At the Foundation Financial Officers Group conference in San Francisco on October 3, 2019, Vineer Bhansali, founder and CEO of LongTail Alpha, Inc., and prior to that a longtime portfolio manager and researcher at PIMCO, spoke on “Who (and Why) in the World Is Buying All These Low and Negative Yielding Bonds, and Can We Do Anything With This Knowledge?”

Just a few weeks later, on October 29, Professor Robin Greenwood of Harvard addressed the Q Group in La Jolla, California on a similar topic: “The Impact of Pensions and Insurance on Global Yield Curves.”

What follows is a summary of these two presentations. I then add my thoughts on the larger meaning of this phenomenon for the way we think about economics and, in particular, public policy regarding economic activity.

**The Strangest Chart in Finance**

**EXHIBIT 1**

**The Really, Really Long-Term History of Nominal Interest Rates (Best Credits or Lowest Rates, 3000 BCE–2019 CE)**

What’s strange about this chart? To begin with, it’s curious that interest rates even existed in 3000 BCE, or that we have data on them so we can draw such a diagram. It’s also might be considered odd that we’d care about what interest rates were so long ago. But, from an economic point of view, by far the strangest aspect of the chart is that something changed very, very recently — sometime in the last decade — for the first time in 5000 years. Until a few years ago, nominal interest rates were always positive. Borrowers had to pay lenders to get them to lend you money. But not any more!
Now — and you know this unless you’ve been living in a cave, but you probably don’t know why — lenders have to pay borrowers in many countries. This bizarre fact is true of about one-quarter of all the sovereign debt in the world, and is even true of some corporate bonds and even a few “high-yield” bonds. The entire financial world has turned upside down.

What in the heck is going on?

Vineer Bhansali, one of the leading fixed income researchers and managers in the world, describes the phenomenon in terms of physics (this is a paraphrase):

Perpetual motion machines are not supposed to exist. In physics, a perpetual motion machine generates at least as much energy as it consumes, so it runs forever without outside power. We all know this is impossible.

In finance, a perpetual motion machine generates more cash than it consumes so it is a money tree that grows forever without nutrition. That is not supposed to happen either. But, right now, we’re seeing bonds with nominal negative yields, which are a perpetual motion money tree for the borrower and a catastrophe for the lender.

We investors are lenders and we don’t like catastrophes. Hence, our job is to understand what is going on.

Bhansali explains how negative interest rates happen with a straightforward example: a zero-coupon German Bund (government bond) maturing in 31 years (2050). It’s issued at a price of €103.61 and will be redeemed at par, or €100. This amounts to a yield-at-issuance of minus 0.11% which, if compounded over the 31-year life of the bond and guarantees a loss of €3.61 (that is, €103.61 minus €100.00).

While no interest is paid over the 31 years in Vineer’s example, the same logic applies to bonds with coupons. A negative interest rate is created by bidding up the price of the bond so that it exceeds the sum of all the coupons and payment at maturity. This is how a bond can have a negative yield without having a negative coupon. The question we will shortly address is: who is buying these bonds, and why? Who would voluntarily buy a security that guarantees a loss if held to maturity?

Bhansali continues,

Of the $50 or $60 trillion of bonds out there in the global bond markets, approximately 25%, a little over $15 trillion, are trading at negative nominal yields. Negative *real* yields are not very surprising — they’ve happened many times, including recently and in the United States and
other stable countries. Real yields obviously just equal nominal yields minus inflation. To try to boost economic performance, central banks have often forced real yields into negative territory, the best-known example being the 1970s when inflation rates were persistently higher than U.S. Treasury yields. So, that’s not a strange phenomenon — but nominal yields have only gone negative in the last 5 or 6 years and that is a very strange phenomenon.

Exhibit 2 shows that, out of nowhere, the negative-yielding market has boomed since 2012:

**EXHIBIT 2**
**DOLLAR VALUE AND PERCENTAGE OF NEGATIVE-YIELDING BONDS IN THE BARCLAYS GLOBAL AGGREGATE, BY MARKET CAP, 2009-2019**


Yale Brozen, my great economics professor at the University of Chicago’s Booth School of Business, told me in the mid-1970s (yes, I’m that old) that when you see a price you don’t understand, you should look for the law or regulation that causes it. In other words, if two people would not ordinarily agree to trade at that price, maybe someone is forcing or strongly incentivizing them to.

A bond yield is, of course, a price — and, if negative, hard to understand. Bhansali follows and extends Brozen’s principle. He identifies clienteles of traders or investors who are either required to trade at that price or who expect to benefit from doing so, even if the benefit is not obvious. Figuring out who invests in bonds that are sure to lock in a loss was the core of Bhansali’s talk.

Here, in Bhansali’s words (lightly edited), are the clienteles who buy negative yielding bonds:
• Passive agents: Those who must [hold these bonds] due to prospectus, i.e. bond index funds, as their job is to hold a representative portfolio of all the bonds outstanding

• Risk managers: Those who must due to risk management reasons, i.e. pension funds, insurance companies, and other institutions that must hedge the interest rate sensitivity of their liabilities. (This clientele was studied in detail by Robin Greenwood, whose work we’ll get to later.)

• Speculators: Those who are looking to buy them now to sell them to someone else at an even larger negative yield, that is, at a higher price (“greater fool theory”)

• “Quants”: Those who look at prices, but not yields, e.g. trend followers, systematic traders

• Arbitrageurs: Those who are looking to arbitrage cross-currency interest rate differentials

• Policy makers: Those who are looking to engineer economic outcomes indirectly, i.e. central banks such as the ECB, by “crowding out” other buyers. (Policy makers are non-market players, while all the other clienteles listed above are market players.)

That’s a lot of clienteles! No wonder yields have gone negative. Of course, in ordinary times, regular investors seeking a return on their capital should swamp these specialized clienteles, but these are not ordinary times. I’d venture a guess that central banks — policy makers — are by far the most important player causing yields to be negative, a position Bhansali seems to agree with. As I indicated, Robin Greenwood focuses on the role of pension funds and insurance companies, but I think these and other institutions are being forced to go along for the ride offered by central banks…

...and it’s an unpleasant ride: €103.61 to €100 in 31 years, with no coupon payments, and before subtracting any inflation that might take place. It kind of reminds me of the great bond bear market of 1940-1981, where, after inflation, bondholders in the U.S. lost 67% of their money, even with interest income reinvested.

...BUT WHY IS ALL THIS HAPPENING?
There are three broad categories of possible reasons why nominal interest rates, for the first time in recorded history, are negative:

1. The real interest rate, that is, the nominal rate less inflation, is set in the market. This rate fluctuates and can be positive, zero, or negative, but on average it has been positive — this makes sense because the time value of money is a near-universal principle. If nominal rates are negative but the real interest rate is zero or positive, or even slightly negative (less negative than the nominal yield), the market is forecasting deflation over the life of the bond.

2. The real interest rate set in the market is so sharply negative that, even when added to a positive inflation expectation, the sum is a negative number. In other words, the market is forecasting very low or negative real economic growth for a very long time — sharply negative real interest rates being a market forecast of weak demand for capital and depressed economic activity.

3. These are not market rates; someone is manipulating the rates.
We’ve been over #3 in some detail so let’s look at the other two explanations.

Deflation has come and gone throughout history but it hasn’t lasted long except when a gold standard was in force (for example in the U.S. over 1870-1900). If explanation #1 is correct, over how long a period is the market forecasting deflation?

**THE SEMPER AUGUSTUS BOND**

There’s an Austrian Bund (government bond) that matures in 2117 — 98 years from now — that carries a yield of 0.72%. That’s not negative, but if people require a positive real return from bonds, it’s consistent with a forecast by the market that there will be 98 years of cumulative deflation in Austria. Considering the amount of government debt in that country and almost everywhere else, that’s about as unlikely a forecast as could be imagined. Deflation causes debts to become more and more expensive to the borrower and will eventually bankrupt the borrower. Governments don’t like that outcome and will do what is necessary to avoid it. And, as goes Austria, so does every other country with negative-yielding or near-zero-yielding bonds. We should expect inflation, not deflation.

Bhansali called this particular Austrian bond the Semper Augustus bond, in honor of the tulip that, at one point in the 17th century Dutch tulip mania, cost as much as a nice house. Few people had ever seen a Semper Augustus tulip, but they traded them anyway, and it’s a fine tulip indeed (see below). Still, I’d rather have the house. Bhansali implied that this tulip, like the Austrian Bund of 2117, is in the running for a booby prize: Most Overpriced Investment In History.

**THE FOREVER DEPRESSION?**

Ninety-eight (or, in the case of the German Bund, thirty-one) years of negative returns could also be interpreted using our explanation #2, a real economic contraction that lasts as long, ignoring interim fluctuations, as the life of the bond. This forecast, which corresponds roughly to the end of the world, is wildly inconsistent with what the stock market is telling us, which is that everything is fine.

The U.S. stock market seems to hit a new high every day and is priced for robust earnings growth, even beyond the current high level of corporate profits as a share of GDP. Non-U.S. markets, while less exuberant, are forecasting moderate growth, not endless depression. Stock prices are the locus in the economy where risk capital is allocated and stock returns reflect the growth of the real economy on the margin, so we should look to stocks, not bonds, for our long-term market consensus forecast. And
what we see is not scary. It’s just confusing, because it’s the exact opposite of what the bond market is telling us.

How to resolve this contradiction? I think that negative yields are manipulated prices, not free-market forecasts, so I’d say hold cash and equities. The legendary Herbert Stein once said, if something can’t continue forever, it will stop. But something that can’t continue forever can nevertheless continue much longer than you think. By holding only cash and equities, I’ve missed out on a huge run-up in long-term bond prices. It’s an upside-down world.

**ROBIN GREENWOOD AND THE ROLE OF “REAL MONEY” INVESTORS IN SETTING INTEREST RATES**

In his Q Group presentation (the Q Group being a discussion group for senior investment executives, “Q” signifying “quantitative”), Professor Greenwood argued that we underestimate the size and market power of long-term, non-central-bank market players such as pension funds and insurance companies. These investment institutions, called “real money” investors in industry jargon (to contrast them with short-term speculators), are either required to hedge the duration risk inherent in their liabilities or simply prefer to do so for risk management reasons. And they have trillions of dollars to invest.

**EXHIBIT 3**

**PENSION AND INSURANCE-RESERVE ASSETS FOR LEADING COUNTRIES AS A PERCENTAGE OF GDP, 2009-1016 AVERAGE**

These are *really big* funds, in some cases amounting to multiples of a nation’s GDP. That’s a good thing, because large reserves are needed to offset the pension and other liabilities that the country will face in the future. (Austria, Czechia, Mexico, Slovakia, and Slovenia are going to face some challenges. Or we could all move to Denmark.)

But funds this large have an impact on markets. Pension funds and insurance reserves are not supposed to speculate on interest rates. Their job is to be liability hedgers, matching the duration of their assets (as best they can) to the very long duration of their liabilities.
The usual way to do this is to buy long-term bonds, although derivatives can also be used.\(^1\) And, having been blindsided by the huge recent increase in the present value of liabilities due to the unprecedented fall in interest rates, pension and insurance managers want to make sure they’re hedged against further increases in the present value of liabilities in case interest rates fall further. The upshot is massive demand for long bonds, almost at any price.

As a result, long-term investors such as pension funds and insurance companies have contributed to the negative interest rate mystery. It is not just central banks. But the fall in interest rates that spooked (and sometimes bankrupted) them would not have occurred if central banks had “behaved,” keeping interest rates within more or less normal ranges instead of lowering them — years after the Global Financial Crisis was over — to levels that only make sense in a true economic emergency, if they ever make sense at all. It is to this topic that we turn next.

**The end of the age of experts?**

In this section, I engage in some speculations and draw some conclusions. They are my own, not Bhansali’s or Greenwood’s.

The actions of central banks in 2008 as lenders of last resort saved the global financial system from collapse. They followed Walter Bagehot’s rule during a bank run: “Lend without limit, to solvent firms, against good collateral, at ‘high rates’.\(^2\)” This they did, despite questions about how good the collateral was. In the case of the United States, the Fed made about $100 billion per year doing so.

But, the subsequent years of massive stimulus provided by central banks to promote economic growth aren’t working. Global growth continues to be well below potential. This is not because central bankers haven’t provided enough stimulus — they’ve probably provided way too much — but because growth does not come from either monetary or fiscal policy.

In an accounting sense, two and only two factors account for long-term economic growth: how many people are working and how productive they are. The latter factor, however, is complex and it does not mean working harder (although that can be a consideration), but working smarter and with better tools. In other words, long-term economic growth *per capita* primarily comes from technological change: people finding ways to do more with less.

**The role of governments and central banks in the economy**

There are some necessary but not sufficient conditions that need to be supplied by government: an adequate (and also stable and predictable) rate of growth in the money supply; the public goods that are provided by any competent government (this is the fiscal side); and, most importantly, secure property rights and the rule of law.

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\(^1\) A purchase of duration in the derivatives market will have roughly the same effect on long-term bond prices as a purchase of the bonds themselves, because the derivatives issuer or counterparty has to hedge their own risk by transacting in the bond market.

\(^2\) Bagehot’s (1873) thoughts, as summarized by Tucker (2009).
Education and infrastructure are also vital. But the ingredient that government cannot supply is the widespread desire to improve one’s condition, expressed through enterprise, savings, and technological improvement over time. Paul Romer won a Nobel Prize for saying something along these lines.

If a visitor from Mars observed the behavior of central banks around the world in the last ten years, he or she (or, more likely, “it”) would conclude that they had not studied either their Keynes or their Friedman — which are required reading for all economists. Instead, they seem to be using a recipe book to promote growth that is based on a serious misunderstanding of both men’s contribution to economics.

**KEYNES VERSUS THE KEYNESIANS**

Keynes said that governments should engage in deficit spending in emergencies. The point of this is not just to alleviate the suffering caused by the emergency but also to “prime the pump” so that people have money to save, invest, and deleverage. But, when there is no emergency, Keynes said that governments should run a surplus, in effect building up a savings account to be used in the next emergency.

*But to today’s central bankers and legislators, it’s always an emergency.* Deficit spending is a permanent policy, and government debt just grows and grows. This cannot end well. Because countries don’t default on debt issued in their own currency, we can expect that, sooner or later, substantial inflation will cause the debt to be paid back in cheaper dollars, or euros, or whatever.

This latter behavior is called Keynesian by its supporters but Keynes is rolling around in his grave. There is, however, an emerging recognition of the limits of central bank policy by central bankers. Recently, at a Global Interdependence Center/Fundacion Rafael de Pino conference in Madrid, Luis de Guindos, vice president of the European Central Bank, made the case that there are limits to what central bank policies can do to promote long-term growth. He suggested that

> it is very important to be humble… central banks are not almighty. We cannot address all the problems in the world…mainly because…there are other actors in [the economy]… If we are humble and if we believe we are not the saviors of the world, there are other people [who] will start to take decisions in other areas of economic policy.

“Central bank policy,” de Guindos concluded, “needs to be humble and respect the roles of fiscal policies, regulation, and labor market flexibility.”

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3 Leijonhufvud (1968) explains this distinction in the revealingly titled *On Keynesian Economics and the Economics of Keynes.*

**FRIEDMAN VERSUS THE MONETARISTS**

An apocryphal saying in monetary economics is that the money supply only matters when it’s broken. It aligns closely with the position taken by Milton Friedman, but I can’t find that he said it.

When the money supply is broken, that means there is too much money in circulation (and you get inflation) or not enough (and you get a depression). But that sentence only makes sense in the context of a quite technical and narrow definition of the word “money.” What matters for most economic decisions is the quantity of real economic resources available to people, not the number of little pieces of paper used to trade them. A shortage of real economic resources does not cause inflation (except in the very short run as prices adjust). More importantly, an oversupply or “general glut” of resources does not cause a depression. Quite the opposite: a depression is defined as a shortage of real economic resources – people not having enough of what they need.

“Monetarists” in central banks and in the academy appear to think that you can manage the economy by manipulating the money supply — that the money supply matters all the time, not just when it’s broken. They follow a recipe in which, if you want either inflation or economic growth, or both (and they think one comes with the other), you should expand the money supply vigorously and lower interest rates, even to negative levels.

Again, this helps no one except in emergencies when the money supply is inadequate to facilitate transactions. In non-emergencies, the money supply should grow at a stable and predictable rate, roughly equal to the expected long-term growth rate of nominal GDP. Friedman, too, is turning over in his grave. He and Keynes are making quite an underground racket together.

**HOW NEGATIVE INTEREST RATES CAN HURT PEOPLE – A LOT**

There are serious unintended consequences when a policy is pursued too far in the mistaken belief that if a little of something is good, more is necessarily better. There are legitimate reasons to cut interest rates at various times. But negative or even extremely low positive interest rates make it impossible to save enough money to generate adequate investment income. If you need retirement income of $100,000 per year, it becomes impossible to save enough money to generate that income if you earn negative interest rates. This is a serious problem because it makes it impossible to save enough money to generate adequate retirement income.

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5 There is also mounting evidence that the nature of money has changed enough since Friedman’s day that we need a new theory of inflation, the most promising one being Leeper’s (1991) Fiscal Theory of the Price Level (FTPL), expanded by Cochrane (2019). The FTPL, which augments Friedman’s work — it does not overturn it. Coleman, Oliver, and Siegel (2020) are writing a paper, to be published by the CFA Institute Research Foundation, that will explain and popularize this theory. We also note that the FTPL explains some past events better than Friedman’s original monetary theory; these include the ending, notably the resolution of the 1923 German hyperinflation through introduction of the rentenmark and the reflation of the U.S. economy in 1933 through revocation of the private right to possess gold.

6 While Keynes and Friedman are usually portrayed as opponents, the much younger Friedman respected Keynes’ technical skill as an economist while thinking his conclusions were wrong. Friedman said that Keynes’ General Theory (of employment, interest, and money) met all the tests of a good theory, except that it was falsified when tested against the data (Friedman 1986).

7 This is covered in greater detail in Coleman and Siegel (2015) and Siegel and Sexauer (2017).
year, you need $2 million at a 5% rate of return, but $5 million at a 2% rate of return, and an infinite amount of money at a zero or negative rate of return.

You can, of course, consume capital, and that is what people are doing. However, that strategy can easily come to a bad end. Your money might expire before you do.

**LET THE PEOPLE RULE**

So, I am hoping that the today’s policy failures mean that what Stephen Sexauer and I called “the age of experts” in earlier work\(^8\) is over, at least for the current episode. We used the phrase to describe the post-World War II period when economic *dirigisme* was explicitly in favor in most of the world, when the experts of the day — economists and mathematicians — were rock stars, crunching numbers to “optimize” the most desirable mix of economic growth, employment, and inflation.

But “the age of experts” equally applies to the present, as central bankers and legislators think they run the economy and pursue strategies to optimize on the same three variables! Having found out in the economic deterioration of the 1970s that they can’t succeed at this game of three-card monte, they have unlearned their lesson and are trying again. So far, they haven’t succeeded, and like the experts before them, they won’t. They mostly get in the way of the natural process of gradual improvement that takes place when individuals, sometimes organized into corporations, are motivated by the prospect of gain and an easier life to find ways of producing more while using less.

The age of experts will end only when the experts, or their bosses, the people, realize that the recipe isn’t working. The people are more likely to realize this than the experts, since no one likes to be put out of a job. But the people have to also realize that government cannot guarantee them a healthy economy. They can only do that themselves, using government as a tool to provide a nurturing but not overweening environment.

*Laissez faire, laissez passer.*\(^9\)

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\(^8\) Sexauer and Siegel [2019].

\(^9\) “Let us do, let us pass” (in other words, leave us alone) — attributed to a French vine grower in the 18th century when asked what the government could do to help him. It is the origin of the phrase “laissez-faire economics.”

In their book, *The Narrow Corridor*, Acemoglu and Robinson (2019) argue, correctly, that there can be such a thing as too little government as well as too much. A sufficiently weak state leads to the Hobbesian nightmare of “a war of all against all.” On the world stage, where there are many failed states, and thugs or “non-state actors” (bad actors) behave as a substitute government, this is a legitimate concern requiring remediation. However, in the highly developed countries that have negative bond yields, too small a government is not a realistic concern. My review of Acemoglu and Robinson is forthcoming in *Advisor Perspectives* (December 2019).
Laurence B. Siegel is the Gary P. Brinson Director of Research at the CFA Institute Research Foundation, an independent consultant, and the author of *Fewer, Richer, Greener: Prospects for Humanity in an Age of Abundance* (Wiley, 2019). He may be reached at lbsiegel@uchicago.edu and http://www.larrysiegel.org. Stephen C. Sexauer, CIO of San Diego County Employees Retirement Association (SDCERA) provided extensive comments on, and contributions to, this essay.

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