

GLOBAL BOND STRATEGY

Interest Rates: A Growth Story



Photo: Micheile Henderson on Unsplash

Interest rates in the US are at levels never seen before. Companies gorge on debt as their cost of debt capital declines. Meanwhile, income-focused investors and savers yearn for the security of higher levels. Monetary policy certainly abetted the achievement of these levels. The reality is that another factor is complicit in the conspiracy to lower interest rates: growth. Before the yield suppression of the 1940s and the inflationary disconnect of the 1970s led them on a different path, real Treasury yields walked with real growth for decades. That relationship returned over the last four decades. Before the Pandemic, the expectation was that the increasing productivity of the Millennial generation would modestly lift real rates. Without an effective policy response, that outcome is doubtful and could repress real rates for decades. Investors are forewarned that this time is not different.

“

The Pandemic is throwing asunder the growth prospects for the US and bringing lower yields that could persist for decades.

Cash flow investors face headwinds to achieving their objectives that will endure.

- Jason Prole

”

Highlights

- **Interest rates** are at levels never seen in a 150 years.
- **Real bond returns** mirror real growth and is unmoved for 50 years.
- **Low inflation** will not enable the ‘monetary illusion’ to ease the burden.
- A **growing prime-age cohort** will offset a declining workforce.
- Declining **tangible investment** increases profits at the expense of wages and growth.

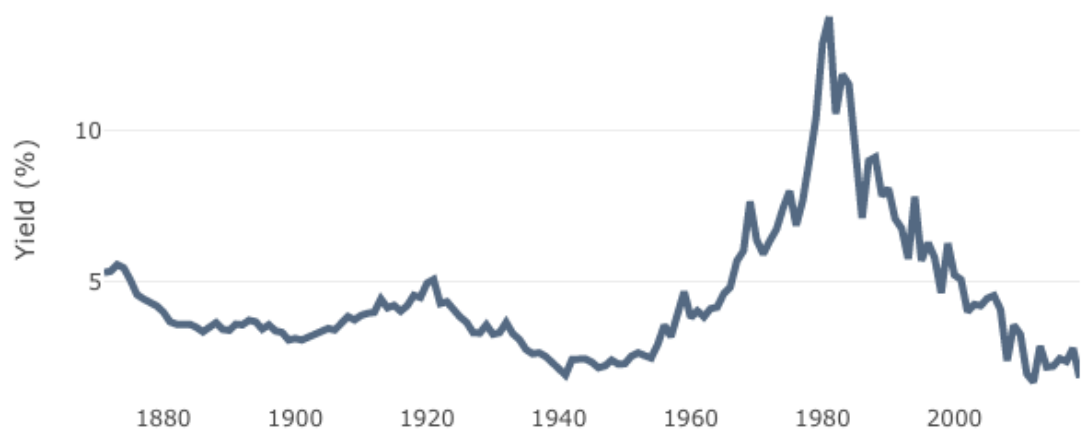
Originally published in 2009. Updated with new data and revised in 2014 and 2020.

Interest Rates: A Growth Story

One of the great conundrums of the current millennium is the vexingly low interest rates at the long end of the yield curve in the United States, particularly with an unprecedented accumulation of debt from expansive fiscal and monetary policies. The outcome bewildered a past Chairman of the Federal Reserve while becoming an explicit target of the current Fed. These esteemed purveyors of monetary policy now provide insight into their decisions: a long verboten action. These outcomes lead the observer to the nature of the real interest rate in the long run.

Exhibit 1. US Government 10-Year Bond Yields

Treasury yields are at levels never seen before.



Source: Federal Reserve Economic Database

Current levels mirror those from 1870-1970.

Meandering through the history of government bond yields clarifies that the inflationary era from the late-1960s to the early 1980s was the exception to the rule (exhibit 1). Yields above five percent were such a rarity that even a stalwart of the gilded age would have thought the usurious rates of the 1970s extravagant for the world's prime credit, even with an inflationary tailwind. The trouble is that this generation of investors did not reference the other hundred plus years when rates were moderate, but only their current anchor point, which started in the 1970s, not the 1870s.

Interest Rates: A Growth Story

Deconstructing Interest Rates. The textbooks extol that there is no reward without risk. This dictum tells us that for bearing more risk, we must expect more return. The disciples of Modern Portfolio Theory attest that the higher rates of interest compensate for the uncertainty to whether the periodic payments and return of principal transpires. Another conundrum resides in the credit market, which does not reflect the degree of economic uncertainty due to monetary policy. While this disconnect is an intriguing question, Treasury rates are the focus of this investigation.

Treasury rates are default-free with risk.

The market wizards view the government (i.e., Treasury) bonds as risk-free. This wondrous outcome exists because the government can luxuriate in its privilege of printing to pay its semi-annual stipend or the voluminous balloon at the end (and the advantage of seigniorage for the US). The astute commentator would ask why the rate would fluctuate at all when the possibility of default is non-existent?

For the answer, our well-worn economics textbook provides an argument that begins with a theory, no matter its dogmatic tendencies. The interest rate on a government bond is where supply and demand forces conspire to meet after an arduous negotiation. They price two key components: the expected inflation rate and the real interest rate until the maturity of the bond. While our recent experience with inflation is low and stable rates, events shattered this calm in the past (exhibit 2). Thus, some variability should occur in the risk-free asset price, which embraces this uncertain inflation element.

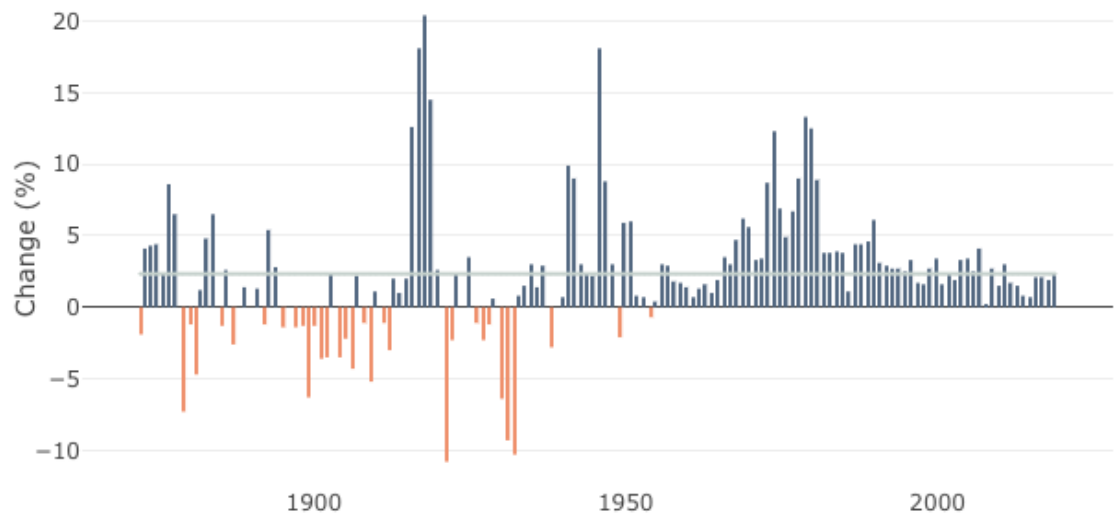
Interest Rates combine the expected growth and inflation rates.

One of the troubling aspects of this analysis is that before the inflationary period in the 1970s, the only time inflation reared its insidious head was during wartime. Without these shocks to the supply (decrease) and demand (increase) of goods, the price level would have been equally probable to deflate as to inflate. This outcome begs a rather trite question: if rates didn't have inflation embedded, was the economy's expected growth rate the critical determinant?

Interest Rates: A Growth Story

Inflation was non-existent before 1970, yet highly variable.

Exhibit 2. Annual Change in the US Consumer Price Index



Source: Federal Reserve Economic Database

In the absence of inflation expectations (and who would expect inflation if it hadn't occurred?), then the answer must reside elsewhere. The parable on markets that there is no return without risk does provide some solace. Inflation may have averaged zero with *high variability*. Thus, investors should demand compensation for this uncertainty. Alas, the absence of option pricing formulas and Treasury Inflation-Protected Securities (TIPS) before the 1970s did not permit such explicit risk pricing.

Correlation suggests no relationship between inflation and real growth.

Without credit risk and the option pricing of inflation, the focus is solely on the economy's real growth rate. A well-worn tool of statistical analysis, correlation, would suggest that no relationships exists between the annual differences over the last 120 years.¹ While a robust measure in some circumstances, it does not design to capture relationships through time. The old saw applies here: correlation is not causation.

¹ Using regression analysis on the log of the prices delivers spectacular results. Unfortunately, this method (and its more egregious twin, merely using the unadjusted prices) violates many model assumptions. Surprisingly, this outcome happens frequently. Notably, a former head of global equity and a current head of quantitative equity fell prey to this error at top-10 global firms!

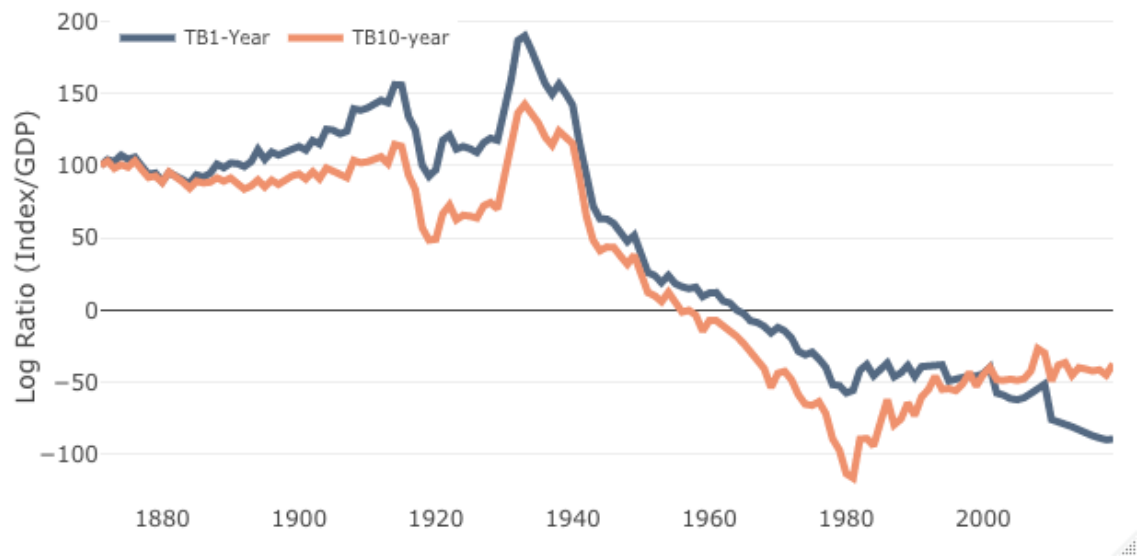
Interest Rates: A Growth Story

Cointegration measures causality.

Fortunately, there are relatively recent Nobel prize winning innovations in time-series analysis that permit the intrepid quantitative analyst to answer the question. This endeavor involves analysis using Granger causality and its successor, cointegration². Critically, it allows an understanding of the relationship in *the levels* of the variables. One can then state whether the price series are cointegrated (i.e., related) and if one Granger-causes the other. More relevant to ease of expression, a line plot shows this relationship simply.

In this cointegration exhibition, the expectation is that the log ratio of two time-series would be flat with random noise causing minor deviations.³ Removing inflation places the focus on real growth. Thus, if interest rates (e.g., 10-year Treasury Bond total return index) reflect growth, then the expectation is a somewhat stable level. At first glance, this relationship is anything but stable (exhibit 3). Closer inspection reveals more.

Exhibit 3. Ratio of Real Bond Total Return Index to Real GDP



Source: Federal Reserve Economic Database

² A full explanation of the tool's statistical derivation is beyond the scope of this discussion. The intrigued analyst should explore the work of Granger and Engle for further insight.

³ The original work of Engle and Granger was extended with a vector-error-correction (VEC) model that accounts for these deviations.

Stability erodes when policy alters the relationship.

Interest Rates: A Growth Story

An investor in 1870 who awakened in 1940 would see no difference between the economy's growth and their Treasury Bond (or Bill). This period was *seventy years*. Indeed, there was significant episodic divergence, yet over the long run the relationship always returned. Then, around 1940 it stopped reverting. The natural question to posit is, what changed?

The Second World War (WWII) brought hereto unseen combination. This era marked the beginning of the downward trend of bonds versus the economy that ultimately peaked at the high inflation rate in 1981. The result was lower returns on bonds mandated for the war effort (e.g., victory bonds). At the same time, growth accelerated to meet wartime (and cold war) demand. The result was bonds levels falling behind real growth (i.e., a downward movement in exhibit 3). Then it reverted again.

The “Great Moderation,” kick-started by Fed Chairman Volker in 1981, saw the return of stable inflation rates and the realignment of bond returns with real growth. In fact, in exhibit 3, it shows that the long Treasury bond returns matched real growth since the late 1960s, notwithstanding the inflation outburst on the 1970s. Indeed, there is a natural relationship between the economy and the real Treasury bond (or bill) returns.

With a preference for simplicity rather than complexity, the issuing government's entire economy's return parallels interest rates. In effect, *the total diversified portfolio for the economy*.⁴ The rate of return on this “portfolio” should thus be the growth of the economy. The double edge sword of leverage may generate more profits. Alas, playing with sharp objects is for the swashbuckling few with a preference for unrewarded risk. The challenge for this cavalier few is to find a trustworthy soul to lend them money at a rate less than the Treasury rate.

⁴ For Modern Portfolio Theory adherents, since the people through their government can call on all assets in the economy, the economy is the *fully diversified portfolio* and the lowest risk investment. The investor needs only to determine their investment horizon or their price of time.

**Policy choices
in the 1940's
led to the
disconnect.**

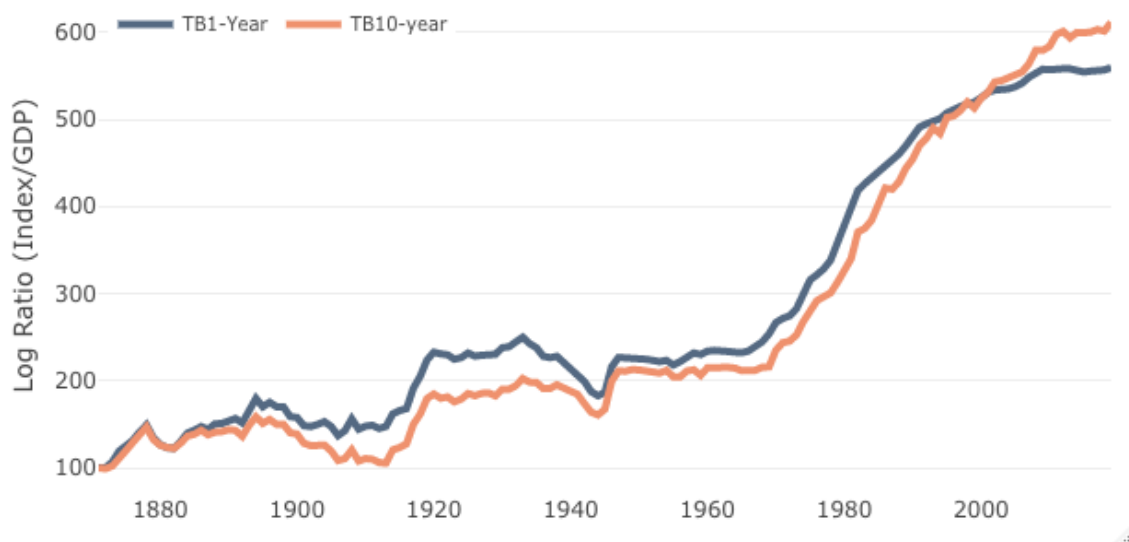
**Treasuries are
the risk-free
asset because
they are fully
diversified.**

Interest Rates: A Growth Story

Nominal bonds moved with the economy for a century.

From this analysis of first principals, the deduction is that when inflation is a non-event, bond returns will broadly reflect the economy's real growth rate. These inflation shocks drove nominal bond returns to effectively have no premium above the price index from the 1890s to the 1970s (exhibit 4). By deduction, the best time for bonds relative to the economy is when expected inflation is systematically higher than realized. This outcome is the rather fortunate scenario a generation of government bond investors experienced at the turn of the Millennium and continues today.

Exhibit 4. Ratio of Nominal Bond Total Return Index to Nominal GDP



Source: Federal Reserve Economic Database

The forlorn investor confronts an unenviable task. Their singular task expands to bifurcated labor that requires a forecast for both the economy's real expected growth and the anticipated rate of inflation. Fortunately for us, many great economic minds have set themselves to this Herculean task.

Real growth supersedes inflation.

In a seminal work of both practicality and theory, economic heavyweight Robert Solow proposed that economic growth remained the domain of two factors of production, capital, and labor. Increases in real GDP are the providence of growth in the labor force (i.e., population growth) and the amount of capital invested in capital goods (industrial production) to push

Interest Rates: A Growth Story

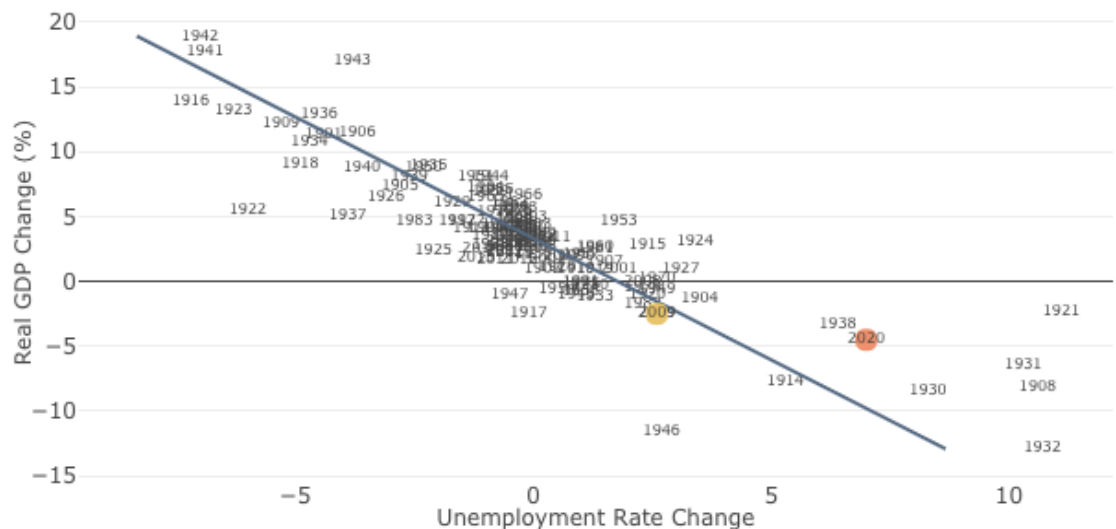
Technology drives growth.

growth higher. Paul Romer showed that technology (knowledge) augments both factors. Thus, the ingredients to growth are labor, land, and capital.

The Labor of Real Rates. In this growth framework, changes in the supply of labor or capital have a direct positive impact on the economy’s growth. The expansion of the labor force increases demand in the economy. Capital enables the investment into production capacity that can supply these wants and needs. Technology is a scalar that leverages labor by increasing efficiency. Their combination determines the real rate of interest.

If growth is a function of labor, then changes in the labor force should show a relationship with growth. This economic axiom is named “Okun’s Law,” which stipulates that economic growth is related to employment changes. While there are no unbreakable laws in the social sciences, this relationship endures the test of time (exhibit 5). The connection is vividly clear: unemployment and real GDP growth tango quite well together.

Exhibit 5. Okun’s Law of the Unemployment Rate to GDP growth



Source: MSCI. Capital Risk calculations. Ratio increases reflect large cap outperformance.

People are critical to growth.

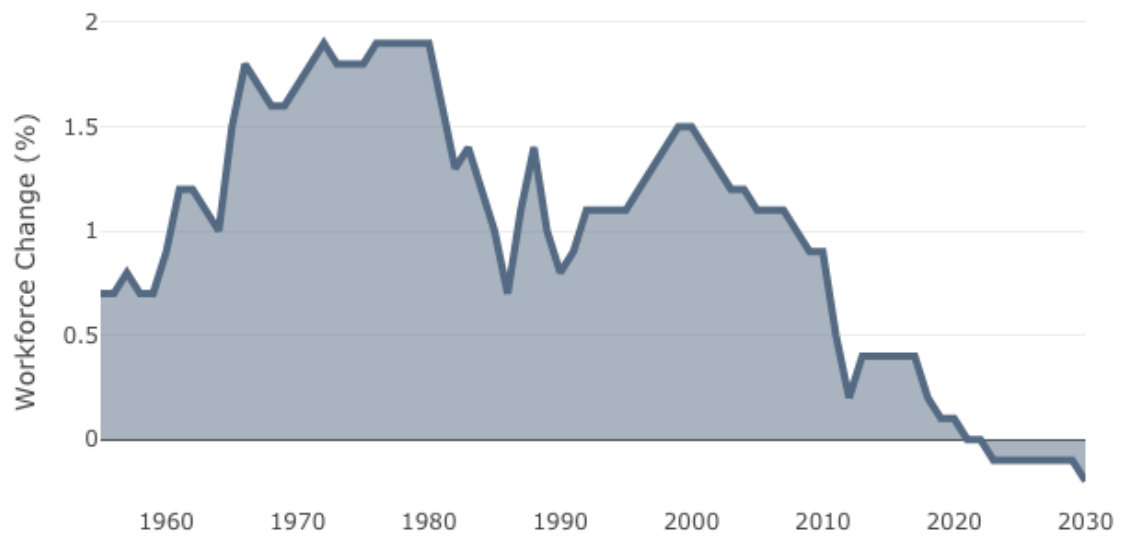
Interest Rates: A Growth Story

Pandemic policy should focus on productivity.

This relationship's significance is timely if the current pandemic-induced malaise in the economy results in a structural resetting of the economy. While the future is uncertain, both organizational and consumer behavior may change as people work, eat, and shop from home. The impact on commercial real estate, transportation, retail, and health services could be profound. The critical question is how the actions *impact productivity*. The outcome for interest rates could require a discount or a premium depending upon the result.

The US faced a seminal moment in 2020 before the Pandemic, and unfriendly immigration policies transpired. This year is the first time the size of the prime-age workforce contracts (exhibit 6). This threshold happened in Japan in 1996, Europe in 2011, and China in 2016.⁵ A declining workforce would suggest lower growth, all else equal.

Exhibit 5. Prime-age (18-65) Workforce Change (% annual)



The US workforce is declining.

Source: MSCI. Capital Risk calculations. Ratio increases reflect large cap outperformance.

Expanding the outlook beyond the borders of the domestic economy delivers another implication. The expansion of the *global labor force* by integrating

⁵ See *World Population Prospects 2019*, United Nations, Department of Economics and Social Affairs, 2019.

Interest Rates: A Growth Story

Labor expansion requires capital expansion.

emerging economies into the world economy continues to provide a massive jump in the supply of labor despite lower headline growth because the switch from agrarian to industrial society proceeds unabated. This labor expansion is unmatched since the North American continent's settling provided the opportunity for under-utilized emigrant labor from around the world to expand their capital in the 19th century. These events reduce the global capital per worker while providing the potential for an expansion of output.

Investing in Real Rates. With global labor expanding, the next question is how changes in capital goods formation impact growth? The capital stock is a function of gross investment minus the depreciation of the current stock. As investment expands, the aggregate capacity of an economy grows. Investment must equal depreciation to maintain output. Lower investment degrades capital goods. In contrast, excess capital increases the level of capital goods at the expense of decreasing returns to capital. Balance is key.

Growth is productivity.

An interesting conclusion from the previous two factors is that population growth will reduce the amount of capital per worker (i.e., population growth will increase poverty). An increase in technology or knowledge that leverages labor (i.e., higher productivity) can offset this loss. Capital formation alone will not lead to growth: the technology must improve efficiency; otherwise, value-destroying investments waste capital.

Deploying capital at a level that offsets the depreciation of the capital goods and the labor force growth maintains output. Excess investment permits an expansion of the economy's real growth rate and supports the real interest rates. The Industrial Revolution at the turn of the nineteenth century, when capital and technology ignited global growth, is an analog.⁶ Before that period,

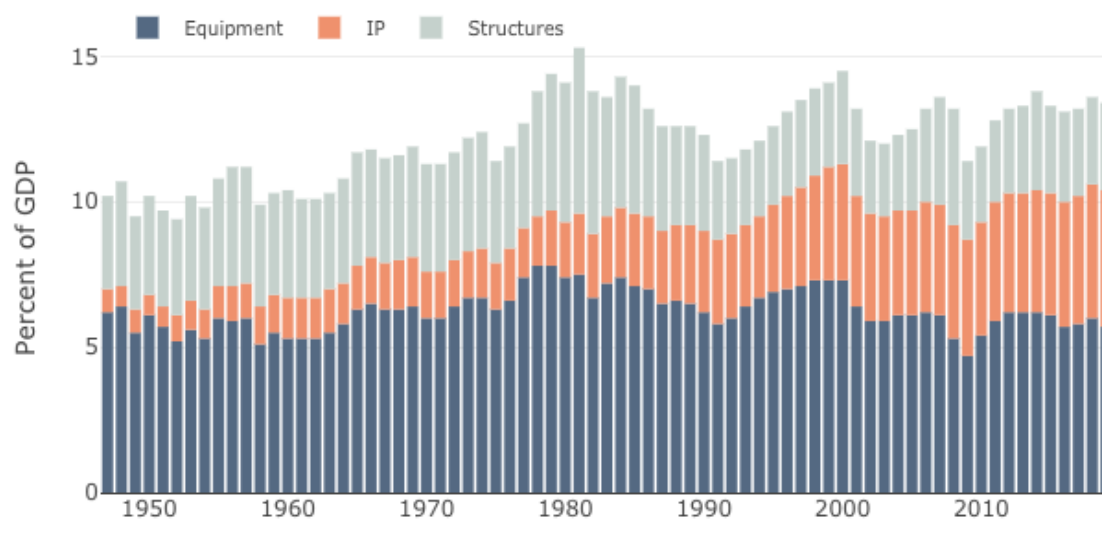
⁶ This conjecture is based on the data created by Angus Maddison and is found here: <http://www.ggd.net/maddison/oriindex.htm>.

Interest Rates: A Growth Story

growth was effectively flat for *1500 years*, with most of it occurring *after 1870*. Investment that improves efficiency results in higher growth.

In the developing world, investment in capital goods increased manufacturing (e.g., China). It provided a vehicle to growth by leveraging capital and labor. In the US, investment as a proportion of GDP is roughly consistent for the last forty years with a material change in the composition (exhibit 6). Investment in equipment and structures declined, while the growth of intellectual property increased. This result is significant for productivity because the former levers *future growth* while the latter protects *past investment* (e.g., patents and trademarks).

Exhibit 6. US Investment Composition as a Percent of GDP



Source: MSCI. Capital Risk calculations. Ratio increases reflect large cap outperformance.

This extraordinary expansion of global labor and investment led to excess capital, which required a home. In the national accounts, investment is the mirror of national savings. The proportion of US investment is little changed, yet the savings rate is low, and the debt level high. As nature abhors a vacuum, so does capital and leads to a fortuitous situation for the US. Trading partners with surplus position (e.g., China) deployed excess capital to support investment (and consumption through lower interest rates).

Intangible investment does not necessarily increase productivity.

Investment is stable with a changing composition.

Interest Rates: A Growth Story

Deficit funding and tax cuts do not help growth.

Herein lies the problem for US growth. Capital goods weren't necessarily the beneficiary of investment that might improve labor or capital growth. Indeed, the expansion of non-performing "investments" into government bonds that fund a deficit does not bode well for future growth prospects. Since the marginal rate return of capital for the economy (the real interest rate) reflects its real growth rate, prospectively, this result will diminish real rates. To the extent that capital fed deficit spending to lower tax rates, it most surely is value destroying.

Technology's Lever. Knowledge is the lever of technology that supports growth. It is the pivotal factor that led to Western growth for the last two hundred years. The Industrial Revolution at the turn of the 19th century and the Information Revolution at the end of the 20th century encapsulates it. The key components are technology and an adaptable workforce that learns new techniques to increase their productivity to benefit themselves and the invested capital. Constant proportions of labor and capital permit equal gains from higher productivity.

Modest productivity can easily offset low population growth.

Henry Ford's insight into the assembly line permitted higher productivity in automobile production. The result was higher wages for employees, who then turned into customers. These productivity advancements allow the other factors to share in the gains and enable a higher growth rate than population growth alone. This virtuous relationship is one reason countries with low skill workforces trail their knowledge-based counterparts.

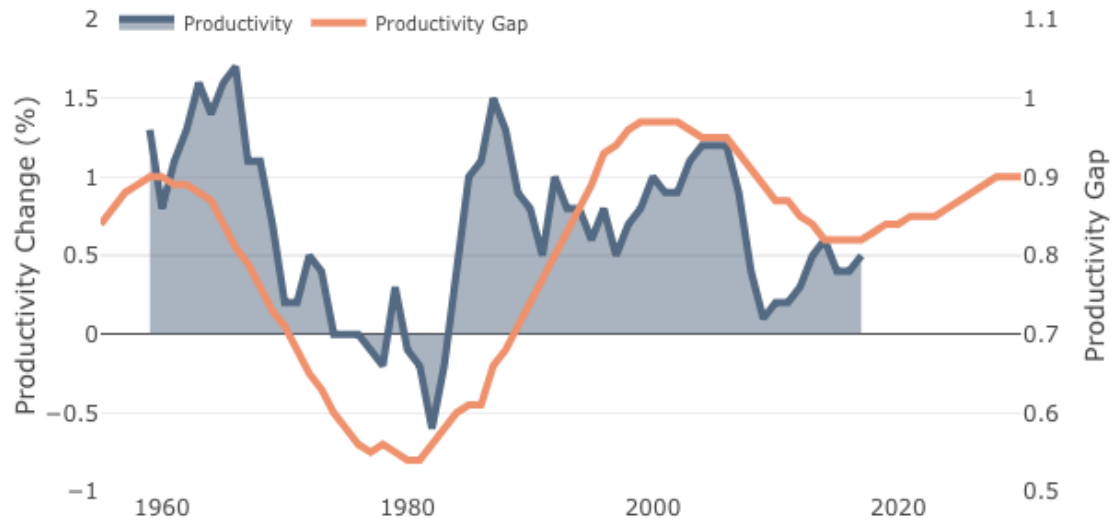
The implication for population growth is material: productivity must expand at the population growth rate merely to keep everything in balance. The overall level of growth may grow, but the per capita level of income *may decrease*. This insight is critical: productivity must expand at a rate higher than the population growth rate to increase income per capita, which entails a continually evolving workforce and replenishing capital goods.

Interest Rates: A Growth Story

Population growth is imperiled by immigration policy.

Historically the US enjoyed a constant refreshing of the workforce through immigration. While that benefit is receding due to policy and the Pandemic, the Millennial generation is the largest US population segment. Critically they are entering their prime production years and could provide a boost to growth (exhibit 7). Their intersection may lift US growth for decades, if the technology revolution is indeed a veritable trend.⁷ In an era of non-productive debt accumulation, this outcome would alleviate the inevitable burden of higher debt service at the public and corporate levels.

Exhibit 7. US Total Factor Productivity & the Productivity Gap



Millennials can drive growth.

Source: Federal Reserve Database and Penn World Table 9.1. Capital Risk calculations. The productivity gap is the ratio of 35-50 year-olds to 20-34 year-olds in the workforce.

The critical dimension is the policy response. The US lifted productivity post-war by increasing knowledge (e.g., the GI Bill), increasing transportation infrastructure (e.g., the interstate highway system), and investing in technology (e.g., DARPA). The incentives for companies are to protect their current monopolies, which trademarks and patents (justifiably) enforce. A national policy focus can help ensure productivity arrives.

⁷ For a further discussion on the relationship between productivity and demographics, see *The Productivity Gap*, Capital Risk (2017).

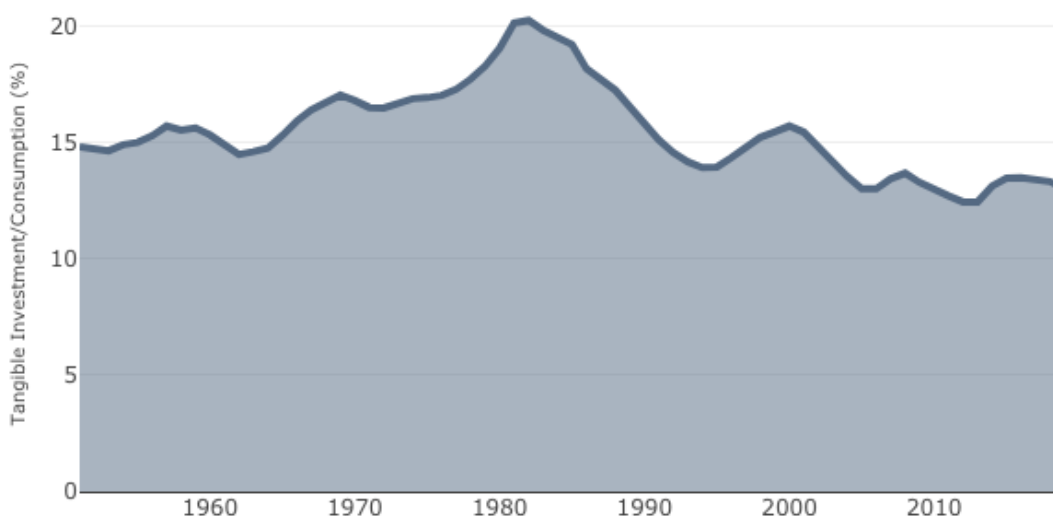
Interest Rates: A Growth Story

Consumption's Golden Rule. The intersection of these three production factors leads to a *Golden Rule* for growth: to maximize growth, maximize consumption, not income. This action prevents the capital to labor ratio from declining while increasing per capita incomes. If not, then capital gains at the expense of labor or vice versa. When out of balance, it creates disincentives.

The increased savings requires more efficient investment opportunities to maintain the capital per worker ratio. Undertaking positive net present value projects decreases the marginal return because of the decreasing marginal productivity of capital (i.e., the high return project selected first, the next highest follows, and so on). A time arrives when no positive return projects remain. At this point, continued investment destroys capital and consumption.

For the last three decades, China's excess savings of *over 30% of income* were invested in US Treasury Bonds and Mortgage-backed Securities (MBS). As the capital sought a home, this action depressed the US Treasury yield levels and *increased US consumption through debt expansion* (exhibit 8). The US had a free lunch of consumption because of the excess capital China provided.

Exhibit 8. Ratio of US Tangible Investment/Consumption



Source: Federal Reserve Database. Tangible investment includes structures and equipment.

Investment must match labor growth.

Tangible investment declined over forty years.

Interest Rates: A Growth Story

China's fixed exchange rate is a root cause.

The key driver of this dynamic is not a Machiavellian plot. It is the consequence following an export-led development path and China tying their foreign exchange rate to the US dollar. Export-led growth requires dependence on foreign consumption to replace its domestic counterpart when investment runs at excess rates. The fixing of China's exchange rate with the US directed excess goods and savings to the US. They balanced each other but left each unbalanced in isolation.

An emerging economy used export-led growth to gain dominance on the world stage once before. The US followed a similar path at the turn of the 19th century to overtake the United Kingdom. Gold was the fixed currency of the time that eventually saw the US controlling most of the global gold reserves after World War II. The US's dominance in trade at that time saw trading of commodities priced in US dollars, which continues today. For those gold standard aficionados that still exist, the US dollar is quoted indirectly in commodity (i.e., gold) terms because of this artifact of the post-war currency regime.

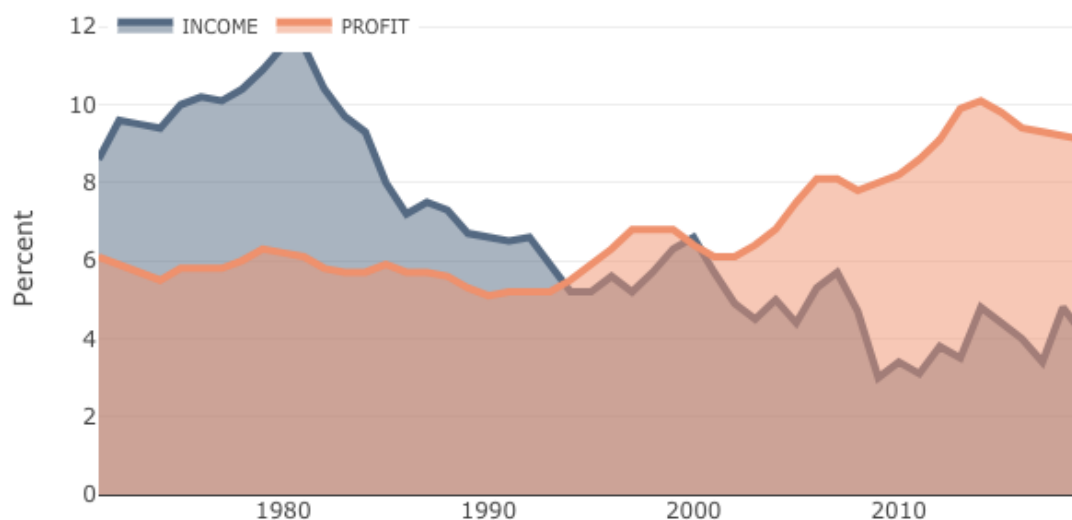
Consumption financed by debt is not effective.

Over the past four decades, the proportion of GDP for investment is stable while consumption increased. The other components must decline if this is the case. While government expenditures fell about one percent, the decline in net exports was nearly three times this amount. As the national account must balance, this is of no surprise. Corporations were able to invest in other countries (e.g., China) with lower costs. This decision is material for growth.

Investing in capital goods in other countries is efficient, and the benefits to the trade are material. The problem is that prices should equalize these differences. Fixed currency regimes alter this relationship by not permitting the price levels to change. This event occurs globally between the US and China. Within the European Currency Union, Germany is replacing China and the southern countries filling the US role. The result is higher returns to corporate profits while national income growth slows (exhibit 9). The implications for *socio-economic policy are material*.

Interest Rates: A Growth Story

Exhibit 9. Corporate Profits/GDP and National Income Growth Rate (%)



Source: Federal Reserve Database. Tangible investment includes structures and equipment.

The net marginal product of capital is equal to the growth rate of total output. From this standpoint, it is critical to understand the country's growth prospects to determine the country's long-term interest rates. The implication is not that all rates will be equal: different terms will require different risk premiums. Investing capital in riskier propositions that are not adequately diversified will require further compensation. The real interest rate will broadly reflect the aggregate economy's growth rate because it is the fully diversified portfolio and measures the aggregate marginal product of capital.

Deviations can occur in the relationship. Notably, the counter-cyclical fiscal policies espoused by Keynes and the monetary policy trumpeted by Friedman and everyone's central banker mutated the natural connection between economic growth and interest rates. Regardless of all the noise the cognoscenti shower upon their policies, interest rates and the economy's growth are like a donkey pulling a cart: the path may waver, but the two are on the same path.

Debt helped investment, not people.

Growth and Treasury rates are the same.

Interest Rates: A Growth Story

Demographics is a tailwind for the US.

Fortune smiles upon the US relative to other developed countries. It benefits from one of highest expected population growth rates (current immigration policy notwithstanding). The Millennial generation will dominate the workforce for the next two decades. This generation can leverage the US's technology dominance and deliver higher productivity growth. The potential for real rates to move higher with real growth is evident.

Policy choices will determine the outcome.

The challenge for the US is the Chinese currency and the Pandemic. Fortunately, strategic policy choices can mediate the impact. With the Chinese Yuan entry into the SDR basket in 2016, there are limited ways to address the former outside of preventing US investment in China. Policies are needed to mitigate the damage from the Pandemic while positioning the workforce for the future. Real rates will remain low otherwise. Inflation is not the answer: it took the US decades to recover from that seduction (exhibit 4). The US has many comparative advantages: best use them rather than a monetary illusion.

"Strategy is a commodity, execution is an art."

Peter Drucker

Artful Questions. Scientific Solutions. TM

For more insight, contact:

Capital Risk Management LLC
415-373-7152
contact@capitalriskmanagement.com

www.capitalriskmanagement.com
Los Angeles | San Francisco | Toronto

Disclosures

This document was produced by and the opinions expressed are those of Capital Risk Management LLC (CRM) as of the date of writing and are subject to change. The information and/or analysis contained in this material have been compiled or arrived at from sources believed to be reliable, but CRM does not make any representation as to their accuracy or completeness and does not accept liability for any loss arising from the use hereof. The information in this document may contain projections or other forward-looking statements regarding future events, targets, management discipline or other expectations, and is only as current as of the date indicated. There is no assurance that such events will occur, and they may be significantly different than that shown here. The information in this document including statements concerning financial market trends, are based on current market conditions, which will fluctuate and may be superseded by subsequent market events or for other reasons. This material was prepared solely for informational purposes and does not constitute an offer or an invitation by or on behalf of CRM to any person to buy or sell any security. This material should not be viewed as a current or past recommendation or a solicitation of an offer to buy or sell any investment products or to adopt any investment strategy. Nothing in this material constitutes investment, legal, accounting or tax advice, or a representation that any investment or strategy is suitable or appropriate to your individual circumstances, or otherwise constitutes a personal recommendation to you.