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Debt Supercycle versus Secular Stagnation[1]

By Kenneth Rogoff, Harvard University

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Over the past decade, few ideas have been more influential in macroeconomic policy that the notion advanced economies can look forward to a century of stagnation, with perpetually slow productivity growth and rapidly aging populations implying a very long era of slow growth and ultra-low real interest rates. In his magisterial (2016) book on the history of economic progress, productivity expert Robert J. Gordon essentially argued that after 250 years of stunning economic progress, economically impactful new inventions were becoming increasing scarce and marginal, and there is no end to this trend in sight. Gordon's historical analysis seemed to support what many productivity researchers had been finding for some time, with many papers showing that productivity slowed starting in the 1970s, and except for a burst in the 1990s, had continued at a very low level. Of course, this is only at the frontier; other economies depending on their level of development and institutional capacity, can still look forward to growth coming from deepening human and physical capital, as well as from catch-up through adoption of frontier-economy methods. Eventually, however, all economies would converge to slow growth. Work on demographics was similarly pessimistic, especially as applied to aging advanced economies.

Summers (2015) famously concluded that the world was in secular stagnation, with ultra-low interest rates accompanying slow growth, and was likely to remain that so indefinitely. Summers attributed the low interest rates in particular to insufficient global demand that would have been much worse but for perpetual large government deficits. Indeed, Rachel and Summers (2019) argued that global long-term real interest rates would have been even lower, by just over three percent, but for the cumulative effect of government budget deficits and changes in old-age support programs worldwide that took place from the early 1970s.

Against the backdrop of these two trends, slow productivity growth and ultra-low real interest rates, a number of economists began to advance the idea that government debt was no longer a significant issue, at least in advanced economies, thanks to the fact that growth rates, low as they were, had been consistently outstripping interest rates on "safe" government debt. As Blanchard (2019) noted, a perpetually negative interest rate growth differential implies that many governments, particularly in advanced economies, can safely increase government debt, at the margin, with no need to raise taxes, cut spending, or engage in excess inflation in the future. The higher debt burden would fall slowly, as a share of GDP, over time thanks to growth; indeed, governments could keep running deficits (up to a point) with having the debt/GDP ratio rise. An extreme version of this view is Modern Monetary Theory, as exposited for example in Kelton (2020), who to be fair does note that too much debt can lead to inflation, even if this important qualification did not come through clearly in the media coverage and or the policy debate.

By and large, both academic economists and central banks took secular stagnation as dogma; top journals were filled with articles, both theoretical and empirical, rationalizing the situation and offering policies to deal with it. One major strand of the literature involved finding ingenious ways to stimulate the economy, especially given that policy interest rates in most advanced countries had reached zero, or more precisely "the effective lower bound." Others focused on underlying factors driving secular stagnation and why they were likely to continue indefinitely,

In this intellectual environment, normally fiscally conservative agencies such as the International Monetary Fund consistently urged advanced economy governments to run even larger deficits. The Federal Reserve engaged in massive quantitative easing policies, including both "fiscal quantitative easing" involving the purchase of private securities (or in the case of the

ECB, state debts), and “pure quantitative easing”, where the central bank issues short term reserves to buy long-term Treasury debt. Pure quantitative easing, especially, is a form of maturity transformation that the Treasury could easily do on its own (the US Treasury implicitly owns all the assets and liabilities of it’s the central bank, which is a fiscal subsidiary of the government.) This too is a form of stimulus, although shortening the maturity structure government debt to exploit low short-term rates takes the risk that interest rates may rise.

The academic community, heavily focused on inequality research, came to wholeheartedly embrace larger deficits and fiscal stimulus as a solution even to cyclical problems. A 2021 poll of the American Economic Association found that a substantial majority favored using fiscal stimulus as the primary instrument in dealing with downturns, and a similar majority believed central banks should treat inflation as a secondary target, and not the primary one. A wide swath of central bank researchers moved on from studying the “solved problem” of inflation to focusing on inequality, the environment and social justice (Geide-Stevenson and La Parra Perez, 2021).

The new orthodoxy on interest rates, inflation and growth came to overwhelmingly dominate alternative viewpoints, at least in leading academic journals. Major central bank conferences such as the annual Kansas City Federal Reserve “Jackson Hole” conference in Wyoming each August, and the corresponding ECB conference in Sintra each June, had countless papers on how to deal with lower forever real interest rates and inflation. When the Fed decided to change its monetary policy framework in 2019, the new structure was built on the view that lower forever would be the norm, and generally geared towards heading off deflationary risks as the greatest issue likely to face the Fed into the foreseeable future. Until recently, the policy debate has been almost non-existent, and even now, as long-term real interest

rates have risen sharply, remains surprisingly thin in the academic discourse. Yet, in hindsight, one has to wonder whether secular stagnation was greatly overblown and whether the large ensuing literature, while certainly having important insights, also had large elements of ex-post rationalization.

If not secular stagnation, what then can explain the ultra-low interest rate epoch that occurred especially after the global financial crisis, when the yield on ten-year inflation indexed treasury bonds dropped by roughly 300 basis points, averaging around zero during the decade 2012-2021? In this paper, I will argue that although demographics, inequality and growth unquestionably played some role, and continue to do so, the central reason for the sharp drop in interest rates after 2008 was the sub-prime financial crisis and its aftermath. Indeed, the global financial crisis itself may be embedded in debt supercycle that radiated out from the United States to Europe, and has now (as predicted in Rogoff, 2016b), has reached China. One can even argue that earlier 1997-98 Asian financial crisis, and the Japanese banking crisis are connected to this epoch, as low real interest rates in Asia contributed to large US current account deficits; the resulting capital inflows almost surely aggravated problems arising from major regulatory deficiencies that only become apparent after the crisis.

The paper is organized as follows. We begin by discussing evidence that pushes back on the secular stagnation hypothesis, beginning with the view that ultra-low post-financial crisis real interest rates are likely to be the norm most of the time in the future, and that the current high level of real rates, especially in the United States, will quickly pass. The next section turns to Gordon's influential thesis that mankind has exhausted the most economically impactful inventions and can look forward to a dramatically reduced rate of innovation into the distant future. Finally, we turn to the related question of whether the negative differential between

interest rates and growth implies that higher government debt is effectively a free lunch, and there are no significant costs in terms of long-run growth and volatility.

If post-financial crisis stagnation is better viewed as a long-lasting but ultimately cyclical phenomenon, what is an alternative explanation? The last part of the paper considers the possibility that the global economy has been in a debt supercycle, despite advances in financial regulation.

Secular Stagnation

The term secular stagnation has taken on a few interpretations; here we will take it to imply a prolonged period of ultra-low long term real interest rates (on average) and slow productivity growth (on average) that lasts for at least one to two generations, potentially a century or more. The term originally dates to Harvard economist Alvin Hansen (1939), based in turn on Hansen (1938). As such, it is worth revisiting Alvin Hansen's original framing, especially as he anticipates most of the core issues in today's debate.

Hansen, of course, was writing at the tail end of the Great Depression, during a period where unemployment had remained stubbornly high, even as US President Franklin D. Roosevelt whole-heartedly embraced Keynesianism, and experimented with a wide variety of polities to combat deflation and stimulate the economy. These stimulus policies included not only large-scale government investment projects, but reneging on the gold clause in US debt, weakening anti-trust legislation, and introducing a raft of new federal regulations. Rather than diagnose the Great Depression as an epic banking crisis, as Bernanke (1983) did five decades later, Hansen attributed the malaise to a lack of investment demand that he believed was absolutely essential to produce growth, with the root cause being slower population growth. Hansen notes that a

growing young population requires a steady flow of new housing and real estate, which is capital intensive, whereas an aging population has need for services, which require far less capital. He recognized that secular stagnation would bring down the interest rate, though he doubted that this would be enough to cure the problem of insufficient demand.

> "I am increasingly impressed with the analysis made by Wicksell who stressed the prospective rate of profit on new investment as the active, dominant, and controlling factor, and who viewed the rate of interest as a passive factor, lagging behind the profit rate. This view is moreover in accord with competent business judgment." (Hansen, 1939, p. 5)

Hansen recognized that growth of breakthrough new industries can create significant growth even in the absence of investment, but with remarkable parallel to Gordon (2016), was quite skeptical that the economy of the 1930s and 1940s would keep pace with earlier eras. "But there is equally no basis for the assumption that we can take for granted the rapid emergence of new industries as rich in investment opportunities as the railroad, or more recently the automobile, together with all the related developments, including the construction of public roads, to which it gave rise." (Hansen, 1939, p. 10). He goes on to say

> "And when giant new industries have spent their force, it may take a long time before something else of equal magnitude emerges. In fact, nothing has emerged in the decade in which we are now living." (Hansen, 1939, p. 11).

Of course, Hansen's main diagnosis of the Great Depression was that it was the inevitable culmination of slowing growth

> "This is the essence of secular stagnation-sick recoveries which die in their infancy and depressions which feed on themselves and leave a hard and seemingly immovable core of unemployment." (Hansen, 1939, p.4)

An important point here is that Hansen, and later Gordon, are referring to technological progress in the frontier economy, the United States. Overall global growth will in general be higher, with the overall level depending on the ebbs and flows and development and business cycles

It may seem tedious to belabor the writings of Hansen when there has been such a fertile modern literature on secular stagnation, but it really is the root citation for most of the core ideas, although of course the modern literature has made major contributions in terms of theory and empirics. A central issue here is the extent to which what Hansen and his later disciples label as secular stagnation might be better interpreted as typical post-financial crisis malaise (Reinhart and Rogoff (2009)).

Figure 1 is exhibit A for secular stagnation, showing the steady decline in the nominal US ten-year Treasury nominal interest rates since 1981. Though inflation fell over this period, much of that change had taken place by the mid-1980s, so overall the figure would seem to strongly support the Rachel and Summers thesis that the drop in real rates that occurred after the financial crisis was not a discontinuity but continuation of a long-term trend decline. Figure 2, which illustrates inflation indexed ten-year treasuries, which gives a more granular picture of the decline that took place after the global financial crisis. It covers only half as long a period, since the United States only introduced inflation-indexed bonds in the late 1990s, and the market was relatively thin the first few years. The figure starkly illustrates the extent to which real interest rates fell off a cliff in the years after the 2008 global financial crisis, dropping from a pre-crisis June 2007 peak to a post-crisis November 2012 trough by almost 350 basis points. It fell even to an even lower level during the pandemic. It is hard to believe a change of this magnitude was precipitated by slow moving variables such as demographics and productivity. True, the indexed component of Treasury debt constitutes well under 10% of the total, and the market is thin

compared to benchmark ten-year US Treasuries. Nevertheless, any reasonable method of forming inflation expectations would yield broadly similar results.

Most research on real rates has concentrated on relatively short time periods, so it is interesting to look at significantly longer time periods as well. Rogoff, Rossi and Schmelzing (2024)'s construction of real interest rates exploits the archival data research of Schmelzing (2025) on nominal interest rates going back as much as eight centuries, along with a swath of other recent research from economic historians on prices, growth and demographics. (We refer the reader to RRS for a discussion of the earlier literature, for example Rose (1988).) Schmelzing's work represents a major advance over the classic study of Homer and Sylla (2005), relying far less on tertiary sources, and providing annual data that fills in the multi-decade gaps in the earlier research. Schmelzing's data similarly improves on Jorda, Schulariak and Taylor (2027), whose historical interest rate data large builds quite closely on Homer and Sylla, and inherits many of its limitations.

Rogoff, Rossi and Schmelzing show that over the long run, and across all eight countries in their sample (Italy, Spain, Netherlands, Japan, United States, United Kingdom, France and Germany) there is a gentle downward trend in the real interest rate that is remarkably stable across time; the trend is more on the order of one to two percent per century rather than 300 basis in a few years as after the financial crisis. (Although it appears that the downward trend might no longer present over the past 100 years.) The dashed line in the figure 3 for UK real interest rates employs Muller and Watson's smoothing mechanism to extract a trend, following Rogoff, Rossi and Schmelzing (2024), Note for the "recent period", post 1900, the Muller-Watson smoothed trend is no longer downward sloping. It is interesting to observe how from the perspective of this

long-dated time series, the 1981-2023 period of falling real interest rates seems much less convincing as evidence for secular stagnation..

Indeed, what jumps out from figure 3 is the volatility around the trend, much of which tends to die out over time (Rogoff, Rossi and Schmelzing 2024). It is also clear that there have been both sustained low and sustained high real interest rate eras in the past. Perhaps the only thing unique about post GFC period is that with many countries stuck on the zero bound, quantitative easing policy being vastly less powerful than conventional monetary policy, and inflation also near zero, real interest rate fluctuations at all maturities were uncharacteristically low. [2]

Rogoff, Rossi and Schmelzing also explore the relationship between growth, demographics and real interest rates across the countries in their sample. Prior to the second world war, the correlations between growth and real rates, as well as demographics and real rates, were not only weak, but the sign is consistently in the wrong direction. The fact that demographics do not work well should not be a surprise, as the theoretical connection is in fact much more complex and ambiguous that in Hansen's analysis. People save for retirement, but once they have retired, they dissave. Goodhart and Pradhan (2020) forcefully make the case that the unprecedented coming bulge of very old citizens is going to lead to a surge in consumption as society strains to care for its aging population.

Although one wants to be cautious about being persuaded by ex-post rationales, there are many structural factors one can point at to explain the post-covid rise in real rates. First and

[2] Indeed, Ilzetski, Reinhart and Rogoff (2020) argue that particularly starting in 2015, the fact that major currency short and long-run real interest rates all converged at very low levels helped contribute to exceptionally low exchange rate volatility between the four major currencies, the euro, dollar, yen and renminbi.

foremost, global public and private debt levels are at records relative to income, and in almost any model this will raise the real interest rate. Second, if inequality was a driver of lower real rates (it is difficult to bring to bear definitive long-dated historical evidence), then populist pressures to redistribute income and increase government spending may have unwound some of the effects. Third, there are massive pressures on spending to finance the Green Transition, as well as on national defense spending in light of greater geopolitical tensions. And as noted, the transition in advanced economies towards having a much larger share of the population that is very old (say, 85 and above), also places pressures on consumption that should raise real rates. Last but not least, the term premium on long-term bonds has likely risen toward more normal levels, given greater risk of inflation spikes, which are tantamount to partial default. This, too, pushes up long-term real rates. (Evidence on long-term real rates does not directly apply to "r*", the very short-term real interest rate that prevails when inflation is at target and unemployment is at the natural rate. Nevertheless, it seems likely that r* will end up higher as well.)

We will return later in our discussion of financial repression to the question of whether government regulation has the effect of holding down interest rates on government debt. This is surely the case in much of the developing world, and very much still in both India and China. Financial regulation has likely also played a role even in advanced economies such as Europe, the United States and Japan, with liquidity restrictions and capital requirements effectively forcing many pension funds, insurance companies and banks to hold much larger quantities of government debt than they might otherwise choose to do. The line between what constitutes "financial repression", and "prudent financial regulation" is somewhat in the eye of the beholder, but there is little question that government policy does affect interest rates. Importantly, when inflation rises, as it did after the pandemic, it is quite possible that a set of policies that were

essentially “prudent regulation” with low inflation suddenly begin to look more like “financial repression” when inflation is high and market rates can be expected to rise commensurately. (Payne and Szoke, 2024, argue that the role of financial regulation in creating the so-called “convenience yield” on “safe debt” has played a far larger role historically than commonly recognized.)

A second key element of secular stagnation is the view that productivity growth is likely to be lower going forward into the distant future. (Again, this refers to the frontier economy, the United States,) Although the empirical correlation between trend growth and long-term real interest rates is quite weak when one looks at very long-term data, and it does not appear to be a dominant factor in the very long-term trend decline in real interest rates, the theoretical presumption of a strong positive correlation between trend growth trend real rates nevertheless comes across in almost any model. And in any event, slow growth itself is both a central element of Hansen’s secular stagnation and an important motivation for considering policy intervention, albeit Hansen himself was far more cautious about the “solution” of an ever-expanding government than some of his 21st century disciples.

Numerous scholars came to conclusion that after a brief burst of productivity increase starting in the mid-1990s in the United States and somewhat later in Europe, trend growth had declined. In an authoritative NBER Macroeconomic Annual paper, Fenald (2014) argued that in fact “As of 2013, about ¾ of the shortfall of actual output from (overly optimistic) pre-recession trends reflects a reduction in the level of potential.” (referring to the 2008-09 United States sub-prime downturn). There were scores of productivity pessimists, including Gordon (2012) in a paper that anticipated the main results of his book, and Cowen (2010); The more optimistic assessments in Brynjolfsson and McAfee (2014) and Shackelton (2013)’s have to be

considered contrarian. By the mid-2010s and into the present, Federal Reserve and IMF estimates of the sustainable growth pace of the United States have generally embodied the low trend productivity growth perspective.

Gordon's (2016) summary of the productivity pessimist view was particularly eloquent and influential, not only among academic economists but among policymakers and on Wall Street. His synthesis argued that there was no real innovation until around 1750. (A more nuanced view has been advanced by Clark (2009), and more recently by Boucasse, Nakamura and Steinsson (2023), who argue that major innovation in England began already more than a century earlier.) Gordon's first industrial revolution includes steam engines and railroads and lasted until around 1830. The second industrial revolution includes electricity, the internal combustion engine, running water, indoor toilets, communications and petroleum took place in the last half of the 19th century. Later innovations including airplanes, automobiles, container ships and interstate highways are categorized as extensions of the second industrial revolution. The third industrial revolution began in force in the 1960s, and includes computers, cell phones, and the internet. This last revolution, the pessimists argue, was much less than impactful than the first two, as summarized in Robert Solow's 1987 oft-quoted quip "You see the computer age everywhere but in the productivity statistics."

Although a distinct minority, there were important counterpoints to the pessimist view, notably the historical perspective of Mokyr, Vickers, and Ziebarth (2015), Mokyr (2016) and Mokyr (2018). In a nutshell, the historians' view of innovation is that today, the elements seem to be in place for a fertile period of economic innovation. They are as follows: First, there is a key interaction between innovation and new instruments for scientific discovery, with examples of new instruments being the microscope, the telescope and Volta's battery. Second, there needs

to be widespread access to information, which expands the number of people who can invent and create. And third, there need to be institutions that allow ideas to develop and flourish. As is well known, the Chinese invented moveable type, paper, and gun powder long before the Europeans did, but lacked the institutions including especially middle class entrepreneurs, needed to foster development. Institutions such as access to education at all levels, the rule of law, property rights (including a stable tax system), and a financial system capable of supporting innovation, are all critical.

Taking stock of these factors, the internet and globalization have allowed expansion of knowledge to a stunning degree, greatly magnifying the number of people who have access to cutting edge ideas, just as the printing press did six centuries ago, an example being Diderot's 18th century illustrated encyclopedia that showed revealed trade secrets such as how to organize a pin factory. Mokyr and co-authors are careful to state the rate of technological progress cannot easily be predicted, only that the pieces are in place for rapid advancement.

It is ironic how much Hansen's concerns about future productivity change, quoted earlier, were echoed later in the modern-day secular stagnation discussion. My own view has always been much more optimistic, largely based on my knowledge of what was happening with chess which, while only a game, nevertheless has been at the cutting edge AI applications for six decades.[3]

[3] "As the global economy limps out of the last decade and enters a new one in 2010, what will be the next big driver of global growth? Here's betting that the "teens" is a decade in which artificial intelligence hits escape velocity and starts to have an economic impact on par with the emergence of India and China." (Rogoff, January 2010)

True, the major economic impact did not begin to hit in the teens, but in the 2020s. Still, with today's AI revolution, this claim hardly seems outlandish today.

Indeed, it seem increasingly clear that the big risk is not that technology will advance too slowly but rather that it might advance too quickly for society to adjust. Until recently this counterview, informed by Mokyr's historical analysis, has largely fallen on deaf ears within the financial community and among academics; both had been seized by the secular stagnation thesis since Summers rekindled the idea in 2013 along with Gordon (2016). Of course, it is not possible to say what will come next; the pessimists certainly may prove correct. If so, however it will more likely be because of conflagration and environmental degradation rather than a permanent stall in innovation. Mokyr et al. (2015) review how present-day anxieties are uncannily similar to those that have been voiced in past eras over technology. One concern is that instead of technological progress unfolding that widely benefits mankind, there could be dystopia: Kurt Vonnegut's first novel *The Piano Player* (1952) anticipates a world very much like many present-day technologists foresee where large parts of the population have no useful work to perform.

In sum, technology moves in waves. The idea there would never be another big wave was vastly overblown in the 2010s, as it was by Hansen in the 1930s. Indeed, as AI becomes a research tool, it is far easier to imagine innovation accelerating than AI being a fizzle. True, there are ample reasons to doubt we are anywhere near the accelerating rate of technological progress that singularity theorists predict. Nevertheless, a permanent state of secular stagnation is not likely either, unless it is rooted in political dysfunction. How long this will take is, of course, anyone's guess, but one should be careful not to put too much stock in studies based on data assessing what has happened to date. Experience from chess – which for decades stood at the

center of AI research -- has shown, the periods of major acceleration of progress often take place decades after the initial successes of AI.

True, one can expect AI firms to go through similar boom-bust cycle to those that tech firms experienced before a select few ultimately grew to dominate the US stock market. Nevertheless, like tech, the long-term rise of AI does seem far more likely than not.

We next turn to the observation that during much of the 21st century, and across most advanced economies and emerging markets, the interest rate on "safe" government debt has consistently been less than the economic growth rate, and what this might imply. In principle, this issue is only loosely related to the secular stagnation literature, since one can have secular stagnation without having $r - g < 0$, and one can have $r - g < 0$ without having economic stagnation. The overlap between the two issues comes mainly because after the financial crisis the real interest rate remained ultra-low across many countries, especially in the advanced world, even as growth somewhat recovered.

The topic has been of particular policy interest as it underlies a widespread view that many governments – not just the United States -- can issue substantially more government debt without ever having to make significant compensating adjustments to spending or taxes in the future. And moreover, there are no other significant downsides to very high debt. Do extremely high debt levels portend slower growth, at least on average over long periods and other things being equal, as conjectured by Reinhart and Rogoff (2010, 2013), and Reinhart, Reinhart and Rogoff (2012). Or does it have little significance, as Blanchard (2019, 2023) or Kelton (2020) suggest based on the r – g logic? As surveyed in Abbas, Pienkowski and Rogoff (2019), a growing literature does indeed appear to show that very high debt does indeed predict slower

average long-term growth and higher volatility, albeit causality is difficult to demonstrate. Of course, none of the early literature claims causality, only correlation.[4]

Many point to the US experience after World War II as evidence that real growth can be counted on to bring down debt with very little other adjustment needed. Indeed, according to conventional wisdom (e.g., McBride, Berman, and Siripurapu, 2023), the US was able to reduce its debt from 106 percent in 1946 to 23 percent in 1974 mainly through high growth. This same claim is widely stated in economics textbooks, and in opinion columns in major media such as the *New York Times* and the *Wall Street Journal*.

In fact, financial repression may have played a much larger role in paying down post-war det than commonly recognized in the academic literature, at least until recently. For example, Elemendorf and Mankiw (1999) emphasize that the US's WW II debt was paid down in no small part because the interest rate on government debt was often lower than the growth rate. However, they focus mainly on the fact growth was high and not so much on why the real interest rate was low.

In an important paper, Reinhart and Sbrancia (2015) calculate that between 1945 and 1955 alone, US debt fell from 116 percent of GDP to 66%. Had the average real interest rate on US debt (weighted by maturity) consistently paid a zero real interest rate instead of the realized negative rates, US debt in 1955 would have been 144% of GDP, and not 66%. They attribute much of the difference to the Fed-Treasury accord that until 1951 controlled the level of interest

[4] The politics around this debate are fraught; it is notable that in their paper for the August 2023 Jackson Hole Symposium, Arslanalp and Eichengreen (2023) express concern that public debt to GDP ratios have hit record levels in advanced economies, yet they avoided making any precise argument as to why this should be an issue for advanced economies.

rates. Later, the Great Inflation of the 1970s was another period where financial repression loomed large and helped to sharply reduce the debt. Reinhart and Sbrancia find even stronger results for a number of other advanced economies, including the UK and Italy, for example.

Concentrating on the United States, Acalin and Ball (2023) reach very similar conclusions after performing an articulated calculation that parses the reduction in the US debt to GDP ratio into growth, surpluses, unexpected inflation and financial repression. They calculate that without financial repression, especially in the years following World War II, and unexpectedly high inflation, especially during the 1970s, the US debt to GDP ratio in 1974 would have been 74% instead of 23%. Acelin and Ball conclude there is little reason to expect that the current US debt trajectory can be paid down without major adjustments.

Mauro and Zhou (2021) emphasize that having $r < g$ has been common in advanced economies for over two centuries, yet that this has not stopped countries from having debt crises. Indeed, many countries had $r - g < 0$ on the eve of a debt crisis; this can easily happen when in a financial repression situation of course. Weicheng, Presbitero, and Wiriadinata (2020) explore a cross-country data set and find that as a country's debt grows, the percent of years it gets to enjoy $r < g$ falls. Rogoff and Schmelzing (2024) argue that in fact the trend in $r - g$ was positive for much of the twentieth century, and that current levels of $r - g$ in the United States and the United Kingdom, along with some other advanced economies, might have been well below trend until the recent spike in interest rates.

If one wants to argue that "debt is a free lunch," it is also important to recognize that state sponsored "pay as you go" pension systems have a similar macroeconomic footprint to marketable debt, even if they do not carry the same legal status. If issuing higher marketable debt squeezes out some of these other programs, one might regard this as form of default on "junior

debt," as Rogoff (2020) argues. Figure 4 is based on OECD data (updated from Rogoff (2020)) showing the stunning size of old age expenditures across a spectrum of countries. These "debts" are not legal in the same strong sense as normal government debt. Rather, they are political obligations that are nevertheless difficult and costly to abrogate. It is quite likely in the United States, for example, that social security payments will eventually be restricted to low and middle-income citizens. If this happens, it is only a matter of semantics whether one wants to describe this as a tax hike or a default on junior debt.

One should not presume that the literature surveyed in the discussion until now particularly solves the intense debates about r – g, the role of government fiscal policy, or whether the present period is merely an interlude from secular stagnation. Although no one can know for sure, it does today seem entirely plausible that the secular stagnation theory will once again crash and burn as it did in Hansen's era. The topic is one of active debate; my point is only that the issue is not nearly so clear as held by the overwhelmingly dominant strand of the academic and policy literature,

If, on average, real interest rates due turn out to be higher in the next decade, will it mostly be because growth is higher? At a global level, this seems unlikely, particularly given the problems facing the world's second largest economy, which we will consider next part.

Debt Supercycle

There is little question the 21st century has seen some extraordinary shocks, including the stunning rise of China, the explosion of social media, the pandemic, not to mention the geopolitical tensions unveiled by Iran's aggression in the Middle East, and Russia's full-scale invasion of the Ukraine. This century has also witnessed an extraordinary sequence of financial

crises, which we have argued have generated some of the effects that have been interpreted as secular stagnation, or at the very least greatly amplified them. Indeed, as Reinhart and Rogoff (2009) show, the runup to the 2008-09 global financial crisis bears many of the standard markers of the runup to other post-war systemic financial crises, not only qualitatively but quantitatively. These markers include a large debt-financed housing price boom, an equity price boom, and sustained current account deficits. They also include a slowing of growth that typically precedes the financial crisis itself.

The aftermath of the 2008-09 crisis involved a long, slow recovery rather than a conventional V-shaped recovery, with per capita output typically taking two years just to bottom out, and unemployment taking five years. A number of other quantitative metrics are also consistent with the financial crisis diagnosis. Housing prices and equity market collapsed in the many countries. Measured peak to trough, the metrics match up surprisingly well with the average of earlier post-war crises, mostly notably for the United States. The large rises in government debt were also typical.

The idea that slow post-financial crisis growth was mainly due to secular stagnation appears to fly in the face of international evidence, although researchers looking narrowly at US data, might have reached the conclusion that the slow growth period should not have been a surprise given previous trends. Stock and Watson, for example, conclude "most of the slow recovery in employment, and nearly all the slow recovery in output, is due to a secular slowdown in trend labor force growth."

Why do financial crises have such large and long-lasting footprints? One reason, of course, is that in Western systems, it can take many years to resolve debt problems, and this greatly amplifies the real effects compared to what the situation would be in a world of perfect

markets. A second reason is that asset price collapses cause people to experience a large collapse in wealth. This in turn reduces consumption and, through Keynesian multiplier effects, can potentially lead to deflation. The weakness of the banking sector, as conjectured by Bernanke (1983), is also a factor since it makes it more difficult for small and medium-size businesses especially to get loans. Large businesses that might be able to borrow in public markets in order to invest in equipment, structures and especially research, are prone to hoarding cash and refrain from investment until uncertainty falls. Last but not least, government regulation policy is prone to overshooting to protect against the next crisis, leading to policies that might go beyond prudence into repression.

All this is well known of course, but bears re-emphasizing given the extent to which the literature became dominated by the notion that most of what happened after the financial crisis should be regarded as just a continuation of chronic low productivity and inadequate demand that has prevailed long before 2008. This difference between secular stagnation and financial crisis is mor than a matter of semantics; it affects the calibration and duration of the response.

In Rogoff (2016b), I observed that 2008-09 financial crisis might have emanated from the United States, but also came as part of a larger sequence of crises including Japan and Asia in the 1990s and the 2010-12 European debt crisis. I predicted that the sequence would eventually migrate to China in the form of a real estate centered crisis.

For years, China has been the classic "this time is different story," with most experts refusing to believe that China could ever experience anything other than a mild deceleration. My view, as expressed in Rogoff (2016b) and elsewhere, is that a major long-term slowdown was always inevitable, eventually brining Chinese growth back to earth. In our 2020 NBER paper entitled "Peak China Housing", Yuanchen Yang (now of the IMF) and I showed that the

construction sector in China is inordinately large by global standards, counting both direct and indirect inputs (23% of GDP, 26% including imported content). Moreover, because the fast pace of construction had been going on for over two decades, China's per capita housing stock was beginning to rival that in much richer countries, including Germany, France and the United Kingdom. We concluded that real estate construction was likely running into diminishing returns in many parts of the country. After the collapse of Evergrande in 2021, our first result on the size of demand for production of new real estate in China, became widely known

The second result on the possibility that significant diminishing returns had set in, was perhaps less appreciated/accepted, perhaps most previous research had focused on the largest and richest cities, where housing prices still appeared to be rising. In a follow-up paper (Yang and Rogoff, 2022), we showed that in fact the overbuilding problem was particularly concentrated in many of the smaller and less well-known "Tier 3" cities, which nevertheless collectively account for 60% of GDP. It is not so unusual for a country's real estate problems to be regional: the 2008-09 subprime financial crisis in the United States hit California, Arizona, Florida and Nevada especially hard and much less so other states, for example New York. Similarly, Spain's housing crisis was particularly concentrated in overbuilding in resorts along the coast, etc. Today, the viewpoint that China is in a housing crisis has become widely accepted, as for example embodied in the October 2023 IMF World Economic Outlook.

Nevertheless, many observers continue to believe that the real estate situation in China could be turned around simply by loosening restrictions, for example, on real estate lending. This seems unlikely if the true problem is one of an overhang of excess housing in many locations. If the problem is overbuilding, then the long-term solution requires a reallocation of resources

away from real estate and infrastructure into other areas, a transition that most financial-crisis stricken countries have found extremely difficult.

In some ways China is different, especially in that the central government has the capacity to rapidly allocate losses, at least in principle. In analogy to the Coase theorem, establishing property rights is integral to economic efficiency. Nevertheless, there are many ways in which China's crisis bears strong similarities to the Western variety, even if bank runs are suppressed and aggregate statistics on bankruptcies are hidden. Of particular importance is that real estate not only constitutes a large fraction of aggregate demand; it also constitutes an exceptionally large share of consumer wealth. Figure 5, updated from Rogoff and Yang (2020), shows that housing wealth forms a very large fraction of total Chinese household wealth, far more so than in the United States, where equity holdings are proportionately far more significant. Aggregate data on falling house prices can be suppressed to some extent by authorities, but the public quickly catches on. The perceived loss in wealth from lower house prices has caused Chinese savers to pull back. Savings has also risen out of fear of unemployment, which is widespread among youth and likely to become widespread in the construction sector as real estate inevitably pulls back, even if other sectors such as green energy partially substitute.

It is important to recognize that China is not experiencing a central government debt crisis; it has ample reserves and is a net creditor internationally. In this sense, China's crisis is far more similar to Japan's than to say Spain's or Ireland's. Although the central government is not bankrupt, many local governments are in deep trouble, particularly stemming from local government financing vehicles that are either implicitly or explicitly backed by the local government. The situation has become so dire that in many smaller cities, private firms are being taxed to provide transfers and social payments that the government itself cannot afford. Notably,

central government debt is projected to grow sharply, much along the lines of a garden variety financial crisis. The April 2024 IMF Fiscal Monitor projects China's debt to reach 84% of GDP in 2024, and to exceed 100% of GDP by 2027, and the report contains a footnote noting that these estimates exclude some categories for China that are included for other countries.

Rising central government debt is one of the factors that has somewhat paralyzed the response to the crisis, for example making central authorities reluctant to restore taxation powers to local governments, and also reluctant to engage in unconditional blanket transfers to individuals. This kind of situation, where authorities have to take ever-increasing risks to engage in needed stimulus policies in a deep recession or crisis, is one of the central reasons why very high government debt can lead to sustained lower growth. Mauro and Zhou note that r – g has been negative in China 100% of the time. So one might ask why Chinese authorities should be concerned with following the recommendation of simply allowing debt to go much further, say to 200% of GDP as Japan. That might be right, but the Chinese authorities are also aware that the negative r – g differential is importantly due to massive financial repression, which in turns creates major inefficiencies that will be exacerbated by having to ramp it up. Rightly or wrongly, they do not accept the view that $r - g < 0$ implies a free lunch, because they know from decades of experience that it does not.

So far, we have concentrated on the problems in China's real estate sector, which constitutes approximately 70% of China's construction sector (Rogoff and Yang, 2020); similar overbuilding problems extend to infrastructure which has also expanded disproportionately in the tier 3 cities (Rogoff and Yang, 2024a,b). And China has many other problems, including demographics, as well as changing attitudes in the United States and Europe towards Chinese exports, not to mention geopolitical tensions. Over-centralization of economic power and

decision making in China has intensified in recent years, and this too has likely contributed to the slowdown in economically productive activities. If one is looking for solutions to China's malaise, an obvious first step would be to strengthen the role of the private sector, though this seems challenging given other political objectives. A second would be to restore the central importance of merit and technocratic competence in major policy appointments, as China has long been known for.

Getting an accurate reading on China's fast-moving economic situation in difficult, especially as China's official government statistics have become more politicized. Although Western economists have far more data on China today than they had on the Soviet Union during the cold war – if nothing else night light data – it has still become increasingly difficult to assess the validity of Chinese statistics. My guess is that at some future date, when there is scope for a forensic historical review of the data, it will show that China experienced at best very modest economic growth in 2023 and 2024, not even the four to five percent growth shown in the official statistics, already a sharp decline from the heady pre-pandemic era.

We now turn to how the various sequence of crises, starting from Japan in the 1990s, might be connected, if only loosely so. This is a bigger task than can be taken up in this paper, but we will venture a few thoughts. There is little question that US subprime crisis could have been avoided with better regulation. Few today would place the country's current account deficits, which exceeded 6% of GDP just prior to the 2008-09 crisis, at the center of the crisis. However, US current account deficits may have been a greater contributing factor than is commonly acknowledged. Surely Asian surpluses would put downward pressure on global interest rates, as one can ascertain from the familiar Metzler diagram for the open economy, as emphasized recently by Obstfeld (2023) in last year's edition of this lecture; Eggertson et al.

(2016) also make this point. In principle such surpluses and deficits are completely benign. This is not the case, however, for a country with regulatory imperfections, as was clearly the case in the United States prior to the financial crisis. Federal Reserve officials were well aware of the correlation between US current account deficits and second mortgages that were used for consumption. Had the United States been an emerging market, the IMF might have warned that the surge in capital inflows could exacerbate misallocation of credit, potentially leading to banking problems. That is, the IMF might have been recognized that the large capital inflows were pouring fuel on the fire caused by poor regulation.

The link from the US financial crisis to the European debt crisis is much clearer, of course. Spain and Ireland, in particular, had their own brewing housing crises that would have likely unfolded eventually anyway. These are countries that on paper did not have any kind of fiscal problem, except that government guarantees of the financial sector implied large hidden debts. The contagion to countries such as Portugal, Italy and Greece, all of which had problems that were more fundamentally fiscal, however, was certainly sparked by the broader uncertainties in markets that the US sub-prime crisis caused, not to mention weaknesses in European banks that the crisis revealed. One can go more deeply into the interconnections, though I will not do so here.

How is China's current economic malaise possibly connected? The stimulus policies that China put in place to prop up its economy during the global financial crisis, while widely praised, were very much concentrated on supporting real estate and infrastructure, leading ultimately to the imbalances that prevail today. Notably, the success of the initial stimulus led to further rounds, as well as to changes in regulations that permitted so-called "local government financing vehicles". These LGFVs in turn have become a weak spot in the economy today. Of

course, China could have adopted other policies over the past decade to counter these problems, but as the case of the United States in 2000s, the issues were not fully recognized.[5]

We finally turn (briefly) to policy issues. Here understanding that the debt supercycle is a large part of what has been labelled secular stagnation is of some significance, even if the policies proposed for dealing with a secular stagnation also make sense if a country is in a financial crisis, up to a point. For example, engaging in policies to backstop the financial sector, as well as stimulus policies such large-scale transfers to individuals or spending on infrastructure all make sense in doses, and can be debt financed (although taxes on high income earners that are redistributed to lower income earners are also way to do stimulus without deficits). Nevertheless, if one rejects ideas such as assuming that real interest rates on government debt will almost certainly remain low forever, or that growth can always be counted on to clear away debt overhang, then it is important to distinguish between temporary and permanent policies. The idea that, practically speaking, there is no such thing as too much stimulus, and that any restraints amount to "austerity", is very short-sighted and ignores risks.

Relatedly, one of the lessons central banks seemed to have learned from the financial crisis seems to be that for banks "when in doubt, bail it out." If r – g is negative in perpetuity, and not the result of financial repression, if government spending does not significantly crowd out private investment, then perhaps this extreme view makes sense. If, however, there is a risk in the future that real rates rise (as they have the past two years), and or that growth will fall (as global growth has done), then suddenly tradeoffs re-emerge, and overly generous bailout

[5] Rogoff and Yang 2020, 2024a,b).

programs create hidden debts that can later create pressures to inflate these away or use financial repression to make them manageable.

There are certainly important forces, especially demographics, that have may have slowly and steadily contributed to slower growth and low real interest rates. There is a good case to be made, however, that serial financial crises, in the form of a debt supercycle that has now reached China, have played an equal or larger role. With real interest rates apparently set to be elevated for a prolonged period, it appears that at the very least, that the secular stagnation era is over. This paper makes the stronger argument though, that there probably never was a secular stagnation era, certainly not as the dominant theme, any more than when Hansen brought forth the idea in the 1930s.

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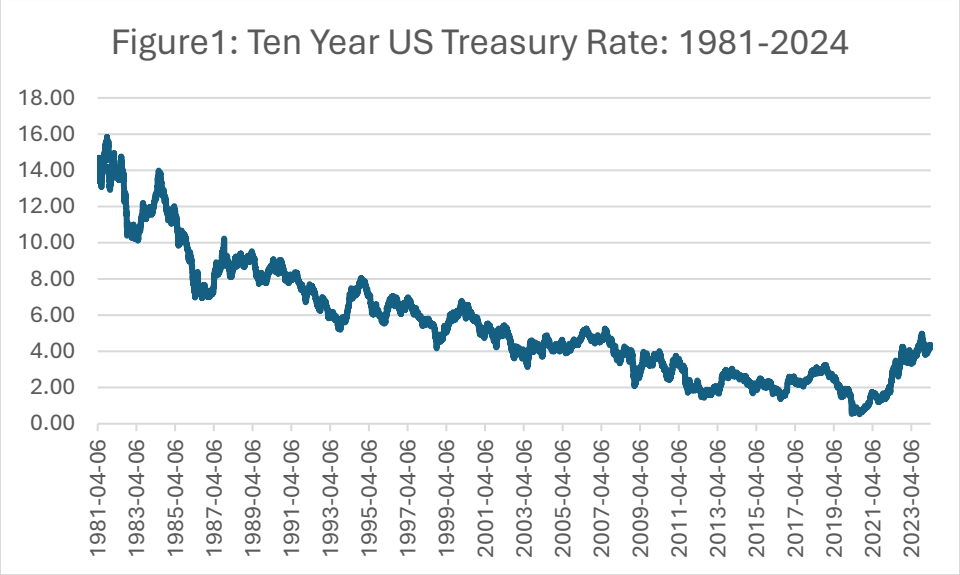
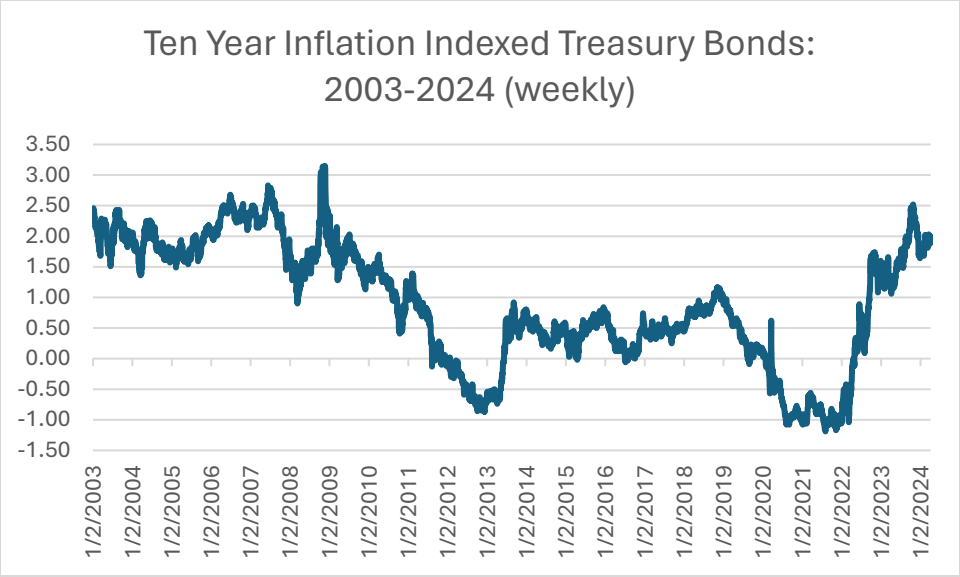
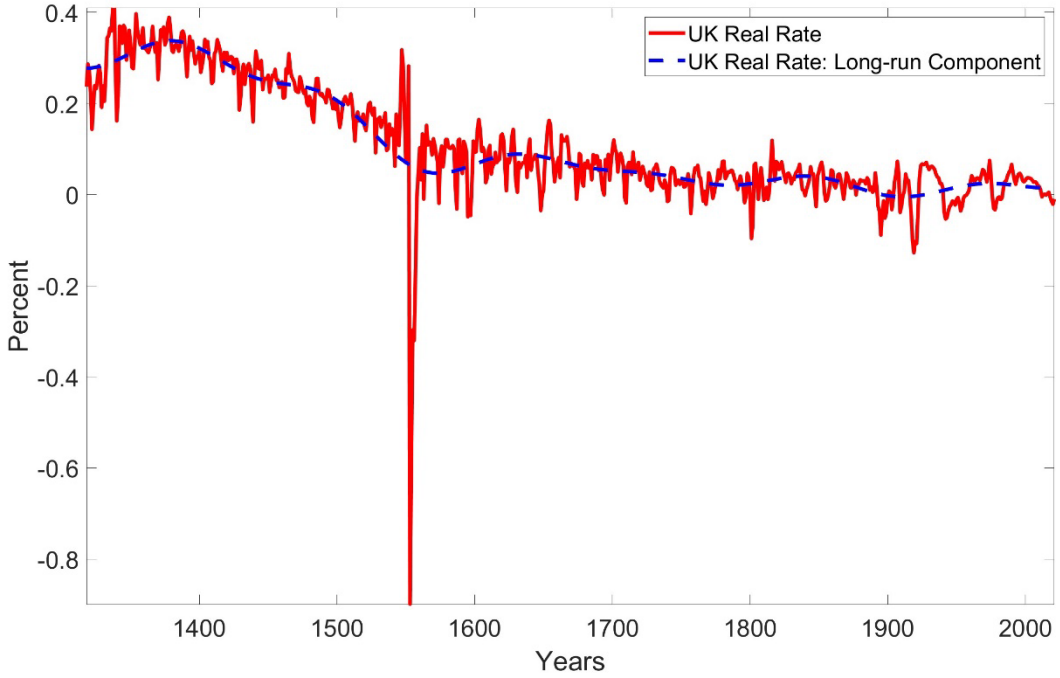


Source: Federal Reserve Bank of St, Louis

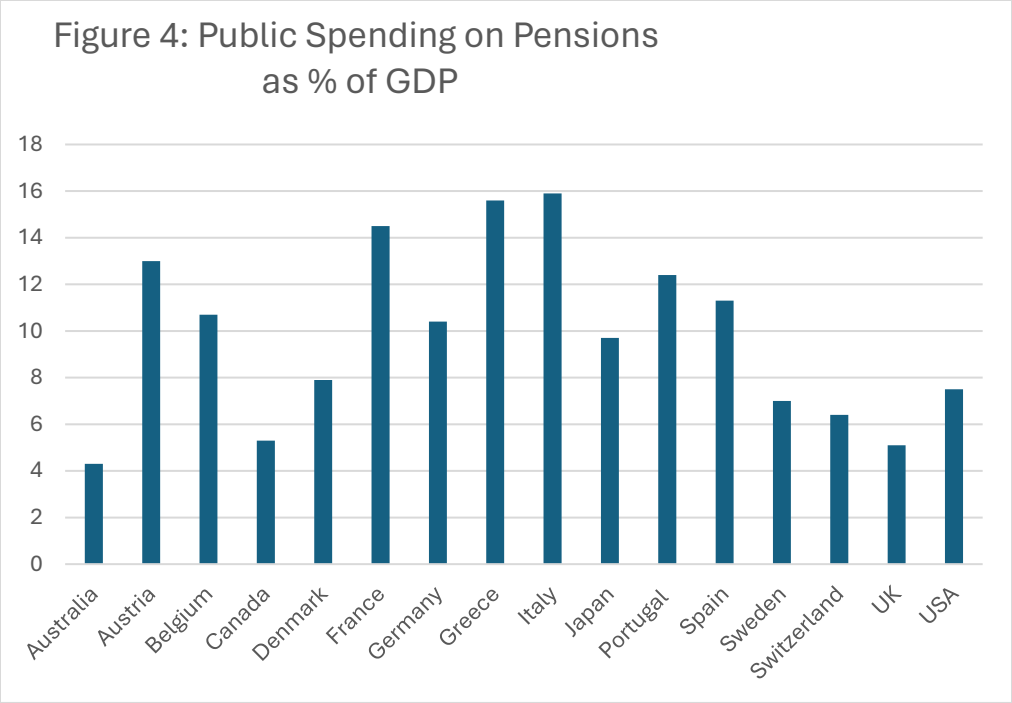


Source: Federal Reserve Bank of St, Louis

Figure 3: UK Long-Term Real Interest Rates: 1318-2021

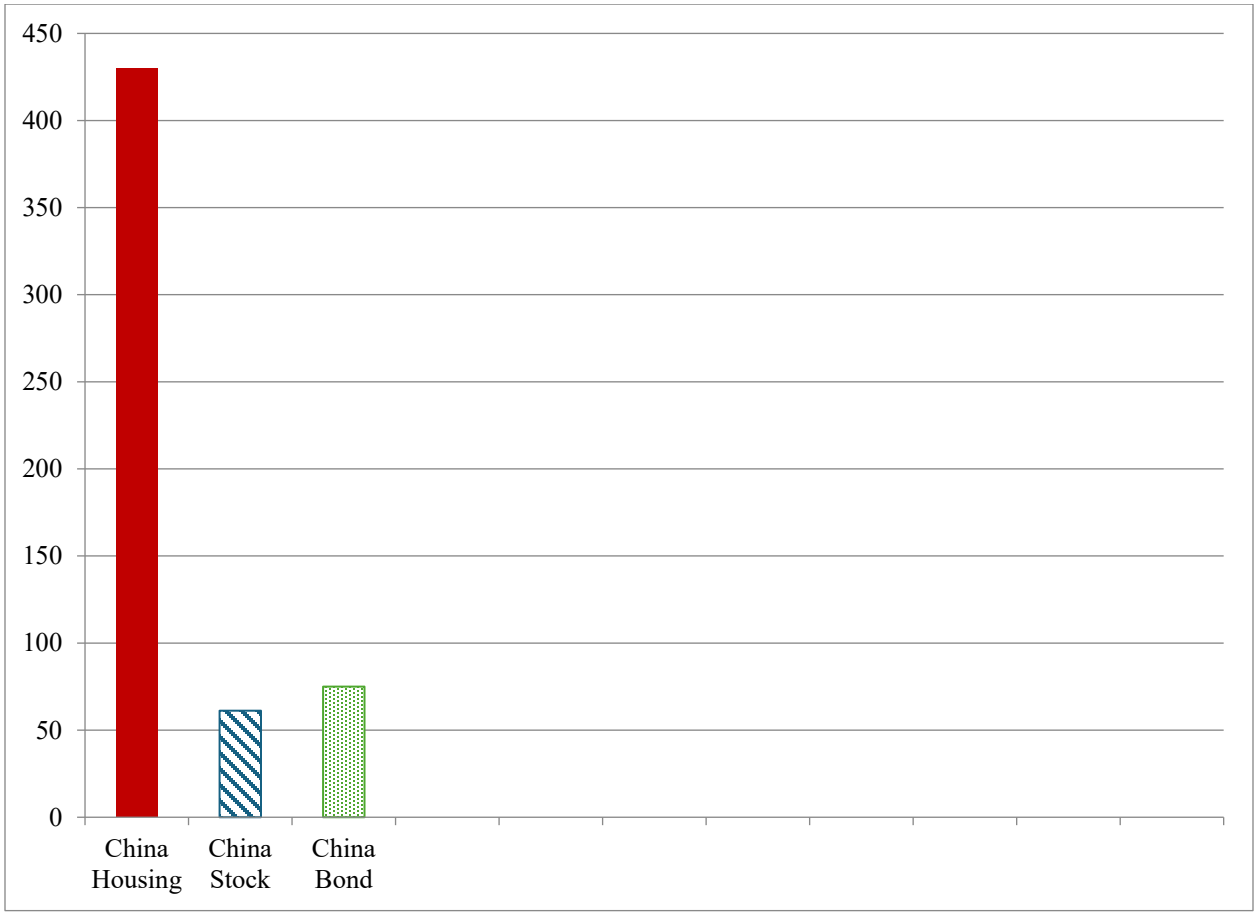


Source: Data and methodology for constructing real interest rates and smoothed trend: Rogoff, Rossi and Schmelzing (2024), Underlying original source for interest rate data: Schmelzing (2025) data set. Dashed blue line represents the long-run Muller-Watson filtered component.



Source OECD (2021, or most recent year available) https://data.oecd.org/socialexp/pension-spending.htm

Figure 5: Distribution of Chinese Wealth:



Source: Rogoff and Yang, 2020)