

Antecedent Analysis and Strategy Counsel

The Growth Outlook:
Are We in a Low-Growth
Environment?

Uncertainty in
Three Parts

Antecedent counsel is provided as internal guidance to our portfolio managers and analysts. This counsel is not a forecast and has a longer time horizon than our commentaries. We use this guidance to inform our fundamental analysis, having measurable impact on our model inputs. Antecedent counsel should assist our clients in understanding our analysis and strategies.

In 1938, Alvin Hansen coined the phrase “secular stagnation” to describe the “stunted” economic progress and investment opportunities that he anticipated following the Great Depression. Not unexpectedly, after the Great Recession the phrase was revisited, this time by Larry Summers. However, the phrase that captured the public’s attention is “new normal,” coined at PIMCO and revealed in 2009 by Mohamed El-Erian. The phrase was PIMCO’s attempt “to move the discussion beyond the notion that the [global financial] crisis was a mere flesh wound, easily healed with time.” Rather, PIMCO wanted to convey a belief that “the crisis cut to the bone.” Having captured the imaginations of investors, the low-growth “new normal” outlook now dominates thinking about the future.

Is this a low-growth environment? That depends. If the horizon is short—the next two or three years—then I am a neutralist. If the horizon extends out six or seven years, then I am increasingly becoming a pessimist. Lastly, if I protract the horizon to a few decades, then I am an optimist. Each of these time horizons is important for investors in the present. The long-term horizon is important for determining fundamental values, the intermediate for full-cycle risk management, and the short for exploiting conventional misperceptions. In this *Antecedent Analysis and Strategy Counsel*, I discuss each horizon’s growth prospect, associated uncertainty, and the framework with which we will organize information, focus our discussions, and direct our portfolio strategies.

1. The Framework:

Assets are claims on the underlying economic engine. Wide acceptance of this fact has led macro investors to concentrate on their economic outlooks to forecast equity and bond market returns. The result has been poor performance and the common perception that top-down investing cannot generate superior investment performance. Nothing could be further from the truth. We observe that fundamental values depend on long-term economic developments. It is in the short term that prices fluctuate independent of economic variability.

We are not the first to come to this conclusion. The esteemed John Maynard Keynes referred to his “top-down investment approach using monetary and economic indicators to market time his switching between equities, fixed income, and cash.”¹ However, Keynes’s own writings indicate that he had “not proved able to take advantage of a general systematic movement out of and into ordinary shares as a whole at different phases of the trade cycle.” The phrase “phases of the trade cycle” was commonly used to mean “economic business cycle.”²

Ultimately criticizing market timing based on economic forecasting, Keynes wrote extensively on the importance of fundamental valuation and the movement of prices around intrinsic values. In fact, Chambers and Dimson indicate that “Keynes justified his success in managing the College investments as being due to his ‘careful selection of a few investments’ as judged by their ‘intrinsic value’ [sic] (Collected Writings XII, p. 107, emphasis in original).”³

Despite his fundamental value-based investing success, Keynes did not indiscriminately embrace macro efficiency. Quite the contrary, in his 1938 National Mutual Insurance Company annual meeting chairman’s speech, Keynes said, “[Markets] are governed by doubt rather than conviction, by fear more than forecast, by memories of last time and not by foreknowledge of next time. . . . Faced with the perplexities and uncertainties of the modern world, market [prices] . . . will fluctuate more widely than will seem reasonable in the light of after-events.”⁴

¹ *The Collected Writings of John Maynard Keynes*, Volume XII, p. 33 (1983), edited by Moggridge. This quote is from the 1924 prospectus of the closed-end fund Keynes co-founded.

² *Ibid.*, pp. 100, 106. This quote is from a 1938 King’s College internal memorandum.

³ Chambers, David and Elroy Dimson, “Retrospective: John Maynard Keynes, Investment Innovator,” *Journal of Economic Perspectives*, Volume 27, No. 3, (Summer 2013), pp 213-228. The article affords a well-documented analysis of Keynes’s performance with many citations providing Keynes’s own observations about his investment approach.

⁴ *Ibid.*, p. 239.

But, if assets are claims on the economy's output, how can economic forecasting result in unsuccessful investment performance? The answer is horizon. To understand why horizon is important, I relate "The Tale of the Drunk and Her Puppy."⁵

If one were to find an exceedingly drunk woman in the middle of a park, she would appear to be meandering without motivation or reason. Similarly, a puppy would wander aimlessly following each scent that blows past, chasing scampering squirrels, and exploring myriad shiny objects. If asked where the puppy is, you would likely answer, "Well, I last saw him over by that tree." You would say the same about the drunk, guessing that she would be where previously seen. The longer span between the time that you last saw the puppy or the lady, the farther they are likely to be from where you last saw them. Since the puppy and the lady would drift farther from where they were last seen, each of their locations would be said to follow a *nonstationary* random walk.

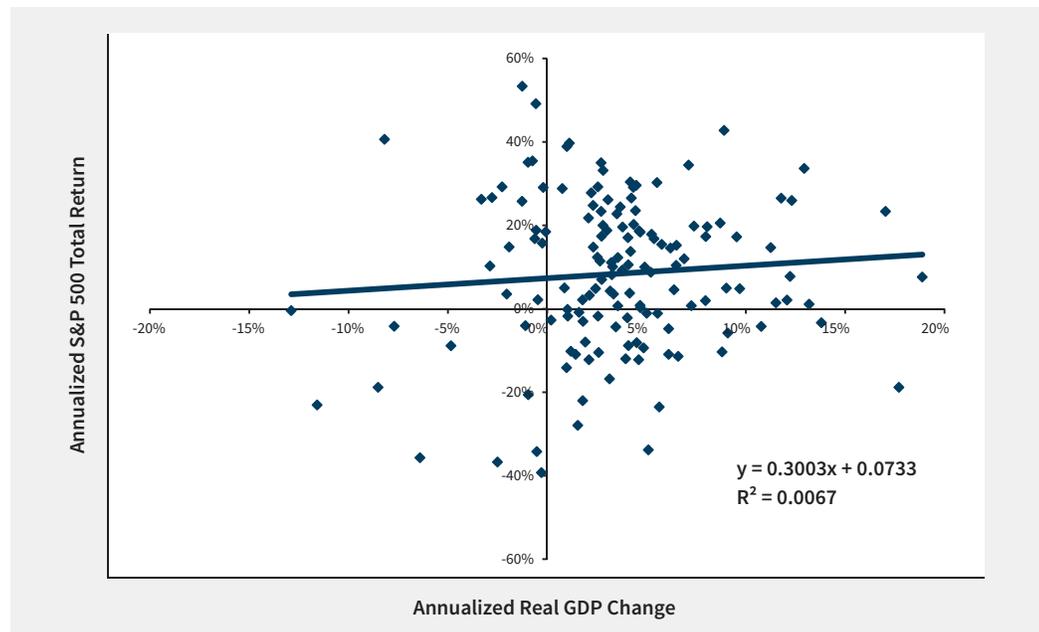
But what if the puppy belongs to the drunken lady? Imagine the lady wandering around the large park, occasionally calling out for her puppy. The puppy, hearing her intonation, barks happily in reply. Each moves to close the gap, the puppy responding vaguely to its name and the lady cognizant of distant barks. The two meander randomly, but are tied together by what is formally called an *error correction mechanism*. They are drawn to each other by cues that may be neither clear nor understood. If you were to follow either the drunk or the puppy, their locations would be nonstationary, but if you find one the other is likely to be nearby. In such case, the distance between the drunk and the puppy is *stationary* and their paths are said to be *cointegrated*.

The relationship between the drunken lady and the puppy is analogous to the relationship between the economy and the equity market. While both are nonstationary, meandering in a seemingly random manner, they are in fact tied together in a stationary, cointegrated way.

⁵Adapted from Michael Murray, "A Drunk and Her Dog: An Illustration of Cointegration and Error Correction," *The American Statistician*, February 1994, Vol. 48, No. 1.

The chart below compares year-over-year real S&P total returns and real GDP growth rates from 1871 to present. The scatterplot reveals almost no relationship between the two. Although the relationship is statistically significant, it is not relevant. The R^2 is only 0.0067 (a 0.08 correlation). Simply stated, equity prices do not co-move in any germane way with economic activity over one-year horizons.

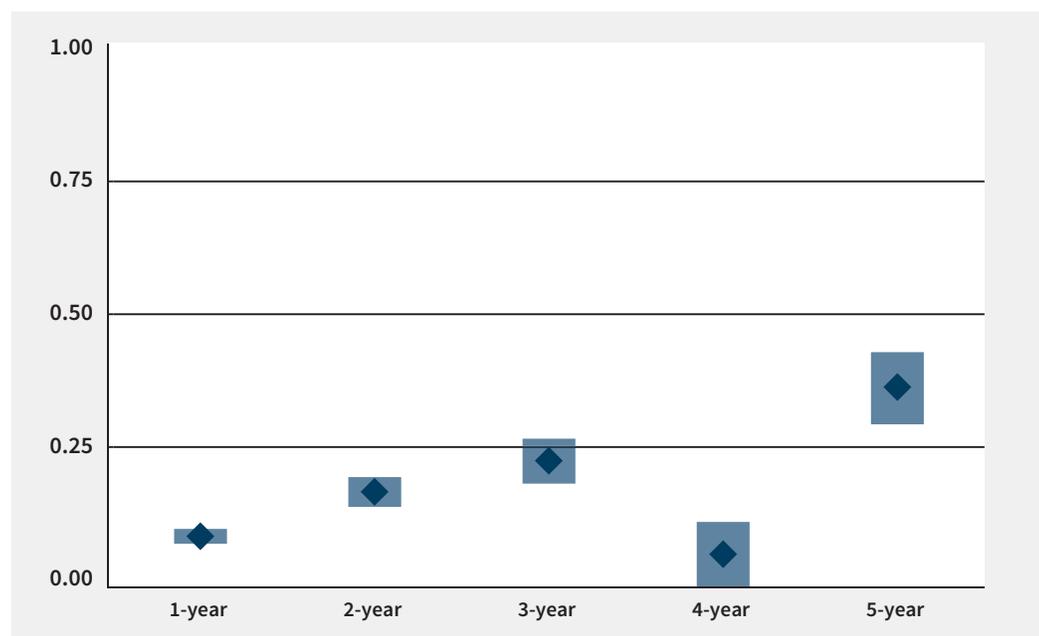
Real S&P Return versus Real GDP (one year rates of change/1871-present)



Sources: William Blair, U.S. Department of Commerce: Bureau of Economic Analysis, Maddison Project⁶, Robert Shiller⁷

Over non-overlapping one-, two-, three-, four-, and five-year horizons, the correlations range from 0.04 to 0.36. Shorter-term correlations, even up to five years, are neither convincing nor compelling. The diamonds are correlations and the lighter bars are 95% confidence intervals.

Correlations and 95% Confidence Intervals: GDP versus S&P 500

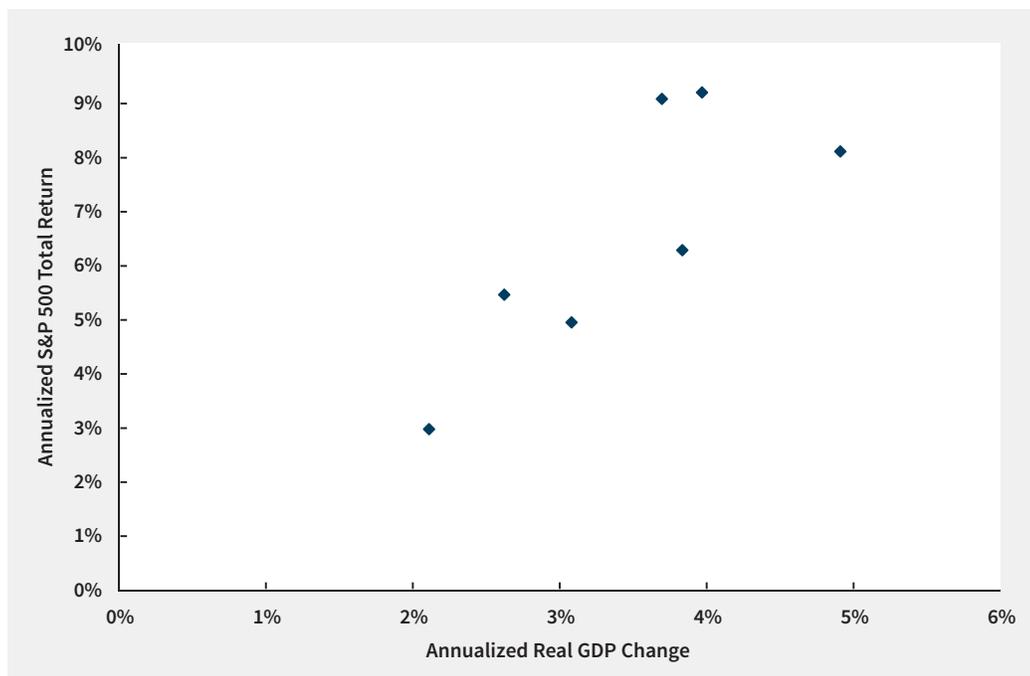


Sources: William Blair, U.S. Department of Commerce: Bureau of Economic Analysis, Maddison Project⁸, Robert Shiller⁹

Over longer horizons, a valuable relationship emerges; long-term price moves are closely related to long-term economic growth—their paths are *cointegrated*. There so happens to be a test of cointegration that discerns longer-term co-movement despite the random variation that dominates shorter-term periods—the Augmented Dickey-Fuller (ADF) test. In using the ADF test, I find that both real GDP growth rates and real equity returns follow, like the drunken lady and the puppy, nonstationary paths. Further, the ADF test indicates that the long-term relationship between GDP growth and equity return is stationary and that the paths are cointegrated.

A scatterplot of annualized real GDP growth and real S&P returns over non-overlapping 20-year horizons gives some sense of their long-term cointegration. This is not a statistical test; rather, it is simply a chart that makes the information provided by the ADF test less abstract. Generally speaking, if you know the level of real GDP growth over long-term horizons, the real S&P return would be nearby, consistently about 2% higher.

Real S&P Return versus Real GDP (twenty-year rates of change/1871-present)



Revelation! Economic information can be used by investors to discern equity market performance. Long-horizon performance is compelled by fundamental value, but short-term returns are pretty much a random walk.

⁶ Bolt, J. and J. L. van Zanden (2013). “The First Update of the Maddison Project; Re-Estimating Growth Before 1820,” Maddison Project Working Paper 4.

⁷ Stock Market Data Used in Irrational Exuberance, Princeton University Press, 2000, 2005, updated.

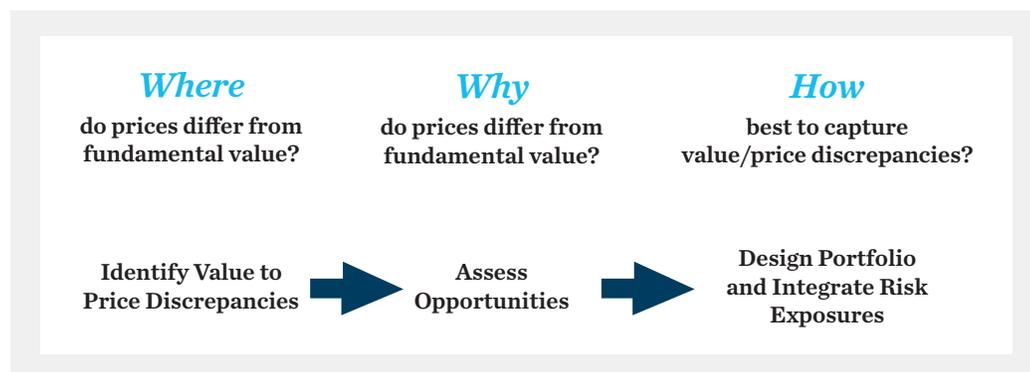
⁸ Bolt, J. and J. L. van Zanden (2013). “The First Update of the Maddison Project; Re-Estimating Growth Before 1820,” Maddison Project Working Paper 4.

⁹ Stock Market Data Used in Irrational Exuberance, Princeton University Press, 2000, 2005, updated.

Our framework accounts for market participants' *inappropriate* foci on short-term economic noise and the *theoretically opposite* relationship evident over longer horizons. The framework begins with the determination of fundamental values and subsequently discerns the conventional economic wisdom of other investors leading to *pricing* errors.

- Fundamental *values* are the present values of future cash flows driven ultimately by the underlying economic engine—the “Where?” aspect of our investment process.
- In the short and intermediate runs, the preoccupation of other investors with short horizon economic performance engenders inappropriate *price* opportunities that we exploit and risks that we navigate—the “Why?” and “How?” aspects of our investment process.

Investment Process Overview

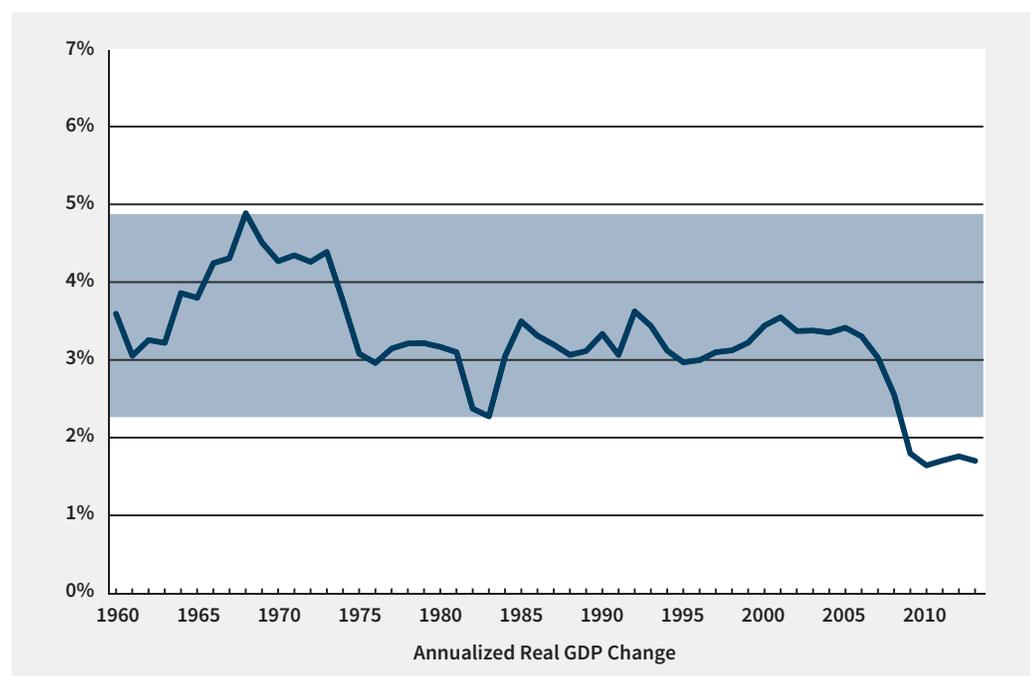


2. Prospects and risks in the short, intermediate, and long term

The Short Term: The Neutralist Is Unexcited About Growth and Equity Returns

The following annualized U.S. real GDP chart shows that recent growth has indeed been below the norm of the prior half-century. Although disconcerting, it must be reiterated that while real growth was a measly 1% per year over the five years ending in 2013, the total annualized real S&P total return was 16%. Over the prior five years, annualized growth was 2% and the return was -5%.

Annualized U.S. Real GDP Growth *Rolling 10-Year*



Sources: William Blair; U.S. Bureau of Economic Analysis, Real Gross Domestic Product [GDPCA], retrieved from FRED, Federal Reserve Bank of St. Louis <https://research.stlouisfed.org/fred2/series/GDPCA/>, December 29, 2014.

Our economic outlook does not diverge significantly from that of most market participants; we anticipate low real growth globally and more recessionary dips than usual because growth variation will occur around a low average rate. In this sense, we concur with many capital market participants that the future is likely to be one of lower real growth than we have become accustomed to over the last five decades.

However, we will not fall into the trap of confusing real economic growth with real equity return potential. For example, while consensus growth estimates over the next two years are lower for the eurozone (+1.3%) than for the United States (+3.0%), values are above prices in the eurozone (+46%) but below prices in the United States (-5%).¹⁰

Barring changes in fundamental values, we will consider short-term *price* fluctuations from the perspective of the “Why?” and “How?” aspects of our investment process. Our objective over the coming years will be to discern whether conventional wisdom-based divergences of market prices below fundamental values are excessive and buy into such opportunities accordingly (or above values and sell). We will interpret short-term capital market reactions to economic activity with skepticism and will be prejudiced to respond consistent with value/price discrepancies.

¹⁰“Consensus Forecasts: A Digest of International Economic Forecasts,” April 14, 2014, *Consensus Economics, Inc.*, London, U.K.

The most difficult aspect of our navigation will be anticipating each central bank's compulsion to be a never-ending force to shift risk from those who purposefully take it onto the broad public. Market participants have learned to rely on central bank abatement beginning with the 1987 market crash and the emergence of the "Greenspan Put." Since then, this behavior has been reaffirmed by the Federal Reserve and Bank of England after the 2008 global financial crisis, the European Central Bank after the 2011 eurozone crisis, and the Abenomics-driven Bank of Japan stimulus in early 2013. Most recently, the FOMC responded to a 100-basis-point rise in the U.S. 10-year yield caused by then-Fed Chairman Ben Bernanke's announced "tapering" of Quantitative Easing (QE) by quickly releasing a statement that the Fed had decided not to taper hastily. Per CNBC, "The statement served both as a notice that the Fed remains in the easing game, and that it is unmoved by a recovery that has seen . . . employment show slow but steady growth."¹¹

The Intermediate Term: The Pessimist Doubts the Wherewithal of Policy Making and the Competence of Policy Makers

I think of secular stagnation, as opposed to cyclical sluggishness, as an intermediate-term concept for the next 5 to 10 years. Secular stagnation is often considered synonymous with long-term slow growth, but there is more involved and, as a result, the time frame is shorter while the implications are greater. A more precise description is that "negative real interest rates are needed to equate saving and investment with full employment."¹² This perspective on secular stagnation focuses on excess saving that emerges from a "balance sheet recession" as the private sector pays down its debt. While these debt pay-downs may be appropriate individually, in aggregate the consequences are long-lasting and growth constraining.

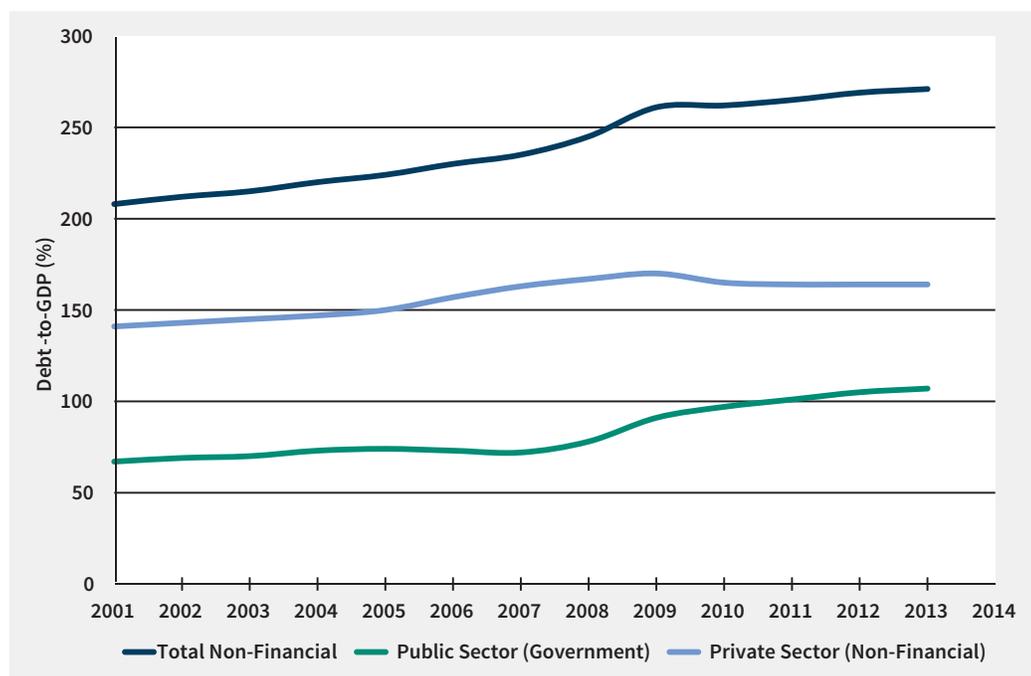
The last couple of decades witnessed a rise of both private and public sector debt-to-GDP ratios across the developed world.¹³ Early in the expansion, the private sector increase was referred to as a "democratization of credit"; in other words, financial intermediation had made credit available to a broad swath of the population. While this account was partly true, it proved to be as much rationalization as democratization. It is clear from the following chart that a recent private sector balance sheet retrenchment (red line) has occurred. Peering deeper, household debt has returned to 2004 levels and corporate nonfinancial debt to pre-crisis levels.

¹¹"Fed: No taper," Jeff Cox, Wednesday, 18 Sep 2013 | 3:01 PM ET

¹²Teulings, C. and R. Baldwin, eds. (2014) "Secular Stagnation: Facts, Causes and Cures," A VoxEU.org eBook, p. 2.

¹³"The Geneva Report on the World Economy 16: Deleveraging? What Deleveraging?", Buttiglione, Lane, Reichlin, Reinhart. International Center for Monetary and Banking Studies (IMB), CEPR Press, 2014.

Developed Market Debt Breakdown (% of GDP)



Sources: William Blair; U.S. Bureau of Economic Analysis, Real Gross Domestic Product [GDPCA], retrieved from FRED, Federal Reserve Bank of St. Louis <https://research.stlouisfed.org/fred2/series/GDPCA/>, December 29, 2014.

While the private sector attempts its deleveraging, the state of public debt can only be described as dire. Across developed countries, the public sector has assimilated the private sector debt reduction and has satiated a continued spending spree with even more debt (green line). The United States is particularly unique in the adoption of pay-as-you-go social welfare systems that do not reveal themselves in balance sheet accounting such as that used in the Geneva deleveraging report. Even without accounting for unfunded liabilities, total U.S. gross government debt-to-GDP increased from 78% in 2007 to 117% in 2013.¹⁴ In developed countries, the ratio increased from 72% to 107% over the same period.¹⁵

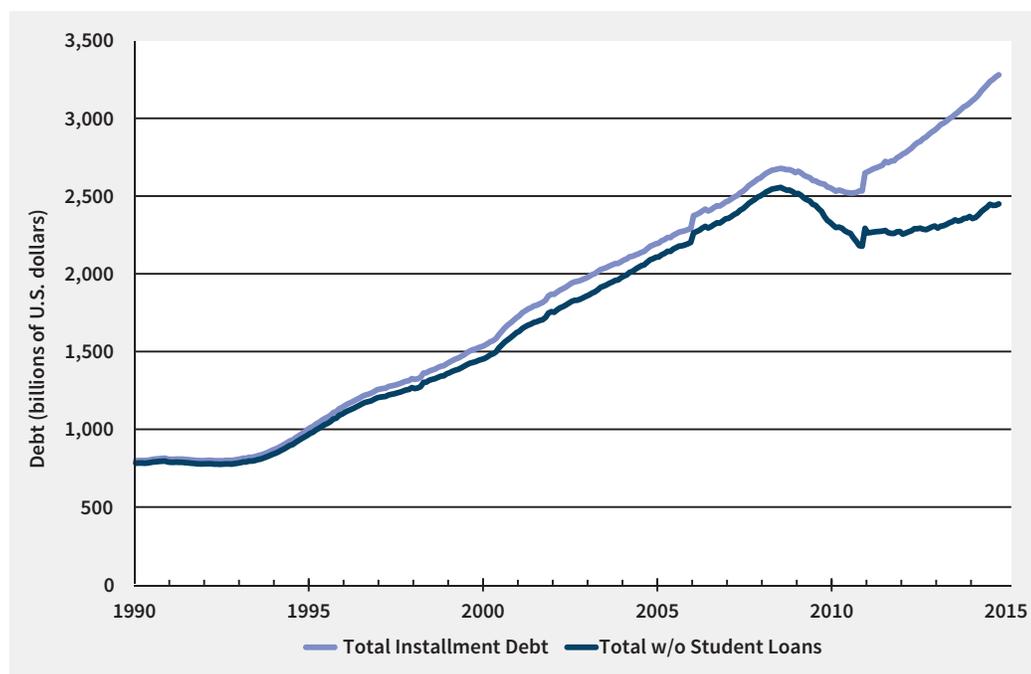
The sovereign debt situation would not be so bad if such debt were incurred in the undertaking of productivity-enhancing infrastructure projects. Such *investment* could spark stronger economic growth. Alas, expenditures have generally been at the behest of special interest subgroups that have locked on to the public fisc for their narrow, generally nonproductive benefit. The future is made bleak by the fact that overwhelmed fisces are unable either to act as effective economic stabilizers or to undertake productivity-enhancing expenditures.

Further, while one might be tempted to believe that U.S. private sector credit is returning to pre-crisis growth rates, it is clear that the expansion is narrow and potentially reflective of an “education bubble.” Peter Thiel, co-founder of PayPal, has argued that, “Tuition costs are too high, debt loads are too onerous, and there is mounting evidence that the rewards are overrated. Add to this the fact that politicians are doing everything they can to expand the supply of higher education (reasoning that the ‘jobs of the future’ require college degrees), much as they did everything that they could to expand the supply of ‘affordable’ housing, and it is hard to see how we can escape disaster.”¹⁶ The following chart confirms this cause for concern.

¹⁴U.S. Government Debt, <http://www.usgovernmentdebt.us>

¹⁵“The Geneva Report on the World Economy 16: Deleveraging? What Deleveraging?”, Buttiglione, Lane, Reichlin, Reinhart. International Center for Monetary and Banking Studies (IMB), CEPR Press, 2014.

U.S. Total Consumer Installment Debt (with and without Student Loans)



Sources: William Blair; Federal Reserve Economic Data¹⁷

Beyond the next few years, consensus forecast's prognosticators do not express substantially different views from the shorter horizon. Over the next 10 years, the eurozone and the United States are expected to grow 1.5% and 2.6%, respectively. In addition, Japan is expected to grow at a meager 1.2%. Continuous deleveraging gives me reason to believe that these soothsayers may prove too optimistic in aggregate.

My fears are grounded in what is considered a more "Austrian" perspective of the business cycle. This perspective ascribes more future economic adversity to extreme monetary policy actions than does the typical Keynesian approach that dominates strategists' and macro investors' analyses. The central bank can create an illusion of progress by engaging in loose monetary policy. What tends to follow is a period of corrections in the economy, when growth slows while the economy is reorganizing toward investments and levels of savings and borrowing based on fundamentals. I see the private sector deleveraging as part of this process.

Ill-conceived monetary policies have augmented the adverse fiscal policies of governments in developed economies, creating a transient economic chimera. Fiscal policy has amounted to a debt-building spending spree that initially helped forestall economic and capital market corrections in 2008 and 2009, but did little to build productive capacity for future sustained growth. Productivity-enhancing government expenditures would be valuable, but not worth wasting any neurological activity anticipating. Similarly, monetary policy liquidity injections alleviated the seizing of financial markets, but continued attempts to stimulate the real economy have been misguided.

¹⁶ "Higher Education: The Latest Bubble?," *The Economist*, April 13, 2011

¹⁷ Board of Governors of the Federal Reserve System (US), Total Consumer Credit Owned and Securitized, Outstanding [TOTALSL] and Total Consumer Loans Owned by Federal Government, Outstanding [TOTALGOV], retrieved from FRED, Federal Reserve Bank of St. Louis <https://research.stlouisfed.org/fred2/series/TOTALSL/>, and <https://research.stlouisfed.org/fred2/series/TOTALGOV/> December 30, 2014.

Why are these “do-goodism” endeavors misguided? Frederick Hayek sheds light on the matter with this incisive observation: “The curious task of economics is to demonstrate to men how little they really know about what they imagine they can design. To the naive mind that can conceive of order only as the product of deliberate arrangement, it may seem absurd that in complex conditions order, and adaptation to the unknown, can be achieved more effectively by decentralizing decisions and that a division of authority will actually extend the possibility of overall order.”¹⁸ For those of a slightly different demographic, the acute perception of Mike Royko, Pulitzer Prize-winning Chicago columnist, led to the observation, “History tells us that when the reformers get their way, the result is usually the opposite of what they intended.”¹⁹

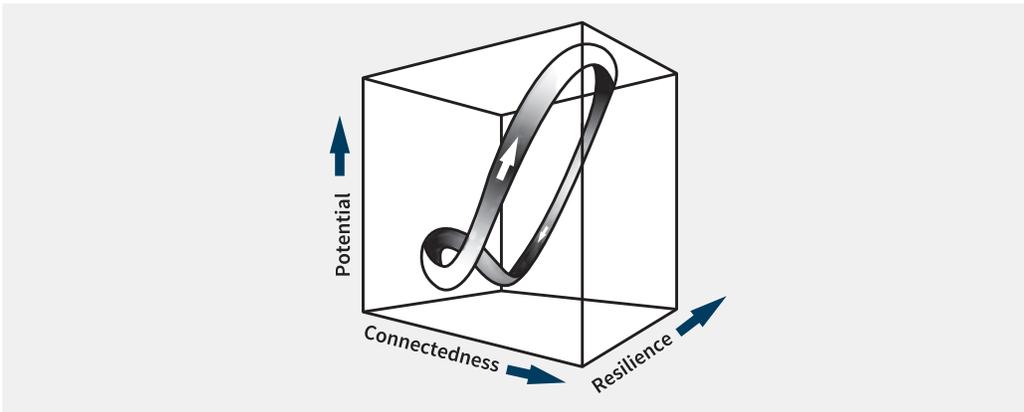
More formally, the economy is a complex adaptive system. Such systems are characterized by a web of *connectivity*, *nonlinearities* (small provocations can have large effects and large changes can have de minimis consequences), and *emergence* (occurrence of novel properties). While complexity provides a greater potential to adapt to change by absorbing and dissipating shocks, it causes opacity that contributes to uncertainty. In other words, risks that can be probabilistically assessed become uncertainties that are unpredictable unknown unknowns.²⁰

Complex adaptive systems adhere to a theorized evolution—Panarchy Theory—that can assist our understanding of the economy and guide our portfolio strategies. The following figure demonstrates the evolutionary cycle theorized for complex adaptive systems.²¹ The up-arrow indicates an economy’s expansion with a commensurate growing web of connections and potential. (In Panarchy Theory, this is referred to as a transition from the *growth* phase to the *conservation* phase.) Unfortunately, specialization expands and regulation attempting to bound disturbances emerges. Increased specialization and bureaucratic rigidity constrains potential and hinders resilience. Ultimately, the web of connectivity breaks and the system deteriorates. During the down-arrow phase, the dynamics are chaotic and uncertainty rules. However, the wealth destruction reveals creative potential and begins a process of restoration from a new higher level of resilience. Restoration potential is exploited via experimentation and innovation. (This is a transition from the *release* phase to the *renewal* phase.) Lastly, the system returns to the up-arrow phase of growth and increased connectivity.

¹⁹“The boomerang called reform,” *The Chicago Tribune*, April 12, 1985.

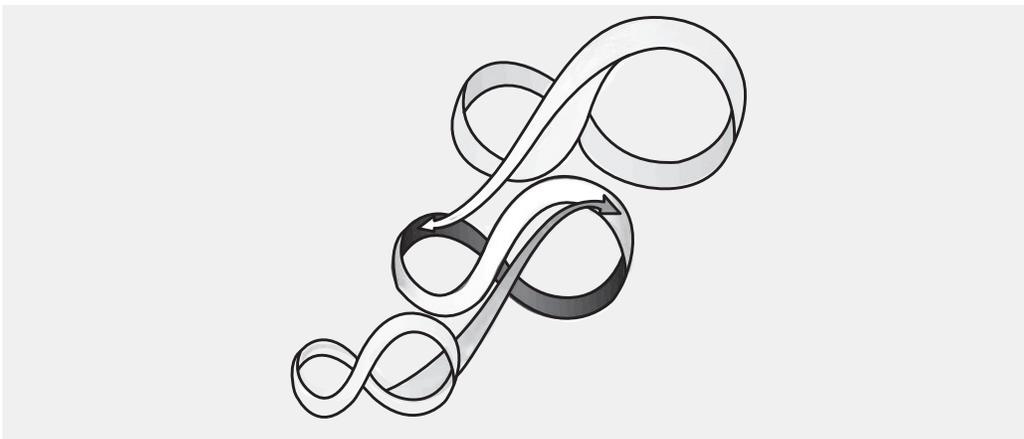
²⁰Homer-Dixon, T. (2010) “Complexity Science in Public Policy.”

²¹Ibid.



Source: <http://www.homerdixon.com/2010/05/05/complexity-science-and-public-policy/>

Ideally, the phases and transitions comprise ever-smaller loops, moderating the entire process into societally manageable processes. However, rigidities preclude such tempering and society experiences larger and more intense transitions.



Source: <http://www.thesustainableleader.org/2014/10/09/resilience-thinking-preparing-for-the-unknown/>

In economic terms, credit created by the easy monetary policies that began with Fed Chairman Alan Greenspan led to the misallocation of real resources (“malinvestment”) that supported the “Great Moderation”—a sustained “growth phase” from the mid-1980s to the mid-2000s of high real growth and low real growth variability. The malinvestment contributed significantly to recent economic crises and current sluggishness while regulatory rigidity limited typically flexible economic responses—the “conservation phase.”

Ultra-easy monetary policy sustained the “conservation phase,” especially since the global financial crisis, in a futile attempt to protect the economic status quo by resisting nonlinear consequences of self-inflicted systemic shocks. For this “conservation phase” to be successful, central bank attempts to buy time would concurrently require bureaucratic and regulatory simplification. However, ultra-easy monetary policy has been sustained beyond its usefulness and the system has become ever more rigid and opaque.

As low interest rates were sustained, households saved less and companies invested in less productivity-enhancing and lower returning projects. When Greenspan became Fed chairman in 1987, gross saving was about 20% of GDP in the United States. It declined over his and Bernanke’s tenures to a low of 14% and has recently rebounded to about 17% or 18%. Low interest rates brought spending forward (there was no incentive to save) from the future. The problem is that U.S. monetary authorities from Greenspan to Yellen, as well as those in Europe and Japan, have administered real risk-free rates of interest below those that would have naturally equilibrated saving and investment plans.

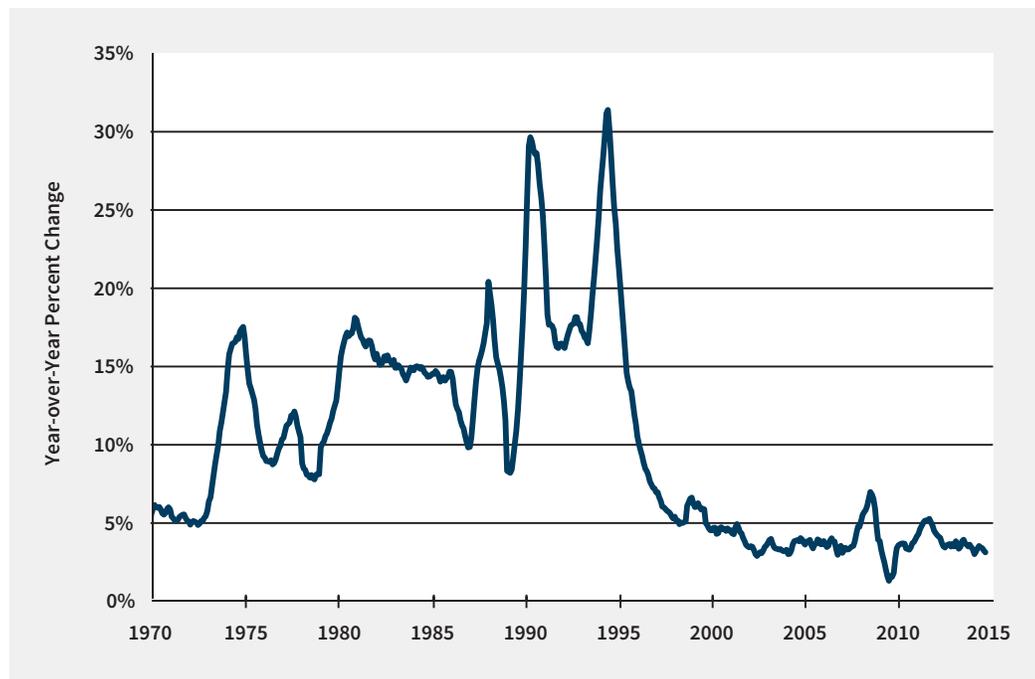
The difficulty that we face as investors is that such credit-driven processes begin to have increasingly indeterminate and extreme outcomes, either significant inflation or debt deflation.²² Leijonhufvud argues that significant inflation and debt deflation are two possible extremes in the “release phase” accompanying or following the end of ultra-easy monetary policies. At one extreme, inflation would transfer wealth from creditors to debtors and all debt associated with malinvestment would become insignificant as real liabilities would be devalued. At the other extreme, debt deflation would result in the real values of all contracts remaining so high that they would be unpayable and uncollectable. Further, opacity of the system, he argues, would result in a lack of trust in the web of public and private contracts and a sense that governing rules would no longer be dependable.²³ Uncertainty would result in both anomie and political extremism, undermining the basis for effective political action.

I *initially* believed that this divergence of the financial real rate below the natural real rate for such a sustained period would lead to an inflationary extreme. Today, I am less convinced of an inflationary outcome. I thought zero interest rate policies (ZIRPs) and quantitative easing (QE) would be limited in duration. As these policies have dragged on, however, I am more inclined to foresee a more uncertain potential for either significant inflation or debt deflation. The collapse of the natural rate after the crisis and, despite desperate QE efforts, declining world inflation are both evidence of a growing probability of debt deflation.

²²Leijonhufvud, A. “The Unstable Web of Contracts,” Berlin 2012.

²³Leijonhufvud, p. 2.

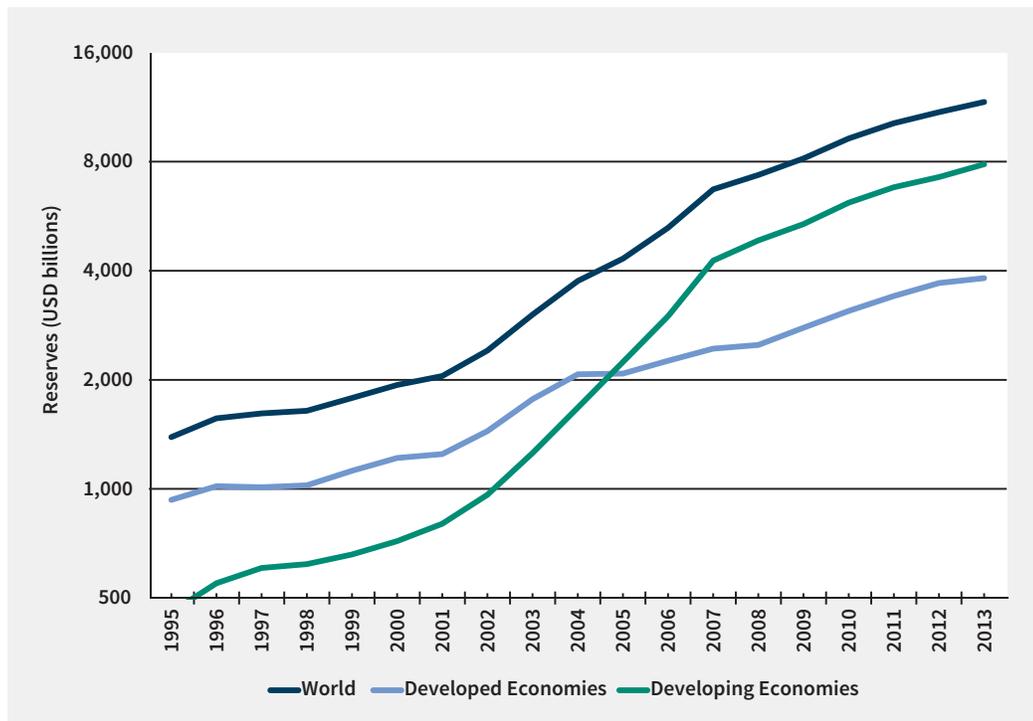
IMF World Consumer Price Index



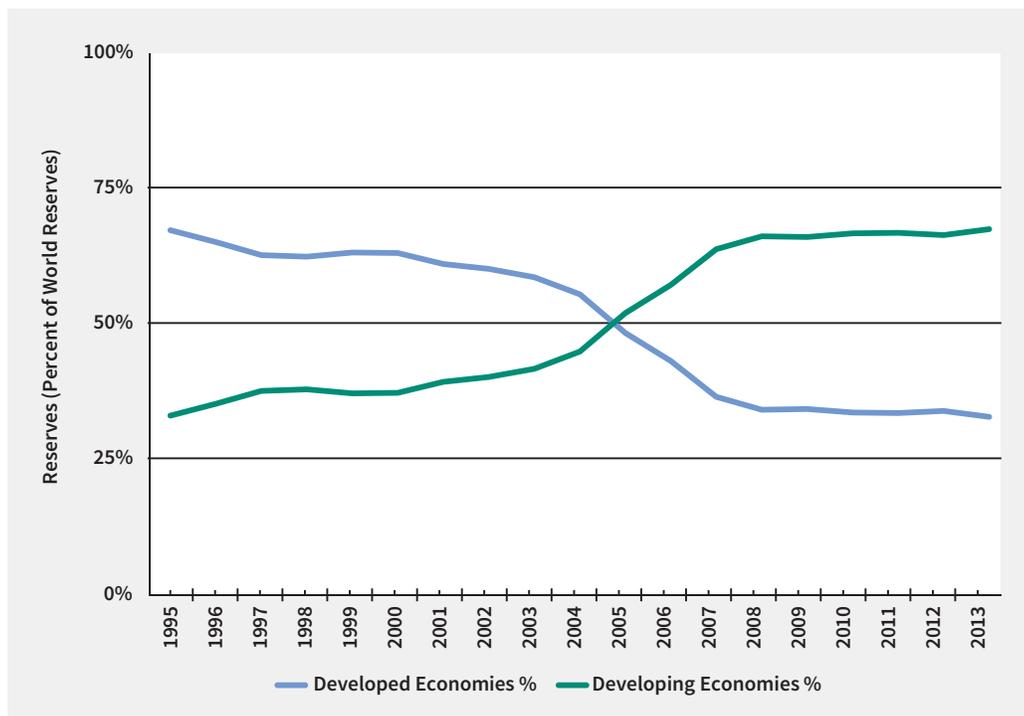
The Great Recession revealed the unsustainability of much of the investment that underpinned the Great Moderation expansion. Unfortunately, financial crises tend to cluster. Just as the global financial crisis contributed to the subsequent shift of Europe's financial problems into sovereign debt problems, the lessening ability of easy monetary policies to buy time will likely lead to future crisis situations. The "release phase" in my mind is in process, but it is far from over.

Outside of developed markets, I have felt that emerging markets would benefit from improving debt dynamics and limited central bank balance sheet expansions. However, many emerging central banks have refused to allow the nominal exchange rate appreciation that would arise from lower developed market interest rates and ultra-easy monetary policies. Over recent years, as the following chart indicates, emerging market foreign exchange reserves have grown in response to anti-appreciation intervention. While emerging markets can be insulated from or may remain somewhat uncorrelated with developed economy crises, the recent monetary expansions in some emerging markets suggest broad asset market vulnerability and unique currency market opportunities.

Foreign Exchange Reserves



Foreign Exchange Reserves



While future disturbances, even crises, are highly likely in both developed and developing economies, developing economies have greater scope to “manage” through these disturbances. Our investments must accommodate the current asset price *uncertainty* that is a result of what we previously perceived to be *risk*. As this uncertainty represents unknown unknowns, prudence dictates lower-than-normal portfolio risk postures, especially systematic market risks. Lastly, since these developments are monetary in

origin, active currency strategies afford the greatest potential for reward as exchange rates fluctuate in response to market misunderstanding of the consequences of these policies.

The Long Term: The Optimist Holds to the Belief That People Respond to Incentives

Long-run pessimists use the concept of secular stagnation to paint a dismal picture of our economic future. I find such long-term pessimism unwarranted, as it fails to appreciate the ultimate responsiveness of decentralized economic systems. While the intermediate hurdles are immense, it would be imprudent to dispute the power of incentives. Ignoring the force of economic agents in pursuit of their selfish interest in providing the world of consumers with better and cheaper medicines, chairs, fruit, luxurious trips, and basic shelter would be folly. The collective interests of the world's 7.3 billion people must be considered when discerning the long-term power of the world's economic engine and the fundamental values driven by that engine. I am relatively optimistic, believing that current economic growth difficulties reflect a transition phase created by the huge information technology revolution. Jobs are being destroyed and it will take time for appropriately trained individuals to emerge to fill and create new jobs.

In the long term, academics like Dr. Robert Gordon offer many reasons to be pessimistic. Their pessimism is a good place to start in considering the longer-term future that determines fundamental values. Gordon posits five reasons for slow future growth:²⁴

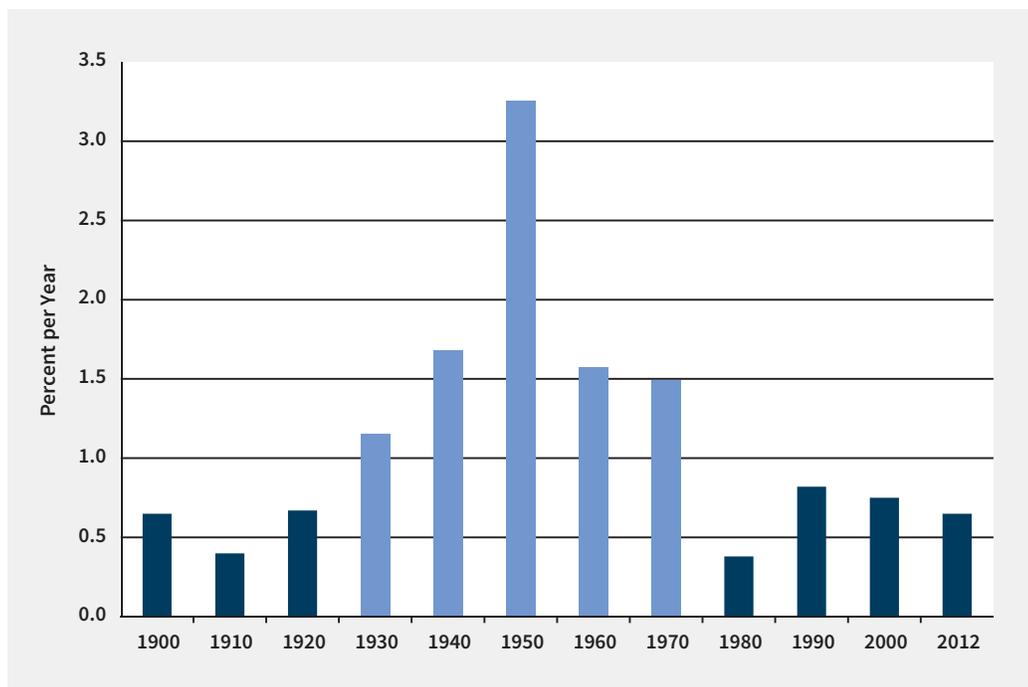
1. **Technology:** The benefits of a past tailwind have passed and while technology will not be subject to a future headwind, per se, Gordon sees a return of productivity growth to that of a lower pre-1930s norm. The higher rate of 1930 to 1980 is an aberration.
2. **Demography:** Stagnant population and increasing life expectancy
3. **Education:** The mass education revolution has run its course
4. **Inequality:** Unequal income distribution has undermined the middle class
5. **Public Debt:** Current levels make the existing social contract unsustainable

Consistent with Gordon's observations, U.S. total factor productivity (TFP) has clearly fallen from prior elevated growth rates. While this chart shows U.S. productivity growth, Gordon observes that the surge slowed "after the first century of implementing the rainbow of benefits from the inventions of the second industrial revolution."²⁵ It is therefore representative of what has occurred across the developed world.

²⁴Gordon, R (2012), "Is US Economic Growth Over? Faltering Innovation Confronts the Six Headwinds," NBER Working Paper No. 18315.

²⁵Teulings and Baldwin (2014), p.52

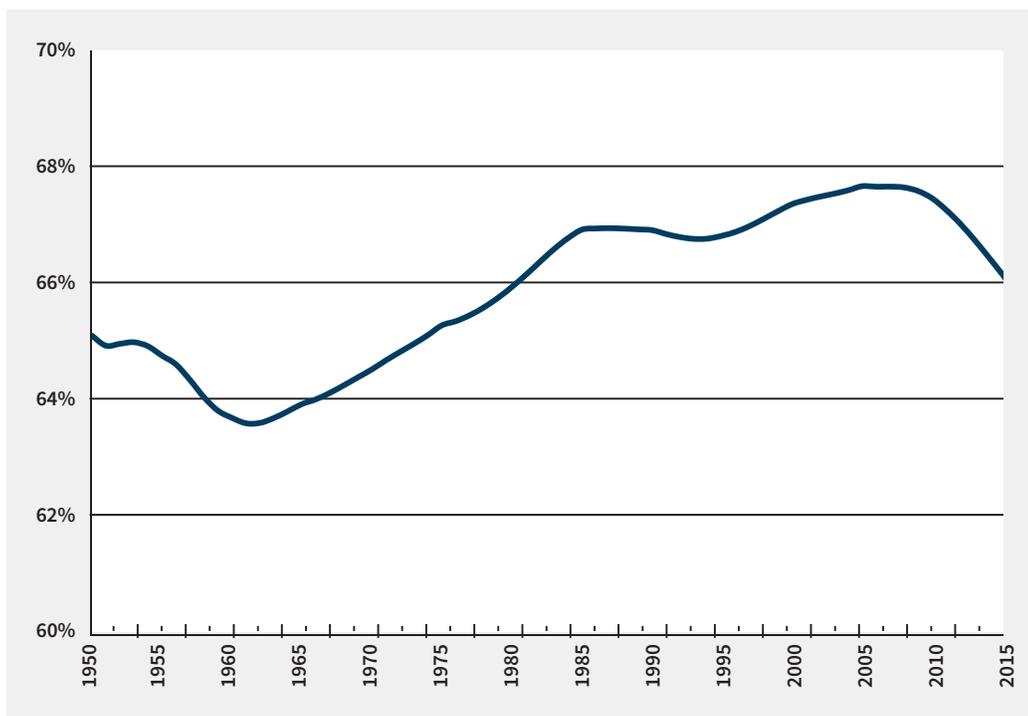
Annual Growth Rate of TFP for Ten Years Preceding Years Shown (ending in 2000 to 2012)



Source: Teulings and Baldwin (2014), p.53.

Labor force growth, the other source of real economic growth, in the developed world confirms the pessimism of Gordon. The baby boom has run its course and may now be a drag on real economic growth.

Developed World Working Age Population (percent between 15 and 65 years old)



Sources: William Blair; UN Population Data.

While Gordon's pessimism is consistent with recent slow growth, it seems to me that his arguments will likely go down in history similar to the Lord Kelvin quote, "There is nothing new to be discovered in physics now. All that remains is more and more precise measurement."²⁶

Let's consider each of Gordon's five impediments to growth and arrive at our own conclusions.

Technology:

Researchers disagree on the outlook for technology. Gordon is perhaps the most notable pessimist, but he is supported by other eminent economists. For example, Tyler Cowen references Charles Jones's research that heady growth over the last half of the last century was due to the harvesting of "previously discovered ideas, combined with heavy additional investment in education and research, in a manner that cannot be easily repeated in the future. . . . We are done exhausting this accumulated stock of benefits."²⁷

I am not a Gordonesque Luddite. As Paul Krugman says, "Productivity isn't everything, but in the long run it is almost everything."²⁸ Innovation is the driver of productivity. Brynjofsson and McAfee address the debate about the future of productivity by asking whether the digital information revolution is a *general purpose technology* (GPT). A GPT is a deep new idea or technique that has the pervasive potential over time to spawn new innovations. The authors argue that "information and communication technology (ICT) belongs in the same category as steam and electricity."²⁹

Societies perpetually fail to see beyond that generation's Malthusian moment to grasp the potential for new ideas and innovations. It is exponentially harder to deduce that ICT may be what is referred to as a "recombinant innovation," one that compounds ideas and innovations. Recombinant innovation stimulates recombinant growth where combinatorial possibilities explode across the web of society's digital information connections exponentially leveraging knowledge. "Progress doesn't run out; it accumulates."³⁰

I lean toward the view espoused by Brynjofsson and McAfee that *digital information technology is doing for mental capital what the industrial revolution did for physical capital*.³¹ The benefits will accrue slowly, but the impact will be felt in the creation of wealth and capital market claims on that wealth. Connectivity through digitization, or ICT, is a GPT that nourishes further innovation.

Of course, reasonable people can disagree. Gordon does so quite poignantly by saying that Brynjofsson and McAfee and Gordon's Northwestern colleague Joel Mokyr are "techno-optimists" who focus their enthusiasm entirely on "unprecedented future breakthroughs in technology."³² True enough. However, when all is said and done, any innovation outlook must be deductive in nature and cannot be inferred from inductive empiricism or data-mining. Reasonable people will deduce different outcomes.

²⁶ Lord William Thomson Kelvin (1824-1907) was a Scottish mathematician and physicist.

²⁷ Cowen, T. (2011), "The Great Stagnation: How America Ate All The Low-Hanging Fruit of Modern History, Got Sick, and Will (Eventually) Feel Better," A Penguin eSpecial from Dutton.

²⁸ Paul R. Krugman, *The Age of Diminished Expectations: U.S. Economic Policy in the 1990s* (Cambridge, MA: MIT Press, 1997), p. 11.

²⁹ Brynjofsson and McAfee, p. 76.

³⁰ Brynjofsson and McAfee, p. 81.

³¹ Brynjofsson, Erik and Andrew McAfee (2014), "The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies," W. W. Norton & Company, p. 54.

³² Teulings, C. and R. Baldwin, eds. (2014) "Secular Stagnation: Facts, Causes and Cures," A VoxEU.org eBook, p. 54.

Regardless of whether one chooses the Gordon or the “techno-optimist” outlook, over the intermediate future the world will struggle with low productivity that is either permanent (Gordon) or a transition from the current capital stock structure to one that greater leverages digital connectivity (techno-optimists). Over the long term, I uphold that people respond to incentives and that the current ICT revolution is compelling overwhelmingly disruptive innovations that will induce faster growth in the long term.

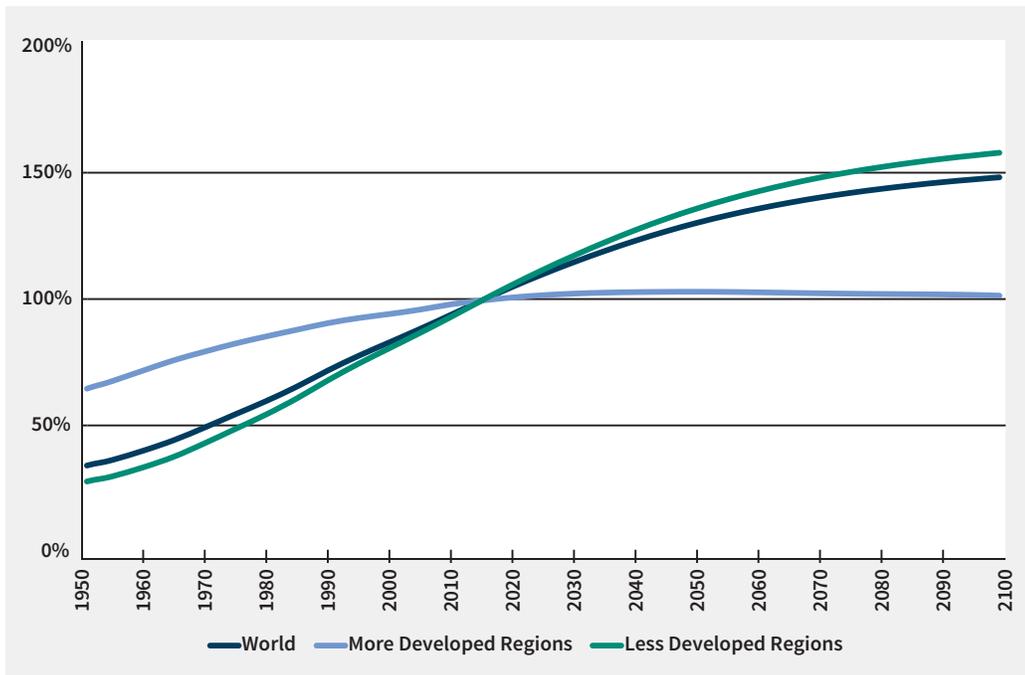
Demography:

The baby boom that dominated developed world labor markets for the last 50 years is over and its ripples fading. It comprised people born between 1946 and 1964 and its growth dividend was a one-off supply shock. The youngest of the lot are now 50 years old and, in the United States, are deciding on which Florida coast they should build or buy their primary residence. This engine of growth is now a damp squib.

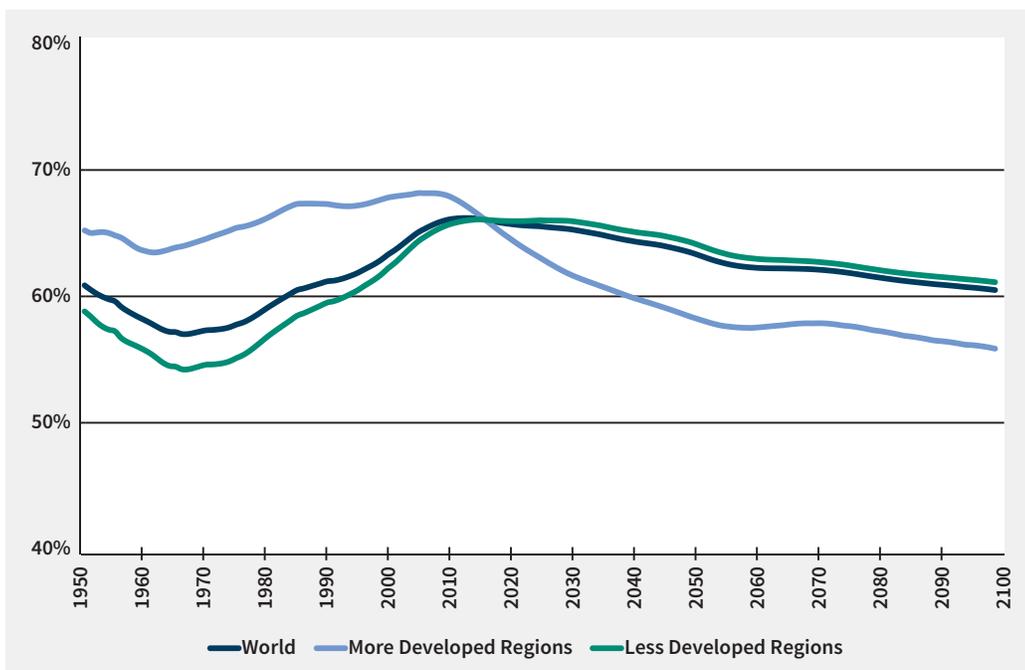
However, many people are stunned to learn that only 17% of the world’s population lives in the developed world. So, yes, slower labor force growth is a factual observation with respect to developed economies; however, the other 83% of the population living in developing regions provides longer-term optimism.

The following charts indicate that the developed world’s population will be flat for the coming decades and its labor force will *decline* (red lines). Ostensibly, this is not good news for servicing high developed-world debt levels or sustaining existing social welfare systems. However, while the labor force of more developed regions is anticipated to slow, that of the less developed world is expected to expand at a rapid pace (green line). Further, the debt and social service obligations of less developed countries do not hinder change. In fact, the divergent situations create an environment of resilience for future growth. These developments are powerful motivations for change. We believe change will continue to occur, and that wealthy societies will not blithely watch as their standards of living decline. Politicians will be the last to move, following the evolving cultures over which they preside. Be assured, these cultures are beginning to and will continue to evolve.

Population (percent of current population)

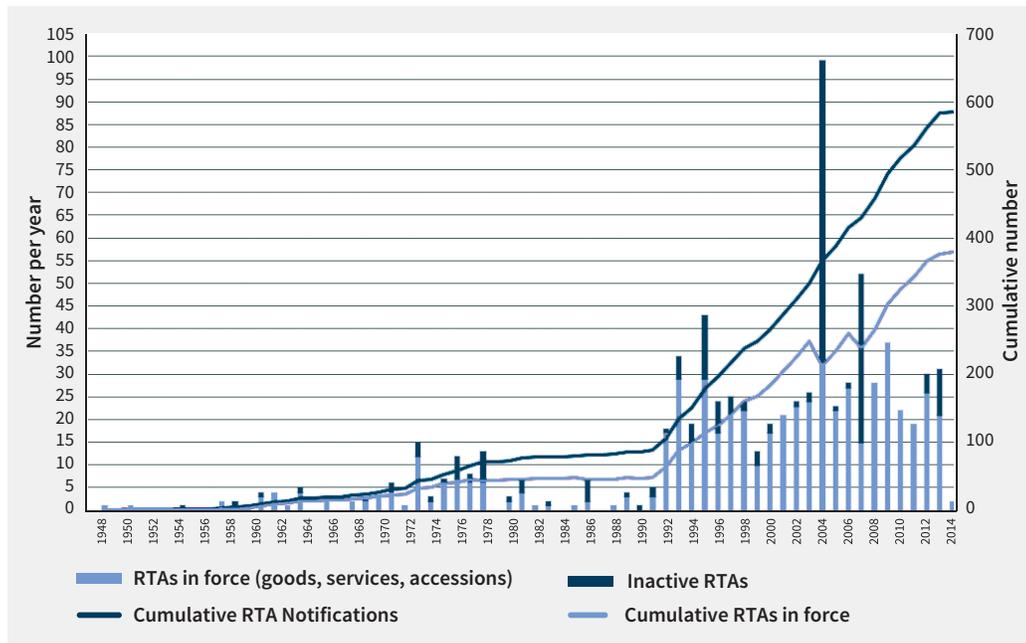


Population (percent between 15 and 65 years old)



For now, suffice it to say that a preponderance of labor supply is located far from current demand, hindering intermediate-term real economic growth. An intermediate-term palliative is the freer movement of goods and services across borders, limiting the need for labor to migrate. This movement is already in force and can be proxied by the explosion in regional trade agreements (RTAs) since 1990, in addition to the World Trade Organization in 1995. As the number of RTAs continues to grow, labor proximity will become less and less relevant. Over the longer term, trade flows and labor migration will both be pieces of the growth puzzle.

Evolution of Regional Trade Agreements in the World



Source: http://www.wto.org/english/tratop_e/region_e/regfac_e.htm

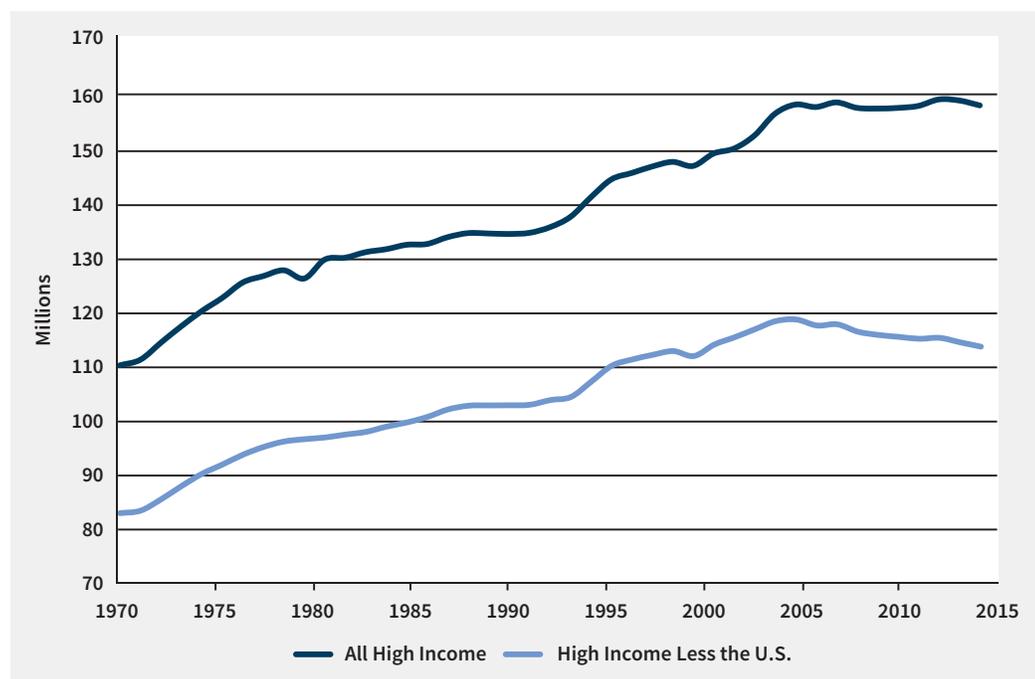
In the “people respond to incentives” category, further integration of the goods, services, and labor markets of developing and developed economies is inexorable. Stagnant populations are a developed-world concern, but only if considered in isolation over the coming decades. While the struggles of integration are troublesome and the cultural motivations for and against integration diverse, the global economic system will ultimately succumb to the power of incentives and integrate.

Education:

However, secondary school education has effectively maxed out in the developed world and college completion rates are plateauing in much of the developed world. The World Bank Education Statistics Database evidences a leveling of secondary and tertiary school enrollment in high-income countries over the last 10 years, confirming Gordon’s concerns.

Most of the secular stagnation advocates observe this higher education plateauing, but focus their attention on the developed world. Absent the U.S. tertiary enrollment boom, the aggregate high-income country education distribution (red line) has *declined* over the last decade, returning to levels of the mid-1990s.

High Income Country Education *(secondary and tertiary, private and public school enrollment)*

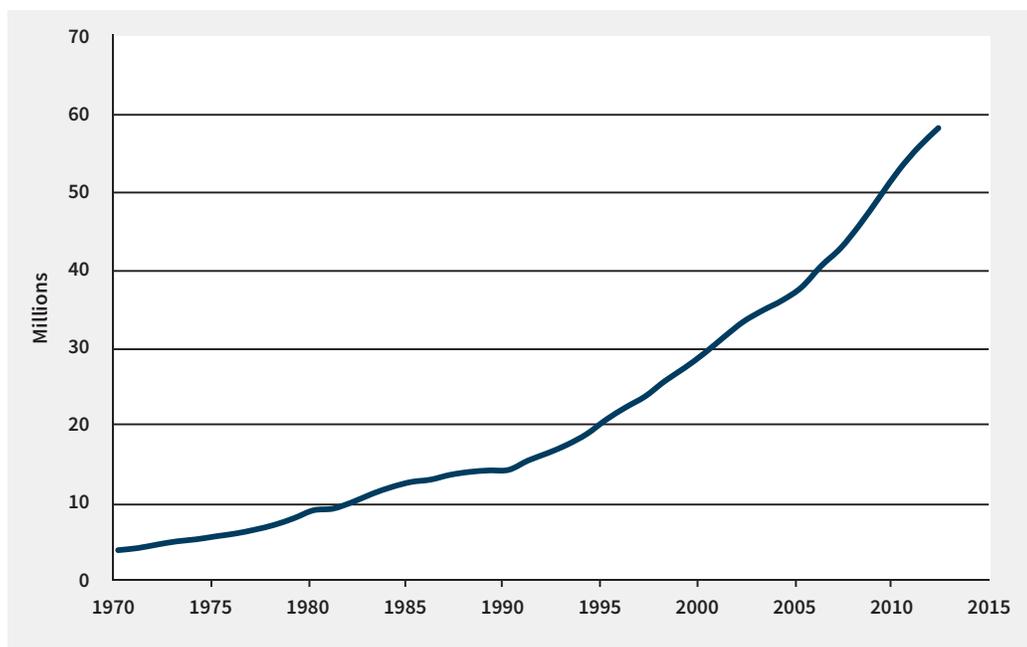


Sources: William Blair; EdStats – World Bank Education Statistics Database
(<http://databank.worldbank.org/data/views/variableselection/selectvariables.aspx?source=education-statistics--all-indicators>)

Further, educational focus on innovation drivers such as science, technology, engineering, and mathematics—the so-called STEM curriculum—has been lacking in the United States. A “glass half full” perspective would be that the opportunity for STEM curriculum adoption in the United States creates potential future growth. Despite being an optimist, I cannot make that leap and must say that the glass is, in fact, half empty and believe that the developed world has laid a foundation for poor labor productivity.

To preclude the perception that I am a dour education pessimist, let me simply observe that the United States is not the entire developed world and the developed world is not the entire world. A labor transition is in store, but intermediate growth will be constrained accordingly. Behind the scenes, developing-world education began a higher trajectory of growth in 1990. Interestingly, this change occurred as the Berlin Wall came down and RTAs began expanding. Perhaps there is something wildly connected and nonlinear about this complex adaptive system that does not quite fit into Gordon’s equilibrium models.

Low Income Country Education *(secondary and tertiary, private and public school enrollment)*



Inequality:

Thomas Piketty has undertaken a tremendous research project that has economists and politicians aquirer. While the middle class has clearly been alienated, I take no position on the implications of this alienation for future productivity and labor force growth. I am content to let Piketty's research be a litmus test of political and economic polarity.³³

Public Debt:

A solution to high public debt and many unfunded commitments is higher nominal growth. One element of nominal growth is inflation. Inflation transfers wealth from debtors to creditors without the need for a single politician's vote. If the developed world does not get caught in a debt deflation trap, this will be one of the solutions. I have argued that the intermediate term is likely to be difficult for real growth; however, I have also reasoned that the long term provides incentives and opportunities.

Beyond these developments, we will witness debt and unfunded liability renegotiations. An obvious example is "means testing" for determining social welfare needs across the members of a nation's population.

³³Piketty, T. (2014) "Capital in the Twenty-First Century", Belknap Press.

3. Conclusions and Implications:

The crooked path that leads to value is becoming enshrouded in darkness. Fundamental values are not changing in aggregate as we see world growth sustaining the roughly 3.5% that investors have come to expect. The mix of contribution has clearly changed from developed to developing markets, and global integration tentatively continues, but the engine continues to chug along at a sustainable real rate that supports current values. The means by which asset markets and currencies participate in the economy depends critically on many variables whose paths are shrouded in uncertainty. The primary risk to fundamental valuations is barriers to the flow of goods, services, and capital across national and regional borders. Moreover, to succeed in the digital information technology era, governments must adopt new institutions that enable flexibility in the midst of accelerating creative destruction. The economies and cash flow growth to assets will be highest in these countries.

Even though our growth outlook remains unchanged over longer-term horizons, the short and intermediate terms are increasingly uncertain. Growth is slow, monetary policies navigate uncharted and turbulent waters, and conventional perceptions about these matters vary widely. Our investment strategies will be very dependent on our understanding of the confused price impulses of these conventional perceptions and our interpretation of geopolitical developments and national and international policies. The investment waters will be turbulent, but therein lies our opportunity to generate superior performance. We will maintain higher-than-normal forward-looking Outlook Matrix (that series of relationships and volatilities representing the current investing environment) risk expectations and consider fundamental value not to be the bottom of the bowl to which the ball of price settles, but rather the dimples on the bottom of a flatter plate that the ball of price settles temporarily as it migrates, sometimes violently, around fundamental values.

During periods of volatility, we cannot allow fear of the market to emerge and cede it control over our investment process. However, neither can we allow a lack of fear of the market to lead to our demise. It is in this environment, more so than in the last five or six decades, that the understanding of macro developments and the dynamic management of macro risks affords opportunity. Dynamic *Macro Diversification* will be central to our thinking and our performance.

About William Blair Investment Management

William Blair Investment Management, the asset management business of William Blair & Company, L.L.C., is committed to building enduring relationships with our clients and providing expertise and solutions to meet their evolving needs. We work closely with private and public pension funds, insurance companies, endowments, foundations, sovereign wealth funds, high-net-worth individuals and families, as well as financial advisors. William Blair is 100% active-employee-owned with broad-based ownership. Our investment teams are solely focused on active management and employ disciplined, analytical research processes across a wide range of strategies, including U.S. equity, non-U.S. equity, fixed income, multi-asset, and alternatives. As of December 31, 2014, William Blair managed \$62.9 billion in assets. William Blair Investment Management is based in Chicago with offices in London, Zurich, and Sydney.

Important Disclosures

This material is provided for information purposes only and is not intended as investment advice nor is it a recommendation to buy or sell any particular security. Any discussion of particular topics is not meant to be comprehensive and may be subject to change. Data shown does not represent the performance or characteristics of any William Blair product or strategy. Any investment or strategy mentioned herein may not be suitable for every investor. Factual information has been taken from sources we believe to be reliable, but its accuracy, completeness or interpretation cannot be guaranteed. Past performance is not indicative of future results. Information and opinions expressed are those of the author and may not reflect the opinions of other investment teams within William Blair & Company, L.L.C.'s Investment Management division. Information is current as of the date appearing in this material only and subject to change without notice.

United Kingdom and European Economic Area

This material is distributed in the United Kingdom and European Economic Area (EEA) by William Blair International, Ltd., authorised and regulated by the Financial Conduct Authority (FCA), and is directed only at, and is only made available to, persons falling within Article 9, 38, 47, and 49 of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (all such persons being referred to as "relevant persons"). This document is intended for persons regarded as professional investors (or equivalent) and is not to be distributed or passed on to any "retail clients". No persons other than persons to whom this document is directed should rely on it or its contents or use it as the basis to make an investment decision.

Australia

This document is distributed in Australia by William Blair & Company, LLC ("William Blair"), which is exempt from the requirement to hold an Australian financial services licence under Australia's Corporations Act 2001 (Cth) pursuant to ASIC Class Order 03/1100. William Blair is registered as an investment advisor with the U.S. Securities and Exchange Commission ("SEC") and regulated by the SEC under the U.S. Investment Advisers Act of 1940, which differs from Australian laws. This document is distributed only to wholesale clients as that term is defined under Australia's Corporations Act 2001 (Cth). This document is not intended for distribution or dissemination, directly or indirectly, to any other class of persons. It is being supplied to you solely for your information and may not be reproduced, forwarded to any other person or published, in whole or in part, for any purpose.