively higher[21] than observed in shorter durations. Be that as it may, the influence of prices is a crucial structural determinant of the wealth-income ratio because of the very large shocks they can diffuse on assets. In Figure 6 it is evident that the price shocks due to World War II and Indian independence were the chief factor behind the "U" shaped trend in β_N between 1939-2012. Despite their changing importance to wealth accumulation it is remarkable that in the long run the rate of capital gains have also been relatively consistent. The large shocks between World War II and independence only temporarily depressed capital gains, with a reversion to mean on a cyclical basis since 1960. They were highest in colonial India, reduced slightly in the mixed economy phase and increased again in the neoliberal period with a very sharp rise between 2002 and 2012. Accordingly, q averages between 1.5-1.8% in each historical phase but g exceeds it (on average) after independence.

[Figure 3 about here.]

The role of asset prices features strongly because non-reproducible assets carry significant weight in national wealth both in the past and in the present. To shed more light on this, Figure 4 breaks β_N into four major categories. In order to distinguish reproducible, scarce and unproductive wealth, I have included estimates of gold & silver to the series used in Figure 2. Briefly put, land has always been a concentrated but highly valued source of wealth in India. To a great extent, the socioeconomic structure of colonial India was exactly the kind of scenario Ricardo envisioned in his theory of rent. Landlords in possession of such an important non reproducible resource particularly in an agrarian society would benefit from capital gains (capitalized rents) as fertile lands would be exhausted under population pressures. Ultimately this would absorb much of capitalist saving - no doubt reflected in the low rate of saving in pre-independence India. Yet, during the second half of the nineteenth century, the value of land was only equal to around 100% of national income. This was not nearly as high as observed in Western Europe during the nascent stages of industrialization where the corresponding ratio was closer to 300-400%. Fundamentally, in Britain and France pre-1870 values of land were attributable to substantial investments[22] into agricultural productivity.

[Figure 4 about here.]

The state of landed society[23] in India around 1860 was markedly different. Land tenure arrangements had empowered landlords and skewed incentives towards exploiting tenants rather than investing in improving agricultural output. From an undercapitalized agrarian economy, the setting up of railways and integration into global markets[24] contributed to a steady rise in land values between 1860-1913.

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[21]See Appendix 6 for the asymptotic explanatory power of s for g_w

[22]Piketty and Zucman (2014a) suggest close to 4% of national income was invested in improvements of land, irrigation and other factors

[23]For a perspective on the social composition of landed society in Eastern India see Chaudhuri (1975). Historical literature on agrarian society and landlordism is particularly rich - excellent summaries maybe found in Tomlinson (2013) and in specifically for the period 1858-1914 see Chapter 3 in Habib (2006)

[24]The integration with the global market also shifted the focus of agricultural production from subsistence crops towards cash crops. The effects of globalization with regard to factor prices are discussed in Roy (2007).

By all means, land ownership meant control of an economically beneficial andscarce resource even with industrial expansion. It then directly follows that this scarcity became particularly acute as mortality rates declined[25] substantially in the first half of the twentieth century. Tomlinson (2013) estimates that while population growth was around 36% between 1900 and 1939, the corresponding increase in gross-of-depreciation cropped area was only around 14% - itself mostly due to increased irrigation. Land revenue taxation, inherited from the Mughals had been the basis of appropriating the surplus with a strong influence[26] of Ricardian theories. But by the end of colonial control the emphasis on squeezing out this revenue had fallen substantially. Land taxes used to be 15% of national income when the British took over. On the eve of World War II, this had fallen[27] to 1%. Under these circumstances, during the inter-war period the value of land almost doubled from just under 200% of national income to around 400% by 1939. Land in Western Punjab became perhaps the highest quality asset during this period[28] due to the investments in canal irrigation. Thus the asset price explanation of the first wave of β_N essentially captured the rising importance of land in national wealth and the wealth portfolios of the social elite.

War, famine[29] and a turbulent partition followed by land reforms in India thereafter reversed this tremendous appreciation in relative land values. In particular, Western Punjab itself became part of Pakistan while the newly independent Indian government initiated efforts to reduce the concentration of land ownership. Ceilings on land ownership were combined with acquisitions of aristocratic (private) land. At the same time, the semi-soviet character of capital accumulation somewhat de-prioritized the importance of land, particularly as a productive resource. Instead the rising national saving rate was reflective of the steady accumulation of reproducible capital rooted in the so-called "commanding heights" approach to industrial growth. The one good steady state formula $\beta = s/g$ does a good job of capturing the rising ratio of capital relative to national income for independent India. On the eve of Indian independence, capital was worth 200% of national income but by 2012 it stood at almost 330% - by far the largest component of national wealth. The importance of land on the other hand was not permanently suppressed. The decline that started around 1939 was arrested by 1960 and since then has risen steadily reaching just over 200% of national income by 2012. The return of land is related to (but not exactly) a return of Ricardo's landlords. The economy and the role of land have metamorphosed quite obviously. Between 1960 and 2012, according to official national accounts the share of agriculture in domestic output fell from 45% to less than 20%. Through technological innovations such as the Green Revolution India also achieved self sufficiency in food production, reducing these Ricardian pressures. The shift in terms of trade against agriculture reduced the importance of agricultural land similar to what occurred in Europe and the US over the last two centuries. The resurgence of land is instead rooted in urbanization and real estate prices and far less in its use as a factor of production. Based on AIDIS figures, the value

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[25]See Guha (1991)

[26]See for example Swamy (2011)

[27]These statistical summaries are provided in Maddison (1971)

[28]See Mukerji (1969) - land prices rose nearly 1000% between 1900-1945 in Punjab

[29]The Bengal famine of 1943

of urban land per capita grew secularly through three decades to become almost double the value of rural land per capita by 2012. Note that while rural land is part of the production process, urban land is not. The urban value of land signifies its utility in the provision of "housing services." Those who are in possession of this important resource can exclude others from these services lest they pay rent. Indeed the post 1980s rise of capital, which includes substantial household investment in buildings and structures is complementary to the rise of land as a *positional* good. Under limited diffusion of financial markets, investments are sunk into physical assets like land. The scarcity principle is re-inforced because with productivity, population growth and urbanization the ownership of private land allows capital gains from a very high demand asset. Badarinza et al. (2016) show that Indian households show unusually large preferences for real estate with less than 10% of portfolio held in financial assets. The nature of land may have changed over a century but it still shapes the dynamics of national wealth.

Ultimately the long run consistency of capital gains points to the fact that individuals need not rely on extending claims on productive capital. Past ownership of assets is as important (if not more) to becoming wealthy as it is to save income and accumulate capital. In high inflation environments which characterize India over the last hundred years, these assets at the very least provide a hedge against rising consumer prices. At best, they represent high ranks in the social hierarchy due to past inheritance. Historically Indians have also held large stocks of precious metals, perhaps the most easily inter-generationally transmitted asset. The British were acutely aware of these riches in the eighteenth and nineteenth century. For example, Atkinson (1902) in his report to the Royal Statistical Society went to great lengths to trace privately held gold in India over every conquest of the last six centuries. This importance is evident and captured in Figure 4. In the second half of the nineteenth century, gold & silver constituted almost 100% of national income. A large store of these metals was held by aristocratic society, many of whom were the richest people in India and the planet. Today the proportion of these precious metals is much less but still significant. If anything, the value of domestic gold and silver relative to national income is more or less stable since the early twentieth century. If accurately assessed they would slightly increase the impact of capital gains but these estimates are perhaps too fragile to include[30] in this section.

3.2.3 The demise of public accumulation/the rise of private wealth

The role of the state in shaping wealth dynamics in independent India is a natural extension of this analysis. Emancipated from colonial control, the newly formed Indian government was keen to raise economic growth. It initiated a development plan itself based on the Harrod-Domar model[31] which

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[30]Appendix A.1 extrapolates historical estimates to current levels in a range of scenarios and recomputes the decompositions using the multiplicative wealth equations in Appendix B.2. Importantly, there is no change in contemporary trends regardless of the extrapolation method used. The explanatory power of capital gains increases slightly but not enough to overturn benchmark results

[31]The model itself was modified into the Feldman-Mahalanobis model which can be found in Mahalanobis (1953). For a summary of the early planning phase see Chandrasekhar and Ghosh (2002)

stressed capital accumulation as a means of raising growth in the long run. The plan itself did not last long but it was indicative of the political economy of public expenditure - the state would take a lead in driving up capital accumulation. This is clear in the upper panel of Figure 5 which divides the share of saving into private and public components. The rate of saving in independent India, as we have already seen, was much higher than the colonial era. The high share of public saving suggests it was driven up by the state and it did lead to capital formation because the capital to income ratio was rising between 1950 and 1980. To further capture the private surplus, successive governments introduced progressive inheritance, wealth and income taxation in the 1950s besides nationalizing core sectors such as rail and air transport. Unable to raise enough revenue for capital formation, by the early 1970s, government policy took a stronger socialist turn by expropriating private wealth directly. Various sectors such as banking, coal, steel and insurance were nationalized and state socialism became part of the constitution by 1976. Wealth growth lagged growth of national income but it was far from stagnant. At a 3% growth rate over three decades, the real value of national wealth had more than doubled by 1980.

This had important implications. When market reforms were initiated in the 1980s, the country's capital had been built or developed on the back of public saving. Between corporate and public capital, according to official accounts the share of the former was only 30% around 1981. While private wealth was large relative to public capital, the capital of corporations was not. As government regulation was reduced, the share of public saving came down sharply, from a high of 70% in the 1980s to almost 20% between 2002 and 2012. The share of corporate capital therefore rose from 30% in 1981 to almost 50% by 2012. Many public sector enterprises were acquired by corporate bodies especially in the latter half of the 1990s. The state retreated from its piloting role in capital accumulation similar to what occurred on a larger scale in China over the same period. The direction of expropriation had reversed itself.

[Figure 5 about here.]

4   Discussion

There are a range of reasons why these estimates of the wealth-income ratio may still be incomplete. In particular, land estimates for independent India come from surveys rather than valuations made by statistical agencies or real estate consultants. In the face of data limitations or an inadequate data collection and dissemination program, such survey statistics are the best possible estimates that may be available. NSS surveyors have also increasingly turned to more systematic accounting[32] of property values by consulting with district level registrars to compute prices. Unfortunately even if surveys are able to accurately capture the value of land and buildings in the future, from a methodological standpoint they will suffer from downward biases in their estimates of private property. The rich tend to have far lower response rates and there is a likelihood that their holdings of real estate are

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[32]See Appendix A.1 for a discussion of methods employed in the AIDIS

not fully reflected in the survey estimates. As the Indian government moves towards computerization of land records perhaps eventually tax authorities will engage in large scale data collection. Leaving aside underestimation issues, it is indisputable that land is valued more than financial assets by Indians. Participation in stock markets has been very low in India and a large proportion (around 90%) of the population is employed in informal labor markets with uneven access to finance. In such circumstances, land is likely the safest sink for the large private savings generated by Indian households. With population growth and urbanization as cities face increasing pressures to expand, it would likely accelerate future expectations of capital gains from land ownership. But the point is this need only be the case in the future. Such a scenario perhaps played a crucial role in driving up the value of land in the first decade of the twenty first century. Thus if anything, the real value of land today may be even higher than presented in my final estimates. The comeback of the wealth-income ratio may also be stronger if book values underestimate corporate wealth, which is a possibility if Tobin's q is far above 1. In this scenario, the explanation of wealth accumulation due to capital gains may be slightly stronger. One point of comparison is to "inflate" the wealth-income ratio with gold and silver stocks, as I have done in alternate decompositions in Appendix B. This is not to say that equities and gold are the same, but rather to simulate asset price increases in this alternate wealth-income ratio. As stated earlier, this does not make any substantial changes to benchmark findings and explanations.

4.1   Income inequality and the wealth-income ratio

So far I have not discussed the distributional consequences of the long run wealth-income ratio. Generally, large swings of wealth (of the kind we have seen for India) have a transformational impact on social equity. Large downward shocks to asset prices can lead to a painful transition for the rich gentry who possess these resources. This was certainly true in Europe and the USA where wealth and income inequality were certainly related to the U shape of the wealth-income ratio. In the ideal case, one would like to compare wealth inequality and the wealth-income ratio simultaneously but this presents serious data limitations for India. No long run wealth inequality series is available. The best substitutes for the concentration of economic resources are long run income inequality series which are available from the World Wealth and Income Database. In Figure 6, I compare β_N and the share of income captured by the Top 1% between 1913 and 2012. Trends in inequality closely track the first and second wave of the wealth-income ratio. The appreciation of land values (and wealth) relative to national income accompanied the rise of top income shares before independence. Thus the interwar years were a prosperous time for the economic elite - landlords and top income earners, i.e the kind of elite that inhabit a colonial agrarian society. The downfall of β_N immediately around World War II was not an isolated event as top shares also fell substantially. Since the early 1980s both β_N and income inequality began trending up together, the latter eventually rising to its highest level in a century by 2012. The comeback of the wealth-income ratio between 1990 and 2012 was also accompanied by rising wealth inequality according to survey estimates by Anand and Thampi (2016). As wealth accumulation outpaced income growth, the Top 10% captured an increasing share

of total household wealth. The more recent trends should not be surprising. With reduced state intervention also came reforms[33] in direct taxation, giving breathing space to the rich. The tax codes put in place during Nehruvian socialism were dismantled between in the 1980s as top marginal rates of income taxation reduced substantially. Further policies in favor of private wealth accumulation followed as taxation of inheritance was repealed and wealth taxation more or less disappeared. In short the situation was ideal, in relative terms, for the revitalization of private property.

[Figure 6 about here.]

Interestingly and importantly the period immediately preceding market friendly reforms (i.e the mixed economy experiment) presents an anomaly when understood in historical context. The wealth-income ratio did not start rising in the last decade of the twentieth century but rather it had been rising since1960s. Between 1960 and 1980, national wealth was growing at the same time as top income shares continued their fall downwards. One can thus unimaginatively estimate that public capital was being formed at the same time as social inequities were being compressed. This perhaps lends context to the role of public savings previously presented. Public accumulation played the role that private accumulation is playing today.

4.2   Demographic changes and inheritance

Although the analysis of the article is about the past, it presents possibilities that perhaps extend further. I have shown previously that the larger share of domestic private wealth in twenty first century India came at the cost of public capital. The rise of private wealth also poses new challenges for social mobility in the future. Should national wealth become mostly private, then the amount of wealth that can be inherited will grow relative to national income. The prospects for unfettered transmission of inheritance in India is obviously far larger today since the institution of estate taxation does not exist anymore.

Briefly I will review the determinants of inheritance, drawing largely from Piketty and Zucman (2014b) where the concepts are dealt with in detail. At death, the untaxed wealth of the decedent flows as inheritance. This flow as a proportion of national income can be expressed as:

$$b = m * \mu * \beta_P \tag{2}$$

Where m is the death rate, i.e the annual number of deaths as a percentage of the living population. μ denotes the ratio of average wealth of decedents and the average wealth of the living. β_P is the private wealth to national income ratio. If decedents hold on the average the same amount of wealth as the living then the mortality rate is simply that fraction of private wealth which will be inherited. Naturally, a rise in m, μ or β_P will lead to higher inheritance flows. On μ this analysis does not dwell any further - it may depend on estate planning and the proportion of bequest savers relative to those who save for lifecycle reasons. It is also easy to ignore m because this would only be relevant for

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[33]See Acharya (2005) for a history of tax reforms in independent India

economies with a growing aging population. At the moment, the issue in India is the exact opposite: more young people are joining the labor force. As Figure 7 shows India achieved an outstanding decline in mortality rates since independence. Between 1960 and 2015 the number of deaths per thousand of population fell by a factor of three. Therefore for unchanged levels of private wealth, the flow of inheritance would have reduced due to improving life expectancy. Given the rapid decline of mortality rates, even a growing proportion of private wealth would not have been sufficient to raise the level of inheritance. Development acted as a natural tax on bequests by delaying them.

[Figure 7 about here.]

Yet it is also apparent that the largest achievements in reducing mortality have peaked - the rate of decline of death rates itself is slowing down and as of 2015 verging on zero. Death rates in India are converging to global averages. The assistive role of natural factors in choking the intergenerational transmission of wealth is likely over. At the same time, by delaying death in the heavy taxation periods between 1950 and 1980, we can argue that many private inheritances were actually protected. Consider the following example:

- In 1970, Mr A who is 50 years old was in possession of Rs 1 million worth of wealth. With no improvement in life expectancy, he could expect to live till (say) 55. He would therefore bequeath his wealth to his children under an inheritance tax regime - the Indian estate tax applied between 1953 and 1985. Instead, due to improvements in health standards he goes on to live till the age of 80, i.e until the year 2000 hence easily outliving the estate tax regime and allowing his heirs to not pay any inheritance taxes

In summary, private inheritances would have been lower prior to 1980 due to declining mortality combined with high taxation. In the twenty first century, many inheritances "escaped" into the low taxation regime and going forwards the likelihood of mortality is unlikely to change. All this implies that if private wealth continues trending up (as it has since 1980), then the flow of inheritance will acquire much more importance going forwards than it did in the past.

4.3 Concluding remarks

This article has presented new stylized facts about the historical evolution of national wealth in India. The evolution of wealth over the last fifteen decades was unique due to its non-linear shape. But despite differences in economic structures and stages of development, India like other large economies is characterized by the same U shaped trend in wealth-income ratios between the start of World War II and the first decade of the twenty first century. National wealth is rising faster than income and private wealth is replacing public capital. This more or less marks the new "drain" of wealth: public property is fast becoming private property. Such trends raise new dilemmas due to close historical associations between the concentration of economic power and wealth-income ratios. It is already evident that barring a specific phase of anti-elite policies, income inequality and wealth accumulation have moved together. In the future, it may also be the case that these trends will feed a growing level of inheritances which will impact the degree of social mobility in India.

This research creates many new potential pathways for further study. A natural extension is to analyze the distribution of national income between labor and capital alongside trends in national wealth. I have only considered tangible capital and land but not natural resources, intellectual property rights and other sources of wealth. These are especially important to fully visualize the complete composition of wealth. The current series may also be improved by taking into account extensive corporate balance sheets to assess wealth-income ratios with rising stock market capitalization. Finally, there is scope for bring in offshore wealth held by Indians. Since tax authorities are making efforts to track unaccounted assets of Indians held in tax-havens, this would add a better picture of the actual external wealth of India.

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Appendices

This appendix presents in detail all data, methods and estimates utilized in this paper. The accompanying database is available as Excel spreadsheets and Stata datasets with sources and metadata. Most abbreviations are specified again in the appendix but where no mention is made, the symbols stand for their conventional meanings.

A   Definitions and Data

Wealth and capital are perhaps some of the most important components of macroeconomic analysis. However their measurement poses many conceptual difficulties, most of which are extremely well addressed in the appendix of Piketty and Zucman (2014a). What follows in the appendix of this current paper draws heavily on these insights but is shaped to account for the characteristics of a developing economy where data are not of the same quality and at the very least, not always as easily available.

The standard guidelines and definitions of national wealth are provided in the UN System of National Accounts (SNA). According to the SNA, National Wealth for an economy is the sum of non financial assets plus net claims on the rest of the world. Non financial assets themselves can be divided into produced and non-produced assets. Capital stock is that part of national wealth which is reproducible, with land constituting the non-reproducible portion. Ownership rights over assets are exerted by four main institutional sectors: Households, Non Profit Institutions Serving Households (NPISH), Corporations and Government. National wealth can be therefore also be considered to be the sum of net-of-liabilities financial assets for each institutional sector. Since at the aggregate level one sector's liabilities constitute another sector's assets, national wealth (W_N) at any time t can be written as:

$$W_{Nt} = \underbrace{L_t}_{\text{Land}} + \underbrace{K_t}_{\text{Capital stock}} + \underbrace{NFA_t}_{\text{Net foreign assets}} \tag{3}$$

or equivalently,

$$W_{Nt} = \text{Net assets of Households \& NPISH} + \text{Net assets of Corporations} + \text{Net assets of Government} \tag{4}$$

This broad definition above is used throughout the paper -i.e regardless of the time and source I make an effort to maintain strictly the above components of national wealth. Since historical estimates from the colonial and newly independent period do not make estimates of intangible[34] wealth, these are excluded from more recent estimates. Consumer durables are excluded from the reproducible

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[34]Definition in SNA (1993): "Fixed assets consist of mineral exploration, computer software, entertainment, literary or artistic originals and other intangible fixed assets intended to be used for more than one year." Also included are "new information, specialized knowledge, etc., not elsewhere classified, whose use in production is restricted to the units that have established ownership rights over them or to other units licensed by the latter."

capital stock regardless of the sources used. Official accounts automatically forego their inclusion since they follow SNA guidelines but in some historical estimates[35] these have been entered into the national balance sheet.

Reproducible capital stock: This component of national wealth plays a fundamental role in the productive capacity of an economy. New savings or investment can augment the capital stock of a country hence much of these estimates are done using asset life-tables, consumption of fixed capital (depreciation) and the Perpetual Inventory Method (PIM). The reproducible capital stock is further subdivided into fixed assets and stocks or inventories. When institutional subdivisions are permissible (ie households, corporations etc), both components can be allocated to each sector. Fixed assets comprise dwellings (i.e residences), buildings & structures (including historical monuments), machinery & equipment used for production (households' stocks of such capital is excluded), cultivated assets like livestock and transport related equipment. In building official contemporary capital stock series, tables are benchmarked to previous estimates which did not include intangible wealth hence they are automatically excluded from the final reproducible capital stock. Accordingly, capital stock is always:

$$K_t = \underbrace{fK_t}_{\text{fixed assets}} + \underbrace{\text{Inv}_t}_{\text{inventories}}$$

When institutional holdings of capital stock are available then capital is held by Public Sector (administrative departments, departmental enterprises and non departmental enterprises) and Private Sector (private corporate[36] and households). In this case the following definition also applies:

$$K_t = \text{Capital of public sector} + \text{Capital of private sector}$$

Corporate capital: One area which poses alternate routes in measurement is the so-called net worth of the corporate sector due to the differences between market and book value wealth. In the case where Tobin's Q for the corporate sector is 1, national wealth will be the same whether measured using market values[37] or the book value definition. In the case where Tobin's Q is less than 1, the book value definition of wealth is biased upward because the corporations may in fact be undervalued on capital markets. In keeping with standard practices of previous related studies it is preferable to use market value national wealth and hence include corporate capital stock as equity holdings of households and NPISH as well as government. This poses problems with available data in the Indian case because of at least three reasons. Firstly a lot of production at the private level in India is undertaken in the informal sector where data is scanty and at best severely inappropriate to stock-market valuation methods. Were we to follow such methods, one would have to value listed companies using stock market capitalization then trace every unlisted private company and value their assets

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[35]Goldsmith (1983) includes estimates of consumer durables for India's post independence era

[36]Further subdivided into joint stock companies and cooperatives

[37]Keeping in mind that book value national wealth is equal to market value national wealth plus the net worth of corporations.

by pricing unquoted shares using heroic assumptions. Secondly stock market capitalization as a proportion of GDP in India conveys even today a highly underdeveloped capital market - less than 4% of the population has any direct interaction.[38] Finally nearly all historical sources used in this paper estimate reproducible capital using perpetual inventory type methods (more details follow in the next section) therefore to keep the temporal comparisons legitimate only book-value corporate capital seems more appropriate. In the semi-related case of China, Piketty et al. (2017) use similar methods for allocating corporate capital stock. The main drawback of using perpetual inventory methods applies when capital losses are not accounted for - in fact no estimate (historical or official) has made an attempt to adjust for firms going out of businesses. It is assumed in all series as if the capital of firms which exit production is acquired by firms in business. However given that this issue holds for the entire series for India, this should not have serious implications for the trends and rather only impact the magnitude of the corporate capital stock

Flows of income and savings: Definitions of national income are followed exactly as outlined in the SNA (1993, 2008) i.e national income equals domestic output less depreciation plus net factor income from abroad. Savings at the national level are defined as capital formation (inclusive of omissions and errors adjustment) *less* depreciation *plus* net foreign investment. Net foreign investment is the sum of the trade surplus (exports *less* imports) plus net foreign income and capital transfers from abroad. Institutionally national saving can also be defined as the sum of saving (net) of households, corporations, government and *foreign saving* with an adjustment for errors and omissions due to the GDP estimate based on the expenditure vs income method.

A.1 Detailed Sources and Literature

This section lists the various sources for stock and flow variables as well as price indices and population series.

A.1.1 Wealth

There is no exhaustive or comprehensive long run wealth series for India in existence at the moment. As Piketty and Zucman (2014a) state, SNA guidelines for national wealth only appeared in 1993 and even most advanced economies began producing retrospective balance sheets in recent years. Ironically (though not surprisingly) estimates of India's national wealth, even if for one or two years, were more common in the years before 1980. It makes sense that in newly independent India, statistical bodies and policymakers would be interested in wealth (particularly capital) due to the emphasis on heavy capital in industrial policy and national planning. Similarly, in the era of British India too there were attempts to measure India's balance sheet especially privately held land, gold and silver for the purposes of land revenue policy or monetary policy planning by the colonial

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[38]The total number of "demat" accounts in India are around 30 million. These accounts need to be established by law to trade in listed equities. See for example http://www.thehindubusinessline.com/opinion/the-buffett-indicator-is-not-for-india/article9781610.ece with the stock market.

administration. It seems as attention moved to increasing economic growth and per capita income, attention has shifted towards flows rather than stock of capital. To collect and systematically compare all historical series I adhere to the definition of wealth in equation (3) and add sources accordingly.

Land: Estimates of the total value of land in India are available in various studies starting 1860 (though more reliably starting 1875) in spurts - mostly decennial. Goldsmith (1983) makes estimates of land using various other studies and estimates for the period from 1860-1977. Although relatively fragile, these estimates are the best and only figures on hand. Their trends, as evaluated in the main text however make sense and square with corresponding revenue based estimates by Atkinson (1902). Goldsmith in particular studied various land tax revenues and acreage making adjustments for British India and the princely states for the period 1860-1913 at intermittent intervals (1860, 1875, 1895, 1913). For further periods until independence he continued using updated acreage figures in combination with land prices making appropriate augmentations to include urban land which seems to be priced at the same rate as agricultural land. During the period between 1920 and 1945 his figures however are strongly biased to reflect land prices in Punjab which saw rather turbulent movements upwards. For independent India, Goldsmith aggregates various statistical reports of the Reserve Bank of India (RBI) and extrapolates using movements in agricultural prices in cultivated areas. Importantly, his figures for the value of land in 1950 square up very well with independent estimates of Mukherjee and Sastry (1959) who used the Rural Credit Survey[39] to draw their conclusions. Until 1970, I use directly the land value estimates from Goldsmith after which I draw upon the various rounds of the National Sample Survey (NSS). In any period (before or after 1970) this is meant to only include privately held by households for residential or agricultural purposes.

The NSS conducts a decennial survey of Indian households referred to as the All India Debt and Investment Survey (AIDIS) sponsored by the RBI. This survey appeared in the the 26th, 37th, 48th, 59th and 70th round of the NSS reports and uses stratified random sampling to make representative estimates of net worth across the population. At the moment it is the only comprehensive survey which provides information on assets, liabilities by Indian households, whilst being a natural update of the Rural Credit Survey. The one major advantage of the AIDIS is that it provides separate estimates of land and buildings in terms of real estate holdings of households. Ultimately using individual reports, the All India level value of assets can be calculated using estimated national population (households) and the average value of assets. From these assets, the survey provides the share held in land and buildings. Additionally for the period 1981-2012, the total value of land can be distinguished between rural and urban areas. The 70th round departed from previous editions by estimating land values using using normative guidelines - the surveyors accessed registrar (urban) and *patwari* (rural) records to separately record the price of land holdings and buildings. In previous rounds as reported by the subject directly. This may cause some upward bias in land values for 2012 and in the trend joining 2002 and 2012. However even these updated methods perhaps undervalue land prices since registered records tend to understate the value of real estate for evasion

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[39]Itself conducted by the RBI

of stamp duties. The land series shows a significant jump from 2002 to 2012 partly due to the revised assessment methods. Since 2008, the RBI produces a House Price Index which can be at least give some idea about the trend - this is the only official source to confirm any movements in land prices in the contemporary period. Extrapolating the 2002 AIDIS based series to 2008 using growth rates between 2002-2012 and setting 2008 = 100, the two comparative series are presented below. Essentially even the updated AIDIS lags in growth behind the house price index indicative of the real estate bubble.

[Table 3 about here.]

Capital Stock: Contemporary series (1981-2012) on capital stock are derived from the national accounts produced by the Ministry of Statistics and Program Implementation (MOSPI). Due to the importance of the reproducible capital stock in economic performance, the responsible authorities have historically devoted much attention to estimating and updating official capital stock series for India. For independent India, the benchmark estimates rely on the first major study of the reproducible wealth of India by Mukherjee and Sastry (1959) for 1949-50 and subsequently updated by the Reserve Bank of India[40] for 1960-61. These series recorded India's capital stock for six main sectors, namely: Agriculture (plus animal husbandry and allied activities), Large Scale Mining and Manufacturing, Small Enterprises, Transport and Communication, Trade & Commerce and finally House Property. Two committees were formed in 1981 (under K.N Raj) and 1995 (under Raja J Chelliah) to update these prior estimates of the Net Fixed Capital Stock using depreciation and perpetual inventory methods. The sources and methods for Capital Stock series are outlined in Chapter 26 of *National Accounts Statistics: Sources and Methods (2007)* which is made available on the website of MOSPI. All utilized methods correspond to the SNA 1993 guidelines. MOSPI maintains life tables of fixed assets based on detailed industry level studies which it uses to update official estimates but makes it clear that at present no provision exists for accounting of capital losses. Gross Fixed Capital Formation (GFCF) and depreciation is estimated industry wise at sub-sectoral levels for public capital while RBI estimates are used to build corporate capital series. Household capital is developed using a range of sources such as benchmark capital-output ratios, surveys and relevant indicators. Note that the methods employed here depart from measuring corporate capital as the equity holdings of Indian households i.e corporate capital is measured at book values and equals market value corporate wealth is Tobin's Q equals 1. On this issue no comprehensive census-like methods exist to estimate the equity holdings of Indian households in the corporate sector. Some infrequent estimates of paid-up capital are available in the Statistical Abstracts of India but MOSPI makes it very clear than less 47% of registered firms report their balance sheets and the RBI has been unable to develop a representative sampling scheme.

In the long run, the post independence series at least have (or permit the possibility of) institutional divisions of the capital stock. The data prior to independence, fragile as they are, do not have this potential. Reproducible capital stock was aggregated from different sources with adjustments

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[40]See Reserve Bank of India Bulletin Vol XVII, no.1 (1963)

made for undivided India vs the Indian Union by Goldsmith (1983). For the 19th century, Goldsmith predominantly used Atkinson (1902) and updated these figures using Roy's capital formation[41] estimates (till 1946) and Statistical Abstracts for India. Other estimates exist due to Mukherjee (1969) but these assume a constant capital-output ratio and exclude inventories. Once Goldsmith processes these various sources, he provides the reproducible capital stock divided into structures & equipment, inventories and livestock. No estimate is unfortunately available or provided for the stock of dwellings with some value assumed to be subsumed into the estimate for land.

Net Foreign Assets: Data on foreign assets and liabilities are sourced for the period 1970-2011 from the updated and extended dataset constructed by Lane and Milesi-Ferretti (2007). The RBI provides the foreign asset position of the country starting 2012. Due to the attention and importance of India's external balance and trade accounts coverage is fairly good and reliable even before independence. For the period 1860-1970, I use the estimates provided by Goldsmith (1983) who himself uses RBI Bulletins and retrospective series in Singh (1965) compiled by Bose.

Gold and Silver: One particularly important and relatively unique category of wealth for India is precious metals and the national appetite for holding wealth in gold and silver has a long history. This importance is underlined by the detailed efforts made by Atkinson (1902) to trace and speculate the stock of gold in India since the first invasions by Alexander the Great. Until independence in 1947, due to unrestricted imports of gold, Atkinson's numbers were updated by Goldsmith (1983) and combined with other bulletins to compute proportions of gold & silver in India's national wealth. Subsequent values of the gold and silver stocks are however speculation since imports of Gold were banned between 1947 and 1992. This by no means implies that precious metals were not imported illegally and indeed in large quantities since AIDIS surveys still show a large portfolio weight dedicated to gold. In particular, Goldsmith used prices on the Bombay market which are recorded by the RBI and obtained estimates until 1975. In the following years, the World Gold Council provides some approximations. In between, studies have tried to use econometric models to predict possible imports of gold but not silver. The AIDIS also records households' stocks of gold but excludes silver. Additionally, unlike land which is at least visible there is quite a large possibility of under-reporting actual holdings of precious metals. Therefore compared to other categories of national wealth, estimates are far too unreliable and thus I use a range of scenarios until 2012 to compute gold and silver on the national balance sheet. The benchmark decompositions in Section B do not include the national gold & silver portfolio although alternate decomposition scenarios are presented in Section B.2. When reporting the national wealth-income ratio I use Scenario 3. The different scenarios are computed using the following methods:

- Scenario 1 (lower bound): Gold is assumed to be 80% of gold and silver stock in 1975. The stock of both metals is fixed (in kg) at the national level and prices on the Bombay markets

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[41]B. Roy: Capital Formation in India, PhD Dissertation: University of Calcutta 1975

are used to measure appreciation of gold and silver. This obviously assumed the stock of gold does not flow in or out of the country and all scrap is recycled into new stocks of gold.

- Scenario 2 (intermediate range): Starting from the initial stocks in 1975, the compounded annual growth rates between 1975 and 2012 are used to interpolate total value of these precious metals. The value of gold and silver in 2012 is assumed to be the reported aggregate in AIDIS taken from Badarinza et al. (2016).

- Scenario 3 (upper bound): For gold, interpolate 1975 to 2002 and 2002 to 2012 using tonnage estimates of the World Gold Council. Silver stock is held constant and only price changes are computed from year to year. To compute values, I use annual (averaged) prices of gold & silver on the Bombay (Mumbai) markets from the RBI.

[Figure 8 about here.]

A.1.2 National Income and Savings

Series on national income as well as GDP vs GNP have a long tradition in many well known debates on the economic history of India. Due to the pressure to uncover the impact of British rule on impoverishment on the Indian population, many income series were calculated using a range of assumptions. In particular, per capital level estimates of colonial India trace back to statisticians such as Digby, Atkinson and the Indian nationalist thinker Dadabhai Naoroji. Therefore there exists a well documented line of successions on the accuracy and reliability of income & savings series.

National Income: All post independence national income (NNP) series are taken from the Central Statistical Organization (CSO) which are reproduced in the RBI database of the Indian economy. For the years before independence I use the updated historical series by Sivasubramonian (2000) which were essentially revisions from the original estimates for 1900-1946 made during the the 1960s fully taking into account the competing (sometimes derived) series by Mukherjee (1969), Heston (1983) and Maddison (1985).

Savings: Historical series on Indian savings are prepared using the database associated with Maddison (1992). Although Maddison provides gross domestic savings starting 1870, investment abroad is only available starting 1900 and hence this is the year from which I compute National Savings and the Rate of Saving out of National Income. Starting 1951, national savings are directly calculated from the official national accounts. Savings are calculated net-of-depreciation using Consumption of Fixed Capital from Sivasubramonian (2000) (1900-1950) and national accounts (1951-2012).

A.1.3 Prices and indices

All aggregates (stocks and flows) are computed at nominal values i.e current market prices in Billions of Indian Rupees. For inflation, no reliable price series exists for the nineteenth century and this is

discussed in detail by Goldsmith (1983). For the period 1900-2012 I use the National Income Deflator (2012=100). Constant and Current Price National Income (NNP) is provided by MOSPI's official national accounts. Deflators for 1900-1950 are calculated using real and nominal national income series in Sivasubramonian (2000). The two disjoint series are homogenized for different base years using overlapping years for real and nominal national income.

A.1.4   Population

Population coverage is available for the period 1900-2012. The aggregate population prior to till 1950 is taken from database associated with Maddison (1992) and subsequently from the RBI database on the Indian economy. The division between rural and urban population is taken from the World Bank covering the period 1960-2012. All population aggregates are head-counts in millions.

A.2   International comparison series

For international comparisons, I use the comparable wealth-income ratios for five other countries i.e the net national wealth-national income ratios. Series are directly sourced from the Stata package "wid" provided by the World Wealth and Income Database (wid.world). Countries have differential coverage based on the original studies where these data were compiled. Those used in the comparison in this paper are China (1978-2012), Japan (1970-2012), United Kingdom (1855-2012), France (1870-2012) and the United States (1913-2012).

B   Decompositions

This section summarizes the methodology to distinguish the dynamics of wealth accumulation between savings driven accumulation as opposed to asset prices. For the sake of completeness and robustness, I also provide summary tables of decompositions for alternate scenarios which include Gold and Silver.

In an ideal scenario, it would have been possible to compare the estimated residual with some integrated national accounting framework where capital gains were actually recorded. While such integrated macroeconomic accounts are available in advanced economies, this is not possible in the Indian scenario. Thus, it is the position of this paper that the estimated capital gains residual represents the actual capital gains made due to a revaluation of existing assets. In reality, many other effects maybe causing the residual including a bias in the savings measure, the appearance of a new type of capital as well as the shortcomings of the book value method of capital stock estimation. Throughout this paper, the real rate of capital gains is computed as a residual i.e backed out of available data for the real growth of wealth, rates of saving and national income.

B.1 Methodology

The starting point for any wealth decompositions is the simple law of motion:

$$W_{t+n} = W_t + \Delta W \tag{5}$$

Where W is wealth and ΔW represents changes to the stock of wealth between period t and $t + n$. In principle ΔW can be a combination of savings accumulated over the intermediary n periods and revaluation of existing wealth - i.e capital gains or losses. Decompositions of the wealth accumulation equations can arise from two forms i.e through additive or multiplicative wealth accumulation.

Additive Decomposition: In the additive case, it is assumed that changes in wealth between the intermediate n periods are the sum of savings and capital gains:

$$W_{t+n} = W_t + \sum_{i=t}^{t+n-1} S_i + PK_{t,t+n}$$

Where $\sum_{i=t}^{t+n-1} S_i$ represents cumulated savings over the period and $PK_{t,t+n}$ represents cumulated capital gains/losses. Therefore comparing wealth W_{t+n} and W_t, the residual term $PK_{t,t+n}$ captures the relative price effect i.e capital gains over and above consumer price inflation. Without capital gains we would simply have, $W_{t+n} = W_t + \sum_{i=t}^{t+n-1} S_i$. For g_w representing the real rate of growth of wealth and q representing the real rate of capital gains, it is simple to see:

- $(\frac{W_t + \sum_{i=t}^{t+n-1} S_i}{W_t})^{(\frac{1}{n-1})} = 1 + g_w^s$ where g_w^s represents uniform growth of wealth due to cumulated savings. The fraction $\frac{g_w^s}{g_w}$ is the percentage of wealth accumulation explained by cumulated savings.

- $q = g_w - g_w^s$ represents the residual real rate of capital gains. $\frac{q}{g_w}$ is the percentage of wealth accumulation explained by asset price effects.

The advantage of the additive decomposition is that annual balance sheets or wealth estimates are never available but we do have annual savings series. However these methods are not appropriate when there are structural conditions which dictate either permanent capital gains or mis-measurement of savings flows. In the main text of this paper, only multiplicative decompositions are provided but the tables below report the results of using the additive decomposition method.

[Table 4 about here.]

Multiplicative Decomposition: Conventionally, most studies use multiplicative models of wealth accumulation with the assumption that capital gains are made at the end of the period. The multiplicative wealth accumulation formula is given by:

$$W_{t+n} = (1 + q)(W_t + sY_t) \tag{6}$$

Where in the intermediate n periods, s is the uniform saving rate $\frac{\sum_{i=t}^{t+n-1} S_i}{\sum_{i=t}^{t+n-1} Y_i}$ weighted by national income. In this case, q represents the uniform real rate of capital gains residual. Dividing both sides of Equation (6) by W_t and noting that $\frac{W_{t+n}}{W_t} = 1 + g_w$ (where g_w is the uniform real growth rate of wealth) we have the expression for the real rate of capital gains:

$$q = \frac{1 + g_w}{1 + g_w^s} - 1$$

With $g_w^s = s\frac{Y_t}{W_t}$ being the growth of wealth due to savings. In my computations, I compute s as the saving rate weighted by annual national income for the periods t to $t + n - 1$.

- $\frac{q}{q+g_w^s}$ is the proportion of wealth accumulation explained by the asset price effect.

- $\frac{g_w^s}{q+g_w^s}$ is the proportion of wealth accumulation explained by savings.

- Note we can also compute q and g_w^s as proportions of g_w with the remainder $g_w - g_w^s - q$ implying other factors explaining wealth accumulation. These are usually too small to be relevant.

B.1.1   Medium run vs long run

One important factor to note is that in the very long run, the steady state formula for the Solow model dictates that even with relative asset price effects, savings are the dominant explanation for wealth accumulation. This is well explained in the Appendix of Piketty and Zucman (2014a). To summarize, the expression $1 + q = \frac{1+g_w}{1+g_w^s}$ for a steady state wealth-income ratio (β^*) can be solved using $g_w^s = \frac{s}{\beta}$ as:

$$\beta^* = \frac{s(1 + q)}{g_w - q} \tag{7}$$

If $q = 0$ then the formula above breaks down into the one-good steady state $\beta^* = s/g$ but if $s \to 0$ then $\beta^* = 0$. For any period t to $t+n$, the explanatory power of $\frac{q}{q+g_w^s}$ will always be greater in intervening periods as opposed to longer timeframes. As $t \to \infty$, $\frac{g_w^s}{q+g_w^s} \to 1$. The intuitive explanation is quite simple, without past saving there will be no wealth (and no possible capital gains) in the future as the time horizon tends to infinity. In the data, it is observed that even when capital gains are the dominating explanation over (say) ten years, over longer periods the explanatory power of savings volume is much greater. In a growing economy, this is only logical. As income grows and the uniform saving rate is weighted by income, then even for a constant annual saving rate the weight of savings at the end of the period increases. Therefore comparing $\frac{g_w^s}{g_w}$ for $t, t+n$ and $t, t+m$ with $m > n$ it should be the case that $(\frac{g_w^s}{g_w})_{t,t+m} > (\frac{g_w^s}{g_w})_{t,t+n}$

B.2   Alternate bullion scenarios

The tables below decompose the wealth equation where now gold and silver are taken to be part of national wealth. Scenarios refer to the cases outlined in Appendix A.1

[Table 5 about here.]

[Table 6 about here.]

[Table 7 about here.]
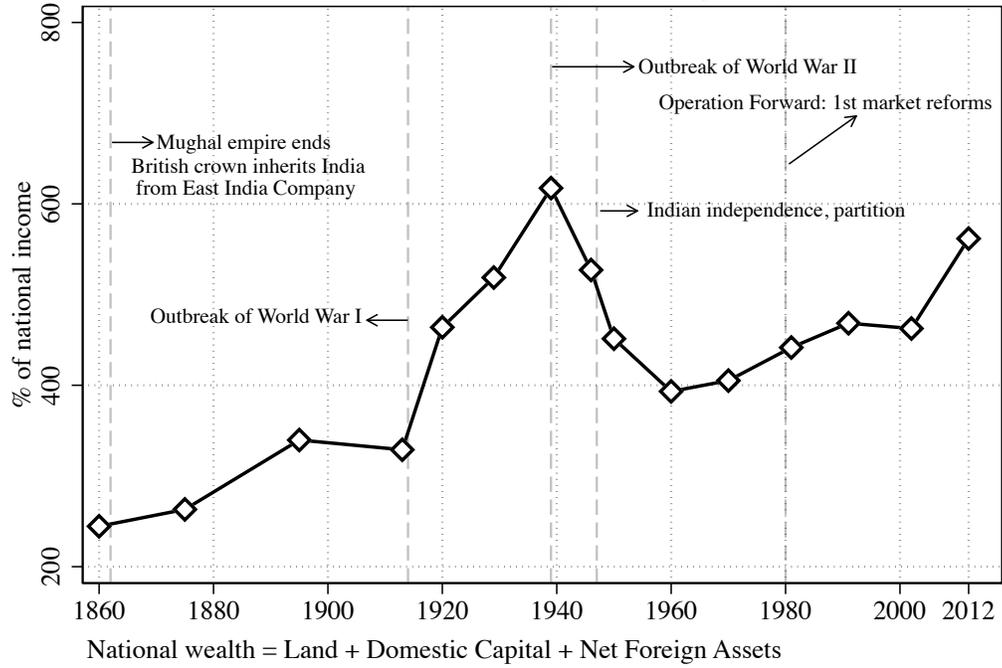
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National wealth in the long run

Figure 1: The evolution of India's national wealth 1860-2012
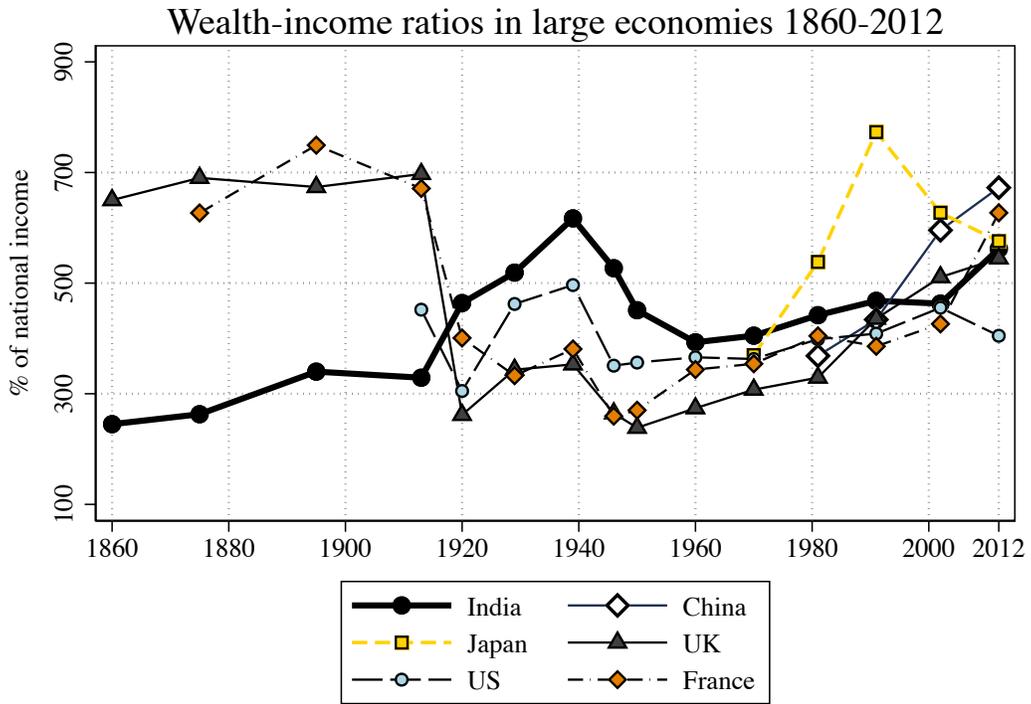
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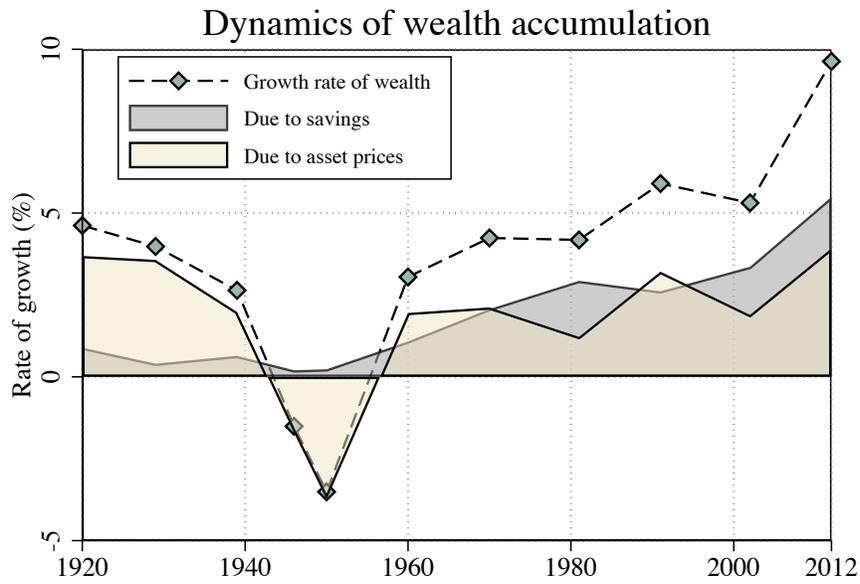
Figure 3: Growth of (real) national wealth (g_w) between 1913-2012 and its decomposition into contribution of savings ($g_w^s = s/\beta_{Nt}$) vs residual capital gains ($q = (\frac{1+g_w}{1+g_w^s}) - 1$). Author's computations.
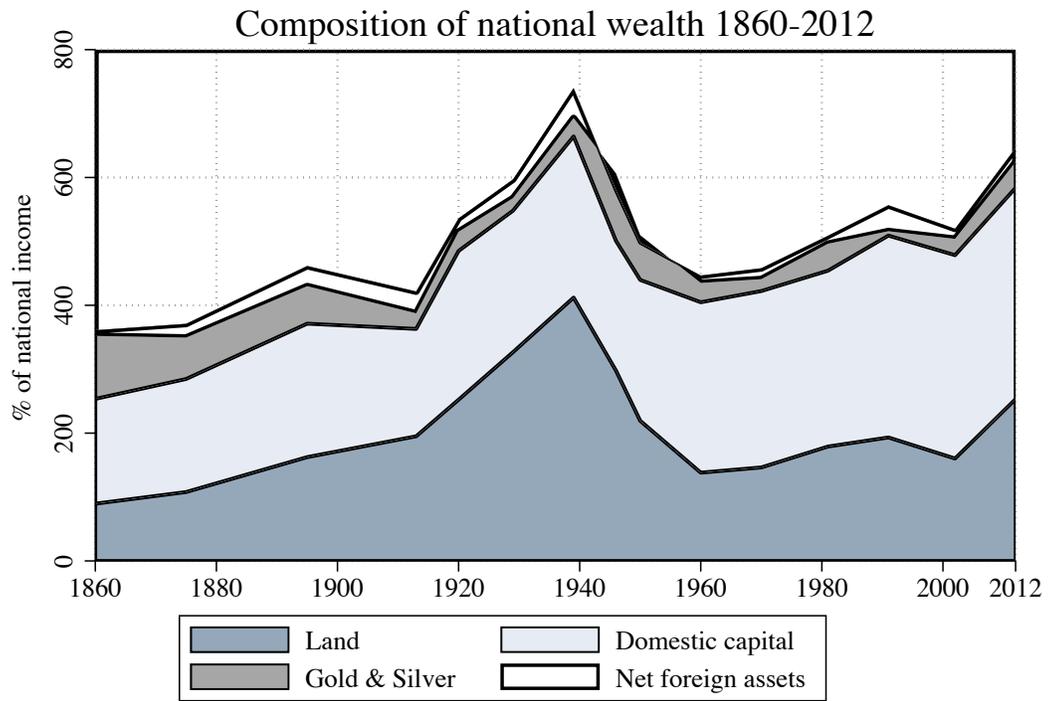
Figure 4: Author's computations. Gold and Silver included using Scenario 3 (see Appendix A.1).

Share of public saving since 1951

Private wealth vs public capital since 1980

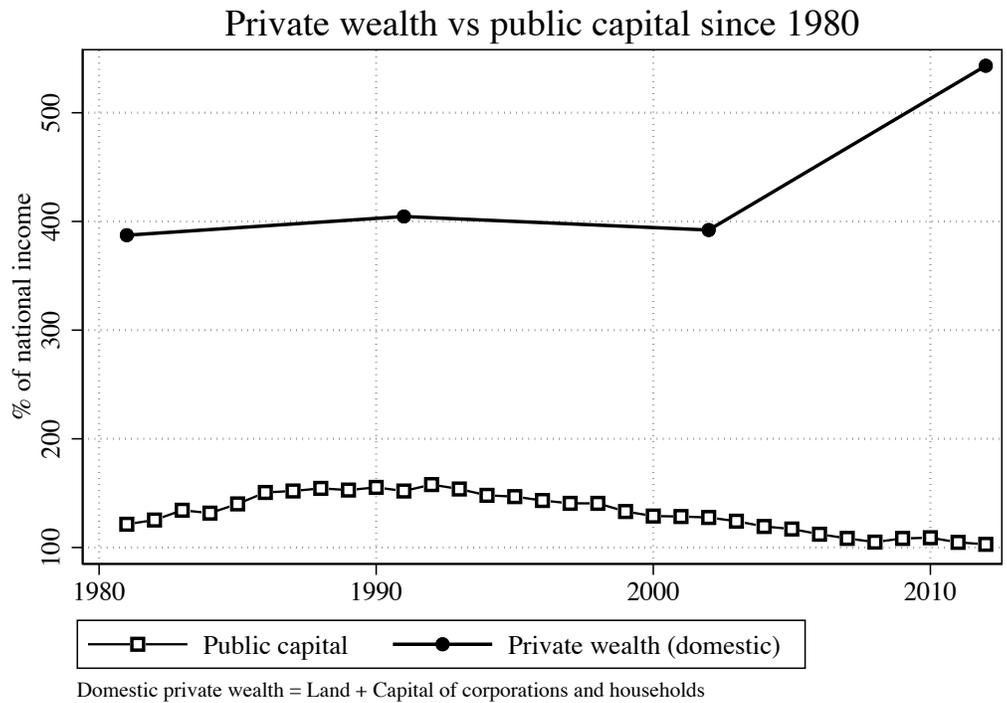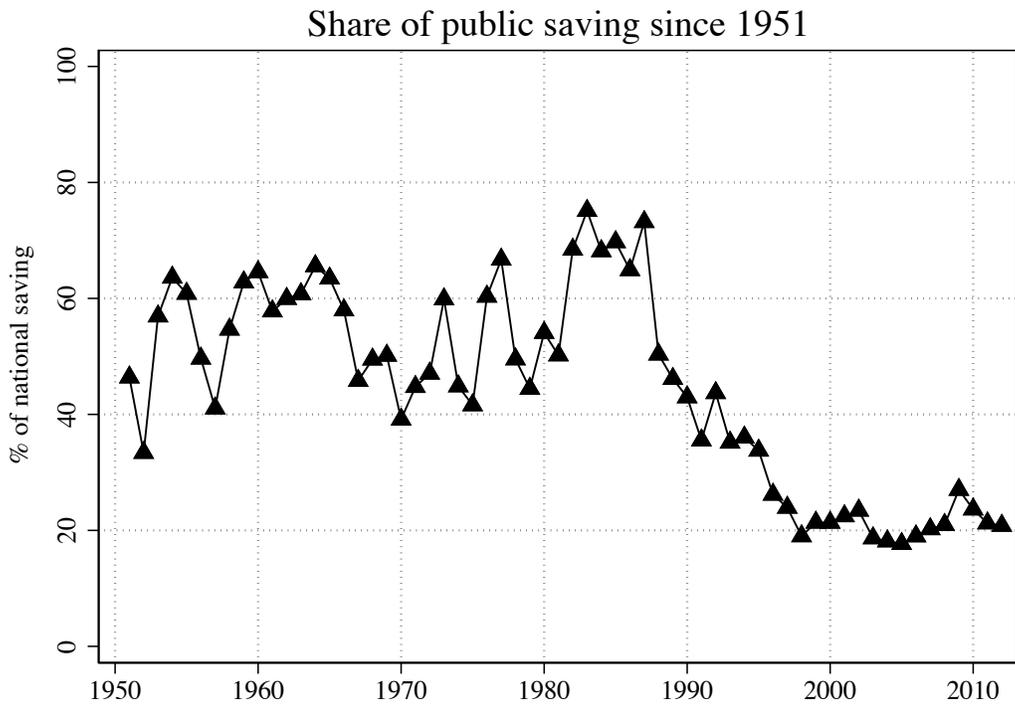Domestic private wealth = Land + Capital of corporations and households

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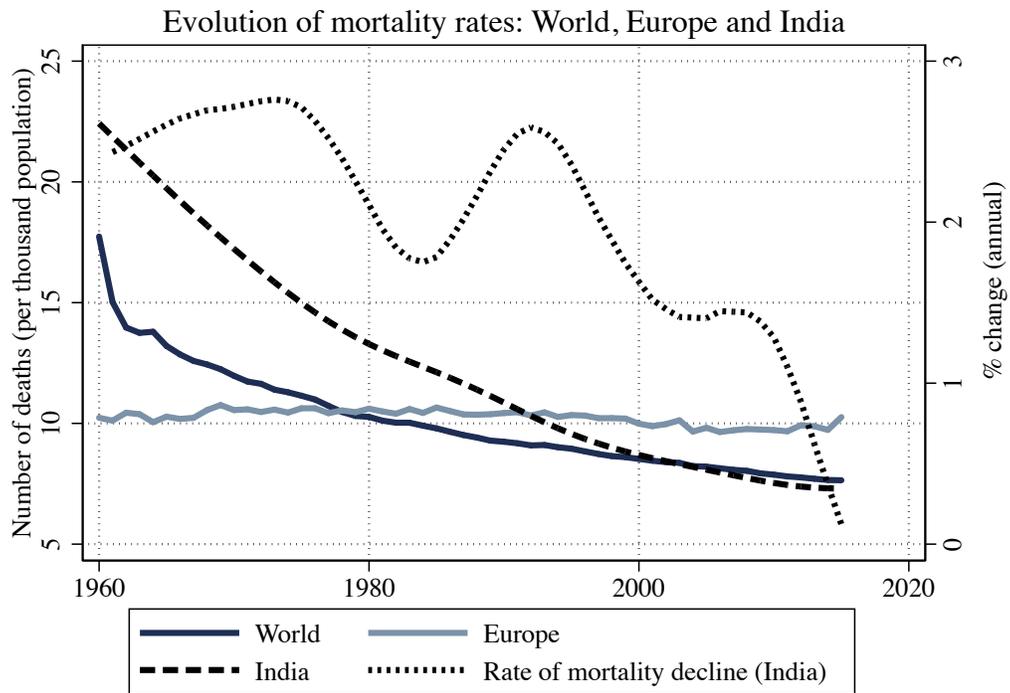
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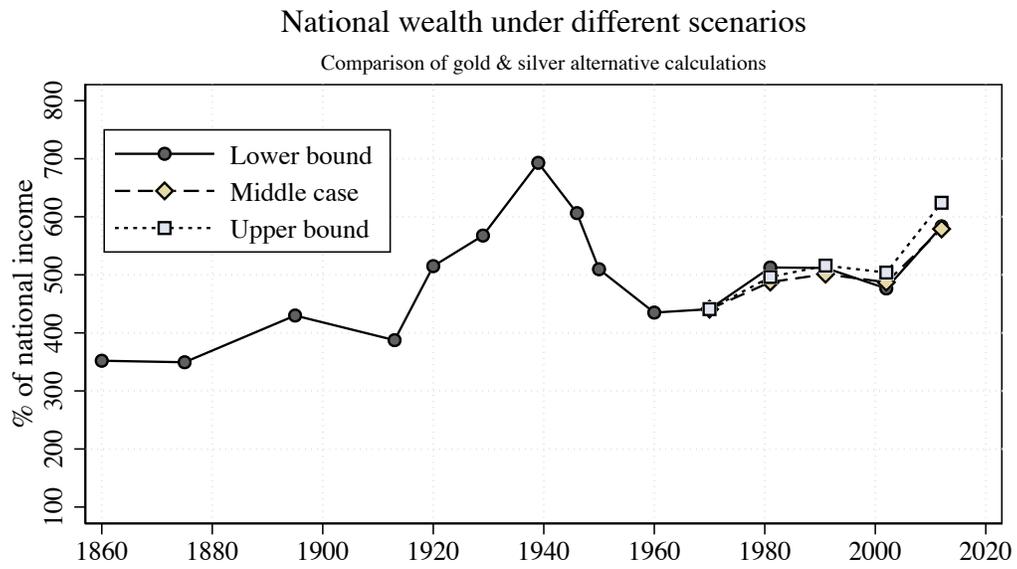
National wealth under different scenarios

Comparison of gold & silver alternative calculations

Figure 8: Alternate wealth-income ratios. Author's computations

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Period $(t, t+n)$	Growth of wealth g_w (real)	Rate of saving s	Growth of national income g (real)	One good steady state (s/g)
Colonial Era (1913 - 1946)	2.52%	2.16%	1.06%	202.78%
Mixed Economy (1950 -1981)	3.83%	10.40%	3.91%	266.28%
Neoliberal Growth (1981 - 2012)	6.88%	22.47%	6.05%	371.33%

Table 1: Growth rates of wealth and income 1913 to 2012 measured at 2012 prices using national income deflator. Author's computations

Period $(t, t+n)$	Initial β_{Nt}	Growth of wealth g_w (real)	Rate of saving s	$g_w^s = s/\beta_{Nt}$	$q = \left(\frac{1+g_w}{1+g_w^s}\right) - 1$	Savings effect	Price effect
1913 to 1920	328.91%	4.62%	2.94%	0.89%	3.69%	19.50%	80.50%
1920 to 1929	463.95%	3.98%	1.84%	0.40%	3.57%	9.99%	90.01%
1929 to 1939	518.81%	2.64%	3.33%	0.64%	1.98%	24.46%	75.54%
1939 to 1946	617.37%	-1.51%	1.24%	0.20%	-1.71%	-13.34%	113.34%
1946 to 1950	527.13%	-3.51%	1.21%	0.23%	-3.74%	-6.56%	106.56%
1950 to 1960	451.36%	3.05%	4.88%	1.08%	1.95%	35.73%	64.27%
1960 to 1970	393.22%	4.24%	8.15%	2.07%	2.12%	49.41%	50.59%
1970 to 1981	405.17%	4.18%	11.86%	2.93%	1.22%	70.61%	29.39%
1981 to 1991	441.63%	5.90%	11.52%	2.61%	3.21%	44.80%	55.20%
1991 to 2002	468.42%	5.31%	15.73%	3.36%	1.89%	64.00%	36.00%
2002 to 2012	462.59%	9.63%	25.40%	5.49%	3.92%	58.35%	41.65%
Period $(t, t+n)$	Initial β_{Nt}	Growth of wealth g_w (real)	Rate of saving s	$g_w^s = s/\beta_{Nt}$	$q = \left(\frac{1+g_w}{1+g_w^s}\right) - 1$	Savings effect	Price effect
Colonial Era (1913 - 1946)	328.91%	2.52%	2.16%	0.66%	1.85%	26.16%	73.84%
Mixed Economy (1950 -1981)	451.36%	3.83%	10.40%	2.30%	1.49%	60.66%	39.34%
Neoliberal Growth (1981 - 2012)	441.63%	6.88%	22.47%	5.09%	1.70%	74.93%	25.07%

Table 2: Contributions of savings and relative capital gains to wealth accumulation 1913-2012. Growth of wealth measured at 2012 prices using national income deflator. Decompositions based on multiplicative wealth accumulation equations. Author's computations.

	Year	RBI House Price Index	AIDIS Land Prices
1	2008	100.00	100.00
2	2009	118.50	126.10
3	2010	248.30	159.00
4	2011	311.00	200.49
5	2012	372.00	252.81

Table 3: Comparison of prices series (2008=100): RBI real estate (land and buildings) vs AIDIS (extrapolated) land prices.

Period $(t, t+n)$	W_t (Rs Billions)	W_{t+n} (Rs Billions)	$S_{t,t+n}$	Growth of wealth g_w (Real)	g_w^s	$q = g_w - g_w^s$	Savings effect	Price effect
1913 to 1920	9,102.60	12,484.16	591.42	4.62%	1.05%	3.56%	22.85%	77.15%
1920 to 1929	12,484.16	17,732.52	508.16	3.98%	0.50%	3.48%	12.57%	87.43%
1929 to 1939	17,732.52	23,004.91	1,147.71	2.64%	0.70%	1.94%	26.51%	73.49%
1939 to 1946	23,004.91	20,683.89	516.61	-1.51%	0.37%	-1.88%	-24.59%	124.59%
1946 to 1950	20,683.89	17,925.97	167.17	-3.51%	0.27%	-3.78%	-7.65%	107.65%
1950 to 1960	17,925.97	24,203.45	2,445.88	3.05%	1.43%	1.62%	46.96%	53.04%
1960 to 1970	24,203.45	36,663.80	5,993.08	4.24%	2.49%	1.75%	58.69%	41.31%
1970 to 1981	36,663.80	57,538.83	13,493.63	4.18%	3.18%	1.00%	76.12%	23.88%
1981 to 1991	57,538.83	102,118.66	18,529.44	5.90%	3.15%	2.75%	53.36%	46.64%
1991 to 2002	102,118.66	180,436.17	48,434.76	5.31%	3.96%	1.35%	74.53%	25.47%
2002 to 2012	180,436.17	452,370.19	137,137.23	9.63%	6.48%	3.14%	67.34%	32.66%

Table 4: Additive decomposition of wealth (Real, 2012 prices). Author's computations

Period $(t, t+1)$	β_t	g_w	s	$g_w^s = s/\beta_t$	$q = (\frac{1+g_w}{1+g_w^s}) - 1$	Savings effect	Price effect
Colonial Era (1913 -1946)	387.43%	2.44%	2.16%	0.56%	1.88%	22.87%	77.13%
Mixed Economy (1950 -1981)	509.68%	3.93%	10.40%	2.04%	1.85%	52.49%	47.51%
Neoliberal Growth (1981-2012)	512.67%	6.49%	22.47%	4.38%	2.02%	68.42%	31.58%

Table 5: Scenario 1: Multiplicative decomposition including Gold and Silver (lower bound)

Period $(t, t+1)$	β_t	g_w	s	$g_w^s = s/\beta_t$	$q = (\frac{1+g_w}{1+g_w^s}) - 1$	Savings effect	Price effect
Colonial Era (1913 -1946)	387.43%	2.44%	2.16%	0.56%	1.88%	22.87%	77.13%
Mixed Economy (1950 -1981)	509.68%	3.76%	10.40%	2.04%	1.68%	54.81%	45.19%
Neoliberal Growth (1981-2012)	487.56%	6.64%	22.47%	4.61%	1.94%	70.34%	29.66%

Table 6: Scenario 2: Multiplicative decomposition including Gold and Silver (middle case)

Period $(t, t+1)$	β_t	g_w	s	$g_w^s = s/\beta_t$	$q = (\frac{1+g_w}{1+g_w^s}) - 1$	Savings effect	Price effect
Colonial Era (1913 -1946)	387.43%	2.44%	2.16%	0.56%	1.88%	22.87%	77.13%
Mixed Economy (1950 -1981)	509.68%	3.82%	10.40%	2.04%	1.74%	53.97%	46.03%
Neoliberal Growth (1981-2012)	496.26%	6.84%	22.47%	4.53%	2.21%	67.20%	32.80%

Table 7: Scenario 3: Multiplicative decomposition including Gold and Silver (upper bound)